Master‘s thesis

Interactions and Management of the Stakeholders-Tourists-Trails-Environment system at Látrabjarg Cliffs (Iceland):

A comparative study with Moher Cliffs (Ireland)

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Interactions and Management of the Stakeholders-Tourists-Trails-Environment system at Látrabjarg Cliffs (Iceland): A comparative study with Moher Cliffs (Ireland)

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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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_____

Student‘s name

Abstract

Látrabjarg Cliffs (Iceland) are the biggest cliffs and sea bird colony of Europe. This site attracts an increasing number of international tourists. However, the current infrastructure presents on the site is not adapted for this tourism and the resulting pressure on the environment raises issues for the sustainability of this important site. Stakeholders are currently transforming Látrabjarg into a National Park and developing conservation and land-use plans to address these issues. The research objective is to help this development process by gathering information on how tourism should be managed at Látrabjarg in order to ensure sustainability of this tourist destination.

In order to meet this objective, a mixed method approach was chosen. Information was collected through a qualitative comparison with the planning and management process of Moher Cliffs (Ireland) case study. This tourist destination was chosen because of its many environmental and management similarities with Látrabjarg Cliffs. Information was also collected through on-site direct and indirect observations, key stakeholder's meeting. Literature and information analysis was done to answer research questions.

The research has proposed a new approach for tourist destinations study through the Stakeholders-tourists-trails-environment systems (STTES) framework. The research found that the current path of Látrabjarg planning process presents numerous issues and concerns. These included stakeholder's conflicts and improper involvement, a profound lack of base data and analyses about tourists, society, economy, environment and tourist impacts, general lack of environmental and sustainability considerations and poor planning timeline.

Considering these findings, failure in tourism management, the sustainability of the STTES, nature conservation, and sustainability of Látrabjarg National Park is likely. The main recommendations of this research are to conduct more research before going forward in the planning process, to ensure proper and ethical stakeholder's involvement and empowerment, to finalize the land-use plan after the conservation plan and to better consider and apply sustainable and precautionary principles.

I want to dedicate the following work to the country of Iceland, its culture and its people.

Foreword

I came first in Iceland as a tourist and was struck by the magnificence, strangeness and contrast of the landscapes. I decided to come back in this beautiful country by the means of my master studies. Arriving in the small town of Ísafjörður in the Westfjords (around 2500 inhabitants), I didn't expect to meet such nice people and so rich a culture. It was a thriving environment for studying and for personal enrichment. The internationality of the students and professors has created interesting debates, knowledge and ideas sharing that have naturally led me to my research subject.

I didn't know at this moment that a master thesis could literally change a life but it did it for me, in an unimaginably positive way. There have been of course a lot of difficulties and uncertainties but as everything else in life.

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1 Introduction

1.1 Background

1.1.1 Látrabjarg Cliffs

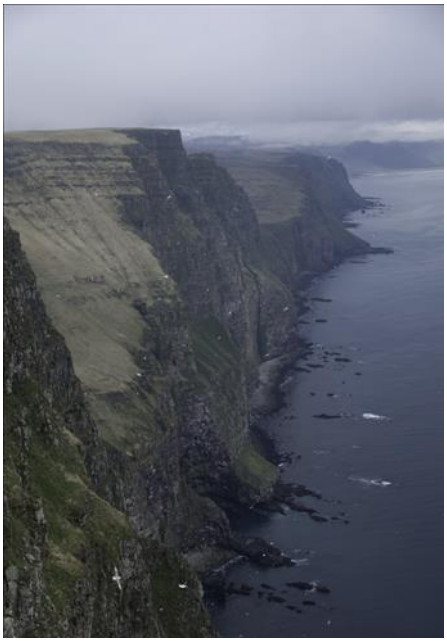

Figure 1.1 A portion of Látrabjarg Cliffs (Legatelois Marie©)

Látrabjarg Cliffs are Europe's biggest cliffs and host the most important cliff-breeding bird colony of Europe. Látrabjarg Sea Cliffs (also called maritime cliffs) are Europe extreme west land (excluding Canary Islands), are around 14km wide and 441m at their highest point (Þórisson et al., 2010, Umhverfisstofnun, 2013). The Cliffs are one of the most important sea-bird nesting area in the world (Baark ehf., 2014). They are situated in the southern part of the Westfjords, in the North-West region of Iceland, and are within the boundaries of Vestur-Barðastrandarsýsla County and Vesturbyggð municipality, which have Patréksfjörður as their main city (Figure 1.2). The cliffs are part of the Breiðafjörður geological feature and are composed of slightly inclined basaltic layers, alternated with fine sedimentary layers. The lowest layers are 13 to 16 million years old and are amongst the oldest rock formations of Iceland (Baark ehf., 2014).

The Látrabjarg colony hosts 40% of the world population of Razorbill (*Alca torda)*, 14% of Common Guillemot (*Uria aalge)* European population and a significant amount for other bird populations (Náttúrufræðistofnun Íslands et al., n.d.) making it of international importance. Consequently, Látrabjarg Cliffs designed an Important Bird Area (IBA) by Birdlife International (Birdlife International, 2013; Þórisson et al., 2010). It has not been designated a Ramsar Convention site (Ramsar Convention on wetlands, 2013), even though it seems to fulfil the conditions and could be considered to become one in the future (Þórisson et al., 2010). All these bird populations are currently in decline in Látrabjarg, except Thick-billed Murres (*Uria lomvia*) population which seems stable (Garðarsson, n.d.). There has been, for example, a decline of 30% of Common Guillemots and 44% of Thick-billed Murres in Iceland from 1983 to 2008 (Hilmarsson, 2011).

1.1.2 Tourism and other interests in Látrabjarg Cliffs

Since 2000, tourism in Iceland has doubled and grown at an average rate of 8.2% per year, despite decreases in some years (Óladóttir, 2014). The tourism industry represents 15.4% of Iceland GDP and so is of primary economic importance (Óladóttir, 2014). Continuing this rate of growth would result in 1 000 000 tourists coming to Iceland in 2020 (Óladóttir, 2013). This tourism is mostly driven by a fictive or real image of Iceland's wilderness, ecotourism and greenness (Sæþórsdóttir et al., 2011a; Taylor, 2011), strengthened by the current advertising campaigns and websites like "Inspired by Iceland" and "Visit Iceland" (Inspired by Iceland, 2013; Visit Iceland, 2013). Iceland tourism is also enhanced by numerous international awards (Icelandic tourist board 2013).

The main access to Látrabjarg Cliffs is a long, mostly gravel road from Patreksfjörður (Figure 1.2) (Vegagerðin, 2013). The road was resurfaced twice in 2013, but despite this the road was rough leading many drivers to lost control of their vehicle. Látrabjarg and the Westfjords region are difficult to access for tourists due the distance from classic tourist itineraries and the shape of the area. However, large numbers of tourists come each summer to visit Látrabjarg cliffs for their nature, ornithology and landscape. In 2011, a total of 50525 tourists visited the site (Óladóttir, 2013; Óladóttir, 2012).

The percentage of tourists coming to Látrabjarg Cliffs is also likely to dramatically increase. The overcrowding of the popular Golden Circle and Road 1's destinations combined with touristic advertisement efforts from the Westfjords (Mrs. Sturludóttir,

personal communication, 15th July 2013) make this peripheral destination more attractive. The increase of cruise ships passengers in Iceland (12.4% per year since 2000) and in the Westfjords (50% for Ísafjörður between 2011 and 2013) (Óladóttir, 2014; Óladóttir, 2013) could be a future source of increase tourism for Látrabjarg (Mr. Gíslason, pers. comm., 02nd July 2013). Moreover, Látrabjarg is internationally advertised. For example, National Geographic placed Látrabjarg Cliffs in its "Top ten Ocean Views of the World" (National Geographic, n.d.) and the region is widely described and known as a paradise for puffin photography.

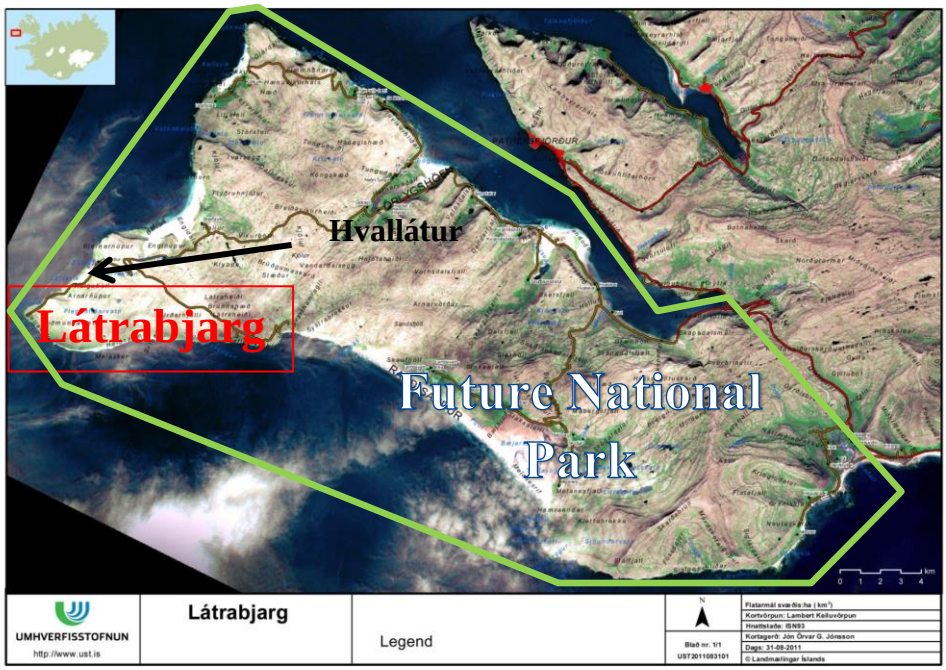

Figure 1.2 Map of the south-west of the Westfjords showing the location of principal places and the main roads. Red lines indicate asphalted roads and brown lines, gravel roads. Red surfaces are the towns (Umhverfisstofnun, 2011).

Látrabjarg Cliffs are historically and culturally important for farming, bird catching, egg picking and fishing history (Hjálmarsson, 2012; Umhverfisstofnun, 2013). Nowadays, there is a governmental ban on bird hunting and egg picking. A special authorization exists for the landowners of Látrabjarg (Umhverfisstofnun, 2013) who collect around 10 000 to 25 000 eggs per year (Mr. Gíslason, pers. comm., 02nd July 2013). The Látrabjarg area is also known a good location for Arctic fox (Alopex lagopus) hunting (Mrs. Unnsteinsdóttir, pers. comm., 04th March 2013) and mink (*Neovison vison*) hunting (Mr. Stefánsson, pers. comm., 08th March 2013). Many archeological remains are present in the area (Mr.

Edvardsson, pers. comm., 29th March 2013) and people can hear about the Monster of Látrabjarg folk tale (Hjálmarsson, 2012).

1.1.3 Concerns at Látrabjarg Cliffs

Numerous environmental, economic and social concerns arise in this context. The environmental issues include tourist safety, trail erosion, pollution, lack of infrastructure, and animal disturbances. Trails are on the cliff's edge, there are no fences and no proximate rescue facilities. This contributed in the death of one tourist in 2010. However, very few serious accidents have occurred in the past (Mr. Gíslason, pers. comm., 02nd July 2013). A more important issue is that tourists can theoretically hike on the entire length of the cliffs but it is easy to become lost or be put in a dangerous situation. The trail is poorly marked, often foggy conditions are present and there are deep and dangerous access valleys with misleading sheep trails. This security concern in Látrabjarg is in line with the current concerns in Iceland about tourists and rescuers security. The parliament member of Alþingi (the Icelandic Parliament) recently called for a risk assessment of Icelandic tourist destinations (Hávarðsson, 2014, 20th January).

Trail erosion and trampling are currently causing slippery conditions (Mr. Ásgeirsson, pers. comm., 12th June 2013) and will negatively affect plant composition (Umhverfisstofnun, 2012; Mr. Heiðmarsson, pers. comm., 2013; Vesturbyggð, 2003). Other concerns include pollution, lack of infrastructure and possibly animal disturbances. Economic issues include the lack of financial benefits from tourism in Látrabjarg, especially for locals and the lack of accommodation for tourists. Social issues include the underdevelopment of the region, employment insecurity, disturbances to locals from tourists, the presence of more than 100 Icelandic landowners and the ban of egg and bird picking (Mr. Gíslason, pers. comm., 02nd July 2013; Umhverfisstofnun, 2013).

1.1.4 History of the planning process

Local communities saw these issues but also saw opportunities for economic and social developments. These opportunities include protection of natural and archeological features, supporting that protection with a holistic land-use and conservation plan, better maintenance of roads and clearer demarcations of paths, increased watching by rangers, better access to the area, increased tourist information and trail markings and increased research on animal, natural and cultural features in the area (Unknown, 2013). As a

consequence, the 2006-2018 master plan for Vesturbyggð Municipality (Aðalskipulag Vesturbyggðar 2006-2018) set tourism management and preservation of the area as primary goals (Mr. Ásgeirsson, pers. comm., 12th June 2013; Vesturbyggð, 2003). It has also been decided under the Icelandic Nature Conservation Plan of 2004-2008 and 2009-2013 that the area of Kleifarheiði to Látrabjarg should be preserved (Baark ehf., 2014; Mr. Ásgeirsson, pers. comm., 12th June 2013; Náttúrufræðistofnun Íslands et al., n.d; Skipulagsstofnun, 2012; Vesturbyggð, 2003).

Vesturbyggð Municipality with the landowners decided to preserve the area under the status of a National Park (Mrs. Sturludóttir, pers. comm., 15th July 2013). The work started in January 2011 and currently focuses on the 89.6 km^2 Keflavík-Breiðavík-Látrabjarg area (Figure 1.3) (Umhverfisstofnun, 2013). The Icelandic Natural History Institute (Náttúrufræðistofnun Íslands) conducted environmental research to advise which area should be protected (Mr. Ásgeirsson, pers. comm., 12th June 2013; Náttúrufræðistofnun Íslands et al., n.d.). A land-use proposal was developed by the engineering firm Baark (Baark ehf., 2013, 28th February; Baark ehf., 2014) for Vesturbyggð Municipality and in collaboration with the Environment Agency of Iceland (Umhverfisstofnun) and other stakeholders.

An Environmental Impact Assessment (EIA) was included in this land-use plan, as required by the Icelandic legislation (Mr. Ásgeirsson, pers. comm., 25th February 2014). The final land-use plan proposal was made public on the 24th February 2014 and is open to review until the 26th Mai 2014 (Mr. Ásgeirsson, pers. comm., 25th February 2014). Its outcomes are infrastructures development like new parking, tourism buildings, accommodations and a new access road that would avoid Hvallátur village (see APPENDIX A) (Baark ehf., 2014). If there are no drastic comments, this land-use plan will pass (Mr. Ásgeirsson, pers. comm., 25th February 2014).

Figure 1.3 First area of focus to be transformed in National Park (green hatching) (Umhverfisstofnun, 2011b).

The Environment Agency of Iceland, Vesturbyggð Municipality in collaboration with landowners and other stakeholders (see section 6.2.4) are currently working on a conservation plan for Látrabjarg through a working group (Mr. Ásgeirsson, pers. comm., 12th June 2013).

This work started in October 2013 and is due to finish in January 2015. The conservation plan aims to maintain the value of the area in the spirit of sustainable development and to prepare the establishment of the national park (Mr. Ásgeirsson, pers. comm., 12th June 2013).

1.2 Research objectives and questions

The main objective of this study is to generate advice on the widest range of topic possible through literature analysis and comparison with a case study, to help planners currently working on the future management of tourism at Látrabjarg Cliffs. The main research question is: How to best deal with tourism at Látrabjarg Cliffs?

In order to answer this broad question, we should ask and explore the following seven sub-questions:

1. What is the current situation and future trends regarding tourism in Látrabjarg Cliffs?
2. What are the possible or certain, positive or negative impacts of tourism at Látrabjarg Cliffs?
3. What opinions are held by different stakeholders about how to best deal with tourism at Látrabjarg Cliffs?
4. What is the state of knowledge on the social, environmental, economic features and their interactions in Látrabjarg Cliffs?
5. Which system framework could be used to describe and analyse Látrabjarg Cliffs?
6. How does the chosen comparison site Moher Cliffs in Ireland help understand opportunities and threats in cliff planning and management processes?
7. What measures could enhance tourism planning and management of Látrabjarg Cliffs?

Tourism at Látrabjarg Cliffs is expanding at a rate that requires the rapid development of a planning and management framework. The international importance of the site for many species and geological features must be recognized. Lack of research and knowledge on this area is a main problem that could cause impacts on the environment and security to become problematic. This lack of knowledge leads also to certainties, propositions and believes that differ greatly amongst stakeholders and that are without support from any scientific study or observation. This can lead to mistakes and failures in the current planning process, even if an appropriate precautionary principle is taken. Increasing and unmanaged tourists in Látrabjarg Cliffs will surely decrease the value of this natural site for all stakeholders in the long term.

1.3 Scope of the thesis

1.3.1 Geographical limits

This research focuses on the area of the Látrabjarg Cliffs sea bird colony (Figure 1.2). It represents a length of 14 km of cliffs on the height that varies up to 441m. The future

national park has a boundary currently settled up to two km from shore in front of Látrabjarg (Náttúrufræðistofnun Íslands et al., n.d.; Unknown, 2013). The present research area width is approximately two km from shore and approximately 100 m inland because that is the average limit of the nutrient uptake to the soil by the birds (Arnþór Garðarsson, pers. comm., 09th June 2013). This area is in fact much larger than the traditionally named Látrabjarg Cliffs, but for reader easiness and as it is internationally known under this name, all the extent of the cliffs will be referred to under the term "Látrabjarg Cliffs" or just "Látrabjarg" when including the surrounding area.

There are two areas of touristic interest in the region: Látrabjarg Cliff's bird colony and the secondary Látravík beach bird colony. These areas could be seen as a continuum as tourists often stop at Látravík before or after visiting Látrabjarg and the distance between them is only three to four kilometers. Nevertheless, the ecological and social differences between these two areas are a limitation to including them both in this research. A separate study would be necessary to study Látravík. Although this research focuses only on Látrabjarg Cliffs, Látravik will not be forgotten and will be mentioned and taken into account because the current land-use and conservation plans cover this area.

On a bigger geographical scale, a focus will be set on the accessible zones for tourists, especially the trails which are the main places where direct interactions between human and environmental features take place. It is the reason why a special section on trails will be included in this research.

The social, economic and ecological aspects integrated in this research widen the total geographical range. This range is difficult to determine because of a lack of data on the area, but also because the geographical range will vary for each stakeholder and element considered. Látrabjarg includes stakeholders that have different time and geographic scales. Some come from around the world (e.g. Travel agencies, Tourists), from across Iceland (e .g. Umhverfisstofnun, Icelandic government) or are locals (e.g. Landowners). Some spend no time (e.g. Government), less than one day (e.g. Tourists), less than a week (e.g. Tourists, Researchers) or a summer (e.g. Landowners) in the area. Nevertheless, this area should at least include Patrekfjörður town and area where tourists stay in accommodations before and after visiting Látrabjarg.

1.3.2 Topic boundaries

Látrabjarg planning process is currently on-going and the land-use plan is in its final stage. The research approach is to provide advice on the widest scope possible rather than focussing on one subject, in order to help as much as possible decision-makers. Consequently, the broad scope of this project means that the research necessary includes many different topics. Focus will be on social and environmental topics. However, due to its wide scope, the research will not analyze in depth every sub-topic. For example, the ethic of tourism or ethic of management will not be part of the focus of my research. Economic topics are briefly overviewed through literature analysis but no market or other economic analysis will be done.

In Chapter 5 about stakeholders, no social analysis is undertaken. The apparent relationships between stakeholders were determined by literature review and only a few interviews and therefore may not be representative of a larger sample size. The research will briefly enter into the social problems that have been raised and are possibly rising in the future around tourism and its management in Látrabjarg.

Environmental topics will be studied more in depth because they are the main feature linking tourism to Látrabjarg Cliffs. The environment is also the main feature that is to be protected in the planning process and in managing tourism. However, due to data limitations, no precise quantitative analyses could be done on environmental data. Literature and on-site direct and indirect observations were the main sources of information on environmental topics in this research. Numerous field studies and statistical analyses should be undertaken to collect numeric data and to reject or approve hypothesis made in the present research.

1.4 Structure of the thesis

Chapter two clarifies necessary definitions and concepts. Before entering into the research itself it is important to make sure the reader knows what it is meant when using important terms such as, tourism, sustainability or cliff.

Chapter three is an overview of the knowledge on the research subject. Chapter four discusses the methodology used in this research.

Chapter five is the presentation of the stakeholders, their interactions and their roles in the planning and management process of each of the case studies. This chapter on stakeholder's interactions will review the interactions between the stakeholders and tourists, stakeholders and trails and stakeholders and environment relations of the Stakeholders-Tourists-Trails-Environment system (STTES).

Chapter six will discuss different issues around the trails, the planning and management process in each case study. This chapter will focus on the interactions between tourists and trails and the trails in the planning process.

Chapters six and seven will present critical information on the STTES of the two case studies. The case study comparison and the results extracted from this comparison in the form of recommendations are explained in chapter seven. This chapter will contain the most important information for Látrabjarg planning process and for tourism management as it contains all the recommendations for decision making and recommendations about future research needed on Látrabjarg.

Chapter eight concludes the thesis. This chapter will give an overview of what has been done through the thesis and will summarize the main recommendations that can be draw from this research.

2 Definitions and concepts

This chapter will review important definitions and concepts used in the research such as cliffs, sustainability, tourism and wilderness. The concepts of a Stakeholders-Tourists-Trails-Environment system (STTES) and a precautionary principle are introduced, and reasons given for why carrying capacity is not a reliable enough concept to be used in this research.

2.1 Definition of cliff

Cliffs are defined in the following ways:

- "*A high area of rock with a very steep side, often on a coast: Keep away from the edge of the cliff - you might fall*." Cambridge Dictionaries online, 2013
- "*Littoral escarpment more or less steep due to the action or the presence of the sea and whom the foot ordinary connects to an abrasion platform*." Larousse, n.d.

It is interesting to note that almost all of these simplistic definitions make a partial or total connection to the sea. Only a pure geological definition does not refer to any surrounding element of the cliff (Larson et al., 2000). It shows that sea cliffs have a particular appeal for people. Even without the sea associated, cliffs represent beauty and danger that result in a powerful attraction (Larson et al., 2000).

Cliffs are also called precipice, bluff or rock fall. Rock outcrops are defined as "a portion of bedrock protruding through the soil level" (Larson et al., 2000, p.8). So cliffs are rock outcrops but not all rock outcrops are cliffs. For Larson et al. (2000), for an outcrop to be called a cliff it needs to have the followings features: the presence of a level of sloping, a platform or a plateau at the top; a pediment consisting of base rock at the bottom; and a vertical or near-vertical part, called cliff face or free-face, in between. In addition, the face should be tall and steep. Tallness is relative to the observer and so introduces a species bias. A satisfying definition of cliff minimum height would be "high enough that falling off will kill you" (Larson et al., 2000, p. 8). It is otherwise impossible to define a critical angle that separates cliffs from other structures. A certainty is that slope angles from 180° to 90° are all strictly "cliffs", whereas angles less than 90° are less so. An issue with this

definition is that cliffs are not homogenous from bottom to top and can present much less steep slopes in middle of vertical or overhanging parts, as is the case for Látrabjarg cliffs.

Cliff in its narrowest sense is only the cliff face but in a broader sense it includes a cliff edge and a talus, also called talus slope at the bottom (Figure 2.1). The cliff edge is the zone from the face back an arbitrary distance and the cliff talus is the accumulation of rocks from the cliff face that have accumulated at the bottom of this one. The cliff edge and talus experience many of the same processes; hold many of the same plant and animal species as the cliff face and so are ecologically linked to it. In this research when using the term cliff, it will refer to the broader sense of cliff that includes cliff edge and talus.

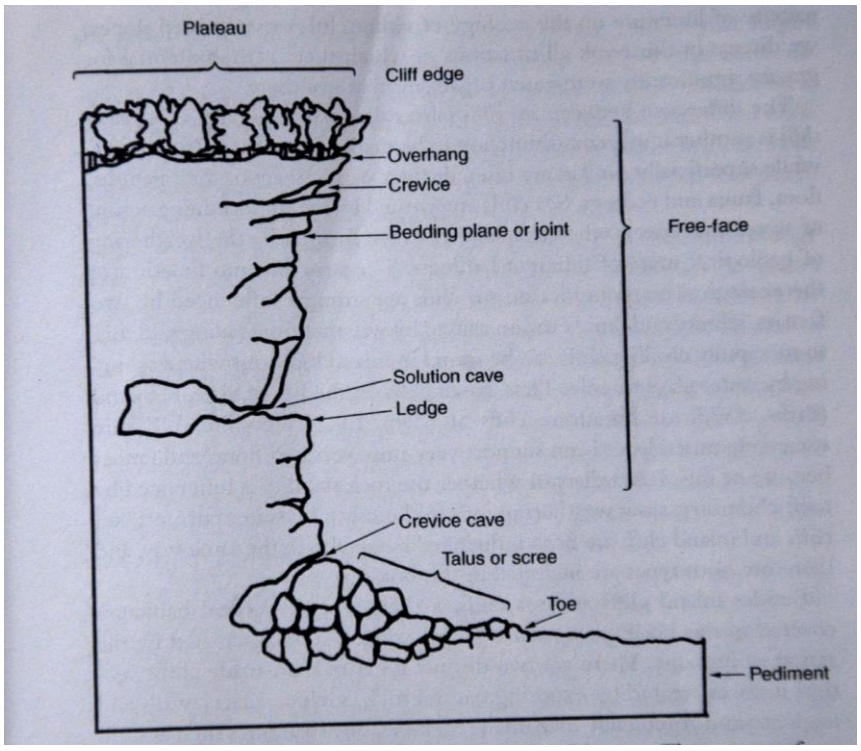

Figure 2.1: Illustration of frequently encountered cliff features. The concept of cliff may relate to the free-face alone, or to the cliff edge, free-face and talus combined. On the face there may be cracks, crevices, ledges, overhangs and caves. The talus slope is composed of rock fragments and slabs derived from the free-face and the edge. The toe is the point where the talus slope meets the pediment, or base rock. Original artwork courtesy of C.E. Ryan (Larson et al., 2000).

Another distinction to make is the difference between sea cliffs and inland cliffs. Inland cliffs are formed by the weathering of different geological strata of different hardness. However, Látrabjarg Cliffs are sea cliffs which are formed by the action of water and waves and are exposed to the influence of salinity. Consequently, ecological,

geomorphological and human processes are completely different between inland and sea cliffs (Larson et al., 2000).

2.2 Sustainability concepts

The meaning of sustainability and sustainable development is a source of intense debate for both scientists and economists. One of the first sources utilizing the term sustainable development is Allen (1980, p.23) where it is defined as a form of development "that is likely to achieve lasting satisfaction of human needs and improvement of the quality of human life". The generally accepted definition of sustainability is the one from the WCED (Brundtland commission) report of 1987 "Our common future": "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs". Sustainability aims to be an ethical consideration as it states that we should not threaten current and future generation's possibilities (intra and intergenerational equity) but should secure human well-being (Ang et al., 2012; Hediger, 2006; Withagen, 2001; Ayres et al., 1998; Ott, n.d.).

This concept of sustainability is rooted in an anthropocentric conception of relations between human beings and nature: the debated consideration of ecosystem services and substitutability of different capitals (for example, natural and human-made) (Ang et al., 2012). These debates have created different views of sustainability: very weak, weak, strong and very strong sustainability (Figure 2.2) (Ayres et al., 1998).

Weak sustainability is dominant among economists (Ayres et al., 1998). A growth or development is weakly sustainable if it does not diminish from generation to generation. This strict criterion is referred to as "sustainedness" because it does not allow temporary decrease of development or growth (Ayres et al., 1998, p.1). A weaker criterion referred to as "survivability" states that a temporary decrease of development or growth is allowed as long as consumption levels exceed subsistence levels. Weak sustainability allows human-made capital to substitute for natural capital in order to maintain or increase human welfare in the future (Ang et al., 2012; Ayres et al., 1998; Ott, n.d.). It is named "Hartwick-Solow sustainability".

The very weak or "Solow sustainability" states an unlimited substitutability and constant consumption per capita where weak sustainability or "modified Solow sustainability' states

the existence of some restrictions to the substitutability and existence of critical natural capital and maintenance of welfare (Hediger, 2006; Turner et al., 2000). It implies that in weak sustainability, savings from exhaustible resources are re-invested in manufactured capital or human capital and that trade is a substitute to natural capital in order to maintain consumption. This last statement is known as the Hartwick rule (Ang et al., 2012; Hediger, 2006; Ayres et al., 1998) but has been proven to fail when the environment has been destroyed and the invested human-made capital has disappeared during financial crisis, leaving nothing to live on (Ayres et al., 1998; Ott, n.d.). The weak sustainability paradigm believes that sufficient technological progress would allow increasing human well-being despite environmental damages (Ang et al., 2012).

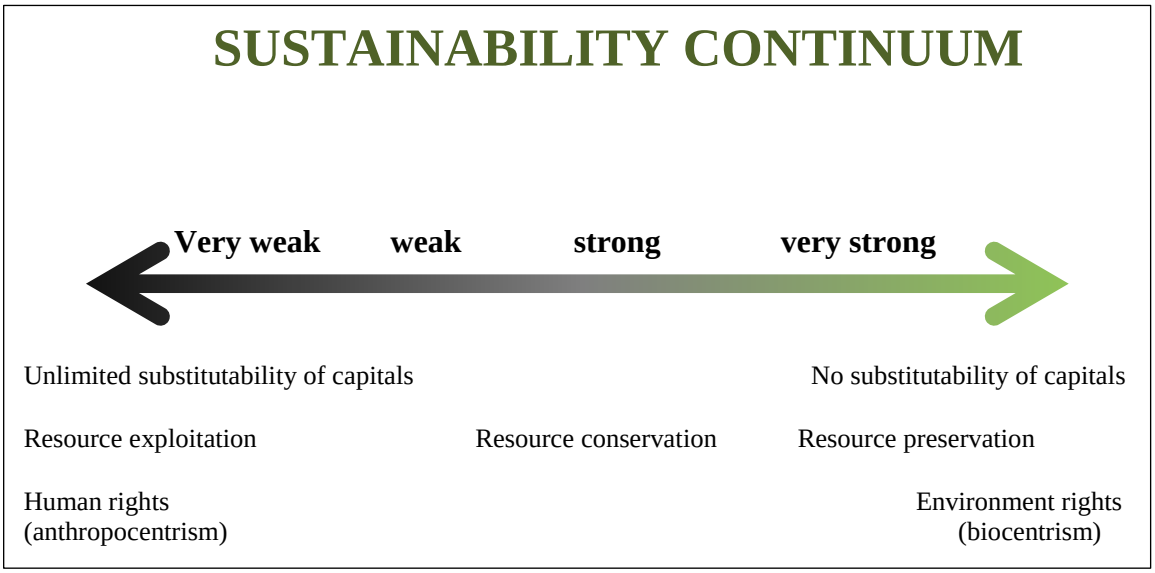

Figure 2.2 Continuum between very weak, weak, strong and very strong sustainability concepts.

A countermovement to weak sustainability is strong sustainability. It involves "conserving" the stock of human capital, technological capability, natural resources and environmental quality. Ecologists and biologists are often more in favor of this concept (Ayres et al., 1998). Under strong sustainability, social, natural and economic capital should be independently maintained as they are complementary and natural capital can become a limiting factor for the human-made capital but not vice-versa (Ang et al., 2012; Turner et al., 2000; Ayres et al., 1998). Natural capital cannot be substituted by human or physical capital due to the complexity and overlapping services of features in the environment. We also should not rely on technological progress to increase this

substitutability (Ang et al., 2012; Ayres et al., 1998; Ott, n.d.). Another consideration in strong sustainability is the "rights" of nature (Ayres et al., 1998).

Deep ecologists argue for a very strong sustainability underlined by biocentrism considerations (Ayres et al., 1998). This has also been called "absurdly strong sustainability" in order to dismiss it from practical consideration (Ekins et al., 2003, p.170). It says that every species and physical stocks have rights and should be "preserved", not only conserved. This extreme concept is quite critical because of the dependence of our economy on natural resources, the dynamic and continuous processes of the environment and the total change of our laws implied by the concept (Ayres et al., 1998; Turner at al., n.d.).

Neither very weak, weak, strong nor very strong sustainability have shown to be completely satisfactory. They present many downsides (for example: unrepresentative stock-flow framework of natural capital) and their arguments for substitutability of capital failed to explain the environmentalist paradox: observed increase of human well-being when natural capital goods and services decrease (Ang et al., 2012; Ott, n.d.).

2.3 Tourism

This section will explain the different concepts and definitions related to tourism that are primordial to approach for Látrabjarg National Park planning. It will clarify exactly what is meant when using the terms tourism, tourists, visitors, sustainable, eco and mass tourism.

2.3.1 Tourism, tourists and visitors

Tourism is a human industry and activity which can be defined as "… a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes" (UN-WTO, n.d.). The UNWTO (n.d.) defines a visitor as "… a traveller taking a trip to a main destination outside his/her usual environment, for less than a year, for any main purpose (business, leisure or other personal purpose) other than to be employed by a resident entity in the country or place visited" (UNWTO, n.d.). Although the terms 'visitor' and tourist' are often use synonymously, they are also frequently distinguished in the literature based on their length of stay "A visitor (domestic, inbound or outbound) is classified as a tourist (or overnight visitor), if his/her trip includes an overnight stay" (UNWTO, n.d.).

Surprisingly no official definitions of tourism, tourists or visitor were found in the Icelandic legislation and strategies. Tourism is defined as the activity of tourists but also the industry related to this activity. For convenience, in this thesis a clear separation will be made. The term tourism will only mean the activity and the term tourism industry the business around tourism. It is interesting to notice that tourists and visitors definitions make no reference to nationalities or foreignism. People visiting a place in their own country are considered as visitors or tourists at the same level as foreigners. A name distinction should always be made when these two categories are separated. The names of foreign or international visitors/tourists and local or domestic visitors/tourists will be used in this research. From the UNWTO definitions above, a tourist is a visitor but not all visitors are tourists. Látrabjarg experiences both tourists and visitors. To simplify, the term 'tourist' will be used in this research to cover both tourists and visitors.

2.3.2 Sustainable tourism, mass tourism and ecotourism

Continuing the discussion on sustainability and for answering research questions one and seven, we need to see how the sustainability concept applies to tourism.

Sustainable tourism is defined by the United Nation World Tourism Organization as: "tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of tourists, the industry, the environment and host communities" (European Commission Development, Cooperation Europeaid and UNWTO, 2013, p.17; UNEP AND UNWTO, 2005, p.12). (UNEP AND UNWTO, 2005). It is a state (and not a type) where tourism should achieve the three pillar of strong sustainability: economy, social and environment sustainability (UNEP AND UNWTO, 2005). In order to attain this state of sustainable tourism, the United and Environmental program (UNEP) and UNWTO have developed twelve equally important aims for an agenda for sustainable tourism that are economic viability, local prosperity, employment quality, social equity, tourist fulfillment, local control, community wellbeing, cultural richness, physical integrity, biological diversity, resource efficiency and environmental purity. The Icelandic Tourist Board uses the definition from UNWTO for sustainable tourism (Ferðamála stofa, n.d.). Sustainable tourism is complex and it is challenging to attain a real sustainable state. It is a single-sector concept and fails to acknowledge the inter-sectoral competition for resources, the resolution of which is primordial to attain sustainable development and long-term tourism sustainability (Wall, 1997). Sustainable

tourism is tourism where the stakeholders have a sense of ownership and desire for it to be of high quality. Otherwise, when stakeholder's interests are presumed rather than thoroughly researched, a status quo between stakeholders and tourism is managed. In this situation, the sense of community ownership and the confidence in the management strategy could be low. It is likely to cause failure and unwilling impacts in the long-term and is known as maintainable tourism (Hardy and Beeton, 2001).

Ecotourism is a term surrounded by confusion and there is no established conceptual and technical definition (Diamantis, 2004; Wall, 1997). It was first defined as "traveling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestations (both past and present) found in these areas" (Ceballos-Lascuráin, 1987, p.14). Another definition is "responsible travel to natural areas that conserves the environment and sustains the well-being of local people" (Blangy et al., 1993, p.32). The common components of ecotourism definitions are nature-based, educational and sustainable management that include economic, social, cultural and ethical issues (Diamantis, 2004; Weaver, 2001). Ideally, ecotourism is a sustainable tourism but with a focus on preserved natural settings, educations and local communities. For Weaver (2001), ecotourism is present whenever an enterprise makes every reasonable effort to ensure that its operations are sustainable, in line with current best practices. Otherwise, ecotourism seems to not be automatically sustainable (Wall, 1997). Ecotourism presents a spectrum from hard to soft activities (Figure 2.3). Hard ecotourism involves a small number of environmentally aware active tourists that expect few, if any, services and a direct experience. In contrast, soft ecotourism involves tourists expecting comfort, activity diversity and services and relying on interpretations of attractions. Soft ecotourism is often associated with "steady-state sustainability" that includes leaving an area in the same condition in which it was found. Otherwise, hard tourism is often associated with "enhancement sustainability" that involves improving the conditions of an area through donations and volunteer activity (Weaver, 2001, p.106).

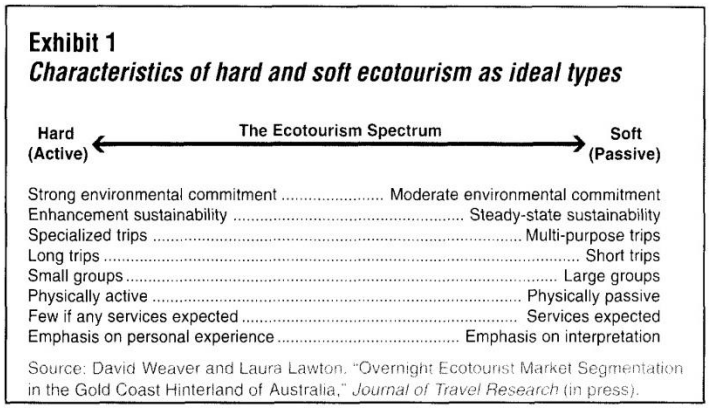

Exhibit 1
Characteristics of hard and soft ecotourism as ideal types

Hard (Active)	← The Ecotourism Spectrum →	Soft (Passive)
Strong environmental commitment		Moderate environmental commitment
Enhancement sustainability		Steady-state sustainability
Specialized trips		Multi-purpose trips
Long trips		Short trips
Small groups		Large groups
Physically active		Physically passive
Few if any services expected		Services expected
Emphasis on personal experience		Emphasis on interpretation

Source: David Weaver and Laura Lawton, "Overnight Ecotourist Market Segmentation in the Gold Coast Hinterland of Australia," *Journal of Travel Research* (in press).

Figure 2.3 The Ecotourism spectrum: Characteristics of hard and soft ecotourism as ideal types (Weaver, 2001, p.106).

Mass tourism is described as a phenomenon of modern societies (Mairesse, 2008). Common features of mass tourism include the participation of large numbers of people who have holiday experience through a standardized, all inclusive and rigid packaged product. Mass tourism is a distinctive type of tourism product that is manufactured, marketed and sold for an undifferentiated consumer (Mairesse, 2008). The key benefits of mass tourism are income and employment generation and competitive prices. Mass tourism consumers have generally little interest for local norms, culture, people or environment. They are also not really aware of the environmental impacts of the kind of tourism they are in (Mairesse, 2008). In contrast to mass tourism, small scale tourism involves no standardizing or pre-packaging product and target small groups with generally high awareness of the kind of tourism they are in and with specific interests such as nature, geology or archeology (Weaver, 2011). A misconception is that mass tourism cannot be sustainable or ecotourism compared to smaller scale tourism (UNEP and UNWTO, 2005; Weaver, 2001). Mass tourism due to its larger scale impacts and limited environmental interest, is more difficult to make sustainable or ecotourism (Weaver, 2001); however, the United Nation World Tourism Organization encourages "making all tourism more sustainable" (UNEP and UNWTO, 2005, p.11) and mass tourism could be beneficial for ecotourism and protected areas.

2.4 Wilderness

In Iceland unspoiled wilderness is a recently emerging concept. It was first precisely defined in the Icelandic Conservation Act 44/1999, chapter 1, article 3:

"*Wilderness: an area of land at least 25 km2 in size, or in which it is possible to enjoy the solitude and nature without disturbance from man-made structures or the traffic of motorized vehicles on the ground, which is at least 5 km away from man-made structures or other evidence of technology, such as power lines, power stations, reservoirs and main roads, where no direct indications of human activity are visible and nature can develop without anthropogenic pressures."*

This definition clearly states that humans are not part of nature and wilderness. Wilderness is considered as the most natural area and is the opposite of cities (Sæþórsdóttir et al., 2011b). However, this definition can differ from what tourists consider wilderness. Wilderness and tourism in Iceland will be discussed further in section 3.4.

2.5 Stakeholders-tourists-trails-environment systems (STTES)

Stakeholders-tourists-trails-environment systems concept (STTES) (Figure 2.4) will be used as a framework in this thesis. This concept is inspired by the recognized concept of Social-Ecological Systems (SES) (Walker et al., 2004; Walker et al., 2006). STTES concept has emerged through the literature analysis, the on-site observations and stakeholder's meeting done in this research. STTES helps understand Látrabjarg and Moher Cliffs case study and could potentially be used for other tourist destinations. However, due to research limitations, this concept is only a draft hypothesis that needs refinements and further research.

In the STTES concept, the tourists are the people defined in section 2.3.1 and 3.3. The term tourist in the STTES concept does not include the tourism industry and its components that are considered stakeholders. The trails in this research are the physically visible consequence of human passage. Trails originate through human influence (such as the simple presence of a person, the trampling or the littering) on the soil after one or more passage. The areas where humans are wandering with invisible or visible traces will be considered as off-trail hiking areas. As it is related to the trails and trails origin phenomenon, the term trail in the STTES includes these human wandering areas or trail influence areas. Stakeholder conflicts, tourism impact and management issues are originating from or pointing to trails at Látrabjarg and Moher Cliffs. This is why trails are an element by themselves in the STTES concept. The environment component of the

STTES concept includes every non-human living or non-living elements. It also includes the human cultural environment (such as legends, folklores and archeological remains) and spiritual elements (such as well-being, spiritual resourcing or belief). The stakeholder component of STTES includes people having an economic, ethical or social interest in tourists, trails or environment. However, this concept is a simplification of the reality in order to better understand and analyze a tourist destination. Each element of the STTES, especially stakeholders, is composed of many sub-elements that can have similar or opposite influences on the system. Economy and social issues are not particular elements of the system because of their natural presence in each of these elements.

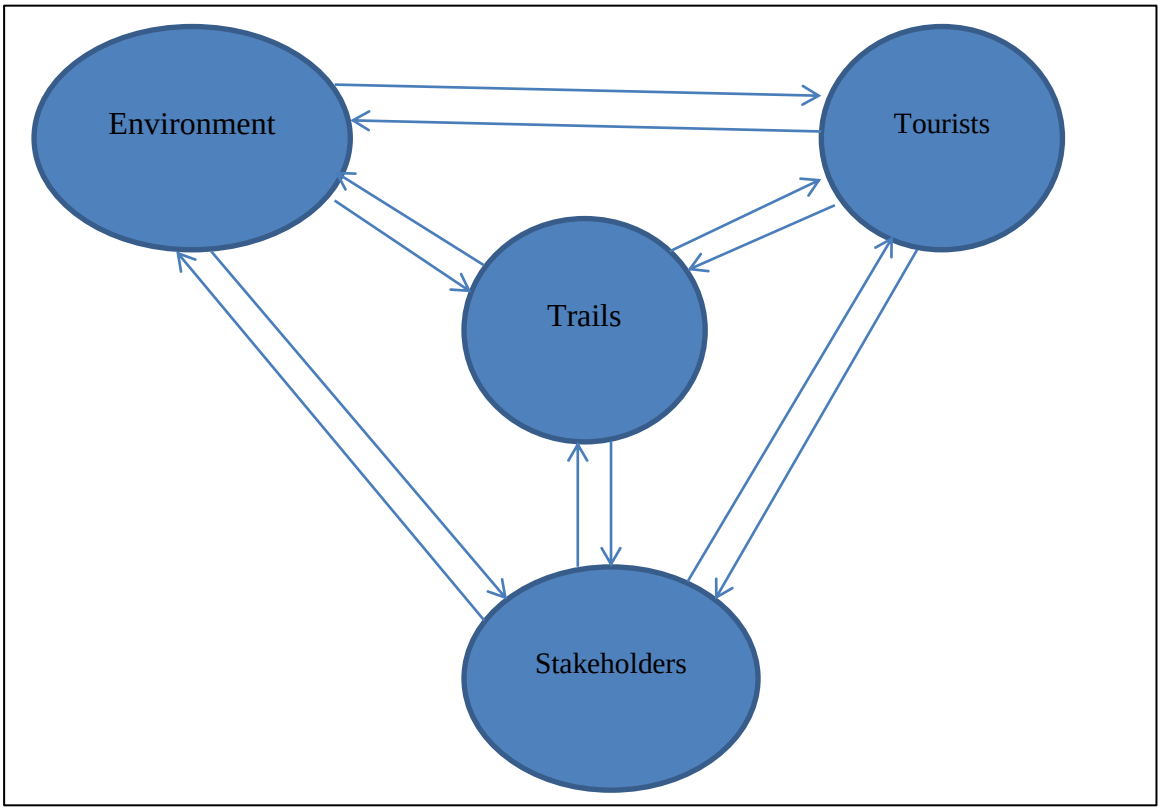

Figure 2.4 Graphical representation of the system Stakeholders-tourists-trails-environment. Circles represent the features of the system and arrows the influences of the features on other features.

This concept considers that stakeholders, tourists, trails and the environment are influencing each other through numerous interrelations. Changes can be made to the system. A direct action is when a modification of an element of the system is done: for example new trails are built. An indirect action is when for modifying an element, another element is changed and through its infuences will modify the targeted element: for example, to eliminate an invasive species in the environment, tourists could be educated to

destroy this species and so increase the quality of the environment. In any case, modifying an element will obviously automatically change its influences on other features. The complexity of the system makes it quite difficult to predict the consequences of a single modification at short or long term on any single element and interrelations. Through an effect of cascade, this change could cause a disruption of an existing equilibrium that would create permanent instability or a completely different state of the system. It is why precautionary principles should always be applied in decision processes and any environmental management must be carefully decided. The system will also have capacities of resistance that would moderate the modifications made and capacities of resilience that would allow the system to even come back to the original state (Adger, 2000). The capacities of resistance and resilience will determine the general stability of this system; that is, the "ability to weather a stress period or perturbation and return to normal afterward" (Harrison, 1979, p.659). Resilience mechanisms of SES have been well researched and would be interesting to look into more carefully for STTES (Walker et al., 2006; Adger, 2000).

2.6 Precautionary principles

A precautionary principle is based on "an ounce of prevention is worth a pound of cure". Precautionary principles states that "if there is a potential for harm from an activity and if there is uncertainty about the magnitude of impacts or causality, then anticipatory action should be taken to avoid harm" (Raffensperger and Tickner, 1999, p.1).

This principle was developed when scientific and governmental communities realized that our knowledge is sometime false and that there have been worse consequences than expected from the post-world wars industrial development. In the 1970s and 1980s some tools were developed to compensate the problem, such as risk assessment and cost-benefit analysis. However, these methods have some biases and are not totally satisfying. One of these biases is that these methods are "sound science" approach to decision making. It means that decisions are made only with the elements we know and what can be quantified, leaving other important unquantifiable elements unconsidered. Nevertheless, these tools have been used widely in decision making and agencies argumentations without any interrogation. Unwilling consequences are now appearing from this overconfidence in our scientific tools (Raffensperger and Tickner, 1999). Consequently, precautionary

principle is an indispensable concept in modern decision making to avoid bad and irreversible consequences. This principle will be follow in my research and particularly in the recommendations for management and planning of Látrabjarg area. Although this principle has been adopted, several have been rejected.

2.7 Concepts rejected

The World Tourism Organization defines carrying capacity as: "the level of tourists use, an area can accommodate…" while Mathienson and Wall (1982, p.184) consider carrying capacity more precisely as the maximum number of people who can use a place without an unacceptable alteration in the physical environment and an unacceptable decline in the quality of the recreational experience. Another definition by Buckley (1999) defines carrying capacity as a more ecological concept. He considers this concept to be the number of tourists that produces no detectable, or at least no irreversible, ecological change to the ecosystems in an area; or the maximum level of recreational use in terms of numbers and activities that can be accommodated by an area or an ecosystem before an unacceptable or irreversible decline in ecological values occurs.

It is an attractive concept but definitions are not clear and no good methodologies exist to measure it. In fact, many authors say that carrying capacity is a concept that is too complex and unreliable, cannot be measured by any rigorous analysis and is impractical in management and planning decision processes (Simón et al., 2004; Buckley, 1999). The reason is that the types and scales of future impacts in an area and the tolerance of the environment to these impacts, that have to be known precisely before taking any decision in management, are almost impossible to assess. Carrying capacity is unable to give an answer about the amount of use that an area can support (Simón et al. 2004; Sæþórsdóttir, 2004). For these reasons this concept will not be used in this research.

This chapter gave explanations of the most important terms and concepts used in this research. The following chapter will review what is the state of knowledge on the different subjects explored in the research and will help extract recommendations for Látrabjarg planning and management process.

3 State of knowledge

This chapter reviews the state of knowledge on different subjects discussed in the research such as cliffs, tourism, and wilderness. Specific knowledge on the Látrabjarg area is also explored.

3.1 Cliffs environment

Due to their verticality, cliffs experience particular conditions of insolation, accessibility, moisture, water availability, wind regimes, stability, temperatures that are much more different than in the surrounding environments (Larson et al. 2000). This is the reason why they hosts very different morphs, species and communities from the surroundings environment and are so attractive and indispensable for some of these species (Larson et al., 2000). Cliffs are a unique and interesting environment that has not been well studied (Larson et al., 2000). For more information on cliff geomorphology, ecology, usage and their interactions, the reader is recommended to refer to Larson et al. (2000).

Relatively more is known on the ecology and physiology of cliff nesting birds (Sandvik and Erikstad, 2008; Hunt et al., 1986). Particularly useful is a literature review of plant ecology associated with seabird colonies by Ellis (2005). Key literature on bird's sensitivity (such as tolerance to disturbances and minimal distances) from tourism seems almost nonexistent (Carney, 1999; Burger, 1981), which is surprising given that a large quantity of research on bird sensitivity to researcher manipulation and intrusion is available (Sandvik and Barrett, 2001; Carney, 1999; Rodway et al., 1996; Fetterolf, 1983; Ollason and Dunnet, 1980). However, the time and impact scale of researcher disturbances are really different from tourism disturbances.

Research on birds in Látrabjarg is not plentiful and is minimal in scope. Four aerial vertical transect surveys were conducted in 1986, 2005, 2008 and 2013; however, only results from the 1986 survey were published (Garðarsson, 1995). However, a general decrease of almost all populations has been determined (Garðarsson, 1995 and pers. comm., 02nd March 2013). A land sector counting survey is also currently on-going (Mr. Guðmundsson, pers. comm., 2013; Þórisson, 2010). Some papers available on Látrabjarg and Iceland

marine birds are Helgason (2011); Umhvefisráðuneytið (2011); Narfason (2005); Garðarsson et al. (n.d) and Náttúrufræðistofnun Íslands et al. (n.d).

White-tailed Eagles (*Haliaeetus albicilla*) are rarely seen in Látrabjarg and may be annual stragglers. There is one historical nest site known in the area, but it has not been occupied since the 19th century. White-tailed eagle's nests are protected within a 100 m radius of the nest (Mr. Skarphéðinsson, pers. comm., 04th March2013). Gyr falcons (*Falco rusticolus*) might hunt near or in Látrabjarg colony but the area is not a territory for them. Ptarmigans (*Lagopus muta*) are known to breed in the area but are spread out and in low densities (Mr. Nielsen, pers. comm., 18th March2013).

Few data are available about fauna and flora at Látrabjarg cliffs (Narfasson, 2005). Nothing is known about invertebrates (Mr. Ólafsson, pers. comm., 04th March 2013), arctic foxes (Mrs. Unnsteinsdóttir. pers. comm., 08th March2013) and minks (Mr. Stefánsson, pers. comm., 15th March2013). The only available data for minks and foxes are the registered kills from hunting. No complete and recent list of plants is available (Mr. Heiðmarsson, pers. comm., 14th May 2013; Narfason, 2005; Náttúrufræðistofnun Íslands et al., n.d.). Existing vegetation maps have scales that are too small to be useful (1:500000) and the current Icelandic vegetation mapping project (1:25000 to 1:40000) does not cover Látrabjarg and will not before some years (Mr. Guðjónsson, pers. comm., 05th March 2013). Nevertheless, it seems that Látrabjarg vegetation is mainly grassland with not many lichen species. Saxicolous (stone growing) lichens might be more prominent (Mr. Heiðmarsson, pers. comm., 14th May 2013).

More is known about geology at the cliffs (Narfasson, 2005) but almost nothing on economy and social issues (Umhverfisstofnun, 2013). CAD software format data on the numerous archeological remains will be public and accessible at an unknown date (Mr. Edvardsson, pers. comm., 30th March2013). However, an archeological report has already been published for Látrabjarg land-use plan (Lárusdóttir and Guðmundsdóttir, 2014).

3.2 Sustainability

Sustainability concepts have been the source of numerous literature and intense debates in environmental, social and economic research and decision processes, as discussed in section 2.2. Sustainability is mainly viewed by the public as a tool to protect the

environment; however, this view is false and the state of knowledge on its state, efficiency and relevance at Látrabjarg should be explored.

3.2.1 Látrabjarg and sustainability

Agenda 21 from the Rio de Janeiro Earth Summit of 1992 recommends that national strategies for sustainable development should be developed. The Icelandic Ministry of the Environment and Natural Resources (Umhverfis- og Auðlindaráðuneytið), formerly the Ministry for the Environment in Iceland, developed a 2002-2020 National strategy for sustainable development named Welfare for the Future. It uses the strong sustainability definition: "Sustainable development has three pillars: economic growth, social welfare and environmental protection. These three pillars must be studied in context and economic and social development must be strived for without harming the environment" (The Ministry for the Environment in Iceland, 2002, p.9).

Weak sustainability by the substitutability of natural capital with human made capital does not make preservation of the environment and natural resources a long term obligation. The weak sustainability path needs careful consideration because the capital substitutability assumption can lead to total environmental devastation with return to the original situation impossible (Ayres et al., 1998). Moreover, aggregate consumption (GNP) and other goods and services variable are used to measure human well-being, welfare and maintenance development in weak sustainability. Consequently, it is easy to forget to include ecosystem's goods and services in weak sustainability analyses as consumption is likely interpreted in produced goods and services (Ayres et al, 1998). In contrast, strong sustainability makes an obligation of preserving and maintaining natural capital, natural resources and so the environment in general. It is normally the objectives of protected areas and so it is in the Látrabjarg conservation and future National Park.

3.2.2 Tourism and sustainability

It is quite logical to reject the possibility of applying very strong or very weak sustainability for Látrabjarg area. Very strong sustainability is incompatible with the presence of tourists, locals and perturbed environmental state. Very weak sustainability is irrelevant with the willingness to implement a national park.

Otherwise, sustainability in the tourism sector does not seem a priority for the Icelandic Government. In its Parliamentary Resolution for a tourism strategy for 2011-2020 (2011), the only mention of nature protection is under the term "environment-awareness" and "maintain Iceland uniqueness" that is known to be nature. These mentions are quite small compared to the first objective "increase the profitability of the sector" (Icelandic Tourist Board, n.d.b). In the Tourism administration act n° 73/2005 (section 1, art. 1), the purpose of the act is set as "*to promote the development of tourism as an economic sector and an important facet of Icelandic economic and societal activity. The guiding principles shall be economic efficiency, Icelandic culture, environmental protection, professionalism, and the safeguarding of consumer interests"*. If sustainability cannot be seen in this statement (there are no social protection goals), environmental protection is at least of primordial importance.

Strong sustainability is a plus for advertising "environmentally friendly" tourism in Iceland. It would attract more tourists sensible to these considerations. Besides, strong sustainability could restrain and decrease the number of tourists willing to come to Látrabjarg because of the inconvenience of this concept about restrictions for conservation. It would mean stricter rules, less freedom and more pressure on tourists visiting Látrabjarg. But as economic outcomes of both weak and strong sustainability concept can be positive, the question here is more about what kind of tourism we want to see in Látrabjarg. Strong sustainability, even if restricting the number of tourists willing to come, could attract people sensitive to sustainable and ecologic considerations that could be willing to pay more (see section 3.6**Error! Reference source not found.**) and comply with the strict rules in order to be in agreement with their believes and have the premium of a preserved site with low visitation rates.

In contrast, weak sustainability is likely to attract more mass tourism (see section 2.3.1) that would be less sensitive and careful to the environment and would more likely cause environmental damages. As tourists coming to Látrabjarg are expected to be people interested in nature, birds and landscape (see section 3.3); it would be easier and more efficient to apply strong sustainability. Tourism in Látrabjarg under strong sustainability will decrease only slightly or increase by its "green" reputation. Economic benefits can increase in any case. In contrast, under weak sustainability, it will be more difficult to

attract mass tourism in the area where only natural features are of interests and where impacts would have increased, leading to increasing costs for small benefits.

Other capitals to take into considerations for sustainability are human, moral and cultural capital (Turner et al., 2000). These capitals are important in Látrabjarg due to the importance of culture in Iceland and social depletion of the region. These capitals are also endangered by tourism and the end of regular activities in the area by locals (for example there is no more farming). Another cultural capital is the archeological capital that is quite important in Látrabjarg (Lárusdóttir and Guðmundsdóttir, 2014; Mr. Edvardsson, pers. comm., 2013). These capitals cannot really be substituted with economic capital and they are strongly related with natural capital; therefore strong sustainability is recommended for conserving these capitals.

The next section will explain which type of tourism Látrabjarg Cliffs are experiencing and expecting in the future. Understanding this will help to make decisions about which sustainability should be implemented in Látrabjarg.

3.3 Iceland and Látrabjarg tourism

This section will answer research question one by reviewing which type of tourism Látrabjarg Cliffs are facing and likely to face in the future.

3.3.1 Tourism

Tourism management is a growing area in academic literature. It includes considerable research about economic and social aspects of tourism, including stakeholder's interactions and the theory and feasibility of sustainable concepts in tourism and ecotourism. However, extremely few have looked into combined sustainability (Buckley, 2012) and literature on tourism management presents gaps that are quite surprising, such as the responses of individuals to tourism and the land-use changes during protected area creation (Buckley, 2012).

General tourism impacts on the environment have been well studied, especially regarding trampling, trails and disturbance effects (Tomczyk and Ewertowski, 2012; Li, 2005; Cole and Spildie, 1998; Wilson and Seney, 1994; Dale and Weaver, 1974). There is also a relative good knowledge of tourism impacts on seabird colonies, especially on penguins (Villanueva et al., 2012; Burns, 2006; Walker et al., 2005; McClung et al., 2004) and

albatrosses (Wheeler et al., 2009; Buger and Gochfeld, 1999; Higham, 1998) but it seems that nothing exist for Northern Hemisphere seabird colonies (Carney, 1999).

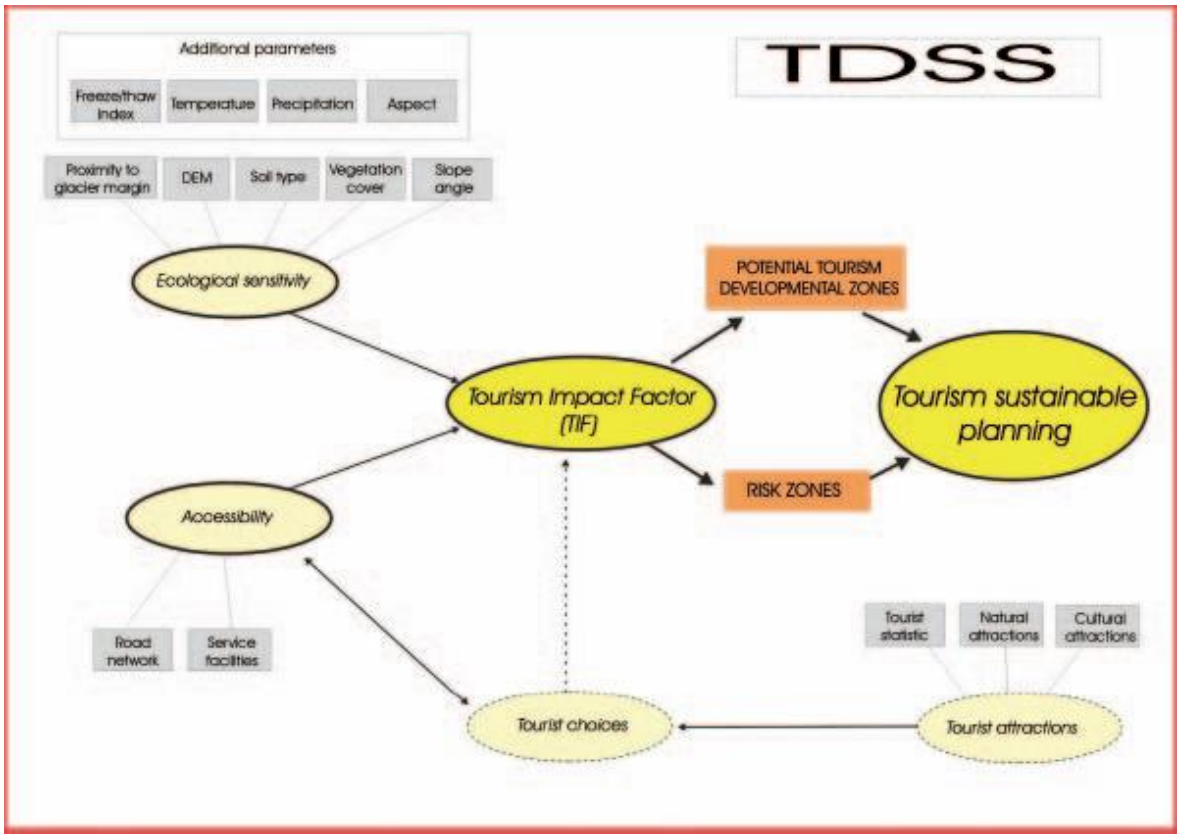

Figure 3.1 Conceptual model outlining the major influencing factors and variables in the Tourism Decision Support System (TDSS). DEM means Digital Elevation Model (Ólafsdóttir and Runnström, 2009).

An important methodology that has been developed for tourism assessment and planning of sustainable tourism is the Tourism Decision Support System (TDSS) (Figure 3.1). It uses Geographical Information Systems (GIS) to evaluate ecological sensitivity in fragile environments in using a great number of spatial variables and indicators (Ólafsdóttir and Runnström, 2013 and 2009).

3.3.2 Tourists to Iceland

Since 2000, international tourism in Iceland has doubled and grown at an average rate of 8.2% per year (Table 3.1) (Óladóttir, 2014). The tourism industry represents 15.4% of Iceland Gross Domestic Product (GDP) and so is of primary economic importance

(Óladóttir, 2014). Continuing this rate of growth would result in 1 000 000 international tourists coming to Iceland in 2020 (Óladóttir, 2013).

Table 3.1 Number of International tourists in Iceland from 2000 to 2013 and percentage of increase or decrease (Óladóttir, 2014).

	Number of visitors		Increase/decrease
2000	302.900	00-01	-2,3%
2001	296.000	01-02	-6,1%
2002	277.900	02-03	15,1%
2003	320.000	03-04	12,6%
2004	360.400	04-05	3,8%
2005	374.100	05-06	12,9%
2006	422.300	06-07	14,9%
2007	485.000	07-08	3,5%
2008	502.000	08-09	-1,6%
2009	493.900	09-10	-1,1%
2010	488.600	10-11	16,6%
2011	565.600	11-12	18,9%
2012	672.900	12-13	20,0%
2013	807.300	**00-13**	**8,2%**

A fictive or real image of Iceland's wilderness, ecotourism and greenness is what is driving tourism in Iceland (Sæþórsdóttir et al., 2011a; Taylor, 2011), strengthened by official advertising campaigns and websites like "Inspired by Iceland" and "Visit Iceland" directed toward international tourists (Inspired by Iceland, 2013; Visit Iceland, 2013). Cruise ships passengers are another type of international tourist. They have also significantly increased from a total of 26000 in 2000 to 95000 in 2013 with an increase of 12.4% in average per year (See table 3.2) (Óladóttir, 2014; Óladóttir, 2013). Along with this international tourism, around 90% of the Icelandic citizens (approximately 321 000) were travelling in Iceland in 2011 and 2012 (Hagstofa Íslands, 2013; Óladóttir, 2013).

Table 3.2 International cruise ships passengers to Iceland (Óladóttir, 2014).

	2010		2011		2012	
	Passengers	Vessels	Passengers	Vessels	Passengers	Vessels
Reykjavík[1]	62.673	67	91.954	81	92.412	80
Akureyri	49.475	56	66.383	62	71.338	63
Ísafjörður	21.000	31	31.385	34	42.317	38
Grundarfjörður	5.674	14	5.784	17	1.905	8
Vestmannaeyjar	5.087	17	4.744	17	5.928	15
Seyðisfjörður o.fl.[2]	4.974	10	7.150	14	5.989	9

[1]approximately 96% of cruise ships that visit Iceland berth in Reykjavik.

[2]In 2012, 396 passengers came to Djúpivogur and 376 to Húsavik.

International tourists in Iceland are principally coming for the nature and for the culture and history. Attractive price offers and low airfares are the third reason (Figure 3.2) (Market and media research, 2012). In an open survey question international tourists responded that both nature/scenery/landscapes and the blue lagoon were the most memorable experiences of their visit. Answers given were all related to nature, landscape, the people and hospitality and activities offered (Market and media research, 2012; Óladóttir, 2013). It shows how much international tourism in Iceland is related to natural attractions and activities. The green image is strong and tourism in Iceland is mostly nature-based (Gössling and Alkimou, 2006).

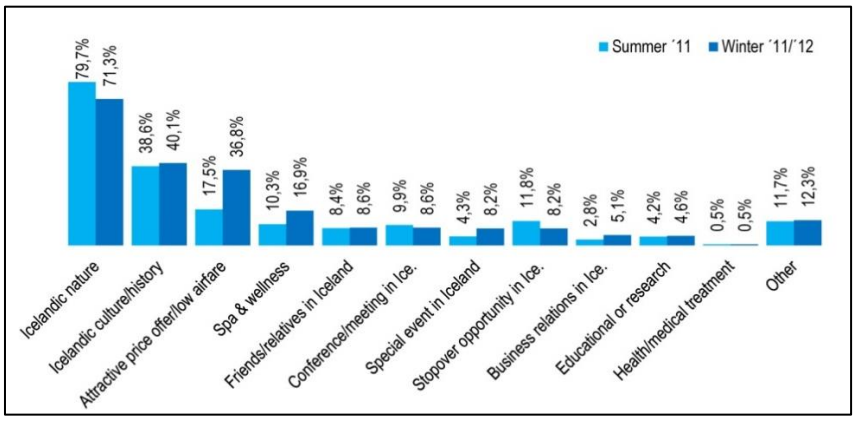

Figure 3.2 "Which of the following factors had a major impact on your decision to visit Iceland?" (Market and media research, 2012).

The reasons given for local travel are very different from those given by international tourists. Only 24.5% of locals travel for outdoor recreations and 5.1% for education (Figure 3.3).

Mass tourism does not seem the current type of tourism in Iceland, although the projected future increase in tourism numbers makes it possible to imagine the development of such tourism. The core question for the future tourism in Iceland and on shorter timeline for Látrabjarg is more: Is it wanted or wise to develop mass tourism or is it better to privilege more targeted small scale tourism?

Ecotourism is a term widely used by tourists, tourism industry and for tourism marketing in Iceland (Gössling and Alkimou, 2006). Iceland was, for example, selected as the best ecotourism destination in the world by the readers of *National Geographic Russia* in 2012 (Iceland.is, 2012). However, tourism is responsible for 18% of the national carbon emissions in Iceland, with two tons per tourist due to air travel. This is unsustainable and is

likely to become even less sustainable with the current strategy of the Icelandic Tourist Board to attract more tourists from further away markets. The risk is that Iceland will become a high-volume and unsustainable high value destination with a false image of ecotourism. From an international perspective, Iceland is not a true ecotourism destination. However, at a local level it seems it could be considered so due to the sustainability of Iceland's energy resources (except for transport fuel consumption) (Gössling and Alkimou, 2006).

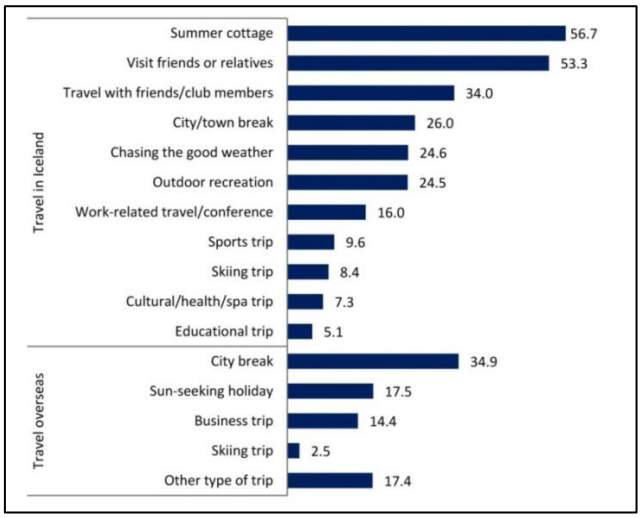

Figure 3.3 Reasons of planned travel for 2013 of domestic tourists (Óladóttir, 2013).

Rating of Iceland's tourism industry by international tourists is really good. Higher rating was given for nature activities in Iceland with the variety of nature-based activities that was rated 9 out of 10 and the service of companies with nature-based activities 8.5 out of 10. Almost all international tourists had their expectations met for the most part or to a great extent (96% in summer 2011) (Market and media research, 2012). Quality achievements need to be important in the future Látrabjarg National park to reach and contribute to the good quality existing in the Icelandic tourism industry and expectations of tourists. Labels, certifications and awards systems are a way of testing this quality and ensure incentives to keep and improve this quality. Which certifications could be relevant and their different advantages or disadvantages regarding Látrabjarg will be reviewed in the following section.

3.3.3 Quality certification in the Icelandic tourism industry

The majority of international tourists in Iceland recognized quality certification as very important (56.2% in summer 2011 and 64.5% in winter 2011/2012) (Market and media research, 2012). Certifications are developing in Iceland, especially with the new Iceland tourism's official quality and environmental label Vakinn. However, other forms of accreditation also exist.

The Vakinn was introduced in 2013 and took over the current rating system from the Icelandic Tourist Board. It is based on the ideology of sustainability and the balance between financial, social and environmental mainstays. It is a joint enterprise of Nýsköpunarmiðstöð Íslands (the Innovative Center of Iceland), Ferðamálastofa (Icelandic Tourist Board), Ferðamálasamtök Íslands (Icelandic Tourism Association) and Samtök ferðaþjónustunnar (SAF, the Icelandic Tourist Industry Association). The label will assess accommodation services with a five star system and a red logo and other travel services with a fail or pass system and a blue logo. Finally, an environmental logo identified in green will be introduced. It rates a company's status in regard to environmental issues with gold, silver and bronze classification (Ferðamálastofa, n.d.; Vakinn, n.d.). This certification system is new and not yet known to the international tourists but will be used widely in Iceland in the near future.

The Icelandic Tourist Board also awards an environmental award to tourism companies and individual having projects for achieving sustainability in tourism. These projects should be self-sustainable with quantitative and tourist education objectives. One award is given each year and it is used as a marketing tool for the companies awarded. Most of the awards have been given to accommodation services and tourist activity companies (Icelandic Tourist Board, n.d.a).

The Swan has been an official world-leading eco-certification for Nordic countries since 1989. It can certify products and services based on stringent environmental and climate criteria. It certifies 63 product groups, hotels, restaurants and cleaning services based on energy and water usage, kinds of chemical used, recycling and reuse of waste products, life-cycle analyses and other criteria. Some hotels, restaurants, businesses and industries in Iceland have already received this label (Nordic Ecolabelling, n.d., Umhverfisstofnun, n.d.a).

The European Destinations of Excellence (EDEN) award is an "initiative to promote emerging destinations and sustainable tourism" from the European commission on Enterprise and Industry. It is an annual national thematic competition for emerging, little-known destinations based on commitment to social, cultural and environmental sustainability. One destination is awarded each year for each participating country. Icelandic destinations have already been awarded including the Westfjords region under the theme Aquatic Tourism in 2010 (European Commission Enterprise and Industry, 2013).

The Green Globe certification is also used in Iceland (Green Globe, 2013, Gössling and Alkimou, 2006). This certification seems to be a-profit organization that has economic turnover goals. Their expertise in environmental issues seems to be limited and their approach and indicators to sustainability disputable and not adapted to Iceland (Gössling and Alkimou, 2006). This certification is not the best certification available for Iceland and Látrabjarg.

A more general but interesting program is the international environmental EarthCheck certification. It is the biggest certification organization in the tourism industry, certifies mainly tourism industries but is also the only organization that can certify communities. EarthCheck certification was developed by EC3 Global organization, the Sustainable Tourism Cooperative Research Centre, a nonprofit organization owned by the Australian tourism industry, government and universities. In Iceland, the Snæfellsness area applied to the EarthCheck community certification and was one of the first communities in the world to obtain the silver certification. It is a pioneer project and some problems occur such as certification costs, standards not perfectly applying to Icelandic conditions and a lack of knowledge in Iceland and Europe about this certification (Earth Check, n.d.; Matthíasdóttir, n.d.).

3.3.4 Tourists to the Westfjords and Látrabjarg

Around 13.9% of summer international tourists stay in the Westfjords during their travel in Iceland but only about 4.6% stay in winter. It is the least visited area of Iceland by international tourists (Óladóttir, 2014; Óladóttir, 2013) who principally stay for one to four nights in the region (Market and media research, 2012). The cruise ships coming to the Westfjords stop mainly in Ísafjörður. The number of cruise passengers and the number of

vessels have increased since 2000 and doubled between 2011 and 2013 (see Table 2.2). Domestic tourists to visit the Westfjords were 20.2% in 2011 and 22.1% in 2012, placing this region at the 6th place of frequentation after Reykjanes and Highland areas. Domestic tourists spend 8% of their night stays in this region and that is the smallest time spent for a region except the Highlands (2%) (Óladóttir, 2014; Óladóttir, 2013).

From the total of international tourists to Iceland, 6.7% visit Látrabjarg in summer and only 1.8% in winter (Óladóttir, 2014; Óladóttir, 2013; Market and media research, 2012). International tourists infrequently visit Látrabjarg in winter for the simple reason that the road is often closed by snow and avalanches (Vegagerðin, n.d.). Only 2.8 % of the local tourists came to Látrabjarg in 2011 and 2012, which represents around 8025 tourists in 2011 and 8054 in 2012 (Óladóttir, 2013). In total, around 50525 tourists came to Látrabjarg in 2012 (Hákon Ásgeirsson, pers. comm., 7th March 2013). In 2013, the number of tourists in Látrabjarg increased, especially in early and late summer (Umhverfisstofnun, 2013b; Umhverfisstofnun, 2012). A counting survey undertaken during the peak touristic season of June to August from 9 am to 9 pm, counted more than 30 000 tourists (Umhverfisstofnun, 2013b). This number is likely to increase with the general increase of tourism in Iceland and the international and local marketing efforts around the Westfjords and Látrabjarg (Ásthildur Sturludóttir, pers. comm., 15th July 2013).

3.4 Wilderness and tourism

Following the wwilderness definition provided in section 2.4, Látrabjarg can no longer be considered a wilderness area (Figure 3.4). Although, Icelandic vegetation has been transformed since settlement partly due to human activities and partly by natural processes, the landscape observed today in Iceland is largely a result of human activities. Consequently, it could be considered that Iceland does not have any wilderness areas left (Sæþórsdóttir et al., 2011b).

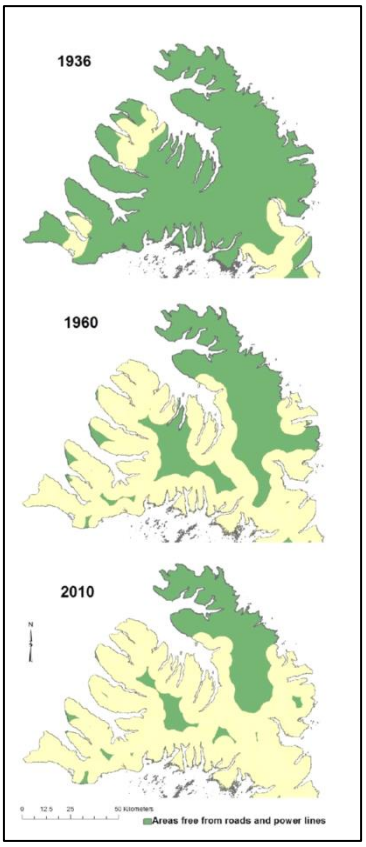

Figure 3.4 Area free from roads (green area) and power lines in the Westfjords peninsula 1936-2010, considered as wilderness (Taylor, 2011).

However, wilderness concepts and values along with the elements decreasing this wilderness vary for each individual people and nation (Sæþórsdóttir, 2013; Kuuliala, 2012; Sæþórsdóttir, 2004, Wall, 2003). Wall (2003) uses a wilderness purism scale to categorize tourists between purist, neutralist and urbanist perceptions toward wilderness on the base of their answer about what should be permitted in wilderness areas. Some human elements could be accepted in an area by tourists without relinquishing too much of its wilderness value (Figure 3.5) (Sæþórsdóttir, 2004). For example, some tourists appreciate and seek the capacity of visiting wilderness areas by roads but only if these roads are bad, with river crossings and adhere to the definition of a wild road (Sæþórsdóttir et al., 2011b). Different wilderness types could be considered in tourism for different types of tourists and Látrabjarg could be defined as "wilderness" for some people or some nations.

The image of wilderness is used extensively to promote Iceland. It is a valued element for some tourists wishing to take a break from modern city life. Stakeholders in municipalities and the tourist industry put pressure to increase the infrastructure comfort and quality in these wild areas. This is in opposition to what the current highlands (wilderness areas in

the center of Iceland) tourist market wants. This market considers that the current infrastructures are good because of the absence of luxury (Sæþórsdóttir et al., 2011b). Besides, pressure to have more luxury (such as better roads, bridges and huts) decreases the value of wilderness areas for the tourist market that remains (Sæþórsdóttir et al., 2011b).

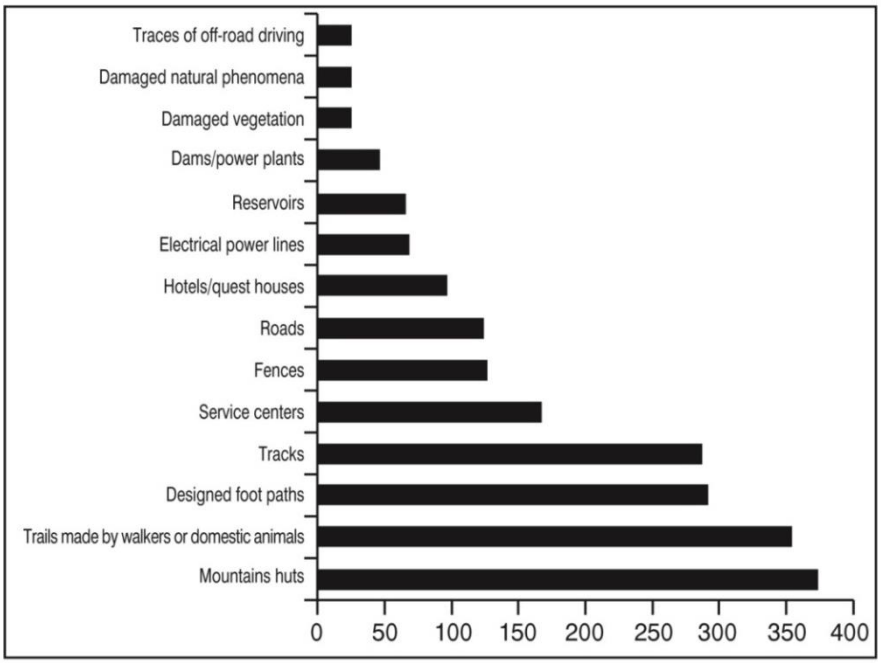

Figure 3.5 Result to the question "Which of the following may be present in an area for it still to be considered "unspoiled nature/wilderness" asked to 546 tourists of Landmanalaugar. 27% of them were from France, 17% from Germany, 14% were Icelandic and 10% from Nordic countries (Sæþórsdóttir, 2004).

With increasing popularity of a natural site, a change of tourist behavior can be noticed. With increasing tourism, a decrease in tourists with natural interest and seeking wilderness is observed to the profit of less nature interest tourists (Sæþórsdóttir, 2013). This difference of behavior will influence the impacts of tourists in an area. This will be explained in the next section on trails and tourism impacts.

3.5 Trails and tourism impacts

3.5.1 Trampling impacts

Hiking is an activity known to have significant impacts on the soil, fauna and flora of any given area. One of the major impacts of this activity is trampling. Trampling is the pressure action exerted by feet on the soil. In consequence, trampling impacts are largely inevitable

wherever recreation use occurs (Cole and Spildie, 1998). Trampling effects occurs either on trails, while travelling off-trails or at campsites (Cole and Spildie, 1998).

The key consequences of repetitive trampling are vegetation, soil and landscape degradation and erosion (Dumitraşcu et al., 2010, Li et al., 2005; Dale and Weaver, 1978). The soil is degraded because of the compaction resulting from trampling pressure (Dumitraşcu et al., 2010, Dale and Weaver, 1978). Soils resistance to compaction depends on the soil texture, density, structure and moisture (Dumitraşcu et al., 2010). Compaction causes an increase in soil bulk density, decreases soil porosity and availability of nutrients, increases soil temperature and causes moisture and aeration regimes to change (Dumitraşcu et al., 2010, Hockett et al., 2010; Wilson and Seney, 1994). This compaction also affects microbial activity (Dumitraşcu et al., 2010). Trampling also causes loss of organic litter (Hockett et al., 2010).

Compaction, loss of litter and microbial activity causes indirect negative effects on plant growth and seed germination (Dumitraşcu et al., 2010). Trampling direct effects on vegetation include introduction of non-native species, mechanical damage causing loss in vegetation cover, plant height, living biomass and species composition (Dumitraşcu et al., 2010; Hockett et al., 2010; Dale and Weaver, 1978). However, changes are species dependent (Dumitraşcu et al., 2010; Dale and Weaver, 1978) as their morphological and physiological characteristics determine the resistance, resilience and tolerance of each plant species (Dumitraşcu et al., 2010; Hartley, 2000; Cole, 1995). Hartley (2000) has shown that consequences of human trampling on dry meadow subalpine vegetation are long-term. Subalpine vegetation takes 19 to 25 years to completely recover when trampled 15 times per week for six weeks and 25 to 30 years when trampled 50 times per week for six weeks (Hartley, 2000). Trampling effects should so be assessed through long-term observations and vegetation is predicted to take many years to recover after trampling stopped (Hartley, 2000). Once vegetation is lost, acceleration of soil erosion is the main problem, especially when trails channel water that is not diverted from the thread (Wilson and Seney, 1994).

Trampling can have effects on insect species and any soil fauna (Hockett et al., 2010). Trampling can cause direct crushing and soil condition modifications that directly kill individuals, decrease the environment suitability and decrease reproduction success (Grandchamp, 2000; Bayfield, 1979). Another element impacted by trampling is

archeological remains. The compaction of the soil, increase water run-off and increase erosion due to trampling are likely to result in the destruction, exposure to weathering, arrangement modification and displacement of archeological remains (Hockett et al., 2010).

If hiking activity and consequently trampling increase, more impacts are observed (Cole and Spildie, 1998). Otherwise, this relation is not linear and other variables are responsible for differences of impacts between different areas (Cole and Spildie, 1998). The primary explanatory variables are the type of use, the amount of intensity of use, use behavior, time of use and durability of the trampled environment (Cole and Spildie, 1998). These are further detailed in the next section

3.5.2 Trampling effects influencing variables

Trampling disturbances depend first on the mode of exploration (Cole and Spildie, 1998). Walking has much less impact than horseback riding or motorcycling (Cole and Spildie 1998; Dale and Weaver, 1978). Horseback riding could be about six to ten times more damaging than walking (Cole and Spildie, 1998). Horses are likely to cause greater increases of soil compaction, litter, trail width and depth compared to hikers and motorcycles because of a higher force (weight per unit area) exert on the soil (Dale and Weaver, 1978). However, horses and hikers make more sediment available than wheels that play a role in erosion processes (Wilson and Seney, 1994). Horseback riding is more damaging than off-road vehicles. However, over 20 km/h off-road vehicles are likely to be more damaging than horses (Dale and Weaver, 1978).

Trampling damages also depend on the physical characteristics of the area trampled. These critical variables include vegetation cover, slope inclination, climate, precipitation, soil nature and previous damages (Dumitraşcu et al., 2010; Cole and Spildie, 1998). Indeed, vegetation type and plant morphological characteristics influence, more than any other site characteristics, the scale and duration of trampling impacts (Cole, 1995). The forb-dominated vegetation (dominance of graminea and graminea-like vegetation) is highly vulnerable but recovers rapidly due to the flexibility of the stems (Dumitraşcu et al., 2010; Cole and Spildie, 1998). In contrast, shrub-dominated vegetation is more resistant to trampling but need more time to recover (Cole and Spildie, 1998).

The topography plays an important role in the impacts of trampling. Generally, slope gradient and erosion are positively correlated (Sæþórsdóttir et al., 2001; Dale and Weaver, 1978). Furthermore, soil erosion depends on the position of the trail on the height of the slope and toward the slope. Trails following the slope (parallel to the slope) channel water and increase erosion compared to trails that are across the slope (perpendicular to the slope) (Wilson and Seney, 1994). Trails located below the crest of slopes cause more erosion than trails located on other parts of the slope (Wilson and Seney, 1994). The impacts of the type of users are also influenced by the slope: for example, motorcycles are most damaging when going uphill. They create a narrow rut that increases the velocity of sediment transport capacity of trail runoff. In contrast, hikers and horses are more damaging when going downhill because of greater forces applied for decelerating in a steep trail compare to motorcycle (Dale and Weaver, 1978).

Soil nature is also an important element that determines the scale of trampling impacts, particularly on soil erosion and compaction (Wilson and Seney, 1994). Soil variables that influence trampling impacts are soil texture, soil type, soil moisture, stoniness and roughness (Li et al., 2005).

3.5.3 Trampling impacts on trails

Trampling also impacts the trails. The topography, intensity and type of use determine the width of the trail. If the frequentation of a trail increases, the width and the percentage of bare ground of this trail will increase (Dale and Weaver, 1978; Dale and Weaver, 1974). The width of trails also depends on the transport mode. For example, horse trails are larger than hiker trails because horses are wider than hikers and have a greater tendency to wander off the trails (Dale and Weaver, 1978). Trail width is also larger on slopes than on level ground probably because of the searching for good footing (Dale and Weaver, 1978). Trail width increases also with wetness and roughness but decreases with the roughness of trailside vegetation and terrain (Dale and Weaver, 1978).

Trail depth is an important characteristic of trails that depends on compaction and erosion and therefore on climate, vegetation type, soil and substrate type, slope, and type of use (Dale and Weaver, 1978). The deepening of trail causes more root exposure and muddy conditions. When trails begin to deepen, water run-off and resulting erosion increase and cause the trail to become even deeper (Dale and Weaver, 1978). Trails become difficult

and people are more likely to walk alongside the original trail causing the widening of the trail (Tomczyk and Ewertowski, 2012; Hockett et al., 2010). A new circle of degradation will then occur causing the continuous increase of the width of the trail and impacted zone (Tomczyk and Ewertowski, 2012; Hockett et al., 2010). Maintenance of trails is unavoidable and important for safety, environmental protection and aesthetic values. Regular maintenance is recommended as destroyed trails need large financial and material outlays to be recovered (Tomczyk and Ewertowski, 2012).

3.5.4 Other tourism impacts and trails location

Impacts on wildlife also need to be considered with the presence of trails and hiking (Dumitraşcu et al., 2010). The presence of a trail is able to modify predation rate on bird nests. This modification depends on the predator species (Miller and Hobbs, 2000). For example, Miller and Hobbs (2000) found that in a lowland riparian area, nests situated near trails experience an increase of predation by bird predators but that mammal predators avoid them.

The creation and use of trails cause also fragmentation of habitats. Trails form a barrier devoid of vegetation and full of human odors that animals will cross with vigilance or try to avoid. Traffic of people on trails avoid animals the possibility to cross the trail at some period of the day or of the year. Trails habitat fragmentation will disrupt essential wildlife activities such as feeding, reproduction and raise of young (Hockett et al., 2010). Moreover, the simple presence of tourists at bird nest sites causes physiological and behavioral stress responses in these birds, such as heart rate increase, increase vigilance, flight or attack toward tourists (Holmes et al., 2005; Fowler, 1999). Tourists can be considered a greater threat by birds than over flight predators (Holmes et al., 2005). Nest predation is increasing during birds stress responses as a result of decrease nest attendance (Madsen et al., 2009; Giese, 1996). Tourist presence disturbance can so cause significant decrease of hatching success and chick survival (Giese, 1996). It seems that birds experiencing high level of human visitation via tourism do not respond to human presence as a stressor any more, but that at medium level of human visitation, birds do not show any sign of habituation (Fowler, 1999). Consequently, Fowler (1999) recommends concentrating tourism visitation in a small part of the breeding colony, allowing these birds to habituate and leaving the rest of the colony free of disturbances.

Trails also concentrate the other impacts of tourists like littering, noise and presence disturbances (Wall, 2003). All these disturbances are influenced by the personal behavior of tourists. The next section will present what influence tourist behavior and the consequences in regard to trampling and other impacts.

3.5.5 Tourist behaviour and trails

The behavior of tourists influences their impacts on trails and on the environment (Hockett el al., 2010). The behavior will determine, for example, the amount of littering, the disturbance of wildlife and the amount of off-trail hiking (Hockett et al., 2010). The presence of the trail, because of its channeling effect, modifies as well the behavior of tourists and the influence of trampling in an area (Hockett et al., 2010). The presence of a trail modifies the adjacent vegetation but generally for not more than two meters (Dale and Weaver, 1974). However, off-trail hiking can widen the impacted area.

In a survey by Hockett et al. (2010), 70.3% of respondent reported intentional off-trail hiking. The reasons given were to get to a scenic vista or take a photo, to avoid or pass others or because of challenging trail conditions. Moreover, 30% of the tourists accidentally hiked off-trail because of poorly marked trails. Hockett el al. (2010) observed a sharp decline in off-trail hiking behavior with the placement of educational and prompter signs. However, the most efficient way to effectively reduce off-trail travel is personal contact where tourists are explained the consequences of off-trail hiking (Hockett et al., 2010). Off-trail hiking can also lead to the formation and proliferation of informal trails. The formation of these informal trails is due to the fact that trail systems rarely access all the locations that tourists want to go. When an informal trail is formed, more people are then tempted to take it and could even think that it is an official trail (Hockett et al., 2010). These informal trails generally have more negative effects than official ones due to their poor design, the absence of signs, the presence of more than one trail to access a same destination and the passage through sensitive environments (Hockett et al., 2010).

Another impact originating from tourist behavior is littering (Hockett et al., 2010; Wang et al., 2009). Wang et al. (2009) observed in a Chinese National Wetland Park that 12.6% of the tourists littered and that it represented 13.6% of the total weight of tourist waste production. Litter can pollute soils, degrades the aesthetics of an area, endangered fauna through entanglement and ingestion and increased costs for litter collection in parks

(Brown et al., 2010; Wang et al., 2009). Small quantities of debris can have highly negative impacts through ingestion, entanglement and utilization in nests (Wang et al, 2009; Van Franeker, 1985). Some substances such as plastics or cigarettes can cause chemical pollution of the soil, the flora and fauna and cause animal death (Wang et al., 2009; Van Franeker, 1985). However, there is no knowledge about the impacts of tourist litter ingestion compared to the marine litter ingestion by seabirds. Tourists are highly intolerant to the presence of litter and degrade easily tourist experience (Moore and Polley, 2007). Provision of information to tourists through printed or oral messages has shown to be efficient in reducing active littering (Brown et al., 2010). Passive littering, such as unseen falling of litter, is much more difficult to reduce. Communication programs to encourage tourists to pick up litter during their visit seem efficient and could be a way to reduce both active and passive littering (Brown et al., 2010). There is a debate on putting garbage bins in touristic sites to decrease littering among park managers and tourists. Those against bins argue that if there are no bins, people will have an incentive to take back their detritus and littering will diminish. In contrast, those for bins argue that having no bins will increase the amount of littering because not all people are sensitive to take back detritus and that they will just throw them in nature. However, it seems that no consistent study has explored this subject.

A tourist behavior that should also be considered is collecting of stones, plants, animals or any other natural and human features (Wang et al., 2009). Wang et al. (2009) observed that 6.5% of tourists presented this behavior. It can be a significant problem if the feature picked up is fragile, endangered or just few represented in an area. It is a problem either if the items picked up are just manipulated, displaced within the site or taken away from the site (Wang et al., 2009).

Trampling impacts and tourist behavior is critical as it has important effect on tourist experience. A study by Lynn and Brown (2003) showed that litter, tree and plant damage, and fire rings had the greatest effect on tourist hiking experience. Trail extension and widening and trail erosion had a moderate effect; and muddiness had a minimal effect on experience.

The potential environmental impacts of tourists on an area and the relation with trails are complex and site dependent (Wilson and Seney, 1994). Furthermore, the consequences of

any plan should be assessed before being applied. The next section will review the possible methods to assess current tourist's impacts and potential future ones.

3.5.6 Assessment of tourist's impacts and ecological sensitivity

All the different variables presented previously which play a role in trampling impacts are indicators that could be used in monitoring trail conditions and assessing sensibility of an area to trampling effects (Ólafsdóttir and Runnström, 2013; Li et al., 2005). However, trampling sensitivity assessment of an area is a key but is not the only element of tourism impact assessments. Indicator's spatial disparities could be important in an area (such as topography, vegetation type and stoniness). Consequently, in order to properly assess sensitivity of an area the use of spatial tools such as Geographical Information System (GIS) should be considered. For example, Ólafsdóttir and Runnström (2009) are using some of these variables to assess through GIS, ecological sensitivity of Icelandic tourist destination alongside other variables such as tourist behavior or accessibility, in their Tourism Decision Support System (TDSS) (Figure 3.6). Ólafsdóttir and Runnström (2013) have also developed an interesting research design for trail condition and ecological sensitivity to trampling impact assessment in order to help better management and planning of trails.

Because trails concentrate hiking activity and negative impacts of tourists, the spatial pattern of trails is a critical factor to consider in the tourism impact assessment of an area (Ólafsdóttir and Runnström, 2009; Li et al., 2005). Trail spatial pattern will influence the spatial pattern of all impacts. Furthermore, the pattern will influence hiking experience (Li et al., 2005). Trail spatial patterns are defined by the variables of connectivity, circularity and accessibility. Connectivity and circularity variables are originated from graph theory and are concerned by maximally efficient flow or connectivity in networks (Li et al., 2005). However, these variables have not been utilized for reducing environmental impacts of tourists and could have increased the possibilities of trampling problems (Li et al., 2005). Accessibility variable deals with the facility with which tourists can access a site. It depends on the topography and infrastructure quality and distance, (Ólafsdóttir and Runnström, 2009). The greater the accessibility of a tourist attraction the more tourists the site will attract and accordingly the tourist pressure on the environment increases. This accessibility can be spatially analyzed through a set of parameters such as type of trail or distance of an attraction from trails (Ólafsdóttir and Runnström, 2009).

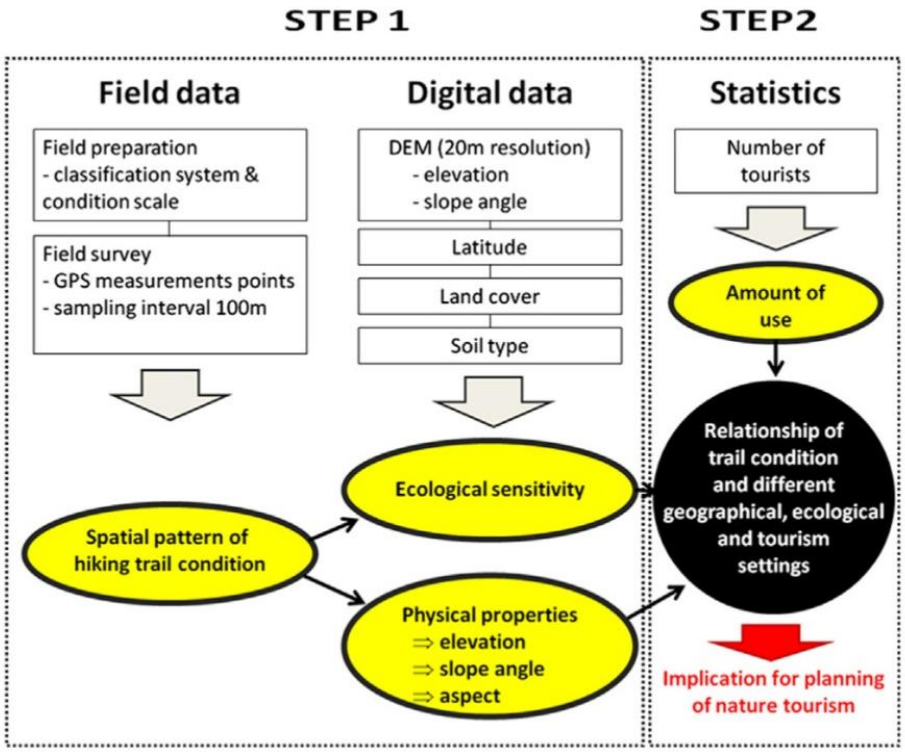

Figure 3.6 Flow chart illustrating the relationship between the major steps of data collection and conceptual elements in the research design developed by Ólafsdóttir and Runnström (2013, p.61).

All the processes presented in this section 3.5 are interrelated and it is difficult to determine which trail design, hiking mode and hiking intensity is the best to assure a good tourist experience without impacting too much on the environment. All these aspects of trampling have to be studied together to determine if a trail should be developed or maintained and to determine the best path for the trail in order to decrease disturbances (Ólafsdóttir and Runnström, 2013).

Consequently, which type of tourists and management is wanted for a natural and especially wilderness area needs careful consideration. One of these decisions concerns the way of financing Látrabjarg's future National Park. Two different systems exist, the tax system and the fee system. A tool for decision is the contingent valuation that measures the willingness to pay of the visitors. The two financing system and the method to measure the willingness to pay will be explained in the next section.

3.6 Financing protected areas

Two systems with different considerations have been developed in order to finance maintenance and management of protected areas. The first system considered that these protected areas are public goods with non-use value; value for people even if they are not using it. So each people from the country of the protected area should contribute to the financing of this public good through their revenue tax. The second system considers that protected areas have only a use value, value only for people using it. Consequently, only users should pay through an entrance fee for equity reasons (Reynisdóttir et al., 2008).

The economic viability of each system varies from place to place because to collect fees some expenses occur. These expenses come from the infrastructures (such as entrance points and barriers) and employees (such as fee collectors, guards and chartered accountants) needed for collecting the fee itself. Particularly infrequently visited and large size sites, these expenses could be higher than the amount of money earned through the fees and make the fee system unviable. Moreover, with this system, tourist experience would become structured and commercialized. A fee-system could reduce the number of tourists. In contrast, this could decrease congestion and impacts in natural sites, increasing the experience of tourists who would be more willing to pay. It could also attract tourists more nature sensitive and that would likely to pay higher fees to enjoy a few visited, preserved area. In any case, fee collect costs are specific for each site and management strategy. Consequently, specific economic analyses should be realized before taking any decision about which of the fee-system or the tax-system is better (Reynisdóttir et al., 2008).

Nordic countries, like Iceland, in opposition to Canada and USA, do not have a tradition of fee-payment for entering national parks or protected areas. In Iceland, maintenance, management and development of natural attractions are currently financed by tax-payers (Reynisdóttir et al., 2008). Since 1281, the Icelandic law set that there should be no restriction for anybody to access non-cultivated land (Jónasson, 2014, 27th February). Moreover, the Icelandic National Strategy for Sustainable Development express clearly that there is a public's right for free access to common land that should not be restricted, unless it is necessary for nature conservation. It is obviously encouraging to not introduce fee-system (Ministry for the Environment in Iceland, 2002). However, financial needs are

much higher than what is provided by the tax (Reynisdóttir et al., 2008). This could explain the contradiction made in this Icelandic national strategy for sustainable development that states also that tourists (and not tourism industry) should increasingly cover costs of monitoring and development of tourist sites (Ministry for the Environment in Iceland, 2002). In the Nature Conservation (Act 44/1999, chap.4, Art. 32), The Nature Conservation Agency (Umhverfisstofnun) is allowed to set a fee for services provided and operator of a nature conservation area can set a fee for access if damage has resulted from travellers (Ministry for the Environment and Natural Resources, 1999). This makes clearly think of a fee-system. Moreover, the Government is currently discussing to introduce a tourist general fee system. This would take the form of a pass that tourists would pay at their arrival in Iceland that would cover the entrance of all natural tourist destinations in Iceland. This measure would be introduced to finance the maintenance and development of Icelandic natural destinations (Jónasson, 2014, 25th February). However, some landowners (such as Dettifoss) seem to not trust the efficiency of this measure and have started to charge tourists visiting the site (Jónasson, 2014, 25th February).

In Iceland, it is currently debated if introducing any kind of fee-system is against or not the law (Jónasson, 2014, 27th February). Moreover, the decisions concerning a fee-system or a tax-system have for now been made upon more popular appeals, ideological reasoning and political pressure not on rational economic analysis (Reynisdóttir et al., 2008). In these economic analyses, the study of the willingness to pay an entrance fee by tourists is done by contingent valuation method. This method consists of asking people directly what value they would place on an amenity if a market existed for it. In such research, it has been shown that tourists would be ready to pay around 333 isk for entrance fee to Gulfoss, representing 41 million isk per year and 508 isk in Skaftafell National Park, representing 34 million isk per year. This willingness to pay has shown to be significantly positively affected by income, attitude towards environmental protection, history of paying entrance fee and education while being negatively affected by age and number of previous visits to the site (Reynisdóttir et al., 2008). It confirms the fact that depending on the management strategy chosen the willingness to pay entrance fees and viability of the fee-system will vary. Mass tourism with the associated structure development and environmental impacts will mean more tourists but with a will to pay a small entrance fee or none. In contrary,

with limited access, few structured developing tourism; it will attract nature sensitive tourists with higher willingness to pay.

In Látrabjarg, the application of entrance fee is discussed in the planning process (Mr. Ásgeirsson, pers. comm., 12th June 2013). However, landowners are skeptic about this fee-system due to the expenses needed in the process (Mr. Gíslason, pers. comm., 02nd July 2013). Mr. Gíslason (pers. comm., 02nd July 2013) thinks that introducing a donation box at the camping site could be more efficient. The decision of which fee or tax-system should be chosen will depend on the management strategy chosen and should be based on complete economic analyses including contingent valuation method to determine the potential willingness to pay entrance fee for the future Látrabjarg National Park (Mr. Ásgeirsson, pers. comm., 12th June 2013).

However, some elements of the management framework will not be subject to any decision process. It has yet been decided that Látrabjarg area will be transformed in a National park. This denomination is used for the IUCN protected area category II that requires meeting national legal requirements and international standards and norms (IUCN, 2008). The following part will review what these standards and norms are and what their implications for Látrabjarg National Park are.

3.7 IUCN categories of protected area

Each country has their own interpretation of what a protected area is and consequently it is impossible to compare protected areas between countries (IUCN, 2008). Since 1933 a clarification of protected areas categories have been attempted. Otherwise, many other attempts occurred later and a veritable start of consensus occurred only with the International Union for the Conservation of Nature (IUCN) protected areas categories. In 1994 the IUCN developed six different categories of protected areas with specific criteria and definition in order "speaking a common language" (Bishop et al., 2004, p.7) These categories are Ia: Strict nature reserve, Ib: Wilderness area, II: National park, III: Natural monument or feature, IV: Habitat/species management area, V: protected landscape/seascape and VI: protected area with sustainable use of natural resources (IUCN, 2013b). These categories are not consistently interpreted across the world (Leroux et al., 2010) and the aim of the speaking a common language program unevenly fulfilled (Bishop

et al., 2004). Furthermore, the application of the system of categories in certain biomes such as forest and marine protected areas, have been problematic (Bishop et al., 2004).

The definition of protected areas given by the IUCN is as follows:

"*A protected area is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values*" (IUCN, 2008, p. 4; IUCN, 2013a).

An important consideration of the IUCN is that protected areas should also be integrated into coherent protected area systems in order to connect protected areas and reinforce their benefits for conservation. This "connectivity conservation" includes "landscape-scale", "bioregional" and "ecosystem approaches" (IUCN, 208, p.10). Otherwise, these connectivity objectives have mostly been interpreted, in national and international policy, as uniform targets based on percentage of area protected. The conservation value of these targets are disputable, have failed along with the fulfilling the goal of enhancing nature protection through networking. The policy of one size fits all has shown to be inadequate for conservation targets (Rodrigues et al., 2004).

National Parks are under IUCN category II of protected area which are "large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and tourist opportunities" (IUCN, 2013b). The principal objectives of this category are:

- "To protect natural biodiversity along with its underlying ecological structure and supporting environmental processes and to promote education and recreation;
- To manage the area in order to perpetuate, in as natural a state as possible, representative examples of physiographic regions, biotic communities, genetic resources and unimpaired natural processes;
- To maintain viable and ecologically functional populations and assemblages of native species at densities sufficient to conserve ecosystem integrity and resilience in the long term;

- To contribute in particular to conservation of wide-ranging species, regional ecological processes and migration routes;
- To manage tourist use for inspirational, educational, cultural and recreational purposes at a level which will not cause significant biological or ecological degradation to the natural resources;
- To take into account the needs of indigenous people and local communities, including subsistence resource use, in so far as these will not adversely affect the primary management objective;
- To contribute to local economies through tourism" (IUCN, 2008, p.16; IUCN, 2013b).

Between the IUCN categories a naturalness gradient is theoretically present (Figure 3.7). Category VI has the least naturalness where Ia has the most naturalness (Bishop et al., 2004; IUCN, 2008). This expected assumption does not correspond to the real situation. Indeed, Category VI protected areas are generally larger areas than other categories and have an unexpectedly low Human footprint index. In contrast, category Ia areas have higher human footprint index measures than expected. Human footprint index is expressed as a percentage of the relative human influence on an area. Naturalness of an area is inversely related to its human footprint index (Leroux et al., 2010).

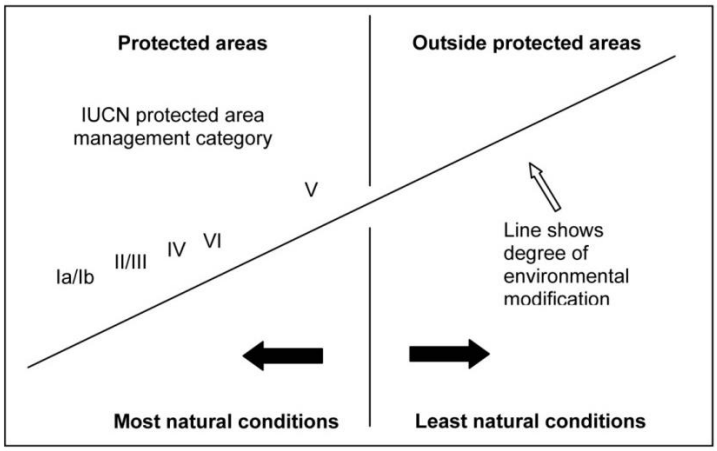

Figure 3.7 IUCN protected area categories and degree of environmental modification (Bishop et al., 2004, p.13; IUCN, 2008).

In the Icelandic Nature Conservation Act (N°44/1999, Chap 7, Art. 51 and 52) a National Park is determined as follows:

> "*The Minister for the Environment may, after receiving the proposals or opinion of the Nature Conservation Agency, the Icelandic Institute of Natural History and the Nature Conservation Council, declare an area of land a national park, because its landscape or biosphere is so unique, or because it has a historical significance, which gives grounds for preserving it and its natural characteristics and allow public access to it in accordance with specific rules. The land of a national park shall be owned by the state unless there are special grounds for other arrangements and agreement thereto is reached between the Minister and landowners. The Minister may establish an advisory committee with the participation of the local authorities concerned to discuss the operation and organization of national parks."*

It is clear that this definition is much wider and more inclusive than the IUCN definition. Látrabjarg future National Park policies could be quite challenging to decide and implement with such few precise goals. This conception of National Park is also much less empowering of sustainability issues and general nature conservation. It could also cause a problem of long-term sustainability for Látrabjarg National Park with such a permissive definition.

However, National Park new status will increase the attractiveness of the area for tourists and consequently increased pressure from tourism on the environment is likely (Mr. Gíslason, pers. comm., 02th July 2013). The Vesturbyggð Master Plan clearly outlines that the only positive effect of the creation of this National Park for the environment will be on the landscape and geological features. It will even have negative impacts on the vegetation because of increase trampling (Vesturbyggð, 2003). However, general positive effects on the social and economic sector of the Municipality (such as employment, transports, security, inhabitants and archeology) are forecasted (Mr. Gíslason, pers. comm., 02nd July 2013; Vesturbyggð, 2003). Creating a National Park in Látrabjarg is not for fulfilling the primary goal of natural protection but to elevate the social and economic sector of the Municipality. It could also explain why the possibility of transforming the area in Nature Reserve that has stricter conservation rules, as proposed in the Nature Protection plan 2004-2008 from the Environment Agency of Iceland (Umhverfisstofnun) and in Vesturbyggð Master plan 2006-2018 has been rejected (Baark ehf., 2014).

4 Methodologies

This chapter will explain the procedures used to collect information to answer the research questions. This was mainly done through the comparison of two case studies. The chapter will describe what a comparative study is and why it has been chosen for conducting this research. The reasons for rejecting some case studies and reasons for choosing the Moher Cliffs case study will also be clarified. Complementary information was also collected through personal communications with key stakeholders, on-site observations and an extensive literature search.

4.1 Case study comparison

Regarding the limited information and data available on Látrabjarg Cliffs, the methodology that would give enough information and advice for the planning and management of Látrabjarg Cliffs is to compare what has been done at another similar site. This is called a comparative method (Azarian, 2011; Lijphart, 1971). Only one site will be utilized, because of the limited time of a master thesis. The comparative study was used to compare the outcomes of a planning and management process at a similar site to Látrabjarg Cliffs, in order to generate advice for the current Látrabjarg planning process and future management of tourism.

The comparative method is not a univocal method. Different approaches exist that each have their own function and goals (Azarian, 2011). The main approach to comparative studies is to focus the analysis to comparable case studies with a large number of similar important characteristics that can be treated as constants. This approach to comparative study allows establishing relationships amongst a lower number of parameters than other approaches (Lijphart, 1971). This approach also allows revealing divergences and variations of presumed united and undifferentiated cases (Azarian, 2011). This is the approach chosen in this research as it allows comparing management in similar environments. The comparison has been done through a comprehensive literature analysis of both case studies.

The next section will explain how the comparative case study for this research was chosen. Specific selection criteria were used as the goal was to find the most similar case study to Látrabjarg Cliffs.

4.2 Choice of the case study

The choice of the case study was driven by two main considerations. The most important was to find a case that had the most and strongest possible knowledge, information and studies on the site and its management. This is necessary to counterbalance the lack of information and data on Látrabjarg Cliffs. The second consideration was to have as much similarity between the sites as possible. Most important is of course to have geological and environmental (including meteorological) similarities. Political similarity was desirable but not the main decisive factor. I decided against using a case study in Iceland because of the absence of similar case studies and the interest to see the management choice of a similar site under different legislation and policy.

The first case study considered was Bonaventure Island seabird colony in Canada's Québec region because of its similar international importance for bird populations. Bonaventure Island is a part of the Parc national de l'Île-Bonaventure-et-du-Rocher-Percé created in 1985 of 5.8 km^2 with 55000 tourists per day. It hosts the largest marine bird colony in the world with 200000 breeding birds, mainly composed of Northern Gannets (*Morus bassanus*) but ten other species can be found (Sépaq, 2013). This case study was rejected because of the following elements. First, the colony cannot be defined as a cliff colony. The cliff is tiny compared to Látrabjarg and the birds mostly breeding on the sloped land at the top of the cliff. Bonaventure Island is situated in the same cool temperate moist world climatic zone as Látrabjarg (European Commission Joint Research Centre, 2013), but has a quite different weather system due to its geographical situation in the Atlantic Ocean. Bonaventure Island is situated at 48°29 N (Google Earth, 2014) and Látrabjarg at 65°30 N (Google Earth, 2014b); so the light conditions are even more different. The bird composition and ecology in Bonaventure Island is very different from the one in Látrabjarg. Bonaventure Island, as its name shows, is an island, and access is by boat operated by the National Park (Sépaq, 2013). The access is quite different and the control of tourism probably easier than land access in a National Park such as Látrabjarg Cliffs. Finally, the political region of Bonaventure Island and the conception of a National

Park are quite different from Látrabjarg. For example, Canada has a tradition of fee-system and Iceland tax-system to finance the National Parks (Reynisdóttir et al., 2008). Moreover, very limited information on the management strategy of Bonaventure Island could be found.

The second case study considered was Vestmannabjørgini in the Faroe Islands. Vestmannabjørgini is not the only cliff in the Faroe Islands but it is one of the most popular and biggest tourist attractions for its grottos and bird cliffs. Vestmannabjørgini attains 457 m of height that is similar but higher than the 441m of Látrabjarg highest point (Sjóferðir, n.d.). Otherwise, the morphology of the cliff is different. Vestmannabjørgini latitude is 62°12N (Google Earth, 2014c) that is near the 65°30 N of Látrabjarg. Consequently, the light conditions are similar. A similar situation in the Atlantic Ocean of Vestmannabjørgini assures that the climatic conditions are not so dissimilar (European Commission Joint Research Centre, 2013; Faroe Islands, n.d.; Veðurstófa Íslands, n.d.). The cliffs of Vestmannabjørgini and Látrabjarg both originated from volcanic activity and ice remodeling (Faroe Islands, n.d.; Náttúrufræðistofnun Íslands, n.d.). Moreover, the bird species composition and ecology is very similar (Faroe Islands, n.d.; Náttúrufræðistofnun Íslands, n.d.). This case study is the nearest available from Látrabjarg outside of Iceland and has the most similar cultural and political environment (Faroe Islands, n.d.). Moreover, three boat tour operators and the Marine Research Institute have participated in The Wild North watching Code of Conduct. However, this case study is not suitable for a comparison with Látrabjarg for two main reasons. First, the tourist access is very different because Vestmannabjørgini is exclusively visited through boat tours and not by land as is Látrabjarg Cliffs (Sjóferðir, n.d.). The second reason is a total absence of scientific research or management policies that could be found on the cliff.

The case study that was selected was Moher Cliffs in the Burren situated in the County of Clare that is a part of the Shannon region in the Mid-West region of the Republic of Ireland) (Figure 4.1). Moher cliffs (Aillte an Mhothair in Irish) is 8 km long with a maximum height of 214 m (cliffs of Moher, n.d.). It is shorter and smaller than Látrabjarg, (14 km long and up to 441m high), but of significant size for this sort of geomorphological feature (Cliff of Moher, n.d.). The area of the cliffs is under National Park and Geopark protection (Cliffs of Moher, n.d.). It is interesting to compare what has been done under these types of protection in Moher Cliffs and what is planned in Látrabjarg Cliffs. Moher

Cliffs are situated at latitude 52°97 N (Cliffs of Moher, n.d.) and on the east of the Atlantic Ocean. Consequently, it has a more similar situation from Látrabjarg than Bonaventure Islands but less than Vestmannabjørgini. Moreover, the morphology of the cliff seems more similar to Látrabjarg than Vestmannabjørgini. The light conditions are quite different because of the lower latitude of Moher Cliffs (52°97 N) compared to Látrabjarg (65°30 N). The bird species composition and ecological structure presents similarities with Látrabjarg (Cliffs of Moher, n.d.).

873 988 tourists visited Moher Cliffs in 2012 which is much more than the approximately 50 000 tourists in Látrabjarg Cliffs (Clare County Council, 2013). However, is predicted to increase rapidly across Iceland as a whole (Óladóttir, 2013) and this will have implications for Látrabjarg. Consequently, it is interesting to study a site that has more tourism but a similar physical environmental in order to make some predictions and recommendations on the possible future issues encountered by Látrabjarg. Access to Moher Cliffs is mostly by land (Cliffs of Moher, n.d) like Látrabjarg but boat tours (Cliffs of Moher Cruises, n.d.) and some surfing at the base of Moher Cliffs also occur (Cliffs of Moher, n.d.). Tourist activities in Moher Cliffs are more developed than in Látrabjarg with regular guiding tours, exhibitions and many facilities such as the visitor experience center (Cliffs of Moher, n.d.). Moreover, documentation on the management of the site is present in good quantity, such as on the construction of the visitor center, tourist management and the new trail system. These developments in the area have been the source of a lot of research on landscape architecture and of a serious debate on the landscape spoiling for tourism (Healy et al., 2012; Healy and McDonagh, 2009; Cliffs of Moher, n.d.). The political and legislative environment of the Moher cliffs site is different from Látrabjarg (Cliffs of Moher, n.d.). The republic of Ireland is part of the European Union whereas Iceland is only part of the European Economic area.

No other suitable case studies have been found either because the difference in environment, climatic conditions, geology, tourism access and/or species is too great or because there is not enough information available on the case study and its management. Enough information was found about Moher Cliffs for the purpose of this research; therefore, the decision was taken to use Moher Cliffs as the second and only other case study of this research. Although the tourism variable between the two case studies is different: the number of tourists is much higher at Moher Cliffs than at Látrabjarg Cliffs;

this variable is forecast to become similar in the future with the expected increase of tourism at Látrabjarg Cliffs. It is interesting to study Moher cliffs in order to compare the management strategy of this case study with what Látrabjarg could become in the future.

Figure 4.1 Panoramic view of Moher cliffs from below O'Briens Tower (Wikipedia, n.d.d).

4.3 Complementary information collection

4.3.1 Direct and indirect observations

The observations used in the research were made in the Látrabjarg area from the 08th June 2013 to the 11th June 2013. Observations were used in the research to collect on-field information about wildlife, trails conditions and on-site tourist's behavior. I went in early June because it was the middle of the bird breeding season and thus when the maximum numbers of birds were at the cliffs. This period was also chosen because it was the beginning of the high tourist season and thus allowed me to observe the state of the trail at this critical time. The observations were made over 24 hours of the day to observe night puffin and midnight sun tourism. The area of observation covers the camping site of Brunnar where I slept and the cliffs from Geldingsskorardalur to Bjargtangar area. I was accompanied by Mr. Garðarsson. He came undertake a bird counting survey and aerial photography survey of the cliffs. I accompanied him in his trips, made observations when possible and asked him questions about his knowledge on Látrabjarg. The observations were made by staying at the light house or during explorations of the trail itself.

The direct observations were made using continuous sampling on a very small time scale. Continuous sampling consists of observing a person or group of people for some time and recording their behavior (Bernard, 2006). In this research tourist's behavior was observed then recorded in field notes and by photography. Tourists were observed when coming to the cliff edge, observing birds and walking on the trails. Time limitations did not allow for more observation sampling on the site. Consequently, observations made in the research are not systematic and cannot generate quantitative data but are participant observations that would generate only qualitative data (Denscombe, 2007).

I believe that tourists did not know that I was observing them. This non-reactive observation method allows collecting few biased behavior. Indeed, people could act unnaturally in front of the observer if they know to be observed. It is probable that tourists did not know that I was more than another tourist. The observation method used in this research is unobtrusive and is also called total participation because I was disguised like the people I was observing (Denscombe, 2007; Bernard, 2006).

Indirect observations are "the archeology of human behavior" (Bernard, 2006, p.413). Indirect observation includes behavior trace studies that study hard, archeological evidence of a behavior (Bernard, 2006). Indirect observational trace study method was used in the research to observe the state of the trails, signs of human littering and the extent of wandering area around the trails. This was achieved by observing the trail itself as well as its surroundings.

However, these observations did not provide information about the planning, management and stakeholders of Látrabjarg Cliffs. To collect such information, meeting with some of the stakeholders were held. This is explained further in the next section.

4.3.2 Personal communications with key stakeholders

For ethical considerations, persons met for research purpose were briefed about the research objectives (Denscombe, 2007) and all agreed to participate. The purpose of conducting meetings in this research was to collect information on stakeholder's roles, opinions and feelings about the planning process. Consequently, three meeting were organized with representatives of the main stakeholders groups involved in the Látrabjarg planning process as identified in the Vesturbyggð Master Plan 2006-2018 (Vesturbyggð, 2003):

- A meeting with Hákon Ásgeirsson, Nature Reserve Officer at Látrastofa/Umhverfisstofnun, Flókalundur on the 12/06/2013.
- A meeting at Háskóli Íslands (Reykjavík) with Gísli Már Gíslason, Head of the landowners association in Látrabjarg on the 02/07/2013.
- A phone meeting with Ásthildur Sturludóttir, Mayor of Vesturbyggð Municipality on the 15/07/2013.

It was not possible to conduct more meetings due to time and travel cost limitations. The meetings were recorded through discussion resume on field notes and not audio recorded and transcribed. In these meetings, precise questions and issues were addressed while flexibility in the order of the questions and freedom for the persons to develop ideas and speak more widely on the issues raised by the researcher were allowed (Denscombe, 2007). These meetings did not follow exactly the methodology for interview in research (Denscombe, 2007). Consequently, these meetings are defined as personal communications rather than interviews.

The discussion with Mr. Ásgeirsson was a one-to-one meeting, with the presence of only the interviewee and the researcher. The discussion with Mrs. Sturludóttir was held by phone and there was no assurance that the interviewee was alone. The meeting with Mr. Gíslason was held with another student accompanying me. This student took part remotely in the interview with some questions and commentaries that brought more information from the interviewee.

The meeting questions were designed to gather information about the purpose and conduct of the planning process and the position of each main stakeholder. To complement information provided by these stakeholders and the case study comparison, secondary information was collected through literature search and by contacting directly relevant persons. Details about this procedure are provided in the next section.

4.3.3 Literature search

The literature search provided most of the background information about legislative frameworks, planning documents, state of knowledge and tourism impacts. Most of the literature was collected through online databases however the search also included Icelandic, Irish and International legislations, statistics, guidelines, strategies and code of conducts toward tourism and National Park management.

This literature search was useful to collect some information but there was minimal published material on either Moher or Látrabjarg Cliffs. Consequently, information was also collected by contacting directly relevant persons. For Látrabjarg, the following persons were contacted by e-mail:

- Albína Hulda Pálsdóttir, Archeologist (Reykjavík)

- Böðvar Þórisson, Biologist at Náttúrustofa vestfjarða (Bolungarvik)
- Erling Ólafsson, Entomologist at Náttúrufræðistofnun Íslands (Reykjavík)
- Guðmundur A. Guðmundsson, Animal Ecologist at Náttúrufræðistofnun Íslands (Reykjavík)
- Guðmundur Guðjónsson, Geographer and Project Manager for Vegetation Mapping at Náttúrufræðistofnun Íslands (Reykjavík)
- Hákon Ásgeirsson, Nature Reserve Officer at Látrastofa/umhverfisstofnun (Reykjavík)
- Kristinn Haukur Skarphéðinsson, Head of Zoology/Wildlife Ecologist at Náttúrufræðistofnun Íslands (Reykjavík)
- Ólafur Karl Nielsen, Ph.D. Ecology, Ecologist Responsible for monitoring Gyr Falcon at Náttúrufræðistofnum Islands (Reykjavík)
- Ragnar Edvardsson, Archaeologist and illustrator at Icelandic Institute of Archaeology (Bolungarvik)
- Róbert Arnar Stefánsson, Director of Náttúrustofa vesturlands (Stykkishólmur).
- Starri Heiðmarsson, Head of Botany, Lichenologist at Náttúrufræðistofnun Íslands (Reykjavík).
- Ævar Petersen, Chief Scientist at Náttúrufræðistofnun Íslands (Reykjavík)

People contacted for Moher Cliffs through e-mails were:

- Congella McGuire, Heritage officer at Clare County Council (Ennis)
- David Bosonnet, Landscape Architect at Bradly and Shipman (Dublin)
- John Horgan, Shannon Heritage (Bunratty)
- Katherine Webster, Director at Cliffs of Moher Visitor Experience (Liscannor)

Information collected was principally qualitative but also quantitative. This research is consequently based on a mixed-method approach (Denscombe, 2007).

Now the research questions will be explored through the comparison of the Látrabjarg and Moher Cliff case studies and the analysis of all literature and information collected through the research. The next chapter will compare stakeholder interactions between the two case studies. This comparison will allow understanding of the different stakeholder opinions and positions about tourism, and the implications of these in planning, controlling and taking care of the area and the management of Látrabjarg and Moher Cliffs.

5 Stakeholders

Stakeholders involved or that should be involved in a planning process could be numerous with sometimes intricate, complicated, badly defined or conflicted interactions. The structure of the stakeholders and their role also vary depending on the point of view (such as by stakeholders themselves or by a third-party person). For these reasons, stakeholder's interactions and the proper management of these interactions should be the purpose of an independent and in-depth analysis. For this research, it is necessary to have an overview of these interactions for each case study, in order to understand who does the planning and how is done to discover the general patterns of interactions and roles of stakeholders and to answer the third research question. This analysis will allow discovering where the main relationship conflicts and problems are encountered among stakeholders in each case study and how they are dealt with and extract recommendations for improving stakeholder's interactions and consequently the planning process for Látrabjarg.

5.1 Moher Cliffs

5.1.1 Government[1]

The Irish government is an important stakeholder in the planning process and management of Moher Cliff's tourism and environment. The government makes and enforces the legislative framework for what can and should happen on the site. This legislative framework is defined by International, European, National and Regional components.

Ireland has signed a number of International Conventions that effect developments at Moher Cliffs:

- Bern Convention on the Conservation of European Wildlife and Natural Habitats
- OSPAR convention on the protection of the marine environment of the North-East Atlantic

[1] These two sections have been modified from an assignment submitted for the course CMM41 Principles of Planning at Háskólasetur Vestfjarða. This assignment is called "Maritime and costal planning in Ireland" by Jennifer Smith, Johanna Schumacher and myself. I have a written agreement from Mrs. Smith and Mrs. Schumacher to utilize this work for the purpose of my thesis.

- Convention on Wetlands of International Importance (Ramsar Convention)
- Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention, not to be confused with the Bonn Agreement), and
- Agreement on the Conservation of African-Eurasian Migratory Waterbirds, or African-Eurasian Waterbird Agreement (AEWA)

The international framework for Ireland's coastal and cliff environment policy and planning comes also in the form of European Union (EU) directives:

- Birds Directive (2009/147/EC)
- Habitats Directive (1992/43/EEC)
- Strategic Environmental Assessment (SEA) Directive (2001/42/EC)

As Moher Cliffs is a tourism destination as well as an important environment, the European legislations and policy on tourism play an important role on Irish government policy for the site. The main EU policy is the Agenda for sustainable and competitive European tourism (COM(2007)621final). This agenda is based on the objectives of the Partnership for Growth and Jobs and of the Sustainable Development Strategy to deliver economic, prosperity, social equity and cohesion and environmental and cultural protection. The principles that should be followed in order to achieve the goal of competitive and sustainable tourism are to take a holistic and integrated approach, plan for the long term, achieve an appropriate pace and rhythm of development, involve all stakeholders, use best available knowledge, minimize and manage risk, reflect impacts in costs (user and polluter pays principle), set and respect limits where appropriate and undertake continuous monitoring (European Commission Enterprise and Industry, 2014; Commission of the European Communities, 2007).

Under the international legislative framework, Ireland has developed national coastal and cliff legislations, policies and plans. Historically, coastal and marine planning in Ireland has been criticized for its unstructured, sectoral, uncoordinated and non-integrative nature (O'Hagan and Cooper, 2002; Coastal Concern Alliance, n.d.). Ireland has also been criticized for not correctly applying the Birds Directive (BirdWatch Ireland, 2011). Efforts have been made to improve the situation, as evidenced by the release of the first Irish Integrated Marine Plan (IMP) (Taoiseach, 2012). However, Ireland is not directly

following the 2002 EU recommendation to adopt an Integrated Coastal Zone Management (ICZM) framework.

In general, it does not seem that Ireland has traditionally considered the coast and cliffs as a special entity in its planning. The country has no integrated coastal or coastal-marine plan. Thus, Ireland deals with its coastal and marine areas using an issue-by-issue or sector-by-sector approach, with some general policies, strategies plans and statutory instruments including specific coastal and maritime features. These are:

- Wildlife Act 1976/39
- Heritage Act 1995/4
- Local Government Act 2001/37
- Planning and Development (Strategic Environmental Assessment) Regulations 2004/435
- European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004/436
- National Development Authority Act 2003/10
- National Sustainable Development Strategy 1997
- National Heritage Plan 2002
- Maritime Heritage Policy 2006
- National Development plan 2007-2013
- Actions for Biodiversity: National Biodiversity Plan 2011-2016, and
- Irish National Spatial Strategy 2002-2020

Many government departments are responsible for different aspects of coastal and marine area planning such as the Taoiseach (Prime Minister); the Department of Education and Skills; the Department of Jobs, Enterprise and Innovation; the Department of Arts, Heritage and Gaeltacht (Irish speaking regions); the Department of Communications, Energy and Natural resources; the Department of Environment, Community and Local Government and the Department of Transport, Tourism and Sport (Taoiseach, 2012). Related to tourism and environment, there are over 600 legislative requirements in over 100 individual pieces of legislation in Ireland (Clare County Development Board, 2011b).

5.1.2 BirdWatch Ireland Action Plan for Marine and Sea Cliff Birds in Ireland 2011-2020[2]

Ireland provides many important habitats for marine and sea cliff birds due to its productive waters, its plethora of islands and spectacular cliffs, and its position in migration corridors. However, the general trend of these populations is toward increasing decline. Consequently, an increasing number of these bird species are endangered under the Bird of Conservation Concern in Ireland list (BoCCI list) and under the Appendix 1 of the European Birds Directive (2009). Moreover, Ireland was found guilty by a European Court of Justice in 1997 for poor implementation of the Birds and Habitats Directives in its national legislation (BirdWatch Ireland, 2011). In response to this lack of a good planning or management framework for the protection of wild birds, BirdWatch Ireland developed a ten year national environmental non-statutory group action plan. A group action plan provides an opportunity to create actions that protect multiple species over a large area and is therefore a good tool to address the present issues. The plan was released in 2011 and is subject to annual review.

The plan´s overarching aims are to "identify, through expert opinion and stakeholder consultation, appropriate measures to protect priority, migratory and dispersed birds in the wider countryside including the marine environment" (BirdWatch Ireland, 2011, p.8). Despite the fact that this plan is non-statutory, the government has actively taken part in its realization and implementation in collaboration with other stakeholders (BirdWatch Ireland, 2011; Department of Arts, Heritage and the Gaeltacht, 2011). Indeed, the Department of the Environment, Community and Local Governments has funded the plan through their environmental fund. Thirty six stakeholders were included in the action plan development through several meetings and workshop. Their role was to find the factors influencing marine and seabirds and the solutions, opportunities and gaps in this plan. They also discussed the responsibilities of the various stakeholders regarding marine and seabird issues. They set recreation and tourism as a main factor impacting marine and cliff birds. The vision of the plan and the ten year objectives have been identified through this

[2] The core of this section is from a section of an assignment submitted for the course CMM41 Principles of Planning at Háskólasetur Vestfjarða. This assignment is called "Maritime and costal planning in Ireland" by Jennifer Smith, Johanna Schumacher and myself. I am the only author of this particular section and that the other authors of the assignment acted as reviewer for this particular section. I have written agreement from Mrs. Smith and Mrs. Schumacher to utilize this work for the purpose of my thesis.

stakeholder consultation. The results are a vision of Ireland in 2050 that, amongst others goals, will support a rich, healthy and diverse environment; where strong coherent strategies will be in place; where sustainable use of resources ensure long-term social and economic stability; where seabird bycatch is eliminated; where pollution mitigation strategies will be in place; where the strongest climate change effects will be mitigated; and where there will be no limitations from lack of knowledge (BirdWatch Ireland, 2011).

Specific targets and actions have been developed under the overarching themes of Research and Monitoring; Policy, Legislation and Advocacy: Species and Site Protection and Education and Awareness for each species. Another set of actions are species specific, aiming to fulfil the recommendations of species action plans development by the EU Birds Directive. Each target has different priority levels, and required the implication and collaboration of different stakeholders (BirdWatch Ireland, 2011).

5.1.3 The Environmental Protection Agency

The Environmental Protection Agency (EPA) is an independent public body created under the Environmental Protection Agency Act (1992/7) which enforces Irish environmental policies. The EPA is also responsible for environmental licensing; environment planning, education and guidance; monitoring, analyzing and reporting on the environment; environmental research development and strategic Environmental Assessment (SEA) (Clare County Development Board, 2011b; EPA, n.d.).

The EPA developed a Biodiversity Action Plan 2011-2013 following the recommendation of the National Biodiversity Plan: Actions for Biodiversity 2011-2016 (EPA, 2012). The vision for 2020 promotes sustainability use of natural resources: “The soil of Ireland will be protected from contamination and loss and will support dependent plants and animals. Our biodiversity will be protected and managed for future generations to enjoy” (EPA, 2012, p.7). Some important actions related to Moher Cliffs planning and management are, monitoring of biodiversity, land use and threats to biodiversity; creation of a Bird Atlas; maintenance of GIS information on Special Area of Conservations (SAC’s) and Special Protection areas (SPA’s) as a reference source for licensing and enforcement inspectors; implementing the SEA Directive, helping to determine if proposed plan or program have adverse impacts on biodiversity and especially in SAC’s and SPA’s; raising public awareness and minimizing disturbance to wildlife during field operations (EPA, 2012).

5.1.4 The Irish Sports Council and the National Trails Office

The Irish Sports Council developed the Irish Trails Strategy in 2007 (Irish Sports Council, 2007; Irish Trails, n.d.). This strategy aims to "create, nurture and maintain a world class recreational trail network that is sustainable, integrated, well utilized and highly regarded, that enhances the health, well-being and quality of life of all Irish citizens and that attracts visitors from around the world" (Irish Sports Council, 2007, p.8). The direction of trail recreational development should be toward sustainable and sensitive trail development; appropriate provision for people with disability; sustained user, landowner, community and agency involvement and support; strategic investment; integrated trail planning, implementation and monitoring/on-going evaluation and coordinated marketing and promotion (Irish Sports Council, 2007, p.42). To achieve these objectives, recreational trails requirements are to respect the integrity of the trail itself, to respect and protect the land and surrounding landscapes in which they are located, to meet the needs of recreational users and be fit for purpose, to be designed and built to appropriate standards that minimize all negative environmental impacts, to promote harmony and minimize conflict between different user groups, landowners and land managers (Irish Sports Council, 2007, p.43).

The National Trails Office (NTO) was established in 2007 by the Irish Sports Council to coordinate and drive the implementation of the Irish Trails Strategy (Irish Sports Council, n.d.; Irish Sports Council, 2007; Irish Trails, n.d.). Under its assignments, the office held a National trails register that contains five levels of trails: accredited, partially accredited, non-accredited, closed and under development. Trails have to be inspected and assessed to be included on this register (Irish Sports Council, n.d.; Irish Trails, n.d.). The NTO is also in charge of increasing awareness and formation in recreational trail planning, development, maintenance and management (Irish Trails, n.d.). The NTO developed the Guide to Planning and Developing Recreational Trails in Ireland in order to help trail planners (National Trails Office, 2012; Irish Sports Council, n.d.; Irish Trails, n.d.). This plan is based on the principle of sustainable trail (Figure 5.1).

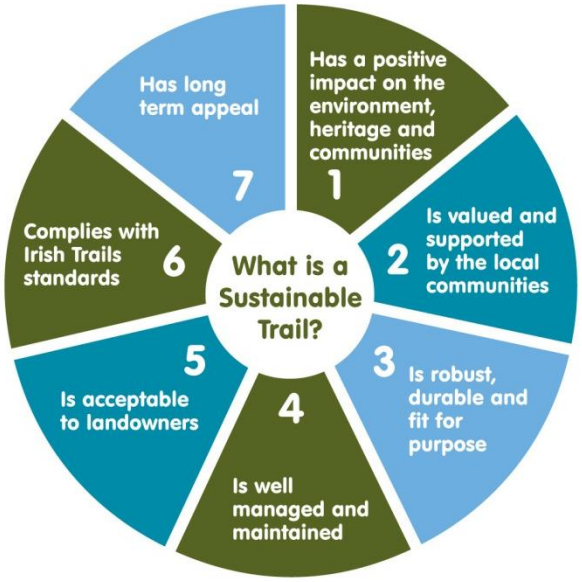

Figure 5.1 The sustainable trail wheel as proposed in the Guide to Planning and Developing Recreational Trails in Ireland (National Trails Office, 2012, p.3).

To attain this sustainable trail state many considerations have to be taken such as category of users, landowners, safety and long-term maintenance. A planning process including the steps of gathering information, consulting landowners and stakeholders, creating a work group, conducting an initial trail planning questionnaire and assessment survey and finally developing, agreeing, financing and applying the Trail Development plan should be followed (National Trails Office, 2012). The Guide to Planning and Developing Recreational Trails in Ireland also provides practical advice for trail planners such as what to look for in field surveys, how to identify positive and negative features about trail development on a site and what to consider in the trail design, construction techniques and material (National Trails Office, 2012). The NTO also developed the Management Standards for Recreational trails (National Trails Office, 2008).

5.1.5 Mid-West Regional Authority

On the regional level, the main planning instrument is the Regional Planning Guidelines (RPG), which is formulated by each of Ireland's eight regional authorities. The RPGs are based on the Planning and Development Act 2006 and set the framework for lower level plans such as the Clare County Development Plan. The RPG of the Mid-West Region (also called the Shannon region), to which Moher Cliffs belongs, is strategic and ensures the successful implementation of the National Spatial Strategy (NSS) and National

Development plan (NDP) 2007-2013 over the period 2010-2022 (Mid-West Regional Authority, 2010a).

The Mid-West RPG expressed the challenges faced by Clare County as "to ensure that the development and maintenance of viable rural communities can continue within the designations Special Area of Conservation (SACs) and Special Protection Area (SPAs) and to ensure that the designations are not used to impose unreasonable blanket bans on social and economic activity within the designated areas" (Mid-West Regional Authority, 2010a, p.45).

In the process of Strategic Environmental Assessment (SEA) and Habitats Directive Assessment (HDA), an environmental report in Mid-West RPG has been developed. This environmental report held many objectives for the region environment protection and conservation such as the maintenance and enhancement of landscape, the protection of SPA's and SAC's. In the Habitats Directives of this report, Cliffs of Moher is said to be threatened by tourism development, rural enterprise development, development of rural trails, major commercial development and wind farm development. In order to mitigate these threats, development or specific policy adoption are not permitted unless an SEA and HDA has been carried out and it has been concluded that no threat to the habitat exists or that any threat that might exist can be mitigated (Mid-West Regional Authority, 2010b, p.101).

In the Mid-West RPG, the recommendation about tourism in Clare County is that it should be enhanced and developed because this sector is of great importance to the future economic and social life of the county. The vision of a sustainable tourism is based on the outcomes of the Shannon Region Tourism Strategy 2008-2010, developed by Shannon Development (Mid-West Regional Authority, 2010a). This report is presented in the following section

5.1.6 Shannon Development

Shannon Development was established by the Irish Government in 1959 to promote Shannon International Airport. It is now a regional economic development agency dedicated to the Shannon region in Clare County where Moher Cliffs belong is located. This agency is the Shannon region tourism authority mandated by the Government to develop the region as a quality tourism destination (Clare County Development Board,

2011a; Shannon Development, n.d.). Shannon development will be renamed Shannon Commercial Enterprises Ltd, trading as Shannon Enterprises (Shannon Development, n.d.a). Shannon Development has contributed to 200 projects in tourism product development, 54 million Euro in approved grant aid, 307 million Euro in direct investment and 614 million Euro in total investment (Shannon Development, n.d.b).

Shannon Development published the Shannon Region Tourism Strategy 2008-2010 for the Mid-West/Shannon Region (Clare County Development Board, 2011a). The strategic aims in this report are: to extend the marketing of the Shannon Region to attract new tourists and revenue, to develop new tourism products to drive future growth including a new tourism attraction for the Region operated by Shannon Heritage, that will attract up to 100,000 tourists, to develop the Shannon Region as a carbon neutral tourism area and to stimulate market demand for the Shannon Airport Gateway (Clare County Development Board, 2011a; Shannon Development, n.d.b)

5.1.7 Clare County Development Board and Clare County Council

Clare County Development Board (CCDB) was established in 2000 and is composed of 25 member agencies working together with tourism as a priority. The CCDB has developed an Integrated Tourism Strategy for County Clare 2011-2014 in the framework of its strategy "Shaping the future" 2002-2012 (Clare County Development Board, 2011a). It has been developed with other tourism agencies including Shannon Development and representatives from the Trade such as Cliffs of Moher. An action plan identifying clear objectives supports this strategy (Clare County Development Board, 2011a). It has been developed "to provide a framework that will support and facilitate the development of a cohesive and sustainable tourism sector in County Clare that will continue to make a significant contribution to the local economy" in an increasing competition and sector difficulties environment (Clare County Development Board, 2011a, p.11).

Clare County Council is one of the members of the CCDB and the local authority (Clare County Development Board, 2011a). As everywhere in Ireland, the local authorities, Clare County Council, are the enforcement statutory bodies of environment policies and assume the informal role of coastal zone managers (Clare County Development Board, 2011b; O'Hagan and Cooper, 2002). The Council adopts a pro-active role concerning tourism with its Clare County Council's Tourism Strategy 2010-2012. Clare County Council is in this

regard complementary to Shannon Development in the promotion and development of tourism (Clare County Development Board, 2011a). Clare County Council owns the part of the cliffs where the visitor center and infrastructures are present (Mcllveen and Martin, 2002). Consequently, Clare County Council has different roles in the planning process at Moher Cliffs (O'Hagan and Cooper, 2002): it has developed a plan proposal for Moher Cliffs and is the one deciding of the final plan to adopt along with the construction permit (Healy et al., 2012). The council has been criticized for that (Healy et al., 2012).

5.1.8 Landowners

Much of the economic, recreational, aesthetic and conservation of the Irish coastal zone is managed by individual property owners (O'Hagan and Cooper, 2002). It is not an exception in Moher Cliffs where only a small extent of the Cliff is owned by Clare County Council (Figure 6.1 in section 6.1.1) (Mcllveen and Martin, 2002).

Landowners in Moher Cliffs have had minimal involvement in the management and planning process in Moher Cliff's tourist destination. This situation has led to conflicts and mistrust toward the Clare County Council from landowners (Healy et al., 2012). The only mention is the assistance of landowners for the development and maintenance of the coastal trail and the request to tourists to respect private property, fences and livestock of the landowners (Cliffs of Moher, n.d.). The conservation of Moher Cliff's parts owned by landowners is unclear and no comprehensive plan for the entire Cliffs is present. The voluntary or involuntary role of the landowners is also not clearly set.

5.1.9 Tourists

Tourists represent an important part of the County Clare's economy. In 2009, a total of tourists 1.73 million generated 390.6 million Euro in related revenue. Overseas tourists represented 791 000 and contributed 250 million Euro in revenue. Six per cent of the total employment in the County is created by tourism (Clare County Development Board, 2011a). However, tourism in Clare County experienced a decline of 28.8 % in overseas tourists in 2009 compared to 2008 and a decline of 34% of the revenues of the sector (Clare County Development Board, 2011a). Tourists coming in Ireland have been defined through marketing analysis as sightseers and culture seekers. These tourists are defined by holiday needs with interests in sight-seeing, learning about, visiting, and experiencing the country and its culture, both living and historic (Clare County Development Board, 2011a).

The Cliffs of Moher is the largest tourist attraction in Clare County with 940 455 tourists in 2007 (Clare County Development Board, 2011a; Cliffs of Moher, n.d.). Tourism then experienced a decrease as everywhere in Clare County (Clare County Development Board, 2011a) and increased again from 2011. In 2013, 960 134 tourists came representing an increase of 10 % compared to 2012 (Cliffs of Moher, n.d.). Domestic Irish, North American and continental European markets, especially Germany are the strongest markets present in Moher Cliffs (Cliffs of Moher, n.d.).

5.1.10 Other stakeholders

Other stakeholders involved in tourism, trails and environment at Moher Cliffs include:

- Tourism Ireland. Responsible for marketing Ireland overseas as a holiday destination (Clare County Development Board, 2011a),
- Fáilte Ireland. The Irish Tourism Development Authority that is responsible for the development of tourism in Ireland and is centrally involved with the development and promotion of trails in Ireland (Cliffs of Moher, n.d.; Irish Trails, n.d.)
- National Parks and Wildlife Service (NPWS). Part of the Department of the Environment, Heritage and Local Government, NPWS is in charge of the conservation of habitats and species in Ireland (Irish Trails, n.d.)
- Clare Tourism Forum. Established in 2005, this forum focuses on providing a collaborative approach to tourism in County Clare and facilitating on-going development of the tourism industry. It has developed the County Clare promotion brand "Live the life" (Clare County Development Board, 2011a),
- Burren Ecotourism Network (B.E.N.). A network of tourism enterprises with the objective of establishing the Burren as a premier internationally-recognized sustainable tourism region (Burren Ecotourism Network, n.d.),
- Other agencies or associations related to tourism, trails and environment or impacted by tourism and trails such as National Biodiversity Data Centre, Cycling Ireland, Irish Farmers Association, Walking Trails Ireland or Clare Biodiversity Group,
- Cliff-seeing boat tour agency "Cliffs of Moher cruises" (Cliffs of Moher Cruises, n.d.), and

- Enterprises offering touristic services such as accommodation, restaurants, recreational activities, travel agencies or car rentals.

The stakeholders involved in Moher Cliffs tourism, trail and environment management and planning are numerous. Stakeholders, strategies and legislations involved in tourism are often completely different than the ones involved in trails and in environment. Moreover, many of these stakeholders have roles that overlap and the decision hierarchy, power hierarchy and interactions are often not well defined. The result of the interactions, implication or no implication of these different stakeholders on the applied case of Moher Cliffs planning process will be review in section 6.1. The next section will present the stakeholders relevant to Látrabjarg Cliffs' management and planning process so in section 7.1 their hierarchy and interactions can be compared with Moher Cliffs to extract useful information and recommendations for Látrabjarg's planning process and future management.

5.2 Látrabjarg Cliffs

Látrabjarg stakeholder's interests and interactions are far more complex and tense than initially expected. Uncertainties, property conflicts, absence of trust, false judgment, etc. seem to happen between stakeholders, around Látrabjarg's future. It is too complex, unethical, not the study objective and against research rules to comment, arbitrate or judge this situation. However, for the clarity and comprehension of the area's social-politic situation, a non-exhaustive review of these interactions is presented in this section. Key stakeholders include the government, the Icelandic National Planning Agency, the Environment Agency of Iceland, the tourism sector, the local municipality, the landowners and others.

5.2.1 Government

Iceland has signed different international environmental conventions that have implications for management at Látrabjarg Cliffs. These include:

- Agenda 21 from the Rio de Janeiro Earth Summit in 1992,
- The International Convention for the Protection of Birds in 1956 (Umhverfisstofnun, n.d.c),
- The Convention on Biological Diversity (CBD) in 1992 (Umhverfisráðuneytið, 2008),

- The Ramsar Convention on wetlands in 1977 (Umhverfisstofnun, n.d.c) and
- The Bern convention on the Conservation of European Wildlife and Natural Habitats in 1993 (Council of Europe, 2014)

In addition, being a member of the European Economic Area (EEA), Iceland has to follow some of the directives of the EEA such as the Environmental Impact Assessment Directive (97/11/EC) (Environmental Impact Assessment Act 106/2000).

Iceland participates in the Nordic Environmental Action Plan 2013-2018 (Nordic Council of Ministers, 2012). This action plan promulgates the evaluation of ecosystem services, the international cooperation and sharing of knowledge, the generation of value based on natural and cultural heritage and sustainability in order to protect Nordic environments (Nordic Council of Ministers, 2012).

The base legislation for environmental protection in national legislation is the Nature Protection Act (44/1999). Its goals are to support cohabitation of human and the environment to ensure that neither life is spoiled, water, air or soils are not polluted, to ensure that Icelandic nature continues to evolve by its own laws (Lög um náttúruvernd, 44/1999).

The main tool for nature conservation legislation in Iceland is the National Conservation Plan, developed in 2004-2008 and 2009-2013 by the Environment Agency of Iceland (Baark ehf., 2014; Mr. Ásgeirsson, pers. comm., 12th June 2013; Skipulagstofnun, 2012; Vesturbyggð, 2003). The objectives of the 2009-2013 plans are to ensure protection of Icelandic nature and execute international agreements on natural conservation. The purpose is to create a network of protected areas to ensure the protection of landscape, nature, biodiversity and special, rare or endangered features and to conserve natural areas for natural protection, scientific research and outdoor recreation (Umhverfisstofnun, n.d.d). The 2004-2008 and 2009-2012 plans both recommended transforming Látrabjarg into a National Park as described in the Nature Protection Act (44/1999) (Mr. Ásgeirsson, pers. comm., 12th June 2013; Skipulagstofnun, 2012) and the 2009-2013 plan is the base for the conservation plan of Látrabjarg. However, a new National Conservation Plan is currently being developed by the Icelandic Institute of Natural History (Mr. Ásgeirsson, pers. comm., 25th February 2014) and as a consequence adaptations will probably have to be made on the Látrabjarg conservation plan (Mr. Ásgeirsson, pers. comm., 12th June 2013).

The Icelandic government also developed in 2008 an agenda for the implementation of the CBD (Umhverfisráðuneytið, 2008). This agenda proposes 27 actions under the following ten goals: basic research and registration, biodiversity monitoring, land and fresh water conservation, regional protection of the marine environment, invasive species regulations, biodiversity recovery, GMO's, protecting livestock and plant varieties, education and biodiversity bank and development of biodiversity indicators (Umhverfisráðuneytið, 2008).

Another important agenda is the Iceland's National Strategy for Sustainable Development 2002-2020, called Welfare for the Future, developed following the recommendation of the Agenda to promote sustainable development in all sectors and sectors integration (Ministry for the Environment in Iceland, 2002). Its goals are to ensure healthy and safe environments with outdoor activities in harmony with nature through free access to common land, consideration of outdoor activities in planning and land-use decisions and encouragement of increased tourism along with measures to protect nature from damage (Ministry for the Environment in Iceland, 2002). The agenda for developing CBD and Iceland's National Strategy for sustainable development are important to take in consideration because Látrabjarg Cliffs are an internationally important environment that need to be protected under these two agendas and that the current planning process is an opportunity to properly follow the recommendations and actions of these agendas.

Three different legislations regulate planning in Látrabjarg: the Planning and Building Act (123/2010), the Environmental Impact Assessment Act (106/2000) and the Strategic Environmental Assessment (SEA) Act (105/2006) (Skipulagsstofnun, n.d). The Planning and Building Act ensure the rational and efficient utilization of land and natural resources, to ensure the preservation of natural and cultural values and to prevent environmental damage and overexploitation, using the principles of sustainable development as a guideline (Skipulagslög, 123/2010; Ministry for the Environment in Iceland, 2002) The EIA Act objective is to ensure mitigation of negative impact of projects on the environment, communicate these impacts to the public and promote cooperation of stakeholders (Environmental Impact Assessment Act 106/2000). The SEA Act is to promote sustainable development, environmental considerations in plans and strategies and reduce negative impacts on the environment (Skipulagsstofnun, n.d).

The Látrabjarg land-use plan is also subject to the Law on the Tourist Destinations Development Fund (75/111) and to the Law on Tourism Planning (117/1994). The law on

the Tourist Destinations Development Fund is to distribute funds to insure the safety of tourists and protect the nature of the country, to increase the number of tourist destinations and reduce the stress on overcrowded destinations. The fund is to repair, develop infrastructures and protect nature that are privately owned or in protected areas (Lög um Framkvæmdasjóð ferðamannastaða, 75/2011). The Law on Tourism Planning law is to support the development of tourism as an industry and the planning of tourist services for Icelandic and foreign tourists as an important factor in the Icelandic working and social life while regarding economic value and environmental conservation and to ensure that the Icelandic Transport Ministry is responsible of the application of the law (Lög um skipulag ferðamála, 117/1994).

The Law on Archeological Remains (80/2012) protects any archeological remains in Iceland (Baark ehf., 2014). Consequently, all remains in Látrabjarg area are protected and should not be impacted by the land-use plan (Baark ehf., 2014).

5.2.2 The Icelandic Planning Agency (Skipulagsstofnun)

The Icelandic National Planning Agency (Skipulagsstofnun) is the state authority responsible for the administration, monitoring and the implementation of the Planning and Buildinc Act, the Environmental Impact Assessment and the Strategic Environmental Assessment Act (Skipulagsstofnun, n.d.). In this regard, Skipulagsstofnun required an environmental impact assessment for Látrabjarg land-use plan. The Icelandic Government through the Icelandic National Planning Agency (Skipulagsstofnun) is one of the entities that have to give its approval in the final decision about Látrabjarg plan (Mrs. Sturludóttir, pers. comm., 15th July 2013).

5.2.3 The Environment Agency of Iceland (Umhverfisstofnun)

Umhverfisstofnun is the authority in charge of environmental protection and the planning of protected area under the article 6 of the Law on Nature Protection (44/1999) (Unknown, 2013). Umhverfisstofnun is in charge of the realization and coordination between the stakeholders in the Látrabjarg conservation plan under the law on Nature Protection (44/1999) (Unknown, 2013). Mr. Ásgeirsson representing Umhverfisstofnun and Látrastófa is the head of the work group on this conservation plan (Mr. Ásgeirsson, pers. comm., 12th June 2013; Mr. Ásgeirsson, pers. comm., 25th February 2014). However, Umhverfisstofnun seems to have a bad reputation amongst many landowners (Mr.

Gíslason, pers. comm., 02nd July 2013). The Environment Agency is another entity that will have to give its approval in the final decision about Látrabjarg's plan (Mrs. Sturludóttir, pers. comm., 15th July 2013).

5.2.4 Tourism sector

The tourism sector in Iceland is well developed due to the importance of tourism in Iceland's economy. Many actors are present and working in collaboration to develop, ameliorate and advertise Iceland to international tourists (Ministry of Industry, Tourism Department, 2010). The tourism sector is composed of many actors that can be divided under the following roles: Government (such as the Iceland Tourist Board and the Ministry of industry and innovation); tourism laws, research (such as the Icelandic tourism Research Center and Statistics Iceland); support for businesses, start-up and entrepreneurs (such as Regional Culture Projects Grants, Innovation Center Iceland and Iceland Regional Development Agency) and advertising, marketing and information (such as Tourist Information Centers, Promote Iceland and Regional Marketing Bureaus). The current efforts of the tourism sector in Iceland focus on the international promotion of Iceland, the development of the Vakinn certification label, the creation of regional clusters, the discussion of the financing and development of personal (Mrs. Kristjánsdóttir, pers. comm., February 2013).

5.2.5 Vesturbyggð Municipality

The Municipality is the main stakeholder and the entity in charge of the planning process for Látrabjarg (Mrs. Sturludóttir, Vesturbyggð Municipality Mayor, pers. comm., 15th July 2013). Látrabjarg's planning process has begun and is based on the municipal master plan (Baark ehf., 2014). This master plan is based on the National legislation about natural conservation and proposed that Látrabjarg should be a designate protected area (Vesturbyggð, 2003). Before the transformation of Látrabjarg area into National Park, the area should be placed under local lower protection status (Baark ehf., 2014; Vesturbyggð, 2003). Other tourism plans exist for the Vesturbyggð Municipality. However, the Látrabjarg plan is the main one and non-official links are made with the other plans in the framework of a vision for the Municipality (Mrs. Sturludóttir, pers. comm., 15th July 2013).

From the view of the municipality, the goal of creating the National Park is to develop the area by increasing revenues from tourists, increasing preservation of the environment and supporting the infrastructure (Mrs. Sturludóttir, pers. comm., 15th July 2013). However, in the Master Plan, positive effects of the creation of the National Park are almost exclusively about social and economic elevation of the region. The effects on nature preservation are null, except a positive effect on landscape and a negative effect on vegetation through trampling (Vesturbyggð, 2003). The decision of creating the National Park has been a common decision between the Municipality and the landowners (Mrs. Sturludóttir, pers. comm., 15th July 2013). According to the Municipality, under the rules set by the law, the landowners have the "final word" about the plans (Mrs. Sturludóttir, pers. comm., 15th July 2013). However, from the point of view of the landowners, their decision power and the real goal of the National Park creation are quite different (see section 5.2.6). The Municipality is the third and last entity that will have to give its approval in the final decision on Látrabjarg plan (Mrs. Sturludóttir, pers. comm., 15th July 2013).

5.2.6 Landowners

The landowners in Látrabjarg area and surroundings are more than one hundred, with 86 landowners in the Látrabjarg-Látravík-Breiðavík area landowners association in which Mr. Gíslason is the head (Mr. Gíslason, pers. comm., 02nd July 2013; Bjargtangar, n.d.). The landowners previously took care of the management of the area. The majority of the signs have been designed, financed and placed by the landowners (Mr. Gíslason, pers. comm., 02nd July 2013; Mr. Ásgeirsson, pers. comm., 12th June 2013). Due to the lack of funding from the government to the landowners, they will not have the capacity to take care of the infrastructure anymore if tourism increases. Moreover, they feel that the Value Added Tax (VAT) on hotel rooms (100 ISK per person per night in 2012) that is supposed to help the conservation of the area has not been paid back and has served as an income for the government (Mr. Gíslason, pers. comm., 02nd July 2013).

The landowners at Látrabjarg are not against increasing tourism on the condition that the road is moved out of Hvallátur village (Mr. Gíslason, pers. comm., 02nd July 2013). Some of the landowners would like to profit from tourism on their land; however, as water supply is very limited in the area is unlikely to be possible (Mr. Gíslason, pers. comm., 02nd July 2013).

Landowners are willing to preserve the area. However, all the landowners are not happy with the transformation into a National Park (Mr. Gíslason, pers. comm., 02nd July 2013). The reasons are in part due to the fact that the landowners will lose the control of their eggs and birds harvesting traditional activity in the National Park. They harvest around 10 000 to 25 000 eggs per year (Mr. Gíslason, pers. comm., 02nd July 2013). Landowners see the creation of the National Park as a way to take control over the landowners on the area. They see this planning process and National Park project as an aggression from the government and a way to increase pressure on the environment in order to increase employment and tourism (Mr. Gíslason, pers. comm., 02nd July 2013). According to Mr. Ásgeirsson (pers. comm., 12th June 2013), the landowners are worried about effects on puffins of tourists visiting during the night and the consequences on the puffins. However, Mr. Gíslason did not express any concern about this issue (Mr. Gíslason, pers. comm., 02nd July 2013).

5.2.7 Tourists

The tourists are one of the main stakeholders at Látrabjarg Cliffs. They are the cause and reason for planning and managing the cliffs. The tourists coming to Látrabjarg have been discussed in section 3.3. Their behavior, particularities, needs and desires should be assessed and considered in the current planning and management process.

5.2.8 Other stakeholders

Many other stakeholders are impacted by the planning process in Látrabjarg and should be involved in the process. These stakeholders include:

- The architecture company Baark ehf. that developed the land use plan proposal and received 1 500 000 isk by the government through funding (Mr. Ásgeirsson, pers. comm., 12th June 2013).
- The Road Administration (Vegagerðin) that is in charge of the road engineering and will be responsible for the deviation at Hvallátur village of the road to Látrabjarg. Vegagerðin is also in charge of the design and maintenance of the roads in the area. Their current policy is to transform ancient gravel roads (70 km/h) into asphalt roads (90 km/h roads). However, the landowners would prefer to keep the gravel road because tourists are there for only three months (Mr. Ásgeirsson, pers. comm., 12th June 2013; Mr. Gíslason, pers. comm., 02nd July 2013). Vegagerðin is

also in charge of two car counting devices, one all year round and one in the summer time, on the road to Látrabjarg that determine tourist number estimates. Vegagerðin will also be in charge of changing the course of the access road to Geldingsskorardalur (Mr. Ásgeirsson, pers. comm., 12th June 2013).

- The Icelandic Natural History Institute (Náttúfræðistofnun Íslands) that is currently working on the National Conservation Plan (Mr. Ásgeirsson, pers. comm., 25th February 2014).
- The fishermen and maritime authorities that are impacted by the up to 2km from shore maritime area that will be included in Látrabjarg National Park. They should also be consulted in the process of decision and implementation of cliffs sea-seeing boat tour regulations.
- Tour operators and guides whose needs and desires should also be considered.
- Bird Life Iceland (Fuglavernd) that works for the protection and conservation of Iceland's birds and their habitats and to promote enjoyment, understanding and study of birds and their habitats (Flugavernd, n.d.).
- The Arctic Fox Center (Melrakasetur) that could conduct research on fox and mouse populations in the area.

The stakeholders involved in Látrabjarg tourism planning and management are numerous. However, their interactions and roles are simpler and more clearly defined compared to Moher Cliff's stakeholders. Consequently, the application of legislations, involvement of stakeholders should be more straight forward and good planning process easier to introduce. However, poor stakeholder involvement, misunderstandings, mistrust and poor planning process seem to have happened like in Moher Cliffs. The consequences of these problems on the development and welcoming of the land-use plan is reviewed in section 6.2.4 of the following chapter.

This following chapter focuses on trails as stakeholder's conflicts turn around trail design and management. The following chapter reviews what tourist impacts through trails have been found in tourist destinations and what are they specifically in Moher Cliffs and Látrabjarg Cliffs. This chapter then presents the existing tools to assess these impacts and mitigate them. This chapter will finally review the development of trails in Moher Cliffs and what is currently proposed and discussed at Látrabjarg Cliffs in order to extract recommendations for the planning and management of Látrabjarg.

6 Moher and Látrabjarg Cliffs planning and management processes

6.1 Moher Cliffs

This section will discuss the trails in Moher cliffs and their management. The first section will review the history and original state of the trails. The second section will more specifically discuss the general planning process and management occurring at Moher Cliffs. Details on trails management and design proposed by Shannon development during the planning process and the actual management of the trails will be reviewed in the second section. This section gives the information necessary to compare the trail management decided at Moher cliffs. Its consequences and the path taken are presented in the next section. It will help determining which path should be taken for Látrabjarg Cliff's trail management.

6.1.1 The trails of Moher Cliffs

The trails developed at Moher Cliffs prior to the recent development works consisted of permanent structures (Figure 6.1). The entrance was situated near the parking and a mall visitor center that could no longer accommodates the number of tourists visiting the Cliffs (Mcllveen and Martin, 2002; Cliffs of Moher, n.d.). The main approach to Moher cliffs trails was a bitmac path approximately 3.5m wide, enclosed between two flags and bank walls made of rock. However, climbing tourists and weather have eroded them (Mcllveen and Martin, 2002). The presence of uneven height and broken and uneven slabs make it unattractive visually and not really secure (Mcllveen and Martin, 2002). A viewing area was present at the end of the entrance path. The wall enclosing the viewing area was low and did not prevent tourists from going on the cliff edge. Many trails have been formed by tourists going from the viewing area to the cliff shelf (Mcllveen and Martin, 2002).

The path leading to the observation tower (O'Brien's tower) was also small, from 2 to 4 m wide, and no longer accommodated the amount of tourists. The result was the creation of a parallel path to the trail and tourists accessing cliff edge creating significant area of

erosion. Moreover, the ratio of the steps was not constant making the flights of steps difficult to negotiate (Mcllveen and Martin, 2002).

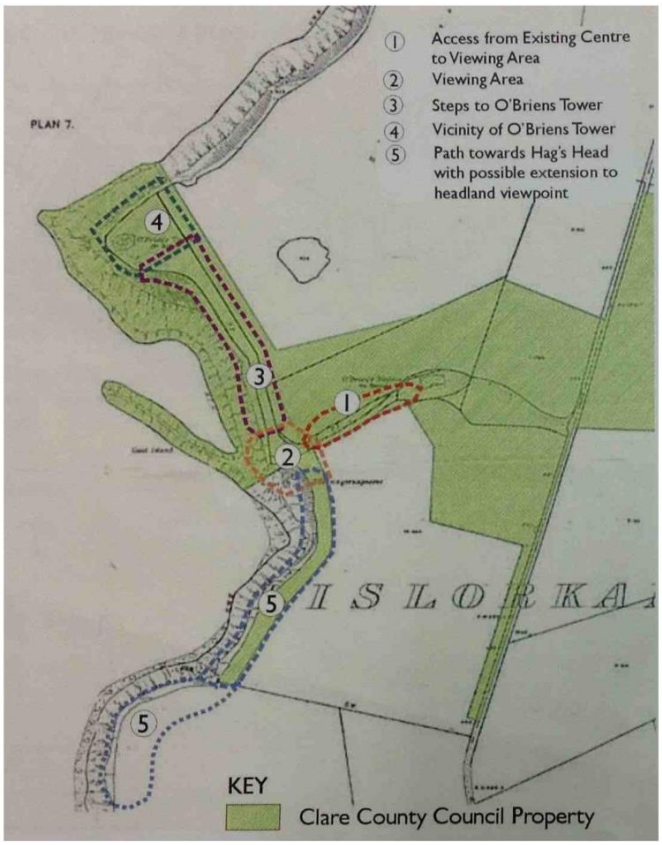

Figure 6.1 Moher cliffs infrastructures before 2002 (Mcllveen and Martin, 2002, p.5).

At O'Brien's Tower, slab paths, 3-4 m wide follow the perimeter slab wall and access the tower. The grass area between the paths is heavily eroded by trampling and weather. The seaward edge of the area is heavily eroded due to tourists sitting (Mcllveen and Martin, 2002). On the other side of the site, a path leads to Hag's Head (Figure 6.1). There is no entrance to the path and the tourists need to cross a series of rubble, slab stone walls and a field fence to access it. Some accidents occurred due to this dangerous maneuver and erosion occurs at the cliff edge (Mcllveen and Martin, 2002).

Signage present at the site was visually intrusive and rapidly damaged by the harsh weather. Signage and leaflets were insufficient to furnish proper information about what to observe, about interesting elements (such as fauna, flora, geology, history or folklore), paths to take, potential risks and appropriate behavior to adopt (Mcllveen and Martin, 2002). The existing viewpoints are few, even though viewing telescopes have been introduced at the main viewing area and O'Brien's Tower, leading tourists to step over the

trail walls. Moreover, benches were two few and only present in the path leading to O'Brien's Tower, resulting in tourists sitting on the walls (Mcllveen and Martin, 2002). The toilet facilities, garbage bins and information center were at the entrance to the site in the tourist visitor center. An additional small garbage bin was situated in the steps leading to O'Brien's tower (Mcllveen and Martin, 2002).

In consequence, Moher Cliff's trails are a source of many concerns: damaged or missing boundary wall, slippery surfaces, inappropriate steps, bad drainage and signage (Mcllveen and Martin, 2002). The existing paths are degraded and too small, resulting in tourists trespassing onto the cliff edge which is a Special Protection Area (SPA), sitting and lying over the wall, crossing walls and displaying inappropriate behaviors (Mcllveen and Martin, 2002). These behaviors cause more degradation to the boundary wall, erosion and degradation of the grassland on the cliff and of the SPA and potential danger for the tourists (Mcllveen and Martin, 2002). The visual and environmental quality of the infrastructure is also poor (Mcllveen and Martin, 2002). The site is overloaded with tourists and the situation creates security, tourist satisfaction, tourist impact, environmental and development problems (Mcllveen and Martin, 2002; Halton, 1993). Other threats to the Cliffs are coastal erosion and potential disturbances of bird nesting habitats (Halton, 1993).

This situation created an urgent need for remedial work, highlighted in two safety reports from Clare County Council and Shannon Heritage (Mcllveen and Martin, 2002). The occasion of creating general area planning that started in 1988 is presented in the next section.

6.1.2 General planning and management

The first main measure taken for managing Moher cliffs was the construction of a new visitor center at the entrance of the site in 2007 (Cliffs of Moher, n.d.). Due to the increase of tourism between 1978 and 1988, the existing visitor center built in 1978 was becoming too small and a new one was required (Cliffs of Moher, n.d.). In 1988, Clare County Council commissioned Brady Shipman Martin to provide development of this center and other tourist facilities. The resulting 1989 Cliffs of Moher Area Development Plan was incorporated into the 1999 Draft Clare County Council Development Plan (Healy et al., 2012). However, this report lacks basic investigation into the type, scale and nature of

facilities most suitable and tourists, locals and other interest groups were not consulted (Healy et al., 2012).

In 1992-1993, a National Architectural Design Competition was held under the auspices of the Royal Institute of Architects in Ireland (RIAI) at the behest of Clare County Council and Shannon Development. The winner was Cork architectural firm Reddy O'Riordan Staehli Architects that proposed a state-of-the-art underground center (Figure 6.2) (Moher Cliffs, n.d.). However, judgment of the competition facilitate by the Royal Institute of Architects of Ireland was purely on architectural design (Healy et al., 2012). The selection committee was composed of three architects, the head of Clare County Council and the local councilor that was there to "help to sell the idea to the local community" (Healy et al., 2012, p 464). In 2001, Clare County Council granted itself the planning permission for the project, creating another controversy (Healy et al., 2012).

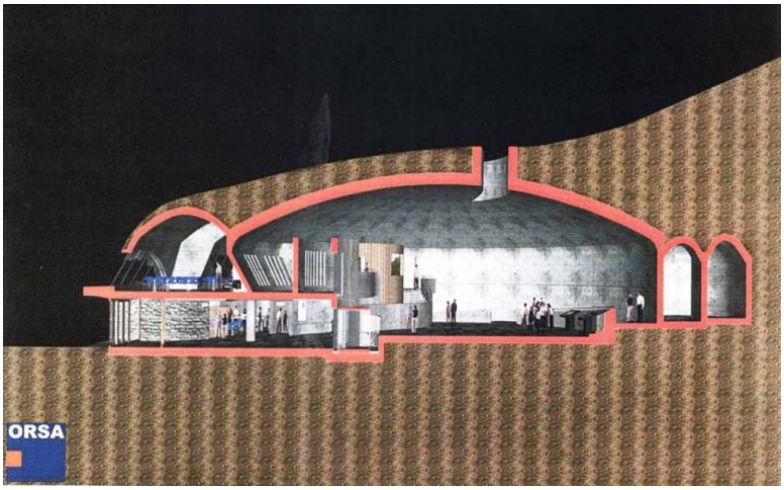

Figure 6.2 Plan of the Cliffs of Moher visitor center (Healy et al., 2012, p. 461).

In opposition to the Clare County Council project, An Taisce and Shannon Development proposed an alternative project based on preserving the naturalness of the area (see section 6.1.3) (Healy et al., 2012; Mcllveen and Martin, 2002). However, when Clare County Council granted itself the planning permission, Shannon development withdrew its proposal and came along the Clare County Council project (Healy et al., 2012).

The development of the project continued until 2005 with the destruction of the ancient visitor center, an environmental impact statement (EIS) and the raising of funds (Moher cliffs, n.d.). The EIS process presents deficiencies and was used as a post facto justification

rather than helping to choose the less environmentally impacting project (Healy et al., 2012). The project got the Failte Ireland grant for Tourism Product Development from the EU Regional Development Fund as part of the National Development Plan 2000-2006 for an amount of 10 million Euro. A 15 million Euro loan was also secured from the European Investment Bank and further funding was provided by Clare County Council (Moher cliffs, n.d.). The project costs a total of 35 million Euro and was finished to be built in 2007 (Healy et al., 2012; Moher Cliffs, n.d.).

This new visitor center consists of an extended parking lot and an underground dome, to reduce visual impact. It is owned by Clare County Council and is managed by the Cliffs of Moher Visitor Experience organization (Mrs. Webster, Cliffs of Moher Visitor Experience Director, pers. comm., 28th August 2013; Moher Cliffs, n.d.). The center proposes a high-tech, multi-sensory interpretative experience including: exhibitions; simulated environments and a state-of-the-art virtual reality experience; talking telescopes on the cliff edge; a large retail area; a cafe and restaurant (Healy et al., 2012; Moher cliffs, n.d.). The new center attracts around one million tourists very year and is the main attraction of the region (Mrs. Webster, pers. comm., 28th August 2013). The key objective of Clare County Council for the visitor center is to promote other local tourism products and work in collaboration with other tourism providers including accommodation, food and beverage, entertainment, tourist attractions and activities (Mrs. Webster, pers. comm., 28th August 2013; Cliffs of Moher, n.d.).

The visitor center and trails have been the source of intense debate about respect of landscape and cultural scenery of touristic infrastructures (Healy et al., 2012). The nepotism, top-down centralized approach, lack of transparency, lack of true public participation and political maneuvering made the planning process slower and created mistrust and conflict (Healy et al., 2012). The planning process in Moher Cliffs has obviously not fulfilled all the principles expressed in the Agenda for sustainable and competitive European tourism and consequently failed to be truly sustainable (see section 5.1.1) (Commission of the European Communities, 2007). In general, it failed to follow many of the Irish national, regional and county regulations and directives (see section 5.1). This is perhaps the reason why tourism development has been set as a threat for Moher Cliff in the Mid-West Regional Planning Guidelines (RPG) and that it is set that no planning should be done without the conduct of a Strategic Environmental Assessment

(SEA) and a Habitat Directive Assessment (HAD) and the assurance that there are no environmental threats or that they could be mitigated (Mid-West Regional Authority, 2010a; Mid-West Regional Authority, 2010b). Moher Cliffs' plan is also lacking proper trail impact assessment. For Healy et al. (2012, p. 461), the site has been transformed "from a robust tourist attraction with basic tourist facilities, to a large-scale, highly professional and commercialized space". Moreover, it is financially and equitably questionable. The car park size doubled but tourists increased eightfold and have to pay to enter the interpretive center. Tour operators and locals expressed concerns about equity and exclusiveness of this situation (Healy et al., 2012). The costs of the site have been transferred to the tourists in an attempt to repay the approximate 2-3 million Euro shortfalls in funding and the 1.1 million Euro loan charges. Given the volatility of the global and Irish tourism market the repayments will be increasingly difficult (Healy et al., 2012).

Along with the new visitor center, a new tourist management program was launched in 2007 (Cliffs of Moher, n.d.). Moher Cliff Experience proclaims "We will preserve our natural and cultural heritage at the Cliffs of Moher and develop new ways to share it with visitors from tourists to fellow heritage sites to lifelong learning groups to the local community. We will establish the Cliffs of Moher at the forefront of Ecotourism initiatives in the region" (Cliffs of Moher, n.d.). One of the objectives of this program was the protection and conservation of the Cliffs of Moher and general sustainability of the site. A Green Team was created under this objective in 2008 to tackle environmental, conservation and waste/energy management issues and participate in local eco-tourism initiatives. The results were recycling bens, waterless urinals and other water sparing devices, motion sensor lighting and energy efficient LED lighting, use of eco-friendly cleaning agents and promotion of local products in the visitor center to reduce transport costs and the carbon footprint of the site (Cliffs of Moher, n.d.). These measures contribute to the social sustainability of the site along with the provision of fair, sustainable and rewarding employment in a pleasant and safe working environment for all staff. (Cliffs of Moher, n.d.). The Moher Cliffs have also entered the ethic and education Leave No Trace Ireland program. This program encourage tourists to " Plan ahead and prepare, Be considerate of others, Respect farm animals and wildlife, Travel and camp on durable ground, Leave what you find, Dispose of waste properly and Minimize the effects of fire" (Leave No Trace Ireland, 2006; Cliffs of Moher, n.d.). The Moher Cliffs Center also

invites the tourists to observe a number of rules for a minimal impact bird watching (Cliffs of Moher, n.d.). This tourist management program allowed Moher Cliffs destination to be eco-certified sustainable travel by Sustainable Travel International (Cliffs of Moher, n.d.).

Cliffs of Moher Visitor Experience organization is also founder member of the Burren Ecotourism Network (B.E.N), following its claim to be "at the forefront of Ecotourism initiatives in the region" (Mrs. Webster, pers. comm., 28th August 2013; Cliffs of Moher, n.d.;). This network has for objective to establish "the Burren as a premier internationally-recognized sustainable tourism region ensuring the future economic and social growth and sustainable development of its communities, environment and heritage. It seeks to support continued training, mentoring and accreditation in sustainable tourism for its members and for businesses interested in joining the Network" (Burren Ecotourism, n.d.). The B.E.N is working in collaboration with the Burren and Cliffs of Moher Geopark to pool their resources and their efforts and to promote the Burren and Cliffs of Moher Geopark as a leading sustainable tourist destination (Burren Ecotourism, n.d.). This includes the promotion of different trail networks (Burren Ecotourism, n.d.).

Moher cliffs and the entire Burren region have applied and gain their designation as Geopark in 2011. Moher Cliffs were fulfilling all the conditions with the presence of numerous network of geological, natural, archaeological, historical and cultural sites of interest and touristic, education and trail networks (European Geoparks Network, n.d.).

Another main planning process is the development and implementation of a Traffic Management strategy that incorporate comprehensive scheme for directional signage for tourists. It involves the Clare County Council, the National Parks and Wildlife Service, the National Monuments Service, local landowners and a number of consultants. Some of the main elements are a Signage Plan and alternative sustainable transport options (Burren and Cliffs of Moher Geopark, n.d; Burren Connect, n.d.). The Burren Signage Plan has been undertaken since 2007 under the Burren Connect Project (now Burren and Cliffs of Moher Geopark) and the Traffic Management strategy.

This section presented the general framework of the planning and management of Moher Cliffs. The next section will focus on the design and management of trails specifically by reviewing the rejected Shannon Development management proposal that was the most

environmental protection focused proposal and presenting what finally has been done on the site.

6.1.3 Shannon Development management proposal

This proposal is based on the claim that best management practices recommend building tourist infrastructures away from environmentally sensitive areas and the approach that the focus should be on increasing tourist expenditure to benefit local communities rather than just increasing tourist numbers (Healy et al., 2012). Moreover, a 2002 survey showed that 67% of tourists mentioned the sense of remoteness and feeling of raw nature among the most appealing aspects of Moher cliffs (Healy et al., 2012). Consequently, Shannon development proposal was to maintain the naturalness and character of the site by relocating facilities to nearby villages and introducing a park and ride system. The existing small visitor center would remain to provide basic facilities on the site (Healy et al., 2012).

The Shannon Development management proposal is a Cliffs of Moher Design and Management Guide that wanted to mitigate the gradual and unacceptable degradation of the tourist experience and the environmental features and securing the future character and quality of the landscape at Moher Cliffs (Mcllveen and Martin, 2002). The guide's main rationales are to define a clear limit beyond which tourist movement is not permitted, the general circulation of people, the compatibility with future site development options, the use of natural materials and the re-use of materials already on site, in order to achieve the primary objectives of improving tourist safety and protecting and enhancing the environment along the cliff edge (Mcllveen and Martin, 2002). The other aims of the Cliffs of Moher Design and Management Guide are:

- Take appropriate steps to ensure that tourists are aware of the hazards and the means to avoid putting themselves in danger.
- Promote safety activities by clearly indicating areas where tourist access is permitted.
- Make tourists aware of the fragile environment at the cliff edge and encourage minimal impact behavior.
- Encourage an on-going site maintenance regime both in terms of hard surfaces and vegetation maintenance/re-instatement

- Provide guidance and information, both through signage literature and presence of wardens at key points, which will lead to better understanding and respect of the area from the tourists (Mcllveen and Martin, 2002).

The entrance area should be designed to mark the entrance to the raw environment of the cliffs and is intended to "hold" tourists temporarily in order to focus their attention on signs giving necessary information with regards to routes, behavior, weather and sensitivity of the cliff flora, fauna and environment (Figure 6.3). On-site wardens reinforcing the information is also necessary (Mcllveen and Martin, 2002).

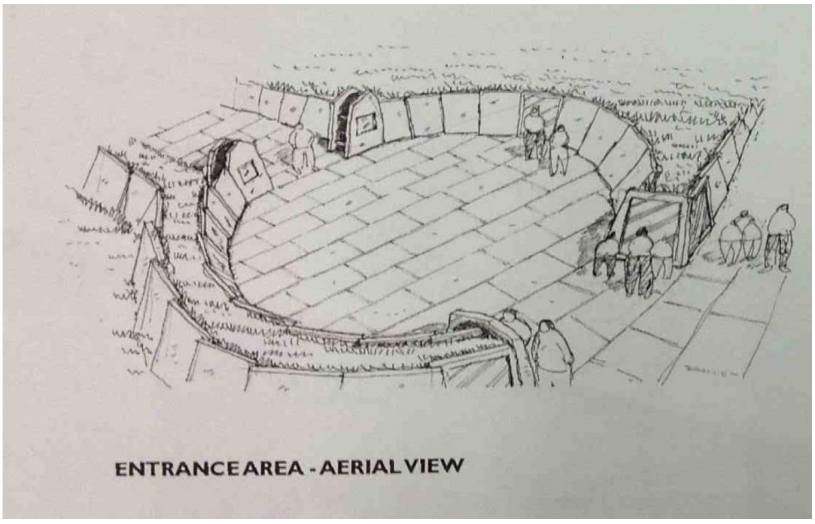

Figure 6.3 Moher Cliff's entrance area design as proposed in the Cliffs of Moher Design and Management Guide (Mcllveen and Martin, 2002, p.7).

The new viewing area should spread the tourist load, separate viewing areas from main circulation routes, sit within the landscape rather than extend out from the cliff, reduce conflict between those wishing to linger and those wishing to get access to and from O'Brien's Tower and increase the opportunity for viewing the cliffs (Figure 6.4). Clear information should be given about the importance of the established edge to tourist access and the fragility of the cliff edge in terms of geological stability and habitat value. All the areas of worn and tracked grass should be reinstated and the area fenced during establishment phase (Mcllveen and Martin, 2002).

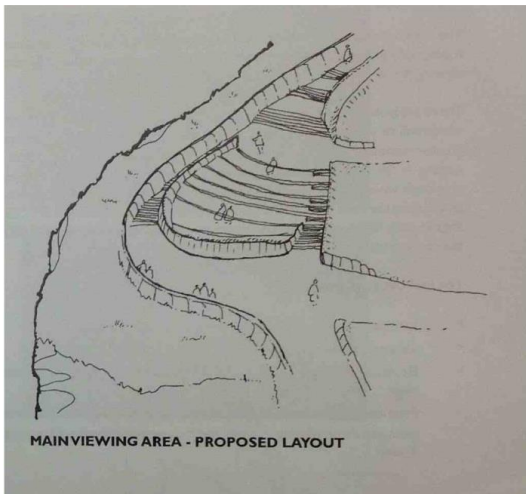

Figure 6.4 Moher Cliff's main viewing area design as proposed in the Cliffs of Moher Design and Management Guide (Mcllveen and Martin, 2002, p.8).

The steps accessing O'Brien's Tower should be enlarged to cope with the number of tourists. The ease of ascent and descent will be assured by regularizing the step ratio. To further improve the step design, the risers will be constructed with contrasting strip of locally sourced sandstones that will visually emphasize the edge of each step and is a more robust construction technique. Steps will be drained to a land drain along the landward side of the path. Some viewing areas and informal seating areas can be implemented by widening the path but the slab wall edge should be redefined to not enter the Special Protected Area (Figure 6.5), (Mcllveen and Martin, 2002).

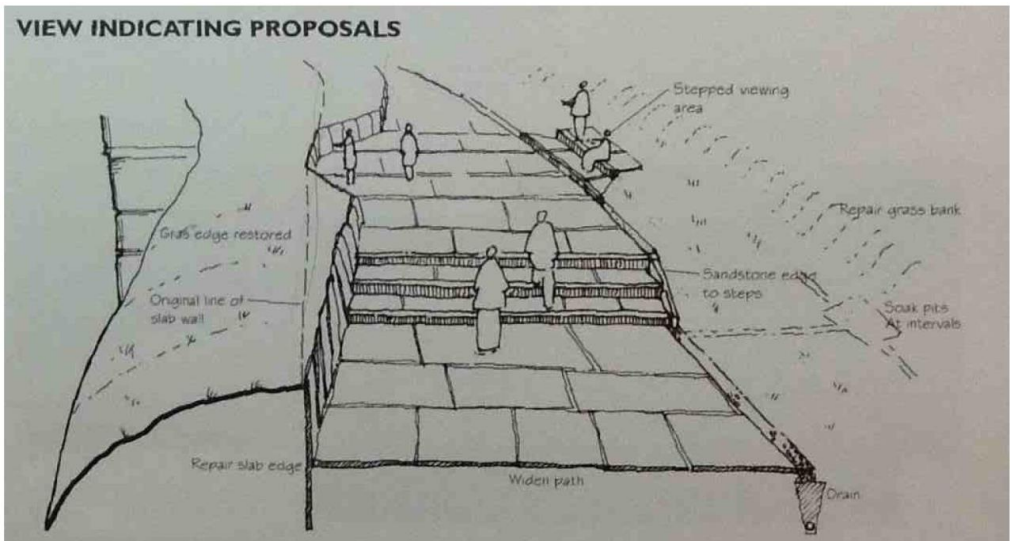

Figure 6.5 Moher Cliff's steps leading to and from O'Brien's Tower design as proposed in the Cliffs of Moher Design and Management Guide (Mcllveen and Martin, 2002, p.10).

In the vicinity of O'Brien's Tower, a series of terraces down from the platform of the tower and extended over the entire grass area between the paths should be installed to create a robust surface, attractive surroundings and seating opportunity. The intrusive eroded signage should be replaced by limited signage flush mounted to the slab wall edge or set in paved areas (Figure 6.6) (Mcllveen and Martin, 2002).

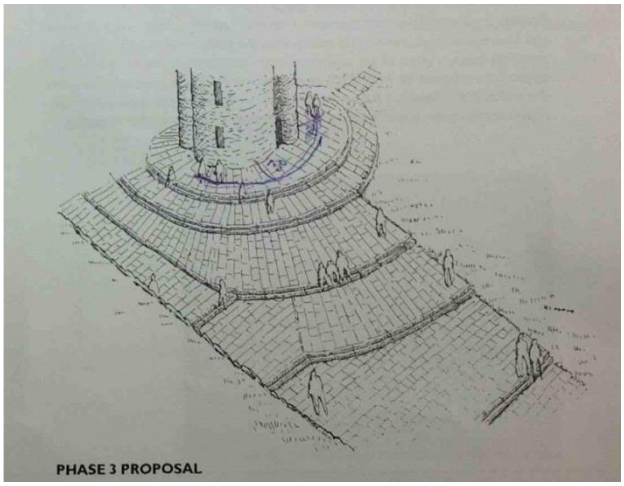

Figure 6.6 Moher Cliff's O'Brien's Tower area as proposed in the Cliffs of Moher Design and Management Guide (Mcllveen and Martin, 2002, p.12 and 13).

For the path leading to Hag's Head, access to the path would be cleared from the obstructing walls and fences. The path of 4 m wide should be ramped and without steps. Two possible lookout points would be created along the path. Interpretive signs should be limited. The eroded area on the cliff edge would be repaired (Mcllveen and Martin, 2002).

The slab walls should be all equalized and increased to 1.25 m to avoid tourists overstepping them. The signage should be carefully designed and provided to assure its life span in the harsh environment and that signs will be read and noticed without be too much intrusion in the landscape. The signage for guidance should be concentrated at the entrance of the site and should be flexible to allow information updates. A weather warning system should also be introduced. The interpretation panels should be reduced at a minimum and a leaflet should be distributed that includes interpretation information referring to numbered signs set into slab edge wall. These numbered signs should be made of local stone. The leaflets should be printed on recyclable paper and tourists encouraged returning them after the visit (Mcllveen and Martin, 2002).

The restoration of eroded area should be the subject of detailed research and development of site specific solutions with locally excavated soil and turfs or seed mix locally sourced and derived from native strains (Mcllveen and Martin, 2002). Public health and safety matters should be addressed during and after the construction phase through design, signalization and management. Members of the public should be segregated away from construction works and workers. Safe methods of working near the Cliff edge and during manipulation of rock slabs should also be implemented and efficiently managed (Mcllveen and Martin, 2002). The guide proposes to remove all garbage bins from the site and to encourage people to take away their litter by guides, wardens and informative signs located near the visitor center, O'Brien's tower and on leaflets (Mcllveen and Martin, 2002).

6.1.4 Trail management

The trails and viewing areas finally built in 2006 at Moher Cliffs have common points but differ by the introduction of metal and wood fences, garbage bins, flags, picnic tables. The absence of grass banks and the absence of flag wall on certain area of the path allow more freedom of tourists to trample adjacent vegetation (Figure 6.8), (Cliffs of Moher, n.d.). Moreover, the introduced design of the entrance area obviously does not fulfil the role of holding tourists to focus their attention on important information. It is more a highway leading the mass of tourists directly to the viewing area (Figure 6.7).

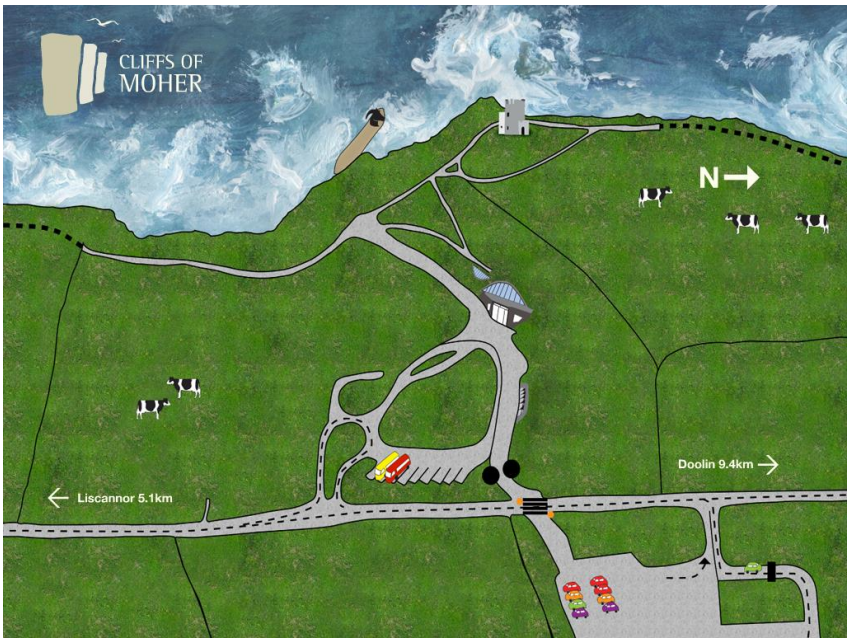

Figure 6.7 Moher cliffs new facilities (Cliffs of Moher, n.d.).

Figure 6.8 The new steps leading from the viewing area to the O'Brien's Tower at Moher Cliffs (Cliffs of Moher, n.d.).

Figure 6.9 The plateau where the tower is located, fenced off to discourage potentially dangerous hiking at Moher Cliffs (Tørrissen, 2012).

Along with the main viewing area and O'Brien's Tower viewing area, a new viewing area on the path to Hag's Head has been opened to observe the Puffin colony on Goat Island (Cliffs of Moher, n.d.). As part of an ecological reconstruction of the SPA the area closest to the visitor center and the damaged cliff top habitats were reseeded during the construction stage with local cliff top grass seed and education programs are taking place (Cliffs of Moher, n.d).

Beyond the area of the Clare County owned part of Moher Cliff lies the new Cliff of Moher Coastal Walk from the town of Liscannor to Doolin that cost 400 000 Euro to develop and was a collaborative project with more than 40 stakeholders. However, the trail is only suitable in good weather conditions and targets experienced walkers with good

physical conditions (Cliffs of Moher, n.d.). This trail has been accredited by the National Trail Office (Irish Trails, n.d.).

This section on Moher Cliffs trails has presented a specific approach to tourist impact mitigation, trail planning and management. This approach proved to have some downsides but also some benefits. The next section will present the current state of the trails in Látrabjarg Cliffs showing how much trail planning and management is required. The next section will also present the current path taken for trail management in the planning process at Látrabjarg Cliffs. It will allow comparison between the direction taken in Látrabjarg Cliffs and the one that was taken in Moher Cliffs and extract important recommendations for Látrabjarg planning.

6.2 Látrabjarg Cliffs

6.2.1 The trails in Látrabjarg Cliffs

There is currently only one trail along the edge of Látrabjarg Cliffs. This trail was originally made and maintained by up to 900 sheep grazing in the area. The last sheep in the area was in 2011 (Baark ehf., 2014; Mr. Ásgeirsson, pers. comm., 12th June 2013) and since the end of sheep grazing, it is hikers who maintain this trail (Mr. Ásgeirsson, pers. comm., 12th June 2013).

The trail is widely used and presents many parallel tracks between the car park and Ritagjá area that are informal (Umhverfisstofnun, 2013b). Only a few tourists climb further to the highest cliff point (Mr. Ásgeirsson, pers. comm., 12th June 2013; Mr. Garðarsson, pers. comm., 10th June 2013). The trail from the highest cliff point to Geldingsskorardalur is quite narrow, poorly marked with no indication signs. On average one or two persons take it each day in the summer that is a significant amount of tourists for this region (Mr. Ásgeirsson, pers. comm., 12th June 2013; Mr. Garðarsson, pers. comm., 10th June 2013; Umhverfisstofnun, 2012). The trail is invisible in some places due to cliff falls and is really hard to follow, especially in foggy or bad weather that is common in. The markers are wood stick with faint red paint on the top that are difficult to spot (Figure 6.10) After arriving at the cliff edge, when going from Geldingsskorardalur to Bjargangar, the trail is not marked anymore.

Figure 6.10 Different sections of the Látrabjarg trail just after leaving Geldingsskorardalur toward Bjargtangar. At least one trail mark is visible in each image. It is obvious that the trail is really difficult to follow and that hikers can easily become lost (Legatelois Marie©).

Another problem is the presence of sheep or vehicle tracks in deep, almost inaccessible, valleys and cliff slopes (Figure 6.11). These tracks could lead people in to dangerous situations, especially if unprepared and ignorant hikers follow these tracks and become lost. Some information is provided on panels at the car park in Bjargtangar about tourist security (Mr. Gíslason, pers. comm., 02nd July 2013). However, many tourists do not read signs and signage is much less efficient than personal contact to modify tourist's behavior (Hockett et al., 2010). If tourists decide to take the trail from Geldingsskorardalur to Bjargtangar, like I did, there are no security instructions or signs at Geldingsskorardalur car park.

The trail from Gelingsskorardalur to Keflavík area seems almost unused and I don't have any information on its exact state. No repair or improvements have been done on this portion.

Figure 6.11 Sheep tracks that look like possible hiking trails can be observed in the difficultly accessible Djúpidalur valley (Legatelois Marie©).

The trail between Bjargtangar area and the highest point of the cliff is better defined. Information in this area is about unstable cliff edge and presence of frequent strong winds warnings that could result tourists falling from the cliff if secure distances are not respected. However, these panels are placed at the entrance to the car park and tourists coming by car are not passing near them when accessing the cliff. Other small panels are placed on the first section of the trail to indicate area where tourists should not go (Figure 6.12). A very obvious indication is the presence of a white paint line and stones since 2012 at 1.5 to 2 m distance from the cliff edge to delimit puffin reproduction areas, to avoid tourists disturbing birds and to warn tourists of the danger of standing on the cliff edge (Umhverfisstofnun, 2012). This line goes from the vicinity of the light house to Ritagjá area and has been an efficient measure (Umhverfisstofnun, 2013b). However, some tourists seem to not take notice of these signs in order to get better pictures (Figure 6.13).

Figure 6.12 A panel informing tourists to stay behind the marked white and stone line in order to not disturb birds (Legatelois Marie©).

Figure 6.13 The continuous line of white paint, small panels and stones warns tourists to not cross in order to avoid impacts on birds. However, it does not discourage all tourists and some come nearer in order to get better pictures (Legatelois Marie©).

6.2.2 Tourist impacts through trails in Látrabjarg Cliffs

In Iceland, due to the slow recovering and fragile Nordic-type vegetation ecosystem, trampling is likely to seriously impact soil cover (Ólafsdóttir and Runnström, 2009; Sæþórsdóttir et al., 2003). Látrabjarg seems to be dominated more by lichens than moss. Lichens and particularly moss are one of the most fragile types of vegetation due to their extreme slow growth (Mr. Heiðmarsson, pers. comm., 14th May 2013; Sæþórsdóttir et al., 2001). I also observed portions of the trail along Látrabjarg more dominated by moss and lichens and some more by grassy vegetation.

Consequently, trampling effects and resulting degradation of trails is an important issue in Iceland and Látrabjarg Cliffs. Studies in different Icelandic protected area show that many trails are in really bad conditions, degrading or at near full capacity (Aradóttir et al., 2003; Sæþórsdóttir et al., 2003; Sæþórsdóttir et al., 2001). This is explained by the fragility of the vegetation (Sæþórsdóttir et al., 2003) and by the behavior of tourists (Sæþórsdóttir et al., 2003). Few tourists are taking the trails on horseback. However, horses have frequently damaged the footpaths. Consequently, horse riding tourism is not recommended within Icelandic conservation areas (Sæþórsdóttir et al., 2003). Bad or difficult trail conditions avoid access of sites to some tourists and improvement of trails would be necessary. However, this access restriction by the condition of trails can be positive for some tourists seeking natural experience or loneliness (Sæþórsdóttir et al., 2003). Otherwise, many trails are in such a bad shape that restoration is an obligation (Sæþórsdóttir et al., 2003).

As said previously, the presence of a trail modifies the adjacent vegetation but generally for not more than two meters (Dale and Weaver, 1974). This influence seems to happen or have happened at Látrabjarg through my personal observations (Figure 6.14).

Figure 6.14 Visual evidence of influence on the vegetation composition of the Kyngjulönd area trail at Látrabjarg (Legatelois Marie©).

This trail degradation is present in Látrabjarg. I observed many indicators of trail over-charging and trampling impacts on trails such as trail deepening, root exposure, rock exposure, trail widening and multiple trails (Figure 6.15). The portion of the trail

experiencing the highest stress is the one from the car park to Hrútanef area (Umhverfisstonun, 2012). Some repair work has been done (See section 6.2.3). However, these repairs were ruined after only one year (Mr. Ásgeirsson, pers. comm., 12th June 2013, Umhverfisstofnun, 2013b).

Figure 6.15 Example of trampling impacts on trails in Látrabjarg. Top left: multiple trails. Top right: trail deepening and widening and rock exposure. Bottom left: rock exposure and vegetation damages. Bottom right: trail deepening, rock and root exposure (Legatelois Marie©).

Trails in Látrabjarg could affect predation rate of nests by foxes, skuas and ravens. This is confirmed by Mr. Garðarsson (pers. comm., 10th June 2013) who expressed his observation that Arctic Foxes in Látrabjarg are going hunting only when there is no traffic on the trail. In consequence, the trail should affect predation rate of birds and bird nests and it is important to consider where to locate the trails considering their effect on predation (Miller and Hobbs, 2000). Insects are present in Látrabjarg and trampling could also affect them (Grandchamp, 2000). However, nothing is known about insect species composition or ecology in Látrabjarg.

Littering can be observed in Látrabjarg. The quantity seems quite small but it is a subjective criterion and does not signify an absence of impact (Wang et al, 2009; Van Franeker, 1985). There are no garbage bins on the site of Látrabjarg. The nearest is some kilometers away at the camping site of Brunnar.

Noise and vibration caused by tourists and trampling is a potential source of disturbance and stress for birds present at the top of the cliff. Puffins are highly sensitive to disturbances but this sensitivity seems to vary between colonies (Rodway et al., 1996). Puffins nest mostly on the top of the cliff in Látrabjarg and therefore are the most accessible birds for tourists. Consequently, puffins should be the most impacted birds by

tourists (Mr. Garðarsson, pers. comm., 10th June 2013). Mr. Garðarsson (pers. comm., 10th June 2013) also mentioned that puffins are sensitive to ground vibration as they nest in burrows in the soil. However, the soil at Látrabjarg Cliffs is mainly rock and the nests should not go far away inside land (Mr. Garðarsson, pers. comm., 10th June 2013). Some tourists cross the demarcation and step on the entrance of nests, probably causing effects. Puffins are more active during the night and consequently there is an increase of night puffin observers and photographers at Látrabjarg (Mr. Garðarsson, pers. comm., 10th June 2013). Disturbances by tourists during both the night and day could have greater effects because there is no disturbances free time anymore. The exact amount of stress induced by tourist presence and its consequences on puffins and other birds at Látrabjarg is unknown.

Off-trail hiking and resulting new path creation seem quite important on the first section of the trail, especially to go from the trail to the cliff edge and from the parking lot to Ritagjá area (Umhverfisstofnun, 2013b). However, little is known about the amount, consequences, extent and distribution of this phenomenon. Off-trail driving and night stay outside regular camping sites are occurring and is a concern for the protection of the area (Mr. Ásgeirsson, pers. comm., 12th June 2013; Umhverfisstofnun, 2013b). Another problem is some dogs brought by tourists chasing puffins and even attempted to dig up holes. The consequences of this disturbance, even if not frequent, are expected to be highly negative, especially during reproduction period (Umhverfisstofnun, 2013b).

Another unsearched behavior at Látrabjarg is removal of items from the cliffs by tourists. The most obvious item that could be collected is the empty egg shells left by predators on the top of the cliff. I personally picked up such shells when I came as a tourist in 2005. The consequences of this collection or other type of picking are unknown.

Finally, another impact to consider is the impact of the access road on the environment. It causes death of fauna and impact on vegetation. The road to Geldingsskorardalur is currently impacting too much the fragile rock moths. The increase in road width and its consequences will need to be displaced (Mr. Ásgeirsson, pers. comm., 12th June 2013).

6.2.3 Current management

The management of trails at Látrabjarg cliffs is the responsibility of the landowners (Mr. Gíslason, pers. comm., 02nd July 2013). The camping toilets cost them around 400-500 000 ISK per month and oblige one person to take care of the maintenance (Mr. Gíslason, pers.

comm., 02nd July 2013). However, because of the increasing number of tourists and the absence of funding from the government, landowners will no longer have the financial capacity to take care of the site (Mr. Gíslason, pers. comm., 02nd July 2013). Mr. Gíslason suggests placing a donation box at the camping site in order to collect funds for maintenance of it. This method would be more efficient financially than an entrance fee due to collect costs (Mr. Gíslason, pers. comm., 02nd July 2013; Reynisdóttir et al., 2008).

Umhverfisstofnun agency has a bad reputation amongst Látrabjarg landowners, exception of landowners that are party members (Mr. Gíslason, pers. comm., 02nd July 2013). It explains the efforts of communication with the landowners from Látrastofa (Umhverfisstofnun, 2013) and the contradiction in some say of both parties. If they cannot ensure all the management of the area anymore, landowners do not want to lose their control over the area (Mr. Gíslason, pers. comm., 02nd July 2013). In the future National Park, they will lose their control over eggs and bird picking at the cliff and to not be taken into consideration (Mr. Gíslason, pers. comm., 02nd July 2013).

The landowners generally do not want any change to the trails and minimal constructions. They do not want to hear about underground viewing tunnels or road along the cliff edge like proposed by the government. These two proposals have caused them to trust and will to talk to other parties (Mr. Ásgeirsson, pers. comm., 12th June 2013). Landowners do to not want further development of signage or if it is imperative with really small signs (Mr. Gíslason, pers. comm., 02nd July 2013). It would maybe be fine to place signs to present some features but only if they are really small and do not obstruct the view (Mr. Gíslason, pers. comm., 02nd July 2013). There are already signs for the safety of the tourists so it would be useless to have more (Mr. Gíslason, pers. comm., 02nd July 2013). Mr. Gíslason thinks it would be better to place the visitor center for Látrabjarg at Hnjótur than at the current location of Breiðavík hotel. It would increase the number of tourists to this interesting museum (which currently receives around 2000 paying tourist per year) and give a new purpose to the museum (Mr. Gíslason, pers. comm., 02nd July 2013).

In parallel to the landowners work some recent maintenance work was done in 2012 and 2013 by Látrastofa (Umhverfisstofnun) in response to the poor state of some portions of the trail (Mr. Ásgeisson, pers. comm., 12th June 2013; Umhverfisstofnun, 2013b; Umhverfisstofnun, 2012). International volunteers helped Látrastofa rangers in this

maintenance of the trails in 2012 and 2013 (Umhverfisstonun, 2013; Umhverfisstonun, 2012).

The trail going from Geldingsskorardalur car park to the cliff edge has been relocated further inland with new trail marks (Umhverfisstofnun, 2013b; Umhverfisstofnun, 2012). The beginning of the path has been outlined with rocks (Umhverfisstofnun, 2013b). This is in response to the widening and hiking difficulty of the ancient trail (Umhverfisstofnun, 2013b; Umhverfisstofnun, 2012). A warning sign about the presence of the cliff edge has been placed at the end of the trail because fog sometimes makes spotting the edge difficult. Information about the trails has been placed at Geldingsskorardalur car park. The ancient trail has been repaired by relocating moss from an area less sensitive (Umhverfisstofnun, 2013b).

New stone steps and repairs have been done on the trail portion in 2013 from the car park to Ritugjá that experience the highest trampling stress (already repaired in 2012). In 2014, it is planned to add new stone steps and add sand to the trail at Ritugjá area to avoid muddiness (Umhverfisstofnun, 2013b). In order to deal with the creation of new paths from the parking lot to Ritagjá area, rope fences have been placed around the parking lot. It seems that this measure has been efficient to regulate pedestrian traffic on the main footpath and allowed the informal paths to heal (Umhverfisstofnun, 2013b). As previously said, Látrastofa drew a white paint line from the Bjargtangar lighthouse to Ritagjá area from 1.5 to 2 meters from the cliff edge to prevent tourist impacts on nesting puffin and to avoid tourists falling from the cliff (Umhverfisstofnun, 2013b; Umhverfisstofnun, 2012). This is efficient (Umhverfisstofnun, 2013b) but I personally observed numerous tourists not observing the recommendations. For this reason, ranger presence and communication with tourists are important (Umhverfisstofnun, 2013b). This repair work has helped to decrease the pressure from tourists on the environment but it will probably be not enough regarding future increase of tourists (Umhverfisstofnun, 2013b).

Rangers of Látrastofa are present on the site during the summer. Their main roles were to monitor travelers, nature and wildlife, to take care of the garbage bins, to clean the toilets at Brunnar camping site and conduct education and information of tourists (Umhverfisstofnun, 2013b ; Umhverfisstofnun, 2012). They have put signs to inform of the forbidding of night stay at Bjargtangar, measure that seem to have been efficient (Umhverfisstofnun, 2013). Discussions with landowners have led to the agreement of

forbidding the presence of dog at Látrabjarg Cliffs and to set up warning signs (Umhverfisstofnun, 2013b). In 2012, some information panels on fauna, flora and trails were installed in the light house that was open when a ranger was present (Umhverfisstofnun, 2012). Two tables at Bjargtangar and two at Brunnar camping site have been installed (Umhverfisstofnun, 2012).

Different propositions to better design Látrabjarg access and minimize impacts from tourists have been suggested. One of these propositions has been underground tunnels that lead to viewing platforms on the bird cliff (Narfasson, 2005). The use of tunnels avoids most of the trampling and off-trail hiking impacts. Viewing platforms in the cliff allow better observation of birds compared to observations from the edge of the cliff (Narfason, 2005). However, this could also lead to increase disturbance stress for birds and higher impact on the landscape. Landowners think this proposition would cause too much impact on the site's aesthetic and naturalness therefore do not want to consider this proposition (Mr. Gíslason, pers. comm., 02nd July 2013).

Planning and design of tourist destinations has also been the subject of an agenda from the Icelandic government, called Góðir Staðir (Sturludóttir et al, 2011). The goals of this agenda are to increase the number of places accessible to tourists, help the designing and give guidelines and framework for the design and architecture of the personal (Sturludóttir et al, 2011). The design should be coherent between the different personal and well integrated in the Icelandic landscape (Sturludóttir et al, 2011). The fund "Framkvæmdasjóður Ferðamannastaða" and the organization of competitions for architect companies for the preparation and design of future tourist destinations exist to help personal (Sturludóttir et al, 2011).

An interesting trail concept emerging in Iceland is a trail network, called Birding Trail North-east Iceland. It is a cooperative project by businesses, organizations and individuals in Northeast Iceland to develop and promote birding and birding tourism in the region (Birding Trail Northeast Iceland, n.d.). This network could be used as an example for improving Látrabjarg bird tourism and would also help tourism development in all the Westfjords. Working as a loop (see map on http://www.birdingtrail.is/), this Birding Trail Northeast Iceland network could easily be applied to the Westfjords. Indeed, the Westfjords region can be only visited through a similar loop or by a trip back and forth of the south part.

6.2.4 Planning process

In the current planning process for the management and transformation of Látrabjarg into National Park, a land-use plan has been developed (Baark ehf., 2014, 18th February). In the offer of the Municipality to architect companies or students for the land-use plan proposal, the emphasis of the Látrabjarg land-use plan state that:

- the organization of the area should be in accordance with the Municipality Master Plan 2006-2018 (Vesturbyggð, 2003),
- the Látrabjarg land-use plan along with the nearby area organizations are coherent,
- it emphasizes the environmental and social quality of the area for the future in a sustainable way,
- it respects the historic inheritance, spirit of the location and cultural rola of the area
- it carefully considers accessibility for everyone. For example, the location of viewing areas, type and place of walk path, access to services, quality of markings and safety,
- the design of all constructs is based on an ecological thinking, fits well the natural and cultural landscape of the area and takes care that the visual of human-made infrastructures does not negatively impact natural settings, and
- the infrastructure is of the highest quality and increase the function and attractiveness of the area (Sturludóttir, n.d.).

The architect agency Baark ehf. has been chosen for the future design of touristic infrastructure at Látrabjarg in collaboration with a stakeholder work group that includes three representatives of the Municipality, three of Umhverfisstofnun, one of the tourism organization of Vesturbyggð and four of the Landowners. The first proposition from the agency was presented on 28th February 2013. The final land-use plan was made public on the 24th of February 2014 and is subject to review until the 08th of April 2014 (see APPENDIX A) (Mr. Ásgeirsson, pers. comm., 25th February 2014).

This land-use plan includes an Environmental Impact Assessment, as required by the Icelandic legislation (Baark ehf., 2014; M. Ásgeirsson, pers. comm., 25th February 2014). It was based on the legislation, expert reports and comments by the interest groups and public (Baark ehf., 2014). The conclusions of this EIA are presented in Table 6.1.

Table 6.1 Conclusions of the Látrabjarg Land-use Plan EIA (Baark ehf., 2014).

Sector	Impact	Description	Regulations
Community	+	Significant positive impact on the landowners in Hvallátur. The period of construction can have a temporary negative effect. Increased the security for accessing summerhouses. Significantly positive impact on road safety in general.	Road law nr. 80/2007. Particularly article 1 and chapter IX on road safety and traffic
Noise and pollution	0 +	Negligible effect on noise and pollution. Mostly this impact is temporary and local and for the period of construction. Reduces traffic noise and dust in Hvallátur.	Law (7/1998) on environmental health and pollution. Regulation (933/1999) on noise and amendment according to the regulation (478/2003)
Land utilization	- +	Replacement of the road has considerable negative effect on land utilization because new lands are under the road. However, Hvallátur regain land that can be used for development.	The Planning and Building Act (123/2012) Vesturbyggð Master Plan 2006-2018
Archeology	-	Numerous archeological remains are registered at this place and are displayed on the drawings of the road design and discussed further in the appendix. Many archeological remains are considered at risk.	Registered protected archeological remains under the Law on Archeological Remains (80/2012). Other archeological remains (cultural remains of 100 years or older such as building remains mounds, burial places, etc.) under article 3 of the Law on Cultural Remains (80/2012).
Animals and birds	0	Negligible impact on birds. Constructions are far from the varied and rich birdlife that thrives on Látrabjarg. Impact because of constructing the road in this place should neither have a great impact on local nor national birdlife.	Icelandic Natural History Institute red list on birds and mammals article 6 according to law (64/1994) on conservation, protection and hunt on wild birds and wild mammals
Plants and soil	0	The placement of the new road will impact vegetation on the construction area but there are no recognized rare species or plant communities on this part of the road or the quarries. After the construction time, the disturbed areas will be subject to restoration where appropriate in consultation with the landowners and Umhverfisstofnun. A new resting place by the road is defined immediately so it is possible to prevent disturbance of other places	Icelandic Natural History Institute red list on plant Article 37 Law on Nature Conservation Welfare for the future, sustainable development in Icelandic communities, emphasis 2010-2013, see chapter 12 on sustainable vegetation use and land recovery
Geological features	0	No remarkable geological formation is disturbed on this way or because of material intake (material intake is done in a defined quarry according to the Master Plan.	Article 37 of the law on Nature conservation

Water	0	Negligible impact on water (Referred to Westfjord Health Agency (Heilbrigðisstofnun Vestfjarða) on impact on water on the area	Article 1 regulation (536/2001) on consumption water Article 1 regulation (796/1999) on the prevention against water pollution Article 1 regulation (797/1999) on the prevention against groundwater pollution
Landscape	0 -	Negligible impact. The placement of the road is such that there will be minimal impact on the landscape. In this part there will be considerable impacts because of permanent change in landscape because of the road and mining. The material will be obtained from defined quarries defined according to the Master Plan	Remarkability/ rarity of landscapes according to article 37 Law on Nature Conservation. Conservation value according to the Natural Monument Register of Umhverfisstofnun. The main landscape feature, such as preserved/natural landscape scenery, form, color, diversity and integrity

The land-use plan has provided an opportunity to conduct an holistic survey of the archeological remains in the area, which are protected by the law (Baark ehf., 2014; Lárusdóttir and Guðmundsdóttir, 2014). However, no proper trail impact assessment (see the precedent section 5.3 for proper trail impact assessments) seems to have been done in parallel to this land-use plan even though an environmental impact assessment has been conducted (Mr. Ásgeirsson, pers. comm., 25th February 2014).

This land-use plan does not fit within the landowner's desire for minimum infrastructure and no change of trails (Mr. Gíslason, pers. comm., 02nd July 2013) and does not seem to be the best outcome that could have been developed. Indeed, new permanent parking infrastructures, resting areas and trails infrastructures (such as a new trail and viewing areas) are planned. These infrastructures are also most likely to dissatisfy tourists coming in Látrabjarg to experience wilderness and preserved environment that is a majority of Látrabjarg tourism.

Moreover, the EIA of the land-use plan obviously is not really favorable, especially in environmental matters (Table 6.1). It is focusing principally on the construction of Hvallátur deviation road and not on the general land-use plan. Moreover, there are signs to suspect a profound lack of data and general positivism in the assumptions made on environmental impacts of the land-use plan. Moreover, the land-use plan does not present any explanation about the particular material and design of the infrastructures. More importantly, no indications about the potential impact on the environment of each infrastructure in the land-use plan are made. There is no explanation of any kind about why

such design or such material has been preferred or is better in regard to environmental, landscape, social and economic impact minimization.

This land-use plan will be followed by the conservation plan (Mr. Ásgeirsson, pers. comm., 25th February 2014; Unknown, 2013). This conservation plan has for goals to discuss about the objectives of the conservation of Látrabjarg Cliffs area and the agenda for preserving the value of the site in the spirit of sustainable development (Unknwon, 2013). The conservation plan will be based on other conservation plans done for other preserved area in Iceland, overlooked by Umhverfisstofnun and valid for five years (Unknown, 2013). The conservation plan will be based on proper cooperation, collaboration and communication and will focus on the value of the area, the conservation and operation arrangements. In the conservation plan, it is indicated that the conservation plan will be made along the land-use plan but it did not happen in reality (Unknown, 2013). To work on the plan a group has been formed and is composed of representatives from Umhverfisstofnun (1), Vestubyggð Municipality (2), and tourism organization of Vesturbyggð (1) and landowners (6). The eight steps of the conservation plan will be:

- 1. Preparation (October to November 2013). Finishing the work plan, communicating, organizing and gathering data, mapping, exploring geological information, realizing a cost plan and visiting the site.
- 2. Description (November to December 2013). Describing the goals for the area (IUCN category), main resources, land use and the legislative framework, current management, ownership, international agreements, plans and government agendas. Observing and describing the relations of the area with neighboring areas.
- 3. Analyzes (December 2013 to January 2014). The conservation value of the area will be analyzed with the help of the advisors, the specificity, threats and opportunities, the stakeholder's interactions, elements external to the National Park that could influence. A short report on natural, cultural, economic and social values of the area will be made.
- 4. Development of goals (January to April 2014). Defining the different management areas. Determining under which category Látrabjarg area should be transformed.
- 5. Development of operations (April to August 2014). An EIA will be required if any development falls under the law on EIA.

- 6. Presentation and commentary process (August to November 2014)
- Reviewing of the comments (November to December 2014), and
- Making the final draft for the 1st January 2015 (Unknown, 2013).

However, it is quite debatable that the land-use plan will be achieved before the conservation plan. It seems logical for natural areas that land-use plans should be made on the conservation plan and not the other way around. Moreover, the time allow for data collection, organization and analyze seems very short regarding the general lack of recent and holistic data on environmental features at least.

This section gives further argumentation that the decision of creating Látrabjarg National Park is mainly for economic reasons and not for environmental considerations that are nevertheless the reasons for creating preserved areas. The current planning process missed the opportunities that could have been taken and were expressed at the start of the planning process. These poor planning processes could lead to the failure of the conservation of nature in Látrabjarg and so failure of social and economic elevation of the region that is totally based on the natural capital of the area.

All the important information that the reader needs to review to understand the known and unsearched interactions of the Stakeholders-Tourists-Trails-Environment system in Látrabjarg Cliffs and Moher Cliffs has now been presented. In the next chapter, the comparison between Moher and Látrabjarg case studies and recommendations important to consider for Látrabjarg future management will be made.

7 Discussion

This chapter will integrate all the information reviewed in the preceding sections of this thesis. It is therefore answering the research questions and objectives of the research. The first section will answer research question six by comparing the differences and similarities of Moher Cliffs and Látrabjarg Cliff's case studies. Recommendations will be made on this comparison and the observed outcomes of the planning process in Moher Cliffs. Then, a complete review of the recommendations that can be drawn from this thesis will be made answering research question seven. Finally, a review of the research limitations and contribution to literature will be provided.

7.1 Comparative study

The transformation of Látrabjarg into a National Park and the current land-use plan obviously focus on increasing tourism and capacity of the site and not on enhancing the preservation of the nature and not enough on increasing tourist expenditure. This strategy caused a decrease of environmental considerations in Moher Cliff's land-use plan. Consequently, the Moher Cliffs plan has been a relative environmental, social and economic failure. **It is recommended that in the Látrabjarg land-use plan, more emphasis should be put on environmental considerations and on increasing tourist expenditure (not tourist numbers that is totally different in term of strategy, impacts and economic outcomes).**

Both the plans in Látrabjarg and Moher cliffs were done by an architect agency. Both are purely design based and are not associated with proper trail impact assessment or other environmental assessment. **Land-use planning of the natural area by an architect agency proved to be an environmental, economic and social failure at Moher Cliffs. Proper measures are required in order to avoid this outcome in Látrabjarg.**

The trails in Látrabjarg and Moher cliffs prior to the planning process were quite different. Moher Cliffs already presented permanent structures where Látrabjarg had none. At Moher Cliffs the necessary restoration of the ancient trails through creation and maintenance of

new trail infrastructure came at a relative high cost. In contrast, Látrabjarg Cliffs do not present any permanent trail infrastructures and maintenance is almost costless and done through voluntary work. If the ancient trails in Moher Cliffs helped to regulate tourist's impacts and wandering off trails, we could see that it was not enough to ensure absence of environmental and visual impacts. Moreover, these permanent structures were not as permanent, especially in harsh Atlantic cliff weather as is the case in Látrabjarg. Both ancient Moher Cliffs and current Látrabjarg Cliff trails were and are no longer able to regulate tourist impact, traffic and behavior. **Permanent trail infrastructure can help manage tourist impact and traffic. However, permanent trail infrastructures are not always enough in themselves to reduce tourism impacts and maintenance cost at cliff sites. Moreover, the design and material of the trail infrastructures play an important role in determining the environmental impacts, maintenance cost and sustainability of these trail infrastructures.**

The actual and future Látrabjarg entrance to the site is not designed to hold incoming tourists and focus their attention on information about appropriate behavior, security, hazards, weather, restrictions and sensitivity of the cliff habitat. In this respect, the entrance design in the Shannon Development land-use plan for Moher Cliffs could be taken as an inspiration.

At Moher Cliffs the new infrastructure and education program are making sure that tourists do not access the cliff edge along with providence of viewing areas. Access to the cliff edge in Látrabjarg is discouraged by panels and a white paint line. However, these measures are not enough as obvious erosion and deterioration of the habitat all along the cliff edge can be noticed. There is no mention of particular measures taken to avoid cliff edge access in the land-use plan**. Consequently, more robust mitigation measures such as infrastructure and education programs should be considered to avoid uncontrolled tourist access to the cliff edge.**

To allow a disturbance free area for birds, an exclusion zone along the main part of Látrabjarg Cliffs is planned. Moher Cliffs seem to confirm the need to restrict tourist access even if in this case it is a much smaller scale than Látrabjarg. Moreover, studies on bird responses to disturbances recommend restricting tourist access to bird colonies in a small area that already experiences the highest disturbance levels because birds in this area are more likely to tolerate more disturbances. **Consequently, the Látrabjarg exclusion**

zone placed in the already least frequented area is a precautionary and good planning measure.

At Moher Cliffs, the presence of big and intrusive signage has shown to be unwelcomed and quick to degrade due to harsh weather conditions. This type of signage has been eliminated in the new design of Moher Cliff's trails. Látrabjarg presents similar conditions of open landscape and harsh weather. Moreover, the landowners clearly express their disapproval for intrusive, numerous or big signage. **It is recommended to not introduce intrusive, big, color contrasting or numerous signage and infrastructure in Látrabjarg.**

A coordinated effort to develop trails and tourist network at Moher Cliffs facilitated access to Moher Cliff's site, attracted tourists in the region and provided easy access to information and services. A similar trail network has been developed in north east Iceland. **This sort of network would be a great tool to enhance tourism in the Westfjord and Látrabjarg**. It would attract tourists off the main touristic itineraries toward the Westfjords and facilitate access for tourists to sites, information and services.

At Moher Cliffs, there have been few considerations about conservation and management of the cliff environment and trails that are privately owned. The landowners were few implicated in these regards. In contrast to Moher Cliffs, Látrabjarg Cliffs is totally privately owned land and landowners have been integrated in the conservation and management of the environment and trails. **However, the participation of the landowners is not without problems that should be corrected, such as mistrust, conflicts of wills and lack of consideration.**

At Látrabjarg Cliffs, like at Moher Cliffs, the planning and decision making processes are largely top-down. In both cases it has created mistrust, improper involvement and conflicts amongst the stakeholders, particularly landowners. This has created social and economic failure of the planning process in Moher Cliff. **Consequently, it is recommended to develop a more down-top approach in the planning process and make sure proper involvement of all stakeholders in the Látrabjarg planning process and management.**

The highly structured, intricate and complicated Irish legislative and policy framework for planning, tourism and environment management has failed to guarantee good process and outcomes in the planning of Moher Cliff. It could be assumed that with the more

straightforward and simple Icelandic legislation, Látrabjarg would have been more likely to follow good planning processes. However, the planning process in Látrabjarg is failing to follow the recommendations and objectives of the international conventions, legislations, regulations and strategies about planning, environment protection and sustainable development like in Moher Cliffs. **Regarding the consequences of improper application of the legislative framework requirements, recommendations and objectives in Moher Cliffs, planning failure is likely in Látrabjarg. Changes in the planning process of Látrabjarg should be taken to ensure the fulfillment of the legislative framework requirements, recommendations and objectives.**

The group action plan for marine and sea cliff birds in Ireland (2011-2020) is a comprehensive, holistic and precise framework to face issues of bird conservation. **It would be good to develop a similar plan for Iceland regarding the important but decreasing Icelandic marine and sea cliff bird's populations.**

It is interesting to see that despite the lack of good national level planning and management framework for coastal and marine issues in Ireland, NGO initiatives can lead to the creation of proper plans (such as the group action plan for marine and sea cliff birds in Ireland). **These initiatives should be encouraged in Iceland and for Látrabjarg planning. However, being non-statutory, this sort of plan can face some problems regarding financing and enforcement as stakeholders´ compliance is completely voluntary.**

The suggestion of Shannon Development proposal at Moher Cliffs to introduce a health and safety management during the construction period was done to avoid public injuries and ensure sustainability of the construction phase. **This measure should be considered at Látrabjarg during the construction time to avoid accidents.**

A number of measures have been taken in the tourist management program at Moher Cliffs (leave no trace program, and eco certification) to increase sustainability of the site. If these programs are ethical and proper choice to reduce impact of tourism, they should not be a post-development measure and uniquely used as a touristic marketing operation to increase tourism. No third party review or any studies are available (except a carbon footprint measure) to confirm the efficiency of such measures at Moher Cliffs. Moreover, it can be debated that the construction of the state of the art center, the infrastructure design and the

objective to handle and attract more tourism is a sustainable measure for the site. Especially the site does not seem totally socially, economically and politically sustainable as we saw in the conflicts related to this center and the management of tourism. **Sustainable ideas and programs are good for Látrabjarg management in order to diminish tourist impacts but they should not be a post development measure of an unsustainable land development and should be integrated in the initial process in order to be truly sustainable and efficient.**

7.2 Recommendations

This section presents recommendations for Látrabjarg tourism management that were extracted from combining material from the literature review and the data collection in this thesis. These recommendations are organized under the following headings that represent themes crucial to the study: sustainability, protected area categories, tourism use, ecotourism, certification schemes, trampling, trails, tourists, planning process, research and other issues.

7.2.1 Sustainability

The concept of strong sustainability was discussed in section 2.2 and 3.2. Implementation of this as an approach to development at Látrabjarg could encounter a strong resistance from tourist operators, hunters, landowners and local businesses due to the perceived opportunity costs. Otherwise, it seems quite feasible and Látrabjarg offers a perfect case study to adopt this concept and see the results. Látrabjarg is a perfect case study because of its relative simple social and economic structure and the absence of infrastructures. It is easier to not do something than undo it and so strong sustainability in Látrabjarg could prove to be cost savings. Látrabjarg presents important natural features worth preserving. This natural capital has attracted tourists who provide principle economic benefit to this area. However, this tourism in combination with a lack of infrastructure, policies and regulations has created some concerns. There are issues about security, impacts on the environment and lack of economic benefits.

In response, planning processes are currently at work. It is the right time to decide about the path we want to have for the future of Látrabjarg. As the conservation plan for the area states that the value of the area should be preserved through the spirit of sustainable

development, the question we have to ask is which type of sustainability should we choose?

This research indicates that Látrabjarg has the most to gain if we apply strong sustainability principles (without going to very strong sustainability) for its development. It is certain to benefit both the environment and tourism.

7.2.2 Protected area categories

As explained in part 3.7, creating protected areas can be a positive tool and opportunity to enhance nature protection and sustainable use of resources. However, in its current state, the transformation of Látrabjarg area into a National Park will increase pressure from tourism on the environment due to increased tourism traffic. In the Vesturbyggð Master Plan, it is clear that the only positive effect of the creation of this National Park for the environment will be on the landscape and geological features. It will have negative impacts on the vegetation because of increased trampling. However, general positive effects on the social and economic sector of the Municipality are forecast. Currently, the creation of a National Park in Látrabjarg is not for achieving natural protection but to elevate the social and economic sector of the Municipality. **Consequently, transforming the Látrabjarg area into a National Park is recommended but profound changes of the reasons and objectives of this transformation have to occur to ensure the sustainability of Látrabjarg's environment, tourism, economy and society.**

As said previously, the IUCN category II, National Park, even if challenging to apply and misinterpretations should be avoided, is the status that applies the best to the Látrabjarg area. This category combines large size, low human footprint and allowance for human activities such as tourism. Moreover, it could be easy to apply to Látrabjarg because of the precise sustainable and conservation goals include in this category that are not included in the National definition.

The future Látrabjarg National Park would also have more international recognition if it follows the IUCN recommendations. However, the conception that one size fits all should be eliminated from the decision process and Látrabjarg National Park should include Icelandic legislation, the wills and needs of stakeholders and other particularities. **Following and applying the IUCN definition of a National Park in the development of Látrabjarg National Park is strongly recommended. If the IUCN definition is not**

followed, then putting much more emphasis on strong sustainability and nature conservation in the development of Látrabjarg than expressed in the national definition of National Park and currently done in the planning process is recommended.

The IUCN encourages the creation of true networks of protected areas in order to maximize conservation value, efficiency and knowledge of protected areas. For example, Látrabjarg National Park could create working networks with the nearby Breiðafjörður marine protected area or with other nearby newly protected area in order to preserve necessary food resources for birds. **Consequently, the creation of protection area networks for Látrabjarg it is recommended to enhance the benefits of the creation of the Látrabjarg National Park**.

7.2.3 Ecotourism

Refer to section 2.3.2. As Látrabjarg tourism and future National Park tourism is nature-based, it can be said that this tourism if sustainability is chosen for goal, will be ecotourism. **Studies will be needed to determine where the current tourism and the tourist demand lie on the hard-soft ecotourism spectrum.**

However, as ecotourism has no well-defined and recognized conceptual and operational definition, **utilization of the term sustainable tourism is recommended in the planning process and future tourism marketing**. Moreover, sustainable tourism by its holistic definition is not restricted to only nature-based tourism and considers cross-sectorial sustainability. It would allow using this term not only for Látrabjarg National Park but also for a more wide tourism or general planning and marketing strategy, such as for the entire Westfjord area. **However, in order to avoid an unachieved state of sustainable tourism, called maintainable tourism, stakeholder's involvement and empowerment in Látrabjarg planning process is primordial.**

7.2.4 Financing

Financial needs for managing and preserving natural areas in Iceland are much higher than what is provided by the current taxes in Iceland, as discussed in section 3.6. No entrance fees are taken for highly visited places. However, collecting entrance fees create costs that could exceed any profit. A contingent valuation study in Þingvellir showed that tourists are

willing to pay a certain amount to access the site in order to assist management (Reynisdóttir et al., 2008). However, this amount varied with the type of tourists. Another issue is that currently fee-system for financing natural tourist destinations in Iceland could be against the law, even if the government and other legislations seem to encourage a fee-system. **Consequently, further economic analysis, such as contingent valuations, are required to determine whether the tax system or fee system should be applied in Látrabjarg National Park.**

Another consideration in financing Látrabjarg National Park is whether to limit numbers of tourists. If tourist access is limited and entry fees must be paid, then those tourists willing to come are more likely to be sensitive to natural considerations and to pay higher fees to enjoy a preserved area. In contrast, if access is unlimited but entry fees apply, then there will be an increase of tourists less concerned with environmental considerations. Consequently, the site become too heavily impacted and crowded for nature purists and the tourists visiting the site are less willing to pay high fees. Thus, revenues from fees may be less in an unlimited access site than in a limited access site. **It is recommended to make further economic and customer analysis to determine which of the unlimited or limited access to Látrabjarg National Park will guarantee higher revenue from tourism**.

7.2.5 Certification schemes

The research showed that an accommodation, tourism services and product labeling strategy for Látrabjarg tourism in the framework of the National Park creation would be a powerful marketing tool for the Park. Providing incentives for tourism businesses and agencies to get specific certifications and awards, and to buy labeled products, could increase the general eco/sustainable reputation of the park and help getting other certifications. However, as discussed in section 3.3.3, all certifications and labels are not equal in quality or trust ability. It would be wise to assess all available certifications and labels in the current planning process and recommend only particular ones. **An organized certification/labeling strategy that recommends a restricted number of good certifications and labels would, avoid effort dispersions for the tourism industry, enhance the impact on tourists and maximize benefits for the future Látrabjarg National Park.**

Earth Check certification seems an interesting certification for Látrabjarg in the future, especially for community certification. However, it may be too complex and not relevant enough to apply for now. It could also be more valuable to wait until this certification is better known in Europe. The EDEN award is a valuable label but it would not be possible to apply each year because of the imposed annual competition theme. Green globe certification is not reliable concerning sustainability goals. **Consequently, it seems that it would be more efficient and have more marketing power to focus efforts on the national Vakinn certification system and Swan Nordic Eco label in Látrabjarg future National Park and avoid the Green Globe certification label. However, other certifications that were not presented in this thesis should be considered and assessed for the future National Park and associated tourism services**.

7.2.6 Trampling impacts and other tourist issues

As discussed in section 3.5 and 3.5, there is increasing tourism traffic in Látrabjarg and trampling impacts resulting from this pressure have been observed. Moreover, the fragile Nordic vegetation present at Látrabjarg is predicted to take many years to recover after trampling stopped. **Consequently, tourist trampling impacts in Látrabjarg should be assessed through long-term observations**. For this assessment different factors should be considered and evaluated such as the value of the site, the resistance to use, recovery from use, susceptibility to erosion, severity of direct impacts and indirect impacts, the amount of use, the social and ecological dimensions to the timing of use and the total area affected.

Different types of use of natural areas are occurring; such as, horse-riding or hiking. However, each type of use has different trampling impacts and modes on the environment. **Consequently, to properly plan and manage trampling impacts of tourists in Látrabjarg, the type of tourists willing to use the site has to be determined along with which type of uses should be authorized and in which area should they be authorized.**

In some cases, education programs seem to be able to lower tourist impacts by changing tourist behaviors and knowledge, even if debates exist on their true efficacy. For example, studies show that the most efficient way to effectively reduce off-trail travel is personal contact where the consequences of off-trail hiking are explained to the tourists (Hockett et al., 2010). Moreover, it has to be considered that many tourists do not read signs and that signs are much less efficient than personal contact to modify tourist's behavior.

Developing education programs in Látrabjarg should be considered particularly because most of the tourism in Látrabjarg is nature based and the efficiency of such programs is predicted to be high.

It has also been shown that accidental off-trail hiking is common because of poorly marked trails. **Consequently, a recommendation is to improve continuous maintenance of trails, close or restore the least frequented ones or the ones in highly sensitive areas, and increase communication with tourists in order to improve security and environment protection in Látrabjarg.** I do not recommend the implementation of signage because the landowners do not want signage. It is intrusive on the landscape and is likely to degrade in the harsh weather of Látrabjarg.

There are other security issues to consider in tourist places. In Látrabjarg such issues are the harsh weather, absence of fences and poorly marked trails. These security issues are currently a concern to the Icelandic government as they involve rescue teams security as well. Consequently, the government is developing a risk assessment program of touristic places. **Látrabjarg needs to participate in this national risk assessment program but should already make such risk assessment for the current land-use plan.**

Birds experiencing high levels of human visitation via tourism often do not respond to human presence as a stressor any more, but birds experiencing medium level human visitation do not show any signs of habituation (Fowler, 1999). Consequently, concentrating tourism visitation in a small part of the breeding colony, allowing these birds to habituate and leaving the rest of the colony free of disturbances, is recommended. **A tourism exclusion zone at the least frequented part of the cliff in the future Látrabjarg National Park is a precautionary and good measure that should be maintained.**

7.2.7 Trails

The research rejected the utilization of the concept of carrying capacity for people and trails because the concept lacks a proper and reliable definition and assessment methods (see section 2.7). **Consequently, using the carrying capacity concept for decision making during Látrabjarg's planning process and any future management is not recommended, unless precise and reliable methodology has been developed meanwhile.**

As discussed in section 3.5, all the processes involved in tourist impacts are interrelated and it is difficult to determine which trail design, hiking mode and hiking intensity will best ensure a good tourist experience without impacting too much the environment. For example, horse riding tourism is not recommended within Icelandic conservation areas due to the high impact of horses on trails. **All the aspects of tourist impacts, such as noise, trampling and littering have to be studied and analyzed spatially to determine if a trail should be developed or maintained and to determine the best path for the trails in Látrabjarg.** As trampling impacts, other tourist impacts, trails and the factors affecting them are spatially variable; a good methodology to use in their assessment, their analysis and the assessment of plans is GIS. Ólafsdóttir and Runnström developed such an assessment of tourism environmental impacts through GIS, called the Tourism Decision Support System (TDSS). **A recommendation is to assess trampling impacts, tourist impacts, existing trails, land-use plans and future trails through GIS methodologies and particularly the methodologies develop by Ólafsdóttir and Runnström (see section 3.5.6).**

Trails create negative feedback. With the degradation of vegetation, there is an increased effect of geomorphological processes, trail depth, presence of roots and rocks. Trails become difficult and people are more likely to walk alongside causing the widening of the trail (Tomczyk and Ewertowski, 2012). This is currently happening in Látrabjarg. Maintenance of the trails is unavoidable and important for safety, environmental protection and aesthetic values. **Regular maintenance of trails is recommended as destroyed trails need large financial and material outlays to be recovered**.

In order to develop appropriate trail design and land-use plan, some key long term design issues must be consider. These considerations are the boundary of tourist movements, the general circulation of people, the principles of environmental best practice, the compatibility with future site development options, the use of natural materials and the re-use of materials already on site. They are important in order to allow decrease tourist impacts, sustainable use, avoid unrecoverable damages and restriction of future development options. **Consequently, assessment and proper consideration of the boundary of tourist movements, the general circulation of people, the principles of environmental best practice, the compatibility with future site development options,**

the use of natural materials and the re-use of materials already on site in designing Látrabjarg trails and developing the land-use plan are of primary importance.

The sustainable trail wheel developed by the Irish National Trails Office (see section 5.1.3) is a good and easy model to follow in order to achieve proper trail design and management in a sustainable way. **The Látrabjarg planning process and trail design should follow or develop this sustainable trail wheel and its recommendations in order to avoid future impacts, maintenance costs and conflicts with landowners and other stakeholders. The Irish National Trail Office questionnaire should be conducted in order to assess if proper information, agreements and considerations in the planning trails have been done.**

Trails network are a great tool to attract tourists in particular regions, increase information access on tourist services and coordinate efforts. This type of trail network has been a success at Moher Cliffs and was recently developed in North-east Iceland. Moreover, it was discussed that Látrabjarg and the Westfjord region present a perfect location in which to develop this sort of network. **Consequently, Látrabjarg in collaboration with the entire Westfjord region should develop a trail network.**

7.2.8 Tourists

It is important to know which sorts of tourists (see section 2.3 and 3.3) are attracted and coming to Látrabjarg along with their expectations, needs and wants in order to plan Látrabjarg correspondingly to these tourists. This knowledge is important for saving costs, determining the financing system of the National Park, enhancing revenue gain from tourism and managing tourism in a sustainable way. One consideration in this regard is the perception of wilderness by the tourists coming to Látrabjarg. Wall (2003) uses a wilderness purism scale to categorize tourist's perceptions toward wilderness and determine what infrastructure should be permitted in an area to still be considered wild. **It would be good to undertake a wilderness perception study of tourists coming to Látrabjarg to determine if the area is considered wild by these tourists and which infrastructure should be placed or not to conserve the value of the site**.

The Icelandic tourism industry is highly rated for its services choices and quality by international tourists. Thus tourists are likely to expect high quality services in Látrabjarg's

future National Park. **Látrabjarg planning should put efforts in tourism services and infrastructure to value quality over quantity.**

Further studies should be conducted to understand the tourists at Látrabjarg and enhance the success of the planning process and management of the future Látrabjarg National Park; such as, what are the values of Látrabjarg according to tourists, what are their requests concerning infrastructure and what they are willing to pay to enter the site.

7.2.9 Planning process

Answering research question four on the state of knowledge of Látrabjarg demonstrated the presence of huge gaps in data of any kind. Moreover, planning process and management success is based on a good and comprehensive knowledge of the area. Furthermore, no substantial and complete studies (except on archeological remains) were undertaken before making the Látrabjarg land-use plan and conservation plan. Consequently, the two plans and the future management in Látrabjarg can be forecast to have a high risk of failure or will not be as good as they could have been. **It is necessary to conduct more base research in Látrabjarg, such as environmental, ecological, tourist, trampling impacts and social research before conducting the planning process.**

The research has shown that it is quite debatable that the land-use plan will be achieved before the conservation plan. Moreover, the land-use plan has failed to include environmental considerations. This poor planning practice is counterproductive and endangers the sustainability of the site. This could lead to the failure of the conservation of nature in Látrabjarg and so failure of social and economic elevation of the region that is based on the natural capital of the area. **Delaying the final decision of the land-use plan for Látrabjarg until the conservation plan is finished is highly recommended or at least its implementation should be delayed until this point. If a delay is not done, the land-use plan should be profoundly revised in the light of environmental considerations, precautionary principles and detailed arguments about design and material, and concept choices for reducing tourism impacts should be added.**

Moreover, the land-use plan does not detail infrastructure design choices considering landscape impact considerations. An important official document is the Icelandic national

strategy, Góðir Staðir, which gives guidelines and frameworks for the design and architecture of tourist places (Sturludóttir et al, 2011). Design should be coherent between different tourist destinations and well integrated in the Icelandic landscape. **When adapted, the recommendations of the national strategy, Góðir Staðir, should be followed in order to enhance the Látrabjarg land-use plan, fulfil national goals and better integrate infrastructure in the landscape. It should be added in the land-use plan details on the reasons about design, material and infrastructure choice considering landscape impacts.**

The research showed that stakeholder relationships in Látrabjarg are problematic. Proper stakeholder involvement in planning processes is required by legislation and shown to be a core element for successful planning outcomes, long sustainability of protected areas, environmental protection and tourism. Nepotism, top-down control and lack of transparency create bad stakeholder's interactions and involvement and have shown to create planning failure. **Nepotism, top-down centralized approach, lack of transparency, lack of true public participation and political maneuvering in the planning processes should be assessed in order to avoid stakeholders conflicts, criticism and delays in Látrabjarg planning processes.**

Regarding the importance of Látrabjarg's environmental value, the changing nature of the environment and tourism, the lack of knowledge on the species, their ecology and tourism impacts, and the current developed plans area likely to not be perfect and become un-adapted. A planning and management process is never fixed in time and needs to be adapted over time. Consequently, **Látrabjarg plans and management strategies should be adapted, refreshed and ameliorated over years when necessary and at small time intervals.**

7.2.10 Research

Many tourism impacts, environmental changes and ecological patterns happen over long period. **As stressed in all the research, research and surveys that need to be conducted for the planning process and management of Látrabjarg should be conducted on a long-term basis and repeated over years and with high time frequency.**

The importance of research methodologies that do not negatively impact the environment and consequently bias the results has been stressed in international literature (Fetterolf,

1983). Moreover, it has been found that marine colonial birds, especially puffins, could be highly sensitive to researcher disturbances and respond with decreased reproduction success. **Regarding the international importance of the Látrabjarg marine bird colony, it should be ensured that research methodologies used in Látrabjarg do not negatively affect the environment, especially puffins, and bias the results as a consequence.**

7.2.11 Other recommendations

A good method to promote positive behavior from tourists and stakeholders is to develop codes of conduct. These allow promoting sustainability, applying precautionary principles and increasing tourist destination and services reputation. **Consequently, Látrabjag National Park should develop a code of conduct with specificities for each species and stakeholders. If such a code of conduct is not developed, then codes of conducts from the other projects (such as The Wild North project which is the only available code of conduct specific to northern environment, tourism behavior and species) should be applied.**

Many other international voluntary guidelines and conventions developed by associations, certification programs and alliances are available and could be used as a base for any planning and management of natural areas. Moreover, foreign country policies can be used as an inspiration. For example, many of the Irish legislations and strategy on trails, sustainable tourism or nature conservation are sound and applicable to Látrabjarg Cliffs. **These sorts of voluntary guidelines and foreign strategies (such as trail strategies in Ireland) could be reviewed and assessed during Látrabjarg planning and management process for inspiration and development of proper measures.**

Látrabjarg's most renowned value is the bird colony and the landscape. However, Látrabjarg interests are not just about environmental features. It is also a historical and traditional site. **Consequently, the archeological, historical, traditional, social and geological resources should not be forgotten in the planning process, management and touristic potentials of Látrabjarg.** An interesting consideration for promoting a new kind of tourism attraction along protection of an area is the creation a geopark and global geopark status like in Moher Cliffs and Katla. **It is interesting to consider the creation of a Geopark in Látrabjarg in order to attract geotourism in the Westfjords, create**

geopark network in Iceland that would promote tourism and enhanced protection of Látrabjarg geological unique feature.

This chapter presented the recommendations and main information that could be extracted from this research. All the recommendations made in this chapter should be considered in the current planning process and in the future management of Látrabjarg National Park and surroundings. These recommendations could be adapted for use in any future planning and management plans in Iceland and any cliff tourist destination in the world. However, the recommendations made in this research were dependent of the data collected and the limitations of this thesis. Consequently, the limitations encountered in this research needs to be reviewed in the next section.

7.3 Research limitations

As with any research, there were limitations that prevented the realization of everything that would be required or wished to do. The principal limitation in this research was time which resulted in inference limitations as no experimentation could be done.

Another main limitation was the general lack of reliable scientific data. This quantity and quality of data available limited the environmental, social and economic knowledge and the capabilities of argumentations of the stakeholders and me. This lack of data obliged the research to adopt the relative weak methodology of literature search and analysis in order to generate advice to planners on the wide spectrum of topics the research reviewed. Consequently, the degree of certainty of statements made in this research is not 100% and further research, analysis and discussions should be made before taking planning and managing decisions.

Limitations were dependent on internal as well as external elements. My personal limitations were a lack of knowledge in English and Icelandic language, about research methodology and about conducting questionnaire surveys and interviews. Being the first important research work I undertook, I had no previous knowledge and experience to confront and was advancing blind.

7.4 Contribution to the literature

This research will contribute to knowledge and literature on Látrabjarg Cliffs. It will particularly add material about considerations to take in the planning and management of the area during its creation into a National Park. The present research also proposes to investigate a new conceptual framework for tourism management, called Stakeholders-tourists-trails-environment systems (STTES)

The research will help understand stakeholder perceptions of the effect of tourism and their opinions. It will also increase knowledge about how the different stakeholders react differently to a management and land-use planning and what the differences are between the way plans are done in Látrabjarg and what is a good plan.

This research is a consistent case study to a comprehensive analysis of tourism impacts and its potential consequences for the management of this touristic area. It will improve greatly the literature for decision makers in Látrabjarg and in similar case studies.

The next section will conclude the thesis, exposing the most important messages that should be retained from this research.

8 Conclusions

Látrabjarg Cliffs is a unique environment by its size and ornithological value. In recent years, this site has attracted an increasing number of international tourists. However, the current infrastructure presents on the site is not adapted for this tourism and the resulting pressure on the environment raises issues for the sustainability of the site. Consequently, stakeholders are currently planning the future of the site through a conservation plan and a land-use plan.

The main research question asked in this study was, how to best deal with tourism at Látrabjarg Cliffs? This research was designed to help planners and decision-makers of the current conservation plan and land-use plan but also for any management decisions that may be taken now or in the future. This research has gathered information on many aspects of Látrabjarg that is valuable to know in this planning process. In order to help as much as possible the planning process before its planned ending in 2015, the research approach was to overview the widest scope of topics possible rather than focussing on a particular subject. To answer the seven sub-questions, and thus the overall research question, a case study comparison with Moher Cliffs in Ireland, direct and indirect observations of the site, key stakeholder meetings, direct and indirect observation and literature search were conducted. Because of time, skills and resources limitations, this research was particularly unable to focus on cultural and economic aspects of Látrabjarg. These aspects are highlighted in the necessary research to conduct for the current planning process. However, the research explored more in depth the aspect of Látrabjarg that were important to consider for the permanence of the site: the environment and social interactions. This included finding information and recommendations about environmental assessments, tourism impact management, trail management and stakeholder's role and interactions.

The present study has proposed a new approach for the study of tourism through the framework of Stakeholders-tourists-trails-environment systems (STTES). Studying each element and interactions of the system in an exhaustive way could allow for better understanding of the tourist destination and extracting information for decision making in planning and management processes at this tourist destination. This thesis is the first

research that went through the available literature and information on Látrabjarg planning process, environment, stakeholders, tourists, trails and compared them to available international knowledge about tourist destinations planning processes and management. This research is also contributing on the under-researched subject of cliff environment and planning and management specificity for tourist destinations in such environment. This is not only a work that could help planners and managers of Látrabjarg but will help any cliff tourist destinations in the world for their present and future planning processes and continuous management.

The current planning process in Látrabjarg is not without problems or issues. These problems include conflicts between stakeholders and lack of participation of some stakeholders in the process. The worst issues are the lack of scientific data on the environment, social and economic situation, dangerous positivism on environmental impacts and lack of proper assessments, particularly EIA and trail assessment for the land-use plan. Moreover, it is debatable to take the final decision about the land-use plan before finishing the conservation plan. Many recommendations to remediate these problems have been presented in this thesis and each of these recommendations should be discussed and considered before going further in the planning and management process. It is a non-exhaustive list and I invite planners and decision-makers to develop and propose their own recommendations from the knowledge and information of their own or gained through this thesis. However, the most important recommendations to retain are:

- To assure proper involvement, respect and empowerment of all stakeholders, particularly landowners, in the planning process and future management of the site.
- Delay the final decision or at least implementation of the land-use plan. More detail and arguments about the choice of design, infrastructures placement, garbage sites and material used in regard to environmental impacts are inexistent. Moreover, the land-use plan should only be finalized after the conservation plan. This conservation plan should not been made around the land-use plan but the land-use plan should be made around the conservation plan. At a minimum, modifications and feedbacks from the conservation plan should be made in the land-use plan before its implementation.
- Apply strong sustainability principles in every planning and management decision to ensure the future of Látrabjarg nature, economy and society.

- Develop a long-term conservation strategy or plan in order to secure the coherence in time of the conservation plans.
- Keep in mind the wills of the tourists: the majority of Látrabjarg tourism is based on experiencing wilderness and preserved environment. The current proposed land-use plan is probably not the best option available to satisfy them. Decide between maximizing tourist number and maximizing revenue from tourists. These two approaches require very different management strategies.
- Always keep in mind and apply precautionary principles. Current positive assumptions about tourist and infrastructure impacts on the environment are likely to cause degradations, decrease the attractiveness of the site and increase economic, environmental and social costs in the future.

Research is needed to collect sufficient data to have a reliable base for decision-making in Látrabjarg's planning processes. Research that should be done to develop a good planning and management plan in Látrabjarg has been examined throughout this thesis. At a minimum, the following research should be conducted in continuation of this thesis and before continuing the planning process:

1. Prior to any other research on Látrabjarg, sound and complete studies and surveys about flora, birds, land fauna, sea fauna and insects along with their interactions should be conducted.
2. Research of trampling effects on Látrabjarg. As recovery is expected to take more than ten years, this research should be conducted on a long term basis. It is indispensible to assess and monitor the vulnerability to trampling of the vegetation, fauna and cultural features in and around the National Park.
3. Research about the exact amount of stress induced by tourism and its consequences on puffins and other birds at Látrabjarg.
4. Research about the exact amount of stress induced by tourism and its consequences on archaeological remains and cultural features in Látrabjarg.
5. Using the GIS ecological sensitivity evaluation for tourism development concept of Ólafsdóttir and Runnström (2009 and 2012) to integrate the results of the precedent research, assess the existing infrastructures, assess the conservation plan in development and develop an adapted land use and conservation plan.
6. Social analysis about the stakeholders, their interactions, their wills and needs.

7. Economic/market analysis for current and future Látrabjarg tourism, such as contingent valuation and market analyses. The choice of which indicators this analysis will be made on should be carefully made (such as valuation or not of natural resources and indicators).
8. Integrate these results into the current conservation plan and make appropriate modifications in the land-use plan before its implementation.

Steps six, seven and eight are equally important to conduct. Fulfilling the wills and needs of stakeholders and increasing revenues from tourism are primordial in order to fulfil the principal objectives of sustainable Látrabjarg and regional tourism development. No long-term economic optimization and achievements can be made if the stakeholder's are not satisfied and participatory. Moreover, stakeholder satisfaction, economic optimization and economic achievement could not happen if Látrabjarg environmental resources on which the economy and society is built upon are degraded or destroyed. Consequently, research step six should have the highest power of decision, followed by step seven and eight. However, step six should not have a dictatorship power. Some concessions could be made on the condition that the long-term consequences of these concessions on the society, environment and economy are not irreversible and do not endanger the goals of the planning and management process.

To finish, I would like to share this French maxim.

"Rushing is useless; one has to leave on time"

Jean de la Fontaine (1621-1695)

This maxim applies more than ever to planning and management of tourist nature destinations. If more assessment is done in the current planning and management process of Látrabjarg Cliffs, outcomes are more likely to be successful and time will be gained in the future on maintenance, conflict management and plan modifications. In regard to the international and national importance of Látrabjarg, applying this maxim is a duty.

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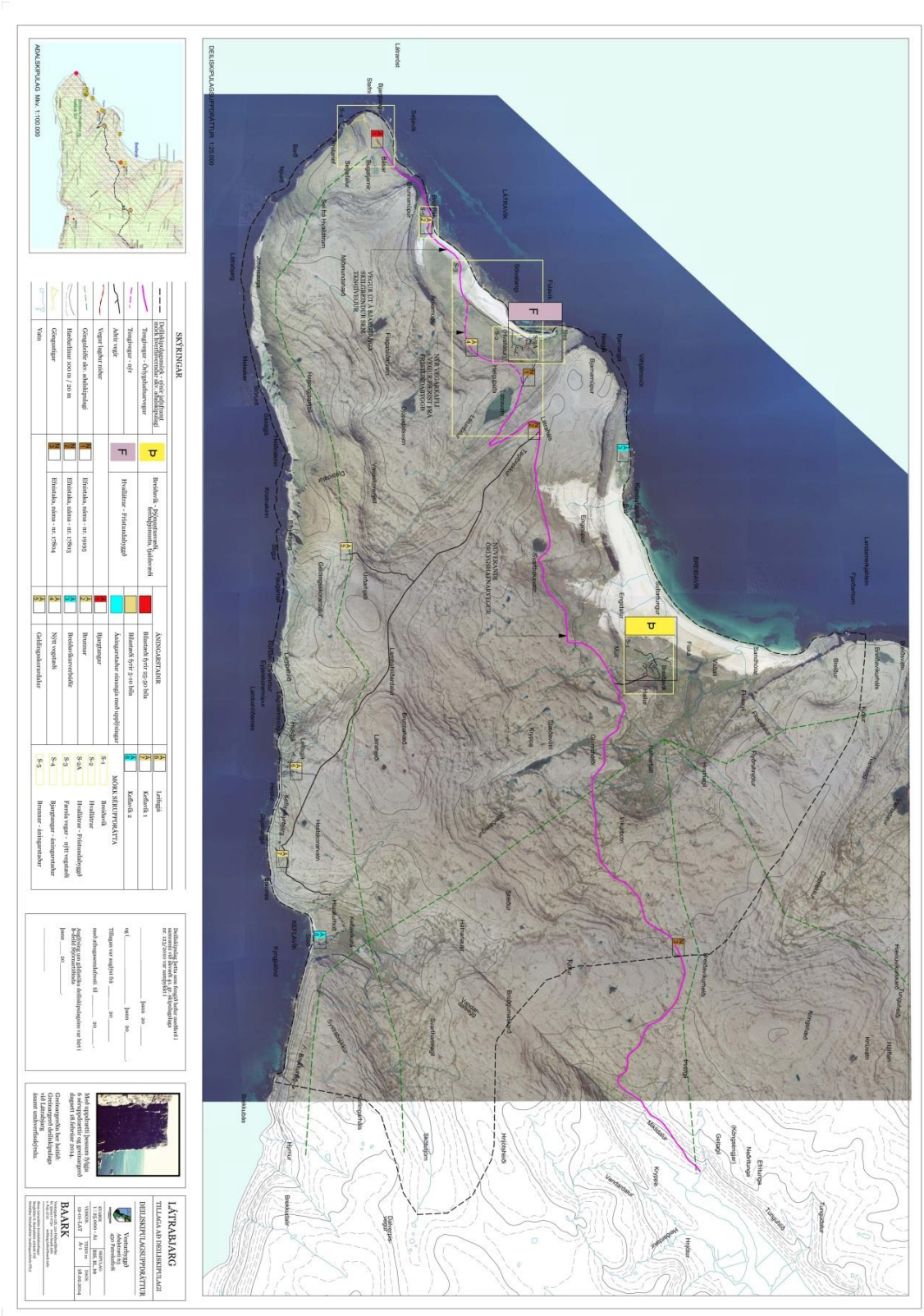
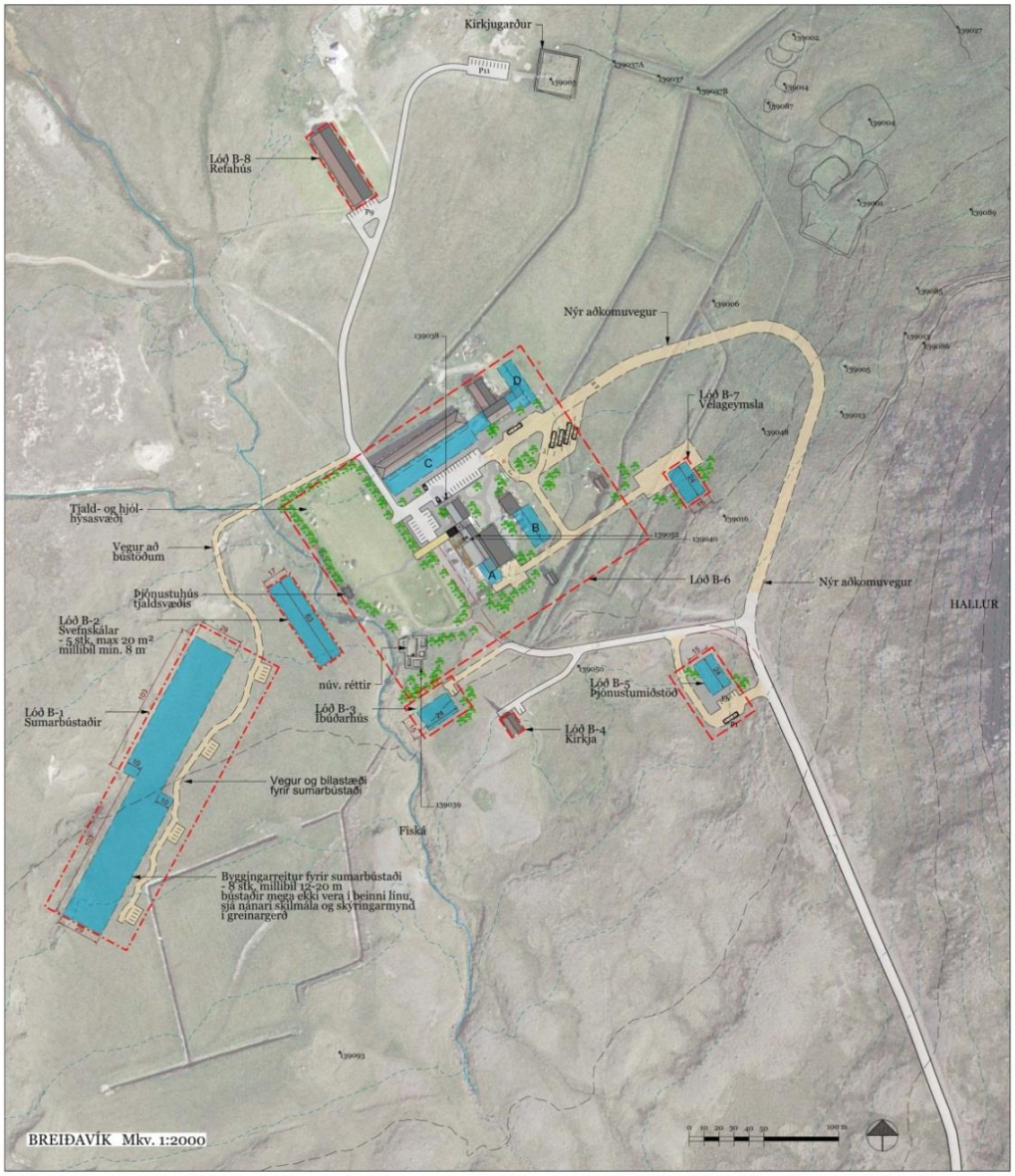
9 APPENDIX A


LÁTRABJARG
TILLAGA AÐ DEILISKIPULAGI
DEILISKIPULAGSUPPDRÁTTUR
SKÝRINGAR
ADALSKIPULAG Mkv. 1:100.000
DEILISKIPULAGSUPPDRÁTTUR 1:20.000
BAARK



SKÝRINGAR

	Vegur - núv.		Minjar - útlínur		Gönguleiðir og dvalarsvæði
	Einkavegir - núverandi	38142	Númer minja - sjá fornleifaskráningu		Rotþró
	Einkavegir - nýir		Hæðarlínur 20 m		Gróður - leiðbeinandi
	Lóðamörk		Hæðarlínur 5 m		Grasflatir fyrir tjöld, tjaldvagna og hjólhýsi
	Byggingarreitur utan um núv. byggingar		Bílastæði		
	Nýr byggingarreitur				

LÁTRABJARG

TILLAGA AÐ DEILISKIPULAGI

BREIÐAVÍK

Vesturbyggð
Aðalstræti 63
450 Patreksfirði

KVARÐI 1 : 2.000/1000 - A2		SKIPULAG: BSS, BL, ÞÞ
VERKNR. 12-01-LAT	TEIKN nr. S-1	DAGS. 18.02.2014

BAARK
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Birna Lárusdóttir forndeildarfræðingur
Borghildur S. Sturludóttir arkitekt FÍ
Þorbjörg Þorbjarnardóttir landslagsarkitekt FÍLA

SKÝRINGAR

	Deiliskipulagsmörk		Einkavegir - nýir
	Tengivegur - nýr		Vegur lagður niður þegar ný vegtengin verður tilbúin
	Einkavegir - núverandi		Minjar - útlínur
	Lóðir	38071	Númer minja - sjá fornleifaskráningu
	Nýr byggingarreitur, 625 m²		Vatn/lækir
	Byggingarreitur, núv. bygginga		Verndarsvæði - kríuvarp
	Frístundahús		Vatnsból og 5m brunnsvæði
	Önnur hús sem geta nýst sem frístundahús		Rotþró
	Önnur hús		Rafmagnslínur og staurar

LÁTRABJARG

TILLAGA AÐ DEILISKIPULAGI

HVALLÁTRAR

Vesturbyggð
Aðalstræti 63
450 Patreksfirði

KVARÐI	SKIPULAG
1 : 2.000 - A2	BSS, BL, ÞÞ
VERKNR.	TEIKN nr.	DAGS.
12-01-LAT	S-2	18.02.2014

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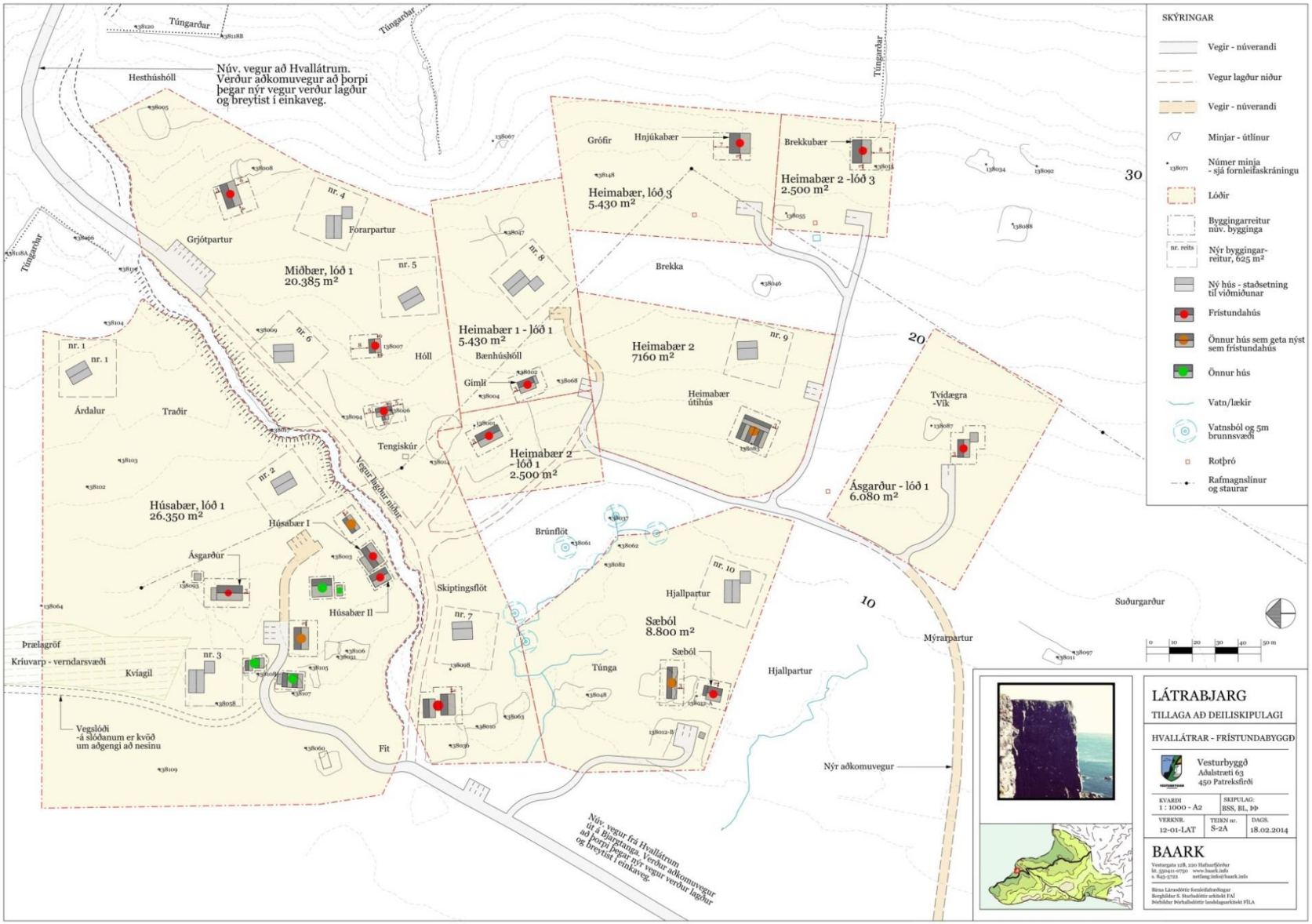
Þórhildur Þórhallsdóttir landslagsarkitekt FÍLA


Túngarðar
Núv. vegur að Hvallátrum. Verður aðkomuvegur að þorpi þegar nýr vegur verður lagður og breytist í einkaveg.
Hesthúshóll
Grjótpartur
Miðbær, lóð 1
20.385 m²
Forarpartur
nr. 4
nr. 5
nr. 6
nr. 1
Árdalur
Traðir
Höll
Tengiskúr
Vegur lagður niður
Húsabær, lóð 1
26.350 m²
Húsabær I
Húsabær II
Ásgarður
Þrælagröf
Kríuvarp - verndarsvæði
Kvíagil
nr. 3
nr. 2
Vegslóði
-á slóðanum er kvöð
um aðgengi að nesinu
Fit
Grófir
Hnjúkabær
Brekkubær
Heimabær, lóð 3
5.430 m²
Heimabær 2 -lóð 3
2.500 m²
Brekka
Heimabær 1 - lóð 1
5.430 m²
Bænhúshóll
Gimli
nr. 8
Heimabær 2
7160 m²
Heimabær
úthús
nr. 9
Heimabær 2
- lóð 1
2.500 m²
Tvídægra
-Vík
Ásgarður - lóð 1
6.080 m²
Brúnflöt
Skiptingsflöt
nr. 7
Sæból
8.800 m²
Hjallpartur
nr. 10
Túnga
Sæból
Hjallpartur
Mýrarpartur
Suðurgarður
Nýr aðkomuvegur
Núv. vegur frá Hvallátrum út á Bjargtanga. Verður aðkomuvegur að þorpi þegar nýr vegur verður lagður og breytist í einkaveg.
30
20
10
SKÝRINGAR
Vegir - núverandi
Vegur lagður niður
Vegir - núverandi
Minjar - útlínur
Númer minja
- sjá fornleifaskráningu
Lóðir
Byggingarreitur
núv. bygginga
Nýr byggingar-
reitur, 625 m²
Ný hús - staðsetning
til viðmiðunar
Frístundahús
Önnur hús sem geta nýst
sem frístundahús
Önnur hús
Vatn/lækir
Vatnsból og 5m
brunnsvæði
Rotþró
Rafmagnslínur
og staurar
0 10 20 30 40 50 m
LÁTRABJARG
TILLAGA AÐ DEILISKIPULAGI
HVALLÁTRAR - FRÍSTUNDABYGGÐ
Vesturbyggð
Aðalstræti 63
450 Patreksfirði
KVARÐI
1 : 1000 - A2
SKIPULAG:
BSS, BL, Þþ
VERKNR.
12-01-LAT
TEIKN nr.
S-2A
DAGS.
18.02.2014
BAARK
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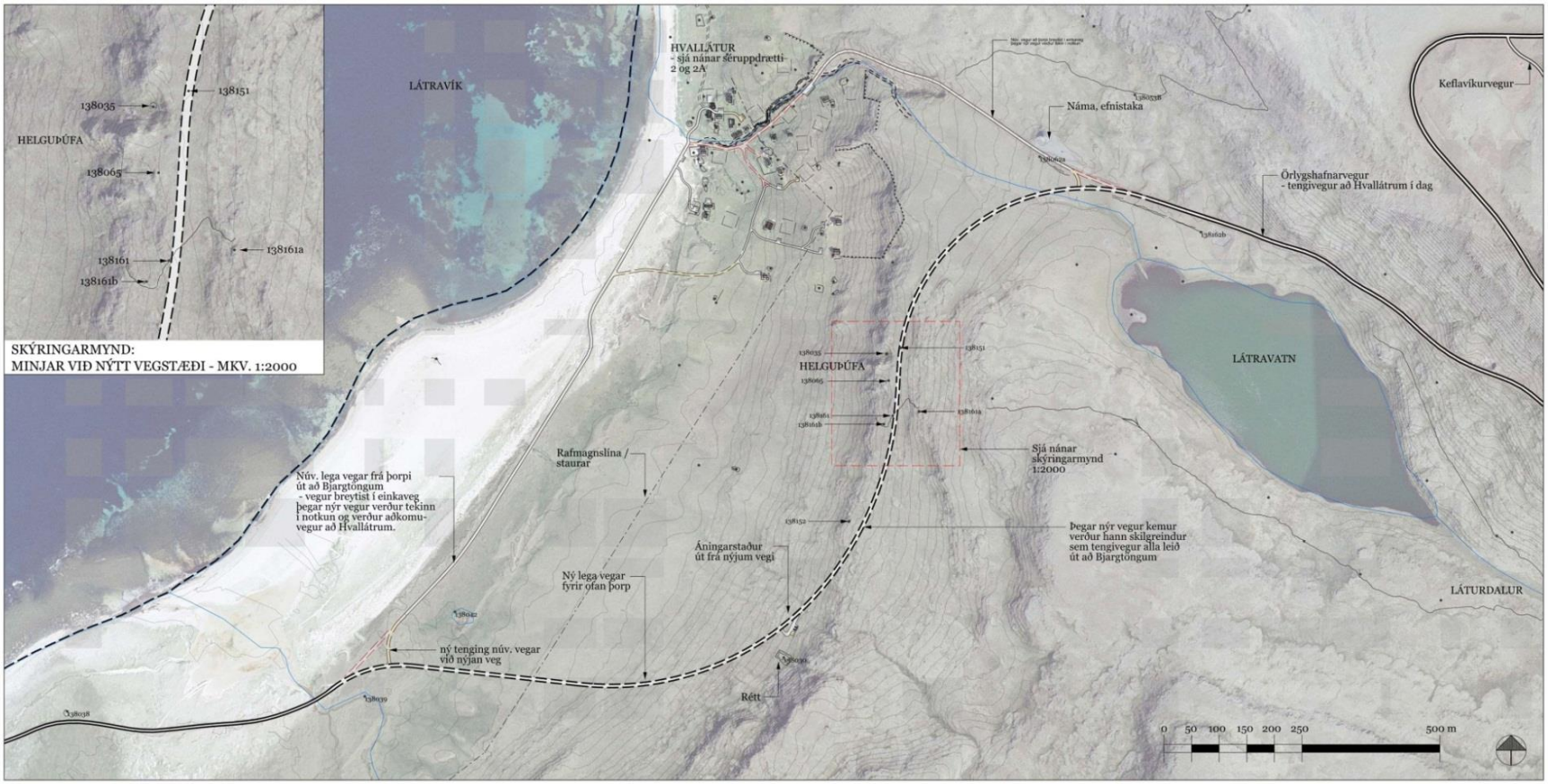
Berghildur S. Sturludóttir arkitekt FAÍ
Þórhildur Þorkelsdóttir landslagsarkitekt FÍLA

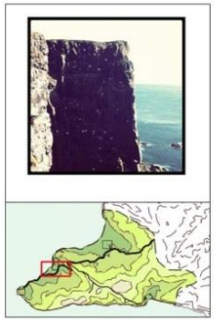


Rétt nálægt áningarstað við nýtt vegstæði

Hvallátur séð frá áningarstað

SKÝRINGAR

	Deiliskipulagsmörk		Minjar - útlínur
	Tengivegur - núv.	138142	Númer minja - sjá fornleifaskráningu
	Tengivegur - nýr		Áningarstaður - náttúrugrjót / malarsvæði
	Vegur lagður niður		Nýjar grjóthleðslur
	Einkavegir - núverandi		Hæðarlínur 10 m
	Einkavegir - nýir		Hæðarlínur 2 m



LÁTRABJARG

TILLAGA AÐ DEILISKIPULAGI

ÖRLYGSHAFNARVEGUR

Vesturbyggð
Aðalstræti 63
450 Patreksfirði

KVARÐI	SKIPULAG
1 : 5.000 - A2	BSS, BL, ÞÞ

VERKNR.	TEIKN nr.	DAGS.
12-01-LAT	S-3	18.02.2014

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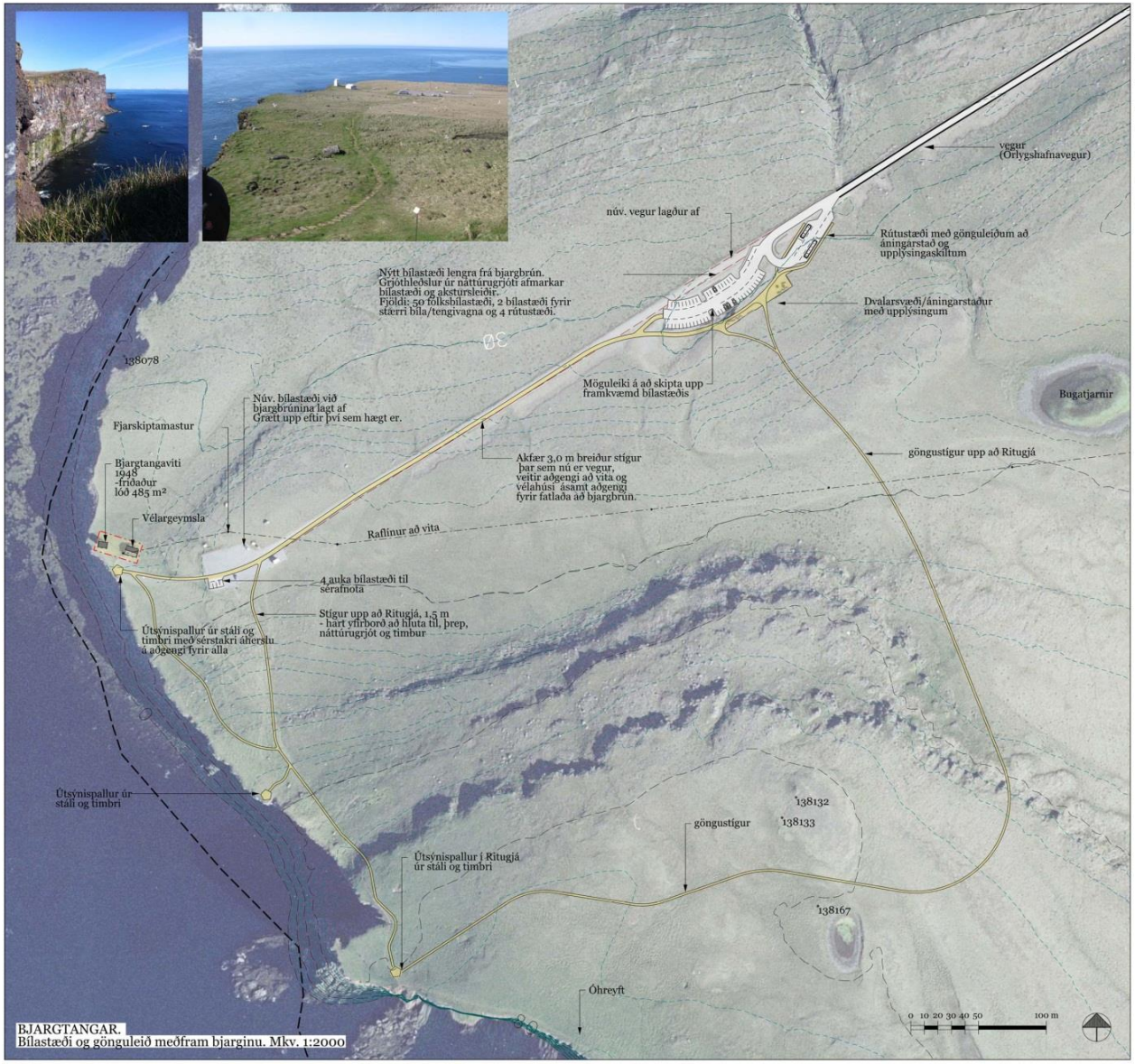
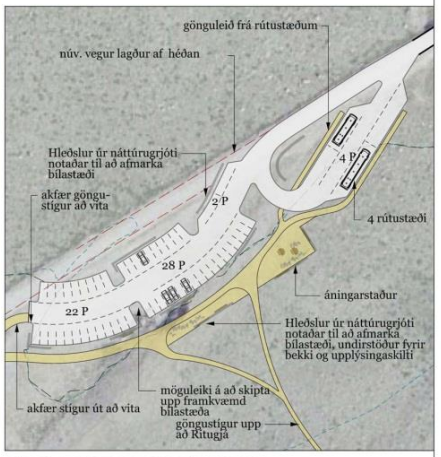
Þórhildur Þórhallsdóttir landslagsarkitekt FÍLA



BJARGTANGAR.
Bílastæði og gönguleið meðfram bjarginu. Mkv. 1:2000

SKÝRINGAR

	Deiliskipulagsmörk		Útsýnispallar
	Vegur - núv.		Áningarstaður - náttúrugrjót / malarsvæði
	Vegur aflagður		Nýjar grjóthleðslur
	Bílastæði		Hæðarlínur 10 m
	Stígar		Hæðarlínur 2 m
138133	Númer minja - sjá fornleifaskráningu		



BÍLASTÆÐI VIÐ BJARGTANGA MKV. 1:1000

LÁTRABJARG

TILLAGA AÐ DEILISKIPULAGI

BJARGTANGAR

Vesturbyggð
Aðalstræti 63
450 Patreksfirði

KVARÐI	SKIPULAG
1 : 2.000/1000 - A2	BSS, BL, ÞÞ
VERKNR.	TEIKN nr.	DAGS.
12-01-LAT	S-4	18.02.2014

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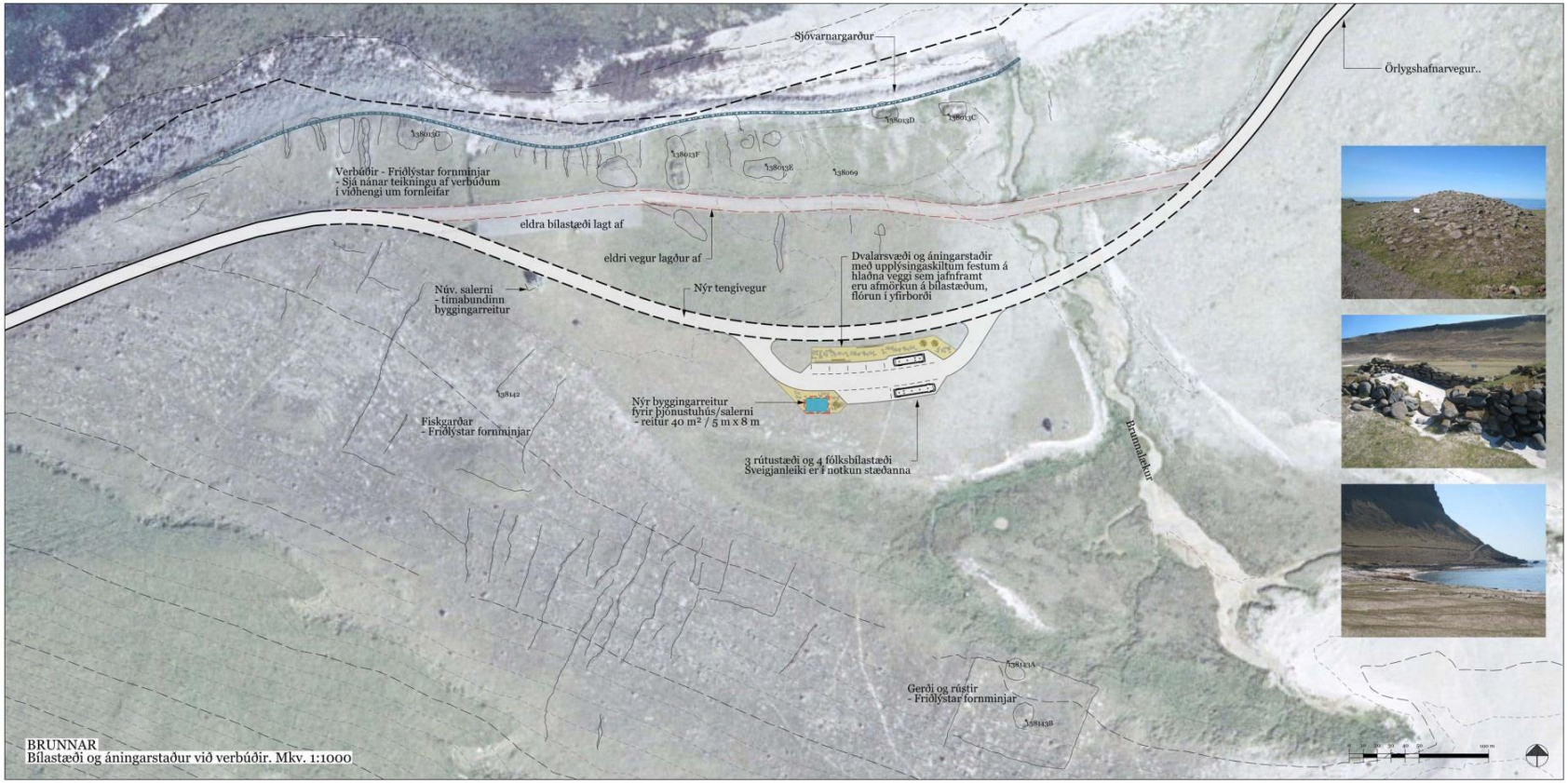
Þórhildur Þórhallsdóttir landslagsarkitekt FÍLA



SKÝRINGAR

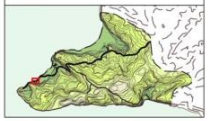
	Deiliskipulagsmörk		Bílastæði
	Tengivegur - núv.		Minjar - útlínur
	Tengivegur - nýr	138142	Númer minja - sjá fornleifaskráningu
	Vegur lagður af		Áningarstaður - náttúrugrjót / malarsvæði
	Lóðamörk		Nýjar grjóthleðslur
	Byggingarreitur utan um núv. byggingar		Hæðarlínur 10 m
	Nýr byggingarreitur		Hæðarlínur 2 m
	Sjóvarnargarður		

Snið til viðmiðunar: Sýna frágang á áningarstöðum.
Hlaðnir grjótveggir mynda afmörkun fyrir umferð og
gönguleiðir, undirstöður fyrir skilti og bekki.
Mkv. 1:100

Hlaðinn grjótveggur úr flögugrjóti undir skilti,
flórun á yfirborði dvalarsvæða

Hlaðinn grjótveggur
með timbursetu

Hlaðinn grjótveggur úr flögugrjóti afmarkar bílastæði



LÁTRABJARG

TILLAGA AÐ DEILISKIPULAGI

BRUNNAR
Áningarstaður og bílastæði

Vesturbyggð
Aðalstræti 63
450 Patreksfirði

KVARÐI	SKIPULAG
1 : 100/1000 - A2	BSS, BL, ÞÞ
VERKNR.	TEIKN nr.	DAGS.
12-01-LAT	S-5	18.02.2014

BAARK
Vesturgata 12B, 220 Hafnarfjörður
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Borghildur S. Sturludóttir arkitekt FAÍ
Þórhildur Þórhallsdóttir landslagsarkitekt FÍLA

Figure 9.1 Overview of the land-use plan for Látrabjarg as proposed by Baark ehf. Black dashed line: limits of the plan. Pink line: road. Dashed pink line: new road. Black line: other road. Red line: road no longer used. Dashed green line: trails according to the plan. Yellow: walkways. Blue line: water (Baark ehf., 2014, 18th February).

Figure 9.2 Land-use plan for Breiðavík area as proposed by Baark ehf. Double Black line: existing roads. Double grey line: existing private road. Double dashed grey line: new private road. Dashed red line: plots delimitation. Blue area: new building areas. Dark line: remains outlines. Black dot and number: remain registration number (see the archeological registration (Lárusdóttir and Guðmundsdóttir, 2014). Light grey area: walkways and promenades. Red squares: septic tank. Dashed grey area: camping site (Baark ehf., 2014, 18th February).

Figure 9.3 Land-use plan for Hvallátur as proposed by Baark ehf. Dashed black line: plan demarcation. Double dashed black line: new connective road. Double grey line: existing private road. Double dashed grey line: new private road. Dashed red line: road suppressed when the new connective roads will be achieved. Blue area: new building areas. Red dot: summer house. Orange dot: other house that can be used as summer house. Green dot: other house. Dark line: remains outlines. Black dot and number: remain registration number (see the archeological registration (Lárusdóttir and Guðmundsdóttir, 2014). Dashed yellow area: protected area-sterns. Red square: septic tank. Dashed grey line: electric lines and poles Blue line: water. Blue circles: water ponds (Baark ehf., 2014, 18th February).

Figure 9.4 Land-use plan for Hvllátur village as proposed by Baark ehf. Double Black line: existing roads. Double dashed grey line: existing road. Double dashed red line: road that will be destroyed. Dark line: remains outlines. Black dot and number: remain registration number (see the archeological registration (Lárusdóttir and Guðmundsdóttir, 2014). Dashed red line square: plots. Dashed with point grey square: built area. Dashed grey square: new building areas. Grey square: new house. Red dot: summer house. Orange dot: other house that can be used as summer house. Green dot: other house. Blue line: water. Blue circle: water pond. Red square: septic tank. Dashed grey line: electric lines and poles (Baark ehf., 2014, 18th February).

Figure 9.5 Land-use plan for Látravík area as proposed by Baark ehf. Dashed black line: plan demarcation. Double Black line: existing connective roads. Double dashed black line: new connective road. Double dashed red line: road that will be destroyed. Double grey line: existing private road. Double dashed grey line: new private road. Dark line: remains outlines. Black dot and number: remain registration number (see the archeological registration (Lárusdóttir and Guðmundsdóttir, 2014). (Baark ehf., 2014, 18th February).

Figure 9.6 Land-use plan for Bjargtangar area as proposed by Baark ehf. Dashed black line: plan demarcation. Double Black line: existing connective roads. Double dashed red line: road that will be destroyed. Yellow line: path. Yellow pentagon: Viewing platforms. Yellow area: resting and information area. Black dot and number: remain registration number (see the archeological registration (Lárusdóttir and Guðmundsdóttir, 2014). (Baark ehf., 2014, 18th February).

Figure 9.7 Land-use plan for Brunnar area as proposed by Baark ehf. Dashed black line: plan demarcation. Double Black line: existing connective roads. Double dashed black line:

new connective road. Double dashed red line: road that will be destroyed. Dashed red line square: plot demarcation. Blue square: new building area. Yellow area: resting and information area. Dark line: remains outlines. Black dot and number: remain registration number (see the archeological registration (Lárusdóttir and Guðmundsdóttir, 2014). (Baark ehf., 2014, 18th February).

Háskólasetur Vestfjarða
University Centre of the Westfjords