

Master's thesis



# Tourist perceptions of forestry in the coastal landscape of the Westfjords

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Ísafjörður, April 2016

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*Tourist perceptions of forestry in the coastal landscape of the Westfjords*

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

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

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Printing: Háskólaprent, Reykjavík, June 2016

## **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

In the Westfjords of Iceland, afforestation, the establishment of trees in a previously treeless landscape, is taking place in order to counteract some environmental and economic challenges the region is facing. The regions scenic coastal landscape attracts a steadily rising number of visitors, making tourism increasingly important as a source of income. Afforestation can significantly alter an environments aesthetic character, making it susceptible to public judgement especially in landscapes of high scenic value. A knowledge gap in the study of social acceptance of afforestation efforts in the Westfjords has been noticed. The objective of this project was to better understand the perceptions and preferences tourists have with regards to afforestation in the coastal landscape. The findings contribute to better integration of the tourism and forestry sectors and subsequently better founded landscape-related decision-making. Data on visitors' opinions was collected using photo-based questionnaires. Images displayed various forest design approaches. It was found that the coastal landscape is considered visually attractive. It is presently neither positively or negatively affected by the extent of forestry activity. Opposition was voiced towards afforestation activities that modify the characteristic open landscape of the Westfjords, by blocking scenic views or diminishing naturalness. Naturalness was found to be the most important factor determining the attractiveness of forests. A gap between naturalness as perceived by tourists and ecological naturalness became apparent. Suggestions for ways to integrate afforestation practices with tourism in the Westfjords were made. They include policy and education based steps. There is a pronounced need for future research of the social acceptability of forestry in the Westfjords.



*"It is only with the heart that one can see rightly; what is essential is invisible to the eye."*

*(Antoine de Saint-Exupéry, The Little Prince)*





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# Acknowledgements

I would like to thank all the individuals who so generously shared their time and expertise and helped to make this project possible. Sæmundur Þorvaldsson, Kristján Jónsson and Aðalsteinn Sigurgeirsson for invaluable explanations, clarifications and translations. Dagný, Kristin and the UW staff for advice, encouragement and assistance. Thanks also Isabel Stasinski for technical support and Suse Kühn, Ben Dippo, Alex Tyas and Ellyn Davidson for your time and input. I also would like to thank the participants who took the time to take part in the survey and showed genuine interest. Finally I thank my advisor Brad Barr for support when it was most necessary and irreplaceable and patient guidance throughout the past months. And of course, thank you beyond the scope of this project to my friends and family for being there, showing support and always putting things into perspective.



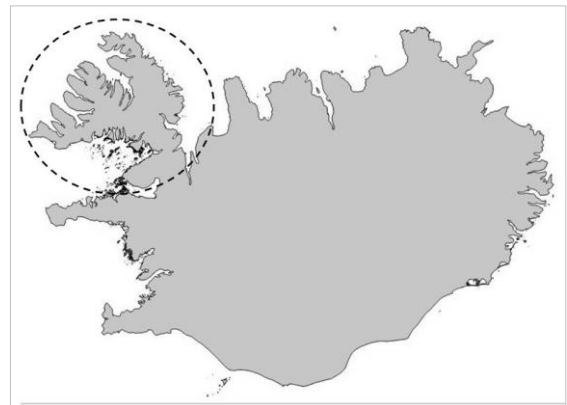


# 1 Introduction

## 1.1 Background

The Westfjords region of Iceland is located on a remote peninsula in northwest of the country (Fig. 1). Historically, its rural coastal communities were highly productive and flourishing in terms of fisheries and sheep farming (Keller, 2009; Skaptadóttir, 2000). Due to technical advances, political shifts and declines in some fish stocks, the fishing industry, still the mainstay of the rural economy, is now providing fewer jobs in the region, leading to demographic shifts and depopulation (Skaptadóttir, 2007; Skaptadóttir, 2000; Eythórsson, 1996).

Tourism is an increasingly important economic sector in Iceland. In rural areas such as the Westfjords it is considered a potential remedy to some social and economic challenges (Byggðastofnun, 2012; Smáradóttir, Johannessen, & Paulsen, 2014). The landscape of the Westfjords is famous for its barren,



*Fig 1: Location of the Westfjords (North-west Iceland). Data source: lmi.is*

otherworldly scenery and rugged beauty, dominated by deeply indented fjords and coastal mountains. Accordingly, much tourism in Iceland

and especially in the Westfjords is nature-based and reliant on the characteristic wild landscape. Outdoor activities such as hiking, kayaking or beachcombing are extremely popular with visitors (Ferðamalastofa, 2015; Hennig, 2011). Wildernesses are frequently perceived as the ‘most natural’ environments (Karlsdóttir, 2013). Daniel & Vining (1983 in Aminzadeh & Gorashi 2007) found a relationship between the visual quality of a place and the quality of visitors overall experience. The more wild or natural a place appears to nature-seeking visitors, the higher the quality of their experience and accordingly their willingness to pay and return (Fyhri, Jacobsen, & Tømmervik, 2009; Healy, 1994; Hennig, 2011; Jacobsen, 2007; Sæþórsdóttir, 2004).

Consequently, the natural character and scenic beauty of the landscape of the Westfjords can be considered an important asset for the tourism industry, worth protecting and preserving.

The impression of unspoiled nature in this area is somewhat deceiving. Just like other parts of Iceland, the landscape of the Westfjords is subject to several forms of environmental degradation. About 35-40% of Iceland's low-lying areas (below 400 m asl<sup>1</sup>) were forested at the time of human settlement around AD 870. These forests were eliminated almost entirely for farming, fuel and building material and have not regenerated due to extensive grazing by livestock and climatic shifts (Eysteinnsson, 2013). Iceland's now characteristic open and barren landscape developed as a result. Erosion of topsoil and further loss of vegetation cover and habitat are currently some of Iceland's most severe environmental problems (Arnalds & Barkarson, 2003). The protection of the remaining birch stands<sup>2</sup> and the establishment of forests by planting trees, including non-native conifer species, was initiated by the Icelandic government in response (Traustason & Snorrason, 2008).

Afforestation, the establishment of trees on land that was formerly not classified as forest, is a considerable environmental alteration ecologically. It also affects the visual character of the landscape, the very asset attracting thousands of visitors from around the world to the Westfjords every year (Bell, 2001; Karjalainen & Komulainen, 1998; Stefánsdóttir, 2010). With increasing growth and resulting visibility of forests in the Icelandic landscape, public awareness has increased. Currently some public and scientific controversy exists regarding potential ecological and visual consequences which are presently little understood (e.g. Fuglaverndarfélag Íslands, 2001; Lange, 2015). In similar environments such as northern Norway, Scotland and Finland, concerns are also expressed that afforestation of formerly open areas may produce negative public responses (Arnsdottir 2006 in Fyhri *et al.* 2009; Karjalainen & Komulainen, 1998). Especially in arctic environments, tree planting has been referred to as a potentially disturbing action (Nielsen, 2006).

On the contrary, forests can bring several benefits, for example environmentally (e.g. carbon sequestration, soil stabilization, habitat creation), and socially.

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<sup>1</sup> Above sea level.

<sup>2</sup> A stand is a unit of trees in a specific area displaying uniform age, size, species composition and arrangement, that distinguishes it from the adjoining forest or ecosystem.

The high recreational value of forests could bring significant gains to the Westfjords in terms of improved mental health and attractiveness to visitors (Bestard & Font, 2010; Bjarnadottir, Sigurdsson, & Lindroth, 2009; Christie, Hanley, & Hynes, 2007; Gudmundur, Oddsdottir, & Eggertsson, 2007). Landscape alterations caused by afforestation may thus elicit positive or negative responses from visitors.

An extensive body of literature shows that, around the world, the visual effects of various forest management practices can significantly affect their public acceptability (Eriksson, Nordlund, Olsson, & Westin, 2012; Gundersen & Frivold, 2008; Kearney *et al.*, 2008; Ribe, 2005; Seely *et al.*, 2004; Tahvanainen & Tyrväinen, 2001). Gobster, Nassauer, Daniel and Fry (2007) contended, that it is then crucial to understand people's perception and experience of beauty in landscapes, in order to achieve public support of landscape change caused by shifts in land use. Accordingly, visual forest design principles are increasingly regarded as an important element of sustainable forest management (SFM). Understanding landscape preferences of recreationists can contribute to well founded landscape related decision-making by forest managers and policy makers (Fyhri *et al.*, 2009; Ode, Fry, Tveit, Messenger, & Miller, 2009; Ribe, 2005). The aesthetic consequences and public perception of afforestation in Nordic environments and especially in Iceland have, to date, received very little scientific attention.

## **1.2 Purpose of the thesis, aims, scope and approach**

Both forestry and tourism in the Westfjords depend on and affect the coastal landscape. They each have the potential to contribute to growth and diversification of the employment market, as well as remedy environmental issues. With backgrounds in both forestry and coastal and marine management, I am fascinated with the interconnectedness of marine and terrestrial environments. The Westfjords of Iceland display this correspondence in many ecological, social and economic ways. This thesis explores the effects terrestrial land use decisions may have on communities largely dependent on marine ecosystems, which in turn may be affected by these decisions and their consequences in the long run. Comprehending and where necessary steering these relationship, lies at the heart of coastal and marine management (EC, 1999).

The visual consequences resulting from the choice of forest design approaches may influence whether and to what extent afforestation will affect the popularity of the Westfjords with tourists (e.g. Gobster *et al.* 2007; Ritter, 2007b). This situation is addressed by the "shared destiny hypothesis" (Daugstad, 2008, p. 403), where two sectors face similar challenges which, if addressed accordingly by both, can bring them mutual benefits. The resulting need for regulation and coordination of landscape activities has been recognized in Iceland and attempts are made to incorporate aesthetic considerations in land-use management such as forestry (Haney, 2010; S. Þorvaldsson, pers. comm. 2015). However, the regulations remain vague and fragmented as will be discussed in the following chapters. Understanding tourists' perception and acceptance of current forestry practices in the Westfjords can help to improve management frameworks and enable successful integration of both tourism and afforestation. This study aimed to explore the relevance of the coastal landscape for tourists and to develop a deeper and more informed understanding of visitors' perception and awareness of afforestation. It then aimed to investigate tourists' preferences for specific forest design approaches. The following research questions were addressed:

1. *How relevant is the visual character of the coastal landscape of the Westfjords to tourists?*
2. *How have tourists perceived the presence of trees and forests in the coastal landscape of the Westfjords?*
3. *Do tourists feel supportive or apprehensive about afforestation efforts in the Westfjords?*
4. *Are certain forest design approaches likely to be more acceptable to tourists than others?*

A survey based approach was used for this study. Photo-based perception surveys targeting international tourists were carried out during the summer season of 2015 in the northern Westfjords of Iceland. Colour photographs were used to help participants visualize different forest design options and resulting landscape-changes. This project can be regarded as a first step towards improved communication between two developing sectors, with the aim of mutual understanding and integrated management of coastal forestry and tourism in the Westfjords to ensure better results for both.

Financial and temporal factors defined the scope of this study. The timeframe available for sampling was dictated by the tourist season, limiting the time available for research tool design and refinement as well as data collection.

A lack of funding limited the possibilities for technically advanced solutions for image development, volume of data collected and software available for data analysis. The fact that much legislative literature on forestry in Iceland is available only in Icelandic, posed challenges in terms of comprehension and interpretation.

The thesis is structured as follows: Chapter 2 provides a literature review on the definitions for essential key terms and a summary of some of the most relevant studies. Coastal tourism in connection with landscape aesthetics and forestry is introduced and reviewed in more detail in the context of the Westfjords. Forest management strategies for visual landscape management are also introduced. A detailed description of the instrument and survey design is provided in Chapter 3 (i.e. Materials and Methods), followed by a summary of the methods applied for data analysis and a presentation of the results of this study in Chapter 4. Chapter 5 discusses the results with regards to the previously reviewed literature and in the context of the research questions.

Building on the findings from the study, several recommendations are made to help achieve the sustainable development of both forestry and tourism in the coastal zone of the Westfjords in Chapter 6. The recommendations are based on Kangas' (1994) three steps for multiple use forest management planning:

1. Define objectives and understand their weight or relevance,
2. Determine and evaluate potential alternatives to decisions regarding each objective,
3. Measure whether objectives have been reached.

Kangas (1994) suggested that no good management program could be developed unless these three specific considerations are integrated. If translated to the afforestation project in the Westfjords his considerations can provide guidance for management actions and are used to that end in Chapter 6.



## 2 Theoretical overview

### 2.1 Definitions of key terms

The following terms (i.e. forest, tourist, landscape, afforestation and coastal zone) have been described differently in various contexts. Since they are important concepts and will be used throughout this document it is important that they are well defined. Their definitions for this project will be briefly introduced in the following section for clarification and mutual understanding.

Definitions of a "*forest*" depend on several physical parameters (e.g. tree density, tree height and size of the forested area). Environmental factors (e.g. climate, latitude, elevation, soil types) as well as cultural and social aspects, (i.e. who uses forests and for which purpose) further influence whether a woodland is considered a forest or not. According to the United Nations Framework Convention on Climate Change (UNFCCC), individual countries may, within certain limits<sup>3</sup>, set their own definitions of a forests (UNEP, 2009). Iceland declared that woody vegetative cover of at least 0,5 ha, with a mean height greater than 2 m and a tree crown cover of 10 percent is defined as forest. Areas with plant heights less than 2m are referred to as woodlands (Snorrason, 2010). The Icelandic definitions was used for the purpose of this study when referring to forests and woodlands.

The UN World Tourism Organization (WTO) defines a "*tourist*" as a visitor<sup>4</sup> engaging in "a social, cultural and economic phenomenon related to the movement of people to places outside their usual place of residence, pleasure being the usual motivation" (UN Department of Economic and Social Affairs, 2010, p.1). For the purpose of this project, any individual who has travelled to the Westfjords from abroad, or has his or her place of permanent residence in a different region of Iceland was considered a tourist, in reference to the WTO definition. Most definitions of the term "*landscape*", indicate that it is a perceived mosaic of natural and manmade features which is not static but changes over time due to natural events and human driven developments.

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<sup>3</sup> 0.01-1.0 hectares for minimum area, 2-5 meters for minimum tree height and 10-30 per cent for minimum crown cover." (UNEP, 2009, p. 8)

<sup>4</sup> A visitor is defined as "someone who is travelling under certain conditions [...] namely, for holiday, leisure and recreation, business, health, education or other purpose" (United Nations, 2010, p. 1)

Recent definitions acknowledge that *landscapes* also carry an intangible element sometimes referred to as "identity" or "sense of place" (e.g. Leskinen, 2004, p. 606). A landscapes' geographical scope is generally limited by the reach of the observers senses (Gobster *et al.*, 2007; Morin, 2009; Schaich, Bieling & Plieninger, 2010). Antrop (2006) summarized these elements by describing landscape as:

*"...a synthetic and integrating concept that refers both to a material-physical reality, originating from a continuous dynamic interaction between natural processes and human activity, and to the immaterial existential values and symbols of which the landscape is the signifier."* (p. 188)

The definition used by the Council of Europe, describing the term somewhat less poetically as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" in the European Landscape Convention<sup>5</sup> (Council of Europe, 2000, Article 1) and was referred to throughout this project.

In order to avoid (frequent) confusion between the terms "reforestation" and "afforestation", both terms are briefly discussed here. Reforestation describes the process of re-establishing trees shortly after the original forest cover was removed (i.e. the planting of new trees in clear cut areas). Afforestation on the other hand is defined as the "establishment of forest [...] on land that until then, was not classified as forest" (FAO, 2012, p. 5). This included environments that never had a forest cover or have been deprived of it for a long period of time. Iceland has been deforested for an extensive period of time and most sites that are planted were not formerly classified forest area. Hence, the process of planting trees and enabling the natural spreading of birch vegetation in areas such as the Westfjords can be described as afforestation as is done by forest professionals dealing with forestry activities in Iceland (Eysteinnsson, 2009). This approach was adopted for this thesis.

The cultural, economical, visual and ecological importance of the coastal zone to the Westfjords and both tourism and forestry is undisputable. Common definitions of "*coastal zone*" are therefore addressed at this point. They can be defined based on biophysical parameter or, more broadly, take political and economic factors into account.

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<sup>5</sup> The European Landscape Convention is an international treaty aiming to protect and manage European landscapes and raise awareness of their value.



The Millennium Ecosystem Assessment defines the coastal zone based on the definition by Small and Nicholls (2003). The extent of coastal ecosystems reaching inland is defined as "the line where land-based influences dominate up to a maximum of 100 kilometers from the coastline or 50-meter elevation [whichever is closer to the sea]" (Agardy *et al.*, 2005, p. 516). Coastal systems include only those "dominated by ocean influences of tides and marine aerosols" (Agardy *et al.*, 2005, p. 516). ICZM<sup>6</sup> in Europe attempts to integrate all uses of the coastal zone, including those in the hinterland of the shoreline susceptible to flooding and may also refer to the zone where economic, social, and cultural activities take place that is not physically affected by the sea (Jennings, 2004).

## **2.2 Coastal tourism and landscapes**

The following sections introduce relevant studies and frameworks which address the interaction between tourism and visual landscapes. They also describe the management approaches and tools available. The significance of forestry in the management of visual landscapes is introduced.

### **2.2.1 Tourism and landscapes**

As mentioned previously, pursuing pleasure and enjoyment is one of the key motivations for travellers who seek out new destinations. Tourism with emphasis on experience of scenic, pristine and sublime nature, dates back to the early nineteenth century (Daugstad, 2008; Karlsdóttir, 2013). Since the romantic era of the 18th century, and the rise of industrialization and urbanization in the 19th century, scenic, natural landscapes have become an increasingly rare commodity and sought-after experience to many people. During and after the Industrial Revolution in Europe and North America, individuals started to yearn to leave their urban, often polluted settings of everyday life to find relaxation and rejuvenation by experiencing a natural environment (Antrop, 2005; Jacobsen, 2007; Lowenthal, 1982 in Jacobsen; 2007; Karlsdottir, 2013). Green and beautiful spaces became referred to as "honey-pot-destinations" (Bradley *et al.*, 2004, p. 3). This trend has continued, further amplified by the green movement that started in the 1970's.

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<sup>6</sup> Integrated Coastal Zone Management has been defined as a "dynamic, continuous and iterative process designed to promote sustainable management of coastal zones" (EC, 1999).

This movement promoted environmentalism and conservation politics, which triggered a growing desire to spend time in nature (Karlsdóttir, 2013).

Tourist landscapes - landscapes valuable to and utilized by tourists - now function as increasingly important "background tourism elements" (BTE's)<sup>7</sup>, as coined by Jafari (1982 in Healy 1994). According to Jafari, BTEs are of essential value to the tourism industry because tourists often visit a place not primarily for the services provided but because of appeal of the BTE's present. Landscapes that stand out aesthetically can bring economic value to a region as they increase the areas popularity, making it a more desirable destination (Clay & Daniel, 2000). However, natural and wild destinations are increasingly coming under pressure by development and environmental degradation, especially within reasonable accessibility to populated regions (Hall, 1999; Vermaat, Bouwer, Turner, & Salomons, 2005). Nohl (2001) reflects on the destruction and visual reduction of landscapes in Germany caused by an economy that drives rigorously rational management for profit and technical advancement. Considering this background, it is likely that the largely undeveloped landscape of the Westfjords will continue to increase in value as such landscapes are growing increasingly rare in Europe.

Since scenic quality is increasingly be considered an economically and culturally significant resource, some researchers and landscape managers have suggested that it should be managed and protected accordingly (Daugstad, 2008; Healy, 1994; Sheppard, 2001). The consequences of failing to do so have been addressed by Jacobsen (2007), who found that tourists will not return to locations that fail to satisfy their needs and expectations in terms of environmental quality. The significance of landscape quality for tourism and associated industries is addressed in the following section.

### **2.2.2 Tourism and coastal landscapes**

Coastal areas are constantly developing and changing environmentally, culturally and economically (Schou, 2000; Zhang, Douglas, & Leatherman, 2004). Human population densities are high and continue to grow in many coastal zones in the world.

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<sup>7</sup> Natural, socio- cultural, or manmade resources which "are the reason for which the consumer-tourist travels." (Jafari, 1982 in Healy, 1994, p. 597)

In 2000, the global average inland population was 38 people per km<sup>2</sup> while coastal populations averaged 100 people per km<sup>2</sup> (Agardy *et al.*, 2005). In 2001, almost 39% of the global population was living within a 100 km of the coastline, a number that has likely continued to increase along with growing global population numbers (Burke *et al.*, 2001; United Nations, 2010). In 2001, 99.9% of Iceland's population lived within 100km of the coastline. This illustrates the significance of the coastal zone for the country in comparison to the global average (Burke *et al.*, 2001).

The increasing scarcity of wild spaces especially along coastlines, has led to a rising popularity of destinations like the Westfjords, which can provide a sense of untouched nature to visitors (Hall, 1999; Hall, 2007 in Lundmark & Müller, 2010). The desire to experience pristine nature is especially prevalent in people from industrialized nations who make up the majority of tourists in Iceland (Ferðdamalastofa, 2015; Sayadi, González-Roa, & Calatrava-Requena, 2009). While rising visitor numbers can lead to potentially damaging development, tourism impacts can be low if managed responsibly. It can present sustainable opportunity to utilize intangible coastal resources (i.e. landscape aesthetics), in comparison to other, extractive industries (e.g. mining, fisheries) (Hall, 2001; Jennings, 2004). In order to enable this balancing act, careful assessment and protection of elements valued by tourists in a destination are necessary.

Coastal landscapes play a unique role in tourism. They function as magnets to visitors, as a wealth of literature covering coastal tourism in all its facets, attests (e.g. Agardy *et al.*, 2005; Hall, 2001; Hardiman & Burgin, 2010; Jennings, 2004; Lundmark & Müller, 2010). In a review of several publications, Hall (2001) identified coastal tourism as "one of the fastest growing areas within the world's largest industry" (p. 601). As mentioned in the previous section, the visual scenery in coastal landscapes is a key factor determining the popularity of places. The unobstructed ocean view from beachfront properties, coastal highways and hiking trails are highly valuable assets and important economic drivers for coastal communities (Fraser & Spencer, 1998; Luttik, 2000; McCartney, 2006). Studies exploring the importance of the visual character of a shore- or seascape, show that the scenery visible from a beach, strongly determines the locations popularity with tourists (Rangel-Buitrago, Correa, Anfusio, Ergin, & Williams, 2013). Developments that will obstruct views or affect the surrounding scenery are often seen critically, as they may degrade the quality of vistas (Ergin, Karaesmen, Micallef, & Williams, 2004).

The popularity of open sceneries is consistent with results found by Appleton (1975), Kaplan and Kaplan (1989) and Zube (1984), in Fry, Tveit, Ode, & Velarde, (2009) as well as Tveit (2009). They suggest that openness in a landscape, termed scale or extent of the view, and resulting visibility increase the attractiveness of an area. Fry *et al.* (2009) stated that view shed size, depth of view, and the degree to which vegetation penetrates the view visually, are indicators for visual scale. In northern Norway, concerns were voiced that landscape change due to re-growth of forests on formerly open areas in the coastal environment might negatively affect the regions popularity with tourists (Arnstad 2006 in Fyhir *et al.* 2009). In response, Fyhir *et al.* (2009) explored tourists perception of Norway's rural coastal zone based on three elements: typicality, vegetation lushness, and degree of human influence, which were considered influential to the individual's preferences. High correlations were found between the rated degree of perceived typicality and level of preference. Approaches used and challenges faced regarding management of landscapes will be addressed in the section that follows.

### **2.2.3 Protecting and managing landscapes**

Beautiful, characteristic panoramas not only provide aesthetic pleasure and economic revenue, they also carry a society's cultural identity (Antrop, 2005). Landscapes display patterns created by processes otherwise invisible to the human eye (i.e. ecological, physical or social), making landscape aesthetics highly relevant for environmental perception, communication and management (Council of Europe, 2000; Fry *et al.*, 2009; Sheppard, 2001; Walker & Ryan, 2008). The resulting need to protect characteristic landscapes, particularly along coasts attractive for tourism has been recognized by scientists and managers alike (Antrop, 1998; Nielsen & Jensen, 2007). As a result, in the UK for example, the visual landscape was acknowledged as an element requiring management, when the DEFRA<sup>8</sup> declared that shoreline management plans should account for the surrounding landscape settings (Ergin *et al.*, 2004). On a European level, the protection of characteristic landscapes was officially recognized as a priority in October 2000, when the Committee of Ministers of the Council of Europe opened the European Landscape Convention (ELC) for signature.

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<sup>8</sup> UK Department for Environment, Food and Rural Affairs

The ELC or Florence Convention was adopted in order to assess, and protect European landscapes including land, inland water and marine areas. In the preamble, the function and value of landscapes are explained as follows:

*"the landscape [...] has an important public interest role in the cultural, ecological, environmental and social fields, and constitutes a resource favourable to economic activity and whose protection, management and planning can contribute to job creation; ... contributes to the formation of local cultures and ... is a basic component of the European natural and cultural heritage, contributing to human well-being and consolidation of the European identity"* (Council of Europe, 2000, p. 7)

The ELC provides a framework for the management and planning of landscapes as part of Europe's common heritage and a link between the past and future. The main goal is motivating member states to develop frameworks for the protection of their exceptional and everyday landscapes (Antrop, 2005; Nordic Council of Ministers, 2010). Iceland signed the ELC in June 2012 but has not ratified it as of yet. The text has however been translated and is applied in the new Nature Conservation Act 2015 (*Náttúrverndarlög*) and local spatial plans (S. Þorvaldsson, pers. comm., 2015).

Opinions as to what extent and by which means visual elements of landscapes should be subject to protection have shifted over time and have caused some political and scientific debate (e.g. Antrop, 2005; Parsons & Daniel, 2002; Sheppard, 2001). Landscape change was once desired and planned. It was considered a positive sign of development, progress and human victory over wild and daunting spaces (i.e. deforestation in the middle ages) (Van den Berg & Koole, 2006; Muir, 2000 in Antrop, 2005). In much of Europe, landscape changes are nowadays no longer seen as a positive development as the ELC reflects and society is striving for landscape preservation (Antrop, 2005; Weinstoerffer & Girardin, 2000). Antrop (2005) attributes this to globalization, due to which developments often lead to a "loss of diversity, coherence and identity" (p. 22). These are elements important to a society's cultural integrity. Meanwhile Antrop also argues, that the dynamic way in which natural and cultural elements interact are expressed through the changing face of landscapes and should be acknowledged as natural processes. He states that while it is important to accept change, it should also be explored how elements from the past that today's society values, can be preserved and integrated in a modern, increasingly globalized world (Antrop, 2005).

Gobster *et al.* (2007) agree that aesthetics, if not protected, should be taken into account by landscape planners and ecologists. This is because they can help us to better understand and anticipate landscape change and the resulting environmental consequences. Changes in ecosystems and resulting landscape appearance, should to be accepted as natural processes, especially since our scientific knowledge of ecological processes is dynamic and uncertain (Bell, 2001; Gobster *et al.*, 2007).

In Iceland, there is some uncertainty about the environmental state of the landscapes prior to human settlement and what type of changes (natural or anthropogenic) have occurred since. Discussions over the role of anthropogenically- induced developments in contributing to modification of a potentially original environmental state, tie in with the somewhat philosophical debate whether or to which degree anthropogenically induced modifications can be considered natural (Gillson & Willis, 2004; Gobster *et al.*, 2007; Van den Born, Lenders, DeGroot, & Huijsman, 2001; Willis & Birks, 2006). A lack of clarity and agreement in this matter can cause a gap between what is perceived as natural by the public, and what can be considered ecologically natural. Gobster *et al.* (2007) refer to this as "the disjuncture between aesthetics and ecology" (p. 962). They state that, as a consequence of this disjuncture and in an attempt to please the public, visual management has sometimes been characterized by the attempt to maintain visual beauty of a scene in disconnection from the underlying ecology. In some cases, they state, the focus on cultural naturalness with an emphasis on public enjoyment of a landscape that appears natural, rather than being so, has deferred from pursuing what could be considered natural (i.e. ecological) state (Gobster *et al.*, 2007). Bell (2001), argues that simply "manicuring" landscapes to achieve aesthetically pleasing sceneries aims at "hiding and screening" (p. 202) unpopular activities such as clear cutting or mining and their visible legacies. On the other hand, visual resource management (VRM) has sometimes been viewed to be going to an extent where it hindered the pursuit of primary land use objectives. Sheppard (2001) argues that some national (US) forests seem to be viewed as "naturalistic recreational playgrounds - parks in all but name - rather than multiple-use working forests supplying industrial and other products" (p. 152). The trend in landscape management has consequently moved towards a more holistic approach, integrating aesthetic considerations with other objectives (Bell, 2001; Fry *et al.*, 2009). Under the concept of "ecological aesthetic", the where the field of landscape aesthetics specifically takes ecological considerations into account rather than focusing purely on visual element.

This way, aesthetically pleasing and ecologically healthy landscapes can become better aligned (Gobster *et al.*, 2007; Parsons & Daniel, 2002).

## **2.3 Social acceptance of forest management practices**

### **2.3.1 Forest management from a public perspective**

The visual impact of forestry activities has a strong influence on the social acceptability of the industry. Visible results of forest management practices (e.g. clear cuts or reforestation) are more obvious to the public than some ecological or social consequences of the activity. Therefore visual impacts tend to be more sensitive to public judgment (Gobster *et al.*, 2007). Studies have shown that acceptance of clear cutting practices decreases with an increasing level of visual change (Palmer, 2008; Sheppard, 2001). The aesthetic consequences resulting from forestry activities such as (large scale) harvesting, can happen very suddenly leaving people no time to adapt. At the same time the long term character of forest management decisions implies that some of the results from today's management practices (e.g. afforestation) will be visible for years if not decades from now and may therefore cause public concern (Bell, 2001; Willis & Birks, 2006). Some managed forest areas are remotely located, such as northern Canada or parts of Finland, where they receive little public attention. Many others serve not only as a timber resource but also as a recreational area and destination for tourism. For the sustainability of forestry in any setting where other stakeholder groups are involved, social acceptability is essential (Shindler, Brunson, & Stankey, 2002). In these forests, countries like Canada, Germany and the U.K., understand the importance of informing and ideally involving the public in decision-making processes. Consequently, several important natural areas that also cater for tourism, such as national parks or community forests, increasingly take visitor preferences for scenic quality into account when taking management decision (Horne, Boxall, & Adamowicz, 2005; Lupp, Konold, & Bastian, 2013). The Canadian Ministry of Forests, Lands and Natural Resources Operations acknowledges the key value of natural and manages scenic landscapes as a base for the growing tourism sector. The ministry aims to manage the scenic landscapes in a way where "levels of visual quality desired by society are achieved on all crown land in scenic areas" (Gov. B.C., 2016b).

### 2.3.2 Visual forest management

The importance of addressing aesthetics in forest management was first recognized by policy makers under what has become known as Visual Resource Management (VRM) (Gobster *et al.*, 2007; Picard & Sheppard, 2001). Sheppard (2001) went as far as stating that the purpose of VRM is to "reduce [...] public hostility to forestry on public lands" (p. 152). The concept emerged in the US around 1970, when the US National Environmental Policy Act was established and decreed the consideration of aesthetic consequences of projects funded by the federal government. Around the same time, the US Bureau of Land Management of the Department of the Interior established the Visual Management System in response to a controversy on clear cutting on public forest lands. Simultaneously in the UK, a debate was held over the planting of conifers on formerly open, and aesthetically valued land and integrated visual design standards were adopted in British Columbia (Canada) a province highly reliant on forestry resources (Sheppard, 2001). VRM includes carrying out a visual landscape inventory - in British Columbia, or landscape character assessment in the UK- to assess and map scenically valuable sites and features. Visual quality objectives (VQOs) are then established to determine the level of acceptable change for landscapes through forest management on public land, thereby acknowledging scenic resource values (Gov. B.C., 2013). VQOs are defined as "the means by which society identifies the level of disturbance that would be acceptable on a viewscape" (Gov. BC, 2016a).

Visual aspects that determine landscape character and need to be considered when managing forests for aesthetics, include (amongst others) imageability/typicality, harmony and diversity (Fry *et al.*, 2009; UK Forestry Commission, 2011). Landscape character or "imageability" as termed by Fry (2009), is created by characteristic, unique features or scenes that suggest a sense of identity and place. Harmony between such landscape features is considered a further important aesthetic parameter (Daniel, 2001; Fry *et al.*, 2009). Elements such as planted forests, should harmonize well with one another and the surrounding landscape in order to avoid an unbalanced, out-of-place appearance of features. They should "look as though they belong in the landscape" (UK Forestry Commission, 2011, p.16), achieved for example by interlocking shapes. A sense of harmony can be influenced by the types of trees present in the forest, while it is debated to which extent this factor affects public preference. Ribe (1989), reviewed a number of studies indicating that species composition is an important factor influencing forest aesthetics.



Karjalainen & Komulainen (1998) on the other hand found that choice of tree species did not affect people's appreciation of different afforestation approaches. Gundersen & Frivold (2008) reviewed 53 studies exploring public preference for forest structures and came to the conclusion that the context of the forest including such factors as light infiltration and density, along with the types of forests people have experienced previously strongly affects preference for species of trees.

After VRM has been criticized to be a simplistic and superficial approach to resource management, policy makers and foresters around the world now strive for a more holistic, sustainable forest management approach that meets commercial management objectives while avoiding negative ecological, social, or visual impacts (Bell, 2001). Countries with a long history of forestry such as Canada and the UK have developed guidelines for VRM such as the *Forests and Landscape- UK Forestry Standard Guidelines* (2011). *Forests and Landscape* is one of seven reports produced by the UK Forestry Commission to support the UK Forestry Standards<sup>9</sup> and guide forest managers. It includes legal requirements and good forestry practices for the visual management of woodlands and forests with regards to the landscape. The report, hereinafter referred to as UK Guidelines, will be used throughout this paper to give examples of principles that provide guidance regarding visual forest design, as an element of sustainable forest management.

Most actions for visual forest management were initiated as a response to the management of mature forests (e.g. timber harvesting practices) (Benson & Ullrich, 1981; Ribe, 2005; Seely *et al.*, 2004; Shindler *et al.*, 2002; Tahvanainen & Tyrväinen, 2001). Afforestation on the other hand is frequently considered a positive development in terms of ecosystem restoration, carbon sequestration, or visual improvement of urban or monotonous looking rural spaces (Karjalainen & Komulainen, 1998; Lupp *et al.*, 2013; Ritter, 2007a). However, the establishment of trees in landscapes that people feel strongly attached to may be looked upon critically. Karjalainen & Komulainen (1998) explored the perception of afforestation in two landscapes in Finland. Their results show that afforestation evoked opposition, especially with local residents who had grown used to the deforested landscape formerly present. Afforestation in open fields, highly valued areas in densely forested Finland, was particularly unpopular.

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<sup>9</sup> The UK Forestry Standard (UKFS) is the "reference standard for sustainable forest management." (UK Forestry Commission, 2016)

The effects of forest establishment on a landscape are also treated with caution in Germany, where afforestation will only be permitted if the scenery "is not severely harmed" (Schaich *et al.*, 2010, p. 273). Forestry legislation dictates that the visual consequences of afforestation have to be determined prior to proceeding with any afforestation activities (Schaich *et al.*, 2010). The Icelandic landscape is an important national icon and valued by its inhabitants as Hennig (2011) stated, referring to a poll from 1997 (Árnason, 2005). He contends that in Iceland, landscape is considered "the most important national symbol [...] even before the flag and the language" (p. 61). Due to this strong attachment, some Icelanders may regard afforestation skeptically.

### **2.3.3 Afforestation in coastal landscapes**

Most studies in the field of coastal landscape management address the impact of major constructions such as hotel complexes or wind parks (e.g. Morgan, 1999). However, in Scotland, Ireland and parts of Scandinavia, changing the composition of an area's plant cover, such as by afforestation or natural re-growth of vegetation, may change the scenery or obstruct scenic views (Karjalainen & Komulainen, 1998; UK Forestry Commission, 2011). It has been referred to as one of the most severe visual landscape alterations (Fyhri *et al.*, 2009; Jacobsen, 2007). Studies exploring how presence and characteristics of vegetation cover influence the attractiveness of coastal landscapes, show that the presence of vegetation is generally received positively by tourists and other visitors (e.g. Eleftheriadis, Tsalikidis & Manos, 1990; Rangel-Buitrago *et al.*, 2013). Ergin (2004) found that natural vegetation cover was one of the top rated parameters in beach perception studies. In their publication on coastal landscape preferences by European tourists, Eleftheriadis *et al.* (1990), found that they enjoy experiencing water and forests in combination. In a study preferences of coastal landscapes by international tourists in Greece, Eleftheriadis *et al.* (1990) found that when comparing photos showing coastal scenes with and without forest, the participants preferred those displaying both elements. In addition there is a significant body of literature attesting the recreational value of forests and forest landscapes in a non-coastal context (e.g. Bestard & Font, 2010; Christie, Hanley, & Hynes, 2007; Horne *et al.*, 2005).

In the studies mentioned above, the vegetation was naturally present. It is unclear whether the same positive response could be expected in response to afforestation of the currently almost treeless coastal landscape in Iceland. The popularity of afforestation can depend on the visual context in which it takes place (Karjalainen & Komulainen, 1998).

While the establishment of trees is generally perceived positively in urban settings, it can lead to a decrease in appreciation of the scenery in natural landscapes (Nielsen & Jensen, 2007). This means that for acceptability of afforestation, the landscape in which afforestation takes place can be more important than the way in which it is carried out. Fry *et al.* (2009) illustrate that a managed park that would be considered an element of nature in a city however could also be perceived as artificial in a wilderness setting, where it may appear out of context. It has also been suggested that attractive water features in the viewscape, might get blocked by trees making afforestation again less popular (Karjalainen & Komulainen, 1998). Afforestation in aesthetically valuable or vulnerable landscapes, such as coastal areas, is likely to meet more criticism than it would in less attractive landscapes.

#### **2.3.4 Perceived naturalness**

Perception is a cognitive process that shapes our view of the surrounding environment based on personal history and background (Morin, 2009). Perception means capturing information with all senses, then comparing and evaluating the information with previous knowledge and experiences (Fry *et al.*, 2009). This suggests that perception is the key process linking the physical and ecological processes of the environment with the human conscious, virtually creating a mental image linking individual elements present in an area (Barr & Kliskey, 2014). Individuals then establish opinions and views of the world around them which in turn may trigger actions that may affect these elements as conceptualized by Gobster *et al.* (2007) (Fig.2). Landscapes essentially are places where "people and nature meet" (Brown, Mitchell & Beresford, n.d.). Their features are intuitively understandable to the human mind and are interpreted within a social-cultural context that, in turn, cumulatively influences how that person responds to that landscape (Zube, 1987). Actions that visually affect landscape elements may potentially affecting the ecosystem at spatial and temporal scales not as easily grasped by humans, but equally important for our wellbeing and that of all other living things (Gobster *et al.*, 2007).

Gobster *et al.*'s (2007) conceptual model shows how considering visual elements (i.e. landscape patterns) can help to understand and anticipate reactions that could potentially lead to adverse environmental impacts (i.e. affective reactions and actions that affect the landscape) (Fig.2).

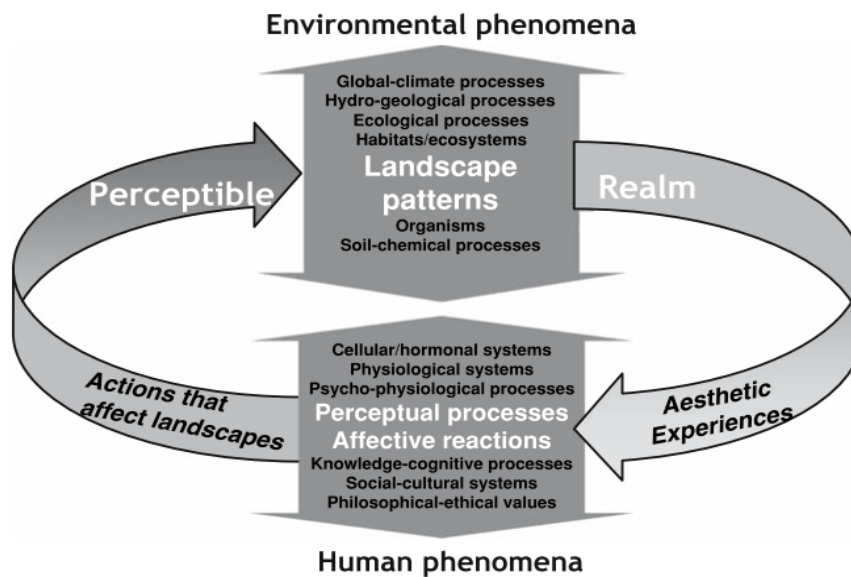


Fig 2: Conceptual model of human–environment interactions in the landscape (Gobster et al., 2007).

It displays how action rooted in perceived realities can affect ecological processes on scales less easily recognized by humans. This model will be referenced again during the research and management recommendations later in this paper. Importantly, if information captured by the observer's senses is interpreted based on incorrect or incomplete background knowledge, inappropriate judgements may be the result, as fittingly explained by Bell (2001):

*"The intellectual tends to take over from the sensory. If knowledge that we apply is faulty, incorrect or comprised of 'factoids' (when false statements are repeated often enough to be believed as hard fact), then it is possible that the intellectual aesthetic response may be inappropriate, based as it is on falsehoods."* (p. 207)

The power of perception in the formation of peoples' views and judgements about their environment is an important process to consider in participatory forest management. Perceived naturalness has been found to be a key element determining the attractiveness of a forest and landscape, albeit with a focus on harvesting and silvicultural treatment methods (Daniel, 2001; Gobster et al., 2007; Ode et al., 2009; Purcell & Lamb, 1998; Ulrich, 1986). Eriksson et al. (2012) conducted an analysis of preferred recreational activities in different forest settings depending on the level of human intervention and biodiversity.

He found that all groups surveyed, liked scenes displaying signs of forest management least. Ribe (2005) studied how different approaches to clear cutting, leaving varying levels of green leaf retention, affected the social acceptability of the activity. He found distinctly negative responses to any type of clear-cut in comparison to a virgin forest. These examples show that the level to which people will support forestry activities, will depend to a large degree on the naturalness of the resulting landscape changes as perceived by the public.

While "naturalness" is a powerful element in participatory resource management, it has been acknowledged to be a "slippery", "ambiguous and contested term" (Gobster *et al.* 2007, p. 967). This connotation is rooted in the question whether and to which extent can humans and their actions be considered a natural, ecological factor? This extensive and somewhat philosophical debate is an interesting one, albeit beyond the scope of this paper to address it in detail. The term "natural" is frequently used to describe things that have not been artificially affected or modified (Machado, 2004). Perceived naturalness then, describes the proximity to a potential natural state displayed by a landscape (Tveit *et al.*, 2006 in Ode *et al.*, 2009). The extent to which landscapes that are visually perceived as natural, are also ecologically intact, meaning, whether ecological integrity can be visually perceived and appreciated by an untrained individual, has been well explored (e.g. Daniel, 2001; Gobster *et al.*, 2007). Theories state that for evolutionary reasons, we perceive ecologically intact landscapes as more attractive (e.g. Parsons & Daniel, 2002). While many studies support this hypothesis, other works suggest that ecologically healthy areas such as wetlands were perceived as ugly and ecologically poor sites as beautiful (e.g. well tended, rural areas) (Bell, 2001; Gobster *et al.*, 2007; Junker & Buchecker, 2008). Perceived naturalness, (i.e. what is considered natural or wild or not by people) may be different from what is ecologically natural (Ode *et al.*, 2009; Tveit, 2009). Educational background may affect to which extent the two align. Purcell and Lamb (1998) carried out a study on the effect of naturalness on landscape preference where respondents judged images of forest scenes and were asked about their educational background regarding botany. They found that the presence or absence of such knowledge significantly influenced preference in participants. Due to this fact, it has been suggested that using only participants with an environmental sciences background in studies that explore the visual experience of landscapes and links between landscape indicators and preference can cause problems (Fry *et al.*, 2009).

## 2.4 Tourism in the Westfjords

As mentioned in the introduction, developments in the traditional sectors like fisheries leave, especially young and educated individuals with little satisfactory employment and perspectives in the Westfjords (Byggðastofnun, 2012). Demographic shifts such as depopulation towards the cities and abroad and an aging population in rural regions are the consequence, a common challenge in peripheral and rural in an increasingly globalized and urbanized society areas, not only in Iceland but around the world (e.g. Antrop, 2005; Hall, 2001; Ode *et al.*, 2009; Smáradóttir *et al.*, 2014). The Icelandic regional development board (Byggðastofnun) published the *Community, Economy and Population Trends in regions with long-term decline in population* report in 2012. They found a population decline ranging between 21 and 50% in many of the rural regions (including the Westfjords). Especially young people (<20-39 years old) were leaving (Byggðastofnun, 2012). In a poll conducted by Byggðastofnun in 2012 (n=1500), a large number of respondents rated the opportunities for employment in the areas concerned, "rather poor or very poor" for both genders. Participants felt that the employment market was not diverse enough, possibly due to the geographical remoteness of the area (Byggðastofnun, 2012). Limited road connectivity, and lack of major rivers or easy access to geothermal heat for electricity generation make the Westfjords unattractive for heavy industrial development (Elliot, 2012). Tourism is therefore an extremely important alternative economic sector for the Westfjords. Elliot (2012) conducted several interviews with citizens from the region and found that they considered tourism to have strong potential to combat regional, social and economical challenges. This aligns with Snyder and Stonehouse (2007) who state that responsible tourism can present a positive and long-lasting way of utilizing natural resources.

Tourism in Iceland has grown and diversified significantly since the 1980s and has become a major contributor to the country's economy. The Icelandic Tourist Board (*Ferðamalastofa*), released that the number of foreign visitors to Iceland has increased from 302 900 in 2000, to 998 600 in 2014. In 2014, the sector was the nation's largest foreign currency earner, generating 27.9% of the national revenue and providing 21 600 job to Icelanders, 2600 more than in 2013. It now exceeds fisheries and the aluminium industry which used to be the most important employment generating sectors (Ferdamalastofa, 2015). The trend has continued in 2015, when 1.2 million visitors entered Iceland through Keflavík airport (Ferdamalastofa, 2016).

The Westfjords have received a share of the national growth in tourism. While in 2010, 120 000 overnight stays were recorded in the Westfjords, the number nearly doubled to almost 200 000 of the 3.1 million nationwide overnight stays in the summer of 2014 (Ferðapjónustugreiningar, 2015). A 2014 survey revealed that 13.6% of participants (n=2338) who travelled to Iceland stated to have stayed overnight in the Westfjords during their visit (Icelandic Tourist Board, 2014). The number of tour operation permits issued in the Westfjords has doubled from 20 in 2011 to 40 in 2014 (Ferðapjónustugreiningar, 2015).

What draws visitors to this rugged peninsula at the end of the road? In highly populated Europe, the Nordic countries<sup>10</sup> have become a popular destination for natural landscapes and wilderness experiences (Karlsdóttir, 2013). Lundmark & Müller (2010) found, that people in non-northern European countries perceive and construct Nordic countries to be wild and natural. As a peripheral region of a country that itself is remotely located, the Westfjords have been able to preserve much of their natural heritage from development, a typical characteristic of peripheral regions, making them attractive for tourism (Hall, 2007).

Not surprisingly, the tourism industry promotes Iceland as "Europe's last wilderness" (Oslund, 2005, p. 1). Especially the Westfjords, dominated by deeply indented fjords and characteristic table mountains, are being advertised under that image (Sæþórsdóttir, 2010 in Sæþórsdóttir, 2014). Several tourist advertisements describe the following:

Visit Iceland, Iceland's official tourism information site:

*"The Westfjords are a true Icelandic wilderness, and are undoubtedly the ideal place for spotting birds, arctic fox and other unique fauna in their natural habitats."* (Visiticeland.is, 2015)

Visit Westfjords, the official travel guide to the Westfjords:

*"When people ask what they should see and do in the Westfjords, the simplest answer is simply "the Westfjords". Every turn brings something new. Every fjord is its own little world. Every mountain competes for your attention. Even the least remarkable parts of the Westfjords glow with natural beauty, begging to be explored – and the most remarkable parts of the Westfjords are too numerous to list here."* (westfjords.is, 2015)

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<sup>10</sup> The seven Nordic countries include Denmark, Norway, Sweden, Finland and Iceland, the Faroes and Greenland (Kaslegard, 2010)

Lonely Planet, the world's leading travel guide publisher states :

*"The Westfjords is where Iceland's dramatic landscapes come to a riveting climax and where mass tourism disappears. [...] Rutted dirt roads snake north along jaw-dropping coastal fjords and over immense central mountains, revealing tiny fishing villages embracing traditional ways of life."* (Lonelyplanet, 2015)

A survey conducted by Ferðamálastofa during the summer of 2014 found that for 79.6 % of the summer visitors (n=2629), Icelandic nature was a main attraction and it has had a major impact on their decision to visit Iceland. The majority (51.3 %) stated that it was the beautiful untouched and unspoiled landscape/ scenery/ wilderness that attracted them. 62.7% of summer visitors stated that beautiful/ unspoiled/ untouched landscape/ scenery/wilderness were Iceland's strengths as a tourist destination (Ferðamalastofa, 2015).

The landscape character and natural beauty of the Westfjords are magnets for tourists. In turn, increasingly scarce, wild and natural appearing coastlines are now effective marketing features in nature based tourism, the type of tourism prevalent in the Westfjords. The more "wild" and "untouched" a place appears and can be promoted as such, the higher the draw for tourists and thus its market value. Managing these assets carefully and appropriately will be imperative to ensure that rural communities can "continue to depend on utilization of [their] rich natural resource base" (Snyder & Stonehouse, 2007, p. 110).

## **2.5 Forestry in Iceland and the Westfjords**

In the section that follows, a brief overview of the history of forests and forestry in Iceland since settlement is given. The motivation for afforestation, expected benefits, prevailing challenges and concerns around forestry management are outlined. Current policy and management framework for forestry activities are described.

### **2.5.1 Beginnings of forestry in Iceland**

There is abundant evidence that Iceland was significantly more forested at the time of human settlement (*landnám*) around 870 AD than it is now.



In 1120, the priest Ari Þorgilsson wrote in *Íslendingabók* (the Book of Icelanders)<sup>11</sup>, that "Iceland was wooded between mountains and beach at the time of settlement" ("Í þann tíð var Ísland viði vaxið milli fjalls og fjöru") (Eysteinnsson, 1996). Pollen records show a rapid decline in birch pollen abundance soon after the estimated time of landnám. There is also increasing evidence of grasses and sedges that likely replaced woodland habitat (Dugmore *et al.*, 2005). Historic reports, such as the Icelandic sagas, and traditional names of farms or regions such as *Reynivellir* (Rowan flats) or *Skógarströnd* (Forest-coast) indicate that now treeless parts of Iceland once had a notable forest cover (Olafsdóttir, Schlyter, & Haraldsson, 2001). It has been estimated that downy birch (*Betula pubescence*) forests and woodlands likely covered 25-40% of Iceland's surface at the time of settlement (Eysteinnsson, 2006; Gunnarsson, Eysteinnsson, Curl & Thorfinnson, 2005; Wöll 2008).

Up to 95% of the original birch forest cover was eliminated once settlers started using local forest resources for fuel, building material and clearing it for farmland, reaching a low of less than 1% land cover in the mid-20th century (Eysteinnsson, 2013; Sigurmundsson, Gísladóttir, & Óskarsson, 2014). Poorly regulated grazing by livestock and lower average temperatures are considered to be the main reasons which prevented recovery of former woodlands to the present day (Dugmore *et al.*, 2005; Olafsdóttir *et al.*, 2001). However, there is an ongoing debate in the scientific community about the exact extent of vegetation decline since settlement and the degree to which climatic shifts could have caused or contributed to the change in vegetation cover (Dugmore *et al.*, 2005; Levanič & Eggertsson, 2008; Olafsdóttir *et al.*, 2001; Sigurmundsson *et al.*, 2014; Stefánsdóttir, 2010). Even though today's dominating heath like vegetation represents "superficially tundra-like physiognomy" (Tuhkanen, 1993, p. 120), most of Iceland is geographically located south of the Arctic Circle and low lying areas (< 400m a.s.l.<sup>12</sup>) have been classified as part of the sub-alpine birch-forest belt of Fennoscandia, climatically suitable for boreal forest (Dugmore *et al.*, 2005; Traustason & Snorrason, 2008; Tuhkanen, 1993). It is likely that a combination of factors such as anthropogenic activities, low temperatures and volcanic events causing ash fall led to decreased carrying capacity of ecosystems.

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<sup>11</sup> *Íslendingabók* is one of the earliest and best known sagas, stories telling the tale of early settlement, life and relationships in Iceland (Hennig, 2011).

<sup>12</sup> Above sea level

This further increased ecosystem vulnerability to disturbance which contributed to the degradation of the Icelandic forest environment (Arnalds & Barkarson, 2003). Rapid erosion of sediments took place as a consequence of vegetation cover removal (i.e. deforestation) (Greipsson, 2012). Much of Icelandic soils are volcanic in origin and lack a stabilizing component of silicate clay minerals making them vulnerable to erosion when exposed (Arnalds *et al.*, 2001). The loss of fertile soil results in desertification affects vast areas of Iceland's land surface and is considered the country's most severe environmental problem. Iceland is rated the European country most damaged by land and soil erosion and desertification, (Arnalds & Barkarson, 2003; Arnalds *et al.*, 2001; Greipsson, 2012; Ólafsson *et al.*, 2007).

In an effort to counteract these issues, the Icelandic government initiated forestry efforts in the early 1900s, with the initial objectives of protecting the remaining birch stands, which warranted the essential fencing for protection from grazing sheep, and remedy soil erosion (Eysteinnsson, 2013; Stefánsdóttir, 2010)<sup>13</sup>. Until approximately 1950, afforestation work focused on the conservation and to some extent reestablishment of natural forests, composed mostly of downy birch (Eysteinnsson, 2013). Some experimental planting of conifer species took place as well. After 1950, forestry practice focused increasingly on tree planting and more effort was put towards planting of non-native, mostly coniferous species. Timber production became an additional objective. These non-native species included Lodgepole Pine (*Pinus contorta*), Sitka Spruce (*Picea sitchensis*), Black Cottonwood (*Populus trichocarpa*) and Siberian Larch (*Larix sibirica*). In addition to downy birch, the two types of larch are the most frequently planted species today (Bjarnadóttir *et al.*, 2009). Between 1960 and 1990, planting efforts were between 500 000 and 1.5 million seedlings annually and forestry could no longer be referred to as "harmless hobby of a few eccentrics" (Eysteinnsson, 2009, p. 10; Eysteinnsson, 2013). In 1990, Héraðsskógar, was the first of several Regional Afforestation Programs (RAPs) which oversee and manage afforestation on privately owned land. The RAPs aim is to afforest 5% of low lying areas by means of natural regeneration and tree-planting (Regional Afforestation Projects Act no. 95/ 2006). Subsidized afforestation on private land (i.e. farms) became the most important contributor to afforestation in Iceland.

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<sup>13</sup> The first action of organized forestry activity in Iceland is considered to be the planting of a pine stand in Thingvellir, in southern Iceland in 1899 (Eysteinnsson, 2013).

The numbers of planted saplings increased after 1990 to approximately 4 million seedlings/year and then to 6 million/year between 2001 and 2009. At this point, native birch was planted at about 30% of the total number. The state supported project is meant to run until 2040 and currently about 1.2% of the low lying areas are covered by native and planted forest (SNS, 2009).

In comparison to other European countries, Iceland's forests ratio compared to the total landmass is still low. In 2005, about 0.5% (25 000 ha) of the total land area were covered with native downy birch and planted forests of mixed species which contribute to about one third of the total forest (i.e. according to the FAO-definition of forest). In 2010 about 30 000 ha in Iceland were forested and approximately 86 000 ha were classified as woodlands (Snorrason, 2010). Distinctions are made between primary forest, naturally regenerated forest, and planted forest.

### **2.5.2 Forestry objectives in Iceland and the Westfjords**

The objectives of afforestation in Iceland have diversified since the early beginnings when the focus lay on erosion control. The Icelandic forest service (IFS) now refers to "multiple use objectives" (Gunnarsson *et al.* 2005). According to the Regional Afforestation Projects Act no. 95/ 2006, there are three categories of forestry objectives: timber production, agro-forestry (i.e. forests for farming), and forests for general improvement of the land (e.g. soil and vegetation reclamation) (Þorvaldsson, 2015). In addition to economic purposes, Icelandic forests now fulfill a variety of environmental and social functions including the protection of water-sources, conservation of habitat and biodiversity, research and recreation. The value of forests for physical and spiritual health has increasingly been recognized by the IFS (Snorrason, 2010). Some forest areas near urban centers such as Reykjavík and Akureyri received over 400 000 visits in 2013 (Eysteinnsson, 2013). Due to this trend, the FAO 2010 Forest Resource Assessment report states leisure value as "the most valuable product of forests and woodlands in Iceland" (p. 54). Afforestation was furthermore presented as one of Iceland's main strategies for carbon sequestration as climate change mitigation measure in their Climate Change Strategy released in 2007 (Ministry for the Environment, 2007).

In the Westfjords RAP, most forestry activity is initiated by the government funded project Skjólaskógar á Vestfjörðum (i.e. woodlands for shelter). Skjólaskógar was a farmer's association between 1996 and 2000, but became the Westfjords overseeing forestry agency in 2000.

It aims at the improvement of farming conditions by creating shelter from wind using trees and shrubs (i.e. Agro forestry). The project's intentions are also to divert snow accumulations in undesired locations (e.g. surround buildings, on roads) and to diversify the functions of farms in the area. Soil reclamation and, potentially, avalanche prevention are further benefits afforestation may bring (Þorvaldsson, 2015).

Developments that motivated the establishment of Skjólस्कógar include the emerging trend towards more sustainable management of the wild landscape of the Westfjords, and its resulting need to integrate sheep farming through better grazing control (Gudmundur *et al.*, 2007). Almost as a sideeffect, forests have become popular recreational areas and people in the Westfjords visit the established woodlands regularly for mushroom and berry picking or social gatherings (personal observation). Non-timber forest products such as mushrooms, herbs, berries and materials for decoration and crafts are becoming increasingly popular in the region (Snorrason, 2010). While direct economic revenue such as sales of lumber as well as wood chips are an important objective for afforestation in most parts of Iceland, it is not the primary goal in the Westfjords. The region is dominated by a somewhat harsher climate with lower temperatures than the south of the country, which may limit growth, but more so the far distance of timber processing facilities and markets (Eysteinnsson, 2013; A. Sigurgeirsson, pers. comm. 2016).

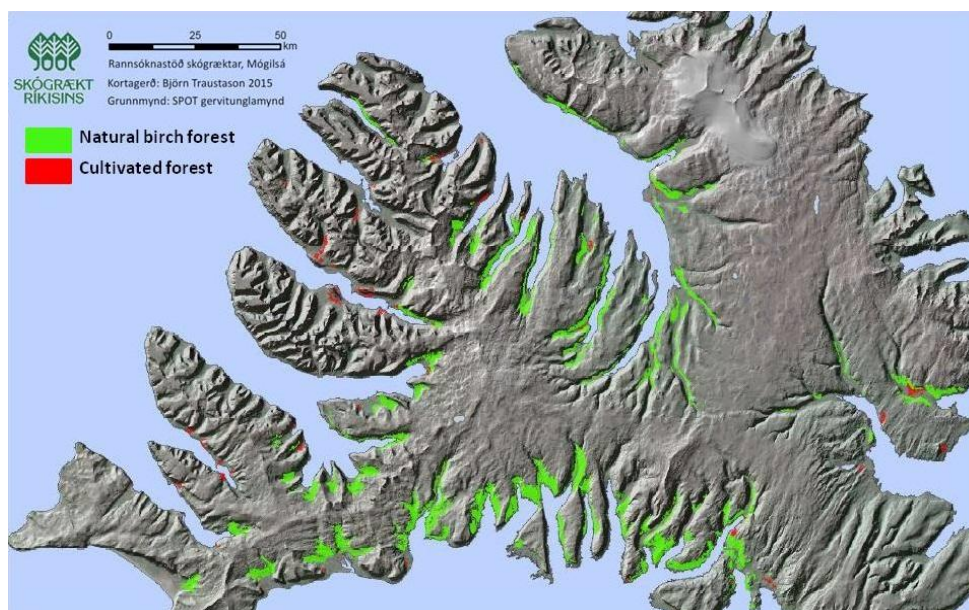
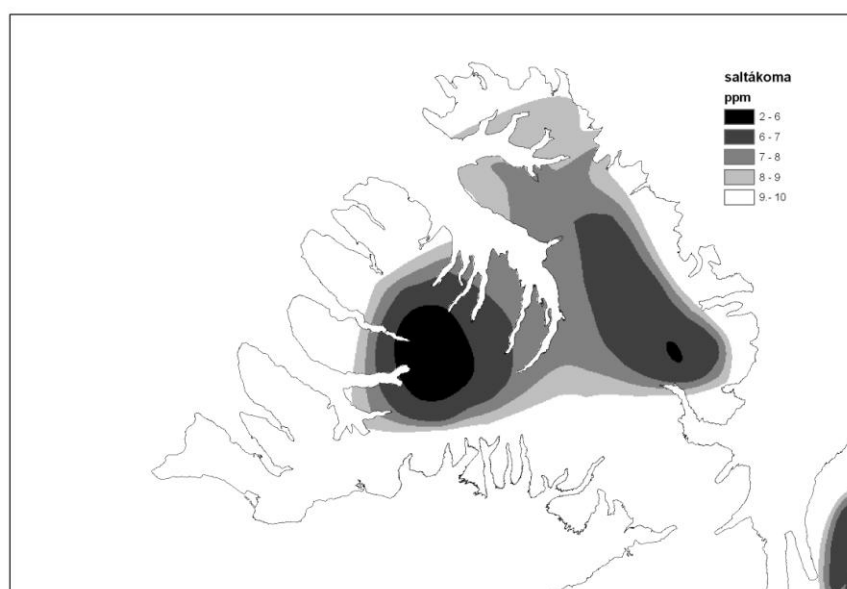


Fig 3: Forest area in the Westfjords in 2015 (excerpt from original map (Traustason, 2015).

The afforestation activities in Iceland are not lacking challenges and opponents. Concerns are that important habitat, especially for birds might be damaged since many open areas and wetlands, located in low-lying areas are essential for breeding birds (Fuglaverndarfélag Íslands, 2001)<sup>14</sup>. As mentioned previously, concerns that trees will affect the character of the landscape have been voiced numerous times. Farm forestry operates with an emphasis on the species best suitable for the prevailing growing conditions which includes conifers on some sites (A. Sigurgeirsson, pers. comm. 2016). The introduction of exotic species, which are particularly interesting for the production of timber, is controversial and seen critically by some Icelanders and foreigners alike (Ritter, 2007b).



*Fig 4: Concentration of sea-salt in groundwater in the Westfjords. Source: Sigurðsson, 1993, in Þorvaldsson, 2010.*

Environmental difficulties such as poor soils and climatic challenges as well as limited experience and scientific data, for example on suitable species and provenances, also complicate afforestation.

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<sup>14</sup> Icelandic association for the protection of birds

In the coastal areas, the influence of the ocean salt spray (Fig. 4) and frequently shifting weather conditions, especially temperatures, can cause problems for species not adapted to such conditions. For this reason, Lutz spruce (*Picea x lutzii*), a hybrid species from Alaska adapted to both high salt concentrations and cold temperatures, is used experimentally (S. Þorvaldsson, pers. comm. 2016).

### **2.5.3 Forestry management and legislation**

In the following section, relevant bodies responsible for forestry in Iceland as well as the policy framework and legal environment for the sector with a special focus on VRM are introduced. The Ministry of Fisheries and Agriculture and the Ministry of Environment were in charge of forestry in Iceland until 2013, when the Ministry of Environment and Natural Resources took sole responsibility (Eysteinnsson, 2009). The following agencies currently manage and control forestry activities in Iceland; the Icelandic Forest Service, the Regional Afforestation Projects and the Icelandic Forestry Association.

The Icelandic Forest Service (IFS), founded in 1907, is Iceland's government-authority for forestry. Their responsibilities include the protection of natural forests, establishment of new forests and to provide advice to other forestry organizations. They also represent Iceland in international forestry cooperation. While tree planting has increasingly been taken over by other agencies, the IFS now engages in forestry research. With continuously increasing knowledge and experience, they provide advice and support on forestry matters in Iceland.

As mentioned in the previous section, the Regional Afforestation Projects (RAPs) were established in the 1990s by the Ministry of Agriculture with the aim to foster afforestation on privately owned land. The intention of this approach is to regenerate forests on degraded farmland and provide farmers with a potential future source of income. There are six RAPs operating under the Regional Afforestation Project Act no. 56/ 1999. Each RAP is managed on a government-funded budget by an independent board of directors including one delegate from the IFS. Apart from that they operate independently but are provided with information and advice. In 2004, 70% of tree planting in Iceland was coordinated by the RAPs (Gunnarsson *et al.*, 2005).

The third relevant institution in Icelandic forestry is the Icelandic Forestry Association (IFA), dating back to 1930. The IFA provides forestry related information and education including the publication of *Icelandic Forestry*, Iceland's leading journal on forest related matters.

It oversees more than 60 local forestry societies, uniting private individuals interested in forestry, and has about 7500 members making it the largest NGO in the country (A. Sigurgeirsson, pers. comm. 2015). The forestry societies serve different purposes but are primarily in charge of managing older stands on municipal land for recreational activities. Cooperation with the governmentally coordinated RAPs is limited and depends on the initiative of the individuals involved (K. Jónsson, pers. comm. 2016). There are approximately ten active forestry societies in the Westfjords (i.e. Skógræktarfélag Dýrafjarðar and Skógræktarfélag Ísafjarðar). In addition, the Forest Owner Association (FOA), established in 1998, represents those individuals who have or are establishing trees on their private land. A merge, initiated by the Ministry of Environment and Natural Resources, to combine the IFA and RAPs into one overseeing agency, the Icelandic Forest Service („Skógræktin“), will commence in the summer of 2016.

Forestry legislation in Iceland is somewhat patchy and fragmented, likely due to the relatively small scale of the industry. Overall, it reflects two overarching objectives, namely to protect existing forests and to encourage afforestation on formerly treeless land where appropriate. Legislative restrictions put on forestry activities (e.g. by the Nature Conservation Act and the Environmental Impact Assessment Act as introduced below) are attributed to developments in EU legislation, not a perceived need to confine forestry in Iceland itself (Gunnarsson *et al.*, 2005). Currently, the most relevant acts regulating forestry in Iceland are:

- Icelandic Forestry and Soil Conservation Act no. 3/ 1955
- Regional Afforestation Projects Act no. 56/ 1999 and 2006
- Nature Conservation Act no. 44/1999
- Environmental Impact Assessment Act no. 106/2000
- Regulation on Exotic Plant Species no. 583/2000
- Planning Act no. 73/ 1997, 135/ 1997 and 58/ 1999

The **Icelandic Forestry and Soil Conservation Act** (i.e. Forestry Act) is Iceland's oldest forestry law. It has been in effect since 1907 and was revised mainly with regards to farm forestry and shelterbelt development in 1928, 1955 and 1988. It lines out the primary goals of forestry in Iceland. While it was once the most important forestry law, the Icelandic National Audit Office (*Ríkisendurskoðun* ) stated in 2004 that the relevance of the Forestry Act for today's forestry practices is limited to outlining the broad, main objectives.

The **Regional Afforestation Projects Act** was established 1999 and revised in 2006.

Within this document, the concrete goal to re-establish forests and woodlands on 5% of Icelandic areas below 400 a.s.l. was settled. Skjólaskógar the forestry agency of the Westfjords and the other five RAPs, operate under the Regional Afforestation Projects Act.

The **Nature Conservation Act** (1999) aims to ensure that land use activities such as forestry do not damage the environment while at the same time protecting existing natural woodlands from potentially damaging activities. It decrees that the Forest Service and the Nature Conservation Agency collaborate in striving for these goals (Gunnarsson *et al.*, 2005). Amendments to the Act were made in 2015 without concrete reference to forestry management (A. Sigurgeirsson, pers. comm., 2016).

The **Environmental Impact Assessment Act** (2000) regulates the assessment of activities with regards to their potential environmental impact. Afforestation projects fall under Annex 2, which includes "projects which may have substantial effects on the environment..." (Environmental Impact Assessment Act No. 106, 2000, p. 17). This act rules that initial afforestation of areas sized 200 hectares or larger, or those located in protected areas require an environmental impact assessment (EIA)<sup>15</sup>.

The **Regulation on exotic plant species** oversees the introduction of non-native species in Iceland. Outlined in this regulation, it is prohibited to cultivate exotic plants in protected areas and in high elevations (>400 a.s.l.<sup>16</sup>).

#### **2.5.4 Landscape management in the Westfjords**

The UK Guidelines distinguish between small-, medium- and large scale landscapes. Scale has been defined as "the relative size of one visual element to another, and the relative size of the whole landscape to the observer" (UK Forestry Commission, 2011, p. 31). They state that the scale increases as the elevation of the observers position increases and his/ her view expands. By these standards, the mountainous Westfjords can be considered large scale landscapes as they include a multitude of vantage points and very little obstructions of view.

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<sup>15</sup> Protected areas include: "national parks, natural monuments, nature reserves, state parks, areas protected by specific laws, Holocene volcanic formations, wetlands over 3 ha, waterfalls, hot springs, coastal mud flats, archaeological sites, groundwater protection areas, areas protected by international agreements such as the Ramsar and Bern conventions and areas protected through official local planning" (Environmental Impact Assessment Act No. 106, 2000, p. 17).

<sup>16</sup> A regulation change made in 2011 lowered the elevation limit from 500 to 400 a.s.l..



The resulting vast vistas, contribute to their popularity with visitors. At the same time, they make them vulnerable to visual mismanagement, especially in cases where plantations are located on hillsides, amplifying the visual effect of forests (UK Forestry Commission, 2011). These factors increase the need for aesthetic considerations when carrying out forestry activities in the landscape. ). There seems to be a growing trend towards visual management in Iceland with regards to forestry. While there is no law in place that primarily addresses scenery management, most Acts mentioned in the previous section refer to landscape as an element that needs to be taken into consideration when making land use changes. The Planning Act (1999) and Nature Conservation Act (1999) state that substantial development projects that may affect or modify the environment and its appearance, including land reclamation and forestry plans, need to comply with local development and land use plans.

Where appropriate EIAs are required. The new Nature Conservation Act of 2015 states that the objective of protecting the geological and landscape diversity is to preserve landscape features, that are special or rare, or can be deemed especially valuable for their aesthetic and/or cultural importance (S. Þorvaldsson, pers. comm. 2015). The definition of nature conservation areas in Iceland, as "demarcated areas on land or at sea which are protected by other Acts due to their nature or landscape" (Nature Conservation Act no. 44, 1999, Article 3) acknowledges landscape value. In addition to legal regulation, the IFS has developed guidelines for afforestation projects which urge foresters to avoid tree planting in sites that are considered valuable, such as "special landscape features and much visited sites with scenic vistas". When designing stands, care should be taken that forest edges blend "as well as possible into the landscape" (Gunnarson *et al.*, 2005, p. 341).

Personal communication with forest professionals from Skjólaskógar in the Westfjords revealed awareness for the aesthetic aspects of afforestation, despite limited legal requirements (S. Þorvaldsson & K. Jónsson , pers. comm. 2015). Training in the field of VRM has been part of Skjólaskógar staff's professional development. Landscape aesthetics is considered an important element of their land use planning activities and they take visual aspects into account when designing new stands. It was stated that the topic of landscape planning and analysis has been regularly discussed at Iceland's annual forestry conferences. While aiming for multiple use forest with its benefits for soil reclamation, wind shelter, habitat for wildlife and timber production, Skjólaskógar staff bear in mind the visual enhancement of the landscape (S. Þorvaldsson, pers. comm. 2015).

Land use planning in the Westfjords is carried out separately by each of the nine individual municipalities. Ísafjarðarbær in the northern Westfjords, published a land use master plan in 2009. A regional plan (*Aðalskipulag Ísafjarðarbæjar*) was also developed in 2009 and will be valid until 2020. The regional plan addresses forestry in the area, and similarly to the above mentioned Acts, it touches on landscape considerations without being very specific. According to the plan, forestry activities should be consistent with the social, environmental and economic objectives of the municipal plan. The results should harmonize with the natural and cultural landscape. The plan stresses sustainability as one of the guiding principles for development in the municipality. Attempts are made to cooperatively develop a strategy for future development involving all municipalities by the Association of Municipalities (*Fjórðungssamband Vestfirðinga*). However, the management framework for afforestation with regards to landscape aesthetic is relatively vague (S. Þorvaldsson, pers. comm. 2015).

## **3 Materials and Methods**

Research was carried out using a combination of qualitative and quantitative methods for data collection. Surveys with tourists in the northern Westfjords were performed using a questionnaire including verbal and visual elements. This chapter provides an overview of the methods used as well as development of the research tools. Photo-based landscape perception research and reasons explaining why it was chosen as the appropriate tool for this study are introduced. The advantages and disadvantages of using photographs as a research tool are outlined, giving an overview of the most important strengths and weaknesses of photo-based surveys. Furthermore, the design of the research instrument and the process of carrying out the surveys including the selection process for the participants are explained. Limitations of the methodology are outlined.

### **3.1 Photo-based perception surveys**

Using methods based solely on verbal descriptions of scenes in surveys addressing a visual component such as landscape and landscape elements, has not proven sufficiently adequate to reveal true preferences (Aminzadeh & Ghorashi, 2007; Jacobsen, 2007; Tahvanainen & Tyrväinen, 2001). When people base their opinion on preconceived images, evoked by the verbal description of a scene, the results may differ from those obtained if responses were founded on images or the real landscape. Individuals may associate different scenes with certain professional terms such as "old growth forest" or "thinning treatments". In a study on scenic landscape quality and recreational activities in Iran, Aminzadeh and Ghorashi (2007) found that wild landscapes were preferred over designed ones when data was collected without providing visual surrogates. After including visualizations however, results showed that people did not actually use wild landscape frequently for recreational activities or considered them to appear visually beautiful. Tahvanainen and Tyrväinen (2001) conducted a study on the impact of forest management practices on the scenic and recreational value of forest landscapes in Finland. They compared visual and verbal evaluation methods and found that participants frequently had preconceived "mental images" of the results of forest management actions that differed from illustrations showing the actual consequences the proposed actions were going to have.

The understanding of the effects of forest treatments if presented only verbally, is based largely on an individual's imagination and is likely to be inaccurate (Tahvanainen & Tyrväinen, 2001). Providing visual surrogates such as photographs to survey participants, is a common tool to overcome this difficulty and create mutual understanding of features or treatments in question. Using images can be an effective compromise between using exclusively verbal stimuli and physically taking participants to the respective landscape and have been used successfully to research landscape perception research for many years (Barr & Kliskey, 2014; Daniel & Meitner, 2001; Daniel, 2001; Jacobsen, 2007). The use of photos as an element of interviews and questionnaires has proven helpful in the field of tourist landscape perception studies with regards to environmental management and planning and for the investigation of destination images, as is the case in this study (Fyhri *et al.*, 2009; Gundersen & Frivold, 2008; Jacobsen, 2007).

The use of images has several other advantages: A non-scientific audience may have difficulties comprehending and interpreting scientific models and graphs. In such cases, visualizations of the potential consequences of management decisions can be valuable communication tools (Bell, 2001). In addition, experimental control, (i.e. elements present in the images can be controlled and manipulated) allows a more targeted approach to sampling (Karjalainen & Tyrväinen, 2002). If presenting several photographs simultaneously, they allow comparison between different landscape elements or aspects, which was the goal of this study. To achieve this in a true landscape setting would be extremely difficult if not impossible. Further advantages of simple visualizations such as sketches or manipulated photographs are they are low cost and can be produced with timely efficiency (Bell, 2001; Karjalainen & Tyrväinen, 2002). These advantages make photographs an attractive tool for this project.

However, Scott and Canter (1997), argue that individuals evaluating photographs, can only rate the contents of the visualization instead of judging the true place represented on the photo. They stress the importance of distinguishing between a rating of a photo and a rating of the represented scene when formulating the survey questions and evaluating the results. In this study, differentiation was made by specifically asking what appealed to the respondents "in the photo" when referring to the images. Jacobsen (2007) argues that visualizations such as photo representations reduce landscapes and landscape elements to their visual component. The participant gets deprived of the non-visual aspects such as sound and smell making it impossible to receive a fully-faceted rating of the individual's perception.

Scott and Canter similarly stated that photo-based surveys are only useful to a limited extent because people only truly experience landscapes when they are physically in the setting. Daniel and Meitner (2001) on the other hand hold a contradicting viewpoint. In a review of photo-based research approaches in landscape perception research, they found a high positive correlation between stated preferences based on realistic, photographic landscape representations and experience of the true place in several independent studies. Jacobsen (2007) points out that a potential bias between true landscape experience and a visual surrogate can be avoided if the survey is carried out in the respective setting. On-site studies have been found to reduce some of the potential disadvantages of photo-based studies because of respondent's are (temporarily) present in landscape that is being examined (Jacobsen, 2007). Daniel and Meitner (2001) concluded that realistic representation (i.e. colour photos) are valid surrogates to use in scientific and applied qualitative assessment of landscape, in particular if the environmental experience is primarily passive such as cruising or driving for pleasure. This is because other, strenuous physical activities may influence how one's surroundings are perceived and limit the validity of photos as a representation of the actual setting (Hull & Steward, 1992 in Jacobsen, 2007; Daniel & Meitner, 2001). A final concern regarding photo-based surveys is the visual quality of the representations, particularly when the researcher works with manipulated images, is the possibility that the artificial images cannot represent reality in sufficient detail and realism (Daniel & Meitner, 2001).

Despite the limitations to using photos within the survey, they were deemed appropriate for this project. Three types of photo-based approaches are commonly used in landscape perception research. These are: first, the use of photos as an element in questionnaires; second, subject-employed photography where participants take photos of scenes or elements that are relevant to them; and third, some form of sorting procedure. Both the first and third option were chosen for this study. The aim was to support verbal questions and to explore participants preferences of different forest designs by asking them to rate images.

## **3.2 Research design**

### **3.2.1 Questionnaire design and structure**

Questionnaires are a commonly used tool in the social sciences to gather information about the opinions and perceptions of larger groups of individuals.

Such data can then be evaluated and discussed in a structured manner (Taylor-Powell, 1998). A wealth of options is available for the design and administration of surveys, many of which will affect quality and/or quantity of the data. Bowling (2005) provides a comprehensive review of the positive and negative effects that different survey administration modes such as face-to-face interviews, telephone surveys, or self-administered computer based surveys can have on the quality of the data obtained. Her main findings include difficulties regarding comprehension of terms or limited literacy as a limitation of self administered survey methods. The time consuming nature and a lacking willingness to disclose sensitive information were regarded potential disadvantages in face-to-face interviews. The strengths of self administered surveys are the high number of responses that can be obtained or, in interviews, the ability of an empathetic interviewer to provide motivation or explain difficult terms if a survey proves challenging. For this project, a self-administered paper and pencil questionnaire was chosen while the surveyor was present to introduce the survey and help with questions. It ensured that an adequate number of questionnaires was completed while achieving sufficient data quality necessary for the analysis.

The survey was comprised of 17 questions consisting of both closed and open-ended question formats and four photo cards (PC) presenting 13 colour photographs of the landscape of the Westfjords including and excluding forest elements. Background information on survey design and photo-based surveying was gathered from the literature review as presented above. The research questions (RQ) were used as a basis for the design of the questionnaire structure, the definition of the types of survey questions used, and the group to be surveyed. They were broken down into questions that would provide the information necessary to answer the research questions without being leading. Through discussion with academic advisors and test sampling they were refined to the final survey questions (SQ). The survey aimed at gathering information about:

- Demographics (e.g. age, gender, nationality).
- Purpose of the respondent's trip (i.e. was the natural environment an important aspect to the participant?).
- Respondent's awareness of forestry activity in the region.
- Respondent's opinion regarding the presence of trees and forests in the coastal landscape of the Westfjords.
- Respondents' preference regarding specific forestry design approaches.

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The following priorities were considered in the design of the survey:

**Compactness:** The limited time visitors have available in the destination affected their ability or willingness to spend their time on survey participation (Jacobsen, 2007). Due to this factor, the survey was limited to the most essential questions and images. As well, a rough estimate of the time required to fill out the survey was stated before handing it out.

**Comprehensiveness:** The survey randomly targeted international tourists. Therefore, the language proficiency, education level or professional background and of the participants were previously unknown. The special challenges of multinational surveys have been acknowledged by other researchers (e.g. Fyhri *et al.*, 2009; Becker & Murrmann, 2000). It was important to assure that the questions were easily comprehensible with regards to language and terminology. Potentially challenging professional terms such as "silvicultural treatment" or "aesthetics of vistas" were replaced by more commonly used phrases such as "thinning of trees" or "the looks of a landscape". The questionnaire was available in English and German, for individuals to choose from.

**Consistency:** In order to avoid confusion, consistent terminology such as "forests" "trees" and "landscape" was used throughout the questionnaire. All tree stands, for example, whether they would officially be classified as plantation, woodland or forest were referred to as "forest" instead of using more diverse and professional terms such as woodlands, stand or shrubs. Care was taken to group similar types of questions and to phrase them in a way that made it possible to use the same method of answering for most questions.

**Logical order:** Since the questionnaire was self administered, it was important that it followed a logical sequence to guide the participant through the questions. To that aim, the chronology was based on the order of the research questions. It included a brief introduction and some simple questions, introducing the participants to the topic. All question touching on one topic (e.g. landscape character) were grouped in order to avoid confusion and distraction by questions that seemed out of context. Questions that did not require a previous encounter with forests were asked before questions referring to the images. Subsequently, questions referring to the visual character of forests could be answered by referring to the photos if respondents had not personally observed forests.

**Neutrality:** Leading element in the survey were avoided by taking care to balance positive and negative options to avoid biasing participants in one or the other direction.

The questionnaire was structured in a way that asked a few simple "warm up" questions such as the participant's mode of travel (i.e. SQ 1) (Appendix A). SQ 2-6 touched on the respondent's motivation to come to Iceland and specifically to the Westfjords addressing RQ 1 (i.e. research question 1). They further explored the importance of the visual character of the coastal landscape of the Westfjords as well as what was perceived as characteristic landscape elements. SQ 7-13 aimed at the forestry aspect of the study, exploring awareness of the presence of trees and forests, preference of forest design and the perceived impact that trees and forests have on the character of the landscape (i.e. RQ 2, 3 and 4). As mentioned above, this structure of the questionnaire enabled tourists to answer SQ 1 through 7 based on their personal experience and SQ 8 through 16 referring to both their own experience as well as the photos, in case they had not personally seen any forests. Since perceived naturalness has been found to indicate popularity of forests and landscapes as mentioned in the literature review, it was explored in more detail in order to potentially draw conclusions regarding the acceptability of forested landscapes. Perceived naturalness of forests in the coastal landscape of the Westfjords were addressed twice using different question formats (e.g. SQ 7 & 11). By comparing the responses of both questions, it was possible to verify the results to some extent. SQ 10 and 12 more specifically explored tourists' opinion concerning the potential effects afforestation (i.e. the establishment of trees on formerly non-forested land) might have on their experience in the Westfjords as visitors in terms of increasing or decreasing the attractiveness of the landscape. In SQ 10, four statements were provided with the option to either strongly agree, agree, remain undecided, disagree or strongly disagree.

The questionnaire included open and closed types of questions. Multiple choice questions using a 4 or 5 point Likert scale were used most frequently. Likert type questions have been found an effective tool for exploring e.g. people's opinions, feelings, attitudes, or perceptions as they are commonly complex and multidimensional (Bernard, 2006, p. 328). If no fifth, neutral option is available, respondents are forced to choose either a positive or negative standpoint (Bernard, 2006). For SQ 2 and 3 only 4 Likert response categories were provided (i.e. very much, somewhat, not very much, not at all). This was done in order to receive a stronger sense of why individuals chose to come to the Westfjords. For the other questions, five categories seemed appropriate as they explored the tourist's opinion on forestry. Providing a neutral option seemed appropriate here.



SQ 10 and 12 more specifically explored tourists' opinion concerning the potential effects that afforestation (i.e. the establishment of trees on formerly non-forested land) might have on their experience in the Westfjords as visitors in terms of increasing or decreasing the attractiveness of the landscape. In SQ 10, four statements were provided with the option to either strongly agree, agree, remain undecided, disagree or strongly disagree.

Qualitative data was collected to better be able to explain the quantitative results (e.g. why did participants prefer the image they liked best). An opportunity to provide additional options was given where appropriate, namely in SQ 1, 2, 3, 11 and 13. In SQ 8 and 9 participants were asked to specify briefly what appealed to them in the image they liked best. The respondents were also given the option to provide additional comments at the end of the questionnaire and to leave their email address to receive information about the outcomes of the study. No names or personal information were collected and all participants remained anonymous.

Prior to sampling, the questionnaire was tested by neutral individuals and several tourists. The pretesting revealed challenging terminology and minor difficulties in terms of comprehensibility of the photo-cards. The questions were subsequently modified, including changes to the format and wording of questions 8, 9 and 10. The fairly general question, which landscape image was preferred (SQ 8 & 9), generated very vague replies. The wording of SQ 8 and 9 was changed to ask more specifically whether the forested or non-forested option was preferred. (e.g.: from "Comparing the two photos [...], how appealing do you find the scenery presented?" to "Comparing the two photos [...], do you prefer the forested or non-forested landscape?"). In addition, two statements were eliminated from SQ 10 after the pretesting because they did not prove relevant towards answering the research question. One new statement (i.e. 10.4, Appendix A) was added in order to evenly balance the number of those supporting and opposing afforestation in the area, which was not the case previously.

### **3.2.2 Photographs**

The verbal questionnaire was accompanied by a set of colour photographs (Appendix B). Photos were used to explore whether participants preferred landscapes that included trees and woodlands or those that did not, and in order to examine whether tourists had preferences regarding specific forest management practices. Forest elements that are particularly dominant visually (e.g. shape, species composition and size of stands) were identified.

This was done by reviewing relevant studies (e.g. Bell, 2001; Daniel & Meitner, 2001; Purcell & Lamb, 1998; UK Forestry Commission, 2011), communicating with people familiar with the landscape in the Westfjords and personal, qualitative observation of the area. In the UK Guidelines, the following forest design principles are identified: Shape, Landform, Pattern of enclosure, Scale, Unity and Spirit of place. It was beyond the scope of this study to address every element. Considering which elements might affect tourists and can best be influenced by foresters, the aspects spirit of the place (i.e. how does the presence of trees affect the general landscape character), scale, shape, and diversity were selected. Different types of forests, plantations and woodlands in the Westfjords that display relevant characteristic such as different degrees of succession, different shapes or species diversity as well as comparable landscapes and features without woody vegetation were selected and photographed. The photos were taken by the researcher during spring and early summer of 2015 and some were used from an existing personal database. Similar to Eleftheriadis *et al.*'s (1990) approach, most scenes chosen were visible from the coast such as cliffs or coastal roads and were located in areas popular with tourists. They were taken with a digital camera at eye level.

The rapid change in foliage density and colour throughout the Icelandic spring and summer seasons proved challenging. Images taken in May and early June did not exactly represent the landscape a visitor would experience in mid August. This difficulty was addressed by a) making sure that the photos on each PC all showed the same level of foliage cover and colour and b) by manipulating images slightly in order to match the scenery displayed with the actual landscape tourists encounter during the summer months. Editing was done with the open source software *Pixlr*<sup>TM</sup>. Similar to well known programs, such as *Photoshop*<sup>TM</sup>, it allows one to erase or add elements and to adjust colours. Care was taken to keep the images as realistic as possible, addressing Daniel & Meitner's (2001) concern that manipulated visualizations may lack detail and therefore be less representative. Choice and editing of photographs used in a photo-based survey are therefore an essential step in the research design. Against this background there was an emphasis on the careful selection, processing and arrangement of the images in this project. Only the forest element addressed as well as a few background details were manipulated or changed in the original photographs. That way the surrounding landscape was left nearly natural-looking. Distracting elements such as a creek in PC A, pair I photo 2 were erased.

It has been commonly recognized that water features strongly affect the perception of landscapes and landscape images (e.g. Arriaza, Cañas-Ortega, Cañas-Madueño, & Ruiz-Aviles, 2004; Daniel & Meitner, 2001; Scott & Canter, 1997). Other elements that were eliminated were caravans in PC A, pair II image 2 that would have not been visible in image 1. The aim was to minimize the number of elements that varied between photos and except for the respective variable (e.g. shape of the cut block). Bell, (2001) found it to be generally accepted that the manipulation of only one factor such as a cut block shape can produce accurate results if everything else in the image stays the same. Colour photographs were chosen in order to increase the realism of the images and provide more detail and carry the atmosphere of a landscape better than black and white images (Daniel & Meitner, 2001).

The photos were arranged in pairs in PC A, and groups of three in PC B, C & D, depending on the RQ or forest design approach which they addressed (Appendix B).

**PC A** referred to SQ 8. It displayed three photo pairs, each showing the same scene with (image I) and without forests (image II) (Fig. 5).

#### **Pair III**



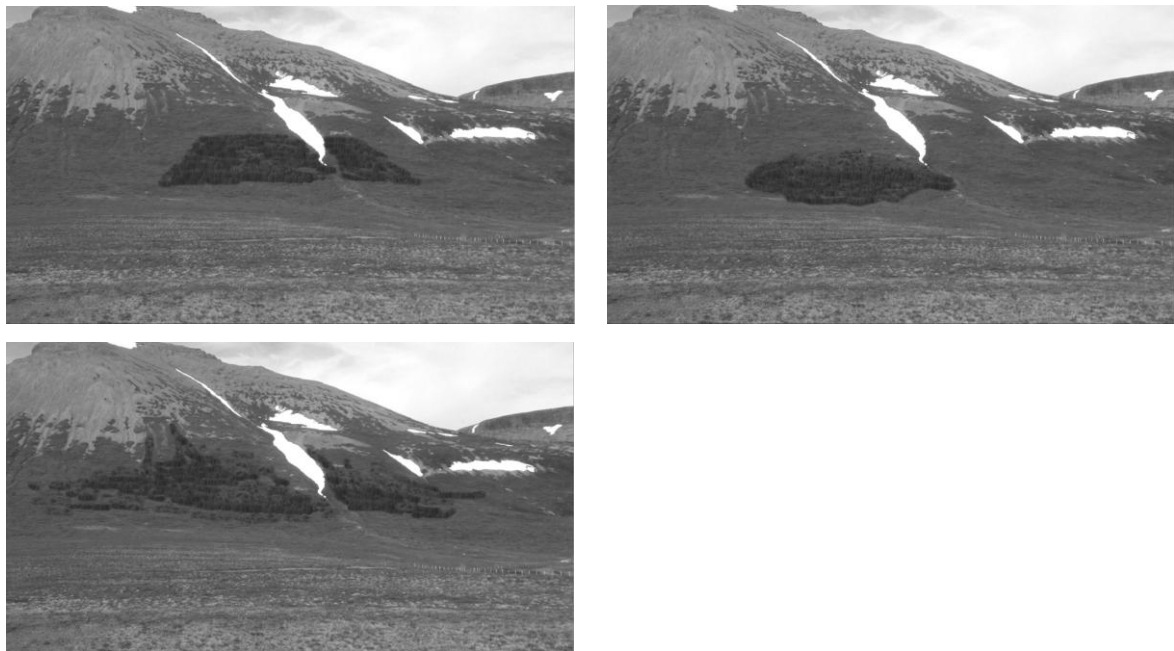
*Fig 5: Black and white example of photo pairs displayed on card A (pair III) (image source: Lange, 2015).*

The scenes displayed were typical tourist settings such as hiking trails, campsites or scenic vistas. The purpose was to explore whether images displaying landscapes with or without trees and forests were preferred.

While card A pair I does not display exactly the same scene, the images were used because they were the best option available to compare a forested and non-forested hiking trail.

Even though the photos were not taken on the same day and in the same location, the forest in option 1 obstructs the landscape differences, making it difficult to notice them. The two photos chosen were considered to serve the purpose sufficiently well.

**PCs B, C and D** referred to SQ 9. They displayed three images depicting the same landscape at the same time of day and the same weather conditions. The elements in focus such as the shape of the plantation was manipulated to show two opposite extremes and one moderate option "in between" (e.g. geometric, organic, naturalistic shape) (Fig. 6).



*Fig 6: Black and white example of images used for the comparison of different forest shapes (PC C) (image source: Lange, 2015).*

The following themes were the focus of each card: PC B explored the preferred dominance of woody vegetation in the landscape. PC C addressed the preferred shape of a plantation in the landscape, while the purpose of PC D was to inquire which species composition was most and least preferred (Table 1). Exploring more options would have been preferable but again, care had to be taken that the survey did not exceed the participants' time and patience.

Ideally, the photographs should have included coastal elements such as ocean views or beaches. Due to the technical means, the budget and time available, it was not possible to obtain an appropriately consistent set of such images including.

Therefore, it was verbally indicated in the questions of the questionnaire that the study focuses on coastal landscapes (e.g. "If you have observed forests in the coastal landscape of the Westfjords...").

*Table 1: Forest design option presented in PC B, C and D.*

|  | <b>Photo I</b>         | <b>Photo II</b>      | <b>Photo III</b>           |
|--|------------------------|----------------------|----------------------------|
| PC B: Ratio of forested area and open ground in the landscape (forest cover) | No forest              | 50% forest cover     | Forest dominates           |
| PC C: Shape of plantations (Forest shape)                                    | Geometric, symmetrical | Organic, symmetrical | Asymmetrical, naturalistic |
| PC D: Species composition (Types of trees)                                   | Coniferous forest      | Mixed forest         | Deciduous forest           |

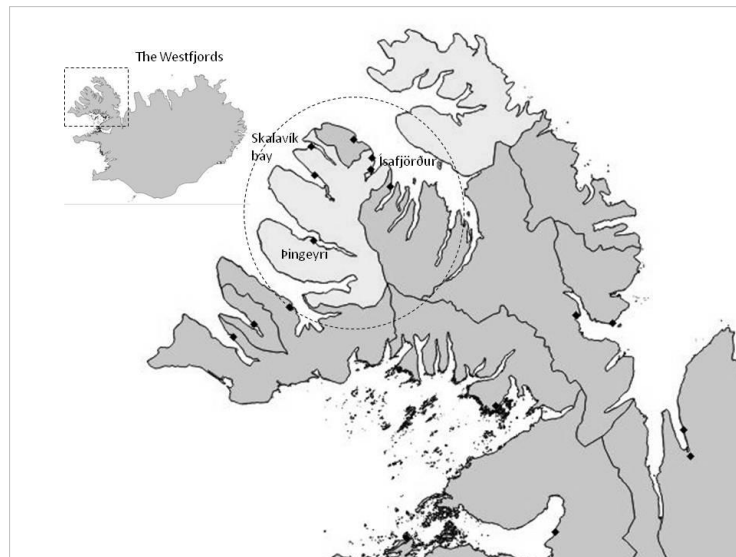
### **3.2.3 Sampling process and participant selection**

Surveys were conducted during the main tourist season in the Westfjords (mid June-late August). Sampling took place between July 16th and September 10th, 2015. The research area for this study was the northern Westfjords, namely the area of the municipality of Ísafjarðarbær. Fieldwork focused on two settlements located in the northern Westfjords including the communities of Ísafjörður and Þingeyri as well as the surrounding areas such as Sklavík bay (Fig. 7).

Hardcopies of the questionnaires were distributed amongst participants by the researcher. This method was deemed the best available mode of administration to obtain the best possible data with the time and funds available. At the beginning of each sampling session, the location and weather conditions were noted. Participants were approached at a variety of tourist sites in town (e.g. cafes, cruise docks) and in the surrounding area (e.g. hiking trails, campsites) where hikers, bikers and hitchhikers were asked to participate.

Individuals were approached randomly by the researcher during each survey session and every individual who was not identified as a local was approached as a potential participant. Initially they were asked "are you travelling in the Westfjords?", to establish whether the individuals were tourists. At the same time it was possible to find out whether they knew either English or German well enough to complete the questionnaire. Those who responded that they were not travelling were not asked to participate. Next, the purpose of the study and the time participation would approximately take (about 15 minutes) was explained.

A broad sample of tourists from different groups (e.g. campers, hikers, cruise ship passengers) and those of different nationalities were targeted. They were asked about the purpose of their visit and their means of travelling in order to be better able to categorize them.



*Fig 7: Location of the research area including communities where surveying took place (municipality of Ísafjarðarbær highlighted). Data source: lmi.is.*

Three sets of photo cards were available and were provided along with the questionnaire. A few times several individuals had to share PCs. While they were asked to use the cards only during the corresponding questions in the questionnaire, it was not always possible to prevent individuals from looking at the photos right away. They usually did not examine the photos more closely however until they were asked to do so in the questionnaire. Respondents filled out the survey without assistance as far as possible. The surveyor stayed nearby to assist with arising questions but encouraged participants to fill out the questionnaire without help in order to avoid bias. Only questions addressing language difficulties or the response protocol were answered. A few times, participants requested explanation and further background information regarding the purpose of the study or forestry in the Westfjords. Such questions were not answered until after the questionnaire was finalized. Comments and statements regarding forestry in the region made at this point were noted. Depending on an individuals' interest in the topic, confidence in English or German, and thoroughness in answering the questions, completing the questionnaire took between 10 and 30 minutes.

## 4 Analysis and Results

In the following chapter methods for analysis and results are presented as follows: Data preparation and errors are discussed followed by the methods for analysis. The demographic composition of the sampled participants are presented. Quantitative and qualitative data were analysed separately and the respective results are laid out individually.

### 4.1 Data preparation and Errors

In total 157 surveys were completed on 17 days of surveying between July 16th and September 10th 2015 in Ísafjörður and the surrounding area, Þingeyri, and Skálavík bay. Throughout the fieldwork phase, data was continuously entered into an Excel spreadsheet. The accuracy of entered data was verified by once again comparing all entered data with the original surveys. A number of errors were encountered that needed to be considered during data analysis. The following errors were encountered while entering the data:

- a. Questionnaires were completed by more than one individual.
- b. SQ 8, 9 and 10 were worded differently in some questionnaires since the format had been changed after pretesting of the questionnaire (old format).
- c. SQ 9 was completed incorrectly (i.e. the preferred image was indicated but no rating was provided).
- d. Questions and sometimes entire pages were left blank.
- e. Multiple options were chosen when participants were asked to only circle one.
- f. Participants marked in-between two options or did not clearly indicate their choice.
- g. Unknown abbreviations or illegible handwriting were used.

108 questionnaires were completed correctly. Four individuals were approached but were unable to participate due to language difficulties. Three people did not have time or refused to participate without stating a reason. Questionnaires encompassing one of the errors were treated as follows:

- Questionnaires completed by more than one participant were not included in the analysis unless specifically stated in the results. Hereinafter they will be referred to as "multi-response-surveys".

- The old format surveys were used for analysis of all questions except for SQ 8, 9 and statement 10. 4., which was added after pretesting the questionnaire.
- In the cases where SQ 9 was not completed accurately, the questionnaires were excluded from the analysis of that question but not that of the others since the other questions were generally answered correctly.
- In cases where it was unclear which option had been chosen or if the question was left blank, the answer was invalid and included as "not specified" (ns) in the results.
- Illegible comments were disregarded.

Table 2 identifies the distribution of surveys according to errors a) through c). Errors d) through g) are not included in the table since they were considered minor and only affected the analysis of individual survey questions. The number (n) stated with each figure in the results section, indicates which questionnaires were included in the analysis.

*Table 2: Number of surveys including errors a)- d).*

|  |            |
|--|------------|
| <b>Total number of questionnaires completed</b>            | <b>157</b> |
| Error a) Multi-response-surveys                            | 6          |
| Error b) Old format  | 10         |
| Error c) Survey question 9 completed incorrectly           | 24         |
| Error d) Survey question 9 completed incompletely          | 7          |
| Multi-response and incorrect                               | 2          |
| <b>Questionnaires completed accurately</b>                 | <b>108</b> |
| <b>All surveys excluding multi-response surveys</b>        | <b>149</b> |
| <b>All surveys excluding multi-response and old format</b> | <b>139</b> |

In 18 cases more than one option had been chosen for SQ 1 (i.e. transportation). For analysis, a value was assigned to those cases where an active mode of transportation such as biking or hiking was provided in addition to, for example, rental car or hitchhiking. That way it was possible to distinguish between individuals who were actively engaging in outdoor activities and those that were not, which has been found to influence the perceived relevance of the visual landscapes quality (Bell, Tyrvalinen, Sievanen, Pröbstl, & Simpson, 2007; Daniel & Meitner, 2001). For analysis, each SQ was assigned to one of five categories including one of the four RQs or background & demographics (Table 3). Each SQ was analyzed individually and subsequently relevant results were compared with those of other questions.



*Table 3: Reference of survey questions to the research questions for analysis.*

|      | <b>RQ</b>  | <b>SQ</b>         |
|------|--|-------------------|
|      | Demographics and background  | 1, 14, 15, 16, 17 |
| RQ 1 | How important is the visual character of the coastal landscape of the Westfjords to tourists?      | 3, 4, 5           |
| RQ 2 | How do tourists perceived the presence of trees and forests in the coastal area of the Westfjords? | 5, 6, 7, 11, 12   |
| RQ 3 | Do tourists feel supportive or apprehensive about afforestation efforts in the Westfjords?         | 8, 10, 12         |
| RQ 4 | Are certain forest design approaches likely to be more acceptable than others?                     | 9, 13             |

## 4.2 Quantitative data

A sample size of 348 valid responses would have been required for the study to be statistically representative based on an estimated population size of 200 000<sup>17</sup>, a margin of error of 5% and a confidence level of 95%. Since the sample size of this project was significantly smaller than the statistically representative sample, evaluation focused on descriptive, univariate analysis for the quantitative data. Summary statistics, including means and medians were applied where appropriate to enable better comparison of the results and express tendencies. From a theoretical point of view this is not considered a valid option for ordinal data as collected in this study. Yet, it has been found to be useful in the analysis of Likert type data and worked well in previous studies (Sullivan & Artino, 2013). Office Excel was used to sort the responses and determine the frequency distributions of responses per SQ. The results were compared with reference to the research questions, as displayed in table 3, and visualized in graphs and tables. Link between the groups of RQs were explored. No further inferential statistical analysis was carried out. Quantitative data used for analysis included:

- a. Likert type data.
- b. Preferences indicated in SQ 8, coded: Preference for image 1 (forested) = "1" and image 2 (non-forested) = "2".

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<sup>17</sup> Number of overnight stays recorded in the Westfjords in the tourist summer season of 2014 by Ferðapjónustugreiningar.

- c. Scores that participants had assigned to images in SQ 9. Score values ranged from 1-5 or 0 if no score had been provided.

#### 4.2.1 Demographics

The gender distribution in the sample was 51% female, 43% male, 4% both (i.e. filled out by more than one individual) and 2% not specified. Respondents from 26 countries participated in the study. The largest percentage of participants (25%) were Germans followed by Americans (14%), and Dutch (12%). 9% of came from the United Kingdom, France (7%), Belgium (6%), and respectively 5% or less came from Switzerland, Ireland, Canada, Norway, Spain, and Italy (Exhaustive list: see Appendix C). In total, 81% of the participants were European, 16% North American, 2% Asian and 1% Central American. A large number of respondents were between 21 and 30 (27%) or 31 and 40 (23%) years old. An equal number were either 51-60 or older than 60 years old (17% each) (Table 4).

*Table 4: Distribution of age categories in the sample (n=157).*

| Age | <20 | 21-30 | 31-40 | 41-50 | 51-60 | >60 | Multi-response | n.s. |
|-----|-----|-------|-------|-------|-------|-----|----------------|------|
| n   | 4   | 39    | 35    | 18    | 26    | 26  | 7              | 2    |

The most commonly used mode of transportation was by rental car (43%) followed by cruise ship (11%) (Table 5).

*Table 5: Modes of transportation used by survey participants (n= 157)*

| Mode of transportation      | n  | Mode of transportation | n |
|-----------------------------|----|------------------------|---|
| Rental car                  | 64 | Hitchhiking            | 7 |
| Cruise ship                 | 16 | Public transport       | 6 |
| Multiple choice inc. hiking | 15 | Bicycle                | 2 |
| Hiking                      | 14 | Other                  | 2 |
| Personal car                | 13 |                        |   |
| Sailboat                    | 9  | Not specified          | 2 |

10% of the participants indicated more than one mode of transportation but specifically included "hiking" as one of their ways to get around Iceland and the Westfjords. Other means of transportation that were mentioned included: ferry, airplane and electric car.

In total, 78% of the participants were travelling by car, rental car or sailboat, while 22% stated that their mode of transportation in the Westfjords was active such as hiking, biking or a combination of driving and hiking.

#### 4.2.2 Relevance of the coastal landscape for tourist experience

SQ 2, 3 and 4 explored what elements drew the surveyed tourists to the Westfjords and how relevant landscape and the visual character of the coastal landscape was to them. The results from SQ 2 (i.e. What motivated you to come to Iceland) did not differ significantly from those to SQ 3 (i.e. What motivated you to come to the Westfjords) and will not be discussed further. The distribution of answers to SQ 3, addressing the relevance of the elements culture/ history, landscape, nature, adventure, relaxation and work as reasons for tourists to come to the Westfjords are presented in Figure 8.

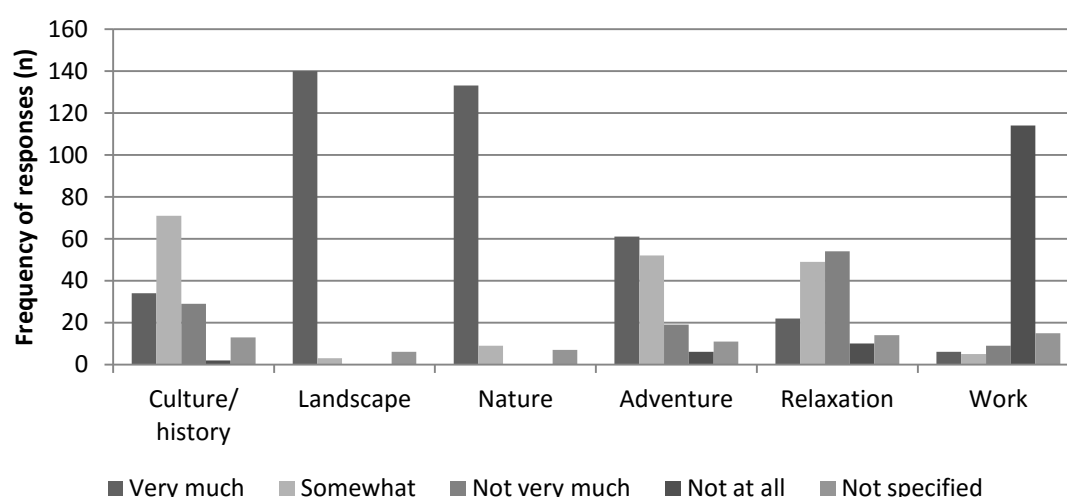


Fig 8: Relevance of elements motivating tourists to visit the Westfjords. (n= 149)

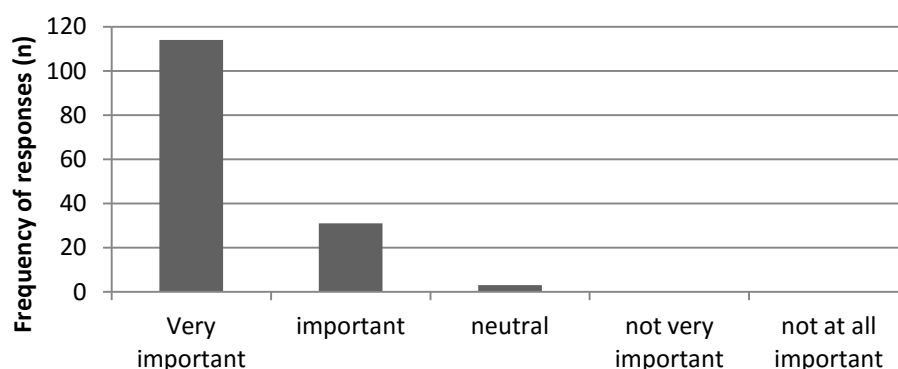
Three peaks become apparent: Nature and landscape are the most frequently chosen elements that motivated individuals to visit the Westfjords. Their median value for both is 4 (Table 6). "Very much" was selected by 88% of individuals to describe how important nature was as a motivating element for their visit and "somewhat motivating" by 3%. "Not very much or "not at all" was stated by 1% respectively. Work on the other hand was rated least significant.

Almost all of the visitors rated it as "not at all" significant (median value=1 and mean=1,13). Landscape was "very much" motivating for 89% of the participants and somewhat motivating for 3%. It was "not very much" or "not at all" motivating for 0,5%. Additional reasons that were stated included: inspiration/artist residency (3 times), cruise itinerary (1), studying (2), visiting friends (1), visiting family (1), looking for work (1), stopover to Greenland (1), friends recommendation.

*Table 6: Mean and median calculated for the results from SQ 2 (n=149 ).*

|        | <b>Culture/ history</b> | <b>Landscape</b> | <b>Nature</b> | <b>Adventure</b> | <b>Relaxation</b> | <b>Work</b> |
|--------|-------------------------|------------------|---------------|------------------|-------------------|-------------|
| Median | 3                       | 4                | 4             | 3                | 2                 | 1           |
| Mean   | 2,33                    | 3,67             | 3,63          | 2,74             | 2,06              | 1,13        |

The visual character of the coastal landscape (i.e. SQ 4: the way the landscape looks), was "very important" for 76% of the participants of the survey, "important" for 21% and "neutral" for 2%. Nobody found the visual character "not important" or "not at all important" (Fig. 9).



*Fig 9: Importance of the visual landscape character to tourists in the Westfjords. (n= 149)*

#### **4.2.3 Perceptions of trees and forests in the coastal landscape**

SQ 6, 7 and 11 explored whether participants had noticed trees and forests in the coastal landscape and if so, if they had experienced them as either positive or negative attributes. SQ 6 inquired whether or not trees and forests had stood out to visitors in the landscape of the Westfjords.

The terms "trees" and "forests" were presented along with several terms that might have been considered coastal elements in order to allow comparison. Figure 10 displays the overall distribution of replies.

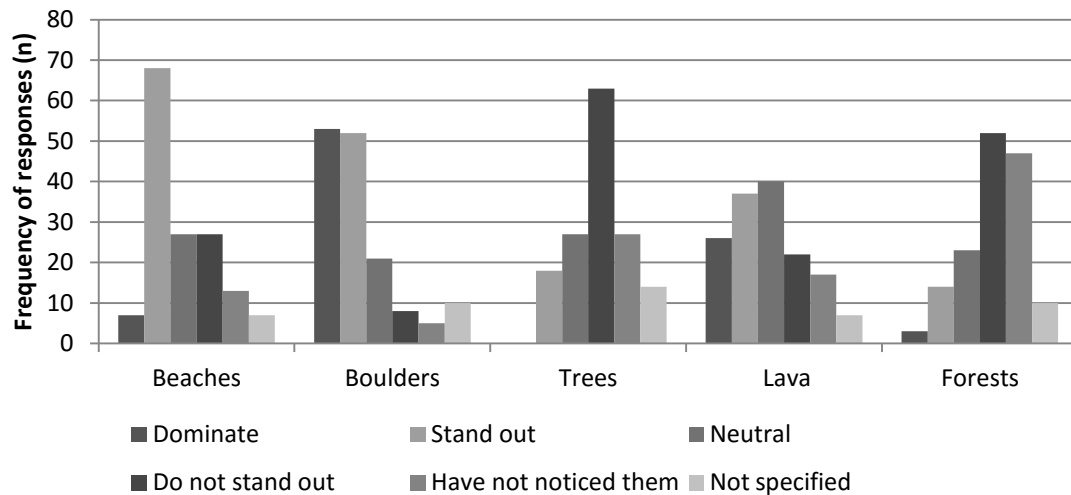


Fig 10: Prominence of elements in the coastal landscape of the Westfjords as perceived by tourists (n=149).

The results show that none of the participants had considered trees a "dominant" element. 12 % stated that they stood out however and 18% had experienced them as "neutral". 42% responded that in their opinion trees did not stand out and 18% had not noticed any. 10% did not specify their opinion. Forests, similarly, were considered "dominant" by only 2% of the surveyed individuals. "Standing out" was selected by 9% and "neutral" by 15%. 35% did not consider forests to stand out and 32% had not noticed any. 7% chose not to specify.

It is possible that in addition to those participants who selected "have not noticed them" those who did not specify an answers, had not noticed forests in the Westfjords which would mean that 59% of all participants have noticed trees and 43% have noticed forests in the coastal landscape of the Westfjords.

Table 7: Mean and median calculated for the results from SQ 6 (n=149 ).

|        | Beaches | Boulders | Trees | Lava | Forests |
|--------|---------|----------|-------|------|---------|
| Median | 4       | 4        | 2     | 3    | 2       |
| Mean   | 3,05    | 3,74     | 2,05  | 3,08 | 1,95    |

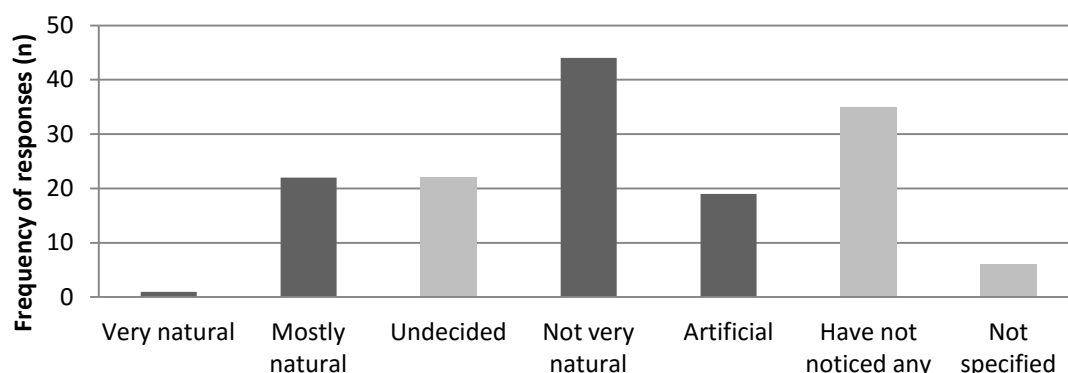
The fact that trees and forests are not perceived as dominant elements is reinforced by the relatively low mean and median values (Table 7).

In order to better illustrate which elements stood out least and most, the descriptors "neutral", "do not stand out", have not noticed them" and "not specified" were excluded in an additional step and the responses for "dominate" and "stand out" were combined. It was found that a boulders and beaches were perceived as most prominent in the coastal landscape, while trees and forests were rated least dominant, having been selected by 6% respectively (Fig. 11).



*Fig 11: Combined frequency distribution of descriptors "dominant" and "stand out" for landscape features.*

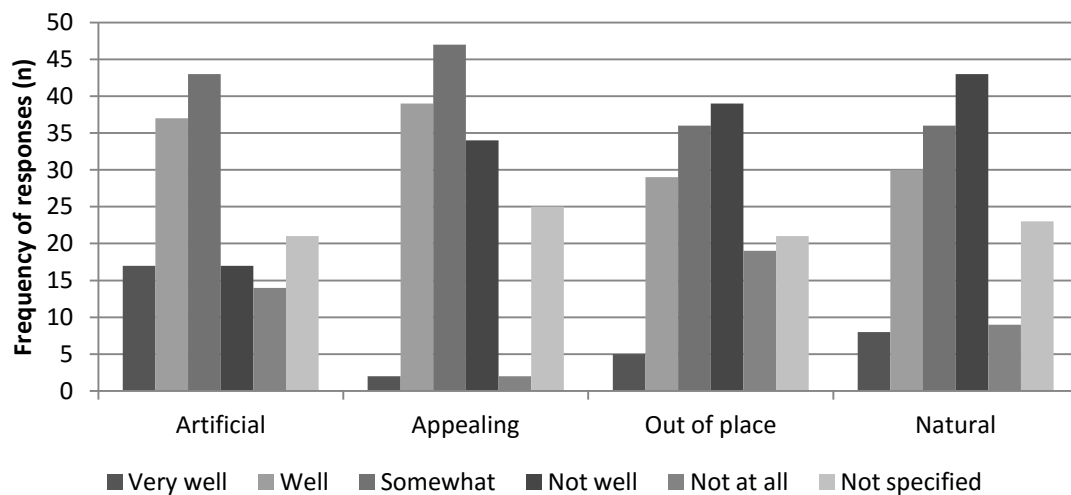
SQ 7 explored how visitors perceived the level of naturalness of forests in the coastal landscape of the Westfjords in case they had observed them (23% stated that they had not noticed any forests).



*Fig 12: Perceived naturalness of forests in the coastal Westfjords by tourists. Focus on: very natural/mostly natural and not very natural/artificial (dark columns (n=149)).*

1% had perceived them as "very natural" and 15 % selected "mostly natural". 15% were undecided, 29% had perceived the forests that they had observed as "not very natural" and 13% as "artificial". Again, in order better explore the prevailing opinion regarding the naturalness of forests, all responses that were either "undecided", "have not noticed any" or "unspecified" were excluded in an additional step. Combining values ("very natural" / "mostly natural") and ("not very natural" / "artificial") of the remaining 90 responses, 27% of respondents perceived forests to appear natural while 73% viewed them as not very natural or artificial (Fig. 12).

SQ 11 investigated participants' opinion concerning the perceived character of forests in more detail (Fig. 13). Respondents indicated that they considered the terms provided for describing forests (i.e. artificial, appealing, out of place and natural) neither particularly fitting or inappropriate, as illustrated by the low variance in mean values (Table 8).



*Fig 13: Perceived level of appropriateness for terms describing forested areas in the Westfjords (n=149).*

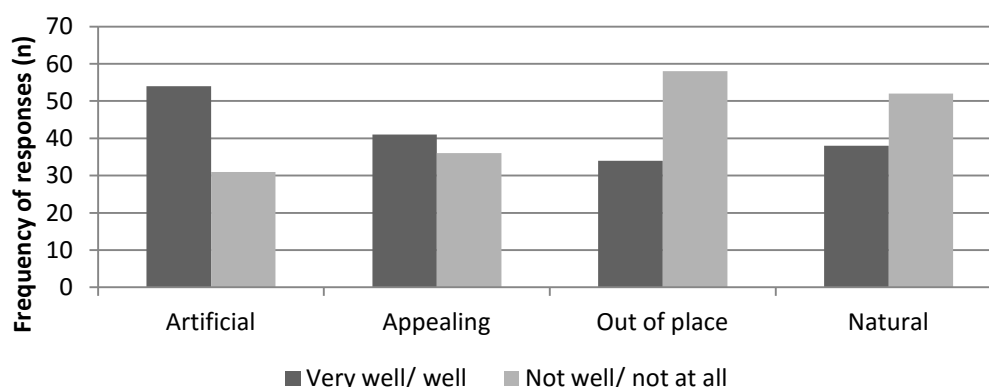
"Artificial" did score the highest mean (2,75). 20% of the participants stated that it presently described the forested areas in the landscape "very well" or "well" after all. 29% indicated that it did not portray forests well and 6% were of the opinion that it did not describe them at all. The term "appealing" with the next highest mean (2.53) also received mixed reviews.

While the two extremes (i.e. "very well" and "not at all") each were chosen by only 1% of the respondents, forests were considered appealing (i.e. "well") by 26% and not appealing (i.e. not well) by 23%. "Out of place" was rated similarly (20%) and an additional 24% stated that forests seemed "somewhat" out of place. 26% indicated to think that it was an inappropriate term (i.e. "not well"). "Natural" received the second highest number for "very well" (12% of the participants). 25% thought it fit "well" while 29% thought it was somewhat appropriate. According to 11%, "natural" did not describe the forests well and 9% stated that it fit "not at all". A high percentage of participants did not select a preference (i.e. not specified).

*Table 8: Mean and median calculated for the results from SQ 11 (n=149).*

|        | <b>Artificial</b> | <b>Appealing</b> | <b>Out of place</b> | <b>Natural</b> |
|--------|-------------------|------------------|---------------------|----------------|
| Median | 3                 | 3                | 2                   | 2              |
| Mean   | 2,75              | 2,53             | 2,32                | 2,44           |

25 additional comments were provided out of which 16 indicated that forests had not been observed (e.g. "have not seen any"). Furthermore some participants stated that they did not want to generalize and commented for instance, that the perceived forests character "has varied depending on the specific forest". Others suggested that they did not think trees looked natural but supported them regardless (e.g. "it doesn't really look natural, but trees are needed").



*Fig 14: Combined values ("Very well"/"Well") and ("Not well"/"Not at all") for adjectives describing the character of forests in the Westfjords.*



Again, combining values ( "very well"/"well") and ("not well"/"not at all") for each of the adjectives, it was found, that "artificial" (32%) and "appealing" (25%) were considered the most appropriate descriptions. "Out of place" (33%) and "natural" (29%) were perceived the least fitting (Fig.14).

The answers provided in SQ 7 and 11 were compared in order to test their consistency (Fig. 15).

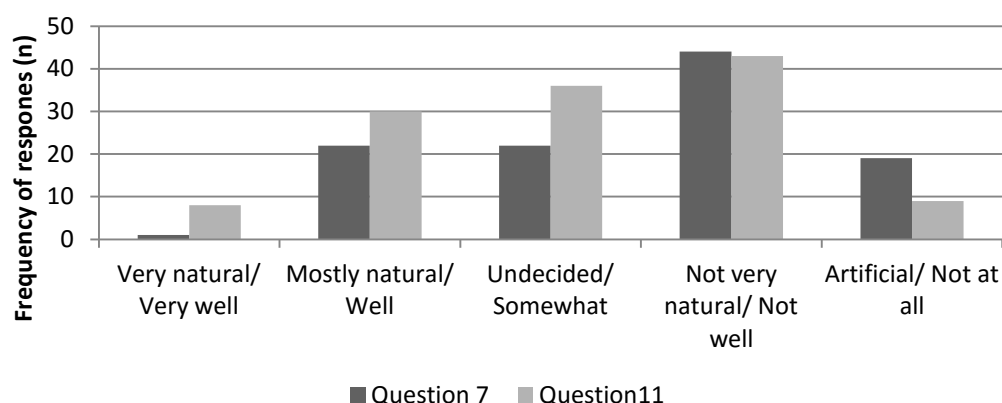
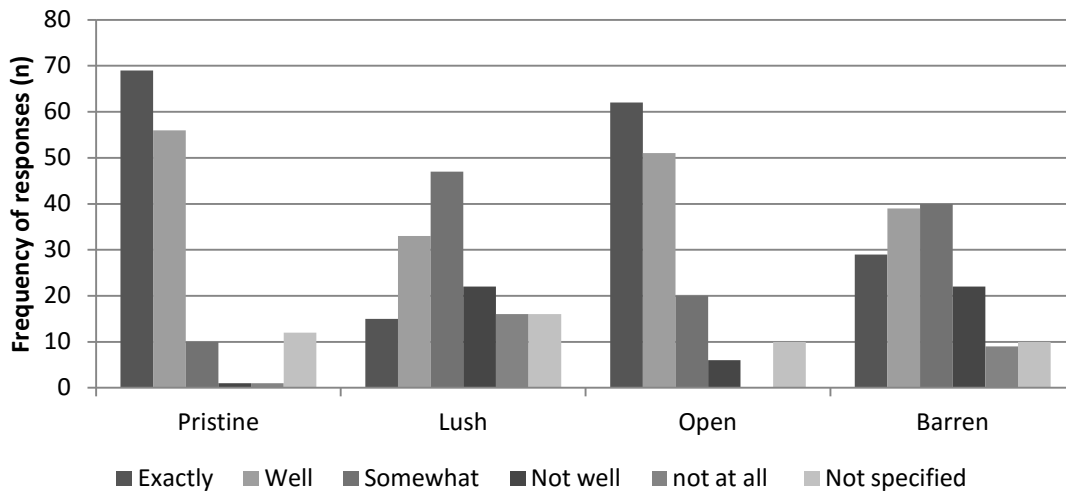


Fig 15: Comparison of responses to SQ 7 & SQ 11.

Despite somewhat different wording in the questions, the distribution of answers to SQ 7 (i.e. whether forests in the Westfjords appear natural) and 11 (i.e. whether the term "natural" describes forests well) generated similar results.

The appropriateness of the terms "pristine", "lush", "open" and "barren", to describe the character of the coastal landscape of the Westfjords in the participants opinion was explored in SQ 5, as displayed in Figure 16. "Pristine" and "open" best described the coastal landscape of the Westfjords according to the participating tourists, with the former being most appropriate as the mean of 4,04 indicates (Table 9). "Open" was considered an appropriate term to characterize the Westfjords' landscape by almost 80% of the participants of this study. It was selected as describing the landscape "exactly" by 46% of respondents and 37% stated the term described it "well". 42% of the participants chose "open" as an exact description of the landscape, making it the second most fitting term.



*Fig 16: Level of appropriateness of adjectives describing the coastal landscape of the Westfjords as perceived by tourists (n=149).*

34% responded that it described it "well" and 13% "somewhat". "Barren" and "lush" were considered slightly less appropriate but in the case of "barren", the participants leaned towards considering it fitting rather than not as the calculated mean indicates. Lush was the least appropriate term of the four options.

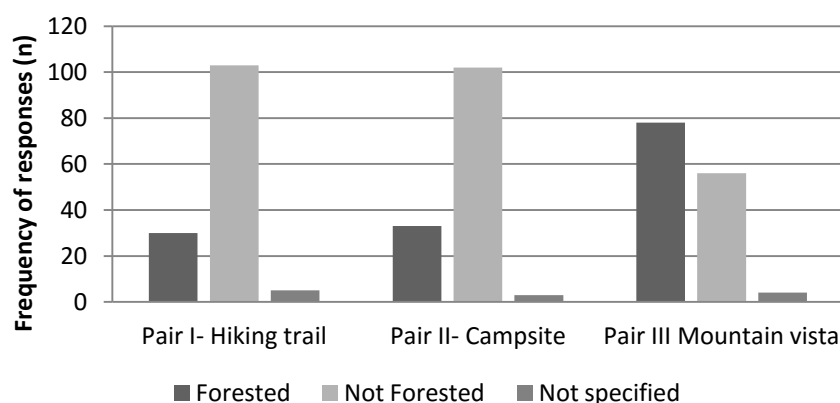
*Table 9: Mean and median calculated for adjectives describing the coastal landscape of the Westfjords (n=149).*

|        | Pristine | Lush | Open | Barren |
|--------|----------|------|------|--------|
| Median | 4        | 3    | 4    | 3      |
| Mean   | 4,04     | 2,74 | 3,93 | 3,18   |

#### 4.2.4 Popularity of trees and forests in the coastal landscape

SQ 8, 10 and 12 explored participants' opinion regarding the presence of trees and forests in the coastal landscape. SQ 8 tested whether visitors preferred images displaying forested or non-forested landscapes in the Westfjords. 138 questionnaires were included for the analysis, excluding multi-response and old surveys. One questionnaire was not completed correctly and disregarded for the analysis of SQ 8.

The following results were found (Fig. 17): In pair I, 75% of the participants preferred image 1 (i.e. forested) and 22% image 2 (i.e. non-forested). 3% did not specify their opinion. For pair II, 74% preferred non-forested and 24% the forested landscape and 2 % did not specify. In pair III, 41% liked the image one, 56% image two and 3% did not specify. The qualitative data collected as part of this question provided some insights explaining why which image was preferred, which will be presented in the next section (4.3.).



*Fig 17: Tourists' preference for images of forested or non-forested landscapes. (n=138)*

For the analysis of SQ 10 and 12, all questionnaires, excluding the ones completed by more than one individual, were used (n=149). For the results of question 10.3, the old format surveys were disregarded since this question was only included in the new format of the questionnaire (n=139). The results are displayed in Table 10.

14% of the participants "strongly agreed" with the statement that "forests take away" from the landscape of the Westfjords as tourists had expected it (statement 1). 30% "agreed". Although 26% "disagreed" and 5% "strongly disagreed", almost half of the participants leaned towards considering this statement to be true. Whether or not forests would enhance their experience in the Westfjords was unclear (i.e. undecided) to 32% of the participants. 39% "disagreed" or "strongly disagreed", more than the 28% who do think that forests would make the coastal Westfjords more attractive.

Statement 3 found more acceptance. Almost half of the participants (48%) "strongly agreed" or "agreed" that forests would block the view on the landscape. At the same time, a fairly high number (34%) disagreed.

The highest level of consensus was found with statement 4. 65% "strongly agreed" or "agreed" with it and only 17% disagreed or strongly disagreed.

*Table 10: Tourists' attitude towards statements regarding forests in the coastal landscape of the Westfjords. (n=149/ 139)*

|  |       |           |          |                   |               |
|--|-------|-----------|----------|-------------------|---------------|
| Statement 1: Forests take away from what I expect the characteristic coastal landscape of the Westfjords to look like.             |       |           |          |                   |               |
| Strongly agree   | Agree | Undecided | Disagree | Strongly disagree | Not specified |
| 21   | 45    | 32        | 39       | 8                 | 4             |
| Statement 2: Forested areas would enhance my experience in the Westfjords as a visitor.  |       |           |          |                   |               |
| Strongly agree   | Agree | Undecided | Disagree | Strongly disagree | Not specified |
| 8  | 33    | 47        | 46       | 11                | 3             |
| Statement 3: Forests in the Westfjords would block the view on the landscape.  |       |           |          |                   |               |
| Strongly agree   | Agree | Undecided | Disagree | Strongly disagree | Not specified |
| 17   | 55    | 26        | 35       | 15                | 1             |
| Statement 4: The way a forest looks determines whether I think it is an appealing or diminishing feature in the landscape. (n=139) |       |           |          |                   |               |
| Strongly agree   | Agree | Undecided | Disagree | Strongly disagree | Not specified |
| 33   | 57    | 24        | 15       | 8                 | 2             |

For a better understanding of the general tendency of agreement or disagreement with the statements, data was combined into two categories (i.e. "strongly agree"/"agree" and "disagree"/"strongly disagree"). Undecided responses were excluded. The results show that 32% felt in agreement with statement 1 while 46% disagreed. Statement 2 was agreed with by 29%, not agreed by 39%. Regarding statement 3, 49% agreed and 34% disagreed and statement 4 received agreement by 66%, disagreement by 17% (Fig. 18).

Responses to SQ 12, (i.e. whether participants think that forests make the coastal landscape of the Westfjords more or less attractive to them as visitors) were distributed as follows: The majority, 42%, stated that forests make the landscape neither more nor less attractive to them. 23% stated that it would make it "somewhat more attractive" and 19% provided that they make "somewhat less attractive". The two extremes (i.e. much more and much less attractive) were selected by 6% and 5% respectively. The mean was 2,91 and median was 3 (Fig. 19).

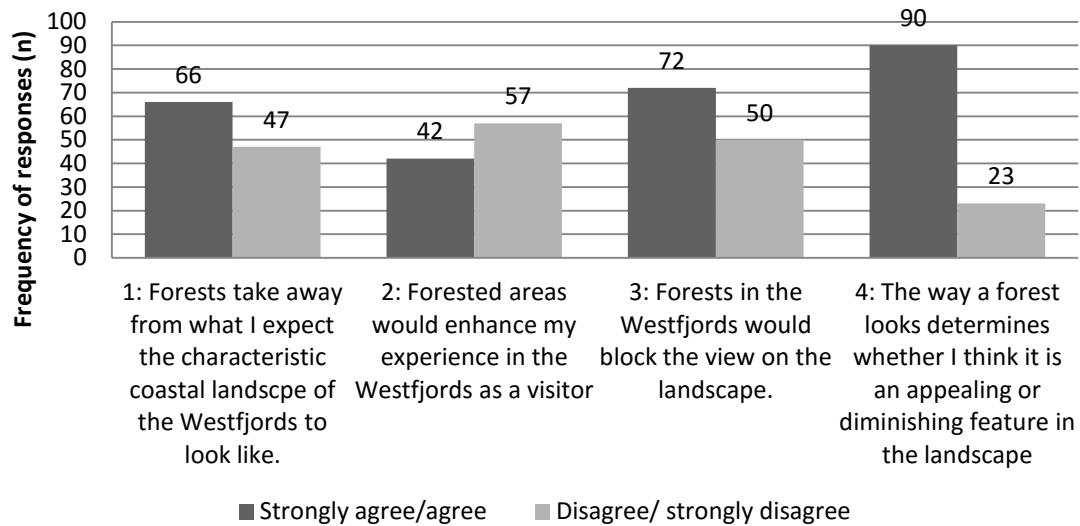


Fig 18: Level of agreement with statements regarding forests in the coastal area of the Westfjords comparing positive and negative of responses.

Again, the positive ("much more attractive"/"somewhat more attractive") and negative responses ("somewhat less attractive"/"much less attractive") were grouped. 30% of all participants responded that forests make the landscape generally more attractive and 25% think the area is less attractive with forests.

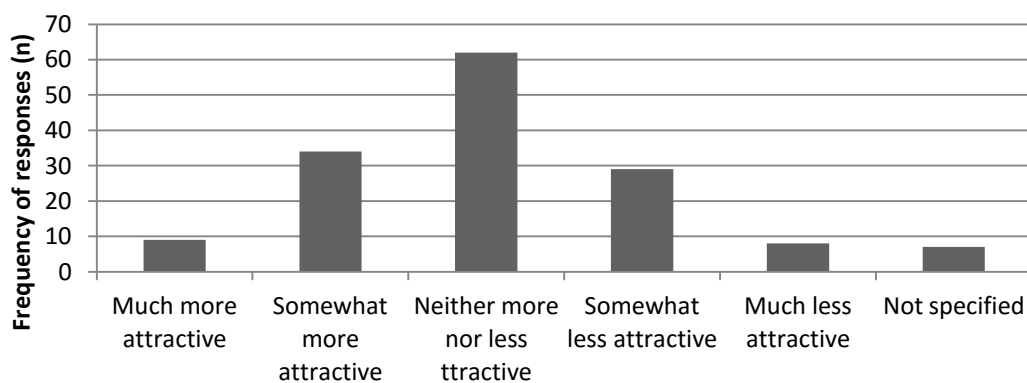


Fig 19: Effect of forests presence in the coastal landscape of the Westfjords according to visitors (n= 149).

#### 4.2.5 Acceptability of forest design approaches

Tourist preference for different forest design approaches was addressed in SQ 9 and 13. SQ 13 verbally inquired to what extent certain stand characteristics influence the perceived attractive of forests in the Icelandic landscape. SQ 9 investigated the participants' preferences regarding specific forest design options (i.e. forest cover, forest shape and types of trees) and the resulting synergy with the landscape in more detail, using visual surrogates. The results of responses provided with regard to each of the PCs are presented separately in the following section. Only questionnaires completed correctly (i.e. all three images were rated), were used for the analysis, excluding old format and multi-response surveys. 108 questionnaires were evaluated. Data was sorted based on the value participants had assigned to each photo. The resulting frequency distribution of scores per image are presented below. In most cases of SQ 9 being completed incorrectly, a preference was indicated by ticking the most preferred image rather than rating it numerically. Questionnaires where this was the case, were grouped and evaluated separately. The results were added to the outcomes of the initial, exclusive analysis in a separate step in order to explore this additional information provided.

The results of SQ 13 (Fig. 20) show that naturalness is considered noticeably more important than the other elements (i.e. shape, forest size, tree size, tree types).

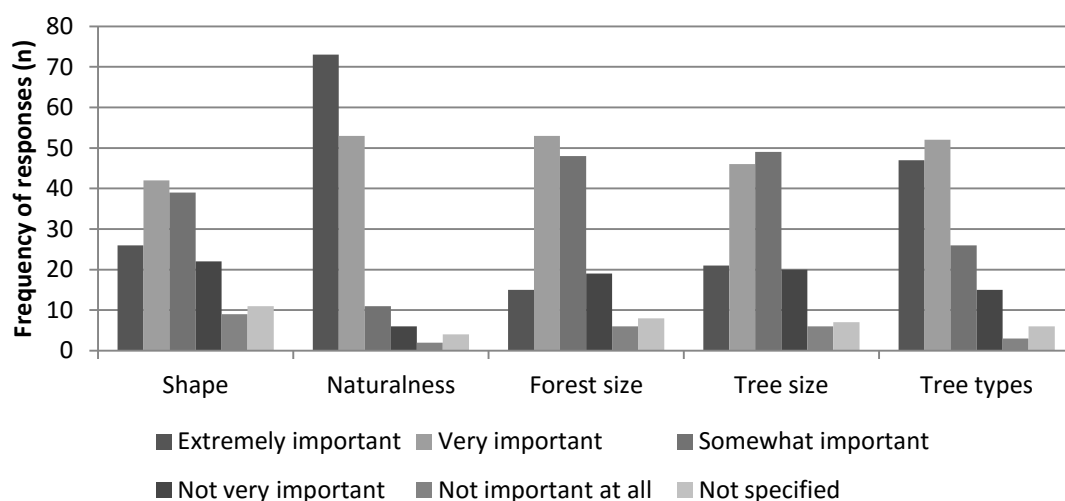


Fig 20: Relevance of forest characteristics for perceived forest attractiveness (n= 149).

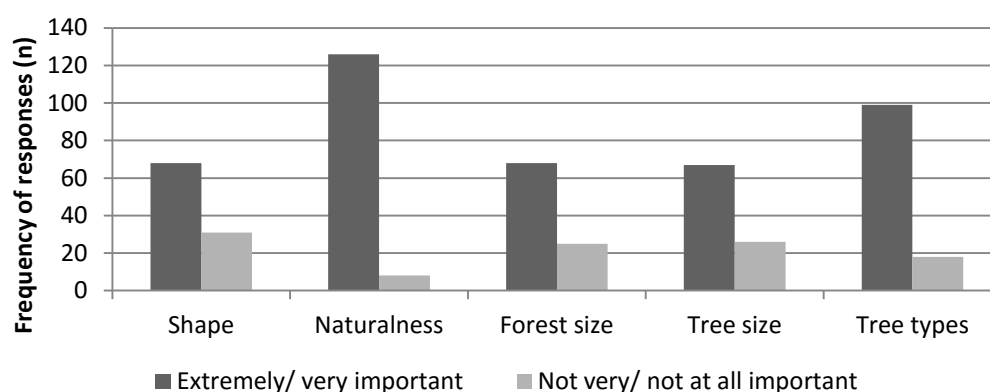
49% of the participants responded "extremely important" and 36% stated that they find naturalness "very important" in a forest. A mere 4% rated naturalness "not very important" and only 1% selected "not important at all". The vegetation composition significantly influence the perceived attractiveness of a forest. This can be interpreted from the fact that the types of trees were considered "extremely important" by 32% of the respondents and "very important" by 35%.

Tree size, forest size and shape were rated somewhat less important but on average, they all received more responses leaning towards "important" rather than "not important" as the calculated means indicate (Table 11). In total, 126 out of 145 replies indicated that for the participant, naturalness was either "extremely" or "very" important in determining the attractiveness of a forest.

*Table 11: Median and mean calculated for responses to SQ 13.*

|        | <b>Shape</b> | <b>Naturalness</b> | <b>Forest size</b> | <b>Tree size</b> | <b>Tree types</b> |
|--------|--------------|--------------------|--------------------|------------------|-------------------|
| Median | 3            | 4                  | 3                  | 3                | 4                 |
| Mean   | 3,14         | 4,19               | 3,19               | 3,23             | 3,72              |

By combining the positive ("extremely important"/"very important") and negative ("not very important"/"not at all important") values for each element (shape, naturalness, forest size, tree size and tree type), it was found that naturalness and tree types were important to 29% and 23% of the participants respectively (Fig. 21).



*Fig 21: Combined scores of "extremely important"/"important" as well as "not very"/"not at all important" for forest characteristics as perceived by tourists in the Westfjords.*

Forest shape, forest size and tree size were each considered important by only 16%. On the other end of the spectrum, forest shape and tree size were considered the least important attributes (29% and 24% selected "not very important" or "not at all important"). closely followed by tree size (24%). Naturalness and tree types received 7% and 17% of the negative scores.

**PC B** explored which ratio of forest vs. open ground in the landscape was preferred by tourists (Table 12). The image displaying no forest (BI) was scored "neutral" by almost half of the participants (42%). On average, they leaned towards rating it rather positively than negatively. 49% selected either 4 or 5, 5 being the most appealing, while only 9% scored it low (2 and 1). Image BII was liked better. 59% scored it 5 or 4 while 15% rated it 2 or 1. Image BIII clearly displayed the least preferred scenery. 57% chose 1 (least appealing) and only 10% rated it either 4 or 5. The slightly higher mean value further supports that image BII was, on average, preferred best while image BIII was rated lowest.

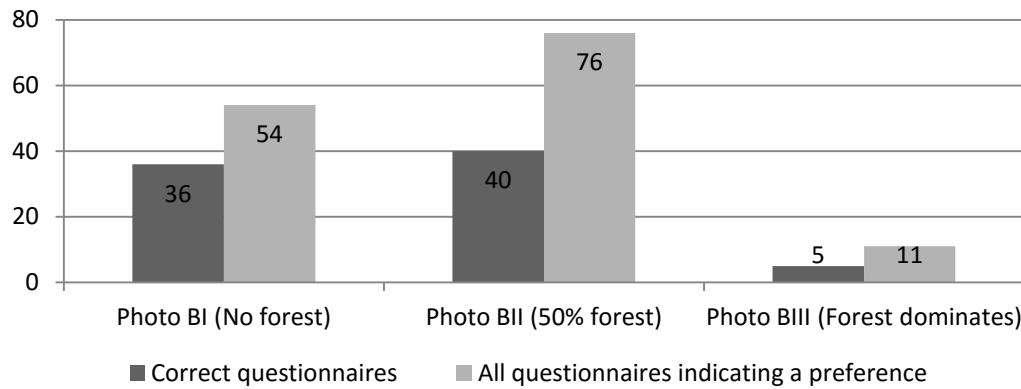
*Table 12: Preference of forest cover ratio in the landscape. (n=108)*

| Image                   | Frequency of score    |    |                |    |                        | Median | Mean |
|-------------------------|-----------------------|----|----------------|----|------------------------|--------|------|
|                         | 5<br>(Most appealing) | 4  | 3<br>(Neutral) | 2  | 1<br>(least appealing) |        |      |
| B I- No forest          | 36                    | 17 | 45             | 4  | 6                      | 3      | 3,65 |
| B II- 50% forest cover  | 40                    | 30 | 31             | 9  | 8                      | 4      | 3,72 |
| B III- Forest dominates | 5                     | 6  | 16             | 19 | 62                     | 1      | 1,82 |

Again, all questionnaires with an indicated preferred image were assigned a value (1, 2 or 3), according to the preferred image (Fig. 22). This included multi-response surveys and those with only one preferred option marked or scored. Image BII (50% forest cover) was the image considered most appealing most frequently both when analysing only the surveys that were completed correctly and when including the other group of questionnaires as well.

**PC C** examined the popularity of different forest shapes. Table 13 presents the results of ratings for image CI, CII and CIII. Photo CI was the least popular image (mean value =1,85). 58% found that it was the least appealing scene, rating it 1 and 5% rated it 2.





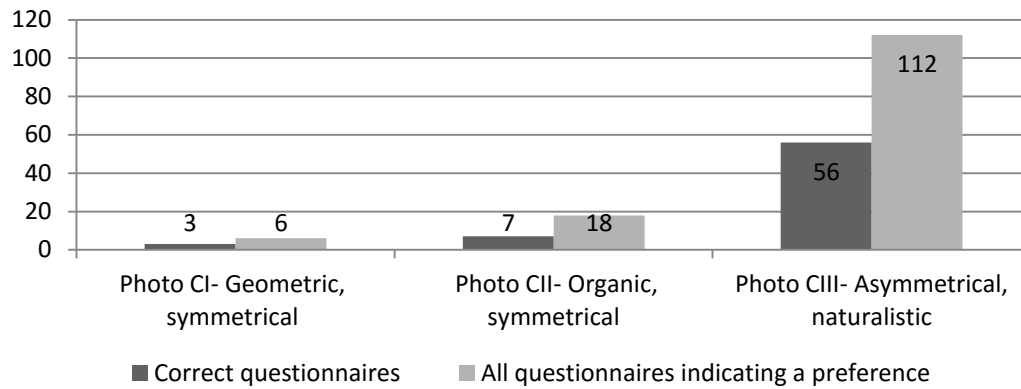
*Fig 22: Comparison of scores for photo BI, BII or BIII in correctly completed questionnaires vs. all other questionnaires with an indicated preference.*

It received 5 points by only 3% of the respondents and 4 by 10%. 14% considered its appeal neutral (3). Photo CII was liked slightly better but still only 15 % scored it 5 or 4 and 40% selected 3 (neutral). 28% rated it 2 and 17% thought it was not appealing (1). Photo CIII displayed the most popular forest design (mean= 4,20). 51% of the respondents found it most appealing (5) and 25% scored it 4. Neutral (3) was chosen by 16% and a 2 was assigned by 4%. Another 4%, considered it least appealing (1). Image CIII was liked best by the highest number of participants both when analysing only the surveys that were completed correctly and when including surveys that were filled out by more than one individual and where only one preferred option was marked or scored (Fig. 23).

*Table 13: Preference of forest shapes. (n=108)*

| Image                                  | Frequency of score       |    |                |    |                           | Median | Mean |
|--|--------------------------|----|----------------|----|---------------------------|--------|------|
|  | 5<br>(Most<br>appealing) | 4  | 3<br>(Neutral) | 2  | 1<br>(least<br>appealing) |        |      |
| CI- Geometric,<br>symmetrical          | 3                        | 11 | 16             | 16 | 63                        | 1      | 1,85 |
| CII- Organic,<br>symmetrical           | 7                        | 10 | 44             | 30 | 18                        | 3      | 2,62 |
| CIII-<br>Asymmetrical,<br>naturalistic | 56                       | 27 | 18             | 4  | 4                         | 5      | 4,20 |

**PC D** investigated whether participants had a preference regarding types of trees in a forest. Table 14 presents the distribution of scores participants assigned to each image. Image DI was preferred slightly better than the others (mean value = 3,47).



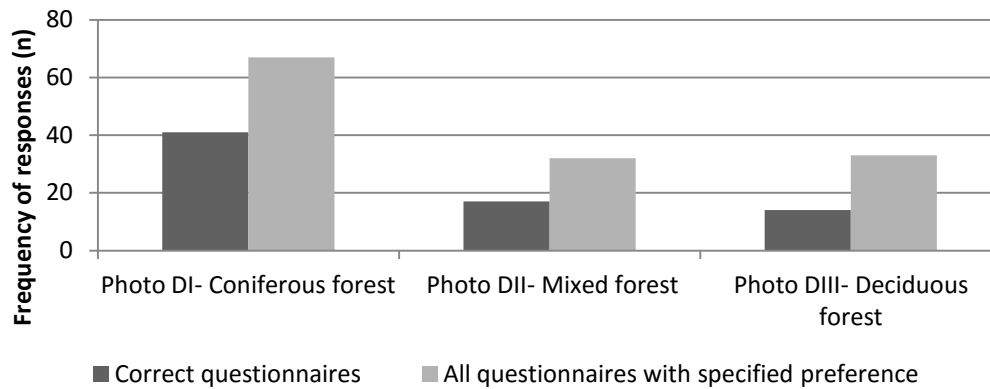
*Fig 23: Comparison of scores for photo CI, CII or CIII in correctly completed questionnaires vs. all other questionnaires with an indicated preference.*

38% of the participants rated it 5 and 15% chose 4 as the appropriate score. A significant number (22%) considered it neither appealing nor unappealing (3). After all, 25% liked it not very much, rating it 2 or 1. Image DII was slightly less popular but 30% did rate it 5 or 4. It stands out, that 43% indicated to feel neutral about it while 27% rated it either 2 or 1. Image DIII also received mixed results with 13% having rated it 5, and 14% 4. Its appeal was considered to be neutral (3) by 27% of participants. A noticeably large group (46%) rated it low (2 or 1) and the mean value was correspondingly lower (2,64).

*Table 14: Preference of types of trees present in a forest. (n=108)*

| Image                      | Frequency of score    |    |                |    |                        | Median | Mean |
|----------------------------|-----------------------|----|----------------|----|------------------------|--------|------|
|                            | 5<br>(Most appealing) | 4  | 3<br>(Neutral) | 2  | 1<br>(least appealing) |        |      |
| D I-<br>Coniferous forest  | 41                    | 16 | 24             | 7  | 20                     | 4      | 3,47 |
| D II- Mixed forest         | 17                    | 15 | 47             | 16 | 13                     | 3      | 3,06 |
| D III-<br>Deciduous forest | 14                    | 15 | 29             | 18 | 32                     | 3      | 2,64 |

Image DI (coniferous forest) was the preferred best, both when analysing only the surveys that were completed correctly and when including multi-response surveys and those where only one preferred option was marked or scored (Fig. 24).



*Fig 24: Comparison of scores for photo DI, DII or DIII in correctly completed questionnaires vs. all other questionnaires with an indicated preference.*

### 4.3 Qualitative data

Qualitative data included comments provided as explanations for the preference of images in SQ 8 and 9<sup>18</sup> and additional remarks provided at the end of the questionnaire (SQ 18). They were analysed using a process based on grounded theory<sup>19</sup>.

All questionnaires with a preferred image indicated by a respondent were included for analysis. Both the multi-response and old-format questionnaires were considered since they provide potentially valuable information regarding reasons for preferring one landscape image over another even though the wording in the question was somewhat different.

Comments were evaluated individually for each photo card. The remarks people had provided for each photo were grouped, that is, image 1 or 2 for PC A and image I, II or III on PCs B, C and D. Comments referring to an unspecified preference were excluded. SQ 18 remarks presented a separate category. Using a method called inductive coding, specific categories were developed on the basis of responses contents or repeatedly occurring terms, for example, "natural" or "view" (Bernard, 2006). The large initial number of categories was subsequently regrouped and merged into broader, overarching themes.

<sup>18</sup> Participants were asked to explain what had appealed to them in the image they had preferred.

<sup>19</sup> "Grounded theory is a robust and systematic method of designing, conducting, analyzing and evaluating research, which at the same time facilitates and integrates the scientific and creative aspects of research." (Bailey, White & Pain, 1999, p. 170 ). Using this method, the researcher gets "grounded" in the data by thoroughly reading it several times and eventually identifying the emerging themes.

The process was repeated for each PC, generating slightly different categories for each card. Tables presenting the process of developing the final themes can be found in the Appendix D. The comments provided by the respondents were then categorized according to the themes they fit in most appropriately and subsequently each comment was coded based on the theme it had been assigned to.

The themes that emerged regarding **PC A** were: visibility of the landscape, composition of the landscape, character of the landscape, functionality and other. Table 15 summarizes the respective distribution of comments explaining why either the forested or non-forested landscapes displayed were preferred.

*Table 15: Frequency distribution of comments explaining preferences regarding PC A. Preferred images marked in **bold letters**.*

| <b>PC A- Forest presence in the landscape</b> |   |                              |                            |               |          |                         |
|---|---|------------------------------|----------------------------|---------------|----------|-------------------------|
| Image   | Visual scale/ Visibility of the landscape | Composition of the landscape | Character of the landscape | Functionality | Other    | More than one indicated |
| <b>Pair I</b>                                 |   |                              |                            |               |          |                         |
| 1   | 0   | 8                            | 7                          | 0             | 2        | 0                       |
| 2   | <b>20</b>                                 | <b>13</b>                    | <b>31</b>                  | <b>0</b>      | <b>3</b> | <b>9</b>                |
| <b>Pair II</b>                                |   |                              |                            |               |          |                         |
| 1   | 0   | 10                           | 5                          | 6             | 4        | 0                       |
| 2   | <b>31</b>                                 | <b>5</b>                     | <b>23</b>                  | <b>0</b>      | <b>6</b> | <b>1</b>                |
| <b>Pair III</b>                               |   |                              |                            |               |          |                         |
| 1   | <b>3</b>                                  | <b>21</b>                    | <b>15</b>                  | <b>2</b>      | <b>6</b> | <b>2</b>                |
| 2   | 7   | 4                            | 42                         | 0             | 3        | 1                       |

In pair I, three comments were given by more than one participant and four referred to an old format survey. Image 2 (no trees) was generally preferred best and received most comments (76). The majority (41%) referred to some aspect of the landscape character. Responses offered for liking the non-forested landscape displayed referred to the typicality of the scenes and included comments such as: "more authentic" or "truly Icelandic without trees". Others referred to the "barren landscape" as the main reason for liking it. The natural look of the landscape was most frequently stated for preferring one image over the other (12 comments). 26% indicated that the visibility of the scenery was important to them, for example: "I prefer open landscape" or "able to see the landscape and colour changes". 17% liked the composition of the landscape. 12% indicated a combination of more than one reason such as: "looks more natural and trees seem to spoil the view" or "colours and barren".

In six cases participants did not prefer one image over the other and stated that they either liked or disliked them both equally.

Regarding pair II, two responses were given by a group and three referred to old format questionnaires. Photo 2 was most popular and comments were offered by 66 respondents. 47% of the comments referred to the ability to clearly see the landscape. 27 referred directly to the better view: "clear view of the mountain", "open view of spectacular mountains". 35% of the participants preferred the landscape character in image 2, stating for example, that in their opinion "this is Iceland, Iceland has no forests, it should stay that way" or that the "forest looks out of place". The composition of the landscape was important to 6% and more than one reason were indicated by 3%, such as "looks more natural and trees seem to spoil the view". Two participants liked both images equally much.

Comments referring to pair III included two multi-response comments and three old format ones. Out of 49 comments provided, the most important reason for preferring image 1 was the composition of the landscape (43%) with remarks such as "trees make the landscape more interesting" or that they present a "nice visual contrast". The character of the landscape was referred to by 31%: e.g. "the forest looks more natural" or "sense of wilderness". The visibility of the landscape was referred to by 6% of the comments. 4% mentioned reasons of functionality (e.g. "stopping erosion").

Other remarks, not directly referring to forest presence, such as "mountain landscape", were stated by 12% and more than one reason expressed by 4%. Four times both images were preferred.

Tables 16-18 lay out how the comments were distributed that people provided when asked to explain which image they liked best on PC's B, C and D. The themes for evaluating the comments on PC B (forest cover) were the same as in PC A, except for "Composition of the landscape" which was replaced by "Synergy between forest and landscape". 81 participants provided comments on their scoring. Five comments were provided by more than one participant and four in old format surveys.

PC B image 2 was preferred by the largest number of participants (Table 16). 42 comments were provided primarily including statements referring to the synergy between forest and landscape (52%): "good mixture of trees and mountains" or "I like the small willows, they add to the landscape". 22% made reference to the character of the scene depicted such as "looks more untouched". 14% indicated that the visibility of the landscape influenced their choice (e.g. "depth in photo", "trees didn't block the view").

Practical reasons such as "protection" were named by 2% and other reasons by 7%. Six comments referred to cases not indicating a preference.

*Table 16: Frequency distribution of comments explaining the preference of image 1, 2 or 3 on PC B.*

| <b>PC B- Forest extent</b>      |                             |                            |                        |               |          |                         |
|---------------------------------|-----------------------------|----------------------------|------------------------|---------------|----------|-------------------------|
| Image                           | Visibility of the landscape | Synergy with the landscape | Character of the scene | Functionality | Other    | More than one indicated |
| 1 No trees                      | 9                           | 0                          | 0                      | 18            | 2        | 1                       |
| 2 50% forest cover              | <b>6</b>                    | <b>22</b>                  | <b>9</b>               | <b>1</b>      | <b>4</b> | <b>0</b>                |
| 3 Forest dominates scene        | 0                           | 1                          | 0                      | 1             | 0        | 4                       |
| No preferred image specified: 1 |                             |                            |                        |               |          |                         |

Regarding PC C, 76 comments were provided including four multi-response replies, five in old format questionnaires one in both multi-response and old (Table 17). The theme "Visibility of the landscape" was replaced by "Distribution of trees". The others remained the same.

*Table 17: Frequency distribution of comments explaining the preference of either image (1, 2 or 3) on PC C.*

| <b>PC C- Forest shape</b>       |                       |                            |                        |               |          |                         |
|---------------------------------|-----------------------|----------------------------|------------------------|---------------|----------|-------------------------|
| Image #                         | Distribution of trees | Synergy with the landscape | Character of the scene | Functionality | Other    | More than one indicated |
| 1 Geometric, symmetrical        | 0                     | 0                          | 0                      | 0             | 0        | 0                       |
| 2 Organic, symmetrical          | 0                     | 6                          | 2                      | 0             | 0        | 0                       |
| 3 Asymmetrical, naturalistic    | <b>8</b>              | <b>6</b>                   | <b>50</b>              | <b>1</b>      | <b>1</b> | <b>1</b>                |
| No preferred image specified: 3 |                       |                            |                        |               |          |                         |

67 of the comments referred to image 3. In 75% of the cases, aspects of the character of the scene were named as reason for preferring it. Participants stated for instance that the landscape looked "wild, not manufactured" and "less artificial". 49 of these responses addressed the natural look of the landscape.

Participants stated that they "prefer natural" or like "the sense of natural forest growth". 12% of the comments touched on the distribution of the trees (e.g. "trees feel randomly placed instead of a tree farm plantation") and 9 % of the responses fell under the category "synergy between forest and landscape". 2% pointed out reasons of functionality while 1% mentioned the ability to see the landscape and 4% stated other arguments. 1% indicated more than one or other reasons respectively.

PC D received 80 qualitative responses with three being multi-response surveys and one old format (Table 18). Again all but one theme were adopted from the previous analysis. "Forest composition" replaced the themes "Visibility of the landscape" and "Distribution of trees".

*Table 18: Frequency distribution of comments explaining the preference of either image (1, 2 or 3 ) on PC D.*

| <b>PC D- Types of trees</b>     |                    |                            |                        |               |          |                         |
|---------------------------------|--------------------|----------------------------|------------------------|---------------|----------|-------------------------|
| Image                           | Forest composition | Synergy with the landscape | Character of the Scene | Functionality | Other    | More than one indicated |
| 1 Conifers                      | <b>19</b>          | <b>15</b>                  | <b>10</b>              | <b>0</b>      | <b>0</b> | <b>0</b>                |
| 2 Mixed                         | 0                  | 0                          | 9                      | 3             | 1        | 4                       |
| 3 Deciduous                     | 4                  | 4                          | 7                      | 0             | 1        | 0                       |
| No preferred image specified: 3 |                    |                            |                        |               |          |                         |

Reasons for preferring image 1 best were dominated by remarks referring to the forest composition such as "conifers look more natural" or "I like the conifers" (43%). 34% of the comments were associated with the synergy with landscape, such as "the trees don't ruin the landscape" or "more pleasing to the eye". A reference to the character of the depicted scene was made in 23% of the comments such as "more Scandinavian" and "seems more natural".

40 individuals provided input at the end of the questionnaire (SQ 18). 7 did not contain information relevant for the study but 33 expressed personal opinions regarding forestry in the coastal landscape of the Westfjords. The themes that were developed to group these comments are displayed and the respective distribution are displayed in Table 19.

Several replies (27%) indicated that the participants did not feel like they had seen enough or had sufficient information but indicated curiosity and interest in the subject, such as the following statement:

*"I don't feel like I know enough to judge well. I can only go by what I've seen and other aesthetics I am familiar with.*

*I know the island has been deforested so it's hard to imagine w trees- but that doesn't mean they shouldn't be here I guess."*

Support for afforestation under certain conditions like consideration of potential effects on biodiversity and habitat or practical purposes such as avalanche protection and erosion control was expressed by 34%. 9% of the comments indicated full support of afforestation efforts focusing on the likely benefits (e.g.: "no question about the influence of the forest on the local climate and employment/economy"). 24% emphasized the present beauty of the landscape without indicating a clear opinion regarding afforestation approaches (e.g. "that's our first time here, we love the fjords even without trees").

*Table 19: Themes and respective frequency distribution of comments provided in SQ 18.*

| <b>Themes</b>                         | <b>Responses per category (n)</b> |
|---------------------------------------|-----------------------------------|
| No opinion (yet) but interested       | 9                                 |
| Conditional support of afforestation  | 11                                |
| Supportive of afforestation           | 3                                 |
| Stressing beauty of present landscape | 8                                 |
| Other                                 | 2                                 |

As a final step, all comments provided in SQ 8 and 9 were assigned to the initial topics that emerged when developing the final themes. This was done in order to explore which themes were most frequently touched upon to explain the preference of an image (Table 20). Of 503 comments that were provided by respondents, 21% referred to "natural" looks/appearance or that what was depicted is considered the natural state as the reason an image was preferred. 14% of the comments indicated that an open view displayed in the photo made it appealing to the participants. Thirdly, the synergy and composition of the landscape and forest or forest type were pointed out as reasons for rating an image higher. The fourth most commonly stated motivation for preferring an image were other reasons that did not fit any of the categories such as "all ok" or "mountain landscape".



Other themes that received a high number of comments are "typically Icelandic" (7%), "presence of trees" (5%) and "open landscape (4%)".

*Table 20: Themes of comments and frequency distribution after combining comments of cards A, B, C and D (n=503).*

| <b>Theme</b>         | <b># of comments</b> | <b>Theme</b>         | <b># of comments</b> |
|----------------------|----------------------|----------------------|----------------------|
| Natural              | 108                  | Vastness             | 13                   |
| Open view            | 69                   | Fake looking         | 11                   |
| Synergy/ Composition | 39                   | Unfamiliar           | 10                   |
| Other                | 37                   | Colours              | 9                    |
| Typically Icelandic  | 33                   | Conifers             | 7                    |
| More than one        | 30                   | Randomly distributed | 6                    |
| Presence of trees    | 24                   | Familiar             | 5                    |
| Open landscape       | 21                   | Beautiful            | 4                    |
| Barrenness           | 19                   | Wild                 | 3                    |
| Diversity            | 17                   | Evenly distributed   | 2                    |
| Types of trees       | 16                   | Deciduous trees      | 2                    |
| Functional           | 15                   | Evenness             | 2                    |



## 5 Discussion

In this chapter, the findings presented above are discussed with regards to the research questions and objectives stated in the introduction and compared with results from previous studies. Furthermore, the extent to which the methodology proved appropriate to collect the necessary data is reviewed.

### 5.1 Landscape character of the coastal Westfjords

The results show that the natural environment and the resulting characteristic landscape of the Westfjords are very attractive to visitors and that the way the coastal landscape looks is important to most participants. This corresponds with the statistics provided by Ferðamalastofa (i.e. Icelandic Tourist Board), which indicate that the majority of international tourists are drawn to Iceland and the Westfjords by the landscape and nature. The fact that almost a quarter of the participants stated an active mode of transportation as their primary mode of transportation (i.e. hiking, biking) further support the appeal of the natural environment since tourists who engaged in outdoor activities have been found to specifically seek out spectacular landscapes (Bell *et al.*, 2007).

Considering the significance, landscape character appears to have for visitors, it is important to understand and keep in mind what tourists perceive as characteristic when planning activities that might change the landscape. It was found in this study that more than two thirds of the respondents would attest the landscape of the Westfjords a pristine and open character. Activities that may affect these attributes, such as afforestation, should be carefully assessed with regards to their potential impact on the landscape, which will be addressed in more detail below. Care should be taken to determine sites that allow the characteristically open view or are visually particularly valuable otherwise and if necessary protect them. The unspoilt state (i.e. pristine character) on the other hand is a matter of perception and hence education as was addressed in the literature review (Bell, 2001; Gobster *et al.*, 2007).

### 5.2 Tourists perceptions of trees and forests

Whether or not tourists notice trees and forests in the coastal landscape can indicate how prominent they are as landscape features at the current state of afforestation.

The results of this study show that trees were observed by most of the participants albeit not as salient features, while a third had not noticed forests (SQ 6 & 7). Both trees and forests were regarded significantly less pronounced compared to other characteristic elements such as boulders and beaches. These results may indicate that the present extent of afforestation is simply too insignificant to be noticed by tourists. At the same time, what visitors perceived as a forests would have been influenced by their cultural and educational backgrounds. Visitors may have observe trees but not perceived them as forests compared to those they are used to at home, a commonly found phenomenon in the study of landscape perception, a field with strong psychological components as shown in the literature review (Gobster *et al.*, 2007; Morin, 2009). Face-to-face interviews and more detailed demographic data could have provided better insights to further explore the potential ambiguity between what is considered a forest in Iceland by definition and by tourists. Pursuing this would be an interesting continuation of the project.

The mode of transportation people used to travel to and around the Westfjords may have been another reason why some tourists did not notice forests, other than the trees small size. 18% of the respondents identified modes of transportation that would have allowed them to come to the Westfjords without passing stands of trees (i.e. cruise ship, sailboat or airplane). The remaining 82% would have encountered natural birch stands or plantations on their driven (or hike) to the northern Westfjords since most forests are located near the main coastal roads (Fig. 3). This further reinforces the theory that the woodlands present in the region were not perceived as forests by many respondents.

In addition to exploring whether the presence of trees and forests had been noticed, the study aimed to find out how they were perceived, if noticed, with regards to their appearance in the landscape. None of the adjectives suggested as characterization (e.g. "artificial", "appealing", "out of place" and "natural") were considered particularly appropriate or inappropriate to describe trees and forests. In fact, a larger number of participants than in other SQs did not provide answers, again suggesting that forests or stands observed were not looked upon as forests. Presumably, they either did not feel fit to describe the character of the forests in the Westfjords, or none of the adjectives were considered appropriate descriptions. The fact that the results do not show an obvious tendency with regards to the character of forests, in addition to the abovementioned factors, may further indicate that many tourists seem to not have perceived forests as prominent element in the coastal landscape of the Westfjords.

In the two survey questions which specifically explored the extent to which visitors perceived forests as natural, more than a third of the respondents replied that they were undecided or had not noticed any forests. Of those who did observe them, the majority leaned towards considering them "not very natural" or "artificial". Considering that 126 out of 145 respondents stated that, according to them, naturalness was extremely or very important for a forests attractiveness, the conclusion could be drawn that forests as they currently look are not very popular with tourists. If nothing changes in either the design process or the communication of reasons why forests look the way they do, they will likely not gain popularity according to this premise. Then however, 25% rated forests that they had observed in the Westfjords as "appealing". Furthermore, the largest percentage of forest area in the Westfjords comprises native birch forest. Cultivated forest including non native species only represents a small fraction (Fig. 3). Several questions arise from these results: a) why many tourists do not consider the forests present a natural element and b) whether some individuals liked the forested scenery even though it was not considered natural or c) if those who rated forests as appealing looking perceived them as natural.

To attempt to answer these questions, the concept of "perceived naturalness" as reviewed earlier is important and relevant. As Bell (2001) and Morin (2009) noted, the level and content of an individual's background knowledge shape the perception of their environment and accordingly opinions regarding the state of that environment. Therefore, judgements based on faulty or fragmented information may be inappropriate and should not be used to base land use management decisions on. In order to reliably answer the three questions posed above, it would be necessary to learn more about the participants educational background or profession and level of understanding of a healthy ecological status in the Westfjords (i.e. whether they know what is natural in the landscape of the Westfjords or not). This data that was not collected in this study. With the information available, and due to somewhat lacking clarity of what "natural" means in the Westfjords as touched on previously, "naturalness" cannot be considered a reliable indicator to measure the perceived attractiveness of forests in the coastal landscape.

Opposing naturalness, "artificial" was considered the most appropriate term to describe forests. In the literature review it was mentioned that the perception of a landscape element depends on the landscape context. It is possible that forests, which may be perceived as natural and attractive elements in more urban landscapes, are considered unnatural in the Westfjords, which are generally considered pristine and scenically beautiful by visitors.

This would especially be enhanced by stands displaying unnatural shapes. Future studies exploring what is considered natural by tourists and for which reasons could help to better understand why currently, forests in the Westfjords are perceived as rather artificial.

### **5.3 Tourists opinion regarding forests in the landscape**

A significant percentage of participants in this study responded that they had not noticed forests in the landscape. The following section outlines the opinions of the individuals who did, as well as opinions that were based on the images provided in this study. Better understanding how trees and forests are perceived by visitor in the coastal Westfjords, can help managers to recognize to what extent afforestation activities are registered and accepted by the public. It can then be decided whether measures such as adapting forest management approaches or better informing the public about possible misconceptions are required.

The results indicated that the participants of this study tended to prefer landscapes without forests. A significant number of them agreed that forests would take away from what they would expect the characteristic coastal landscape of the Westfjords to look like. That is, open and pristine according to this studies results. Even more participants suggested that forests in the Westfjords would block the view on the landscape. In pair I image 2 in photo pair I and II the trees block characteristic scenery such as radiant fall colours of the widely distributed blueberry plants displayed on the hillsides. Being unable to see this famous and popular element of the Icelandic landscape due to obstructing trees, appears to have caused disapproval with participants. This is suggested by comments provided for preferring the non-forested option in this photo pair (i.e. "nice colours, tones"). In pair II, image 2 was similarly preferred. Most of the reasons provided referred to the visibility of the background, especially with regards to the snow-capped mountain (i.e. "it's nice to see the unobstructed mountain"). Both, pair I and II thus had in common that a large fraction of the background landscape was obstructed as a consequence of the presence of trees. Statements provided such as: "no obstruction of the mountain by trees" and the fact that almost half of the respondents agreed that "forests would block the landscape" show that such vista-obstructions were a concern with participants of this study. These result are not surprising considering many visitors come to the Westfjords in order to experience the "typical" Icelandic landscape, the hallmark of the Icelandic tourism industry, as exhibited in the literature review.

These findings align with previous research indicating that landscape popularity strongly correlates with their openness and the typicality (Fry *et al.*, 2009; Tveit, 2009). Interestingly, in the Westfjords environment, the two most frequently stated reasons for preferring images on PC A (i.e. openness and typical character) are interconnected. They will be important elements to taken into consideration for landscape management and research.

Suggested activities that would likely be carried out in the environment depicted in the three photo pairs provided (e.g. hiking in pair I or camping in pair II) could have elicited different preferences concerning the presence of trees in the landscape. In pair I, hikers may have disapproved of trees obstructing the view. In pair II on the other hand (i.e. campsite), one trees could have presented a welcome addition, providing shelter from wind and for screening from others. Both aspects are generally valued highly by campers (Brunson, 1989). However, in both cases, the image displaying the non-forested scene was overwhelmingly preferred and several individuals stated that they preferred the non-forested scene because they were able to see the landscape better. Due to the design of the questionnaire, it is unclear whether the respondents were campers or not. Knowing this would have provided better insights regarding the hypothesis that different activities would elicit different desires in terms of preference of trees.

The next most important element influencing the preference of an image, was the desire for synergy or harmony between forests and the landscape. This was reflected by the choice of preferred images (e.g. 1 over 2 in pair III) and addressed by numerous comments. Respondents liked "good balance", "blending with the landscape" or that "the view looks more complete" which corresponds with the landscape ecology- and forest design principle of "unity" or "harmony" (Daniel, 2001; Fry *et al.*, 2009; UK Forestry Commission, 2011). A presence or lack thereof emerged as an important reasons for liking or disliking a scene in this study as the respondents comments suggest. However, as long as forests harmonized with the present landscape, participants liked the diversity created in the scenery by the presence of trees (i.e. "variety of vegetation", "brush makes the scene look interesting"). Accordingly, respondents liked the forested scene in pair III, which includes both trees and provides a good view of the landscape in the background as opposed to the forested scenes in the previous two pairs where trees block most of the background.

Unity, or harmony is also influenced by the extent to which species present are considered to "fit" the environment.

In the past it has been found that conifers are considered fitting in mountainous landscapes in Scotland, albeit few recent studies are available supporting this, marking a need for additional research (Yarrow, 1966; Gundersen & Frivold, 2008). In this study, conifers were considered the preferred type of trees (over mixed and deciduous) by the majority of participants. PC A, Pair I and II included a considerable amount of birch and willow while pair III displayed almost exclusively conifers. The fact that in pair III, the forested scene was preferred over the non forested scene in opposition to pairs I and II, suggests that respondents did not perceive the mixed forests equally harmonious with the mountainous landscape. Respondents comments such as "the type of trees fit in this landscape" or " tree species look more natural" support this proposition. For the assessment of preference of forested vs. non-forested landscapes, providing more consistent images on PC A (i.e. homogenous tree types in all images) would have produced more conclusive results. In how far types of trees in a forest affects its popularity will be discussed further in the following section.

When asked more directly whether forests would make the coastal landscape of the Westfjords more or less attractive, the results did not suggest a significant tendency. This suggests that the majority of visitors sampled neither strongly supported nor opposed forests. The lack of an obvious trend is an important finding as it suggests that no major "design mistakes" have been made in the visual landscape management of the coastal Westfjords so far. Yet, a considerable fraction of participants did express concern that forests would make the landscape less attractive to them and that the obstruction of scenic views would cause objection. This aligns with previous studies finding that especially the visual obstruction of characteristic water features can be met with public objection (Karjalainen & Komulainen, 1998; Luttik, 2000). Since most natural and planted forests are located near the coastline conflicts may arise if popular ocean vistas get blocked by trees. It is unlikely to expect that the vast vistas will be affected significantly by forests in the Westfjords in the near future due to the currently small scale of forestry in the region. Nonetheless, the concerns voiced should be taken seriously and be addressed. Additional data and more detailed, better focused surveys could help to reveal who the fraction of the sampled tourists were who expressed concern regarding afforestation, and why they think that trees would diminish landscape aesthetics.



## 5.4 Perception of forest design approaches

The results of this study show that the choice of design approaches affects the perceived visual attractiveness of forests to a certain extent. The majority of the participants agreed that their liking or disliking a forest is influenced by the visual appearance of the stand. This corresponds with results from a large body of literature exploring public preference of forest management practices (e.g. Benson & Ullrich, 1981; Gundersen & Frivold, 2008; Karjalainen & Komulainen, 1998; Ribe, 2005). The three forest design elements that were assessed in more depth in this study were the percentage of forest cover, forest shape and types of trees. In addition, tree size and naturalness were addressed briefly in one survey question.

As mentioned previously, it is controversial to which extent species composition affects forest popularity. "Types of trees" were rated the second most important attribute determining the visual attractiveness of a forest in this study, second to "naturalness". This is in accordance with Ribe (1989) but contradicts Karjalainen & Komulainen (1998) who did not find that species composition significantly affected the popularity of different afforestation measures. Likely, while types of trees can affect the visual attractiveness of a forest, the forest and landscape context determines to which extent they do, similar to the way the landscape context determines the perceived degree of naturalness of a forest mentioned earlier (Fry *et al.*, 2009; Gundersen & Frivold, 2008; Karjalainen & Komulainen, 1998; Nielsen & Jensen, 2007).

The specific types of trees preferred best by most participants of this survey were conifers. The most commonly named reason was the more natural appearance of the evergreen trees displayed (i.e. conifers "fit the landscape better"). This contradicts historic evidence which shows that the only native tree species in Iceland are deciduous (i.e. birch and rowan) (Eysteinnsson, 2013; Gunnarsson *et al.*, 2005). These findings further reinforce the abovementioned bias between perceived and true naturalness with tourists. As mentioned previously, they may have been used to coniferous forests in mountainous landscapes at home such as the Canadian Rockies or the European Alps. Birch vegetation possibly appeared foreign to them in a mountain environment. A high number of respondents also liked mixed stands. Shindler *et al.* (2002) stated that species diversity is generally associated with high scenic beauty. Accordingly, some participants mentioned that they specifically liked mixed stands for this, aesthetic, reason (i.e. "I like the variety of trees and the view of mountain").

Again, the results indicate that in addition to looking for naturalness of species, participants felt strongly about the preservation of the typical character of the coastal Icelandic landscape and the open view.

The results suggest that establishing forests could positively affect the landscape of the Westfjords and enhance landscape appreciation with visitors. Regarding preferred ratio of forest cover, participants rated the image displaying 50% forest cover highest and a noticeable number of participants agreed that forests make the coastal landscape more attractive to visitors. These findings also indicate that the abovementioned opposition towards afforestation only surfaces if scenic vistas get obstructed by trees. There is no general apprehension of afforestation in the coastal landscape of the Westfjords with tourists.

No valid conclusions could be drawn about whether a higher percentage of forest cover than the 50% displayed in image II PC B would be preferred or not. Even though image III (i.e. forest dominates the scene) was considered least appealing with most participants, this may have resulted from the images presented rather than the visitors' true opinion regarding full forest cover. While photo I and II showed the scene at landscape level, the vegetation in image III blocks the view as the vegetation is displayed at eye level. Ideally the third image should show the same scene as the other two with a higher percentage of forest cover. The results underpin that participants do not oppose the presence of woodlands in the landscape, as long as popular views do not get blocked. This is further supported by the most commonly named reason for liking images I and II better than image III (i.e. the mountain and "glacier" were visible). These results may also reflect a bias in replies to verbal (SQ 12) or visual stimuli (SQ 9) as has been found in previous studies (Aminzadeh & Ghorashi, 2007; Tahvanainen & Tyrväinen, 2001). Due to the small sample size of this study, no statistically significant correlations could be determined.

Participants rated "forest shape" a moderately important attribute for the visual quality of a stand. An asymmetrical shape was preferred over symmetrical ones by the majority of respondents. The preference for the most naturalistic option corresponds for instance, with Fry *et al.* (2009) and the UK Guidelines. Increasing complexity of shapes with irregular edges contributes to ecological value and visual attractiveness. As mentioned in the previous section, elements that harmoniously integrate with existing landscape structures and features are perceived aesthetically more pleasing. They "interlock" with adjacent patterns and create a more visually pleasing appearance (Fry *et al.*, 2009; UK Forestry Commission, 2011).

Limited literature is available on the preferred shape of planted stands of trees but Karjalainen & Komulainen (1998) found that different shapes (i.e. irregular vs. oblong shapes) were favoured with regards to afforestation between two Finnish villages. More importantly than the shape of individual stands, afforestation was most readily accepted if new stands were located near present forests or merged with the landscape in other ways. Karjalainen & Komulainen concluded that preference of shape may depend on the patterns that prevail in the surrounding landscape. Asymmetrical shapes are likely preferred only if the surrounding elements are naturalistically shaped (Karjalainen & Komulainen, 1999; Ribe, 2005). Since the landscape of the Westfjords is dominated by natural patterns such as rock formations, snowfields and the erratically shaped coastline, asymmetrical shapes may therefore seem more fitting. This was supported by the results of this study. Even though some older stands in the Westfjords display the square shapes least preferred with the participants, the establishment of naturalistically-shaped forests prevails nowadays. Foresters take the visual aspects of afforestation and ecological characteristics such as soil types of each site into account when planning new stands. In addition, natural processes including sapling mortality caused by harsh environmental conditions, influenced by the proximity of the ocean but also the natural dispersal of trees can create asymmetrical shapes (Þorvaldsson, pers. comm. 2016; personal observation).

## **5.5 Spirit of the place**

A principle from UK Guidelines that was not included in the questionnaire but seems important to mention in this paper is "Spirit of the place". It refers to the intangible attributes of landscape elements (e.g. uncommon rock formations or solitary trees) that make a place or landscape characteristic, unique and special to people. While challenging to grasp or put into words, several comments suggest that afforestation if done carelessly might affect the "typicality" or "spirit" of the coastal Icelandic landscape (i.e. "more Scandinavian", "sense of wilderness"). The Icelandic landscape is shrouded with myths and tales, ranging from tourist advertisements describing it as a magical or otherworldly landscape to Sagas and other stories telling tales of magical creatures such as elves, trolls and hidden people, noble, heroic persons and supernatural events (Hennig, 2011). These elements are admittedly difficult to grasp but those responsible for making management decisions should attempt to take the spirit of the place into consideration and respect it.

## 5.6 Methodological considerations

While some aspects of the methodological approach used for this project proved effective, some limitations became apparent. In the following section constraints resulting from the survey design, selection of images or administration of the questionnaire that have not already been mentioned throughout the paper, will be elaborated.

### 5.6.1 Survey design

Pretesting of the questionnaire in order to identify limitations posed some challenges. Suggested numbers for pretesting, to produce relevant results revealing difficulties and weaknesses, range from  $n = 6-50$  (Sheatsley, 1983 & Sudman, 1983 in Presser *et al.*, 2004; Bernard, 2006). The number of questionnaires pretested for this project was closer to the lower end of the range and did not prove fully sufficient. Challenges of pretesting interviews and surveys were described by Presser *et al.* (2004). They argue that while some conclusions can be drawn from results generated from surveys completed by test interviewees, observations made by careful interviewers may be more revealing. This was verified during this project. Possibilities for improvement were discovered throughout the surveying and analysis phase. While some adaptations were made, it was not an option to continuously modify the questionnaire after a certain point. For consistency and with limited time available, all questionnaires completed before such adaptations would have been invalid. This resulted in the difficulties of having worked with two different formats as the design was altered after a number of questionnaires had been completed. For future studies it is suggested to predetermine the number of questionnaires used for pretesting avoid modifying the instrument after even if further weaknesses become apparent.

Further methodological shortcomings originated from the way the questionnaire was structured and worded. A possible explanation for the fact that SQ 9 was not completed correctly by several participants is that using two different rating systems in SQ's 8 and 9 confused individuals. They may not have thoroughly read the questions due, for example, to a lack of time or language difficulties. As a result, they potentially adopted the protocol from SQ 8, where a simple choice between two options (forested/non-forested) was required, instead of scoring each photo individually. Taylor-Powell (1998) suggested that grouping question formats within a questionnaire can help respondents complete the questionnaire correctly.

Using one rating system for both questions would have likely generated more consistent results. Furthermore, the questionnaire inquired why participants liked the most preferred image, but did not ask specifically about perceptions concerning the less preferred image. While one could assume that the opposite of the reason why images were preferred caused other photos to be rejected, further research could provide clarification.

The phrasing of some of the questions, was found to be less than ideal and might have provided somewhat skewed results (i.e. SQ 5, 11& 13 included no clearly neutral choice on the Likert scale<sup>20</sup>). Shortcomings with regards to terminology included language difficulties such as terms used in SQ 5 and 6 (i.e. pristine, lush, barren, boulder). They were difficult to understand for several non-native English speakers. This became apparent after respondents repeatedly asked for clarification of these terms. As several different nationalities were targeted, it would have perhaps been better to use simpler wording for some of these questions (Becker & Murrmann, 2000). Language insecurities or time constraints may have also been the reason for sometimes illegible handwriting in the survey responses and Fyhri *et al.* (2009) suggested that insecurity regarding the research topic may result in brevity of written responses, which may have been the case in this project. Again more thorough pretesting could have revealed some of these limitations but the time available for this project did not allow for it. If targeting an international audience, terminology should be an essential part of the elements assessed during pretesting.

Using closed questions produces results that are relatively simple to analyze (Dey, 1993). However, it pressures participants to choose from the limited options provided and therefore may prevent them from providing their true opinion in all their facets (Bernard, 2006; Dey, 1993; Taylor-Powell, 1998). The closed questions format used throughout most of the questionnaire potentially led to reservations or a feeling of restriction with some participants. This was indicated by their selecting several options instead of one or marking between two options. In addition, a few times participants provided additional comments as a side note where no option was provided to do so, further demonstrating their desire to share their opinion more extensively.

It was not previously established whether completing the questionnaires as a family or with a partner was valid and multi-response-submissions were accepted.

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<sup>20</sup> In all three cases, "somewhat", as adopted from Fyhri *et al.* (2009), was the middle option which may be interpreted as rather positive than negative.

It was permitted because it encouraged some individuals to participate. This caused challenges in the analysis phase of the project. However, even if people were completing the survey on their own, they did sometimes discuss their answers with each other despite being asked not to do so. It was a balancing act to ensure consistency while at the same time avoid frustrating and deterring respondents by setting too many rules before and during participation. Multi response surveys caused challenges during the analysis of the data because the two separate formats could not be easily compared. One could argue that the collective opinion of a couple or family travelling together could be considered one opinion since the approval or disapproval of one individual would likely affect the others. This is however speculative and was not presumed in this study. In future studies, prior to commencing data collection, it should be established whether questionnaires filled out by multiple individuals can be accepted.

Length of questionnaires has been found an important factor in surveying tourists who may be in the area for a limited period of time (Fyhri *et al.*, 2009; Jacobsen, 2007). The time it took to complete the questionnaire varied among participants. That said, comprehending the questions as well as the protocol regarding the photo cards took most participants longer than anticipated. Almost all participants finished completing the questionnaire in a reasonable period of time but sometimes it took longer than what seemed appropriate (~20min).

### **5.6.2 Use of photographs**

Photographs were found to be an effective tool in order to provide a first idea of the landscape features mentioned in the questionnaires. Without them, it would have been extremely difficult to explain different forest design approaches to the participants. The images were produced with relatively limited effort and proved an effective way to survey a broad audience without having to physically bring them to the respective sites. Also, all individuals surveyed were physically present in the general environment studied and had a good impression of the surrounding landscape which increases the reliability of using images as surrogate for the true landscape as discussed in Chapter 3 (Jacobsen, 2007). Most participants seemed to enjoy sorting and rating the photos. This motivational element is an additional positive effect of using photos as an element of questionnaires (Fyhri *et al.*, 2009).

At the same time working with them caused several challenges. As mentioned in the literature review, photographs can only provide a limited representation of reality, limiting their validity as representations of the true landscape.

Differences in backgrounds, foregrounds or light conditions between images that may skew results are further, common difficulty in using visualizations (Bell, 2001; Jacobsen, 2007). This was encountered when producing PC A. Ideally both images of each pair (I and II) would have looked identical except for the variable under investigation (i.e. presence of trees). Attempts were made to achieve a sufficiently high standard despite time constraints and the limited technical means which was successfully done in pairs II and III. The presence of fall colours in one but not the other image in pair I may have biased replies.

As noted in the introduction, Daniel and Meitner (2001) found that the validity of photographs as landscape surrogates decreased if presented to individuals who would experience the presented scene while being physically active (i.e. hikers, bikers). Almost one quarter of the participants indicated an active mode of transportation and the validity of their replies, based on photographs, may hence been lower than that of participants who travelled passively (i.e. by car). This variable should be kept in mind in future studies exploring visitors' preferences.

### **5.6.3 Survey administration**

The chosen method of self administered hard-copied questionnaires and sampling random, anonymous participants overall proved effective. Slight disadvantages became apparent however. Possibilities are limited to reaffirm why respondents chose certain options, to follow up about their interpretation of specific, potentially ambiguous terms (e.g. "nature" and "landscape") or whether or how the survey has influenced their subsequent perception of the landscape of the Westfjords. Personal, face-to-face interviews would have provided the opportunity to collect this additional information and clarification regarding the interpretation of terminology. They also would have resulted in a smaller sample size and provided a level of detail that was not considered necessary for the purpose of this project. With the objective of this study, to preliminarily reveal a general tendency of tourists' opinions, it was considered sufficient to receive the larger number of responses that can be accumulated using self administered questionnaires. The uncertainty concerning potential variations in comprehension of terminology was therefore acceptable. Due to time constraints, the study only provided a small sample size regardless.

While it was attempted to avoid surveyor bias by approaching every individual who might have potentially been a tourist, subconscious processes in the researcher leading to the preference of a certain "type" of people may have affected the selection process.

The manner of participant selection could be improved by applying a more effective way to randomize. Considering small size of the sample and limitations of the methodology, it would be desirable to back the findings up on a larger scale with a better refined methodology.



## 6 Management Suggestions and Future Research

Recommendations to integrate forestry and tourism in the coastal Westfjords are made with reference to Kangas' steps, introduced in the beginning of this paper. Considering them in combination with the results from this study, the following actions are proposed and will be laid out in more detail in the following section:

- a. Explore and define what can be considered natural in the landscape of the Westfjords.
- b. Communicate with and involve the public.
- c. Develop a strategy that includes visual aspects for development and land use in the Westfjords.
- d. Establish a protective framework for landscape and the elements it comprises.
- e. Explore the potential for the integration of ecological and visual indicators.

### 6.1 Defining naturalness

Naturalness is a key element affecting public acceptance of forest management practices (Van den Born *et al.*, 2001). In order to address Kanga's first challenge, i.e. understanding the relevance and weight of forestry in the Westfjords, the concept of "naturalness" in the coastal landscape of the Westfjords should be critically reviewed. The ongoing scientific debate to which extent grazing livestock or climate change have caused deforestation and prevented the reestablishment of forests, indicates a lack of clarity of what can be considered natural in the Icelandic landscape (Sigurmundsson *et al.*, 2014). Even downy birch, generally portrayed as native species could, if planted, could be considered non-native in the Westfjords depending on the applied definition of "naturalness". All provenances used for producing seedlings, originally stem from a few genetic pools in south Iceland (Snorrason, 2010). Also, suggestions have been made that birch would naturally not grow in the "most oceanic parts in south-western Iceland" (Grontved, 1942 in Tuhkanen, 1993, p. 119), further raising the question what the natural extent and composition of vegetation would be in an anthropogenically undisturbed Icelandic landscape. This lacking clarity, also appears to be the prevalent amongst tourists in the Westfjords. A significant number of participants considered introduced conifers the most natural types of trees reflecting the disjuncture between aesthetics and ecology by Gobster (2007) as introduced in the literature review.

Using the principle of "ecological aesthetic" could be an attempt to address both the aesthetic desires of visitors and the ecological integrity of the landscape, while not without controversy (Sheppard, 2001). In order to attempt this, it will be essential to understand the sensitivity of the ecosystem in question to human driven impacts. This requires a reliable knowledge of the ecosystems past and present natural state and a comprehension of ongoing processes and changes over time (Dugmore *et al.*, 2005).

While there are some gaps in this knowledge in the Icelandic context, several scientific approaches and methods from the fields of social and natural sciences are available to address this challenge (Leroux *et al.*, 2010). With an increasing ability to analyse paleoecological records, new doors have opened to scientists to study past temporal and spatial distributions of species. Such applied paleoecological studies provide relevant information for management and conservation and could do so in Iceland as well (Willis & Birks, 2006). Natural regeneration due to the exclusion of disturbances such as grazing can also provide valuable information about the potential natural develop of ecosystems without anthropogenic intervention. In a study near Mývatn in northern Iceland, Lawson *et al.* (2007) found that areas with restricted sheep grazing displayed plant communities including birch shrubs, as opposed to vegetation dominated by herbaceous plants where grazing was taking place. A better understanding of past environmental states may further help to make predictions how the Icelandic environment will respond to large scale environmental shifts such as climate change. It has been suggested that, due to global warming, the distribution range and growing season for plants in the Nordic countries will extend significantly in the future (Kaslegard, 2010; Juday *et al.*, 2004). This may result in changes of composition and diversity of species that naturally occur (or potentially could occur) in the Westfjords. Definitions of naturalness should allow for adaptation to environmental fluctuation and take such shifts into account. Future research should explore to which degree climate change will affect the suitability of the Westfjords for species that, currently, are classified as non native. In addition, information gathered in the course of such studies may help to address the complex and ethically important question to which degree and under which circumstances, the introduction of exotic species, suitable to the vegetation zone in Iceland's unique and fragile environment, can be justified.

When attempting to develop a clearer picture of naturalness in the Westfjords, the time span over which humans and their livestock have affected the ecosystem also needs to be kept in mind.

Species and ecosystems have been found to adapt to anthropogenic modifications of the environment (e.g. hedgerows, old hay meadows or orchards) (Gillson & Willis, 2004). The introduction or removal of elements such as fruit-trees or clearing of forest pastures, maintained over a significant period of time, creates new ecological niches and opportunities. Refraining from the modifying activities can lead to changing habitats and shifts in species composition. This is a concern to Icelandic bird conservationists. Afforestation may damage important bird nesting habitat in areas that have remained open for centuries due to sheep grazing and irrigation (Fry *et al.*, 2009; Fuglaverndarfélag Íslands, 2001; Laiolo, Dondero, Ciliento, & Rolando, 2004).

While scientific research can help to clarify what ecosystems would look like without human influence, the applied definition for naturalness should also be reviewed. Fairweather and Swaffield (2003) found two prevailing understandings of nature in New Zealand, including 'pure nature', (i.e. untouched and wild) and 'cultured nature' (i.e. visibly managed landscapes or those including built structures). Such distinctions might be applicable in Iceland and could help to development of categories for naturalness and vulnerability to change. Some areas may have more pronounced cultural or environmental value. Addressing the definition of "naturalness", is an important step towards better understanding the relevance and weight of the objectives of afforestation in the coastal Westfjords. Having a commonly agreed idea of what "natural" means, will likely help to justify management decisions such as the afforestation of a visually attractive coastline to counteract soil erosion, even if the re-establishment of a potentially natural state is not a primary goal of afforestation.

## **6.2 Public participation**

The results indicate that several participants did not feel sufficiently informed to make confident statements about forests in the landscape of the Westfjords. This corresponds with Brunson's (1993) proposition that natural settings are not only judged "by what is there, but also why it is there" (p. 117). Individuals may have felt that judging forests on aesthetic grounds alone, without having sufficient understanding of their purpose, was inappropriate. Based also on the earlier mentioned idea that acceptability of resource management decisions increases with public understanding of the underlying objectives, public participation has become an essential element in resource management processes (Nijnik & Mather, 2008; Rowe & Frewer, 2000).

It would be useful to better inform and educate tourists and the general public to help them make better judgements about the appropriateness of land use decisions. Providing information to visitors and residents (e.g. providing lectures or publications) would affect the so-called "knowledge-cognitive" processes, referring back to Gobster *et al.*'s (2007) conceptual model (Fig. 2). Accordingly, perceptual processes can influence "affective reactions" which link aesthetic experiences and resulting actions which will in turn ultimately affect the landscape. The ability to judge whether or not a landscape is "healthy" can elicit a desire to protect it (Gobster *et al.*, 2007). In addition, possessing environmental knowledge and the resulting ability to recognize and understand natural elements and ecological processes has been found to provide pleasure, referred to increased "aesthetic appreciation" in Aesthetic Theory (Gobster *et al.*, 2007; Junker & Buchecker, 2008).

Education and information could, for instance, be provided by including photographs of forested areas, if and where appropriate, in tourism brochures or on promotional websites. This could prevent raising false expectations of the landscape, which may have been the case especially with visitors who were not familiar with the typical landscape and natural flora of the coastal Westfjords (Fyhri *et al.*, 2009; Karlsdóttir, 2013). At the same time, it should be stressed that the validity of visitors' opinions should be assessed, when taking public opinions into account for land use decision making since false information tends to produce inaccurate perceptions of realities (Bell, 2001; Gobster *et al.*, 2007). Exploring peoples level and content of education when including them in participatory processes could be a way to do so.

While speculative, there might be concerns that publicly addressing environmental problems in a place thriving off an image as a pristine wilderness destination could deter tourists. Such aesthetically rooted opposition was expressed in association with the reestablishment of a coastal mudflat/ salt-marsh environment replacing a popular beach in the UK (Jennings, 2004). Jennings suggested in response that the increase in biodiversity resulting from restorative activities could offset public discontent. It could further be argued that it might be more attractive to tourists to learn how Iceland acknowledges these problems and works to counteract them. This assumption and whether the ecological and economic benefits from making informed decisions concerning land management would outweigh potential losses from tourism could be further explored by future studies. Answering these question would aim at meeting Kanga's second problem (i.e. to determine and evaluate potential alternatives to decisions regarding each objective).

Due to the limited scope of this study, the focus was on international tourists alone, while in a holistic, participatory management process, all representative parties should be involved. Decisions cannot be solely based on tourists' opinion who may lack the information and insights to grasp the scope of landscape management decisions and their consequences. It has been found that the opinions of tourists regarding landscapes frequently differ from those of other stakeholder groups (e.g. citizens, local businesses, NGO's) since they experience them in a different "situational context" (Gobster *et al.*, 2007). Elements such as familiarity, expectations and intentions or social settings will influence people's aesthetic experience (Wellstead, Stedman, & Parkins, 2003). In a study on the popularity of wolves, Bauer, Wallner and Hunziker (2009), found that attitudes are significantly affected by the extent to which an individual can expect to be personally influenced by actions proposed. The most positive attitude towards change can be expected from those who have the least experience and will likely be least impacted by potential consequences (Bauer *et al.*, 2009). This may apply in the Westfjords. Since the situational context will be different for each stakeholder group, future studies should include, for example, local citizens, companies and businesses which was not done within the scope of this study. Considering the strong attachment Icelanders tend to have to their surrounding landscape, they will be more immediately affected and might have different priorities and objectives than visitors (Hennig, 2011).

While efforts to inform the public about afforestation activities may decrease the chances of conflicts, it should be kept in mind that landscapes will continue to undergo changes. Forests will become more noticeable as additional stands are planted and they continue to grow. Social acceptability will therefore be an ongoing and dynamic process rather than a final state (Shindler *et al.*, 2002). However, from a human perspective, forest growth is a slow process and may gain acceptability over time as people will get used to the modified scenery over generations as the concept of "shifting baselines", suggests. It illustrates how a present state is measured against a reference point from the past, often dating back only one human lifetime, which can lead to a shift in what is considered the "original" state of a population or ecosystem (Pinnegar & Engelhard, 2008). Furthermore, since previous studies found that increasing size of trees and stand development have led to higher popularity of forests, woods in the Westfjords may grow more popular as they mature (Gundersen & Frivold, 2008). Nonetheless, public involvement should become an integral and ongoing element of land use planning in the Westfjords.

Finally, when intentionally distributing information in order to affect environmental perception, ethical implications need to be kept in mind. Gobster *et al.* (2007) suggest caution when using information and education in a persuasive manner to alter peoples perceptions and behaviour with regards to the environment. They question the ethics and effectiveness of such an approach. In order to avoid a manipulative character to public involvement any information provided should be transparent and understandable, including the potential for misjudgements and clearly communicating the intentions of public involvement.

### **6.3 Towards a regional strategy and stakeholder communication**

It was discussed earlier, that VRM (i.e. visual resource management) has sometimes gone to an extent where it conflicts with, or disregards land use objectives or the ecology of a landscape in a pursuit to maintain visually pleasing vistas (Bell, 2001; Sheppard, 2001). At the same time, VRM is addressed subordinately in the Westfjords, while Bell *et al.* (2007) suggest that, due to the the high leisure value and low spatial proportion of forests in Iceland, the aesthetical enhancement of plantation forests for recreational purposes should be of high priority. In order to meet such challenges in the Westfjords, visual landscape decisions should be balance with other, ecological, social and economic priorities. This will require a common vision, or strategy, for the region to coordination land use activities including afforestation and tourism. Spatial-, and regional development plans to do so are in place on municipality level (Fjórðungssambands Vestfirðinga, n.d.). However, an overarching strategy for the development of the coastal region of the Westfjords seems to be lacking.

An example for a regional strategy is the Marine Plan Partnership (MaPP) for the North Pacific Coast of British Columbia, Canada<sup>21</sup>. It was developed for a coastline dependent on marine resources, an extensive forestry sector, and thriving tourism industry with the involvement of numerous stakeholders and includes a large number of marine uses. A plan such as this, could serve as an inspiring example for the Westfjords. Frameworks such as the European Landscape Convention could provide useful guidance.

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<sup>21</sup> MaPP is a co led initiative between Canadian First Nations and the Provincial government of BC developing plans for to coordinate different present and future marine and coastal uses, activities and values based on the principles of EBM ([mappocean.org](http://mappocean.org), 2015).

Scenic values could be classified as intangible resources in such a strategy and the attempts foresters already make to harmonize forests with the landscape could be given a legal and more stable foundation.

An overarching strategy could also foster communication between stakeholders. Most afforestation in the Westfjords takes place on private land. Antrop (2005) noted that uncoordinated land use changes initiated by numerous autonomous landowners can produce rather chaotic results. Since land use planning is the first step of landscape management, it would be desirable to apply a strategy that incorporates voices and goals from many stakeholders. Particularly in the case of the Westfjords, including private landowners here could help to prevent random and chaotic development. Consequently, an essential component of the implementation of a strategy should be communication among the parties involved. Personal conversations with tourism professionals as well as foresters in the Westfjords has revealed that no official cooperation between the sectors is currently taking place. According to Hall (2001), lacking coordination between bodies developing and marketing tourism and those managing coastal and marine areas is a commonly observed situation. In his paper on trends in on coastal and ocean tourism, he stated that:

*"...environmental or planning agencies often fail to understand tourism, while tourism promotion authorities tend not to be involved with the evaluation of its effects or its planning and management. Implementation strategies often fail to recognise the interconnections that exist between agencies in trying to manage environmental issues..."* (p. 614)

Within the context of a regional vision that acknowledges interconnections between sectors, including long-term forestry objectives, afforestation projects could be evaluated against other coastal uses, and their respective objectives. This would satisfy Kanga's second point (i.e. to determine and evaluate potential alternatives to decisions regarding each objective).

## **6.4 Provide a protective framework**

For management purposes, those developing a strategy as mentioned above, should assess whether and to what extent the establishment and maintenance of an ecologically or visually natural and/or attractive state of the coastal landscape are considered important objectives. If so, it will be necessary to develop a framework to achieve effective protection of this envisioned state and to foster their social acceptability.

Numerous examples of treaties, categorization systems and frameworks to identify and potentially safeguard important scenic landscapes are in place internationally. On an international level they include "Cultural Landscapes" status as part of UNESCO's world heritage list, World Heritage Convention (1972) and IUCN designations<sup>22</sup>), European Landscape Convention and Natura 2000 in Europe and Areas of Outstanding Beauty and Heritage Coasts in the UK on a national level (Ergin *et al.*, 2004). The European Landscape Award is awarded to countries, municipalities or organizations who are making efforts to "protect, manage and/or plan their landscape, which have proved lastingly effective" (Council of Europe, 2008, Article 2) by the European Council of Ministers. A number of landscape management and protection projects and policies that have been awarded, provide inspiration and can serve as examples for similar activities in the Westfjords.

If designations, such as the ones mentioned above, are categorized and managed appropriately, they can bring conservational benefits and promotional values (Scott & Shannon, 2007; Selman, 2009). They allow identification of valuable or unique landscapes and provide a framework to implement protective measures. Carrying out visual landscape inventory and establishment of VQO's as is done in BC and the UK, in the Westfjords could identify coastal areas or features that are of special visual value and would benefit from such special protection (Bell, 2001; Jones, 2009; Fyhir *et al.* 2009). That way, forests located in areas of high scenic value could be identified be managed accordingly.

Designations could equip local communities or organizations with a tool to utilize the intangible value of their scenery by promoting it for example, to visitors (i.e. capacity building) (Selman, 2009). They might bring a renewed sense of pride and ownership of the region to local inhabitants. Integrating the objectives and management of protected areas in form of a network on a geographic and organizational level, as in BC's MaPP partnership, has been suggested to bring better results in the long run (Cicin-Sain & Belfiore, 2005; Government of Canada, 2011). Since the frameworks in use in Canada, the US and most of the UK were developed for forested landscapes they would need adaptation for the non-forested landscape of the study area.

In this study, naturalness and typicality were rated highly important by tourists.

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<sup>22</sup> Category V Protected Landscape/Seascape: A protected area where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural and scenic value.



A management regime that focuses purely on aesthetic aspects, as has frequently been criticized with regards to VRM in the past, should be avoided. The way the forests and other native plant and animal communities currently present will develop and affect one another will likely determine to which degree woodlands will be accepted by visitors. Further exploring a potential undisturbed state of the landscape of the Westfjords may help to better understand such developments. Presently especially bird conservationists view afforestation critically (Fuglaverndarfélag Íslands, 2001). Such concerns need to be acknowledged and their validity should be assessed by means of scientific research.

It should be noted that the significant role humans have played in shaping the Icelandic landscape should be acknowledged in a holistic assessment of elements worthy of protection. The cultural value of the landscape should be taken into account in order to avoid a management approach that isolates humans from nature. IUCN's *protected landscapes approach*<sup>23</sup> states that cultural diversity and biodiversity are linked and need to be protected mutually (Brown, Mitchell & Beresford, n.d.). The suggested management recommendations above aim at the landscape scale. While landscape, as graphically displayed in Gobster *et al.*'s (2007) model can be considered the most obvious touching point for perceptive and intervening interaction between the environment and people, it will be important to include mechanisms aiming at other ecosystem levels (e.g. populations and species) in a strategy. This approach called "system perspective", acknowledges that all elements in ecosystems are connected on a spatial and temporal scale (Grumbine, 1994). A holistic strategy and protective framework should account for the mutual interdependencies of elements.

## 6.5 Integrate visual and ecological indicators

This study's results revealed a strong desire for both ecologically and aesthetically sound management among the tourists surveyed. As mentioned in the literature review, concerns about the little understood ecological consequences of afforestation, have also been expressed by Icelandic scientists and conservation groups.

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<sup>23</sup> The *protected landscape approach* recognizes the interconnectedness of culture and nature in landscapes and acknowledges the central role communities living near or within landscapes play in protecting and maintaining them (Brown, Mitchell & Beresford, n.d.).

They particularly targeted forestry activities in ecologically important and/or sensitive habitat (near wetlands, in riparian zones) and those involving non-native species (Fuglaverndarfélag Íslands, 2001; Stefánsdóttir, 2010). These concerns need to be acknowledged by forest managers. Research efforts should aim at developing a better understanding of the effects afforestation may have on local ecosystems. This will be of essential importance for the protection of and integration with present ecosystems. Such knowledge will further enable the development of indicators to assess the environmental status of areas used for forestry activities.

Indicators can be used to assess both the visual and ecological consequences of management decisions regarding forestry, tourism and other natural resources based sectors. This addresses the third point of Kanga's challenges (i.e. to be able to measure whether objectives have been reached). Indicators to measure either visual quality or ecological integrity separately are commonly used in landscape assessments (Ode et al., 2009; Selman, 2009; Tveit, 2009). However, a promising approach may be to apply ecological and visual indicators in connection. Bell (2001) noted that landscape patterns are visible reflections of physical processes taking place in that landscape. Therefore, Fry *et al.* (2009) explored ways to assess projects in the light of both aesthetic and ecological dimensions. They studied the degree to which visual and ecological indicators can be applied interchangeably in landscape management. They found that several indicators deemed potentially suitable for the task. The results of this study support these findings. At the same time it will be necessary to adapt several indicators to the specific context of the Icelandic environment.

Metrics used to describe features in landscape ecology such as "patch area, edges, shape, diversity and configuration" (Fry *et al.*, 2009, p. 935) correspond with those determining the visual quality of landscapes (Ode *et al.*, 2009). High edge permeability for example, as found in organic forest shapes that adapt to the physical character of the landscape, improves connectedness between habitats which increases the ecological value of a landscape (Fry *et al.*, 2009). In this study, almost all participants preferred the forest shape design displaying irregular edges, showing that ecological and visual quality align. Fry *et al.* (2009) warn however, that simply making shapes look natural will not be sufficient to meet ecosystem based management objectives<sup>24</sup>.

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<sup>24</sup> Ecosystem based management (EBM) attempts to consider the interconnectedness of elements in and

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To align visual and ecological results, environmental processes also need to be considered for decision-making. This is already done to some extent in the Westfjords afforestation project.

Some indicators applicable elsewhere (e.g. more temperate environments) may need to be reassessed in the specific environment of the Westfjords. Fry *et al.* (2009) suggested that the natural land cover is assumed to be visually most attractive and that therefore, land cover suitability could be used as an indicator for both visual and ecological coherence. The results of this study conflict with this suggestion as most participants preferred coniferous forests, while birch (deciduous) forests can be considered more natural. This indicates that research and education, elaborated in the previous sections, will be an integral element of the development of effective indicators.

A further premise in landscape ecology is that disturbance causes disruptive effects on ecosystems and can result in adverse changes in the physical environment. Disturbance is generally associated with the extraction of material or organisms (e.g. timber harvesting, mining) (Fry *et al.*, 2009). In the Westfjords on the other hand, afforestation may cause fragmentation of currently prevailing habitats. The introduction of exotic species associated with afforestation practices also would constitute a disturbance in landscape ecology. Since the Icelandic landscape has theoretically been disturbed by grazing for a long time, it will be challenging to predict the effects of additional disturbance. Similarly, habitat heterogeneity is generally considered a positive sign supporting high biodiversity and ecosystem resilience (Fry, 2009). Again, Iceland is unique in the sense that species diversity has naturally always been low and ecosystems relatively homogenous due to the isolated, high latitude location, and relatively young age in evolutionary terms (Dugmore *et al.*, 2005; Ministry for the Environment, 2001).

Future studies should assess the applicability of widely used ecological indicators in the unique environment of the coastal Westfjords and aim at exploring to what degree visual indicators can also provide information about ecological processes in more detail. Understanding the connections between ecological integrity and visual quality at landscape level can help to better communicate change to the general public. More effort must be directed at raising public awareness and education of the less intuitive elements of complex and dynamic ecosystem structures and functions.

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ecosystems in decision-making as opposed to the "single species approach" conventionally applied in many resource management regimes (Browman *et al.*, 2004).

Landscapes can operate as the interface between these functions and us. The potential benefit of integrating ecological and visual indicators is an emerging concept and should be explored further as a way to assess the visual and ecological integrity of an area to meet people's desire for aesthetically attractive landscapes and functioning ecosystems.

## 7 Conclusion

Forestry in Iceland, once a small and much doubted experiment, now provides employment, scientific opportunities, recreational possibilities and environmental benefits in the rural, coastal areas of Iceland, such as the Westfjords. Along with the increasing benefits and opportunities, concerns have arisen including the question how afforestation will affect the visual scenery, an important asset for the tourism industry of the area.

The results of this study have shown that the visual appearance of the coastal landscape and the degree of naturalness are important to visitors. A loss of the characteristic open landscape and view would cause objection with tourists. However, trees and forests were not considered a prominent landscape element and went unnoticed by many participants. Generally, the participants neither strongly supported nor opposed afforestation, as long as woodlands harmonize with the landscape and do not obstruct scenic views. The results indicate that, so far, no aesthetic damage has been done. Visitors of the Westfjords perceive the coastal landscape in a positive way. In how far afforestation will affect the perceived coastal character of the area did not become clear from the results of this study. Although the questionnaire addressed the relevance of the visual character of the coastal landscape to some extent, it was not revealed whether the participants were visiting the Westfjords specifically for the maritime flair. However, it was found that visitors come to experience the perceived sense or spirit of the Arctic as barren and treeless. Trees and forests do have the potential to affect this characteristic which makes the visual landscape particular vulnerable to modification. Future studies should address the extent of this vulnerability in greater depth.

Different forest design approaches elicited variable degrees of preference. It also became apparent that purely aesthetic considerations regarding single stands only play a secondary role in determining the attractiveness of a forest. Even though the visual component did affect visitors' opinions, they were equally shaped by other practical and conservational aspects. The majority of the participants indicated that they support approaches that preserve or restore a natural state of the environment. However, a lack of understanding of what "natural" in the landscape of the Westfjords means was revealed. Participants' replies thus pose questions about the possibility of defining of a potentially "natural" environmental status in the Westfjords.

The debate arises, how, and to what degree philosophically and ethically influenced debates (e.g. the role humans play as an ecological factor) can, and should be incorporated in resource management discourses. This was addressed briefly but should be explored further as it was beyond the scope of this particular project to do so.

Recommendations, based on this studies results were made to help address managerial challenges that lay ahead. They focus on policy and research related efforts as well as the increase of public involvement. Forestry policy and management frameworks in Iceland are in place and evolving but were found to be somewhat patchy, especially with regards to managing the visual effects of afforestation. While the potential of forests to alter sceneries is acknowledged in policy texts, guidance on ways to manage for landscape aesthetics it is largely lacking.

While visual management will, currently, mainly have preventive character, the slow but long lasting nature of forest maturation and management needs to be kept in mind. It is suggested to apply the precautionary principle to enable sustainable growth and development in alignment between the two sectors. That way, forestry may enhance the area for tourism considering that past studies have shown their high recreational value. Especially since no general apprehension towards forests in the coastal landscape was detected in this study fruitful cooperation between the two sectors is conceivable. Proposed actions include to develop a regional strategy and protective framework for the landscape, assess particularly vulnerable sites and promote constructive communication between forestry managers, landscape planners and the tourism sector. It could justifiably be argued that basing land-use management decisions in the Westfjords on tourists' preferences (rather than, for example, those of local citizens) may be a questionable approach and likely not very feasible in reality. However, it has become clear from the analysis of responses to this survey, that landscape development may affect tourist behaviour which will in turn have economic and social consequences for the region. Visitor opinions should therefore be taken into consideration by decision makers when planning and designing forests in scenically valuable areas, not exclusively but ideally in addition to those of the local inhabitant of the area.

The study yielded rich potential for future research in methodological as well as contextual aspects. Using self-administered photo-based surveys proved appropriate for the initial exploration of this field of research, despite a number of limitations in the design and administration of the research tools.

Improvement of the questionnaire structure and images used, as discussed in the previous sections, could elicit more conclusive results in the future.

The way forests, their acceptance and management will develop, will depend on various factors of varying degrees of predictability. Environmental developments including global warming and the responses of native flora and fauna will need to be carefully assessed as part of a precautionary management approach. Further, forest perception and acceptance by the local and non Icelandic public will, to a significant degree, be affected by the extent, type and quality of information that will be provided to them. Studies in the field of environmental psychology should further explore for example to which degree information can influence people's behaviour. The perception of forestry by local citizens may vary from that of tourists and needs to be explored as an important factor that will influence decision making.

The way the tourism industry in Iceland will develop and be managed will also affect the way the Icelandic landscape may be valued and, resultingly, managed. Especially in the Westfjords where most communities, forests and travel routes are located in the proximity of the coastline, research should examine the relevance of the coastal character of the region for tourists and whether an increased forest cover would affect their choice of destination. This list of variables which will affect forest development and its management is non exhaustive. Most elements remain speculative but need to be considered and studied for better understanding and management in the field of public perception of forestry in Iceland in the future.

It needs to be noted that the feasibility of both, future management and research suggestions addressed in the preceding section will largely depend on the efforts designated to the field of landscape management and studies in financial, temporal and personnel terms by private landowners, municipalities and/ or the national government of Iceland. It should also be stressed that the results from this project are a mere snapshot temporally and in terms of the target group. Perception will continue to transform as the elements that influence people and their perception will change, making the need for additional and continuous research and communication inevitable.

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# Appendix A- Questionnaire

I am a graduate student at the University Center of the Westfjords in Ísafjörður studying Coastal and Marine Management. For my thesis project, I am examining the aesthetics of the natural environment in the Westfjords. The information collected throughout this survey will be used as the basis for my research. Answering all questions will take about 10 minutes.

## 1. What is your mode of transportation in Iceland?

Personal car   Rental car   Cruise ship   Hiking   Bicycle   Sailboat   Motorcycle   Hitchhiking

☐   ☐   ☐   ☐   ☐   ☐   ☐   ☐

Other, please specify:

---

## 2. What motivated you to come to Iceland?

|                      | Very much                | Somewhat                 | Not very much            | Not at all               |
|----------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Culture/ History     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Landscape            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Nature               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Adventure            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Relaxation/ Wellness | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Work                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Other, please specify:

---

## 3. What motivated you to come to the Westfjords?

|                     | Very much                | Somewhat                 | Not very much            | Not at all               |
|---------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Culture/ History    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Landscape           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Nature              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Adventure           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Relaxation/Wellness | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Work                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Other, please specify:

---

**4. For my experience in the Westfjords, the way the coastal landscape looks is...**

..very important    .. important    ..neutral    ..not very important    ..not at all important

☐
☐
☐
☐
☐

**5. I think the terms below describe the coastal landscape of the Westfjords .....**

|          | ....exactly              | ...well                  | ...somewhat              | ...not well              | ...not at all            |
|----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Pristine | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lush     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Open     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Barren   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**6. The following landscape elements stand out to me in the coastal areas of the Westfjords:**

|          | Dominate                 | Stand out                | Neutral                  | Do not stand out         | Have not notice them     |
|----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Beaches  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Boulders | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Trees    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lava     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Forests  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**7. If you have observed forests in the coastal landscape of the Westfjords, how natural do they appear to you?**

Very natural    Mostly natural    Undecided    Not very natural    Artificial    Have not noticed any

☐
☐
☐
☐
☐
☐

### 8. Photo Card A:

Comparing the two photos in each of the three pairs, do you prefer the forested or not forested landscape?

|          | Forested             | Not forested         | In point form, what appealed to you in the photo you preferred? |
|----------|----------------------|----------------------|---|
| Pair I   | <input type="text"/> | <input type="text"/> |   |
| Pair II  | <input type="text"/> | <input type="text"/> |   |
| Pair III | <input type="text"/> | <input type="text"/> |   |

### 9. Photo Cards B, C and D:

Of the three photos on each of the cards, which forest scene in the landscape of the Westfjords do you find most appealing? Please rate on a scale of 1- 5 with 5 being the most positive, 3 being neutral and 1 the least appealing.

|        | Photo I              | Photo II             | Photo III            | In point form, what appealed to you in the photo you preferred? |
|--------|----------------------|----------------------|----------------------|---|
| Card B | <input type="text"/> | <input type="text"/> | <input type="text"/> |   |
| Card C | <input type="text"/> | <input type="text"/> | <input type="text"/> |   |
| Card D | <input type="text"/> | <input type="text"/> | <input type="text"/> |   |

### 10. How do you feel about the following statements?

|   | Strongly agree           | Agree                    | Undecided                | Disagree                 | Strongly disagree        |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Forests take away from what I expect the characteristic coastal landscape in the Westfjords to look like.     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Forested areas would enhance my experience in the Westfjords as a visitor.                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Forests in the Westfjords would block the view on the landscape.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| The way a forest looks determines whether I think it is an appealing or diminishing feature in the landscape. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**11. If you have observed forests areas in the landscape of the Westfjords, how well do the following terms describe them?**

|              | ...Very well             | ... well                 | ...somewhat              | ...not well              | .... not at all          |
|--------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Artificial   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Appealing    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Out of place | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Natural      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Other, please specify:

---

**12. To me as a visitor, forests make the coastal landscape of the Westfjords ....**

|                          |                              |                                     |                              |                           |
|--------------------------|------------------------------|-------------------------------------|------------------------------|---------------------------|
| ... much more attractive | ...-somewhat more attractive | ...neither more nor less attractive | ....somewhat less attractive | .... much less attractive |
| <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/>            | <input type="checkbox"/>     | <input type="checkbox"/>  |

**13. In your opinion, which aspects influence the attractiveness of a forest in the Icelandic landscape?**

|                           | Extremely important      | Very important           | Somewhat important       | Not very important       | Not at all important     |
|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Forest shape              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Naturalness of the forest | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Forest size               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Size of trees             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Types of trees            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Other, please specify:

---

**14. Nationality:** \_\_\_\_\_

**15. Country of residence:** Same as nationality ☐ Otherwise: \_\_\_\_\_

**16. Age:**    <20       21-30       31-40       41-50       51-60       >60  
                 ☐           ☐           ☐           ☐           ☐           ☐

**17. Gender:**    Male    Female  
                 ☐       ☐

**18. Do you have any additional comments?**

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**Thank you for your contribution!**

If you would like to be informed about the results of this study, please provide your

---

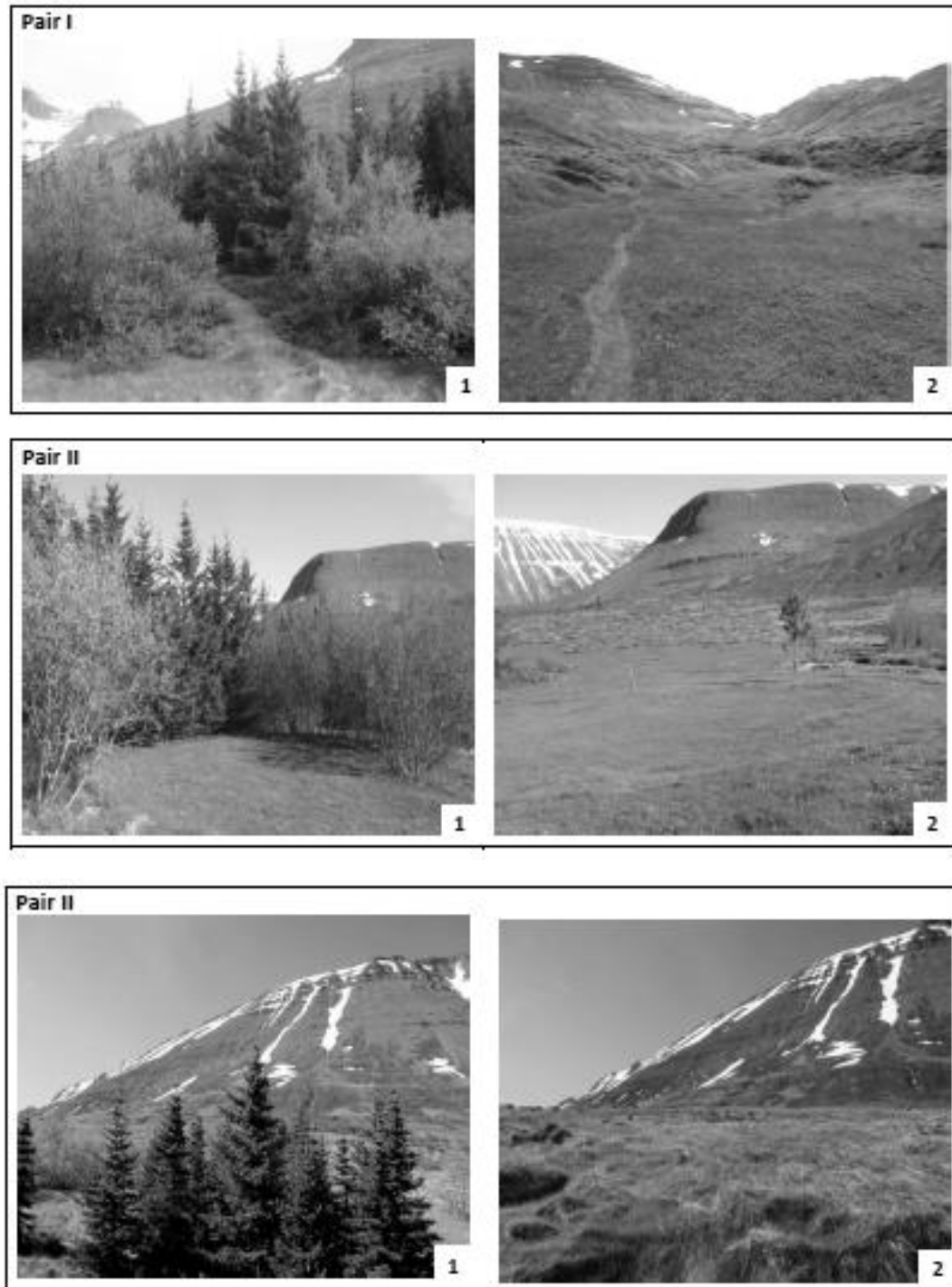


## Appendix B- Photo-cards

Black and white copies of PC A, B, C and D used for data collection.

Comparing the two photos in each of the pairs, do you find the forested (1) or unforested landscape (2) more appealing?

Card A



Card B

I



II



III



Card C



Card D



## Appendix C- Nationalities

List of nationalities and residence

| Nationality    | n  | Of which multi-response | Residence (n) |
|----------------|----|-------------------------|---------------|
| Germany        | 37 | 2                       | 36            |
| United States  | 22 |                         | 22            |
| Netherlands    | 18 | 1                       | 19            |
| UK             | 14 |                         | 12            |
| France         | 10 | 1                       | 10            |
| Belgium        | 9  |                         | 11            |
| Switzerland    | 7  | 1                       | 9             |
| Ireland        | 5  |                         | 3             |
| Canada         | 3  |                         | 4             |
| Norway         | 3  | 2                       | 3             |
| Spain          | 3  |                         | 3             |
| Italy          | 3  |                         | 3             |
| Iceland        | 2  |                         | 2             |
| Australia      | 2  |                         | 2             |
| Czech Republic | 2  |                         | 2             |
| Costa Rica     | 2  |                         | 0             |
| Estonia        | 1  |                         | 1             |
| Lithuania      | 1  |                         | 1             |
| Poland         | 1  |                         | 1             |

|               |     |  |     |
|---------------|-----|--|-----|
| Brazil        | 1   |  | 1   |
| Denmark       | 1   |  | 0   |
| Russia        | 1   |  | 1   |
| Portugal      | 1   |  | 1   |
| Slowenia      | 1   |  | 0   |
| Taiwan        | 1   |  | 1   |
| Sweden        | 1   |  | 1   |
| Not specified | 5   |  | 8   |
|               | 157 |  | 157 |

# Appendix D - Themes as developed from qualitative data

Merging of qualitative themes for PC B, C and D and additional comments (SQ 18)

| <b>Card A</b>  |                                 |
|--|---------------------------------|
| <u>Initial themes</u>  | <u>Final themes</u>             |
| Open view<br>Blocked view<br>Open landscape<br>Type of trees   | Visibility of the landscape     |
| Complete<br>Diversity<br>Colours<br>Synergy<br>Natural   | Composition of the landscape    |
| Barrenness<br>Unfamiliar<br>Fake looking/ out of place<br>Beautiful<br>Familiar<br>Vastness<br>Wild<br>Typically icelandic | Character of the landscape      |
| Shelter  | Functionality                   |
|  | Other                           |
|  | More than one                   |
| <b>Card B- Forest cover</b>  |                                 |
| <u>Initial themes</u>  | <u>Final themes</u>             |
| Open view<br>Blocked view<br>Open landscape  | Visibility of the landscape     |
| Presence/ absence of trees<br>Diversity<br>Colours<br>Synergy  | Synergy of forest and landscape |

|   |                                      |
|---|--------------------------------------|
| Barrenness<br>Unfamiliar<br>Fake looking/ out of place<br>Beautiful<br>Natural<br>Familiar<br>Wild<br>Typically Icelandic | Character of the scene               |
| Shelter   | Functionality                        |
|   | Other                                |
|   | More than one                        |
| <b>Card C- Forest shape</b>   |                                      |
| <u>Initial themes</u>   | <u>Final themes</u>                  |
| Randomly distributed<br>Evenly distributed  | Distribution of trees                |
| Colour<br>Composition<br>View   | Synergy between forest and landscape |
| Natural<br>Artificial/ fake   | Character of the scene               |
| Avalanche safety  | Functionality                        |
|   | Other                                |
|   | More than one                        |
| <b>Card D- Types of trees</b>   |                                      |
| <u>Initial themes</u>   | <u>Final themes</u>                  |
| Types of trees<br>Deciduous<br>Conifers   | Forest composition                   |
| Composition<br>Evenness<br>View   | Synergy between forest and landscape |
| Typically Icelandic<br>Diversity<br>Natural<br>Fake/ artificial<br>Familiar   | Character of the scene               |



|  |               |
|--|---------------|
|  | Functionality |
|  | Other         |
|  | More than one |

| Comments question 18: Additional comments  |                                       |
|--|---------------------------------------|
| Initial groups   | Final themes                          |
| I have not noticed any forests   | No opinion but interested             |
| Couriosity- I need more info   |                                       |
| I prefer whatever is natural   | Conditional support of afforestation  |
| Effects of afforestation on other activities and elements needs to be taken into consideration |                                       |
| Afforestation is only acceptable if it serves a practical purpose                              |                                       |
| I support afforestation  | Supportive of afforestation           |
| I like the typical character of the landscape  | Stressing beauty of present landscape |
| Other  |                                       |