



MASTER THESIS CULTURAL GEOGRAPHY

Landscape preferences, Nature images and Recreational movement; The Case of Terschelling.

Groningen, 2016

Title: Landscape preferences, GPS tracking and recreational movement.
The case of Terschelling.
Master thesis

Author: Liesbeth de Vries

Student number: S2069016

Study Program: M.Sc. Cultural Geography

University: University of Groningen
Faculty of Spatial Science
Groningen, The Netherlands

Supervisor: dr. ir. E.W. (Erik) Meijles
e.w.meijles@rug.nl

Date: July, 4, 2016

SYNOPSIS

In order to maintain and manage the different landscapes and use them for recreational purposes it is relevant to gain understanding in which preferences recreational movers have and how they make use of and behave on the island Terschelling. The aim of this research is to investigate what the preferred landscape types are on the island Terschelling according to the recreational movers, how the recreational movers' spatial behavior relates to these preferences and if respondents with different nature images (Wilderness, Arcadian, Functional view; based on Buijs, 2009) have different landscape preferences. This is researched by means of a questionnaire and the usage of a GPS tracking system in order to track the recreational walkers' spatial behavior. 92 respondents answered the questionnaire and 11 have collaborated in the GPS-research. In general the most preferred landscapes were those of the dune and beach area. Most respondents fitted the Wilderness perception, followed by the Arcadian perception, only a few respondents fitted the Functional perception. To some extent positive as well as negative links were found between the nature images and the landscape preferences.

TABLE OF CONTENTS

SYNOPSIS.....	3
1. INTRODUCTION	7
1.1 Inducement.....	7
1.2 The aim and research questions	8
1.3 Structure of this thesis.....	9
2. THEORETICAL FRAMEWORK.....	10
2.1 Landscape preferences	10
2.2 Environmental psychology & Nature Perspectives.....	12
2.3 Relationship nature images and landscape preferences	14
2.4 Recreational movement by GPS	14
2.5 The landscape of Terschelling determined	15
2.6 Conceptual Framework.....	16
3. METHODOLOGY	17
3.1 The research	17
3.2 The questionnaire.....	19
3.2.1. <i>Measuring the landscape preferences</i>	20
3.2.2. <i>Measuring the nature images</i>	23
3.2.3. <i>Measuring the relationship between landscape preferences and nature images</i>	25
3.3 Measuring spatial behavior by means of GPS trackers.....	26
4. RESULTS AND ANALYSIS	28
4.1 Descriptives of the respondents	28
4.2 Landscape preferences	28
4.3 Nature images.....	30
4.4 Relationship between landscape preferences and nature images.....	32
4.5. GPS results	34
5. CONCLUSION & DISCUSSION	37
5.1 Conclusion	37
5.2 Discussion	38
5.2.1 <i>Landscape preferences</i>	38
5.2.2 <i>Nature images</i>	38
5.2.3 <i>Linking nature images to landscape preferences</i>	39
5.2.4 <i>GPS tracking</i>	39
5.3 Further recommendations.....	39
6. REFERENCES	41
Appendix I. Questionnaire	44
Appendix II . Flyer GPS Application	49
Appendix III . Statements for defining perceptions of nature	51
Appendix IV. Syntax	55

“The only real voyage of discovery consists not in seeking new landscapes but in having new eyes.”

Marcel Proust (1871-1922)

1. INTRODUCTION

1.1 Inducement

We live in a rapidly urbanizing world, this is expected to increase only even further up to 66 percent in 2050 (United Nations Department of Economic and Social Affairs, 2014). Almost 90% of the Dutch population is living in suburban or urban areas (Central Intelligence Agency, 2014) and in many cases citizens have to go to other areas than their living area to find relaxation. For our minds and bodies to recover a sense of wellbeing from our busy daily lives relaxation and reflection is needed. This can be accomplished within a quiet and calming environment, yet this type of surrounding is often not available to us in our daily living environment (Farina, 2014). Nature and recreation on the other hand are thought to have restoration functions to the human system, especially in comparison to the urban environment (Ulrich, 1991). Among people nowadays nature has a special preference, nature is also almost always more appreciated than city landscapes. As de Groot and van den Born (2003) state: in rapidly urbanizing areas as the Netherlands, new longings for nature arise within our cultural domain. Nature can be seen as a place where you can go to relax or have fun, which equals often to happiness (van den Berg, 2004). But our use of these nature areas has its consequences. Humans and their actions have reshaped many elements of nature, yet we consider them as rather distinctly different from our cultural heritage. Intentionally or unintentionally we, humans, change continually and often irrevocably our surroundings (Lowenthal, 2005).

Terschelling is one of these areas, that is visited in many occasions to get a sense of relaxation for one or multiple days. To go to for a holiday or for exploring nature for instance. Every year, approximately 400.000 people visit the island of Terschelling for many different reasons, but one main reason is recreation. A big part of the usage of the island is thus for recreational purposes (VVV Terschelling, 2015a). The area of Terschelling covers a total of 675 square kilometer, but only 89 square kilometer is land and the rest is water (Ecomare, 2015a). When looking at the 400.000 visitors and the 4800 inhabitants that all make use of the island, the usage of the island and its landscape and nature is big (VVV Terschelling, 2015a).

The Netherlands is known for its many different landscape types. This is also applicable for Terschelling which has a diverse and highly appreciated landscape for a rather small area (Farjon, et al., 2001). Many different nature and landscape areas can be pointed out which are all commonly visited by these 400.000 users and the inhabitants of the island. But it is known that different people value certain landscapes differently and preferences and perspectives on nature and landscapes differ from one person to another. Frequent research has been done on the landscape preferences yet the outcomes remain diverse (Kaltenborn & Bjerke, 2002). It has become clear that also attitudes

towards for instance nature, can play an important role in how landscapes are perceived and preferred (Sevenant & Antrop, 2010). Even though nature has a special preference to humans, as well as landscapes, nature itself can also be perceived differently. To some people nature should be wild with a little human interference as possible, yet to others nature should have a definite functional role to humans. Or nature should reflect a rural idyll, a romantic setting as one might say (Buijs, 2009).

A way of managing the many divergent views is by actively engaging the public (Buijs, 2009). As the landscape of this island is highly used it is important that the decision makers on a regional level as well as national level in the environmental sector can be informed about the landscape preferences, attitudes and behavior that the visitors and users their island have. It can help reduce conflicts over land use issues and for the tourism it can be used for marketing purposes to see what are the used an appreciated areas. It is also found that the preferences of the landscapes by the users of the landscape and policy makers and experts can vary, which makes it more interesting to see, what the real preferences, views and behavior of the visitors are (Howley, 2011; Kaltenborn & Bjerke, 2002).

1.2 The aim and research questions

The question for further management is therefore what landscape preferences the users of the island have. Next to this the nature images of the recreationists on the island Terschelling are investigated. Another question that is investigated is whether or not respondents with different nature images (based on Buijs, 2009) have different landscape preferences. In order to add to the research field of landscape preferences a relatively new method is addressed to measure the behavior of the recreationists on the island of Terschelling; the global positioning system (GPS) application for the mobile phone. The behavior of the visitors is thus also measured and it is investigated how this spatial behavior relates to the preferences. The following research questions will be addressed throughout this research:

Main research question: What are the landscape type preferences and nature images of the recreationists on the island of Terschelling and how does their spatial behavior relate.

- What landscape type preferences do the respondents have?
- How does the recreationist's spatial behavior relate to their landscape preferences?
- Do people who have different nature images (Buijs, 2009) have different preferences?

- What are the hotspots/clusters and the most visited nature areas and landscape elements. And what elements in the physical landscape make people choose a certain route, or visit these specific spots?
- What can GPS tracking (by the use of an application) learn us about the landscape preferences of the recreational walkers and how does this add to the research field.

1.3 Structure of this thesis

From this point on a line is set from the introduction of the research towards the final conclusions. Firstly the theoretical framework will be addressed in which an overview is given on the relevant literature on landscape preferences and recreational movement. Also the different nature images are explained in order to explain the preferences. Next to this the landscape(types) of the island Terschelling will be investigated as these are the landscapes where the focus will lay on. Following on this the chapter the methodology will be covered. In this part the procedure of data collection will be explained and a background on working of the GPS (app) will be given. In this part the questionnaire will be explained and the different statistical tests that were used to come to the results are explained. After the methodology comes the chapter with the results and analysis. Here the results of the data collection are gathered and thoroughly analyzed. Finally the research will be concluded with a discussion and the concluding remarks.

2. THEORETICAL FRAMEWORK

2.1 Landscape preferences

According to Berendsen (2008) landscapes can be seen as a spatially heterogeneous part of the earth. This heterogeneity is the cause of alternation by the spatially definable landscape elements as for instance lakes, pastures, small bushes and hedges. Where this composition starts to change a new landscape type starts. These landscape unities can differ on different scale levels. Landscapes convey among others of landscape elements, elements in the physical landscape that define a landscape. This is a rather physical determination of landscapes. Landscapes change physically overtime but also the perception by humans of these landscapes change (Antrop, 2005; Howley, 2011). As this research focuses on landscapes being perceived and valued by humans it is good to take a look at a definition of the landscape that involves the human perception. According to the Council of Europe (2000, in: Sevenant & Antrop, 2010, p. 827) landscape can be determined as '*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*'. This perspective already focuses more on the human perspective and the perception of landscapes and also takes into account the active alterations that humans make within their environment.

Our perception of the evaluation of landscapes is not just a one way process. It is filled with affective and cognitive constructions that humans have based on our relations with society and our physical environment (Kaltenborn & Bjerke, 2002). People experience landscapes often in a more holistic way and after that they integrate the aspects that they see with what they already know from previous experiences and gathered knowledge (Antrop, 2005). It is known that different people value certain landscapes differently and preferences and perspectives on nature and landscapes differ from one person to another. In many cases these differences in landscape preferences can be led back to socio-demographic differences. Landscape preferences can for instance be influenced by the living environment, educational level but also by age (Howley, 2011, van den Berg, 2004). Differences can also be found between occupational groups as for instance farmers or tourists. People with an agricultural background, elderly people and people with a lower educational level tend to prefer the more functional and cared for landscapes. Whereas people with higher income and educational level or young adults prefer more the roughness of nature. It is also identified that the preferences of the landscapes by the users of the landscape and policy makers and experts can vary (Howley, 2011, van den Berg, 2004). This is especially relevant when looking at the discussion whether landscape policy should be based on public preferences or the experts evaluations (Howley, 2011). Over the years the interest on landscape preferences has moved from group based research towards more individual

differences in landscape preferences. Socio-cultural and socio-demographic factors have been common to be used as variables, but also attitudes and values play more and more a role in investigated how landscape preferences are determined (Sevenant & Antrop, 2010).

From a more theoretical literature point of perspective, different theories to landscape preferences are proposed. Appleton for instance has proposed an evolutionary approach to environmental aesthetics, arguing that historically and evolutionary seen human beings have a preference for environments that both provide 'prospect' and 'refuge' aspects. Where 'prospect' refers to having an overview over the landscape and 'refuge' refers to having a hiding place within this landscape. Savannah-like landscapes match this theory (Falk & Balling, 2010). These areas consist of low brushes, and clusters of trees that are divided by open spaces (Appleton 1975 in: Falk & Balling, 2010, Mealey & Theis, 1995). Kaplan & Kaplan (1989) add to this that people should prefer landscapes that 1.) are easily read and of which information can be gathered easily and that are non-threatening. And 2.) of which it appears that new information can be easily gathered when it is explored. "The experience of a landscape is one of understanding and exploring" (Kaplan, 1987 in: Falk & Balling, 2010 pp. 481). According to other researchers landscape preferences represent the elements in the physical landscape that are seen to be beneficial for survival. Also familiarity is a strong predictor for landscape preferences. Next to the evolutionary perspective it is argued that the landscape preferences can also be seen as a continuous progression of aesthetic ideals that have been past on for generations. From this point of view the human behavior can be seen as a product of our culture and history (Falk & Balling, 2010). Mealey and Theis (1995) seek more the relationship between mood and landscape preferences, where people have different preferences at different moments. People are not as dependent on nature as they were before and now the base of valuation of nature lies more in the emotions and meanings (Mealey and Theis, 1995).

When looking more up closely different preferences can be found in the literature. But the most common preferences that are found in many researches to be the most preferred are landscapes that include water (e.g. river areas, or coastal areas). Also cultural landscapes are valued highly (Yang & Brown 1992; Howley, 2011; Dramstad et al., 2006). The landscape types that are denoted as being less attractive are often the modern intensive agricultural landscapes (Kaltenborn & Bjerke, 2002; Howley, 2011). When looking at the current preferred landscape types on the scale of the Netherlands, the research "vijfjaardarmoetikzijn" by Goossen et. al. (2011) has found, after monitoring the landscape preferences of the Dutch population for five years, that the preferred landscape must conclude forest, but also sea and heath are preferred.

2.2 Environmental psychology & Nature Perspectives

In examining the landscape preferences of the recreationists also the psychological aspects and perceptions play a part (Kaplan & Kaplan, 1989). In Buijs (2009) is stated that some studies suggest a relationship between nature images and landscape preferences which is in this research also investigated. Different images of nature here are assumed to function as a filter that influences the perception on the natural landscape. For instance people with a more anthropocentric view on nature tend appreciate natural landscapes with a high degree of human influence more positively (van den Berg et. al. 2006). It is also discussed that the different attitudes towards the environment and the accompanying behaviors are rooted in human values (Howley, 2011).

Nature images exist according to Keulartz et al. (2004) and later added on by Buijs et. al. (2009) out of also two components (represented in figure 1.): 1.) The cognitive component and 2.) The normative component. The cognitive components are reflections of past experiences and the discourse of nature that one has; “what constitutes nature”. The normative component of nature images refers to the relationship between nature and human beings. This component includes not only general values of nature but also the more specific values that one can have. For instance views on human intervention in nature. Further on a third component can be added; the expressive dimension. This component relates to how people experience nature. Landscape perception can also be conceptualized as existing out of two responses; the affective response and also the cognitive response (Ulrich, 1983, 1993 in: Buijs, 2009). Where the first response can be explained as an immediate and unconscious response to adapting to the human needs and a feeling of liking or disliking which is accompanied with a primitive behavioral response. This response is likely to be based on the evolutionary processes and theories as is spoken of in paragraph 2.1. According to Buijs et al. (2009) the main difference between nature images and landscape preferences is that “nature images are cognitions about nature” as for instance general values and beliefs. Whereas landscape preferences are often based on and conceived from “affective responses to the physical environment” which are related to the liking or disliking of the setting.

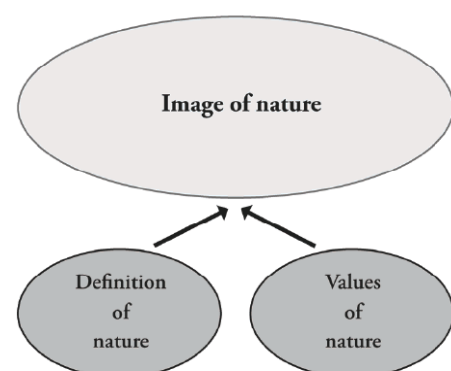


Figure 1. How people come to their individual nature image. Source: Buijs, 2009. Pp.47.

Keulartz et al. (2004) addressed three ideas on nature. Wild nature, Arcadian (classical) nature and functional nature. This was more an expert perspective. In his article Buijs (2009) has researched these three nature views on a citizen level. Buijs (2009) created five ideal types of nature images that would incorporate people's nature images (for more management purposes); Again 'The wilderness image', 'The Autonomy image', 'The Inclusive image', 'The Aesthetic image' and again the 'The Functional image'.

- 1) **The wilderness nature image:** This nature image is as said based on nature-culture divide. Naturalness without human interference is the key here. The focus lays also on the holistic, ecocentric value of nature like for instance the protection of ecosystems.
- 2) **The Autonomy nature image: Again the nature-culture divide.** Yet here real nature is seen to be as self organizing. Nature is not determined by human artifacts and therefore not set to boundaries. It has a biocentric value, where every living being has intrinsic value.
- 3) **The Inclusive nature image:** Here the idea is that nature and culture are intertwined and dependent of one another. All living beings are defined as nature. It has a biocentric value with more a focus on admiration of the force of nature.
- 4) **The Aesthetic nature image:** This image focuses on the aesthetics and recreational value of nature. It should enhance both visual as non-visual qualities. This has a more anthropocentric focus; nature should be protected as it has use for our recreational purposes.
- 5) **The Functional nature image:** This one has a strong orientation to management. This is needed not only for the utilitarian purposes but also for aesthetic purposes.

Yet these five nature images are closely related to each other and the differences between these views are hard to extract through a questionnaire. Especially as this research is on a citizen/tourist level and not on an expert's level. That is why in this research the three views of Keulartz et al. (2004) are used which are also thoroughly investigated by Buijs et al. (2009). These three nature images can be explained as followed:

- 1) **The Functional nature image:** In this nature image the utilitarian values and the function of the nature are the most important. Nature is seen as a source for economic development. The protection of nature should not become for the usage of nature. In comparison to the other two views this image has an anthropocentric view.
- 2) **The Arcadian nature image:** This image builds on an ecocentric value of nature. The experience of the beauty of nature and the emotions that come with that are central in this view. It focuses on the expressive dimension of nature. It is based on the rural idyll and the

idealization of nature and the countryside as a contrast to the hectic urban life. Furthermore here is a strong link between the normative value to nature and the Arcadian nature image.

- 3) The Wilderness nature image:** Here nature is seen as wilderness. This image also is based on the ecocentric value of nature. Real nature without human influences is central in this view, where it is the key to find sublime nature that astonishes with its roughness.

2.3 Relationship nature images and landscape preferences

As said some studies suggest a relationship between nature images and landscape preferences. In the article of Buijs (2009) the relationship between the nature images and the landscape preferences of was examined. There it was concluded that people with the wilderness image show a higher preference for natural landscapes but people with a functional image did not show any significant preferences for neither the natural landscapes nor the managed landscapes. Also in the article of de Groot & van den Born (2003) the relationship between nature images and landscape preferences is also discussed on a larger scale. They divided the landscape types in four categories; man-made landscapes, park-like landscapes, untamed interactive landscapes and experience of greatness and forces landscape. They defined also three types of nature images; Arcadian nature, wild nature and penetrating nature (*“the type of nature that creeps into places we have designed to be our own”* pp. 132). The conclusion was made that the people who ascribe a high level of naturalness to the Arcadian view have lesser preferences for the landscapes of greatness and forces. Respondents who assign a high level of naturalness to wild nature image tend to have a preference for the wilder landscapes especially the landscapes of greatness and forces as for instance rough beaches. Respondents who assign a high level of naturalness to the penetrative nature also prefer the greatness and forces landscapes (Groot & van den Born, 2003).

2.4 Recreational movement by GPS

For many years the recreational movement has been measured by the use of the GPS. The geographic positioning system. A lot of data can be gathered from the respondents without asking much of them. Much information can be found from these tracks as for instance the addressed areas, speed and visited hotspots (Meijles et al., 2014). According to van Marwijk (2009) recreational movement is roughly determined by two spatial patterns: set routes and the roaming pattern. These patterns are influenced by the physical surrounding. In many cases thus the routes chosen and the areas visited are predetermined. From the research of van Marwijk (2009) it has become clear that when people wanted to visit a special place as for instance the sand dunes or heath area, such a specific spot does have to be easily accessible. Only a rather small group in this research had a

specific goal that they wanted to visit as heath or other features most of the recreationist just went with the path.

2.5 The landscape of Terschelling determined

The island is characterized with a broad variety of different landscape types (Dienst landelijk gebied, 2012). When looking broadly at the island of Terschelling different landscape types can be distinguished; for instance the salt marshes, the dune and beach landscape, the forest area, and also the built environment are rather prominent aspects of the landscape of Terschelling and that are correspondingly promoted (Waddenkiosk, 2015 & Goossen et. al., 2011 & Portaal natuur en landschap, 2013). When looking more specifically by means of land use maps a more accurate image of the landscape of Terschelling can be created. Based on the 'bosatlas' of the Netherlands (De grote bosatlas, 2012), the above described visitor websites and the land use map of the Netherlands; LGN5 (Hazeu, 2005) some different key landscape types can be found on Terschelling. This LGN5 map can be found in figure 3. This map shows us the different land use and landscape types that are common on the island. As one can see, the island consists some specific landscape types as forest, the built area (villages), salt marshes, heath, small lakes and of course the dune and beach areas (Hazeu, 2012). Two other more specific landscape types that do not become clear from this map are the dike/polder area and the rural area but they do share a prominent stake in the landscape structure of the island (Dienst landelijk gebied, 2012). Based on figure 3 and the above discussed sources the landscape types that will be used to investigate the preferences of the respondents were determined.

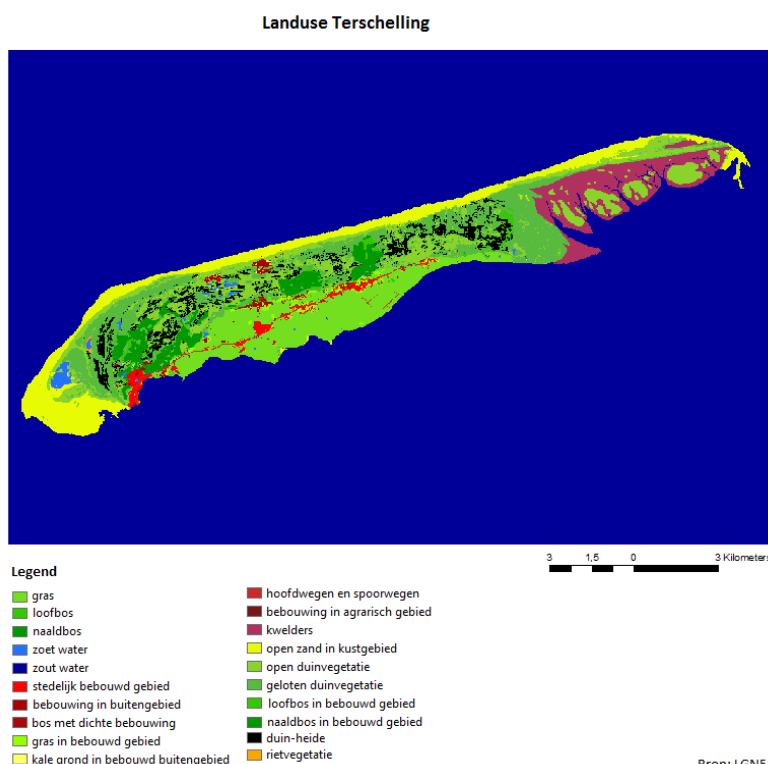
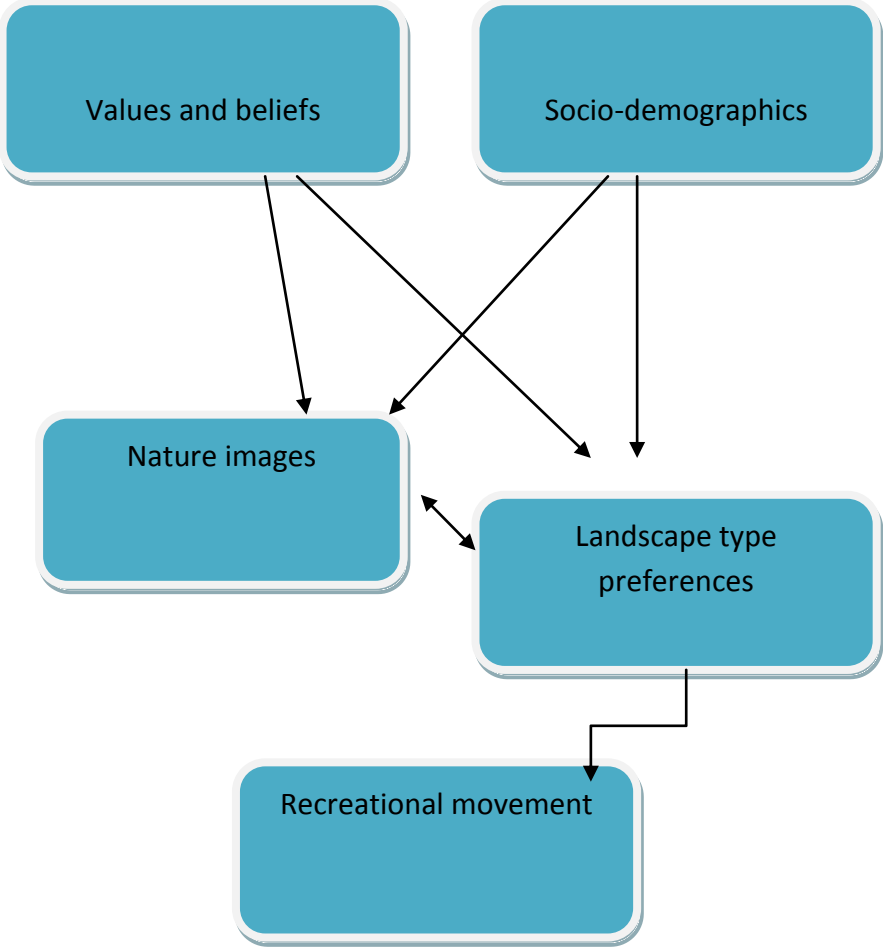


Figure 2. Landuse Terschelling
(Source: Hazeu, 2005)

2.6 Conceptual Framework

This conceptual framework explains the relationship between the aspects addressed in this research. Values and beliefs as well as socio-demographics are known to influence nature images and landscape preferences. Nature images and landscape preferences influence each other. But based on the literature it is mainly nature images that influence landscape preferences, that is why landscape preferences is set lower in line. Lastly it is questioned whether or not the preferences of landscape types can be found back through the spatial behavior of the respondents.



3. METHODOLOGY

3.1 The research

This research is a descriptive as well as an exploratory research. The landscape preferences, the nature images and their connection will be investigated and explained also the relationship between the spatial behavior and landscape preferences is investigated. Through this also the method GPS tracking is explored and may provide new information on the usage of the GPS. The first step of this research has been the gathering of data and background from the literature and also gathering data about the landscape and physical elements of the island. On the island itself an environmental analysis was done in order to investigate the existence of the different landscape types and the possible routes within the area. Data has been gathered from the respondents by using two instruments in order to measure the preferences, nature perspectives and behavior of the recreational walkers. The first instrument was the GPS devices/application which leads to the behavioral data. The second method is a questionnaire, which lead to the preferences and the nature images. A questionnaire as a method was chosen as a range of individuals were asked the same questions and the outcome can represent a bigger population in contrast to for instance interviews (O'Leary, 2010). This mixture of methods can help to build a bigger picture, by creating more depth and an extra set of control variables, as the data collected from the GPS can give more precision to the narratives from the questionnaire and the other way around (O'Leary, 2010).

3.1.1. The study area

For the place of study the island of Terschelling has been chosen. Terschelling is an island upon the North of the Netherlands, part of the Province of Friesland and is one of the Wadden Islands. The location of the island in relation to the rest of the Netherlands can be found in figure 3 where the island is encircled. The whole of the island up close can be found in figure 4. The island covers a total of 675 square kilometer, but only 89 square kilometer is land and the rest is water (Ecomare, 2015a). Also a total of 95 square kilometer of nature area is protected by Staatsbosbeheer Ecomare (2015b). Spread across the island 4800 inhabitants live on the island (VVV Terschelling, 2015a). The island has also 250 kilometer walking/hiking trails (VVV Terschelling, 2015b). The choice for Terschelling was made as the island has a diverse and highly appreciated landscape for a rather small area. Many different nature and landscape areas can be pointed out which are all commonly visited by these 400.000 users and the inhabitants of the island. This made it a good location to do a case study on landscape preferences and different nature images as many of the common Dutch landscapes and nature types can be found on this specific island (Farjon, et al., 2001).



Figure 3: Map of the Netherlands, the island Terschelling red encircled (Kaartenatlassen, 2015).



Figure 4. The island of Terschelling (Texel 44, 2015).

3.1.2. The data collection

The questionnaires have been collected at two different times and by two different methods. The first round of data collection took place on the island of Terschelling itself. This was done in the weekend of 3, 4 & 5 April during the Easter weekend. Here on different hotspots on the island on two executive days 50 questionnaires were gathered. As it was a cold weekend it was hard to find a lot of respondents in one spot, that is why the respondents were approached on different locations on the island. Next to this in this weekend also 6 GPS routes were gathered. Due to a lack of GPS routes uploaded to us, we have chosen to take another trip to Terschelling. The respondents often gave the reply that they would install the application once they were near a Wifi hotspot, yet most of them did not upload any routes. So this time on the fifth of May - which was to most people an off-work day due to liberation day - in consultation with the shipping company Doeksen we were able to remain on the boat for two consecutive trips towards the island. This way we could survey the respondents and give them the chance to install the application immediately as they now had a Wi-Fi connection available. This time 42 questionnaires and also 6 extra routes were gathered. In total 92 questionnaires and 12 GPS routes were gathered.

3.1.3. Ethics

The respondents were asked in public area to participate, the respondents had the choice whether or not they wanted to participate, nothing was mandatory and they participated by free choice. When approaching the respondents, they got a flyer on which the procedure of the participation is written. On this paper is stated how they can download and use the application but also what is going to happen with the information and statements about their privacy. The questionnaire contains an information box in which the anonymity of the respondent and the use of the research is explained. This also stated that by participating the participant will agree on the anonymized use of the data collected from the questionnaires and their track-data by us the researchers. No specific name or characteristics allowing the respondent to be recognized are needed and used in this research (O'Leary, 2010). The data was stored as long as it was needed to finish this research. The raw data gathered by the questionnaires and GPS devices will not be shared with anyone, except for Dorien Cramer with whom the research was conducted. It should be kept in mind that the researcher not purposely might influence the respondent in going for a walk or a bicycle ride by expressing the goal of the research.

3.2 The questionnaire

In order to investigate what peoples' landscape preferences and nature images are, specific questions had to be asked. When looking at the literature different ways of measuring landscape

preferences can be found, yet the most common is measuring landscape preferences through photographs. Therefore by means of photographs of the in paragraph 2.5 determined landscape types the landscapes preferences were measured. The following part consisted of questions lead to determining the nature images. The questions about nature images are inspired on the article of de Boer & Schulting (2002) and Buijs et al. 2009, where the original questions also were based on de Boer & Schulting (2002) and have been applied by Buijs to use as a measure for natures images. Next to this there were also several question leading to the general characteristics of the respondents included and also about the usage of the areas. As for instance age, group size, how many times they have visited the island and what their connection is with the area. The questionnaire was only conducted in Dutch as the preferences of the Dutch recreationists were investigated and otherwise one would measure cultural differences (Yang & Brown, 1992).

3.2.1. Measuring the landscape preferences

In order to measure the landscape preferences of the respondents for the island of Terschelling the method of landscape preferences measured by pictures has been chosen. These pictures have to be graded by the respondents on a scale from 1 to 10. A scale from 1-10 has been chosen as this would give a greater variation between the values given in comparison to a scale from 1-5. As for the last one people would tend to give rather extreme outcomes and might be influenced by this as there is a smaller differentiation between highly valued or low valued. The choice for the landscapes was based on the LGN5 map (figure 3.) and different webpages discussing the landscape characteristics of Terschelling as discussed in paragraph 2.5. There has been chosen to use only the landscapes that are custom to the island and not to the Netherlands in general as this is a case study and also the spatial behavior has to be measured which cannot be done if this does not correspond to the asked landscapes in the questionnaire. Also the pictures used are images of real landscapes existing on either the island Terschelling or sometimes the island Texel as in some cases the quality of these pictures was better. The pictures used can be found at the end of this paragraph.

In many cases landscapes preferences have been measured by the usage of images as is done by for instance Howley (2011) or Kaltenborn et. al. (2002). Studies about landscape perception have often been based on responses to surrogates: photographs (Jakobsen, 2007; Howley, 2011). The quality of the images has been kept in mind, which means that the images have to have a comparable quality and pixilation. Also the color scheme of the sky etc. should be fairly alike to improve the reliability. Some images have been adjusted in order to make only the relevant landscape in the picture visible (Howley, 2011). An advantage of working with pictures is that they give some sort of control over the presentation of the context and procedures, they also give the researcher some control over the

conditions under which the landscapes are perceived by the respondents as for instance the light and the number of elements in the picture. Next to this it makes it possible to compare and at the same time evaluate the landscapes (Jakobsen, 2007). On the other hand pictures create a generalized idea of the landscape and can be perceived in different circumstances as people experience landscapes when they are actually on a location. Also a picture might show the viewer only specific circumstances, that can be ideal and not completely comparable to the real situation (Jakobsen, 2007). But when appropriately chosen and presented, photographs can give a valid representation for the assessment of the perceived landscape in the context such as sightseeing or tourism. It is suggested that when people view a scene, they gather similar information as that is being supplied by a photograph. This can be especially useful in relation to tourism as in this research (Jakobsen, 2007). The landscapes were all analyzed and compared by means of SPSS and a mean grade was calculated for each landscape.

Landscape 1. Salt Marsh (Kwelder)



Source: IMARES

Via: <http://www.wageningenur.nl/nl/nieuws/Kwelderontwikkeling-op-Terschelling.htm>

Landscape 2. Dike/Polder area (Dijk/polder)



Source: EURECO ecologisch onderzoek en advies

Via: <http://www.zodenaandedijk.com/terschelling.html>

Landscape 3. Heath (Heide)



Source: Huize Zonnedaauw

Via: <http://www.huize-zonnedaauw-terchelling.nl/omgeving-van-huize-zonnedaauw-midland-noord-terchelling.php>

Landscape 4. Village landscape (Dorp)



Source: Route.nl

Via: <http://www.route.nl/fietsroute/121352/rondje-terchelling>

Landscape 5. Beach (strand)



Source: Erik Spek

Via: <https://staatsbosbeheertexel.wordpress.com/>

Landscape 6. Forrest area (Bos)



Source: Remi Hougee

Via: <https://staatsbosbeheerterschelling.wordpress.com/2011/10/31/%E2%80%98dennenbos%E2%80%99-orchideeen-in-goede-handen-bij-eilanders/bosafbeelding-2/>

Landscape 7. Rural area (Ruraal gebied)



Source: beleefterschelling.nl

Via: <http://beleef-terschelling.nl/vakantie/huisje-terschelling>

Landscape 8. Small lakes (Doodemanskisten/meertjes)



Source: Sytske Dijkse

Via: <http://www.ecomare.nl/ecomare-encyclopedie/gebieden/waddengebied/nederlands-waddengebied/terschelling/natuur-van-terschelling/doodemanskisten/>

Landscape 9. Dune area (Duinen)



Source: [Holland.com](http://www.holland.com)

Via: http://www.holland.com/be_nl/toerisme/article/duinen-van-texel.htm

3.2.2. Measuring the nature images

One of the most used ways to operationalize a concept is by creating a scale that makes it possible to place respondents along a continuum for a specific variable. One of these scales that is commonly used is the 'Likert scale'. Experts use a 5-point scale, starting from for instance 1. = strongly unfavourable to 5. = strongly favourable with 3. = undecided, to rate the relevance. After this the correlation can be measured (O'Leary, 2010). In the second part of the questionnaire the respondents were asked what they thought about several statements regarding to their perspectives on nature. They could answer on a scale from 1 to 5 which headed from totally not agree to totally agree. The statements reflected on how and what the respondents perceive as nature. The statements used were based on both Buijs et al. (2009) as well as Boer & Schulting (2002) which were previously funded on a research from Alterra. Not all statements used by Buijs & Boer and Schulting were used by us, as some statements weren't as clear in order to lead to a clear answer.

In the research of Buijs (2009) and Boer & Schulting (2002) a factor analysis was used to see if there were commonalities between the different statements, in order to place people in the three nature image groups. In this research we have chosen to use the syntax of SPSS (which can be found in Appendix IV) to classify to which degree the respondents belong in the three nature image groups and not to do another factor analysis. This was done because the statements we have used that lead to a specific nature image were already determined in these previous researches which we have based our statements on. Thus a syntax was used as we now could determine for each single statement whether or not it related to a nature image group. By using the syntax for every respondent a grade was calculated for every nature image, as along the process, it was found to be that none of the respondents fit exactly in one nature image group.

First it had to be decided which statement and accompanied scores belonged to which nature image group. Within the literature the statements were based on, no further explanation of the usage or interpretation of the statements was described. For each statement it was determined to which nature image they would belong. Also it had to be determined what score on the statement would lead to which nature perception. So for instance if one would answer the statement *'The more a nature area has been left alone by humans, the higher the value of this area'* with a 4 or 5 (agree or totally agree) on the 1 to 5 scale he would then score a point for this question within the Wilderness view. As agreeing with this statement is in line with the idea from the Wilderness view perspective that nature should be left alone and humans should not intervene. For some statements it meant that in our opinion they could belong to two nature image groups (in most cases the functional and arcadian view would have some overlap). The explanation of the classification of the statements can be found in Appendix III. After this based on the answers given on the statements for every respondent a grade was calculated for each nature image on a score from 0-1. This was done by dividing the points the respondent scored for his answers on the statements leading to a nature image through the total amount of statements belonging to that nature image. So for instance a respondent has answered 8 answers in line with the wilderness view and in total there were 11 questions leading to this nature image view. The score would then be calculated by dividing 8/11. This was done for all respondents and all 3 nature image groups to make the groups comparable, by all having an equally calculated score from 0-1. Thus a respondent could score 0.10 on the Functional view, 0.75 on the Wilderness view and 0.35 on the Arcadian view. He would then have the highest score on the Wilderness view and fit for the biggest part in this group, yet a part of the respondent's perception also corresponds with the other view. When there was a missing value for a respondent leading to a nature image group, no value could be calculated for that person in that group.

A ternary plot was used in order to visualize the spreading of the scores each respondent scored. This ternary plot produces a three-axis plot, and displays the distribution and variability of a three-part compositional data (JMP, statistical discovery, 2015). The scores had to be normalized in order add up to the sum of 100 for correct use. This might give a degree of distortion yet the spreading remains the same and it gives a clear visual perception of the scores each respondent has gained on the three different nature images. The respondents with actual missing values in one or more of the nature image scores - not zero, as zero is in fact a valid score- were left out of the plot, as no spot could be calculated for them.

Also a controlling question was added which related to the nature images. The respondents were asked when they like nature at its best and could choose out of 3 options (and other, namely) corresponding to the nature images '*Nature should be rough*' -> Wilderness view, '*Nature should be romantic*' -> Arcadian view, '*Nature should be in use of man*' -> Functional view. After analysis it became clear that people could be classified in multiple groups, yet this question can still make visible what is preferred when asked directly.

3.2.3. Measuring the relationship between landscape preferences and nature images

One of the questions investigated in this research was whether or not people with different nature image perspectives have different landscape preferences and if these correspond to the values of that nature image. In order to investigate a correlation coefficient was used. Two correlation coefficients that are commonly used are the Spearman correlation coefficient and the Pearson correlation coefficient. Both range from -1 to + 1. In this research the Spearman correlation coefficient will be used. You don't need the assumption of normality to use it which fits the data collected in this research, as this data is also not normally distributed. It is a nonparametric alternative to the Pearson correlation coefficient, which replaces the actual data with ranks. It measures the strength and the possibility of a linear relationship between the two sets of ranks; the landscape preferences and the nature images (Norusis, 2010). The coefficient has used all of the previously calculated scores a respondent has scored on the three nature images as it has shown that people cannot be put in one specific nature image group. The null hypothesis that comes with this test is: There is no linear relationship between these two variables. The outcomes ranging between + 1 and - 1 indicates the direction of the link between the two variables. For the test of significance there is chosen to use the two tailed test of significance because the direction of the connection between the two types of variables can range from +1 to -1. Which can both indicate a strong linear relationship between the two variables. When there would be chosen to only tested on a one tailed test of significance one of the two directions would already be excluded from the research process.

3.3 Measuring spatial behavior by means of GPS trackers

In order to investigate the spatial behavior of the recreants on Terschelling a GPS application for the telephone and regular GPS trackers (Qstarz, BT-Q1000XT) were used. The usage of a GPS application for the telephone was chosen as GPS trackers were more commonly used in the current literature than measuring spatial behavior by a GPS application. We therefore wanted to explore the workings of this rather new way of gathering movement data. The choice was made to use the Greentracker application, which was developed for research on the faculty of spatial sciences.

Accompanied with the questionnaires the respondents were given a flyer on which the instructions for the usage of the application were written. Of the 92 respondents several people installed the application on the telephone, yet only 7 routes were uploaded to us in the greentracker system by means of the application. Next to this also 4 trackers were used by the respondents to measure their routes. These were handed out on the island and also taken back in on the same day. The biggest part of the respondents did not want to have the application on their telephone as they just weren't interested, did not want to download anything on their phone, or promised to do it later when they were in the surrounding of a Wi-Fi connection -but didn't- .

In ArcMap 10.2 the routes were converted from GPX to features in order to work with the data in the program. After this the routes could be visualized and the locations visited were visible and clear to be analyzed. In order to create a route instead of dot-points the datasets were given vertices, which made lines between each point (dot) where the GPS send its data to the satellite. To measure the average speed of the respondents, in order to see where they stopped or where they didn't slow down at all, the average speed had to be calculated. This was calculated by means of the distance; the length of the vertices and the time the respondents entered and left the various vertices. In this way the speed/kmph/distance could be calculated. Subsequently this average speed was visualized by means of the symbology which was equated for all the routes. As in this way the different routes and visited areas can be better compared. In order to investigate where people stopped with the use of the attribute table and select by attributes all the spots where the average speed was lower than 1 were highlighted.

Many routes appeared to have some glitches. At these points the GPS did not make correct contact with the satellite and tried to compensate this by displaying a long straight vertice as the crow flies with either a speed of zero or for instance 150 or 350 kmph (see figure5). As one can imagine this was not a valid speed for a recreational walker or bicyclist especially when these differences occurred sequentially in a very short time. These vertices were removed by means of the definition query and remove value without leaving significant gaps in the routes.



Figure 5. Glitch in the routes

4. RESULTS AND ANALYSIS

4.1 Descriptives of the respondents

In total 92 people participated in this research. Of the 92 respondents 13 visited the island for the first time and 55 persons visit the island regularly. As one can see in figure 6. the most called answer for visiting the island is for holiday (57 times), other often answered options were 'rest and peace' (39 times) and 'hiking or cycling' (39 times), no one answered 'I work here'. Other answers were 'visiting friends' or a less common answer; geocaching. Of the 92 respondents, 73 feel attached to the island, only one did not answer this question.

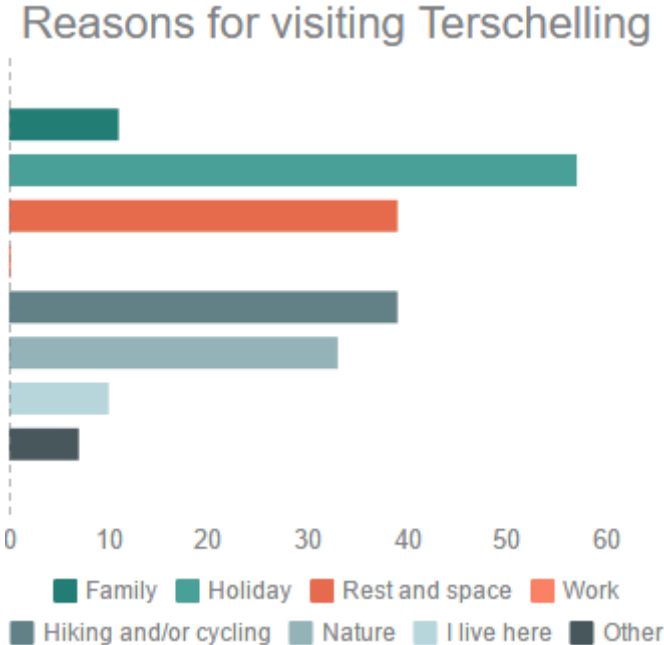


Figure 6. Reasons for visiting Terschelling

4.2 Landscape preferences

The respondents were asked to grade the different landscapes that can be found on the island Terschelling based on their attractiveness on a scale from 1-10. As one can see in figure 7 and table 1 the mean grades range from a 7.51 to a 9.08. The Dune area is the most highly appreciated with a 9.08 after the Dune area the Beach area is the most appreciated with a 9.05. The two lowest graded landscape types are the Dike/polder area with a 7.51 and the Rural farm area with a 7.55.

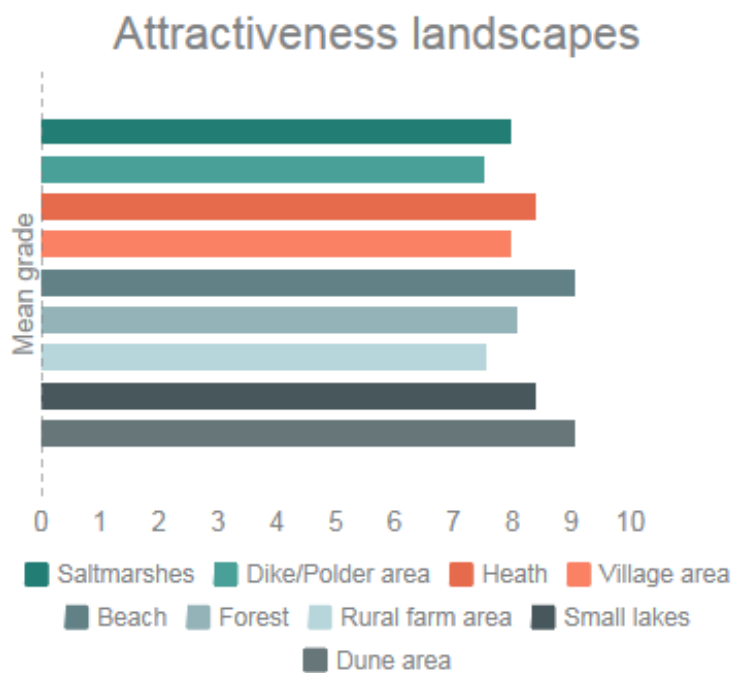


Figure 7. Overview of the mean grades per landscape

Attractiveness
landscape mean grade

Salt marsh	7.973
Dike/polder area	7.51
Heath	8.39
Village area	7.98
Beach	9.05
Forest	8.07
Rural farm area	7.55
Small lakes	8.39
Dune area	9.08

Table 1. Mean grades per landscape

Overall the average grade given was rather high as expected. Also the dune and beach area were graded almost 1.0 point higher than the other landscapes. This can be connected with the fact that the visitors of the island also come looking for these aspects that they might not find in non-island places. In general one could probably even say that we have measured the (holiday) feeling that the respondents have with the island. It can also be seen that the more human influenced structures – dike/polder and rural area- with the exception of the village are valued less in contrast to the more natural landscapes. This corresponds with what can be found in the literature and previous researches where it is found that the most common preferences are landscapes that include water and also cultural landscapes (in this case the village) are valued highly (Yang & Brown 1992; Howley, 2011). The landscape types that are denoted as being less attractive are often the modern intensive agricultural landscapes (Kaltenborn & Bjerke, 2002; Howley, 2011).

Interesting is to look at the differences that can be found between the attractiveness of the landscapes and the respondents who visited the island for the first time and who have visited the island regularly (see table 2.). In 5 out of the 9 landscapes the people who have visited the island for the first time have graded the landscape lower than the average mean of all groups. On the other hand 7 out of 9 landscapes were graded higher than average by the group that visits the island regularly. – Note to these outcomes is that some of the people interviewed on the boat are also first time visitors and do not have seen some of the landscapes in real life before in this particular setting-. If you also take a look at the attachment people have with the island and the times visited one can

see that almost all of the regular visitors (96%) feel attached to the island. This in contrast to 60% of the few times visited group who feel attached and 46% of the first time visitors. This attachment can also play a role in explaining the higher grades of the regular visitors and the lower grades of the first time visitors as people who feel a personal attachment to certain areas tend to value these areas higher (Antrop, 2005).

Attractiveness landscape mean grade	Mean grade all groups	Mean grade first time visitor group	Mean grade regular visitors
Salt marsh	7.973	7.154	8.136
Dike/polder area	7.51	6.85	7.84
Heath	8.39	8.08	8.44
Village area	7.98	7.85	8.24
Beach	9.05	9.08	9.13
Forest	8.07	7.85	8.07
Rural farm area	7.55	7.69	7.75
Small lakes	8.39	8.54	8.29
Dune area	9.08	9.08	9.20

Table 2. Mean grades per visitor group

4.3 Nature images

In figure 8 we can see a Ternary plot of the different nature images that people have. As discussed people can fit within multiple nature image groups and for every respondent a score per nature image was calculated. As is shown in figure 8 most respondents are placed along the wilderness-Arcadian view axis, with a tendency towards the Wilderness view. The respondents with missing values were left out this plot. Most people have scores on two or more nature image groups. But when looking more closely to which nature images people score the highest on, the following distribution can be found (figure 9). The Wilderness perspective is the most common perspective. As is also already explained by the figure 8 where most respondents are centered near the Wilderness-Arcadian axis. 55 Respondents have scored the highest on the Wilderness score. For 23 respondents their highest score is on the Arcadian view and 2 respondents find themselves mostly linked to the Functional view. 7 Respondents had an equal score between two perspectives and were left out figure 9. And for 5 respondents by no means a score for all three perspectives could be calculated due to missing values.

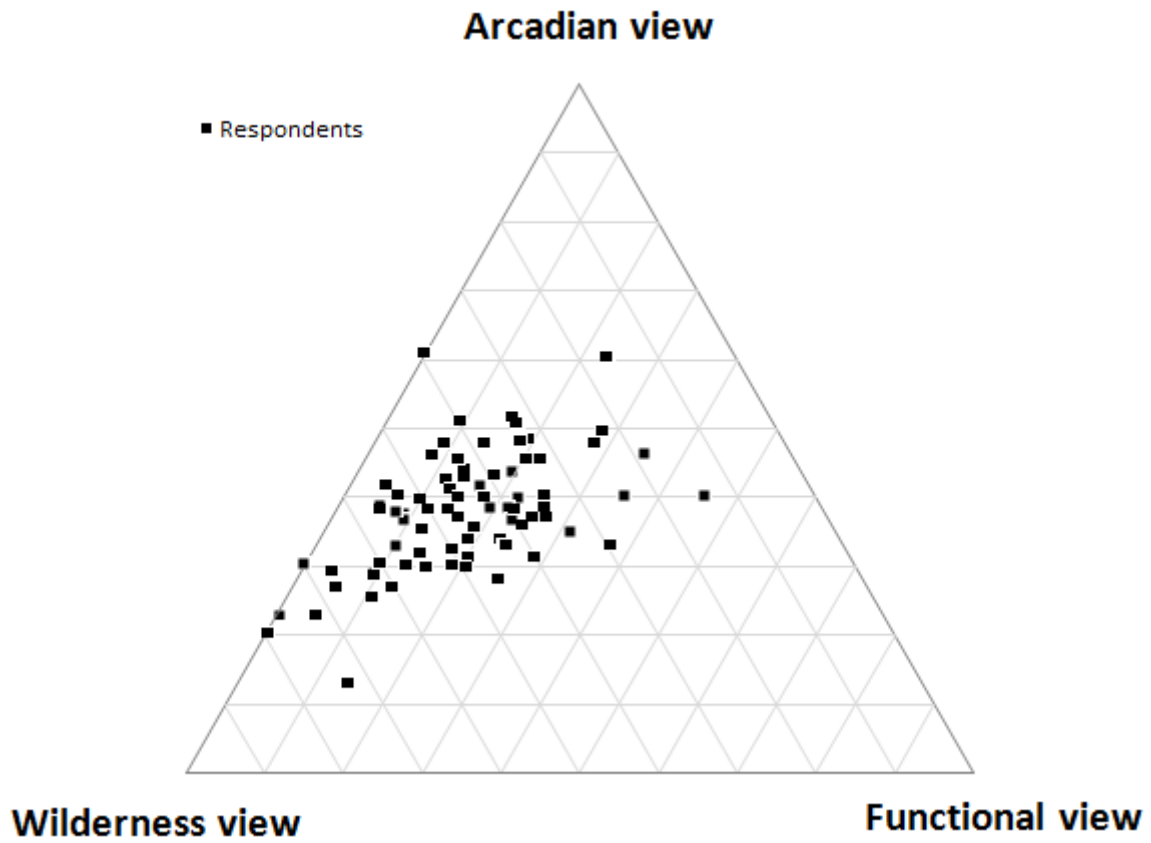


Figure 8. Ternary plot of the respondent's perceptions of nature

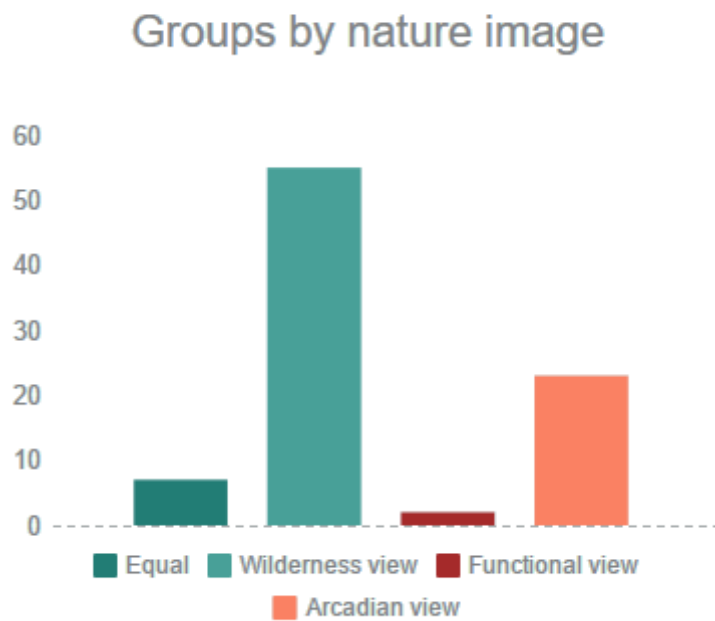


Figure 9. Size of nature image groups according to the respondents highest scores

Table 3 shows us the answers on the controlling question ‘When do you think nature is the most beautiful’. Most respondents from all three nature image groups have answered nature should be rough. No one though in the Wilderness group has answered nature should be in use of men. The Arcadian group also has a preference for rough nature. Over the Functional view not much can be said as only two people fall in this category and both are spread over nature should be rough and nature should be in use of men. Interesting it is to see that the ‘other’ answers of the Wilderness group in most cases were statements as ‘it should be remained untouched’, ‘as little human interferences as possible’ or ‘when nature can take its course’. Whereas for the Arcadian the ‘other’ answers were in the style of ‘When it ‘touches’ me’ or ‘very different’.

	Nature should be rough	Nature should be romantic	Nature should be in use of men	Other	Total
Wilderness view	46	1	0	8	55
Arcadian view	16	2	2	3	23
Functional view	1	0	1	0	2

Table 3. What nature do the respondents in the different nature image groups prefer

4.4 Relationship between landscape preferences and nature images

One of the questions investigated in this research was whether or not people with different nature image perspectives have different landscape preferences. This was investigated by means of the Spearman correlation coefficient. This measures the strength and the possibility of a linear relationship between the two sets of ranks; the landscape preferences and the nature images.

Within the following table (4) several numbers are highlighted with different colors. The yellow pieces are the nature images and the landscapes that show us a significant relationship. As one can see for the wilderness view and the beach area a significant relationship can be seen on the 0.05 significance level. For the Arcadian view a significant relationship with the dike/polder area can be found on the 0.01 significance level. So there is a relationship between people who score higher on the wilderness perspective also score higher on the beach area and the other way around. The same goes for the Arcadian view and the dike/polder area. When looking at the core values of the two nature images this corresponds. As the beach area is considered rough this fits well with the Wilderness view. Also the Arcadian view has as centre the rural idyll setting. The dike polder area is

not always considered idyll but it fits in with the link that the Arcadian view centers of farmer like landscapes and nature (Buijs, 2009).

In red and blue no strong relationships or correlations can be found but they do give a weak negative (red) or positive (blue) direction. Which in the red for instance means that people who score high on functional view value the salt marsh and beach lower and the other way around. Also the people with a wilderness score tend to prefer the rural area and the village (not indicated in blue) lower and the other way around. This also equals the value of the wilderness view where rough nature and the lack of human interference are preferred.

Spearman correlation coefficient

	Functional score	Arcadian score	Wilderness score	Salt marsh	Dike/Polder area	Heath	Village area	Beach	Forest area	Rural area	Small lakes	Dunes
Functional score												
Correlation Coefficient		.546 ^{**}	-.395 ^{**}	-.118	.105	-.004	-.012	-.173	.043	-.002	.132	-.047
Sig. (2-tailed)		.000	.000	.285	.347	.969	.918	.118	.699	.982	.233	.676
Arcadian score	.546 ^{**}		-.101	.020	.268 [*]	.108	.058	.098	.060	.167	.067	.179
Sig. (2-tailed)	.000		.367	.857	.014	.332	.601	.379	.591	.131	.550	.105
Wilderness score	-.395 ^{**}	-.101		.099	-.073	.142	-.103	.332 ^{**}	.165	-.129	.119	.195
Sig. (2-tailed)	.000	.367		.365	.509	.194	.346	.002	.130	.235	.278	.074
Salt marsh	-.118	.020	.099		.440 ^{**}	.636 ^{**}	.279 ^{**}	.490 ^{**}	.311 ^{**}	.226 ^{**}	.228 ^{**}	.352 ^{**}
Sig. (2-tailed)	.289	.857	.365		.000	.000	.007	.000	.003	.032	.030	.001
Dike/Polder area	.105	.268 [*]	-.073	.440 ^{**}		.251 ^{**}	.357 ^{**}	.246 ^{**}	.117	.414 ^{**}	.155	.286 ^{**}
Sig. (2-tailed)	.347	.014	.509	.000		.016	.000	.018	.265	.000	.141	.006
Heath	-.004	.108	.142	.636 ^{**}	.251 ^{**}		.354 ^{**}	.537 ^{**}	.477 ^{**}	.226 ^{**}	.464 ^{**}	.399 ^{**}
Sig. (2-tailed)	.969	.332	.194	.000	.016		.001	.000	.000	.031	.000	.000
Village area	-.012	.058	-.103	.279 ^{**}	.357 ^{**}	.354 ^{**}		.386 ^{**}	.159	.503 ^{**}	.187	.396 ^{**}
Sig. (2-tailed)	.918	.601	.346	.007	.000	.001		.000	.130	.000	.074	.000
Beach	-.173	.098	.332 ^{**}	.490 ^{**}	.246 ^{**}	.537 ^{**}	.386 ^{**}		.365 ^{**}	.353 ^{**}	.369 ^{**}	.792 ^{**}
Sig. (2-tailed)	.118	.379	.002	.000	.018	.000	.000		.000	.001	.000	.000
Forest area	.043	.060	.165	.311 ^{**}	.117	.477 ^{**}	.159	.365 ^{**}		.098	.549 ^{**}	.297 ^{**}
Sig. (2-tailed)	.699	.591	.130	.003	.265	.000	.130	.000		.354	.000	.004
Rural area	-.002	.167	-.129	.226 ^{**}	.414 ^{**}	.226 ^{**}	.503 ^{**}	.353 ^{**}	.098		.294 ^{**}	.402 ^{**}
Sig. (2-tailed)	.982	.131	.238	.032	.000	.031	.000	.001	.354		.005	.000
Small lakes	.132	.067	.119	.228 ^{**}	.155	.464 ^{**}	.187	.369 ^{**}	.549 ^{**}	.294 ^{**}		.450 ^{**}
Sig. (2-tailed)	.233	.550	.278	.030	.141	.000	.074	.000	.000	.005		.000
Dunes	-.047	.179	.195	.352 ^{**}	.286 ^{**}	.399 ^{**}	.396 ^{**}	.792 ^{**}	.297 ^{**}	.402 ^{**}	.450 ^{**}	
Sig. (2-tailed)	.676	.105	.074	.001	.006	.000	.000	.000	.004	.000	.000	

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 4. The outcomes of the spearman correlation coefficient.

Interesting it is to see in green that there are also relationships between the nature images. A positive between the Arcadian and Functional view and a negative one between the Functional view and the Wilderness view. For the first one this means that there is a relationship between the Functional and Arcadian view, where people who score for instance higher on the functional view also score higher on the Arcadian view. This links to the overlap that was found in statements, that were relevant for both images. For the last one this means that people who tend to score higher on the functional score, score lower on the Wilderness score and the other way around.

Important it is to note that overall between the landscapes many positive significant relationships were found. This means that the overall scores were rather high and overall positive and one could imagine that the emotions towards the island and perhaps even the holiday experience were at the background of so many high scores.

4.5 GPS results

Also the behavior of the visitors is measured in order to investigate how this spatial behavior relates to their preferences. In total only 12 routes were uploaded to us from the 92 respondents. One respondent had uploaded two routes, so in total 11 respondents have provided us with routes. Due to this lack of routes and also within these few gathered routes only a 2 or 3 respondents have added their respondents number to their route, it is not feasible to compare the routes taken with the questionnaires, in order to truly investigated whether or not the respondents visited their preferred landscapes. Yet the routes that were handed in will be analyzed in the next paragraph.

When looking at the different factors that influence peoples routes, the most common reasoning mentioned was ‘we decide the route at the moment itself’ (see figure 10). When the routes were investigated during the fieldwork it was found by us that often the routes were predetermined and in many cases the choice for a specific route was not a matter of choice but of a lack of choice and an abundance one way tracks.

Factors influencing the route

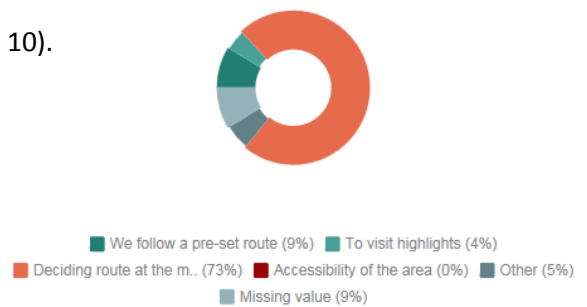


Figure 10. Factors influencing the route

In figure 11 the routes are visualized, where every route is indicated with a different color. When looking at these routes one can see that most routes area centered at the western part of the island.



Figure 11. The routes across the island visualized in different colors

Most routes have crossed West-Terschelling and Midland. Also a lot of routes cross the polder area through the villages at the south of the island and also the forest and dune area in the north-western part of the island. Most routes lead directly or indirectly to the beach. It can also be added that the choices for routes were not always of free choice but were guided through the lack of choice in the routes; one just had to follow one specific route to get from A to B. If you look at the stopping points, where people stopped, these locations were again almost all near the point of residence, the villages and the beach area.

In order to not only see which areas were visited often but also where stops were made the average speed in kmp/h per route was calculated. As one can see in figure 12. The slower areas were often at the beach or in the village, where people walked. Through the dunes ad forest people move quicker. But also the height and the hilly sight plays a role here as downhill the speed tends to be higher than uphill. Also the two routes on the far right were purely of recreational walkers and are therefore slower than the other routes where also the bicycle is used



Figure 12. Average speed of all the routes

The areas where stops were made are highlighted with the light blue markings in figure 13. In these areas the speed was less than 1 kmp/h. Especially at the beach stops were made and in the villages as West- Terschelling and Midland. Interesting it is to see that, when zoomed in more closely and comparing the stops with the map of Terschelling on google maps, many of the other more loose stopping points that can be found along the routes are at intersection points, where different roads come together. Or when zoomed in even further it shows that people have visited their house of residence, shops, have stopped at a bench and have possibly taken the wrong route.



Figure 13. Stopping point along the routes

5 CONCLUSION & DISCUSSION

5.1 Conclusion

The main question that was investigated in this research was what the landscape type preferences and nature images of the recreational movers on the island of Terschelling are and how does their spatial behavior relate to this. It was also investigated whether or not people who have different nature images have different landscape preferences. In total 92 respondents have filled in the questionnaire and 11 routes were provided to us.

As the literature already suggested, the landscapes with water were the most preferred, whereas the more agricultural landscapes were the least preferred (Yang & Brown 1992; Howley, 2011; Kaltenborn & Bjerke, 2002). The most preferred landscapes of the respondents on the island the Dune area which was the most highly appreciated area with a 9.08. After the Dune area the Beach area is the most appreciated with a 9.05. The two lowest graded landscape types are the Dike/polder area with a 7.51 and the Rural farm area with a 7.55. A differentiation in scores can be found between first time visitors and regular visitors. Where the respondents who have visited the island for the first time have graded the landscapes lower than the average mean of all groups. On the other hand the respondents who visit the island regularly grade the landscapes higher than average.

The nature images have proven to be a hard nut to crack. Dividing the respondents in nature images groups was not as feasible as first thought. Eventually it showed that people often had scores for two or more nature images and were not to be fitted entirely in one specific nature image group. Most respondents found themselves on the wilderness – Arcadian axis. When looking at the highest scores for the nature images, 55 Respondents have scored the highest on the Wilderness score, 23 scored the highest on the Arcadian view and 2 scored the highest on the functional view.

No hard conclusions can be said over the link between landscape preferences and nature images. There are though some significant relations that were shown and some soft positive and negative directions. A significant relationship between the wilderness view and the beach area were found. Also for the Arcadian view a significant relationship with the dike/polder area can be found. Also weak negative or positive directions could be found that are in line with the values of the nature images. Which means that for instance people who score high on the functional view grade salt marsh and beach lower and the other way around. There are also relationships between the nature images. A positive relationship between the Arcadian and Functional view and a negative relationship between the Functional view and the Wilderness view. Important it is to note that overall between the landscapes many positive significant relationships were found. This means that the overall scores

were rather high and overall positive and one could imagine that the emotions towards the island and perhaps even the holiday experience were at the background of so many high scores.

Due to the lack of routes no real links could be made between the spatial behaviour of the respondents and their landscape preferences. But based on the tracks that were handed in, the most visited areas were the villages and the beach. Many routes led through the forest area but here it can also be added that the choices for routes were not always of free choice but were guided through the lack of choice in the routes; one just had to follow one specific route to get from A to B. If you look at the stopping points, where people stopped, these locations were again almost all near the point of residence, the villages and the beach area.

5.2 Discussion

5.2.1 Landscape preferences

When it comes to the landscape preferences a critical point can be made on the high outcomes of the dune and beach area. It can be said that the visitors that visit an island in many cases come for the island characteristics of which the beach and the dune are markers. The overall holiday setting might imply that people are in a better mood and this can reflect on their perception of the landscapes (Mealey and Theis, 1995). On the other hand it has been proven that the use of photographs and quantifying landscape preferences overall, also in a recreational or tourist setting, is a solid and trustworthy method in measuring the preferences (van den Berg, 2004; Jacobsen, 2007).

5.2.2 Nature images

It has become clear that it is harder to classify the respondents in nature image groups than meets the eye. The three traditional nature images used by Buijs (2009) and in many other literatures were used in this research. Buijs does not state directly that people fit into one group, yet in the common speech it is often addressed as people fitting into specific nature images. As one can see in the results people score on all three views to some degree and therefore it might not be entirely correct to put people into one specific nature image group. Also adding to this these perceptions on nature given by the respondents fluctuates in different settings and situations.

It has also become clear that the nature image groups are strongly dependent of the statements that are used to measure the respondents view on nature. When statements are added or removed the perception changes and so does the grouping. Also whether or not you use 1/2 and 4/5 when calculating the scores of the statements in order to determine the nature image group or you use only 1 or 5 can influence the outcome of the grouping strongly. When using for instance 1 or 5 the significance tends to be higher and the groups tend to be clearer as the answers given by the respondents are stronger. One could question if questionnaires are complete enough to capture the

entire complexity and interpretability of grouping people in a nature image group. The question thus remains whether or not people are to be fitted within one nature image group. Do people have one perception that varies from inside values or should nature images be determined based on other values and would gain this another perspective on nature images.

5.2.3 Linking nature images to landscape preferences

As said the overall scores given by the respondents on the landscapes were high. These ranged from 7.51 to a 9.08. Therefore no great differentiation could be made. It has also shown to be hard to classify the respondents within one nature image group. When looking more closely there was much overlap between the different groups. Therefore between the nature images also correlation was found. Due to these high outcomes and rather related nature images no hard conclusions could be made, and it was hard to say whether or not other factors had more influence on the differentiation in scores than the influence of the nature perspectives.

5.2.4 GPS tracking

It has also shown us that there remains a lack of trust in installing a device or app on your Phone. In other researches of Koster (2013) and Meijles et al. (2014) there was not much difficulty in finding respondents that were willing to carry a GPS tracker. But in these cases the respondents were approached at the parking lot as they went for a walk so people had to come back to their cars or bikes at the end of the walk. In this research the area was rather big and people had to take into account in their plans to return the tracker and found this in many cases a too big of an obligation. Also another point was the privacy. The tracking of the routes was not the problem but the idea that something 'strange' is downloaded on their telephones made people hesitate and cautious. The lack of routes makes it thus hard to make real conclusions about the spatial behaviour and to link the spatial behaviour to the answers given in the questionnaires in a quantifiable way. This leaves us with determining patterns in a qualitative way. Another interesting point of this way of tracking respondent's movements is that the respondents could choose when to start the application or when to stop or pause it. This makes that they can choose which image they show us of their route. It therefore is possible that not all of the movements were tracked or only a specific part of the route was uploaded.

5.3 Further recommendations

For further research it would be recommended to investigate the method of the GPS application for a telephone more thoroughly. It can give the research a big dataset and is less time consuming, more convenient and can reach a greater area. Yet this method is rather new and there remains a lack of trust when it comes to adding (personal) information on the telephone. Another thing that might be

interesting to look into is the fact that multiple respondents stated that as they were from the country side (currently or born and raised) they have a different perception on nature and landscape then others might have. In this research there was no place for investigating this further as this was not part of the questionnaire and these things were told of the record. It has already been proven that this is a socio-demographic factor that is of influence (van den Berg, 2004) but it might need some further through research as so many people have spoken of this. Interesting is also to take a look at what the wilderness view actually means in a setting as the Netherlands. Is there a difference in what people perceive in general as to be wild. Or when you look specifically into a what is called a wilderness area as the Oostvaardersplassen, are there differences within a wilderness area to what people find to be wild.

6 REFERENCES

- Antrop, M. (2005). Why landscapes of the past are important for the future. *Landscape and urban planning*. Volume 70. Pp. 21-34
- Berendsen, H.J.A., (2008). *Landschappelijk Nederland, De fysische geografische regio's*. 4th edition. Assen: De Koninklijke van Gorcum
- Berg, A. van. den. (2004). *De charme van de savanne. Onderzoek naar landschapsvoorkeuren*. Visited on: 12-09-2015. Available at: <http://www.agnesvandenbergh.nl/savanne.pdf>
- Berg, A.E. van, den, Vries, D. de & Vlek, C.A.J., (2006). Images of nature, environmental values, and landscape preference: exploring their relationships. In: R.J.G. van den Born, R.H.J. Lenders & W.T. de Groot (eds.), *Visions of nature: A scientific exploration of people's implicit philosophies regarding nature in Germany, the Netherlands and the United Kingdom* (pp. 41-60). Münster: LIT-Verslag
- Buijs, A.E. (2009). *Public Natures: Social representations of nature and local practices*. Wageningen: Wageningen University
- Buijs, A. E., Elands, B. H. M. & Langers, F. (2009). No wilderness for immigrants: cultural differences in images of nature and landscape preferences. *Landscape and Urban Planning*. Volume 91(3), pp. 113-123.
- Boer, T.A. de, & R. Schulting, 2002. *Zorg(en)voor natuur. Draagvlak voor natuur en natuurbeleid in 2001*. Wageningen, Alterra, Research Instituut voor de Groene ruimte. Alterra report 453
- Central Intelligence Agency (CIA) (2014). *World factbook; the Netherlands*. Visited on: 11-01-2016. Available at: <https://www.cia.gov/library/publications/the-world-factbook/geos/nl.html>
- De Grote Bosatlas (2012). *54e editie*. First edition. Groningen: Noordhoff Atlasproducties.
- Dienst Landelijke Gebied (2012). *Ontwikkelingsplan Terschellinger polder*. Visited on 25-2-2016. Available at: <http://www.terschelling.nl/document.php?m=1&fileid=12877&f=375dd73d2156d4fe2a7c9aa4ee08355a&attachment=&a=611>
- Dramstad, W.E., Sundli Tveit, M., Fjellstad, W.J. & Fry, G.L.A. (2006). Relationships between the visual landscape preferences and map-based indicators of landscape structures. *Landscape and urban planning*. Volume 78. Pp. 465-474
- Ecomare (2015a). *Terschelling*. Visited: 18-01-2015. Available at: <http://www.ecomare.nl/ecomare-encyclopedie/gebieden/waddengebied/nederlands-waddengebied/terschelling/>
- Ecomare (2015b). *Natuur van Terschelling*. Visited: 18-01-2015. Available at: <http://www.ecomare.nl/ecomare-encyclopedie/gebieden/waddengebied/nederlands-waddengebied/terschelling/natuur-van-terschelling/>

- Farina, A. (2014). *Soundscaping Ecology, Principles, Patterns, Methods and Applications*. Dordrecht: Springer Science + Business Media
- Farjon, J.M.J., Dirkx, G.H.P., Koomen, A.J.M., Vervloet, J.A.J. & Lammers, G.W. (2001). *Nederlandschap Internationaal. Bouwstenen voor een selectie van gebieden landschapsbehoud*. Wageningen: Alterra
- Falk, J. H. & Balling, J. D. (2010). Evolutionary influence on human landscape preference. *Environment and Behavior*. Volume 42(4), pp. 479-493
- Goossen, C.M., Sijtsma, M., Meeuwssen, H. & Franke, J. (2011). *Vijf jaar daar moet ik zijn; Het ideale landschap volgens de Nederlanders op basis van analyse van de website*. Wageningen: Alterra
- Groot, W. T. de & Born, R. J. G. van, den. (2003). Visions of nature and landscape type preferences: an exploration in the Netherlands. *Landscape and Urban Planning*. Volume 63(3), pp. 127-138.
- Hazeu, G.W., 2005. *Landelijk Grondgebruiksbestand Nederland (LGN5). Vervaardiging, nauwkeurigheid en gebruik*. Wageningen: Alterra. Alterra-report 1213
- Howley, P. (2011). Landscape aesthetics: Assessing the general public's preferences towards rural landscapes. *Ecological Economics*. Volume 72, pp. 161-169
- Jacobsen, J.K.S. (2007). Use of Landscape Perception Methods in Tourism Studies: A Review of Photo-Based Research Approaches. *Tourism Geographies: An International Journal of Tourism Space, Place and Environment*. Volume 9(3), pp. 234-253.
- JMP, Statistical discovery by SAS (2015). *Ternary Plot*. Visited on: 12-02-2015. Available at: http://www.jmp.com/support/help/Ternary_Plots.shtml
- Kaartenatlassen (2015). Provinciekaart Nederland 503. Visited on: 02-05-2016. Available at: <https://www.kaartenatlassen.nl/files/provinciekaart-nederland-503.jpg>
- Kaltenborn, B. P. & Bjerke, T. (2002). Associations between environmental value orientations and landscape preferences. *Landscape and Urban Planning*. Volume 59(1), pp. 1-11.
- Kaplan, R. & Kaplan, S. (1989). *Experience of nature: a psychological perspective*. Cambridge: Cambridge University Press
- Keulartz, J. Windt, H. van, der. & Swart, J. (2004). Concepts of nature as communicative devices: The case of Dutch nature policy. *Environmental values*. Volume 13 (1). Pp. 81-99
- Koster, R. (2013). *Wandelgedrag in het Drents Friese wold*. Unpublished Msc Thesis. Groningen: Rijksuniversiteit Groningen
- Lowenthal, D. (2005). Natural and cultural heritage. *Natural and cultural heritage, International Journal of Heritage studies*. Volume 11 (1). pp 81-92.
- Mealey, L. & Theis, P. (1995). The relationship between mood and preferences among natural landscapes: an evolutionary perspective. *Ethology and sociobiology*. Volume 16. Pp. 247-256

- Norusis, M. J. (2010). *PASW Statistics 18, Guide to Data Analysis*. Upper Saddle River: Prentice Hall Inc.
- O'Leary, Z. (2010). *The essential guide to doing your research project*. London: SAGE Publications Ltd
- Portaal Natuur en Landschap (2013). *Inleiding Index Natuur en Landschap*. Visited: 29-01-2015. Available at: <http://www.portaalnatuurenlandschap.nl/themas/overzicht-typen-natuur-en-landschap/>
- Sevenant, M. & Antrop, M. (2010). The use of latent classes to identify individual differences in the importance of landscape dimensions for aesthetic preferences. *Land use policy*. Volume 27. Pp. 827-842
- Texel 44 (2015). Texel 44. Visited on: 07-01-2016. Available at: http://www.tx44.nl/wordpress/wp-content/uploads/2013/03/kaart_terschelling.jpg
- Ulrich, R.S., Simons, R.F., Losito, B.D., Fiorito, E., Miles, M.A. & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of environmental psychology*. Volume: 11. Pp. 201-230
- United Nations, Department of Economic and Social Affairs, Population Division (2014). *World Urbanization Prospects: The 2014 Revision, Highlights (ST/ESA/SER.A/352)*.
- Van Marwijk, R. (2009). *These routes are made for walking*. Wageningen: Univeristy of Wageningen
- Meijles, E.W., Bakker, de, M., Groote, P.D. & Barske, R. (2013). Analysing hiker movement patterns using GPS data: Implications for park management. *Computers, Environment and Urban Systems*. Volume 47, pp. 44-57
- VVV Terschelling (2015a). *Terschelling; feiten en cijfers*. Visited: 18-01-2015. Available at: <https://www.vvvterschelling.nl/landing-pages/terschelling-feiten-en-cijfers/>
- VVV Terschelling (2015b). *Wandelen op Terschelling*. Visited: 18-01-2015. Available at: <https://www.vvvterschelling.nl/landing-pages/wandelen-op-terschelling/>
- Waddenkiosk (2015). *De Natuur Van Terschelling*. Visited: 18-01-2015. Available at: http://www.waddenkiosk.nl/index.php?option=com_content&view=article&id=78&Itemid=219
- Yang, B. & Brown, T. J. (1992). A cross-cultural comparison of preferences for landscape styles and landscape elements. *Environment & Behavior*. Volume 24(4), pp. 471-507

Appendix I. Questionnaire



Enquête landschapsvoorkeuren en natuurbeelden Terschelling 2015

Bij deze enquête hoort ook een GPS-applicatie. Hierover leest u meer op de toegevoegde flyer.

De volgende vragenlijst duurt 10 minuten en is opgesteld voor ons Masteronderzoek aan de Rijksuniversiteit Groningen. De antwoorden uit deze enquête zijn volledig geanonimiseerd. Deze resultaten worden naast de data van de GPS gelegd. Zowel de vragen uit de enquête als de GPS-data zijn niet traceerbaar naar u als persoon.

Wij danken u bij voorbaat voor uw medewerking.

1. Uit hoeveel personen bestaat uw groep?

.....

2. Komt u vaker op het eiland Terschelling?

- Nee, dit is de eerste keer
- Ik ben hier al enkele malen eerder geweest
- Ja regelmatig

3. Wat is de reden van uw bezoek aan Terschelling? Kruis aan wat voor u van toepassing is.

- | | |
|--------------------------------------|----------------------------------------------|
| <input type="radio"/> Familiebezoek | <input type="radio"/> Wandelen en/of Fietsen |
| <input type="radio"/> Vakantie | <input type="radio"/> Natuur |
| <input type="radio"/> Rust en Ruimte | <input type="radio"/> Ik woon hier |
| <input type="radio"/> Werk | <input type="radio"/> Anders namelijk..... |

4. Door welke factoren wordt uw route bepaald

- Een van te voren uit gestippelde route
- Te bezichtigen hoogtepunten (hotspots) op het eiland
- We volgen geen route maar beslissen op het moment zelf
- Toegankelijkheid van het gebied; Verklaar.....
- Anders namelijk.....

6. Voelt u zich betrokken bij Terschelling?

Nee / Ja

7. Bent u lid van een natuur- of milieuorganisatie?

Nee / Ja, namelijk.....

8. Hoe aantrekkelijk vindt u landschap 1?

Helemaal niet aantrekkelijk 1 2 3 4 5 6 7 8 9 10 Heel erg aantrekkelijk

9. Hoe aantrekkelijk vindt u landschap 2?

Helemaal niet aantrekkelijk 1 2 3 4 5 6 7 8 9 10 Heel erg aantrekkelijk

10. Hoe aantrekkelijk vindt u landschap 3?

Helemaal niet aantrekkelijk 1 2 3 4 5 6 7 8 9 10 Heel erg aantrekkelijk

11. Hoe aantrekkelijk vindt u landschap 4?

Helemaal niet aantrekkelijk 1 2 3 4 5 6 7 8 9 10 Heel erg aantrekkelijk

12. Hoe aantrekkelijk vindt u landschap 5?

Helemaal niet aantrekkelijk 1 2 3 4 5 6 7 8 9 10 Heel erg aantrekkelijk

13. Hoe aantrekkelijk vindt u landschap 6?

Helemaal niet aantrekkelijk 1 2 3 4 5 6 7 8 9 10 Heel erg aantrekkelijk

14. Hoe aantrekkelijk vindt u landschap 7?

Helemaal niet aantrekkelijk 1 2 3 4 5 6 7 8 9 10 Heel erg aantrekkelijk

15. Hoe aantrekkelijk vindt u landschap 8?

Helemaal niet aantrekkelijk 1 2 3 4 5 6 7 8 9 10 Heel erg aantrekkelijk

16. Hoe aantrekkelijk vindt u landschap 9?

Helemaal niet aantrekkelijk 1 2 3 4 5 6 7 8 9 10 Heel erg aantrekkelijk

17. Geef hieronder aan in hoeverre u de volgende aspecten echte natuur vindt of niet. Dit doet u door het corresponderende getal te omcirkelen.

	Helemaal geen natuur				Echte natuur
	1	2	3	4	5
Moerassen	1	2	3	4	5
Grote maïsvelden	1	2	3	4	5
Overstromingen	1	2	3	4	5
Kamerplanten	1	2	3	4	5
Oude boerderijen	1	2	3	4	5
Stadsparken	1	2	3	4	5
Een boer op zijn tractor	1	2	3	4	5

18. Hieronder vindt u verschillende stellingen. Geef aan in hoeverre u het eens bent met deze stellingen door het corresponderende getal te omcirkelen.

	Helemaal mee oneens				Helemaal mee eens
	1	2	3	4	5
Dode bomen in het bos moeten worden opgeruimd.	1	2	3	4	5
De mens mag de natuur gebruiken zoals hij zelf wil.	1	2	3	4	5
De mens moet de natuur soms helpen, door bijvoorbeeld in koude winters wilde dieren te voeren.	1	2	3	4	5
De natuur is minder kwetsbaar dan sommige denken.	1	2	3	4	5
Bermen langs de weg moeten netjes gemaaid worden.	1	2	3	4	5
Hoe langer een natuurgebied door de mens met rust is gelaten, des te groter is de waarde van dit gebied.	1	2	3	4	5
Hoogspanningsmasten (elektriciteitsmasten) en windturbines (moderne windmolens) maken natuurgebieden minder waardevol.	1	2	3	4	5
Vindt u het beschermen van agrarisch (landbouw) landschap belangrijk?	1	2	3	4	5
Het verbouwen van gewassen en het houden van vee hoort bij natuur	1	2	3	4	5

Een gebied is pas echt een natuurgebied als de mens er geen invloed op uitoefent	1	2	3	4	5
Grond dat vooral gebruikt wordt om voedsel te produceren is per definitie geen natuur	1	2	3	4	5
Natuurgebieden zijn er vooral voor de mens om te recreëren	1	2	3	4	5
Natuur zou moeten worden gestuurd en gereguleerd door de mens	1	2	3	4	5

19. Wanneer vindt u natuur het mooist?

- Natuur moet ruig zijn
- Natuur moet romantisch zijn
- Natuur moet duidelijk in gebruik staan van de mens
- Anders, namelijk

20. Als u natuur bezoekt, welke aspecten zijn dan voor u van belang? U mag meerdere antwoorden aankruisen.

- Het moet er rustig zijn
- Het moet er avontuurlijk zijn
- Het moet er zo natuurlijk/puur mogelijk zijn
- De natuur moet mooi zijn
- Je moet niet gestoord worden door andere recreanten
- Ik moet overal mogen lopen
- Er moeten recreatie- en horecavoorzieningen zijn
- Anders, namelijk.....

21. Vindt u het beschermen van natuur belangrijk?

Helemaal niet belangrijk 1 2 3 4 5 Heel erg belangrijk

Wanneer u bij vraag 21 antwoord 1 of 2 heeft aangekruist, is de enquête voor u afgelopen.

Wij bedanken u voor uw medewerking!

Wanneer u bij vraag 21 antwoord 3,4 of 5 heeft ingevuld gaat u door naar vraag 22 op de volgende pagina.

22. De natuur op Terschelling moet beschermd worden omdat:

	Helemaal mee oneens			Helemaal mee eens	
... ik mij er op mijn plek voel	1	2	3	4	5
... de mens er goed gebruik van kan maken	1	2	3	4	5
... de natuur erg aantrekkelijk is	1	2	3	4	5
... het samenspel tussen natuur en landbouw zo mooi is	1	2	3	4	5
... de natuur vanuit zichzelf mooi is	1	2	3	4	5

23. Natuurontwikkeling...

	Helemaal mee oneens			Helemaal mee eens	
... mag altijd	1	2	3	4	5
... mag ten koste gaan van cultureel erfgoed	1	2	3	4	5
... mag ten koste gaan van landbouw	1	2	3	4	5
... mag ten koste gaan van recreatie	1	2	3	4	5
... mag niet. Natuur moet de vrije hand krijgen	1	2	3	4	5

HARTELIJK DANK VOOR UW TIJD!

Appendix II . Flyer GPS Application

Uitleg GPS-applicatie

Deze flyer geeft uitleg over het gebruik van de Applicatie, behorende bij het onderzoek naar landschapsvoorkeuren en natuurbeelden op Terschelling. Deze applicatie houdt uw route bij en u kunt een foto uploaden van het hoogtepunt van uw route.

Hoe verloopt het onderzoek?

Wanneer u gaat recreëren zet u de applicatie aan en start u de opname. De applicatie volgt waar u bent en werkt het beste als u uw smartphone in uw jas- of broekzak heeft zitten. Op een plek die u erg mooi vindt, kunt u een foto uploaden. Als u klaar bent met recreëren stopt u de opname en stuurt u deze op. Deelname aan dit onderzoek is op vrijwillige basis en op eigen risico.

Hoe werkt de applicatie?

De applicatie werkt alleen op een Android-device. Alleen het downloaden van de applicatie en het verzenden van de verkregen route verbruikt data. Het gebruik van GPS kost u geen internetdata. U kunt de applicatie downloaden via de volgende link: www.greentracker.nl/download

Het kan zijn dat uw smartphone een melding geeft dat u uw instellingen dient te wijzigen, maar dat niet gegarandeerd kan worden dat de te downloaden applicatie veilig is. Dit komt doordat de applicatie niet via GooglePlay wordt verschaft. De applicatie is echter wel veilig voor uw telefoon.

1. Zet uw GPS aan en wacht op verbinding
2. Start de applicatie (er opent zich een kaart op uw scherm)
3. Druk 'Menu'
4. Druk 'Opnemen'
5. Druk 'Start opnemen'
6. Er komt een melding om een naam in te vullen. Vul de volgende naam in:
Terschelling2015nr(*uw respondentnummer, zie onderaan deze pagina*)
Voorbeeld: Respondent nummer 1 heeft als naam: Terschelling2015nr1
7. Druk op 'ok'. Uw route wordt nu opgenomen

Als u tussendoor een foto wilt uploaden, doet u het volgende:

1. Druk op 'Menu'
2. Druk op 'maak notitie'
3. Druk op 'Neem foto'
4. Maak een foto van het hoogtepunt van uw route
5. Druk op 'Opslaan'. Uw foto is toegevoegd aan uw route

Z.O.Z

Als u klaar bent met uw route, doet u het volgende om te stoppen met het opnemen van uw route en deze aan ons te versturen:

1. Druk op 'Menu
2. Druk op 'Opnemen'
3. Druk op 'Stop opnemen'
4. Druk op 'Menu'
5. Druk op 'Deel route'. U kunt nu de naam van de route controleren. Deze dient te zijn: Terschelling2015nr (*uw respondentnummer. Zie onderaan de pagina*). Het e-mailadres wat u hier dient in te vullen is: Terschelling2015@gmail.com.
6. Druk op 'OK'. Uw route wordt nu aan ons verzonden.
7. U kunt nu de applicatie afsluiten en deze van uw telefoon verwijderen.

Wij danken u zeer voor uw bijdrage aan ons onderzoek en wensen u nog een prettig verblijf op Terschelling.

Voor vragen kunt u ons mailen: terschelling2015@gmail.com of bellen op 0643791860

Met vriendelijke groet,
Dorien Cramer
Liesbeth de Vries

Uw respondentnummer is:



Appendix III . Statements for defining perceptions of nature

In the next three tables for each nature image the statements are gathered that were used in order to define a respondent's nature image. The statements originate from the survey, which was spread in Dutch. Therefore the statements remain in Dutch as translation might lead to transformation of the meaning of the statements. The second column explains why the statement is of importance in determining the nature images. In the third column the score is shown that a respondent had to reach in order to score a point on the statement. The scores shown in the third column stand for: *1: Totally not agree, 2: Not agree, 4: Agree, 5: Totally agree.*

Wilderness view

Statement	Explanation	Score
Dode bomen moeten worden opgeruimd	The idea that people with the wilderness view like nature rough and therefore dead trees should be left in nature and not cleaned up.	1 / 2
De mens moet de natuur soms helpen door bijvoorbeeld in koude winters wilde dieren bij te voeren	A core idea within the wilderness view is that nature should be left without human interference as much as possible. Feeding animals conflicts with this idea.	1 / 2
Hoe langer een natuurgebied door de mens met rust is gelaten, des te groter is de waarde van dit gebied	Agreeing with this statement is in line with the core value that nature should be without human interference.	4 / 5
Hoogspanningsmasten (elektriciteitsmasten) en windturbines (moderne windmolens) maken natuurgebieden minder waardevol	People with a wilderness view should agree with this statement as the visible and physical interference of human life within nature areas	4 / 5
Het verbouwen van gewassen en het houden van vee hoort bij de natuur	Nature should be in this view as rough and influenced free as possible. Agriculture conflicts with this.	1 / 2
Een gebied is pas echt een natuurgebied als de mens er geen invloed op uitoefent	Agreeing with this statement fits the core view of the wilderness view	4 / 5
Grond dat vooral gebruikt wordt om voedsel te produceren is per definitie geen natuur	Nature in the wilderness perspective is in contrast with agricultural functions. People with a wilderness view therefore should agree with this statement.	4 / 5
Natuur zou moeten worden gestuurd en gereguleerd door mensen	Nature should be without human influence and interference according to the wilderness view.	1 / 2
Real nature: Moerassen	Swamps are seen as wild and pure and have been existing before human kind.	4 / 5
Real nature: Overstromingen	Floods can be seen as wild powers of nature.	4 / 5

Natuurontwikkeling mag niet. Natuur moet de vrije hand krijgen	Agreeing with this statements underlines the idea of a lack of human interference.	4 / 5
-----------------------------------------------------------------------	------------------------------------------------------------------------------------	-------

Functional view

Statement	Explanation	Score
Dode bomen moeten worden opgeruimd	People should be able to make good use of nature according to the functional view.	4 / 5
De mens mag de natuur gebruiken zoals hij zelf wil	Nature is in use of human beings according to the functional view therefore the usage is up to humans.	4 / 5
Bermen langs de weg moeten netjes gemaaid worden	By mowing the roadsides, the environment becomes safer and easier in use for humans.	4 / 5
Hoogspanningsmasten (elektriciteitsmasten) en windturbines (moderne windmolens) maken natuurgebieden minder waardevol	Disagreeing with this statement is in line with the functional view. These features are important to humans and do not make the landscape less valuable.	1 / 2
Het verbouwen van gewassen en het houden van vee hoort bij de natuur	Nature should be at service of humans according to this view. Agriculture serves humans and is therefore in line with this perspective.	4 / 5
Een gebied is pas echt een natuurgebied als de mens er geen invloed op uitoefent	Nature should be in use of human beings according to the functional view. People with a functional view should thus disagree with this statement.	1 / 2
Grond dat vooral gebruikt wordt om voedsel te produceren is per definitie geen natuur	Nature is a resource to humans, people with a functional view should not agree with this statement.	1 / 2
Natuurgebieden zijn er vooral voor de mens om te recreëren	This is the core value of the functional view, as nature should be in function of humans.	4 / 5
Natuur zou moeten worden gestuurd en gereguleerd door mensen	Agreeing is in line with this view. As regulated nature is easier in use.	4 / 5
Real nature: Grote maïsvelden	Cornfields are of use to humans, agreeing with this statement is therefore in line with this use	4 / 5
Real nature: Kamerplanten	Plants for in houses are purely in use of humans as for instance decoration.	4 / 5
Real nature: Stadparken	City parks not only in use of men but also specifically created and given that function by humans.	4 / 5
Real nature: Een boer op zijn tractor	Agriculture stands for the use of nature and nature	4 / 5

	being a resource to humans	
De natuur op Terschelling moet beschermd worden omdat de mens er goed gebruik van kan maken	This is one of the core views within the functional perception therefore it is necessary to agree with this statement	4 / 5
Natuurontwikkeling mag ten koste gaan van landbouw	Disagreeing with this statement is in line with this view as nature should be in use of human and their actions. Agriculture is a providing resource to humans.	1 / 2
Natuurontwikkeling mag ten koste gaan van recreatie	Disagreeing with this statement is in line with the functional view, as nature should be in use of men such as recreation.	1 / 2

Arcadian view

Statement	Explanation	Score
Hoogspanningsmasten en windturbines maken natuurgebieden minder waardevol	Wind turbines and power pylons interrupt the landscape and are not in line with the rural idyll represented by the Arcadian view.	4 / 5
Vindt u het beschermen van agrarisch landschap belangrijk?	Rural features in the landscape are in line with the Arcadian view, therefore it is necessary to agree with this statement.	4 / 5
Het verbouwen van gewassen en het houden van vee hoort bij de natuur	Agreeing with this statement is in line with the Arcadian view, rural and agricultural aspects are an important feature of this view.	4 / 5
Grond dat vooral gebruikt wordt om voedsel te produceren is per definitie geen natuur	The combination of nature and humans in an idyllic sense is centre to the Arcadian view. Therefore people with this view should disagree with this statement.	1 / 2
Natuurgebieden zijn er vooral voor de mens om te recreëren	People should experience nature, therefore this is in line with the Arcadian view.	4 / 5
De natuur op Terschelling moet beschermd worden omdat het samenspel tussen natuur en landbouw zo mooi is	The link between rural / agricultural life and nature is in line with the Arcadian view. Agreeing with this statement fits this view	4 / 5
De natuur op Terschelling moet worden beschermd omdat de natuur erg aantrekkelijk is	The beauty of nature should in this view be experienced by humans. The romantic idyll.	4 / 5
De natuur op Terschelling moet worden	The beauty of nature should in this view be	4 / 5

beschermd omdat de natuur vanuit zichzelf zo mooi is	experienced by humans. Agreeing is therefore in line with this view.	
Real nature: Oude boerderijen	This fits the idea that is linked to this view of the rural idyll. Old farms especially fit the romantic perspective of old times.	4 / 5
Real nature: Stadparken	The city parks are often created in more previous times and can be linked to the aesthetics and the idealization of nature.	4 / 5
Real nature Een boer op zijn tractor	The farmer who is working on the land fits the Arcadian idea of rural life.	4 / 5
Natuurontwikkeling mag ten koste gaan van landbouw	The rural (and Agricultural life) are core values of the Arcadian view. Therefore people with this view should not agree with this statement.	1 / 2
Natuurontwikkeling mag ten koste gaan van cultureel erfgoed	Cultural heritage often represent previous times as in many cases also the old farm lands and farms. This matches the idealization of earlier rural life.	1 / 2

Appendix IV. Syntax

If (StelNat1 < 3) wdStelNat1e = 1.
If (StelNat1 > 2) wdStelNat1e = 0.
If (StelNat3 < 3) wdStelNat3e = 1.
If (StelNat3 > 2) wdStelNat3e = 0.
If (StelNat6 > 3) wdStelNat6e = 1.
If (StelNat6 < 4) wdStelNat6e = 0.
If (StelNat7 > 3) wdStelNat7e = 1.
If (StelNat7 < 4) wdStelNat7e = 0.
If (StelNat9 < 3) wdStelNat9e = 1.
If (StelNat9 > 2) wdStelNat9e = 0.
If (StelNat10 > 3) wdStelNat10e = 1.
If (StelNat10 < 4) wdStelNat10e = 0.
If (StelNat11 > 3) wdStelNat11e = 1.
If (StelNat11 < 4) wdStelNat11e = 0.
If (StelNat13 < 3) wdStelNat13e = 1.
If (StelNat13 > 2) wdStelNat13e = 0.
If (EchNat1 > 3) wdEchNat1e = 1.
If (EchNat1 < 4) wdEchNat1e = 0.
If (EchNat3 > 3) wdEchNat3e = 1.
If (EchNat3 < 4) wdEchNat3e = 0.
If (NatOntw5 > 3) wdNatOntw5e = 1.
If (NatOntw5 < 4) wdNatOntw5e = 0.
Execute.

Compute ewdscore = (wdStelNat6e + wdStelNat7e + wdStelNat9e + wdStelNat10e + wdStelNat11e + wdStelNat13e + wdStelNat1e + wdStelNat3e + wdEchNat1e + wdEchNat3e + wdNatOntw5e)/11.
Execute.

If (StelNat1 > 3) fuStelNat1e = 1.
If (StelNat1 < 4) fuStelNat1e = 0.
If (StelNat2 > 3) fuStelNat2e = 1.
If (StelNat2 < 4) fuStelNat2e = 0.
If (StelNat5 > 3) fuStelNat5e = 1.
If (StelNat5 < 4) fuStelNat5e = 0.
If (StelNat7 < 3) fuStelNat7e = 1.
If (StelNat7 > 2) fuStelNat7e = 0.
If (StelNat9 > 3) fuStelNat9e = 1.
If (StelNat9 < 4) fuStelNat9e = 0.
If (StelNat10 < 3) fuStelNat10e = 1.
If (StelNat10 > 2) fuStelNat10e = 0.
If (StelNat11 < 3) fuStelNat11e = 1.
If (StelNat11 > 2) fuStelNat11e = 0.

If (StelNat12 > 3) fuStelNat12e = 1.
 If (StelNat12 < 4) fuStelNat12e = 0.
 If (StelNat13 > 3) fuStelNat13e = 1.
 If (StelNat13 < 4) fuStelNat13e = 0.
 If (EchNat2 > 3) fuEchNat2e = 1.
 If (EchNat2 < 4) fuEchNat2e = 0.
 If (EchNat4 > 3) fuEchNat4e = 1.
 If (EchNat4 < 4) fuEchNat4e = 0.
 If (EchNat6 > 3) fuEchNat6e = 1.
 If (EchNat6 < 4) fuEchNat6e = 0.
 If (EchNat7 > 3) fuEchNat7e = 1.
 If (EchNat7 < 4) fuEchNat7e = 0.
 If (BesWant2 > 3) fuBesWant2e = 1.
 If (BesWant2 < 4) fuBesWant2e = 0.
 If (NatOntw3 < 3) fuNatOntw3e = 1.
 If (NatOntw3 > 2) fuNatOntw3e = 0.
 If (NatOntw4 < 3) fuNatOntw4e = 1.
 If (NatOntw4 > 2) fuNatOntw4e = 0.
 Execute.

Compute efuscore = (fuStelNat1e + fuStelNat2e + fuStelNat5e + fuStelNat7e + fuStelNat9e +
 fuStelNat10e + fuStelNat11e + fuStelNat12e + fuStelNat13e + fuEchNat2e + fuEchNat4e + fuEchNat6e
 + fuEchNat7e + fuBesWant2e + fuNatOntw3e + fuNatOntw4e)/16.
 Execute.

If (BesWant4 > 3) arcBesWant4e = 1.
 If (BesWant4 < 4) arcBesWant4e = 0.
 If (BesWant3 > 3) arcBesWant3e = 1.
 If (BesWant3 < 4) arcBesWant3e = 0.
 If (BesWant5 > 3) arcBesWant5e = 1.
 If (BesWant5 < 4) arcBesWant5e = 0.
 If (NatOntw2 < 3) arcNatOntw2e = 1.
 If (NatOntw2 > 2) arcNatOntw2e = 0.
 If (NatOntw3 < 3) arcNatOntw3e = 1.
 If (NatOntw3 > 2) arcNatOntw3e = 0.
 If (EchNat5 > 3) arcEchNat5e = 1.
 If (EchNat5 < 4) arcEchNat5e = 0.
 If (EchNat6 > 3) arcEchNat6e = 1.
 If (EchNat6 < 4) arcEchNat6e = 0.
 If (EchNat7 > 3) arcEchNat7e = 1.
 If (EchNat7 < 4) arcEchNat7e = 0.
 If (StelNat7 > 3) arcStelNat7e = 1.
 If (StelNat7 < 4) arcStelNat7e = 0.
 If (StelNat8 > 3) arcStelNat8e = 1.
 If (StelNat8 < 4) arcStelNat8e = 0.

If (StelNat9 > 3) arcStelNat9e = 1.
If (StelNat9 < 4) arcStelNat9e = 0.
If (StelNat11 < 3) arcStelNat11e = 1.
If (StelNat11 > 2) arcStelNat11e = 0.
If (StelNat12 > 3) arcStelNat12e = 1.
If (StelNat12 < 4) arcStelNat12e = 0.
Execute.

Compute earcscore = (arcBesWant4e + arcBesWant3e + arcBesWant5e + arcNatOntw2e +
arcNatOntw3e + arcEchNat5e + arcEchNat6e + arcEchNat7e + arcStelNat7e + arcStelNat8e +
arcStelNat9e + arcStelNat11e + arcStelNat12e)/13.
Execute.