Tourist segments for new facilities in national park areas:

Profiling tourists in Norway based on psychographics and demographics

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Abstract

The pursuit of sustainable tourism may involve development of more facilities in the buffer zones of national parks and other pristine nature areas. Two independent samples of domestic and foreign tourists in Norway were segmented based on expressed preferences for a diversity of new facilities in an alpine national park region, all facilities potentially with different impacts on the natural habitat. One sample was recruited inside the alpine area, the other outside.

Post hoc market segmentation was carried out using a combined two-stage hierarchical and non-hierarchical clustering of facility quest factors identified from a set of survey items. We assessed stability of the clusters by comparing independent sample solutions against the pooled sample and further assessing the extent to which the clusters differed with respect to demographic or psychographic characteristics.

Keywords: cluster analysis, market segmentation, sustainable tourism, two-stage clustering

Introduction

The tourism sector experienced substantial growth in the second half of the 20th and beginning of the 21st century (Oh et al., 1995; Gibson and Yannakis, 2002; UNWTO, 2013), with the nature-based segment the most rapidly expanding market (Nyaupane et al., 2004; Mehmetouglu, 2007). Moreover, tourists have become more sophisticated and heterogenous in regard to activity organisation and facilitation (Gibson & Yannakis, 2002; Pulido-Fernández & Sánchez-Rivero, 2010). In creating both challenges and opportunities for tourism business development and for the natural environment (Fredman & Tyrväinen, 2010), the need for more knowledge and a better understanding of the expectations of different tourists can lead to more effective management and improved marketing strategies (Lang & O'Leary, 1997; Park and Yoon, 2009). One particular area of research is the identification of environmentally friendly or nature-based tourists (Formica & Uysal, 2002; Dolnicar et al., 2008; Mehmetoglu, 2007). These tourists often direct their interests towards protected areas such as national parks, which have become major attractions (Reinius & Fredman, 2007) and icons (Boyd 2004: p. 473) for nature-based tourists in many countries (Balmford et al., 2009; Wray et al., 2010). In-depth insight into the characteristics of the demand for national park visitation is needed in order to build up adequate visitor strategies for national parks (Kajala et al., 2007). More knowledge about park visitors and their facility demand will also provide better fundament for developing new nature-based tourism products that can potentially generate local jobs and income in rural regions facing decline in primary sectors and in the number of inhabitants (Lundmark, 2005; Niedomysl & Amcoff, 2011).

In this paper, we present a market segmentation analysis of domestic and foreign tourists in Norway based on their expressed preferences for new facilities in an alpine national park region. The proposed facilities comprise a diversity of types and sizes, all potentially with different impacts on the natural habitat. The use of facility quest as clustering variables is close to the benefit segmentation idea of Haley (1968) focusing on the benefits that people seek in their consumption, which in our case is visiting alpine national park areas in Norway. One topic of interest was the extent

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to which measures of environmental friendliness differed between visitor segments. A main purpose of our paper was to test post hoc market segmentation with the same set of clustering variables between two independent visitor samples, one recruited when leaving Norway by ferry, the other when visiting one of the alpine national park areas. Segmentation was carried out using a combined (two-stage) hierarchical (Ward, to define the number of clusters) and non-hierarchical (partitioning method) clustering (k-means, to actually form these clusters) based on facility quest factors identified from a set of survey items. Stability of the cluster solutions was assessed by comparing independent sample solutions against the pooled sample, a re-drawn sample, and a split sample, as well as varying clustering variables and clustering method. Moreover, we tested the extent to which the segments differed with respect to demographic or psychographic characteristics.

Literature review

National parks as tourism attractions

The shaping of national parks was, from the very outset in the 19th century, to a large extent justified by the parks' social functions (Hall & Frost, 2009, p. 308), i.e. to fulfil the needs of humans searching for unique nature experiences and outstanding landscapes. Protected areas thus served the dual function of conservation of nature and nature-based tourism / outdoor recreation (Sharpley & Sharpley, 1997). After some decades focussing ecological protection as the principal objective of national parks (Eagles & McCool, 2002, p. 22), social and recreational objectives have been reintegrated into the park idea (Hall & Frost, 2009, Reinius, 2009), raising once again the profile and importance of tourism in protected areas (Zachrisson, 2009).

The national parks in Norway (the first, Rondane National Park, established in 1962) have traditionally had a 'wilderness' character (Holt-Jensen, 1978), with little emphasis on active management and care of facilities and services (Haukeland & Lindberg, 2001). Since the millennium, a shift in national policies can be observed and several political initiatives have underlined the wish to develop sustainable tourism in the protected areas (Ministry of Finance, 2003; Ministry of Industry and Trade, 2005). Park visitation and more nature-based tourism product developments can potentially generate local jobs and income, and sustainable tourism therefore represents a way of stemming the aging and outmigration of the resident populations (Niedomysl & Amcoff, 2011). Sustainable tourism strategies need to be based on better knowledge and understanding of the nature-based tourism market in order to develop adequate facilities and services in and around the national parks (Kajala et al., 2007) and thereby potentially sustain affected rural communities. Application of various market segmentation approaches can contribute to enhancing knowledge of the nature-based tourism market.

Market segmentation approaches

Market segmentation is the division of a heterogeneous market into a number of smaller and more homogeneous submarkets (Smith, 1956; Park & Yoon, 2009). It can be assumed that even nature-oriented tourists have fairly heterogeneous preferences and therefore have different demands. There are two essential methodological approaches to market segmentation in the literature; *a priori* (or common sense) and *a posteriori* (*post hoc*, or data-driven). The former utilises pre-defined segments or criteria, and is conceptual and typological in the sense that the criteria for grouping the respondents are known beforehand and are thus the starting point (Plog, 1974; Dolnicar, 2008); the latter are empirically-driven by the collected data (Bailey, 1994; Dolnicar, 2002, 2008).

There are various approaches in post hoc segmentation, with factor and clustering techniques used frequently. In 2002, Dolnicar reviewed data-driven market segmentation in tourism, and outlined critical issues that often lead to overestimation of the validity in cluster analysis (e.g. choice of algorithm, number of clusters, algorithm parameters, optimal ratio of variables to sample size, and so on). Pulido-Fernández & Sánchez-Rivero (2010) focused on a criterion that would ensure the usefulness of the segments obtained, namely that a segment should be identifiable and targetable, and implied that differentiation with respect to observable tourist characteristics was needed. Clustering algorithms had to be assessed carefully and the clustering/segmentation process repeated and re-evaluated if stable clustering solutions were to be obtained (Dolnicar, 2002).

One specific approach to post hoc segmentation is two-stage clustering, i.e. combining Ward's hierarchical method for defining the appropriate number of clusters with the non-hierarchical *k*-means method (Mazzocchi, 2008; Burns & Burns, 2008; see also Milligan & Cooper, 1985; Dimitriadou et al., 2002). An alternative approach is the two-step clustering of the SPSS statistical package (SPSS, 2001), which combines partitioning and hierarchical clustering (Mooi & Saarstedt,

2011) and is founded on a clustering algorithm presented by Zhang et al. (1996). The two-*step* clustering method should not be confused with the two-*stage* approach (of Ward and *k*-means).

Selecting clustering variables in post hoc market segmentation

An important research task for the tourism business is in obtaining the most appropriate and effective basis for market segmentation (Lang & O'Leary, 1997). This includes characteristics such as: demographics (e.g. gender, age, nationality, education and income), geographic location (country of origin), behaviour (e.g. activities, choices, habits) and psychographic identification (e.g. motivations, attitudes, beliefs) (Park and Yoon, 2009; Pulido-Fernández & Sánchez-Rivero, 2010). Formica & Uysal (2002) carried out market segmentation on the basis of the new ecological paradigm (Dunlap et al., 2000), dividing their sample into three segments: conservationist, anthropocentric and optimist. Mehmetoglu (2007) segmented nature-based tourists by their activities, finding three clusters: "nature activity oriented", "culture and pleasure activity oriented", and "low activity oriented". He found only minor differences in terms of demographic and travel characteristics between the segments, but noticed that the "nature-activity oriented" segment had higher household income. Dolnicar et al. (2008) reviewed the literature on environmentally friendly tourist profiles, finding 14 demographic, travel-related and psychographic characteristics: middle age or older, female, higher education, high income, professional occupation, high expenditure, physically active, adventure-seeking, interest in learning, interest in culture, willing to forego comfort, environmental awareness, environmental concern, and health concern.

Segmentation on the basis of tourists' quest for facilities comes close to traditional benefit segmentation (Haley, 1968), as well as yields targetable differentiation of homogeneous submarkets (Kamakura & Novak, 1992; Madrigal & Kahle, 1994). Segmentation based on the respondent's quest for facilities may apply items/variables such as the quest for tourist facilities (QTF) scale proposed by Haukeland et al. (2010), to some extent building on survey elements related to visitor preferences

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monitoring applied in a Nordic nature tourism context (Kajala et al., 2007). Haukeland et al. (2010, 2013) identified four dimensions based on their set of facility quest items using exploratory and confirmatory factor analysis: "Tracks and signposts", "infrastructure and service", "food and accommodation" and "tours and interpretation".

Profiling identified market segments

The use of demographics as clustering variables in post hoc segmentation has been questioned (Madrigal & Kahle, 1994; McCleary & Choi, 1999; Park & Yoon, 2009; Mehmetoglu et al., 2010), but this is needed in profiling identified segments for targeting by marketing (Madrigal & Kahle, 1994; Pulido-Fernández & Sánchez-Rivero, 2010). Psychographic characteristics might also be relevant in profiling identified market segments. Personal values and attitudes influence behaviour and can explain the expressed demand for facilities and tourist behaviour (Kamakura & Mazzon, 1991; Muller, 1991; Kamakura & Novak, 1992; Madrigal & Kahle, 1994; Mehmetoglu et al., 2010). Identified values, beliefs or attitudes might also serve as clustering variables (Kamakura & Mazzon, 1991; Muller, 1991; McCleary & Choi, 1999; Formica & Uysal, 2002; Mehmetouglu *et al.*, 2010). Personal values can be defined as concepts or beliefs about desirable end states or behaviours that transcend specific situations, guide selection or evaluation of behaviour and events, and are ordered by relative importance (Schwartz & Bilsky, 1987).

Segments with different values may have different attributes for a destination or product (Muller, 1991; McCleary & Choi, 1999). Viewing nature orientations as part of tourist values can be applied in order to obtain an understanding of the quest for facilities. Haukeland et al. (2010) identified the following four nature orientation dimensions applying explorative factor analysis (see also Haukeland et al., 2013, p. 295): "*Inspiration*" (the appreciation of nature and landscape as personal stimulation), "*Recreation*" (the enjoyment of serenity and undisturbed quality of nature),

"*Challenge*" (the search for demanding physical activities) and "*Sightseeing*" (the pursuit of touring

and comfort).

Material and methods

Data from two independent visitor surveys

Two datasets are combined for our analysis, the first based on a survey among German, Dutch and Danish motor tourists leaving Norway by ferry during the summer of 2008 (Haukeland et al., 2010), the second on a survey of tourists, foreign and Norwegian, recruited in the Nord-Gudbrandsdal region during the summer of 2009 and followed-up in an Internet-based survey in the winter of 2009/2010 (Haukeland et al., 2013). Similar questions in each dataset about quests for facilities enabled comparison of post hoc market segmentation and the same clustering variables between the two samples. Also included were questions about nature orientations, as well as similar registration of demographics and trip characteristics, e.g. whether national parks in Norway had been visited, most of which are alpine (Figure 1).

(i) The first dataset – foreign motor tourists leaving Norway by ferry: The 2008 sample comprised Danish, German and Dutch ferry passengers leaving Norway on seven out of eight international lines and at four Norwegian harbours (Oslo, Bergen, Kristiansand and Langesund). The chosen category of foreign motor tourists made up approximately a quarter of all guest nights by international summer holiday visitors in Norway in 2008 (Rideng & Grue, 2008). Nineteen departures dispersed throughout the summer season were included in the final sample. A total of 1,048 motor tourists were asked to take part in the survey and 986 completed questionnaires were collected, i.e. a response rate of 95%. Self-administered fill-in questionnaires handed out to motorists waiting in line in their vehicles to embark the ferry, taking 20-30 minutes to complete, were collected by a trained staff of interviewers (Haukeland et al., 2010). A pilot test of the sampling procedure and questionnaire was carried out among a small number of Danish motor tourists in May 2008, and thereafter the final version of the Danish version of the questionnaire was translated into Dutch and German.

(ii) The second dataset – domestic and foreign tourists in an alpine national park region: The 2009/2010 sample comprised tourists of all nationalities recruited in the Northern Gudbrandsdal region, a main alpine national park area in the central part of Southern Norway, with six parks within the region (Figure 2). Approximately 60% were recruited using stratified sampling along the six main roads out of the Northern Gudbrandsdal region in the period end June until end September, 2009, on 18 rotating weekdays. Only 2% of the tourists refused to be recruited at this stage. The remaining 40% were recruited at 42 hotels and other accommodations in the region (out of 84 firms approached for this purpose), using similar recruiting forms. These latter participants can be characterised as self-selected. Both approaches provided an introduction to the project in six languages (English, German, Dutch, Swedish, Danish and Norwegian). A total of 2,719 email addresses were collected, and, adjusting for illegible and undeliverable addresses, 2,510 tourists were reached for the follow-up Internet survey during the winter of 2009/2010, in Norwegian, German (for those residing in Germany, Austria and Switzerland) or English (for all other nationalities). The response rate at this stage was 52.5% (1,318), while 41.4% (1,038) completed the whole survey; with 760 of them answering the questions related to facility quest (while the remaining 278 answered other questions and are deleted from our study). Of the 760, two-thirds resided in Norway, 14% in Germany, 6% in the Netherlands, 2% each in Denmark and in Sweden, the remaining 8% primarily living in another European country.[1]

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[1] Owing to a delay in development of the internet-based survey (using SPSS Dimensions), a planned pilot test was cancelled. However, a small pre-test among project partners was carried out in the autumn of 2009, when considerable parts of the questionnaire were nearly identical to the first dataset, from 2008, or copied from former visitor surveys carried out at the Institute of Transport Economics (Rideng & Grue, 2008). Some small adjustments were made related to the remainders, these primarily amending the allocation to special treatments/questions and eliminating some questions (about transport and expenditure, use of information/media, activities in the national parks, and or expectations/satisfaction) for the sake of shortening

Figure 1

Figure 2

Table 1

Questionnaires and utilisation of scales

The respondents' *quest for facilities* in and around Norwegian national parks was measured by a range of questions listed in batteries and presented on a five-point Likert scale ranging from 1, "not important", to 5, "very important" (Haukeland et al. 2010). Table 1 is the confirmatory factor analysis of the facility quest items for the 2008 (i) and 2009 (ii) data (Haukeland et al., 2013) separately. In the 2008 foreign ferry-based sample, tracks & signposts explained 37.9% of the variance (10 items, construct reliability 0.83), infrastructure & service 9.6% (7 items, construct reliability 0.76), food & accommodation 7.1% (4 items, construct reliability 0.77), and tours & interpretation 5.7% (5 items, construct reliability 0.72). In the 2009 national and foreign Nord-Gudbrandsdal sample, infrastructure & service explained 33.9% of the variance (7 items, construct reliability 0.84), tracks & signposts 9.1% (6 items, construct reliability 0.80), tours & interpretation 7.4% (6 items, construct reliability 0.74), and food & accommodation 6.9% (4 items, construct reliability 0.76) (Haukeland et al., 2013).[2] Both surveys included social background characteristics such as the respondent's

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the response task. None of the eliminated questions relate to the factors and characteristics analysed in this study.

[2] Haukeland et al. (2010) concluded, based on the 2008 foreign ferry-based sample, that there is market potential for developing a number of facilities inside and outside national parks, and that the segments differ in quest for facilities. Based on a *k*-means clustering analysis, they found that the largest market segment

nationality, level of income (qualitatively), level of education, age and gender. Questions covering the *nature orientation* of respondents were also listed in batteries and presented on a five-point Likert scale ranging from 1, "not important", to 5, "very important". The four dimensions identified by factor analysis are termed here "*Inspiration*", "*Recreation*", "*Challenge*" and "*Comfort*" ("Sightseeing"), following Haukeland et al. (2010, 2013). The most important items of the "*Inspiration*" dimension were "obtaining a deeper connection in life", "experiencing nature's magic and mysticism", "finding inspiration in natural surroundings", "feeling connectedness with landscape and nature" and "attaining a feeling of freedom". Within the "*Recreation*" dimension, the most important items were "experiencing tranquillity and peacefulness" and "fresh air, clean water and an unpolluted environment". The important items for the "*Challenge*" dimension were "searching for challenges with a certain risk" and taking an interest in "demanding physical activities in nature". Finally, within the "*Comfort*" dimension the most important item was the enjoyment of "comfort in natural surroundings", while "closeness to co-travellers" and "sightseeing" interests were also important (Haukeland et al., 2013).

In the 2008 foreign ferry-based sample, "inspiration" explained 37.9% of the variance (11 items, construct reliability 0.88), "recreation" 7.2% (6 items, construct reliability 0.87), "challenge" 6.4% (4 items, construct reliability 0.45), and "sightseeing" ("comfort") 5.0% (3 items, construct reliability 0.38). In the 2009 national and foreign Nord-Gudbrandsdal sample, "inspiration" explained 40.0% of the variance (10 items, construct reliability 0.88), "recreation" 8.2% (11 items, construct reliability 0.85), "challenge" 6.6% (2 items, construct

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demanded all types of facilities, and was the only segment that showed any interest for "Infrastructure & service". One segment did not want any type of facilities, particularly not "Infrastructure & service". The two remaining segments preferred either "Tours & interpretation" in combination with "Food & accommodation" or in combination with "Tracks & signposts".

reliability 0.86), and "comfort" 5.5% (3 items, construct reliability 0.50). Most items were significant at the 0.001 level (Haukeland et al., 2013).

Clustering algorithms applied

The main approach selected was two-stage clustering, first applying the hierarchical Ward method (for setting the number of clusters) and then the partitioning k-means method (for forming the given number of clusters). The main clustering variables were the four principal components (factors) identified from the QTF items, where the same four factors had been identified in both datasets: "Tracks and signposts", "infrastructure and service", "food and accommodation" and "tours and interpretation" (Haukeland et al., 2010). Identification of cluster number was based on assessment of the agglomeration coefficients from Ward, such that the number of clusters was based on identifying a demarcated change in the agglomeration coefficients, counting from the last step of the agglomeration (Burns & Burns, 2008, p. 561). This is a simple "elbow test" from which a cluster number can be set. Ward clustering was first carried out separately for the two datasets, applying the four principal components of QTF as clustering variables, which yielded a cluster number of 4 (or possibly 5) for the first dataset (i) and 5 for the second (ii). The same Ward clustering was then carried out on the joint dataset, which yielded a cluster number of 4 (or possibly 5), just like the foreign ferry-travelling tourist dataset. The k-means method was then applied for forming the given number of clusters, for the separate datasets as well as for the joint dataset. We tested for differences between the clusters (segments) with respect to nature orientations, demographics and trip-related characteristics (based on ANOVA).

These two-stage factor-cluster solutions were also validated by re-clustering of split samples (2×2), respectively of dataset (i) and of dataset (ii), and of redrawn samples of equal

sizes (2×1) as the original datasets (i) and (ii), with, respectively, 711 and 760 observations

(similar to the procedure described by Haukeland et al. 2010).

The identified clusters (segments) using QTF factors as clustering variables in a two-stage clustering approach

Tables 2a and 2b give the mean values of the clustering variables (QTF factors) as well as of various demographic, trip-related and psychographic characteristics for datasets (i) and (ii). As there was an "elbow" for either four or five clusters in dataset (i), based on the Ward clustering, we present five-cluster solutions, as these were also indicated for dataset (ii). Moreover, ANOVA indicated just as good differentiation between five clusters as between four for dataset (i). The *k*-means clustering was applied for forming the clusters, thus allocating the respondents to the five clusters. Our sample sizes were well above the $5*2^K$ limit, proposed by Formann (1984), where K is number of clustering variables. The tables include the results of a one-way ANOVA, where the F statistic indicates the strength of rejecting equality in the mean value of a characteristic across the five clusters, which is also specified further by three significance levels, given from the p value. We also included a so-called post hoc Sidak (or Sidak-Bonferroni) group comparison, whereby all ten pair-wise tests of cluster means were performed.

Table 2a

In the sample of foreign ferry-travelling tourists (dataset (i)), cluster 1 is the one with highest factor score on "food and accommodation", thus a demand for food and beverage facilities of high standard, possibly including local food specialities. This cluster represents an affluent and relatively highly educated segment, with a high share stating that their income is relatively high compared to the average income level in their country, as well as a high share

having completed higher education, or, more precisely, "more than four-year studies at university level". The nature orientation of the segment is towards comfort and recreation and is the segment with highest share of national park visitors and longest average stay in Norway. Cluster 1 could be termed a segment of *affluent demanders of high quality food and accommodation* (comprising 31% of the sample). Cluster 2 has the highest factor score on "tracks & signposts", thus demands for tracks/paths for rambling, cycling or self-guiding, and for more accessible information and signposting. Cluster 2 has the highest scores on variables representing dimensions of nature orientation as well as a relatively high share of national park visitors and long average stay in Norway. We might term cluster 2 a segment with a *nature-oriented demand for tracks and signposts* (comprising 15% of the sample). Cluster 3 is the one with highest factor score on "infrastructure & services", thus a demand for new facilities/activities adjacent to the national parks (gondolas, motorboats and staged experiences), and more service personnel in the parks. Cluster 3 has the highest score on comfort, and might be termed a segment of *comfort-oriented demanders of infrastructure and services* (comprising 22% of the sample). Cluster 5 is the one with highest factor score on "tours & interpretation", thus a demand for guided tours/sightseeing to cultural/natural attractions or visitor centres. It has medium scores on most individual characteristics and might be termed a segment of *average-type demanders of tours and interpretations* (comprising 16% of the sample). Finally, cluster 4 has relatively low scores on all QTF factors, as well as the lowest scores on variables representing dimensions of nature orientation. Cluster 4 might be termed as *satisfied and saturated* (comprising 15% of the sample).

Regarding post hoc Sidak-Bonferroni pair-wise tests of dataset (i), it was the segment of *Satisfied and saturated* (segment 4) that had significantly lower levels of "inspiration" and "comfort" orientations than any other segments, and significantly lower level of "challenge"

orientation than most others. The *Affluent demanders of high quality food and accommodation* (segment 1) and the *Nature-oriented demanders of tracks and signposts* (segment 2) had significantly higher levels of "recreation" orientation than the others, except for the *Average-type demanders of tours and interpretations* (segment 5) that did not differ significantly from any other segment for this characteristic. Segment 1 had significantly higher share of those stating relatively high income, compared to any other segment. This segment also had significantly more national park visits than the others, except for segment 2 that did not differ significantly from any other segment for this characteristic. The *Comfort-oriented demanders of infrastructure and services* (segment 3) differed least from the other segments in the pair-wise tests.

Also in the sample of foreign and Norwegian tourists in the Nord-Gudbrandsdal region, dataset (ii), cluster 1 has the highest factor score on "food and accommodation". Also in this sample, cluster 1 is an affluent, highly educated segment of tourists. This is the segment with the highest share of national park visitors in Nord-Gudbrandsdal, but not the one with the longest stay in the region. We also term this cluster a segment of *affluent demanders of high quality food and accommodation* (comprising 19% of the sample). Cluster 2 has relatively high factor scores on "tours & interpretation" and "food & accommodation", which are components of potential tourism packages. Cluster 2 also has high scores on variables representing nature-orientation dimensions of recreation, inspiration and challenge. We might term cluster 2 a segment of *nature-oriented demanders of packages* (comprising 11% of the sample). Cluster 4 is the one with highest factor score on "infrastructure & services" and on comfort. We also term this cluster a segment of *comfort-oriented demanders of infrastructure and services* (comprising 37% of the sample). Cluster 5 has the highest factor score on "tours & interpretation" and "tracks and signposts" and on variables representing dimensions of the nature-orientation inspiration, as well as the longest average

stay in Nord-Gudbrandsdal. Cluster 5 could be termed a segment of *nature-inspired demanders of tours and tracks* (comprising 21% of the sample). Finally, cluster 3 has relatively low scores on all QTF factors, as well as on variables representing dimensions of nature orientation. This cluster, too, is termed as a *satisfied and saturated* segment (comprising 11% of the sample).

Table 2b

More individual characteristics for profiling are available for the sample of foreign and Norwegian tourists in the Nord-Gudbrandsdal region (ii) (Table 2c). The distribution of monthly household income is exactly the same as the distribution of the share stating relatively high income (in Table 2b); yet, for the foreign visitors these two variables correlated because monthly household income was estimated from the share stating relatively high income (Veisten et al., 2014). As expected, trip costs are highest in the segment with the lowest share of Norwegians, while having the highest shares of Germans and Dutch. The nature-oriented / nature-inspired segments expressed the strongest environmental concern, while the *comfort-oriented demanders of infrastructure and services* and the *affluent demanders of high quality food and accommodation* indicated lowest concern. The *nature-oriented demanders of packages* had higher shares stating no acceptance of impacts on wildlife and vegetation from tourism, as well as stating Nord-Gudbrandsdal as main destination for their travel (Table 2c).

Table 2c

Regarding post hoc Sidak-Bonferroni pair-wise tests of dataset (ii), the segment of *Comfort-oriented demanders of infrastructure and services* (segment 4) had significantly higher level of "comfort" orientation than any other segment. The *Nature-inspired demanders of tours and tracks* (segment 5) had significantly higher level of "inspiration" orientation and, together with the *Nature-oriented demanders of packages* (segment 2), higher level of "recreation" orientation than most other segments. Yet, segment 2 did not differ significantly from any other segment regarding "inspiration"; and the *Affluent demanders of high quality food and accommodation* (segment 1) did not differ significantly from any other segment regarding "recreation". Segment 1 had significantly higher share of those stating relatively high income, compared to all other segments, except segment 2 that did not differ significantly from any other segment for this characteristic. The *Comfort-oriented demanders of infrastructure and services* (segment 4) had a significantly lower share of higher education than most other segments. Segment 1 had significantly longer stay than any other segment. Moreover, segment 1 had significantly more national park visits than the others, except for segment 2 and the *Satisfied and saturated* (segment 3) that did not differ significantly from any other segment for this characteristic. Segment 5 had a significantly lower share of Norwegians than any other segment, as well as significantly higher shares of Germans and Dutch compared to most other segments. Segment 5 also had significantly higher trip costs than any other segment, as well as significantly less visits to the Nord-Gudbrandsdal region than most other segments. Segment 4 had a significantly higher level of those who would definitely use a gondola, compared to most other segments. Segment 2 had a significantly higher share of those stating no acceptance of ecological impacts from the tourism activity, as well as Nord-Gudbrandsdal as main destination, compared to most other segments. However Segment 3 did not differ significantly from any other segment for these two variables, nor for the national park being decisive for choosing the destination.

The largest segment in the five-cluster solution of the pooled sample was also the *comfort-oriented demanders of infrastructure and services*, representing 33% of the pooled sample. The next largest segments were the *affluent demanders of high quality food and accommodation* and *nature-inspired demanders of tours and tracks*, each representing 21% of the pooled sample. There was also a segment of *satisfied and saturated* in the pooled sample (comprising 12%).

In the re-clustered samples, the cluster number indicated by Ward was not stable at five, but dropped in many cases to four. Yet, we fixed the cluster number to five in the validation of the k-means analyses where we found that the two segments of *comfort-oriented demanders of infrastructure and services* and of *affluent demanders of high quality food and accommodation* were identified in all cases. Moreover, the segments identified by the re-sampling and split-sampling differed in a similar manner as those identified from the main analysis, although some differences between segments became less clear in the split samples.

Clustering solutions using QTF items as clustering variables

We tried two-stage clustering applying QTF items instead of QTF factors. There were two clusters defined by Ward's method in the sample of foreign ferry-travelling tourists (i), as well as in the sample of foreign and Norwegian tourists in the Nord-Gudbrandsdal region (ii) and in the pooled sample. The ANOVA test of individual characteristics in the two clusters indicated that the use of QTF items rather than QTF factors yielded far fewer different clusters, particularly for dataset (ii).

Clustering solutions using the two-step algorithm with QTF factors as clustering variables

We also applied the two-step clustering procedure, in the SPSS software, which also combines partitioning and hierarchical clustering (Mooi & Saarstedt, 2011). Two-step clustering was applied to the QTF factors and indicated that "tracks & signposts" was the most important clustering variable, followed by "infrastructure & services", "tours & interpretation" (second in the first sample of foreign ferry-based tourists and last in the second sample of foreign and national tourists in Nord-Gudbrandsdal), and then "food & accommodation". The two-step algorithm, like Ward, finds an "optimal" cluster number, i.e. six clusters for dataset (i) and four for dataset (ii). Eight clusters were obtained for the pooled dataset. The profiling and ANOVA testing indicated that the two-step solution did not produce clusters that differed any more clearly in terms of individual characteristics than the *k*-means solution (with cluster number found by Ward's method). However, for both samples, a segment of *affluent demanders of high quality food and accommodation* as well as a segment of *comfort-oriented demanders of infrastructure and services* appeared. The latter constituted 33% in the foreign ferry-based tourist sample and 32% in the foreign and national sample in Nord-Gudbrandsdal, while *affluent demanders of high quality food and accommodation* constituted 14% in the foreign ferry-based tourist sample and 33% in the foreign and national sample in Nord-Gudbrandsdal. However, in the foreign ferry-based tourist sample there was an additional cluster, comprising 9%, also having high scores on the "food & accommodation" factor and a high share indicating relatively high income. If this could be added to a common segment of *affluent demanders of high quality food and accommodation* it would reach 23%. In the pooled sample, too, there were two segments with high factor scores on "food & accommodation" combined with the highest shares of

"relatively high income" and "more than four-year studies at university level", together about 23% of the sample.

Discussion and Conclusions

We applied two-stage clustering in this market segmentation study, first finding an appropriate cluster (segment) number using Ward's hierarchical method, and then applying the partitioning *k*-means method for forming the clusters (Mazzocchi, 2008; Burns & Burns, 2008). Another feature of our approach was the application of factors of quests for tourist facilities (QTF) as clustering variables (Haukeland et al., 2010; 2013). We found that the identified tourist segments differed in characteristics such as activity interests, nature orientations, spending, length of stay, income, education, and nationality. These characteristics overlap several of those formerly identified for tourist segments and environmentally-friendly tourists (Dolnicar et al., 2008; Park and Yoon, 2009; Pulido-Fernández & Sánchez-Rivero, 2010). We also tried other clustering methods, e.g. the so-called two-step clustering of SPSS (Mooi & Saarstedt, 2011), which mostly yielded a higher number of clusters than our preferred approach. Finally, we also tried applying QTF items rather than QTF factors, which yielded a lower number of clusters than our chosen approach. None of these variations in clustering method and variables provided more differentiated clusters than the two-stage clustering with QTF factors. Although there is some loss of information from the data when applying factors (dimensions) instead of single variables (items) (Dolnicar, 2002; 2008; Dolnicar & Grün, 2008), the application of factors seemed more appropriate. We believe factors constituted better representations of the constructs of interest, in our study.[3]

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[3] In the literature on clustering there are also arguments for the use of factor score instead of item scores (Mazzocchi, 2008; Burns & Burns, 2008). To some extent this relates to the distinction between principal component analysis and factor analysis, the former representing a variable-reduction approach while the latter focus on the dimensions behind the variables, the factors that are "manifested" by items. Some will then argue that one should cluster only (unique) dimensions and that factor analysis of the items provides a way of

Applying the two-stage clustering approach, five-cluster solutions were indicated based on an elbow test from Ward's method, although a four-cluster solution could also have been applied for the sample of foreign ferry-travelling tourists. Notwithstanding the differences between this sample and the sample of foreign and Norwegian tourists in the Nord-Gudbrandsdal region, various common segment features were found. In both samples the largest was a comfort-oriented tourist segment demanding more/better infrastructure and services. This segment of tourists in alpine nature is thus not willing to forego comfort, which Dolnicar et al. (2008) pointed to as a characteristic of environmentally friendly tourists. Another relatively large segment found in both samples was an affluent and highly educated one demanding high-quality food and accommodation, thus also weighing the comfort of their stay in the nature areas. Additional analysis of the dataset from the Nord-Gudbrandsdal region showed that these two segments had lowest share stating that the national park status was decisive for choosing the destination; and they also accepted more impacts on nature from tourism. Moreover, in both samples a relatively small segment was found that could be characterised as satisfied with current facility offers, i.e. obtaining relatively low scores on all QTF factors as well as on variables representing dimensions of nature orientation. Thus, even though the main attraction of Norway for motor tourists or tourists in Nord-Gudbrandsdal is nature (Viken, 2006), there is heterogeneity in terms of what facilities are quested; there is also heterogeneity in nature orientations, and this is to some extent correlated with observable or targetable individual characteristics. Moreover, there is an indication of potentially conflicting views on some facility alternatives between the comfort-oriented segments and the more nature-protection-oriented segments; the latter having a relatively stronger preference

capturing these dimensions. Several publications on market segmentation in the tourism literature are based on factor-cluster-segmentation, see e.g., Park & Yoon (2009), Alexandris et al. (2009), Dey & Sarma (2010), Devesa et al. (2010).

for tours or tracks (or nature-visit packages) and being more willing to forego comfort (Dolnicar et al. 2008). When comes to the larger nationality groups, the German and Dutch tourists were over-represented in the nature-oriented "tours and track" segment in Nord-Gudbrandsdalen.

The national parks in Norway are still relatively poorly developed for visitors compared to other countries and the marketing of these protected areas as tourism attractions is also modest. A limitation of this study is that the observed distribution among the actual visiting segments may be different from national park settings in other countries. Nevertheless, the various segments that have been analysed here provide a comprehensive picture of the market for actual national park visitors, taking into consideration the interrelationships between socio-demographic and psychographic variables. The consistency across the two samples indicates a relatively high degree of reliability in our results, although further examination of these patterns is also recommended in new and different settings.

Nature-based tourism has a long history in Nord-Gudbrandsdal and other alpine and coastal regions in Norway; and tourism already contributes substantially to the regional economy (Dybedal 2006). However, the continuous decline in the primary sectors gives an impetus for developing new facilities that can attract new segments or enhance the supply for existing segments product, seeking generation of more local employment and income (Lundmark, 2005; Niedomysl & Amcoff, 2011). Two large segments identified in the Nord-Gudbrandsdal sample (ii) as well as in the foreign motorist sample (i) were the comfort-oriented "infrastructure & services" segment and the affluent "food & accommodation" segment. This gives some indication of the potential for increased activity and income creation in the border/entrance areas of national parks in Norway, an indication that can be further explored in new analyses of specific activity, service or accommodation markets. The exploitation of these business opportunities may support the local communities and thus

contribute to the safeguarding of sustainable tourism development in the wider national park region. Special attention should, however, be given by local planners to the localisation of large infrastructure installations because such investments may also be contested by other tourist segments, that indicate stronger concern about ecological impacts (see also Haukeland et al., 2010, Lindberg & Veisten, 2012). National park managers should notice the general interest for "tracks and signposts" inside the park borders and consider implementing the necessary measures to meet this demand. In order to obtain sustainable tourism development, a more active visitor management, based on monitoring and visitor surveys, is needed in Norway. The results of our study add to a research fundament for what seems to be the consensual policy goal: to obtain visitor strategies that safeguard environmental protection, visitor interests and in turn also the local communities.

Acknowledgement

References

Alexandris, K., Kouthouris, C., Funk, D., & Giovani, C. (2009). Segmenting winter sport tourists by motivation: The case of recreational skiers. *Journal of Hospitality Marketing & Management*, 18(5), 480–499.

Bailey, K. D. (1994). *Typologies and Taxonomies: An Introduction to Classification Techniques*. Thousand Oaks, CA: Sage Publications.

Balmford, A., Beresford, J., Green, J., Naidoo, R., Walpole, M., & Manica, A. (2009). A global perspective on trends in nature-based tourism. *PloS Biology*, 7(6): e1000144.

Boyd, S. (2004). National parks: Wilderness and culture. In: Lew, A., Hall, M., & Williams, A. (eds.) *A Companion to Tourism* (pp. 473483). Malden, MA: Blackwell.

Burns, R., & Burns, R. (2008). Cluster analysis. Ch. 23 in: *Business Research Methods and Statistics using SPSS*. Thousand Oaks, CA: Sage Publications.

Devesa, M., Laguna, M., & Palacios, A. (2010). The role of motivation in visitor satisfaction: Empirical evidence in rural tourism. *Tourism Management*, 31(4), 547–552.

Dey, B., & Sarma, M. K. (2010). Information source usage among motive-based segments of travelers to newly emerging tourist destinations. *Tourism Management*, 31(3), 341–344.

Dimitriadou, E., Dolnicar, S., & Weingessel, A. (2002). An examination of indexes for determining the number of clusters in binary data sets. *Psychometrika*, 67(1), 137–160.

Dolnicar, S. (2002). A review of data-driven market segmentation in tourism. *Journal of Travel and Tourism Marketing*, 12(1), 1–22.

Dolnicar, S. (2008). Market segmentation in tourism. In A. G. Woodside & D. Martin (eds.) *Tourism Management: Analysis, Behaviour and Strategy* (Ch. 8, pp. 129–150). Wallingford: CABI.

Dolnicar, S., Crouch, G. I., & Long, P. (2008). Environment-friendly tourists: What do we really know about them? *Journal of Sustainable Tourism*, 16(2), 197–210.

Dolnicar, S., & Grün, B. (2008). Challenging "factor-cluster segmentation". *Journal of Travel Research*, 47(1), 63–71.

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). Measuring endorsement of the new ecological paradigm: A Revised NEP scale. *Journal of Social Issues*, 56, 425–442.

Dybedal, P. (2006). Economic impacts of tourism in Hedmark and Oppland counties, 2005. TØI Report 863/2006. Oslo: Institute of Transport Economics (TØI).

Eagles, P. F. J., & McCool, S. F. (2002). *Tourism in National Parks and Protected Areas. Planning and Management*. Eastbourne, UK: CABI.

Formann, A. K. (1984). *Die Latent-Class-Analyse: Einführung in die Theorie und Anwendung.* Weinheim: Beltz.

Formica, S., & Uysal, M. (2002). Segmentation of travelers based on environmental attitudes. *Journal of Hospitality Marketing & Management*, 9(3/4), 35–49.

Fredman, P., & Tyrväinen L. (2010). Frontiers in nature-based tourism. *Scandinavian Journal of Hospitality and Tourism*, 10(3), 177–189.

Gibson, H., & Yannakis, A. (2002). Tourist roles: Needs and the lifecourse. *Annals of Tourism Research*, 29(2), 358–383.

Haley, R. I. (1968). Benefit segmentation: A decision-oriented research tool. *Journal of Marketing*, 32(2), 30–35.

Hall, C. M., & Frost, W. (2009). The future of the national park concept. In: Frost, W., & Hall, C. M. (eds.) *Tourism and National Parks. International Perspectives on Development, Histories and Change*. New York: Routledge.

Haukeland, J. V., Grue, B., & Veisten, K. (2010). Turning national parks into tourist attractions: Nature orientation and quest for facilities. *Scandinavian Journal of Hospitality and Tourism*, 10(3), 248–271.

Haukeland, J. V., & Lindberg, K. (2001). *Bærekraftig reiselivsforvaltning i naturområder*. TØI Report 550/2001. Oslo: Institute of Transport Economics (TØI).

Haukeland, J. V., Veisten, K., Grue, B., & Vistad, O.I. (2013). Visitors' acceptance of negative ecological impacts in national parks: Comparing the explanatory power of psychographic scales in a Norwegian mountain setting. *Journal of Sustainable Tourism*, 21(2), 291–313.

Holt-Jensen, A. (1978). *The Norwegian Wilderness: National Parks and Protected Areas*. Oslo: Tanum-Norli.

Kajala, L., A. Almik, Dahl, R., Dikšaitė, L., Erkkonen, J., Fredman, P., Søndergaard Jensen, F., Karoles, K., Sievänen, T., Skov-Petersen, H., Vistad, O. I., & Wallsten, P. (2007). Visitor monitoring in nature areas. A manual based on experiences from the Nordic and Baltic countries. TemaNord 2007:534. Stockholm: Swedish Environmental Protection Agency.

Kamakura, W. A., & Mazzon, J. A. (1991). Value segmentation: A model for the measurement of values and value systems. *Journal of Consumer Research*, 18, 208–218.

Lang, C.-T., & O'Leary J. T. (1997). Motivation, participation, and preference: A multi-segmentation approach of the Australian nature travel market. *Journal of Travel & Tourism Marketing*, 6(3), 159–180.

Lindberg, K., & Veisten, K. (2012). Local and non-local preferences for nature tourism facility development. *Tourism Management Perspectives*, 4, 215–222.

Madrigal, K., & Kahle, L.R. (1994). Predicting vacation activity preferences on the basis of value-system segmentation. *Journal of Travel Research*, 32(3), 22–28.

Mazzocchi, M. (2008). *Statistics for Marketing and Consumer Research*. Thousand Oaks, CA: Sage Publications.

McCleary, K. W., & Choi, B. M. (1999). Personal values as a base for segmenting international markets. *Tourism Analysis*, 4, 1–17.

Mehmetoglu, M. (2007). Typologising nature-based tourists by activity – theoretical and practical implications. *Tourism Management*, 28(3), 651–660.

Mehmetoglu, M, Hines, K., Graumann, C., & Greibrokk, J. (2010). The relationship between personal values and tourism behavior: A segmentation approach. *Journal of Vacation Marketing*, 16(1), 17–27.

Milligan, G. W., & Cooper, M. C. (1985). An examination of procedures for determining the number of clusters in a data set. *Psychometrika*, 50(2), 159–179.

Ministry of Finance [Finansdepartementet] (2003). Proposition to the Storting No. 65. (2002–2003). Tilleggsbevilgninger og omprioriteringer i statsbudsjettet medregnet folketrygden. Oslo.

Ministry of Industry and Trade [Nærings- og handelsdepartementet] (2005). Handlingsplan for reiselivsnæringene. Publication 07/2005. Oslo.

Mooi, E., & Sarstedt, M. (2011). Cluster analysis. In *A Concise Guide to Market Research* (Ch. 9, pp. 237–284). Berlin/Heidelberg: Springer-Verlag.

Muller, T. E. (1991). Using personal values to define segments in an international tourism market. *International Marketing Review*, 8(1), 5–70.

Niedomysl, T., & Amcoff, J. (2011). Is there hidden potential for rural population growth in Sweden? *Rural Sociology*, 76(2), 257–279.

Nyaupane, G. P., Morais, D. B., & Graefe, A. R. (2004). Nature-based tourism constraints: A cross-activity comparison. *Annals of Tourism Research*, 31(3), 540–555.

Oh, H. C., Uysal, M. & Weaver, P. A. (1995). Product bundles and market segments based on travel motivation: A canonical correlation approach, *International Journal Hospitality Management*, 14(2), 123–137.

Park, D.-B., & Yoon, Y.-S. (2009). Segmentation by motivation in rural tourism: A Korean case study. *Tourism Management*, 30, 99–108.

Plog, S. C. (1974). Why destination areas rise and fall in popularity. *Cornell Hotel and Restaurant Administration Quarterly*, 4, 55–58.

Pulido-Fernández, J. I., & Sánchez-Rivero, M. (2010). Attitudes of the cultural tourist: A latent segmentation approach. *Journal of Cultural Economics*, 34, 111–129.

Reinius, S. W. (2009). *Protected attractions: Tourism and wilderness in the Swedish mountain region*. PhD Dissertation No. 140. Stockholm: Stockholm University, Department of Human Geography.

Reinius, S. W., & Fredman, P. (2007). Protected areas as attractions. *Annals of Tourism Research*, 34(4), 839–854.

Rideng, A. & Grue, B. 2008. Norwegian foreign visitor survey 2008. TØI Report 995/2008. Oslo: Institute of Transport Economics (TØI).

Schwartz, S. H., & Bilsky, W. (1987). Toward a universal psychological structure of human values. *Journal of Personality and Social Psychology*, 53(3), 550–562.

Sharpley, R., & Sharpley, J. (1997). *Rural Tourism. An Introduction*. London: International Thomson Business Press.

Smith, W. R. (1956). Product differentiation and market segmentation as alternative marketing strategies. *Journal of Marketing*, 21(1), 3–8.

SPSS (2001). The SPSS TwoStep cluster component: Scalable component enabling more efficient customer segmentation. Chicago, IL: SPSS Inc.

UNWTO (2013). UNWTO Tourism Highlights, 2013 Edition. Geneva: World Tourism Organization.

Veisten, K., Lindberg, K., Grue, B. & Haukeland, J.V. (2014). The role of psychographic factors in nature-based tourist expenditure. *Tourism Economics*, in press.

Viken, A. (2006). Ecotourism in Norway – non-existence or co-existence? In S. Gössling, & J. Hultman (eds.) *Ecotourism in Scandinavia: Lessons in Theory and Practice* (pp. 38–52). Wallingford: CABI.

Wray, K., Espiner, S., & Perkins, H. C. (2010). Cultural clash: Interpreting established use and new tourism activities in protected natural areas. *Scandinavian Journal of Hospitality and Tourism*, 10(3), 272–290.

Zachrisson, A. (2009). *Commons protected for or from the people? Co-management in the Swedish mountain region?* University Dissertation, Research Report No. 3. Umeå: Umeå University, Department of Political Science.

Zhang, T., Ramakrishnon, R., & Livny, M. (1996). BIRCH: An efficient data clustering method for very large databases. In: Proceedings of the ACM SIGMOD Conference on Management of Data (pp. 103–114). Montreal: ACM Special Interest Group on Management of Data.

Tables

Table 1: Quest for tourism facilities (QTF) factors and question items; confirmatory factor analysis results.

Factor	Item	Dataset (i)	Dataset (ii)
Infra-structure & service	Increased opportunities for various activities	0.665	0.827
	Staged experiences for a greater audience	0.766	0.708
	Gondolas and similar installations	0.746	0.704
	Better options for motorboat trips on the lakes	0.622	0.611
	More service persons	0.525	0.744
Tracks & signposts	More and improved rambling tracks	0.710	0.751
	More nature paths for "self-guiding"	0.722	0.740
	More and better sign-posting	0.774	0.814
	More cycling tracks	0.692	0.699
	More picnic areas	0.741	0.310
	More accessible information	0.622	0.458
Tours & interpretation	Guided tour/sightseeing to see animals/ natural attractions	0.852	0.852
	Guided tour/sightseeing to cultural attractions	0.842	0.860
	Visitor centres with exhibitions	0.496	0.493

Food & *accommo-* *dation*	Well-developed food and beverage facilities	0.960	0.986
	Abundance of accommodation facilities	0.591	0.585
	Accommodation with good standard	0.779	0.771
	Local food specialities	0.600	0.423
Goodness-of-fit statistics for measurement models	X^2/df ratio	6.53 (p<0,001)	5.08 (p<0,001)
	RMSEA	0,086	0,073
	CFI	0.842	0,890

Note: This table is a simplified version of Table 2 in Haukeland et al. (2013, p. 302), including only the confirmatory (not explanatory) factor analysis of items present in both datasets, that is, the foreign ferry-based sample, dataset (i), n=947, and the foreign and national sample in Nord-Gudbrandsdal, dataset (ii), n=759. All items were significant at the 0.001 level.

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Table 2a: Mean QTF factor scores, mean scores on variables representing dimensions of nature orientation, and mean values of demographics and trip characteristics for the five clusters; foreign ferry-travelling tourists, dataset (i), n=711.

	Cluster 1 n=159	Cluster 2 n=106	Cluster 3 n=222	Cluster 4 n=107	Cluster 5 n=117	F (ANOVA)
"Tracks & signposts"	0.14	1.00	0.01	-1.44	0.21	
"Infrastructure & service"	-0.86	-0.13	1.01	-0.38	-0.28	
"Food & accommodation"	0.75	-0.18	0.38	-0.47	-1.15	
"Tours & interpretation"	0.34	-1.19	0.28	-0.93	0.93	
"Inspiration"	2.84	2.96	2.85	2.56	2.82	5.06***
"Recreation"	3.27	3.30	3.07	2.91	3.11	6.96***
"Challenge"	2.27	2.50	2.31	2.03	2.21	6.39***
"Comfort"	2.64	2.61	2.68	2.24	2.57	7.71***
Visited national park	0.91	0.82	0.72	0.72	0.76	5.76***
Nights travelling	15.5	14.4	11.2	13.6	13.0	6.99***
Relatively high income	0.36	0.17	0.24	0.16	0.22	4.90***
Relatively low income	0.05	0.14	0.09	0.06	0.06	1.98*
University	0.65	0.48	0.53	0.55	0.52	2.34*

Segment	Affluent demanders of high quality food and accommodation	Nature-oriented demanders of tracks and signposts	Comfort-oriented demanders of infrastructure and services	Satisfied and saturated	Average-type demanders of tours and interpretations	
Age	47.7	46.4	44.7	48.3	44.7	2.51**
Female	0.31	0.36	0.41	0.36	0.38	1.01
German	0.62	0.66	0.49	0.58	0.54	2.76**
Dutch	0.25	0.19	0.30	0.18	0.28	2.26*
Danish	0.10	0.13	0.19	0.22	0.17	2.26*

Note: For nature orientation dimensions the mean value is the cluster mean of the score on factor items, ranging from 1 ("not important") to 5 ("very important"). For demographic and trip characteristic dummies, the mean value is simply the share in the cluster. White cell colour indicates the highest value (the lowest value for the low income dummy), with darker grey-shades for lower values; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$ (ANOVA).

Table 2b: Mean QTF factor scores, mean scores on variables representing dimensions of nature orientation, and mean values of demographics and trip characteristics for the five clusters; foreign and Norwegian tourists in the Nord-Gudbrandsdal region, dataset (ii), n=760

	Cluster 1 n=147	Cluster 2 n=87	Cluster 3 n=86	Cluster 4 n=281	Cluster 5 n=159	F (ANOVA)
"Infrastructure & service"	-0.66	-0.80	0.19	0.84	-0.54	
"Tracks & signposts"	0.53	-1.52	-0.70	0.04	0.65	
"Tours & interpretation"	-0.96	0.66	-0.99	0.18	0.75	
"Food & accommodation"	0.70	0.37	-1.50	0.37	-0.69	
"Inspiration"	3.89	4.15	3.88	3.96	4.17	5.87***
"Recreation"	4.31	4.46	4.10	4.20	4.44	9.50***
"Challenge"	2.74	3.01	2.87	2.99	2.90	1.98*
"Comfort"	3.51	3.33	3.36	3.71	3.41	8.40***
Visited national park	0.51	0.47	0.35	0.33	0.35	4.30***
Nights travelling	7.9	10.9	11.3	9.0	14.9	5.60***
Relatively high income	0.44	0.30	0.27	0.24	0.30	4.39***
Relatively low income	0.10	0.12	0.13	0.12	0.15	0.38

Segment	Affluent demanders of high quality food and accommodation	Nature-oriented demanders of packages	Satisfied and saturated	Comfort-oriented demanders of infrastructure and services	Nature-inspired demanders of tours and tracks	
University	0.84	0.79	0.63	0.63	0.75	7.34***
Age	47.5	47.7	48.6	48.8	44.8	2.53**
Female	0.44	0.41	0.33	0.36	0.39	1.03
German	0.07	0.20	0.15	0.07	0.30	14.33***
Dutch	0.05	0.02	0.07	0.04	0.12	4.08***
Danish	0.02	0.01	0.05	0.01	0.03	1.23
Swedish	0.01	0.01	0.06	0.02	0.04	2.15*
Norwegian	0.81	0.72	0.56	0.81	0.36	32.86***

Note: For nature orientation dimensions the mean value is the cluster mean of the score on factor items, ranging from 1 ("not important") to 5 ("very important"). For demographic and trip characteristic dummies, the mean value is simply the share in the cluster. White cell colour indicates the highest value (the lowest value for the low income dummy), with darker grey-shades for lower values; ***p< 0.01, **p< 0.05, *p< 0.1 (ANOVA).

Table 2c: Mean QTF factor scores, mean scores on some additional variables representing mean values of demographics and trip characteristics of the five clusters; foreign and Norwegian tourists in the Nord-Gudbrandsdal region, dataset (ii), n=760

	Cluster 1 n=147	Cluster 2 n=87	Cluster 3 n=86	Cluster 4 n=281	Cluster 5 n=159	F (ANOVA)
"Infrastructure & service"	-0.66	-0.80	0.19	0.84	-0.54	
"Tracks & signposts"	0.53	-1.52	-0.70	0.04	0.65	
"Tours & interpretation"	-0.96	0.66	-0.99	0.18	0.75	
"Food & accommodation"	0.70	0.37	-1.50	0.37	-0.69	
Monthly household income (EUR)	6,381	6,060	5,561	5,684	5,664	2.75**
Total trip cost per person per day (EUR)	264	311	368	292	484	14.84***
Annual visits to Nord-Gudbrandsdal	2.3	2.2	1.9	2.3	1.9	2.99**
Nord-Gudbrandsdal was the main destination	0.67	0.77	0.59	0.49	0.56	7.13**

	Affluent demanders of high quality food and accommodation	Nature-oriented demanders of packages	Satisfied and saturated	Comfort-oriented demanders of infrastructure and services	Nature-inspired demanders of tours and tracks	
National park status decisive for choosing destination	0.13	0.25	0.22	0.12	0.30	6.93***
National park status contributed to increased length of stay	0.12	0.25	0.20	0.16	0.32	6.38***
No acceptance of impacts from tourism facilities on wildlife or vegetation	0.22	0.41	0.30	0.17	0.33	7.67***
Would definitively have used a new gondola into the national park areas	0.07	0.10	0.12	0.21	0.12	5.25***
Segment	Affluent demanders of high quality food and accommodation	Nature-oriented demanders of packages	Satisfied and saturated	Comfort-oriented demanders of infrastructure and services	Nature-inspired demanders of tours and tracks	

Note: For trip characteristic dummies, the mean value is simply the share in the cluster. White cell colour indicates the highest value, with darker grey-shades for lower values; ***p< 0.01, **p< 0.05, *p< 0.1 (ANOVA).
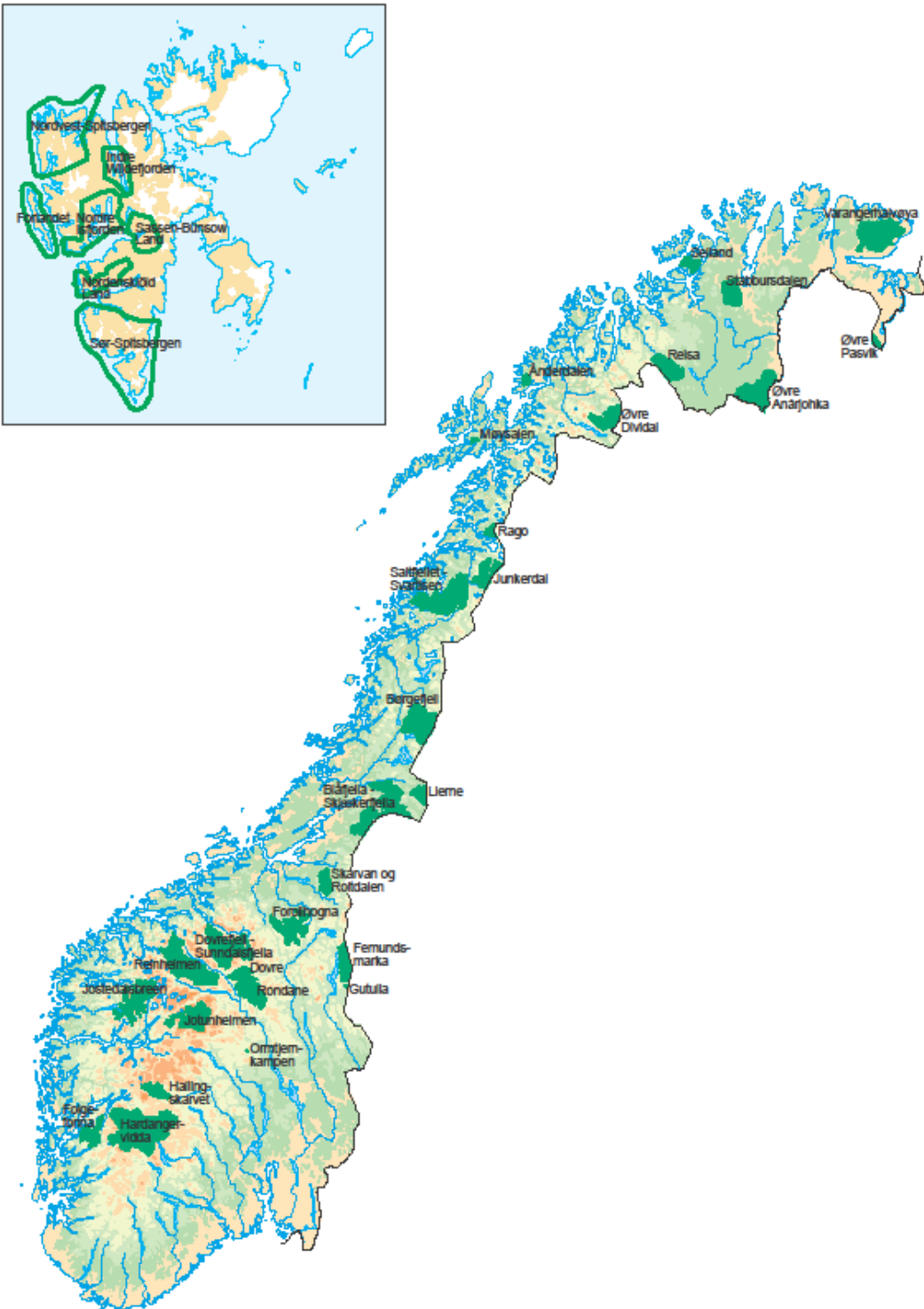
Figure 1: National parks in Norway, 2008-2009 (source: Norwegian Environment Agency,
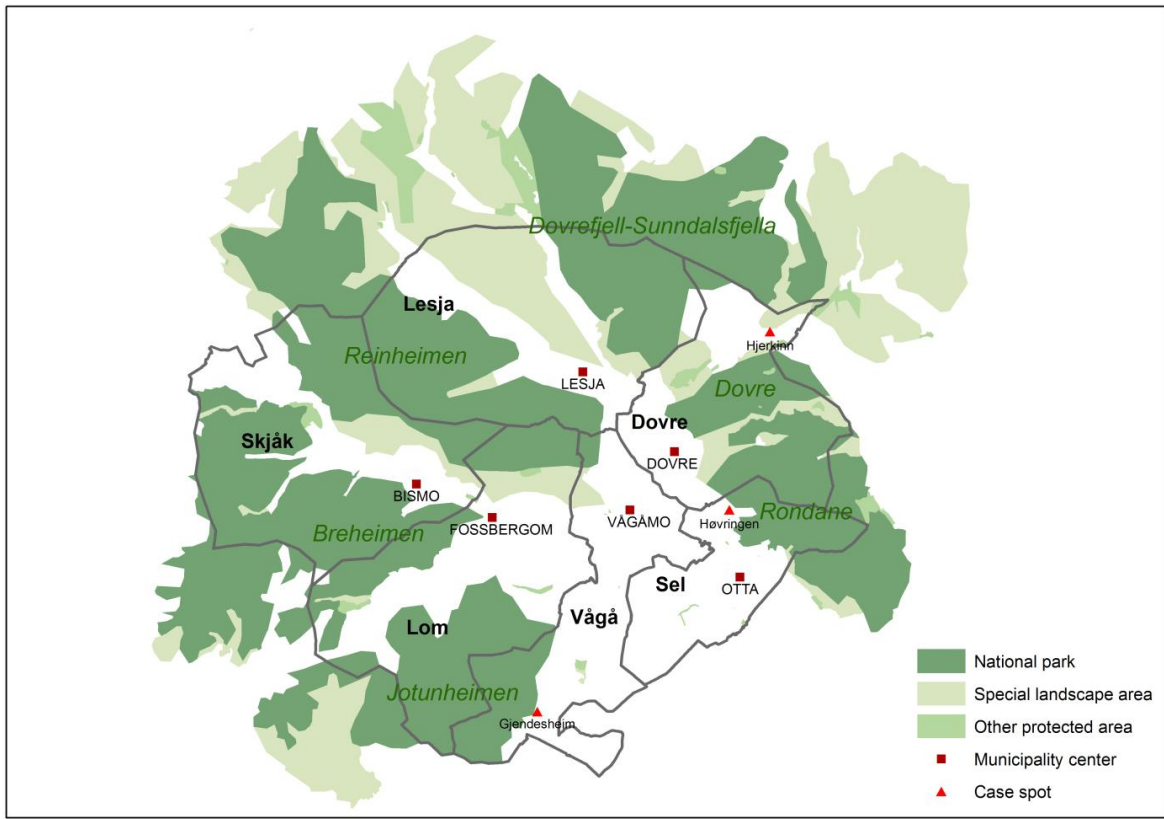
formerly Norwegian Directorate for Nature Management)

Figure 2: National parks in the Nord-Gudbrandsdal region (source: Norwegian Environment

Agency, formerly Norwegian Directorate for Nature Management, own adaptation)