

## National Park Designation – Visitor Flows and Tourism Impact

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**Abstract:** National parks around the world are increasingly attracting visitors to experience pristine and unique natural environments. While increases in national park tourism provides business opportunities both in the parks and in adjacent communities, there are several economic, social and ecological aspects that need to be monitored in order to sustain high quality visitor experiences. Increases in visitation may cause negative impacts on the environment, conflicts between different user groups or within groups. At the same time, data on visitor numbers, distribution and attitudes is needed in order to design efficient management strategies and provide appropriate recreation opportunities. This paper reports preliminary findings from two different surveys of visitors to Fulufjället National Park in Sweden – one year before and one year after national park designation respectively. Both surveys used on site counters and self registration boxes to collect visitor data. Follow-up mail questionnaires were sent to a sample of Swedish and German visitors. The survey of 2001 (one year before national park designation) collected data on visitor numbers, nationalities, demographics, trip characteristics, crowding, willingness to pay, attitudes towards management actions and tourism development etc. The purpose of the 2003 survey (one year after national park designation) was to monitor possible short term changes in some of these parameters as a consequence of the national park designation in 2002. In addition, the 2003 survey was designed to estimate the regional economic impact of the park. Data from the two surveys are compared and the results are discussed from both a methodological and an impact perspective.

### Introduction

Both the attraction and sustainability of a tourist destination is relative to the standard of maintenance and management. To succeed in adequately manage and develop natural areas with respect to ecological and social values it is crucial to collect relevant and accurate data on visitor numbers, characteristics, behavior and attitudes. Among the questions managers need to ask themselves are what motivations and constraints there exist to make a visit; are there recreation conflicts to solve; and ultimately how should the area be managed to maximize visitor benefits while the natural environment is preserved and costs are minimized (Loomis & Walsh 1997, Manning 1999, Fredman & Emmelin 2001)? The reasons for visiting natural areas are often just as diversified as there are visitors. Some come to participate in specific activities, other to experience a certain place or environment (Heberlein & Fredman 2002). Studies of visitors to protected areas in Sweden have shown that peace and quiet, wilderness experiences and absence of litter are of high importance while geographical location and social interactions are less important (Fredman & Hansson 2003, Hörnsten & Fredman 2002).

The number and extent of protected areas in the world has increased considerably over the last fifty years. Today about 30,000 protected areas cover some eight percent of the global land area, and these are increasingly attracting visitors (Driml & Common 1995, Pigram & Jenkins 1999, Eagles & McCool 2002). For example, in 1996 the US and Canadian park systems produced some 2.5 billion visitor days at an economic value in the range of 240-370 billion, and in Costa Rica park visits have increased from 250,000 in 1985 to 860,000 in 1996 (Eagles & McCool 2002). Protected areas are often located in rural regions and can play an important role in their development (Machlis & Field 2000). Driml & Common (1995) estimated visitor expenditures to 1.4 billion at five world heritage sites in Australia and the national parks of Utah generate about 550 million USD in direct consumption (Voorhees et al. 1996). A common strategy in tourism development is to focus on visitor numbers. In protected areas, such strategies may be less appropriate considering possible negative ecological and social impact from too many visitors. One alternative is then to focus on consumption patterns and willingness to pay among current users, and means to minimize local economic leakage.

National park and world heritage are well known labels to many people. In an international perspective, such labels often represent places where pristine or unique natural environments are accessible, often with some degree of development and infrastructure. This is similar to what is known as markers in tourism research, i.e. items that carry information about tourism attractions (MacCannell 1999). There are reasons to believe that parks and protected areas to various degrees represent markers to certain groups of tourists. In a study of national park designation at eight sites in the US, Weiler and Seidl (2004) estimated a six percent increase in visitor numbers as a consequence of the national park designation.

Sweden has 28 national parks and about 2,500 nature reserves. While protected areas in Sweden are established both of ecological and social reasons, there has been no tradition of collecting visitor data, and consequently knowledge about visitor numbers, distributions and visitor impact are generally quite limited. One reason for this could be the relatively low population density in combination with the Right of Common Access – limiting the importance of protected areas for the total supply of land for outdoor recreation opportunities. Recent changes in the Swedish environmental policy does however, indicate an increased focus on social values in protected areas in the future.

This paper reports preliminary findings from two visitor surveys at Fulufjället National Park in Sweden – one year before and one year after the national park designation in 2002. The study presented here is financed by the Swedish Environmental Protection Agency and is an important element in the build-up of knowledge concerning visitor experiences. Fulufjället is the first Swedish national park where the planning strategy explicitly builds on such data. Results from the 2001 study are reported in Hörnsten and Fredman (2002), and the current paper focuses primarily on changes in use. The aim of the research is to provide input to future management of the park based on visitor data and to evaluate short term effects of the national park designation. The study will also provide an important input for tourism development in the park and adjacent gateway communities. For the last twenty years, tourism in the Swedish mountain region has increased – but mostly among mechanized winter activities (snowmobiling and downhill skiing) while more traditional activities like backpacking and cross-country skiing have been stable or decreased (Fredman & Heberlein 2003). Particularly in the southern part of the mountain region there is a strong dominance of winter tourism (Heberlein et al. 2002), and the tourism industry is trying to develop summer tourism. In Fulufjället, local tourism companies and the regional government carried out a tourism development project parallel to the national park designation process, and in 2004 the international

PAN-park organization will open a holiday village in the gateway community of Mörkret that currently has ten permanent residents.

## Study area and data collection

Fulufjället National Park is located in the county of Dalarna in the southern part of the Swedish mountain region (Figure 1). The park is 380 km<sup>2</sup> large, primarily featuring a low alpine region with large areas just reaching above the tree-line at 700 meters above the sea level. Since Fulufjället is not utilized for reindeer grazing, it has large areas of thick lichen covering the ground which is unique for the Swedish mountain region. The area is also known for its wildlife populations, including bear, moose and nesting birds of prey.



Figure 1. Sweden and Fulufjället National Park.

Fulufjällets National Park features the highest waterfall in Sweden – Njupeskar. This is a major tourist attraction in the region and the access to the 90 meter high fall is by car or bus to the trail head followed by a three kilometer round trip hike. The waterfall, the trails to the fall and the major park entrance with car parking, cafeteria and a visitor center are located in the most developed zone of the park. Part of the process to establish Fulufjället National Park was the implementation of four management zones; 1) a wilderness zone, 2) a low-intensity activity zone, 3) a high-intensity activity zone, and 4) a development zone (Swedish Environmental Protection Agency 2002). These zones are an important instrument to meet the objectives of the park and to supply a spectrum of different recreation opportunities. There is a small fishing camp at Rösjön in zone 3, and a network of

small cabins and marked trails throughout the park that provides good opportunities for backpacking. Most visitors will only come to zone 4, which is the most developed part of the park including Njupesjär waterfall.

### Data collection

Visitor surveys were undertaken at Fulufjället National Park in the summers of 2001 and 2003. During the period June to September seven self-registration boxes were located at the major entrances of the national park. Each box was placed clearly visible along the hiking trail together with a poster asking the visitors to fill out a registration card containing a few questions concerning the visit and the person's name and address. The completed cards were placed in a locked section of the box. Automatic trail counters were used at four different locations – two at Njupesjär waterfall and two in back-country areas. A sample of the visitors that registered at the self-registration boxes received a mailed questionnaire sent to their home address a few months after the visit to Fulufjället (Table 1). Besides a large number of attitude questions related to outdoor recreation, park policy and management the questionnaire included items concerning travel patterns, crowding, economic and demographic variables etc. Two remainders were sent out including a new questionnaire in the second one.

Table 1. Data collection statistics.

|                              |               | 2001  | 2003  |
|------------------------------|---------------|-------|-------|
| Completed registration cards | Total         | 4,107 | 6,151 |
| Swedish mail survey          | Completed     | 1014  | 804   |
|                              | Response rate | 80%   | 82%   |
| German mail survey           | Completed     | 483   | 441   |
|                              | Response rate | 74%   | 85%   |

### Non-respondents

On site data collection and mailed surveys involve several possible sources of non-response errors (Mangione 1995). In the current study, on site check-ups were done at the self registration boxes to identify possible biases from non-respondents. In places with many visitors there is a risk of the box being "busy" so that following hikers do not notice it or do not have time to wait for their turn but move on without registering. This was periodically the case along the trail to Njupesjär waterfall. From field

observations, an estimated 50–80 % of the visitors at the Njupesjär old trail (the most frequently used trail in the area) did not register. As long as these non-registrations occur randomly it will not affect the results. To ensure that such, or other non-registrations, do not follow a specific pattern the self registration must be supplemented with a drop-out study. In the 2003 survey, a sample of 236 individuals that did not voluntarily register at the Njupesjär old trail did fill in a registration card upon request from field staff. All of these on site non-respondents later received a mailed questionnaire that was answered by 165 individuals (70%). A preliminary look at the data, comparing the answers with the regular respondents, indicates that the answer to about 20 out of 130 questions asked in the mailed questionnaire (15%) significantly differ between the two groups. Assuming the questions in the survey are unrelated, we would expect at the most a five percent difference in the answers to not reject the hypothesis of no difference between the two groups. This will be subject to further analysis, and consequently the results presented in this paper should be interpreted accordingly.

## Findings

### Visits and visitors

Data from the on site visitor counter at the old trail to Njupesjär waterfall is presented in Figure 2 for the summer of 2001 and 2003 respectively. Because of maintenance work, the trail was closed for about ten days in 2001 and for twenty days in 2003 – reducing the length of comparable time series data. A visual inspection of the two curves indicate a considerably increase in visitors at the trail for most of the season.

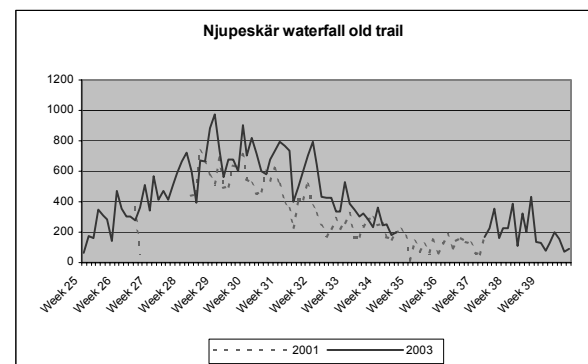


Figure 2. Data from the visitor counter at the Njupesjär trail.

The total number of observations in 2003 is 40 percent higher compared to 2001 for the comparable time period (approx. June 29 – August 24). While the trail to Njupesjär can be considered a front country location, the equivalent figure for Gördalen – a back-country trail in the north-west of the park – is a 12

percent increase in visitor observations. Based on these increases, the estimate of 38 000 visitors to Fulufjället in 2001 and that 93 percent of the visitors come to Njupesjär while 7 percent does visit various back-country locations, the total number of visitors to Fulufjället National Park in 2003 is estimated at 52,000 – a thirty-seven percent increase compared to 2001.

Looking at some basic visitor and trip characteristics (Table 2) collected both in 2001 and 2003, one will find significant changes in gender, place of residence, trip length and transportation. In 2003, Fulufjället was visited by more females and a higher proportion came from cities with more than 20,000 inhabitants compared to two years earlier. One also finds that the average length of the trip during which Fulufjället was visited has decreased from 10.1 to 8.8 days, and the proportion arriving at Fulufjället in bus has increased – but is still a very small number compared to those arriving in car. No changes were observed for age, education or the proportion that came as participants of an organized trip (commercial or non-commercial).

Table 2. Visitor and trip characteristics.

|                                   | 2001      | 2003     |                    |
|-----------------------------------|-----------|----------|--------------------|
| Age                               | 47 years  | 49 years | n.s. <sup>a</sup>  |
| Gender (% female)                 | 47.0%     | 52.9%    | 0.004 <sup>b</sup> |
| Residence in city (>20,000)       | 47.7%     | 52.5%    | 0.014 <sup>b</sup> |
| University degree                 | 39.9%     | 41.2%    | n.s. <sup>b</sup>  |
| Trip length                       | 10.1 days | 8.8 days | 0.000 <sup>a</sup> |
| Car                               | 93.4%     | 95.1%    | n.s. <sup>b</sup>  |
| Bus                               | 1.4%      | 2.6%     | 0.036 <sup>b</sup> |
| Organized trip                    | 4.1%      | 3.5%     | n.s. <sup>b</sup>  |
| Non-Swedish visitors <sup>c</sup> | 39.9%     | 30.6%    | --                 |
| First time visitors <sup>c</sup>  | 59.8%     | 63.6%    | --                 |

a – t-test; b – Chi-sq. test; c – based on data from on site registration cards

The questionnaire also included a closed ended question about the major reason to visit Fulufjället (Table 3). A visit to Njupesjär waterfall is the most important reason among two-thirds of all visitors in both years. The most noticeable change can be observed among those that express the nature reserve (2001 survey) and the national park (2003 survey) is the most important reason. In 2001, about three percent of the visitors said the most important reason to visit Fulufjället was because it is a nature reserve,

while in 2003, some ten percent of the visitors said the most important reason to visit Fulufjället was because it is a national park. There is also a major decrease in the proportion of the visitors that hunt, fish or pick berries, while studies of nature increase. In general, it looks like more people come to visit Fulufjället because of more symbolic reasons (it is a national park) and to participate in non-extractive activities in 2003 compared to 2001.

Table 3. The major reason to visit Fulufjället.

|                                                                                | 2001 <sup>a</sup> | 2003 <sup>a</sup> |
|--------------------------------------------------------------------------------|-------------------|-------------------|
| Visit to Njupesjär waterfall                                                   | 68.4%             | 65.5%             |
| Visit Fulufjället because it is a nature reserve (2001) / national park (2003) | 3.5%              | 10.4%             |
| Hiking                                                                         | 17.6%             | 15.9%             |
| Nature studies                                                                 | 1.7%              | 3.3%              |
| Hunting, fishing or berry picking                                              | 3.8%              | 0.9%              |
| Other                                                                          | 5.0%              | 3.8%              |

a – Chi-sq. < 0.000

### National park designation and tourism

In the 2001 survey, most visitors said that there is still not enough protected nature and wished for more nature reserves and national parks in the mountain areas. About 40 percent claimed that Fulufjället would be more attractive to visit once it became a national park. The majority of the visitors believed that a national park will increase Fulufjället's value to both people and nature. The creation of a national park would also bring advantages to the surrounding communities, as agreed by over 70 per cent of the visitors. One visitor in two thought that a national park in Fulufjället would not pose unnecessary restrictions on human use of the area, whereas 25 per cent believed that would be the case. A majority of the local population (the inhabitants in Särna and Sörsjön) claimed that the creation of a national park has little meaning to them.

In the 2003 survey, several of the attitudes toward a national park had changed (Table 4). A significantly larger proportion of the visitors agreed to the statements that a national park increases the value of Fulufjället to the visitors, increases the value of Fulufjället to the local population and contributes to protecting biodiversity. Still about 25 percent of the visitors believed that a national park at Fulufjället limits human development.

Table 4. Attitudes toward a national park (NP) at Fulufjället. Proportion of the visitors that agree to the following statements.

|                                                                   | 2001               | 2003               |
|-------------------------------------------------------------------|--------------------|--------------------|
| The NP increases the value of Fulufjället to the visitors         | 63.8% <sup>a</sup> | 80.6% <sup>a</sup> |
| The NP increases the value of Fulufjället to the local population | 72.7% <sup>a</sup> | 86.0% <sup>a</sup> |
| The NP at Fulufjället limits human development                    | 26.3%              | 23.2%              |
| The NP at Fulufjället contributes to protecting biodiversity      | 83.4% <sup>a</sup> | 94.7% <sup>a</sup> |

a – Chi.sq.  $p < 0.000$

One effective means of managing visitors to natural areas is to focus on different visitor groups or categories. Different visitor groups are attracted by different natural and social features, and often any single area must be managed to produce a spectrum of recreation opportunities. There are several ways to group visitors into categories. In this study, a question of twenty items was used to categorize the visitors by a factor analysis (principal component analysis with varimax rotation). For each item, respondents were asked to assess its importance to the decision to visit Fulufjället on a five point scale

(ranging from 1 – not at all important, to 5 – very important). The analysis of 2001 and 2003 produced five and six categories respectively (Table 5). The first component for both years is the Protected, unspoiled wilderness – i.e. people who come to Fulufjället because they think the area is unique, it is a nature reserve / national park, they want to experience unspoiled nature and wilderness. While in 2001 comfortable fishing is the second component and Family and sunshine the third, while this order is reversed in the 2003 study. Hence, in 2003 the fishing oriented visitors are somewhat replaced by those more family oriented. Peace and quiet and accessibility make up components four and five, while in 2003 people that have friends living close to Fulufjället form a sixth category.

### Visitor expenditures and willingness to pay

In both surveys, questions were asked about the willingness to pay for parking at the trailhead to Njupesjär waterfall and total expenditures during the visit to Fulufjället. Willingness to pay for parking did not change between the two studies – in both surveys respondents on average said they were willing to pay about 37.5 SEK excluding those ten percent who gave a zero bid to the open ended question. Zeros included imply a willingness to pay of 33 SEK in 2001 and 34 SEK in 2003, but still not statistically different. The expenditure question asked both in 2001 and 2003 – “About how large expenditures did you have while visiting Fulufjället (lodging, food,

Table 5. Visitor categories in Fulufjället National Park 2001 and 2003.

| Component                              | Items                                                                                                       | 2001 |               | 2003 |               |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------|------|---------------|------|---------------|
|                                        |                                                                                                             | Rank | % of variance | Rank | % of variance |
| <i>Protected, unspoiled wilderness</i> | - The area is unique<br>- The area in a NR / NP<br>- Experience unspoiled nature<br>- Experience wilderness | 1    | 13.1%         | 1    | 12.4%         |
| <i>Comfortable fishing</i>             | - Fishing possibilities<br>- Good lodging<br>- Cabins and huts                                              | 2    | 12.4%         | 3    | 10.6%         |
| <i>Family and sunshine</i>             | - Good weather<br>- Family friendly<br>- Good restaurants                                                   | 3    | 10.4%         | 2    | 10.8%         |
| <i>Peace and quiet</i>                 | - No crowding<br>- Peace and quiet                                                                          | 4    | 10.3%         | 4    | 10.2%         |
| <i>Accessibility</i>                   | - Area is close to residence<br>- Good transportation                                                       | 5    | 6.7           | 5    | 8.1%          |
| <i>Friends</i>                         | - Friends close to Fulufjället                                                                              | --   | --            | 6    | 5.7%          |
| Total variance explained               |                                                                                                             |      | 52.9%         |      | 57.8%         |

souvenirs etc.)?” – was less specific than the expenditure items for 2003 reported below. This single question did not take different geographical areas into account, but will give some idea about the changes in expenditures between the surveys. In 2001, visitors reported an average expenditure of 294 SEK while in 2003 the equivalent number was 248 SEK ( $F=3.34$ ,  $p=.067$ ), indicating that expenditures for an average visitor may have been higher in 2001 compared to 2003, depending on the level of significance we use.

Using the figures above and the estimation of 38,000 visitors to Fulufjället in 2001 and 52,000 visitors in 2003, we are able to determine changes in the total amounts for both willingness to pay for parking at Njupeskar trailhead and in visitor expenditures. The total amount visitors are willing to pay for parking increased by 37%, from 1.42 million SEK in 2001 to 1.95 million SEK in 2003. The total expenditures increased by 15%, from 11.2 million SEK in 2001 to 12.9 million SEK in 2003.

A more detailed question concerning visitor expenditures was included in the 2003 survey. In this case, respondents reported their expenditures on lodging, food, shopping, activities, transportation etc. in four different geographical regions: Fulufjället National Park; the gateway area surrounding the park; the local region outside the gateway area; and in Sweden outside the region. Average expenditures, the proportion of the visitors that reported expenditures and the total expenditures for each region are reported in Table 6. Accordingly, about five million SEK were spent in the park, about 11 million SEK in the gateway area, 41 million SEK in the region and just over 74 million SEK in Sweden outside the region.

Respondents to the 2003 survey were also asked to consider a hypothetical scenario under which Fulufjället was not designated a national park; “Suppose that Fulufjället was not a national park in the summer of 2003. Would this have affected your itinerary or time spent in the region, gateway area or current park area?”. Seven percent of the respondents said they would not have undertaken the trip at all, 8.4 percent said their trip would have been different while almost 85 percent of the respondents would not have changed their itinerary or time spent in the different locations. Hence, under a hypothetical scenario of no national park in Fulufjället there will be a decrease in visitors in the range of 7–15 percent. Based on the numbers in Table 6, this change will account for a decrease in expenditures in the range of 0.4–0.8 million SEK in Fulufjället, 0.8–1.8 million SEK in the gateway area, and 2.9–6.4 million SEK in the region outside the gateway area. These figures should however be considered preliminary and will be subject to further research. The relationship between visitor attitudes, real behavior, expenditures and travel patterns may be more complex than the assumptions above are based on.

Table 6. Visitor expenditures by geographical location.

|                               | Average expenditure <sup>a</sup> | Visitors reporting expenditure | Total expenditures <sup>b</sup> |
|-------------------------------|----------------------------------|--------------------------------|---------------------------------|
| Fulufjället NP                | 208 SEK                          | 45.5%                          | 4.98 MSEK                       |
| Gateway area (outside FNP)    | 1022 SEK                         | 31.6%                          | 11.6 MSEK                       |
| Region (outside gateway area) | 1985 SEK                         | 52.8%                          | 41.3 MSEK                       |
| Sweden (outside region)       | 4275 SEK                         | 50.9%                          | 74.4 MSEK                       |

*a* – average expenditure among visitors that reported expenditures in each region

*b* – based on 52,455 estimated visitors to Fulufjällets NP, 35,950 visitors to gateway area, 39,400 visitors to region and 34,200 visitors to Sweden outside the region.

## Concluding remarks

The visitors to Fulufjället differ from those of other Swedish mountain regions by a high percentage of first time visitors (about 60 percent). Four out of ten visitors to Fulufjället are foreigners, which is also considerably more than in other parts of the Swedish mountain region (Heberlein et al., 2002; Vuorio, 2003). Njupeskar – the highest waterfall in the country – is a major attraction in Fulufjället with a high concentration of visitors, situated in an area otherwise little known. All this make Fulufjället a special place, and the benefits of using visitor data both in park management and tourism development should be obvious. What also make Fulufjället a special place is the national park designation process that explicitly involved the local population, applied a management zoning system and initiated social science research – some of which is presented in this paper.

Comparing the visitors that came the year before Fulufjället was designated a national park with those that came one year after show some interesting differences. It looks like a national park attract more females, people from larger cities, people that hike, fish and hunt less, families and people who like good weather. This is clearly not the more wilderness purism oriented groups. In general, visitors are more positive toward national parks and it looks like about one in ten visitors came to Fulufjället only because

the place is a national park. At least so in the short run. While it looks like a national park as such matters, changes identified here may partly be driven by improvements in infrastructure such as roads, visitor center, signs, trails – all of which took place during the study period.

National parks in Sweden are not as important for the supply of outdoor recreation opportunities as may be the case in other countries where access to private land is restricted. Nevertheless, national parks and other protected areas do play an important role in the tourism production process. More focus is needed on the relationship between park management and tourism development. Measurement of visitor satisfaction shows that people are more satisfied with their visit to Fulufjället in 2003 as compared to 2001. Data on travel patterns and expenditures also indicate that a national park matters in economic terms. Future research will explore these relationships in more detail.

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