

# Visitor counting and surveys in a dispersed-use mountain area in Norway

Vegard Gundersen<sup>1</sup>, Oddgeir Andersen<sup>1</sup>

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Studies of disruption on wildlife populations have previously treated human activity largely as an effect with constant magnitude. One has rarely had the possibility to apply a more nuanced approach where the intensity of human travel varies in time, space or among different user groups. Without a description of the dynamic use of infrastructure, it has been difficult both to predict the effect that disturbance will have on wildlife populations, and to come up with precise understanding of threshold or cumulative effects of human travel. Such knowledge is absolutely necessary to agree on management goals for acceptable use and its effects on wildlife populations in alpine areas in Norway; particularly wild reindeer. Obtaining accurate and usable visitor counts and information in backcountry remote settings is challenging, especially if the use is dispersed at a temporal as well as a geographical scale (Kajala et al. 2007). Knowledge about the visitors characteristics is important to be included in a final management strategy and planning tool for the DS. A four year (2009-2012) monitoring project at Dovrefjell-Sunndalsfjella (DS) management area is in this context used as an example of spatiotemporal use in a large mountain area (6830 km<sup>2</sup>) with an limited rate of visitors (approx. 30 000 in 2009). The project uses a wide range of monitoring methods, depending on the kind of visitor groups and data needed to test the level of impact they have on wild reindeer. We present here some preliminary results from 2009.

Our data shows how human travel's spatiotemporal attributes can be described with a combination of different methods. Data from DS in 2009 show that to a large degree (80 %), people use existing travel routes and the intensity is concentrated in a few important areas and along the main trail network; travel is therefore relatively tied to areas with a great degree of organization. But the results from DS also show that human travel varies temporally according to seasons, high-low intensity seasons, weekends vs. weekdays, day vs. night, hunting season vs non hunting season, and according to weather and trail conditions. This is further complicated by the fact that the strength of these factors varies spatially. Visitors to DS generally want wilderness experiences to a higher degree than for example more "comfortable wanted" visitors in nearby national parks. In 2009, eight main visitor groups were identified by a combination of data from three methods: quantitative field survey (24 self-registration boxes), follow-up internet survey (by 2500 e.mail addresses) and automatic counters at main entrances (20).

The first three visitor groups, that are short stop travel, day visit and overnight stay, use mainly the fringe of the management area, mostly along gravel roads or short walks from well designated parking lots. These visitor groups were monitored by on site interviews and data from parking / entrance fees as well as data reported to the project through local tourism agencies or companies (incl. lodging, wildlife safaris, organized hiking trips, horsebackriding).

The two visitor groups of backcountry comfortable and backcountry adventure have a much more integrated use of the area, but still mainly along marked paths. Intensively used marked paths may function as barriers for wild reindeer migratory patterns in some areas. To monitor these visitor groups we used a combination of self-registration boxes and automatic counters at the main entrances in the DS. A short questionnaire was answered by self-registration, including how people visit (including drawing route on a map) the area, as well as purpose of the visit and demographics. The visitors were also asked to leave their email addresses to be contacted later for a more detailed internet survey.

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<sup>1</sup> Norwegian Institute for Nature Research (NINA), Human Dimension Department, Fakkeltgården, NO-2624 Lillehammer, Norway, [vegard.gundersen@nina.no](mailto:vegard.gundersen@nina.no), [oddgeir.andersen@nina.no](mailto:oddgeir.andersen@nina.no)

The last three visitor groups are: backcountry remote experience, traditional subsistence harvest and thrill seeking. These visitor groups have a much more area - consuming - behavior, mainly walking off marked paths and in more remote areas than the former groups, which to a larger extent may overlap and come in interaction with the wild reindeer area use and habitat selection. To get adequate spatial information from these visitor groups are challenging, and we plan to use GPS tracking of representative samples of the respective visitor groups to supplement the information from automatic counters and self-registration boxes.

The oral presentation will summarize results from each visitor group based on self-registrations boxes and automatic counters from the field season of 2009. Preliminary results show that approximately 19 % of the visitors can be classified in the latter three groups; backcountry remote experience, traditional subsistence harvest and thrill seeking. The main resources in the project for the remaining three years will be used to get accurate and usable visitor counts and information from these three visitor groups.

### **References**

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