

Visitor and Environmental Impact Monitoring as Basis for Sustainable Nature Tourism in Estonian Recreational Areas

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The State Forest Management Centre (SFMC) is the agency responsible for the management of state forests, with a total forested area of about 1.08 million hectares, which is about a half of all Estonian territory covered by forest (2.2 million hectares). In addition to silviculture and wood production, the SFMC is also responsible for multiple forest recreation activities in recreational areas located in state forests without damaging forest and biota.

Since 1997 the SFMC has created diverse opportunities to spend time in nature in 10 recreational areas.

In order to clarify the development needs of recreational use of forests and to adopt optimal financing decisions the SFMC has conducted surveys and accounting of visitors of recreational areas since the year 2002.

In order to manage the recreational areas in the best way, the needs of users and changes in needs shall be periodically monitored (visitor survey), the number and distribution of visits shall be assessed (visitor counting) and the environmental impact of recreational activities shall be systematically observed (surveys on the environmental impact and carrying capacity of landscape).

Continuous visitor counting provides information of the areas most visited and the division of the recreational load by objects and types of use.

Visitor counting is carried out in all of the ten recreational areas of the SFMC during the period when land is not constantly frozen. The first counters

were installed on the focuses of visitor traffic of a recreational area in 2002. As of 2005, based on the visitor surveys, 29 electronic counters have been installed in the recreational areas of the SFMC.

The results of visitor counting reveal a steep growth in the number of visits within the last years. SFMC network of recreational areas accommodated nearly 450'000 visits in 2003 and 600'000 in 2005.

Periodic performance of visitor surveys provides the manager with the knowledge of the users profile and types of use.

The results of visitor surveys show that three main types of usage are dominant – coastal holiday and camping with a duration of up to 2 weeks, and picnics as well as visits to natural monuments significant in Estonian conditions usually as brief visits.

Due to the increasing recreational load against the background of diverse types of use and expected special preparation of forest landscapes the assessment of environmental impacts caused by outdoor recreation has become more and more important.

Regular observation of environmental impact of recreational load allows the impacts of different types of use practiced in different capacities on various landscapes to be clarified.

In 2002 the Estonian Centre of Forest Protection and Silviculture (CFPS) in good cooperation with the SFMC started environmental impact monitoring in recreational areas. There was an urgent need to develop a low-cost monitoring system with suf-

ficiently high levels of accuracy. The primary objective of the monitoring was to determine the state of recreational forests and the direction and amount of changes which may vary to some extent in terms of time and causes.

In Estonia, environmental impact is concentrated at and around recreational sites usually developed for visitor use – visitor centers, different hiker and educational trails, campsites, picnic and fire pits and other areas of rest, especially on the coastal areas of rivers, lakes and the Baltic Sea.

In 2002-2005, a network of permanent monitoring transects and sample plots have been established and environmental impact assessments and evaluations started in 7 recreational areas. The network of permanent monitoring transects with distances mainly of 30 m between was established in the campsites. The small sample plots with areas of 1 m² were located systematically on transect lines. An original system of ecological indicators characterizing the condition of the forest ground vegetation, trees, natural regeneration and forest soils has been worked out and tested. Zones of the trails and camping areas with different levels of vegetation and soil damages, shares of bare mineral ground, root exposure and decreases in the soil ground level were measured. In the surrounding forest the vegetation cover, plant species composition, distribution and abundance of injuries were also assessed.

As results of environmental impact assessments on campsites the appearance of soil and soil vegetation damages, injuries of natural regeneration and trees seem to be a very real problem, whereby on trails and the surrounding forest damage to the soil and roots of the trees is considerable.

In almost all of the assessed recreational areas, at least in some parts, the environmental impact is already now higher than an acceptable level.

According to our experience, once every 3-5 years seems to be a reasonable frequency for environmental impact assessments in most situations.

Recreational use of Estonian state forests has increased by 25% within the last three years, the recreational types of use have diversified and the possibly greatest share of the recreational activities has been directed to recreational areas prepared for

visitors. The demand for ecotourism is expected to grow in the future. Different survey and monitoring systems are required in order to assess the supply and demand of recreational resources.

Regular implementation of the surveys and monitoring provides a combined result, which enables the manager of the state forest (SFM) to adopt the best resolutions by the recreational load of recreational areas, which is increasing,

- upon planning development tendencies and managing the existent system;
- upon building infrastructure supporting different needs and types of use;
- upon planning and implementing activities of landscape protection;
- upon making the most optimal financing resolutions.