

Implementation of results of visitor and environmental impact monitoring: an example of Kauksi campsite of the recreation area along the northern coast of Lake Peipsi of Estonian State Forest Management Centre

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Abstract — Kauksi campsite, located in the recreation area along the northern coast of Lake Peipsi of Estonian State Forest Management Centre, is an area of intensive and long-term recreational use. In the years 2003 and 2007 a permanent monitoring network was established in the area and the environmental situation and its changes were evaluated. Based on the results of the environmental status assessment and visitor monitoring, recommendations were made for improving the campsite condition and an action plan for performing the works was prepared. In 2004-2007 an infrastructure for the protection of campsite and the lakeshore dunes was designed and constructed, and measures of landscape protection were introduced, as a result of which the environmental condition has stabilised and for some indicators, considerably improved. This case shows that in an area of intensive use it is important to know the user and use specifics and, in order to support the periodic assessment of environmental impacts, to continuously monitor environmental status and perform preventive landscape protection works in order to maintain the stable condition and the recreational values of the area.

Index Terms — Forest recreation, visitor and environmental impact monitoring, recreational load, campsite condition monitoring, damages on trees, soil vegetation and soil.



1 INTRODUCTION

State Forest Management Centre, the manager of state forests in Estonia, provides opportunities for forest recreation in 13 recreational areas. For making

financing and development decisions, State Forest Management Centre has organised visitor and environmental impact monitoring in recreational areas since 2002. This poster deals with Kauksi campsite in the recreational area along the northern coast of Lake Peipsi of State Forest Management Centre. The campsite is located in a dune forest and is an area of intensive (on average 21000 visits per year) and long-term recreational use and users and traditional ways of use – swimming, sunbathing, camping and picnicking, the two latter causing a strong impact on the landscape. Visitors come to the campsite from surrounding municipalities, 89% arrive by car

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and on average visitors stay in the campsite for two days.

2 METHODOLOGY

The situation and changes in campsite condition were monitored by field measurements in summer and autumn of 2003 and 2007.

A network of permanent transects with the distance of 30 m between the transects was established. Sample plots with the area of 1 m² were established systematically on transect lines. Condition class distribution, share of bare mineral ground and ground vegetation cover, plant species composition, distribution and abundance were estimated. Recreational injuries and damages to trees and natural regeneration, fire scars and trash were also assessed.

3 RESULTS OF THE ENVIRONMENTAL IMPACT ASSESSMENT IN 2003

In 2003 environmental impact assessment was conducted in the area, its results revealing that the impacts cause excess of the limits of acceptable change. So the proportion of area with vegetation loss due to trampling was 33,6 %. The proportion of area with bare mineral ground and partly with erosion was 10,9 %. Anthropogenic damages were found on 25 % of dominant-story pines.

4 WORKS OF LANDSCAPE PROTECTION AND VISITOR MANAGEMENT IN 2004-2007

On the basis of the results of environment impact assessment and visitor monitoring, recommendations were made for improving the campsite condition and an action plan was prepared to perform the works.

In the years 2004-2005 a free gravel-covered and log-railed parking area was designed and built at the entrance to the campsite for the vehicles of one-day visitors. By the road in the campsite six gravel-covered and

log-railed parking spaces were designed and built for multi-day visitors. In addition, traffic of motor vehicles in the campsite was regulated so that a fee is charged for each entry to the campsite with a motor vehicle.

Appropriate infrastructure was constructed for the protection of the dunes between the campsite and the lakeshore, and soil protection works were performed. In the years 2006-2007 stairs were made on the highest dune both on the side of the campsite and on the side towards the shore and a small wooden observation platform was built on the dune ridge. The dune slope facing the campsite was covered with geotextile and mountain pines were planted on the slope. At the foot of the dune side facing the campsite a log rail was constructed, and signs prohibiting climbing and a stand with necessary information were installed. Boardwalks were made on the four paths from the campsite over the dunes to the lakeshore.

Fireplaces were removed from the coastward part of the campsite, where the soil is more vulnerable, and the campsite was expanded towards inland.

The total cost of landscape protection works performed in the years 2004-2007 was approximately 29 000 euros.

5 RESULTS OF THE ENVIRONMENTAL IMPACT ASSESSMENT IN 2007

In 2007 a repeat survey was conducted at Kauksi campsite, which showed that as a result of the implemented measures environmental status in the area had considerably improved, especially as regards ground vegetation and natural regeneration of trees and the recovery of understory. The share of area with vegetation loss due to trampling had decreased by 12,1 per cent compared to the year 2003. The proportion of area with bare mineral ground and partly with erosion was 9,9 %, down by 1 %, despite the continued use of the area. New anthropogenic damages occurred on only 1,3 % of the pines of the dominant story. The total number of

natural regeneration of trees and understory on the campsite increased, although natural regeneration only took place in groups and the number and proportion of pine understory decreased to some extent.

Littering of the area had also diminished considerably.

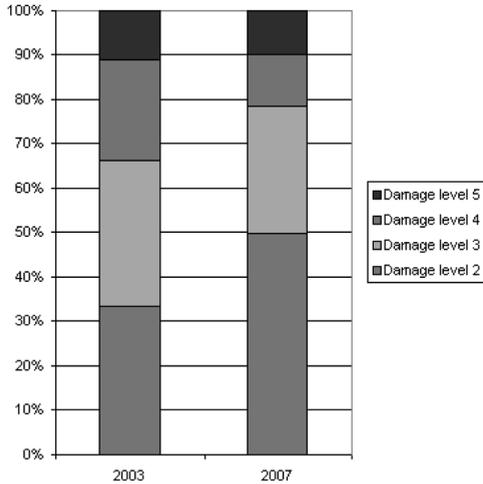


Fig. 1 Proportion of area with different soil and ground vegetation damage in Kauksi campsite in 2003 and 2007. Damage level 2 marks an area with ground vegetation. Damage level 5 denotes an area with bare mineral ground and partly with erosion.

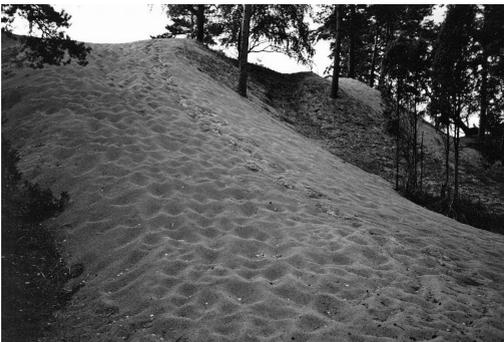


Fig. 2. The state of the highest dune in 2003



Fig. 3. The dune slope facing the campsite was covered with geotextile and mountain pines were planted on the slope



Fig. 4. Boardwalk and observation platform for dune protection

6 CONCLUSION

Expenses made for improving the campsite condition raised the cost of a visit to the area by 30%. The performed landscape protection works improved the environmental status of the area and at the same time the extension of the campsite created conditions for increasing the social satisfaction of visitors.

This case shows that in an area of intensive and eroding use it is important to know the specifics of the user and use and, in order to support the periodic assessment of environmental impacts, to continuously monitor the environmental status and per-

form preventive landscape protection works in order to maintain the stable condition and the recreational values of the area.

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