

Balancing conservation and visitation through a comprehensive monitoring system of nature protection in Estonia

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Designing cross-country monitoring system

Estonia has partially practiced methods of visitor monitoring in forest areas, through a comprehensive and integrated visitor's monitoring programme of protected areas developed between 2009 and 2011. This study aims to design the conceptual framework for a national visitor monitoring system including the selection of a comprehensive indicator set and optimal monitoring network. The design and implementation of the monitoring system (i.e., its core and architecture) relied on the Nordic monitoring systems, drawing especially from the experiences in the Finnish Metsähallitus (Kajala et al, 2007; Sievänen et al, 2008). The Estonian monitoring system incorporates visitor counting, monitoring of carrying capacity and visitor survey. System operationalization applies regulations and criteria of nature tourism set in management plans of protected areas. In addition to maintaining ecosystem and recreational values, the monitoring system also articulates emerging current needs and demand for tourism services (Alexander 2008, Lockwood et al 2006).

Methods been tested in selected pilot and exemplar sample areas and have been adapted for use by conversation officers and nature rangers. The methods are also sensitive to difference in scale (e.g., protected area, regional, and national scale). Monitoring stations are identified according to the type of protected area, priority sites, visitation infrastructure, proximity to county centres, accessibility, visitation, holiday destination and outdoor events. Eco-Counter and TRAFx G3 Infrared Trail Counters were deployed and tested in developing the visitor counting module. Database output and reporting tools of this module consist of monthly and daily totals, time-of-day profile, day-of-week profile, and maximum visitation reports to investigate peak periods with critical load.

System testing

The monitoring system is employed to tackle increasing nature tourist flows. In addition, the recreation infrastructure and facilities has been growing in protected areas. The list of priority monitoring areas comprised areas with extensive visitation as well as low visited areas across different ecological carrying capacities. Also, seasonality and weather aspects have been explored by various monitoring cycles. A management module, which operates within a conservation plan framework and shortlists precautionary and mitigation best practices, is presented as decision-tree. According to the mode of visitation, three types of protected areas are prescribed at decision-tree: very rare visitation area, partly de-concentrated visitation area, and strictly directed/chan-

nelled visitation area. Based on Wirth and Kaae (2010), restrictive, soft and facilitating management actions are applied depending on specific case as regular and urgent. Cases studies of the Vooremaa landscape reserve as an open access landscape and Emajõe Suursoo wetland reserve as restricted access area with entrance gates demonstrated the complexity and functionality of the visitor monitoring system, also possible bottlenecks of implementation became apparent in. In the case of Emajõe Suursoo, the Kantsi visitor centre is the most visited site (up to 200 visits daily during spring-summer), followed by two hiking trails (three gates for counting). The hunting and fishing visitor segments dominate during off-season months requiring different management and inspection mode.

Setting standards for visitor management

The major principles and conditions for sustainable visitor's management in Estonian protected areas are as follows. First, the development of nature tourism infrastructure in distant areas or areas with low visitation is not recommended, but rather the further promotion of already developed areas. Second, protected areas should be monitored, evaluated and managed as a comprehensive unified system despite different managing authorities and an initial task should be to implement systematic visitor counting. Third, the visitor gates, which are not yet widely used in Estonia, should be established as a regular management tool. Fourth, marketing should be focused on target groups instead of done universally, and marketing should include a robust conservation message. Fifth, in the framework of comprehensive and general physical planning, evidence-based zoning for tourism and recreation needs to be introduced to mitigate increasing visitation impacts. In addition to the present zoning scheme of protected areas, a designated tourism zone is proposed for leaner, more straightforward management. As a missing link between conversation and visitation, a tourism and visitation standards and criteria should be assigned to protected areas. Benchmarking and improved management efficiency can be improved via tourism-adapted management plans.

Table I. Indicators of visitor monitoring

Module and category		Indicators
I	Visitor counting	3: annual visitation, weekly max, daily max, its trend
II	Impact on physical environment	3: importance of category, change of category, unplanned trails
	Impact of species and communities	2: Natura 2000 status class (A, B, C), status of indicator species
	Quality of infrastructure	1: status class
	Firewood and waste management	3: quantities, unplanned fireplaces, littering (location, mode)
III	Visitor survey	10: visitor features (age, sex, education, etc), activities, overnights, motives, expectations, satisfaction, expenditures, mode of transport, location of origin
	Entrepreneurs survey	2: accommodation units, employment

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