Monitoring of disturbances in the natural environment on Pohorje Mountain (Slovenia)

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Slovenia is due to its picturesque nature and unique natural resources identified as a country with great potential for the development of green, responsible tourism. Protected areas offer visitors to experience nature qualitatively; at the same time, tourism and recreation increasingly affect these areas. Preserved natural areas attract people, so visits to these sites are becoming more frequent and numerous. It is in most cases impossible to leave these areas to nature conservation only; therefore, it is necessary to actively regulate visits or guide the visitors away from the most vulnerable natural areas to areas, which are less sensitive and less valuable from the point of nature conservation importance.

Research into movement of visitors in natural protected areas is essential if we want to zone the space so that it regulates visitors' activities in a way that minimizes its effect on nature but at the same time still preserves the attractiveness. Data gathered from the field (recording with counters, observation of visitors, etc.) should be meaningfully incorporated in the planning of visitors channelling (construction of new trails, the relevant information and interpretational infrastructure, construction of classrooms in nature, etc).

This paper deals with the monitoring of disturbances (motorized vehicles, snowmobiles, bikes) in the natural environment on Pohorje Mountain range (Slovenia) and presenting implemented activities dealing with visitor management in the area. Activities were carried out through the project SUPORT - Sustainable Management of Pohorje area (EEA Financial Mechanism and Norwegian Financial Mechanism 2009-2014 in Slovenia; EEAG 4300-346/2014; Y2015-2016) and transferring management planning process into ongoing project LIFE TO GRASLANDS - Conservation- and management ofdrygrasslands in EasternSlovenia (LIFE 14 NAT/SI/000005).The project focusedtowards efficient management and monitoring of Natura 2000 sites. One of the work packages of the project included zoning of space on the appropriateness of human activity in the natural environment.With Ferro-magnetic sensors, we have monitored disturbances in the natural environment. The sensors tracked the frequency of disturbances in the natural environment and on forest roads, where traffic is only permitted for forest management.

Based on collected data, apattern of use of forest roads has been established (40 markers positioned on the tables of the Natura 2000 entry into the quiet zone, 50 road signs with time-limited visit andraised up 5 road blocks).

The analysis has also included monitoring of traffic on hiking trails and pathless areas.Analysis of interference showed that the maximum value of journeys was detected during the wintertime. Standing out were the months of February and March

2016 especially during night period (between 20 pm and 6 am in the morning). At this time of the day we can predict with a high certainty (especially due to visual trail in snow) that snowmobiles were the major cause of the disturbance (a location near tourist centres with the accommodation capacities). Between 20 pm and 6 am in the period between 1. 10. 2015 and 31. 3. 2016 observeddata has showed that a fifth of all journeys hasoccurred during the mentioned nigh period.In the autumn dominated cross motorcycles, quads (ATV) and off-road cars and during the winter (especially the period of snow cover - February, March) the snowmobiles. The datasets are necessary tool to aware local and state governance to take additional measure for lowering illegal activities in nature environment.

Analysis of disturbances were carried out since the September 2015 lasting until the end of March 2016. In autumn time (September, October, November 2015) the number of drives increased on all forest roads("mushroom season"). In the winter period, the information on individual sites strongly differ, because the roads had not been ploughed (period January-March). Winter period 2015/16 (December-February)was characterized with the snow cover of the observed forest roads from mid-January until the end of March 2016. For this period, we expect that the road transport was taken by the snowmobiles. New datasets were the base for setting up additional measures for establishing zonation regimes in order to protect high valued natural areas.

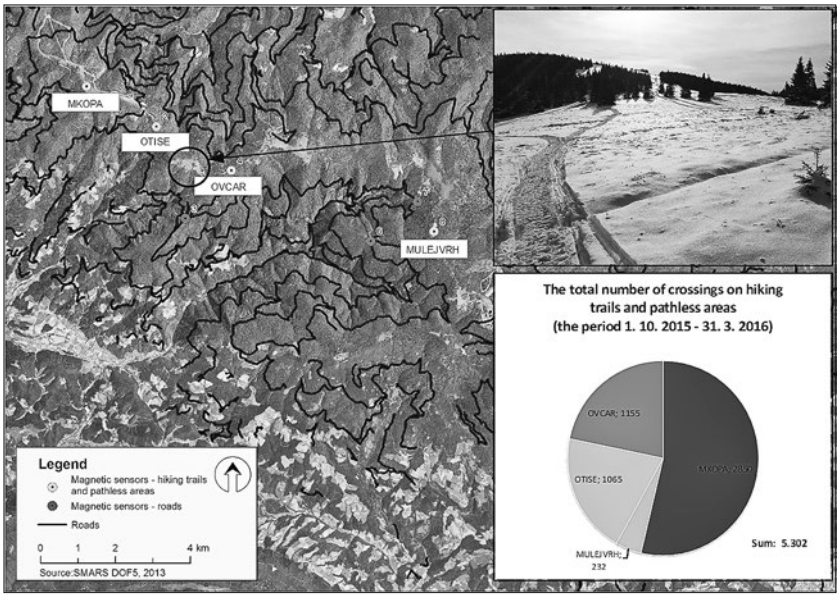

Figure 1. *The monitoring results of traffic on hiking trails and pathless areas*

Project SUPORT (2015-2016). Sustainable Management of Pohorje area (EEA Financial Mechanism and Norwegian Financial Mechanism 2009-2014 in Slovenia; EEAG 4300-346/2014; Y2014-2016)URL: http://http://www.projektipohorja.si/en/

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