Dosing of Physical Load for Hiking Infrastructure Users in the Forests of the Krka National Park

Matija Landekić*, Ivan Martinčić*, Mario Šporčić*

Introduction
The poster visualizes the methodological concept of the risk management model development when visiting protected areas in the Republic of Croatia from an aspect/field of hiking infrastructure categorization regard to the requirements for physical engagement of visitors to overcome trail, or individual section of trail. The model is based on field measurement of physical loads of visitors that were carried out in the Krka National Park, onto the D-1 section of the walking trail “Niz ploču”.

For the purpose of informing the visitor about the required physical engagement for the overcoming the D-1 trail section, physical load on a sample of 23 respondents was determined in everyday conditions. By measuring the heart rate, input elements were obtained for categorization of the trail section requirement, and they were placed in relation to the age group and general physical fitness of the visitor.

Research area
The total length of the hiking trail “Niz ploču” is 1560 m, the altitude difference is 155 m and the time to walk is about 45 min (Figure 1). The use of the trail requires increased visitor attention regarding safety and very often increased physical ability (Figure 1). Particularly physically demanding is considered the D-1 section where the trail follows a naturally formed stone plate that vertically rises to a small fault and to a top plateau (a beautiful viewpoint) with a total length of 520 m and the altitude difference of 143 m.

Materials and Methods
For assessing the risk of physical (over)load, when overcoming the D-1 section on the trail “Niz ploču”, heart rate measurement method was applied with using the Garmin Forerunner 910XT and metronome BOSS DB-3. Field measurements and data collection were carried out during the summer of 2017. The class of physical load (Table 1), and the corresponding level of general physical fitness (Table 2), for each subject were determined by calculating the percent increase in heart rate during the overcoming of D-1 trail section.

Research results
Categorization of the D-1 trail section was conducted according to the level of required physical engagement for overcoming the climb. Based on the categorization, a Take a Break Scheme has been derived from the optimal risk matrix. Scheme to each visitor through two steps, based on the belonging age group and self-evaluated subjective physical fitness, suggests regime for overcoming the D-1 trail section.

Concluding remarks
The established system of programmed regime for overcoming trail section, as a result of the research conducted in Krka national park, is an innovative element of Visitor Risk Management approach. The design of such regimes includes the suggested number, the type and location of the rest on the trail section, and the duration of a break on a resting point. In this way to each visitor is suggested a personal choice between the three regimes of overcoming the trail section. Such an approach, along with a demonstration of responsible park management behaviour, ensures that the decision of each visitor, whether and how to use the trail, significantly reduces unwanted health risks and ensures satisfaction with the experience of visiting the protected area.

References (the most important sources)


* Faculty of Forestry, Department of Forest Engineering, University of Zagreb, Croatia, mlandekic@sumjak.hr, martinic@sumjak.hr, sporcic@sumjak.hr

**Fig. 2 Take a Break scheme for overcoming the D-1 section of the hiking trail “Niz ploču”

**Fig. 1 Researched hiking trail “Niz ploču” in Krka national park