

## **Rain, cost or publicity – what determines variation in visitor numbers to the Swiss National Park?**

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### **Keywords**

economic success, weather, modeling visitation, slab sensors

### **Summary**

Visitor numbers are often used as a measure for the economic success of protected areas, but are influenced by a variety of parameters such as season, weather, social/institutional factors, publicity and the cost of visiting the wider region. The Swiss National Park celebrated its centenary in 2014 with correspondingly high media coverage, enabling the application of a before-during-after design in modeling visitor counts over eight years. Our results suggest that the economic situation was the most important predictor of visitation rates after accounting for month and temperature.

### **Introduction**

Visitor numbers to national parks can fluctuate according to a variety of factors such as the wider economic situation, natural disasters, or simply weather conditions. We investigated visitation rates to the Swiss National Park (SNP) over an 8-year period between 2008 and 2015. This period included the opening of a new visitor centre in 2008, the centenary celebrations of the park in 2014 with high media coverage, and the depreciation in value of the Euro against the Swiss Franc. We hypothesized that visitor numbers would be influenced by an interaction of variables relating to the European economy, weather conditions, social and institutional factors, and publicity around special events.

### **Methods**

Visitors to the SNP were counted using pressure-sensitive mats buried below footpaths (slab sensors; Eco Counter; <http://www.eco-compteur.com/en/products/rangeslabs>) at narrow parts of trails where hikers were forced to walk in single file. Daily counts from 5 permanently installed systems on different hiking trails distributed throughout the park were used as an index of visitation. These daily summaries were used as the response variable in a GLM with month (June – October; the hiking season), holiday, weekend (both coded as yes/no), average daily air temperature, total daily precipitation, average monthly exchange rate between the Euro and Swiss Franc, and total number of media articles published about the SNP per month as explanatory variables. A second model additionally included all first order interaction terms between these parameters.

### **Results**

In the first model without interactions, the most important variable determining visitor numbers to the SNP was month, with highest visitation recorded during September and lowest in June. The second most important variable was the exchange rate, where visitor numbers increased with increasing value of the Euro against the Swiss Franc. As expected, visitor counts were also higher during the holiday season than outside school holidays, increased with increasing temperature and decreased with increasing precipitation. Monthly media coverage only had a weak positive effect on visitation rates.

In the second model with first order interactions included, the interaction between month and temperature was the most important predictor of visitation rate: higher temperatures particularly in October resulted in higher visitor numbers, while there was a weaker effect between July and September. While visitation rate was higher at weekends during September and October (highest on September weekends), it was lower at weekends than during weekdays in July and August. The increase in visitor numbers with increasing value of the Euro against the Swiss Franc was strongest during July and weakest in October. A strong Euro also led to a weaker positive response in visitation to temperature, and a weaker negative response to precipitation. The negative effect of precipitation was strong at low to intermediate temperatures, but weak at high to very high temperatures. Finally, visitor numbers showed a weaker negative response to increasing precipitation with increasing media coverage of the SNP.

## **Discussion**

The strong seasonal effect on visitation rate in the model without interactions can be explained by visitors' expectations of the SNP: one of the main highlights is the red deer rut in September, which is when most visitors are recorded. Particular expectations such as the red deer rut or special events associated with high media coverage (the centenary celebrations in 2014) also lead to visitor numbers being less sensitive to weather conditions (no effect of temperature in September, and decreasing sensitivity to precipitation during months of high media coverage). However, the most important predictor of visitor numbers to the SNP when corrected for seasonal effects was the exchange rate between the Euro and Swiss Franc. The area around the SNP represents an expensive tourist destination, and while a weak Euro against the Swiss Franc makes holidays in the region more expensive for visitors from abroad, it also makes similar offers abroad cheaper for visitors from Switzerland. While particularly high media coverage around a special event such as the centenary celebrations can thus decrease hikers' sensitivity to weather conditions, it cannot compensate for the negative effects of an adverse economic situation in Europe on visitor numbers to the park.

## **References**

Further details can be found in the following publication:

MILLHÄUSLER A, ANDERWALD P, HAENI M & HALLER RM (2016) Publicity, economics and weather – changes in visitor numbers to a European National Park over 8 years. *Journal of Outdoor Recreation and Tourism* 16: 50-57.

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