23 Backcountry winter recreation in the UNESCO Biosphere Reserve Engiadina Val Müstair, Switzerland - Developments in the last 10 years

Reto Rupf, **Jonathan Blank Pachlatko**, **Martin Wyttenbach**, Institute of Natural Resource Sciences, ZHAW - Zurich University of Applied Sciences, Switzerland

Introduction

The UNESCO Biosphere Reserve Engiadina Val Müstair is situated in the easternmost part of Switzerland at the border to Italy. Since 2010, together with the Swiss National Park, it forms Switzerland's first UNESCO biosphere reserve in the alpine region. The biosphere reserve is well known for its wildlife such as the ibex, chamois and red deer as well as grouse such as the black grouse and capercaillie (Tetrao urogallus). The latter is a large woodland species with very specialized habitat preferences. Its population has declined in recent decades in Central Europe and therefore the species is classified as 'endangered EN' on the Swiss red list of breeding birds. Due to cold conditions with high snow cover and a lack of feed, capercaillies are very sensitive to disturbance in winter.

At the same time, Val Müstair biosphere reserve is a renowned backcountry winter recreation area which attracts many visitors who are passionate about winter sports activities like snowshoeing or ski mountaineering. As a consequence, the issue of conflicts between backcountry activities and conservation has emerged. The situation from 2008 to 2010 was analysed by Rupf et al. (2011). It could be demonstrated that winter recreationists travel quite often through capercaillie core habitats.

According to Swiss nationwide representative surveys from 2008 to 2020, the number of declared active winter backcountry sports recreationists has increased by 275 % from about 165,000 to 455,000 (Lamprecht et al., 2009, 2015, 2020). Additionally, Haegeli et al. (2019) and Rupf et al. (2019) state that some backcountry visitor groups look to avoid crowds and therefore enter new terrain, even though it would increase their risk of being caught by an avalanche. Based on those findings, there is an implication that the wildlife habitats will continue to subjected to the pressure of recreational backcountry winter sports activities.

In this article we will address following research questions:

1) Could increased numbers of winter backcountry recreationists also be observed in the countryside, specifically in UNESCO Biosphere Reserve Val Engiadina Val Müstair? – How have the numbers of usage changed in the last ten years?

2) What effects did a forest clearance on a ski mountaineering route have for its neighbouring wildlife habitats?

Methods

Using passive infrared counters Ecocounter® and automated cameras Reconyx®, we counted hits at two different sites along official ski mountaineering and snowshoeing route to Munt Buffalora and Piz Dora – the counters were doublechecked manually or by cameras. To generate a correction term for the long count series of the infrared counter, we used the count of 30 days of the camera data. The two windows of time were tested for significance using the two-tailed t-test for dependent samples. The counting period took place in winter 2010/11, 2019/20 and 2020/21, from 15 December to 15 March.

The spatial use of the backcountry recreationists was investigated in 2008-2010 by means of GPS loggings (Rupf et al., 2011); consequently, we were able to analyse 501 total trips of 303 ski mountaineers and snowshoers with a special focus at the northern slope of Piz Dora. In winter 2019/20 we applied a different visitor monitoring technique – some days after fresh snowfall, we took pictures by a telephoto lens positioned at village Lü on the other side of the valley. With the Adobe Photoshop software we merged the overlapping single pictures to an entire composite photo. The open alpine forest with European larch and Swiss stone pine allowed us to detect and to count recreationists tracks in the snow cover. For statistical analyses we used the R software.

Results

Comparing the two counts ten years apart shows a highly significant increase in hits in the two-tailed t-test ($p < 0.001$). Whereas the 2010/11 survey

averaged 71 visitors counted per day, in 2020/21 we recorded 134 visitors per day on average. This corresponds to an increase of ski mountaineers and snowshoe hikers of almost 89 %.

The spatial use of the sensitive capercaillie area by backcountry recreationists detected through GPS-Loggers, however, could be greatly reduced by the silvicultural measures (planned after the survey of 2010/11 with the wildlife authorities). In 2019/20 the evaluation of three periods of counter-slope photos after fresh snow fall followed by days of fine weather shows the strong tendency of the backcountry recreationists to use the cleared forest corridors for the descent. This behaviour, whether conscious or unconscious, protects the neighboured forest areas of the capercaillie patches well; out of 537 tracks counted in total, only four took the direct descent through the forest (see Figure 1, results of the third counter-slope evaluation).

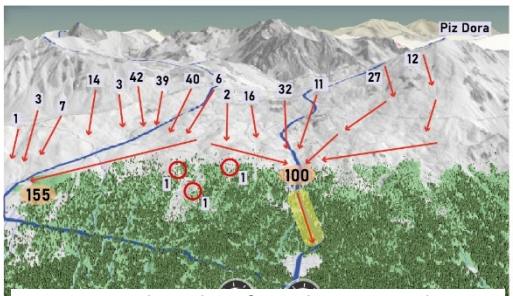

Figure 1: Track analysis from the counter slope images (16.03.2020, ten days after the last snow fall). Three out of 255 tracks in the descent missed the two canalising forest corridors, which were extended by forestry as a capercaillie protection measur

Discussion and conclusion

Regarding the monitoring methods used, the infrared counters worked quite well, which was confirmed by high correlation with camera counts. One must be aware that the visitor numbers are affected by weather and snow cover conditions and, especially in 2020, by Covid19-lockdowns. However, the period under review excludes the lockdown (start of the lockdown in Switzerland: 16 March 2020); despite these variables, we will continue to operate our infrared counter at the Munt Buffalora route in the coming years.

While our data of the Val Müstair certainly show an increase in the number of recorded backcountry winter sports trips, they did not confirm the vast increase of winter backcountry recreationists predicted by the Swiss sports studies (Lamprecht et al., 2009, 2015, 2020). Reasons could be the quite remote location of the UNESCO Biosphere Reserve Engiadina Val Müstair, that the recreationists do not pursue their activity so often as ten years ago or they overestimate their number of trips.

A success story seemed to be the clearance of the forest at the skiing route. Hardly any inappropriate tracks could be detected in the last years. Different factors could have led to this result: firstly, the communication campaigns of the management staff regarding endangered wildlife species and proper recreationists behaviour rules and secondly, the skiers and snowshoers were able find their correct way down clearly because of the open forest corridor.

Nevertheless, sensitive recreationist behaviour is needed, and more backcountry winter sports activities has to be anticipated. To address this, the authors have established a wildlife management concept for the whole Val Müstair in collaboration with the stakeholders. Core elements in its implementation are ongoing wildlife and visitor monitoring and semi-annual management meetings with all stakeholder groups for summer and winter recreation each.

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