Conference Volume	6th Symposium for Research in Protected Areas 2 to 3 November 2017, Salzburg	pages 317 - 320

Wilderness preserved? Representation of wild land within Austria's network of protected areas

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Abstract

Based on previous studies we present a spatially explicit wilderness assessment for Austria. Using GIS-techniques, we have identified areas which still show features typical for wilderness and wild areas, here collectively referred to as 'wild land'. A total of 586,178 hectares (7% of the national territory) qualifies as wild land, all of it is located in the Alps, mostly at high altitudes. There are 39 patches larger than 1,000 hectares, adding up to 473,503 hectares. Only 40% of the remaining wild land enjoys effective protection, especially in National Parks and in the Tyrolean 'Quiet Areas'. We therefore propose 1.) a significant expansion of 'Quiet Areas' to provide basic protection to the remaining wild land and 2.) the establishment of additional wilderness areas (IUCN protected area-category Ib) to secure the wildest and most valuable patches.

Keywords

wilderness, wild areas, protected areas, gap analysis, Austria

Introduction

In recent years, wilderness preservation and restoration have received increasing attention in European nature conservation (WILD EUROPE 2013, SYLVÉN & WIDSTRAND 2015, PEREIRA & NAVARRO 2015, BASTMEIJER 2016). Ongoing, fundamental changes in land use, rapid urbanisation, dwindling spatial resources and a deepening gap between modern agriculture and forestry on the one hand, and biodiversity conservation on the other, have led conservationists to a higher esteem for landscapes and ecosystems that are still predominantly shaped by natural processes. The natural heritage of Europe is no longer perceived as consisting exclusively of man-made cultural landscapes: the importance of remaining wild lands is acknowledged as well. A prerequisite to the preservation of wild lands is their identification, and therefore wilderness mapping exercises are currently conducted throughout Europe, at various spatial levels (CARVER & FRITZ 2016). Building on previous studies of the Austrian wilderness potential (PLUTZAR et al. 2016, KOHLER et al. 2016) we present here results from a recent, refined analysis (ENZENHOFER 2016). Our focus in this paper is on the representation of wild land in the Austrian network of protected areas.

Methods

Our study relies on the idea of a 'wilderness continuum' – a term first coined by NASH (1973), which was later on developed into a formalized concept by LESSLIE & TAYLOR (1985). The continuum approach allows to rate individual locations with regard to the degree of anthropogenic impact and to calculate a quantitative wilderness quality index. Using a Geographic Information System (GIS) we combined a set of input data reflecting anthropogenic land use, including land cover (KUTTNER et al. 2015), traffic system, power plants and high voltage lines (OSM 2014, WWF 2009), isolated buildings and alpine huts (OSM 2014), skiing areas (UMWELTBUNDESAMT 2008), naturalness of forests (GRABHERR et al. 1998) and mountain pastures (BMLFUW 2016). By combining weighted distance decay models with local index assignments we derived a spatially explicit wilderness assessment for Austria, with a spatial resolution of 25 meters (details in ENZENHOFER 2016). We then classified the continuum results using the Jenks algorithm (ESRI 2013), resulting in 6 distinct classes reflecting the degree of naturalness: 1) very unnatural, 2) unnatural, 3) altered, 4) slightly altered, 5) close to nature and 6) very close to nature. For the purposes of this study, class 6 can be equalled to 'wild land', that is potential wilderness and wild areas as defined by WILD EUROPE (2013). In order to assess the current degree of wilderness protection in Austria, we have finally intersected these areas with the existing network of protected areas.

Results

The extent of wild lands in Austria amounts to a total of 586,178 hectares, corresponding to 7% of the national territory. Their distribution is very uneven: only 5 of the 11 Austrian ecoregions have any wild lands left, and all of them are found within the Alps: 77% are located in the ecoregion 'Central Alps', another 13% in the middle and western parts of the 'Northern Alps'. The altitudinal distribution is very much biased towards the highest zones: wild lands in the alpine and nival altitudinal zone (> 2,000 m a.sl.) account for more than 64% of the total.
Accordingly, Austrian wild lands consist mostly of rocks (30%), subalpine scrub- and heathland (27%), alpine grasslands (19%), conifer forests (13%) and glaciers (6%). Within the 9 Austrian federal provinces, Tyrol is by far the 'wildest', it harbours almost 56% of all wild land. Most wild land still occurs in sizeable blocks: there are 39 coherent patches larger than 1,000 hectares, with a total extent of 473,503 hectares (=5.6% of Austria, Fig. 1). The largest patch is located in the western part of the Hohe Tauern and the adjacent portions of the Zillertal mountain range, it extends over almost 132,000 hectares; the second largest in the Ötztal range covers 73,000 hectares.

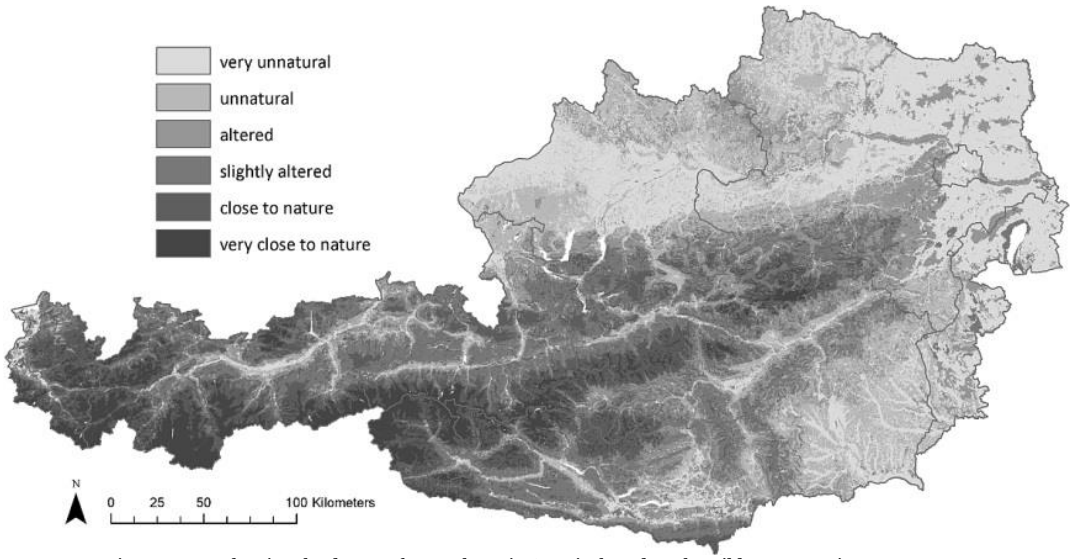

Figure 1: Map showing the degree of naturalness in Austria, based on the wilderness continuum concept.

Regarding its protection status, little more than a third of all wild land is found within Natura 2000 areas (Tab. 1), a fifth enjoys national park status, and a remarkable 15% are located within so-called 'quiet zones' - a type of protected area aiming at the preservation of undeveloped mountain landscapes, which so far has only been implemented in Tyrol. Nature reserves and Biosphere reserves play a comparatively minor role. The only two Austrian wilderness areas (Dürrenstein and Sulzbachtäler) secure just a fraction of the wilderness potential. Note however, that the figures in Tab. 1 cannot be added up, as the various categories of protected areas are often overlapping. Also, regulations in Natura 2000 areas and Biosphere Reserves are often not sufficient to protect wilderness values. Correcting for all overlaps and insufficient protection results in a figure of just 40% effectively protected wild land. Regarding the share of wild land within the different types of protected areas (Fig. 2), it becomes evident that wilderness is of importance especially in national parks and 'quiet zones'.

Type of Protected Area	Hectares	% of total Wild Land
Natura 2000 Areas	210.361,3	35,9
National Parks	122.974,3	21,0
"Quiet Areas"	87.767,6	15,0
Nature Reserves	37.469,8	6,4
Biosphere Reserves	29.408,4	5,0
Wilderness Areas	7.674,3	1,3

Table 1: Representation of wild land within the Austrian network of protected areas (Wilderness Areas includes the recently established Wilderness Area Sulzbachtäler, which is not yet recognized by IUCN).

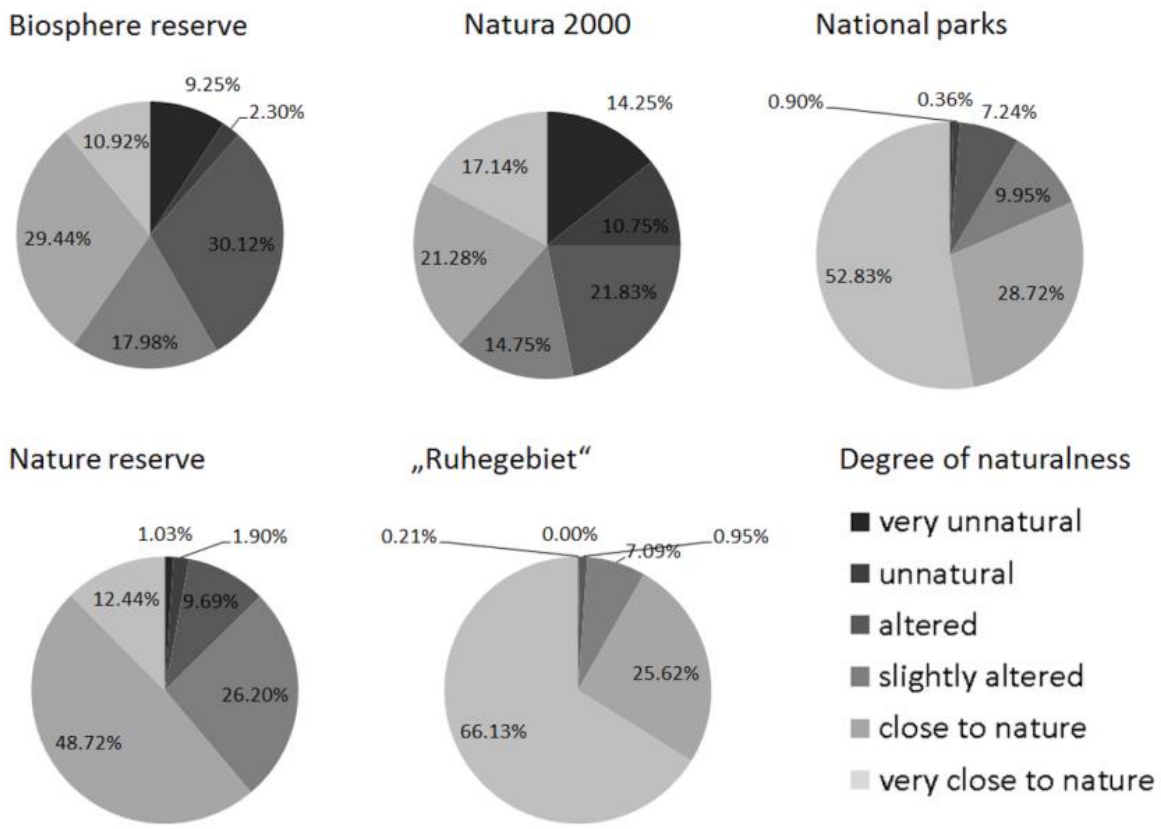

Figure 2: The distribution of the six naturalness classes in the network of protected areas

Discussion

Almost two thirds of the Austrian national territory belongs to the Alps, which many people in Central Europe perceive as a stronghold of wilderness. But much of the mountain landscape is no longer wild, only 7% of Austria can still be classified as such, according to our analyses. Thus, wild land is already a scarce resource. Its preservation should be of some concern to nature conservation, since even remote places at high altitudes have recently come under pressure: from skiing resort-developers trying to compensate for the lack of snow at lower elevations; from hydro- and windpower development; from intensification trends in forestry and the continuing expansion of the forest road network; from the construction of protective infrastructure, aiming to secure increasingly urbanized valley floors against natural disasters; from intensification of mountain pastures, etc.. Although the Austrian tourism industry heavily relies on images of intact alpine landscapes, truly intact nature is already rare.

The existing network of protected areas in Austria is obviously not sufficient for effective wild land preservation, so additional protection must be provided. To this end, we propose a two-fold strategy: 1.) Provide basic protection to most of the remaining wild lands (ideally the full 590,000 hectares, but at least to the 470,000 hectares in the 39 coherent blocks) through the establishment of additional ‘quiet zones’. Such zones would secure basic wilderness qualities by preventing large scale and landscape-altering development projects; but they would not restrict low-intensity forms of land-use, like traditional mountain pasturing, small scale forestry, hunting or hiking tourism. 2.) Establish additional wilderness areas (IUCN protected area-category Ib) in the wildest and most valuable tracts of wild land. The Austrian Biodiversity Strategy (BMLFUW 2014) states that by 2020+, 2% of the Austrian national territory should be devoted to the protection of natural processes, among others through the establishment of ‘areas with wilderness character’. A recent analysis (Kohler et al. 2016) has shown that currently 1.2% of the national territory (located in the core zones of national parks and wilderness areas) already conform to the above goal. To reach the 2% benchmark, another 0.8% (=67.000 hectares) must receive strict protection. This is certainly an ambitious goal, but one commensurate to the challenge of saving Austria’s ‘last of the wild’.

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