

## An application example for modeling grazing intensity: National Park Hohe Tauern

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### Abstract

In the years 2014 to 2016 a determination of the grazing intensity in the National Park Hohe Tauern in Carinthia, Tyrol and Salzburg (Austria) took place. Basis was the land use model called 'Grass pre' (see presentation of G. EGGER). The work was focused on the following questions:

1. Which areas in the National Park are grazed?
2. How high is the grazing intensity?
3. Which measures are required?
4. How was the development of the grazing intensity in the last 20 years?

### Keywords

National Park Hohe Tauern, grazing intensity, land use, alpine pasture, modeling vegetation.

### Introduction

From 2014 to 2016 a repetition of the survey about the uses of alpine pastures in the National Park Hohe Tauern of Carinthia, Tyrol and Salzburg was performed. The survey focussed on the following questions:

- Where do the animals graze in the National Park? What are priorial uses of alpine pastures in the core zone and in the peripheral zone of the National Park?
- How are the cows, goats, sheep and horses distributed on the individual alpine pastures and throughout the National Park?
- Which potential yields are for each alpine pasture and in the National Park achievable?
- What percentage of the potential yield is being used and how high is the density of animal populations on the individual alpine pastures, or rather in the National Park?
- How has the uses of the alpine pastures changed in the last 20 years (since the last survey)
- How does the surface balance of the current grazing intensity look like?

### Methods

The potential yields for each alpine pasture and in the National Park, as well as the grazing intensity have been modeled. The program used for the calculation of the yields is called 'Evaluation model of alpine pastures'. The calculation of the grazing intensity is been done with the model 'Grass Pre'. The methods of these two models will be presented in Gregory Egger's speech 'Modeling grazing intensity of grassland'.

### Results

#### Area distribution of the National Park Hohe Tauern

The Hohe Tauern National Park covers parts of the three provinces Salzburg, Carinthia and Tyrol. The biggest part with around 80 500 ha is located in the federal state of Salzburg. Its emphasis is dairy farming. Especially the long through valleys in the western part of the National Park and the valley called 'Seidlwinktal' are characterized by dairy farming. Eastern Tyrol has the second biggest proportion of the National Park Hohe Tauern with about 61 100 ha. Here the main focus is in the pasturing of young cattles. Additionaly, there are a few big alpine pastures for dairy farming, for example in Dorftal or in Innergschlöss. Carinthia has the smallest area size of the Natinal Park with around 32 700 ha. Nonetheless, the core zone of the National Park in Carinthia is only a bit smaller than the core zone in Eastern Tyrol. In Carinthia the pasturing of young cattles is predominated. Dairy cows are only moved to alpine pastures sporadically.

National Park	Carinthia		Tyrol		Salzburg	
	Total area (ha)	Pasture area (ha)	Total area (ha)	Pasture area (ha)	Total area (ha)	Pasture area (ha)
Peripheral zone	11 320	6 507	26 414	16 523	26 782	10 200
Core zone	32 674	13 838	34 712	7 080	53 780	13 882
Total area	43 994	20 345	61 127	23 603	80 562	24 082

Table 1: Surface balance of the National Park Hohe Tauern. Here, pasture areas are defined as alpine pastures after the map called 'Hofkarte' and by informations of land managers. Areas without share of forage areas are included too.

Carinthia has the biggest share on grazed area in the entire National Park Hohe Tauern. All in all, 46 % of the area of the National Park are alpine pastures. In Eastern Tyrol it is 39 % and in Salzburg 30 % of the protected areas.

However, when considering only the core zone, a different picture emerges. Only 20 % of the core zone in Eastern Tyrol are within alpine pastures and only 8 % of the core zone are actually grazed. In Salzburg 26 % of the core zone is used as alpine pastures and 13 % of the core zone are actually grazed. In Carinthia, however, the share of alpine pastures are with 42 % much higher. But indeed only a small part of it is grazed (13 % of the areas).

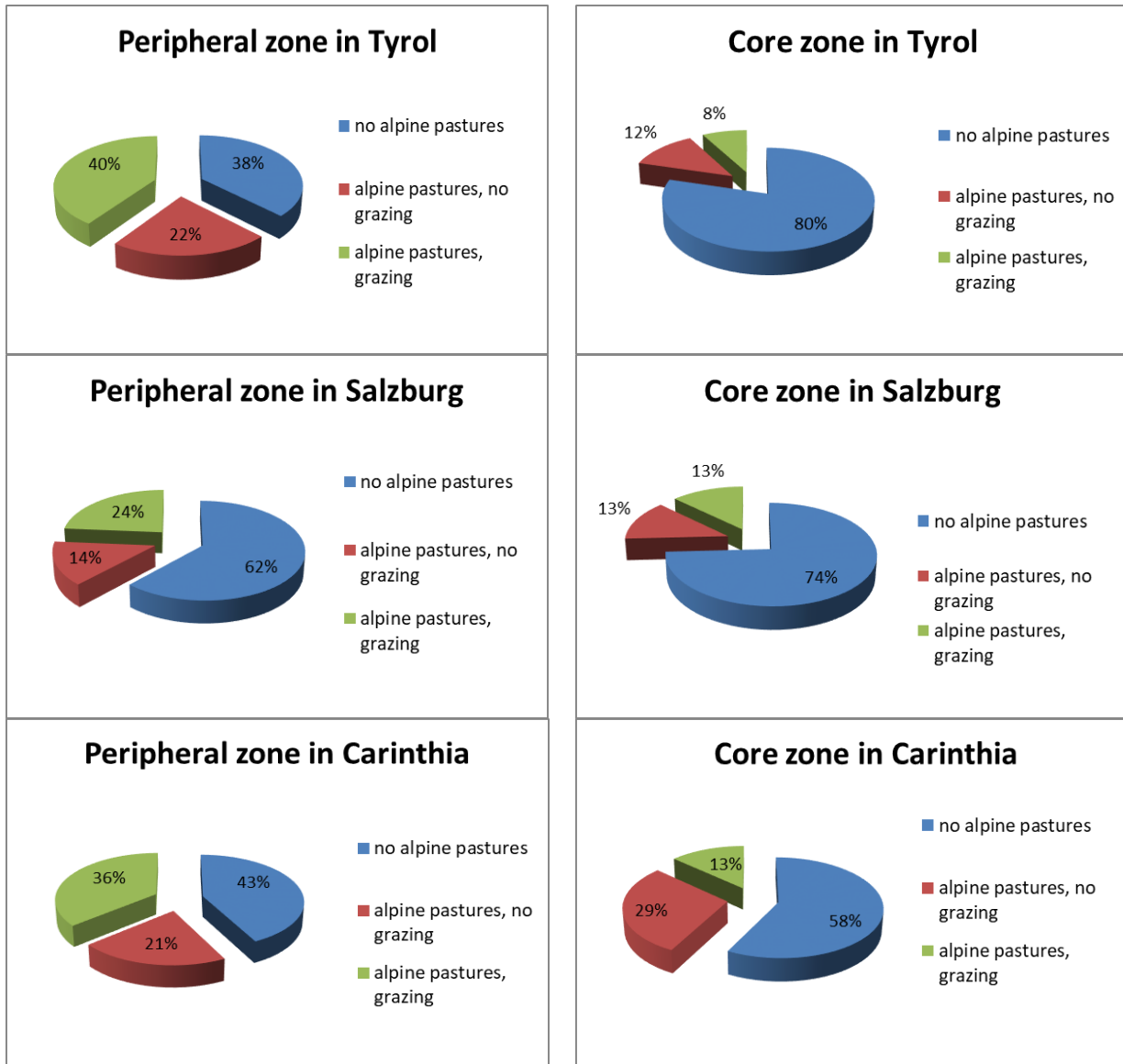


Figure 1: Distribution of the uses of alpine pastures in the National Park Hohe Tauern. Legend: 'No alpine pastures' are defined as areas outside of the external borders marked in the map called 'Hofkarte' of after informations of land managers as not grazed. 'No grazing' is defined as areas within the identified pasture areas and which could be accessible for animals (inside of the map 'Hofkarte') but have been currently not grazed. These are either areas without grazing suitability (e.g. densely dwarf shrubs, very steep slopes) or the uplift is too small so the areas could not be grazed by the animals. 'Grazing' is defined as areas which are extensively grazed (>0,01 GVE/ha).

#### Comparison of the numbers of moving animals to mountain pastures

All in all, 14 166 livestock units (=GVE) are grazing in the alpine pastures of the National Park Hohe Tauern in summer. This number can be split in 20 100 sheep and goats (that is 16 % of the sheep and goats which live on alpine pastures throughout Austria), 12 400 young cattles and horses, as well as 1 700 dairy cows.

With almost 7 000 livestock units, the main focus of alpine pasture use is located in Salzburg's share of the National Park Hohe Tauern. Additionally, Salzburg's part of the National Park also has the largest share of dairy cows (1 200 dairy cows). Whereas in Eastern Tyrol are still a few big milking alpine pastures located, there are hardly any in Carinthia. Here only 37 dairy cows are being milked on alpine pastures. The number of sheep at alpine pastures plays an important role in all three parts of the National Park.

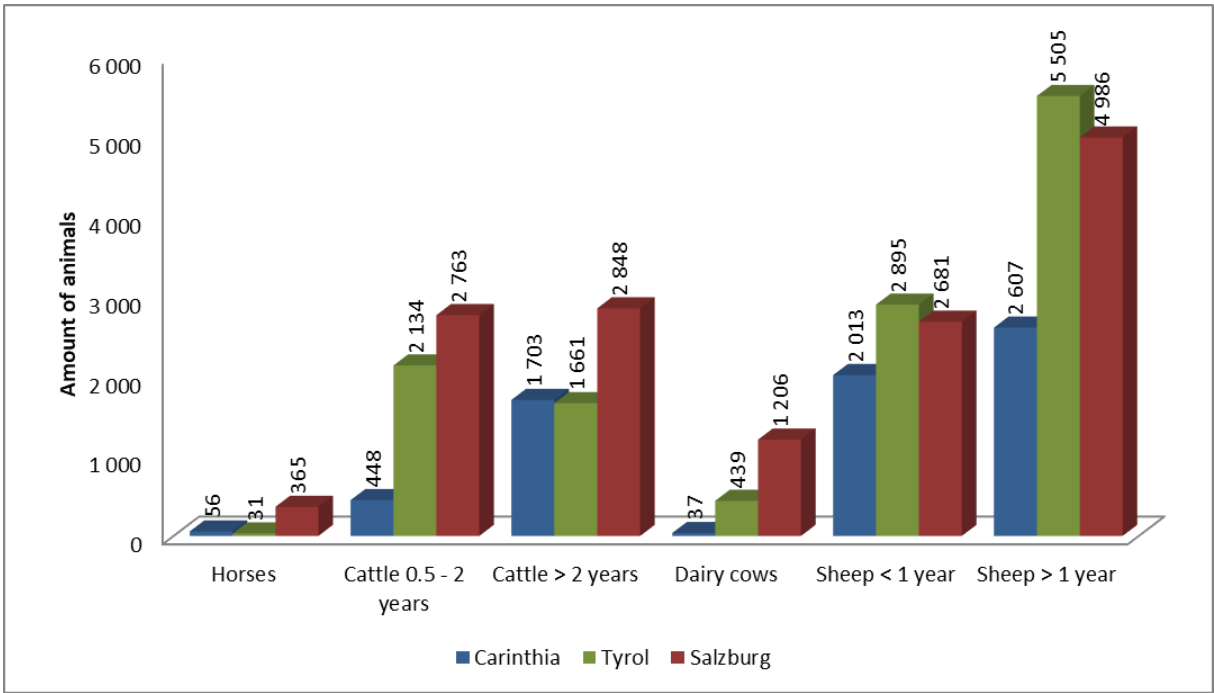


Figure 2: Amount of moving animals to alpine pastures in the National Park Hohe Tauern separated by federal states and livestock categories.

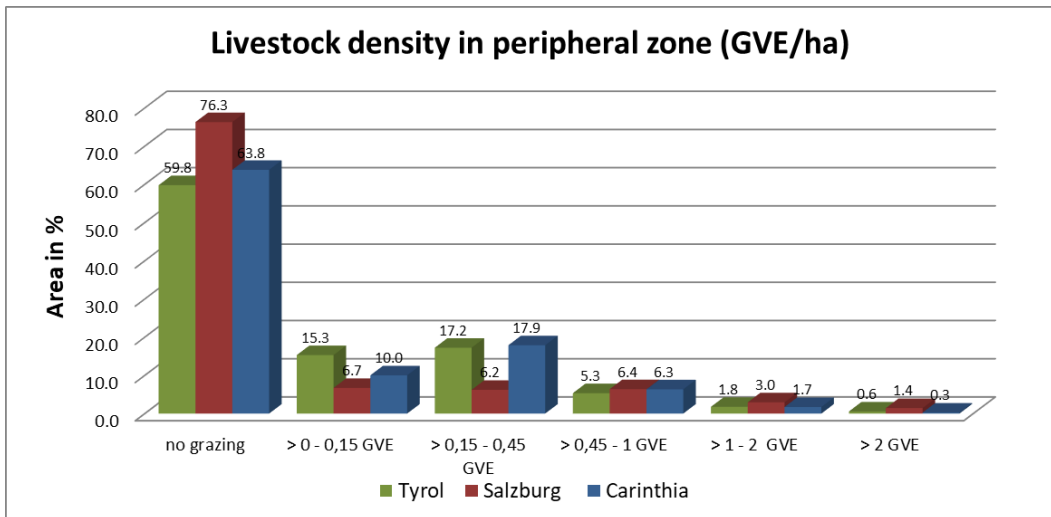


Figure 3: Livestock density in peripheral zone separated by federal states.

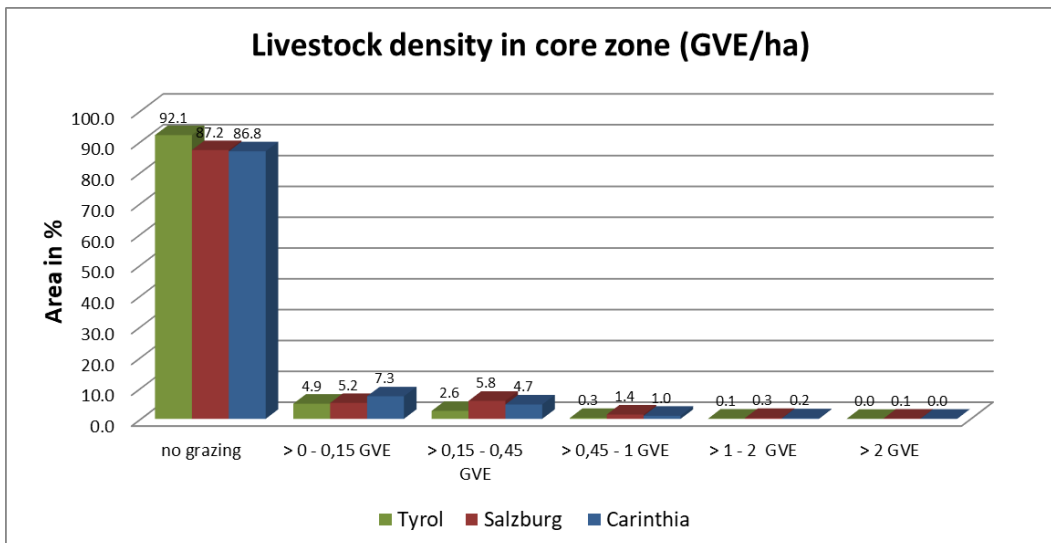


Figure 4: Livestock density in core zone separated by federal states.

### Comparison of the uses of alpine pastures

The density of animal populations (in GVE per ha) is on most alpine pastures, in the core zone as well as in the exterior area, under 0.45 GVE per ha. A densely animal population which is above 1 GVE/ha can be found only on individual areas. Those are usually located on lower elevated, profitable rich pastures in the range of alpine huts or they are very small alpine pastures which got grazed more intensively. That has the effect that the share of areas with densely animal populations are dramatically higher in the exterior areas than in the core zones. In the core zones fast-growing rich pastures are rare and areas with a densely animal population are in all three parts of the National Parks similar low and can be found in most cases only on the edges.

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