

## Development of a nationalpark consistent wildlife management in a model region of the Gastein valley.

Friedrich Reimoser, Richard Zink

### Abstract

Within the hunting districts of the Hohe Tauern National Park (NP) methods of wildlife management consistent with IUCN Kat.II criteria have been developed and tested over a period of several years. A monitoring system has been established to: (i) investigate population dynamics of wild ungulate species and their habitat use, (ii) analyse the impact of wild ruminants on the development of forest vegetation, and (iii) enable an objective success control of applied measures. Results are presented.

---

### Keywords

wildlife management, national park, ungulates, monitoring

### Project Aims

- ◆ Development of a national-park consistent wildlife management, particularly minimizing regulation of wildlife populations by shooting.
- ◆ Prevention that impacts of wild ungulates on forest vegetation remain acceptable.
- ◆ Creation of concepts to make wild ungulates visible for park visitors.
- ◆ Establishment of monitoring systems related to population dynamics and temporal/spatial distribution of wild ungulates as well as browsing impact on forest vegetation.
- ◆ Observation of the health status of wild ungulates.

### Duration

Since 1998

### Study Area

The whole study area covers 83 km<sup>2</sup> and has a range of elevation between 1080-3250m asl. It consists of two smaller valleys connected with the Gastein main valley ("Kötschachtal" and "Anlaufstal"). These valleys are situated in the NE part of Hohe Tauern NP close to the community of Badgastein. The study area is part of the wildlife region "Gastein-Ost" (166 km<sup>2</sup>), which is a subunit of the Wildlife Ecological Spatial Planning (WESP) established in 1993 for the whole province of Salzburg. The two valleys represent two hunting districts with different land owners who have leased their hunting right to the national park since the beginning of the project.

### Methods

The following factors were investigated:

- ◆ Habitat evaluation (seasonal habitat suitability).
- ◆ Regular counts of wild ungulates in key areas and defined time windows throughout the year (field observations).
- ◆ Animal behaviour (activity and distribution patterns via field observations) depending on different regulation strategies (interval hunting, focus hunting).
- ◆ Browsing impact on forest vegetation (sampling, fenced control areas; cf. REIMOSER et al. 1999).
- ◆ Intensity of game damage (browsing and bark stripping) depending on supplemental feeding strategies during winter for red deer (*Cervus elavus*) and roe deer (*Capreolus capreolus*).
- ◆ Spatial distribution of red deer using GPS-GMS satellite technology.
- ◆ Organ samples of ungulates shoot or died by other reasons were analysed in the lab concerning the status of health, condition, rumen content, parasites, and heavy metal load.

### Regulated wildlife species

Within the study area only wild ungulates species (red deer, roe deer, chamois) are regulated mainly depending on their impact on forest vegetation (browsing, bark stripping). Most necessary is a regulation of the wide ranging red deer to support the prevention of game damage particularly in the neighbouring hunting districts. 30 to 45 red deer were shot per year. Regulation done by two professional hunter of the national park is focused on females and calves. Adult males (trophy antlers) are not shot in the national park. Roe deer can be considered a problem due to selective browsing and hence its impact on diversity of tree species in the study area but there is almost no connection with neighbouring hunting districts. Approximately 20-26 roe deer are shot per year. Chamois (*Rupicapra rupicapra*) lives mostly above the timber line in high altitudes and migrate less across the national-park border. Therefore regulation is of less importance (about 10-14 individuals are shot per year). All other game species (mammals and birds) are not hunted.

### Red deer habitats and areas for ungulate census

Red deer lives almost in the entire study area. During summer the animals prefer open areas in high altitudes up to 2500m. In winter they are concentrated around the feeding stations (see figure 1). The most suitable habitats in the different biological phases are visible figure 1.

The areas for systematic ungulate census are shown in figure 2. The census is carried out six times a year (mid winter/February; early spring/April; late spring/June; mid summer/July-August; autumn/rut/September-October; late autumn/November). The highest numbers were counted in mid summer (up to 330 red deer with increasing tendency). The counted numbers can be understood as an index (minimum number) for population size and development. The sex ratio of red deer is close to 1:1, the growth rate is relatively low (about 60% related to the number of all females in spring).

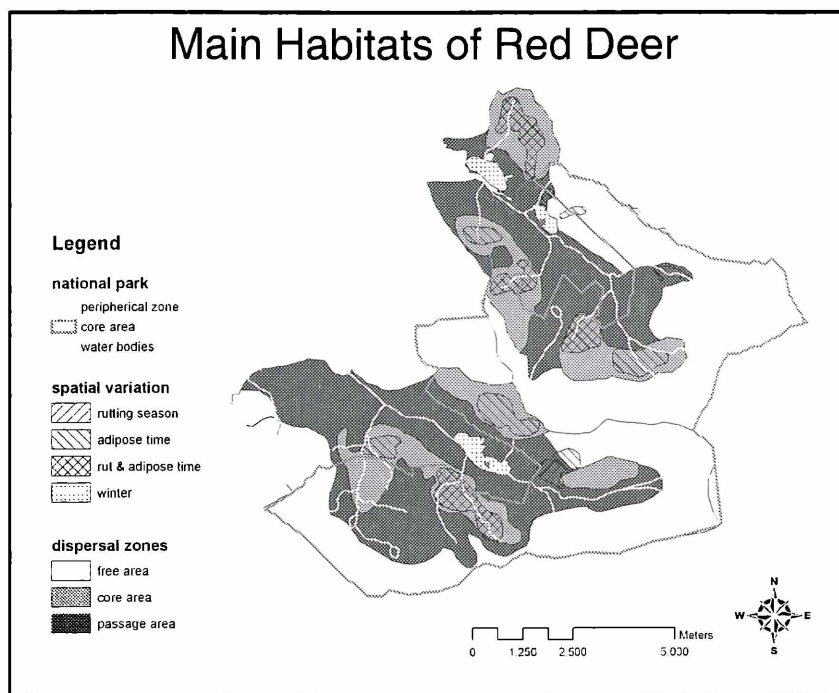


Fig. 1: Main habitats of red deer in the study area depending on seasonal biological patterns: fatness (summer), rut (autumn) and winter. Greyish squares indicate winter feeding stations for red deer. One of them is situated within the study area in the peripheral zone of the national park, two of them are outside the study area.

### Spatial distribution obtained by GPS-GMS satellite technology

Figure 3 shows an example for the seasonal movement of a female red deer in the "Kötschachtal". In Summer the deer used open grassland above the timber line (Tischlerkar), during spring and autumn it stood partly out of the study area (close to green meadows in the valley). In a first step about 10 female individuals will be fitted with a radio-collar to investigate spatial migration pattern throughout the year and whether they leave the study area. Up to now six individuals are marked.



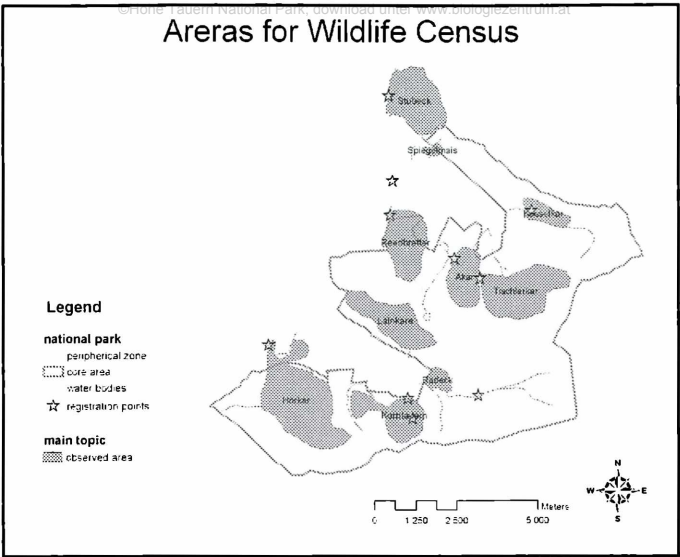


Fig. 2: Areas for wildlife census

### GPS positions of female red deer N° 833

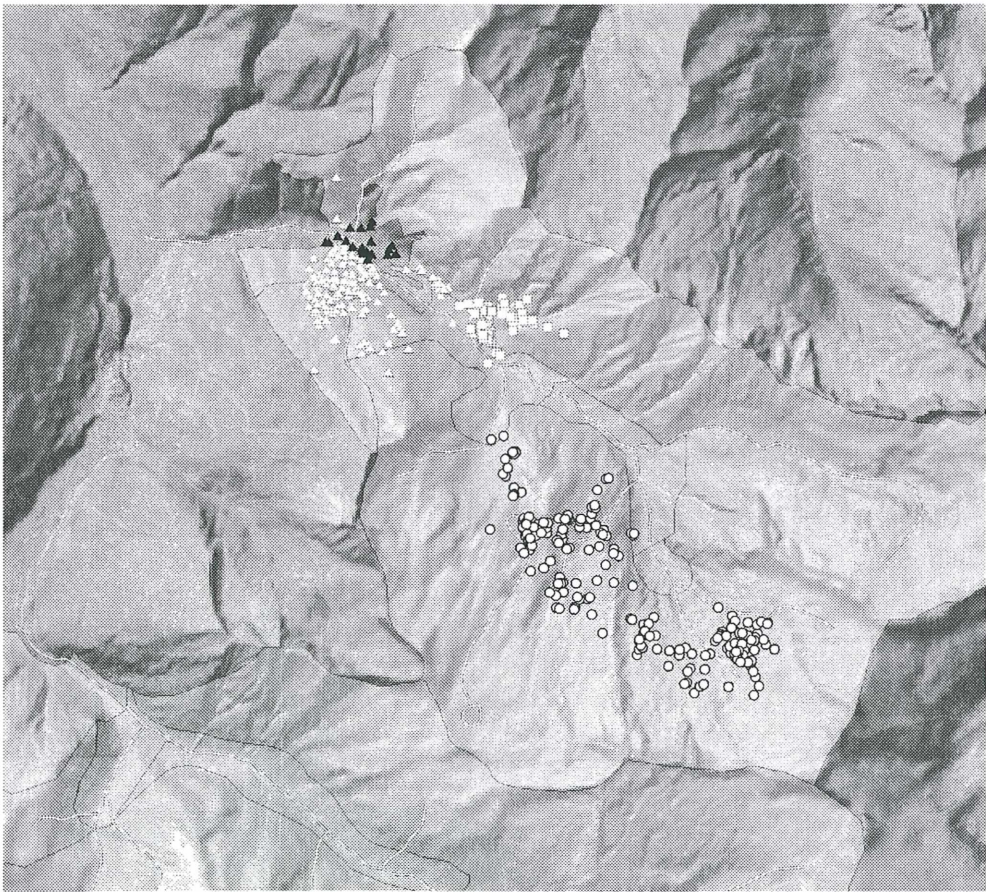


Fig. 3: Seasonal movement of female red deer N° 833 in 2004. Circles for summer, squares for winter (close to the feeding station) and triangles for spring and autumn (dark triangles outside of study area).

In order to become an internationally accepted national park (IUCN Kat.II) a main aim of wildlife management is to minimize the area (and duration) in which regulation activities occur. Following this aim the area where ungulates had to be shot could be reduced to 17% of the total study area. Only a very small part of this area (Kötschachtal, east) belongs to the core zone of the national park (figure 4). Focal hunting (figure 4; 7,2% of area) means intensive hunting activities during the whole hunting season (May until December) and is used to displace ungulates from sensitive forest regeneration areas which are very susceptible to game damage. Interval hunting (7,1%) means intensive but short duration of regulation (some days with suitable weather conditions for hunting) with periods of some weeks in between without any hunting activities to make wildlife less shy when fulfilling the shooting plan. Optional hunting (2,9%) means additional regulation areas used if otherwise minimum number of shooting can not be achieved.

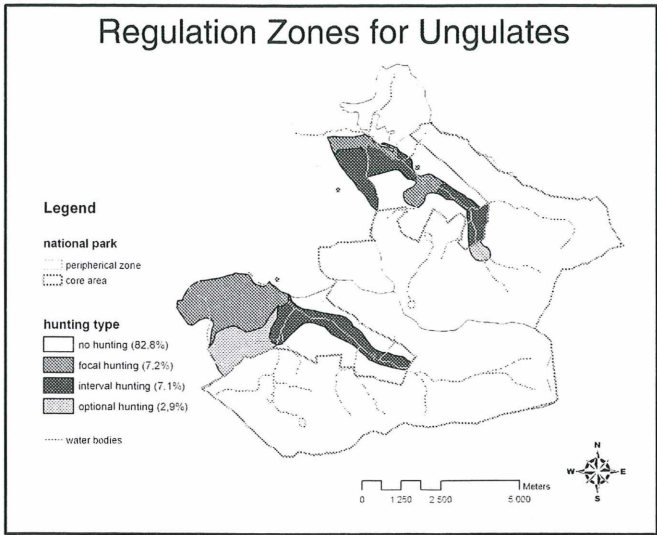


Fig. 4: Types of regulation zones for ungulates in the study area.

Impact of ungulates on forest vegetation

Sampling was established to monitor the impact of ungulates on forest regeneration. In the "Kötschachtal" the impact slightly decreased whereas in the "Anlaufthal" a slight increase could be registered (figure 5). Since 2003 in addition fenced control patches (exclosures, 6\*6 m) were established to analyse the effect of browsing more accurate when comparing fenced patches (without deer) and unfenced patches (impacted by deer) every three years (REIMOSER et al 1999).

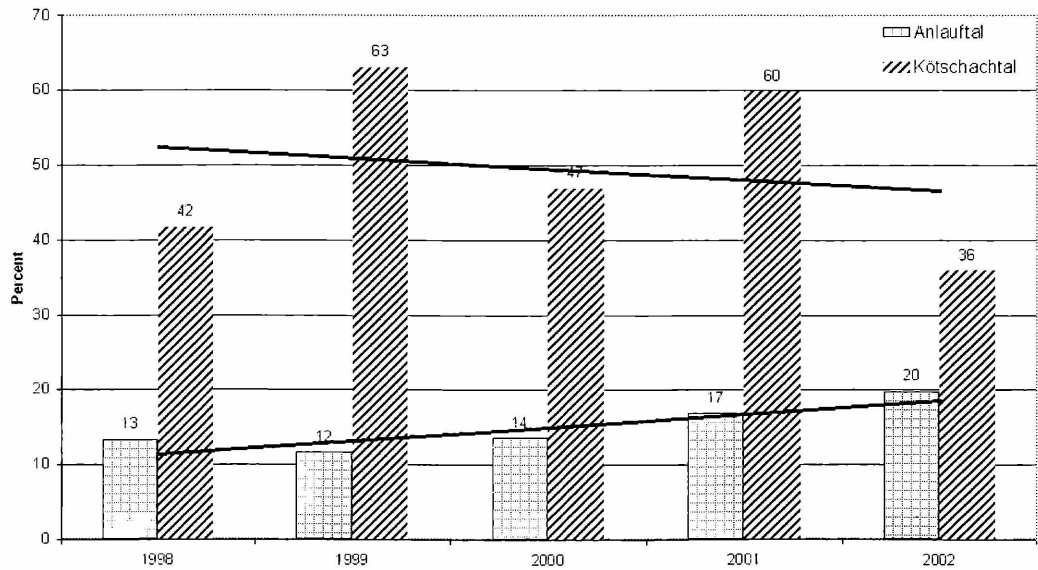


Fig. 5: Development of browsing intensity (proportion of top twigs browsed per year) in the hunting districts Anlaufthal and Kötschachtal



At the beginning of the project there were particular difficulties to harmonize the new and restricted ungulate-regulation strategy of the national park with the common hunting strategies of the neighbouring hunting districts. In addition we faced similar harmonization problems concerning supplemental winter feeding strategy within the whole wildlife region.

One of the effects of the new management in the study area of the national park was reinforcement of discussion concerning the increasing red deer population and the responsibility to reduce and stabilize the population on a lower level. The question was, which hunting district (inside or outside the national park) is able to shoot the minimum number of red deer (females and calves) that is defined every year for the entire wildlife region by the public administration. To answer this question the spatial and seasonal distribution of red deer had to be investigated more accurately. One of the results of the current ungulate management was an increasing aggregation of red deer in optimal grazing habitats above and at the timber line during summer. Our regulation strategy neither allows shooting red deer in open areas above the timber line (it's the case in summer) nor at the feeding station (winter). Therefore regulation by shooting became much more difficult. There is only a short time period to carry out the necessary regulation of red deer in spring and autumn (particularly May and October/ November). The beginning of the hunting season had to be started earlier (May instead of June) in order to fulfill the shooting plan.

Now an advantage is the increased activity of red deer in open areas during daylight that allows park visitors more frequent deer observation.

Following factors were important for a successful wildlife management in the study area:

- ◆ Clearly defined management targets.
- ◆ Qualified staff.
- ◆ Wildlife Ecological Spatial Planning (WESP; REIMOSER 1999) on large areas in cooperation with neighbouring hunting districts.
- ◆ Establishment of a systematic long-term monitoring of ungulate populations (development, seasonal distribution) as well as their impact on vegetation to for an objectivity the discussions.

General aspects to wildlife research in national parks:

- ◆ National Parks provide a good opportunity for ecosystem research based on a consequent long-term monitoring of key factors such as wildlife in the natural system. The results of such investigation offer knowledge generally useful as a basis for sustainable development of cultivated landscapes (REIMOSER 2002).
- ◆ Basic research as well as applied research in national parks can be very useful for science and practise if the results are systematically connected in a holistic sense. This needs a better cooperation between the researcher of different domains and the practitioners (REIMOSER 2003).

## References

REIMOSER, F., 1999: Wildlife Ecological Spatial Planning (WESP): An instrument for integrating wildlife into comprehensive land management. In: C. Thomaidis and N. Kypridemos (eds.) Agriculture forestry – game, interacting wildlife in land management. Proceedings of the International Union of Game Biologists, XXIVth congress (1999), Thessaloniki, Greece, 176-185.

REIMOSER, F., ARMSTRONG, H., SUCHANT, R., 1999: Measuring forest damage of ungulates: what should be considered. *Forest Ecology and Management* 120: 47-58.

REIMOSER, F., 2002: Schutz des Waldes und Wildtiermanagement in Naturschutzgebieten. *Revue de Geographie Alpine* 90 (2): 73-85.

REIMOSER, F., 2003: Steering the impacts of ungulates on temperate forests. *Journal for Nature Conservation* 10 (4): 243-252.

## Contact

Univ. Prof. Dr. Friedrich Reimoser  
[friedrich.reimoser@vu-wien.ac.at](mailto:friedrich.reimoser@vu-wien.ac.at)

Dr. Richard Zink  
[richard.zink@vu-wien.ac.at](mailto:richard.zink@vu-wien.ac.at)

Research Institut of Wildlife Ecology  
Savoyenstraße 1  
A 1160 Wien  
Austria

# ZOBODAT - [www.zobodat.at](http://www.zobodat.at)

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Nationalpark Hohe Tauern - Conference Volume](#)

Jahr/Year: 2005

Band/Volume: [3](#)

Autor(en)/Author(s): Reimoser Friedrich, Zink Richard

Artikel/Article: [Development of a nationalpark consistent wildlife management in a model region of the Gastein valley. 181-185](#)