

## Wildlife Management in Protected Areas - Goals and Concepts

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### Abstract

Wildlife management is a challenge for nearly all European large protected areas and their management concepts. In many cases, wildlife and wildlife management is connected with major conflicts between different stakeholders such as nature conservationists, farmers, fishermen, foresters, hunters, tourists and others.

The reasons for that phenomenon are manifold, but in most cases they are resulting either from the fact that wildlife itself underlies certain utilization interests within the (existing or planned) protected area and/or from the mobility of large wild animals, wandering out of protection zones into the adjacent cultivated landscapes.

Thus, the success or failure of protected areas in many cases critically depends on the question, as to how the wildlife management question will be solved and if the wildlife management concept is well established and integrated into the general concept from the beginning.

The present paper deals with the question, how wildlife management concepts including monitoring systems are to be developed for different goals of protected areas, how the different approaches will fit into the conservation concepts of a certain protected area and what instruments such as participatory processes are to be engaged to accomplish acceptance in the public as well as from the different stakeholders.

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### Keywords

Wildlife management, conservation concept, protected area, hunting, land use

### Introduction

During the last decades, a lot of large protected areas have been established in Central Europe. This might be due to an increasing appreciation of nature conservation in a general public and thus in politics since the 1970s. Conservationists are celebrating this expansion of protected areas, but in many cases they do not agree, how these areas are to be managed in the best way and what the underlying purpose should be (NAUGHTON-TREVES et al. 2005). Political acceptance also does not exclude local conflicts between nature protection and other stakeholders, especially other land users such as agriculture or forestry.

Wildlife, concretely wild animals often are the catalyst of those conflicts, either due to damages in agriculture or forestry, for fear of large predators or because of the expectance of further restrictions to traditional land use such as agriculture, forestry, fisheries or hunting. These negative expectations are often caused by bad experiences with nature conservation administration or the respective nongovernmental organizations (NGOs) in the past. This phenomenon may be reinforced by the exponential increase of land under legal protection over the past decades (see e.g. NAUGHTON-TREVES et al. 2005).

Thus, the long-term success of a protected area critically depends on how the interactions between man and wildlife will be managed.

Beside the typical situation of wild animals being part of the protected area's goals, several other scenarios have to be taken into account.

So, the management of species causing crop or vegetation damages outside (and sometimes in very special situations also inside) the protected area may also be addressed by the wildlife management concept as the management of e.g. introduced and maybe invasive species, or of large predators.

Additionally, a comprehensive concept for integrating (or excluding) certain, mostly traditional methods of utilizing natural resources such as freshwater fishing, hunting or beekeeping into the protection concept seems necessary.

### Definition

A consistent definition of the term „large protected area“ is yet lacking and eventually it might be not meaningful: size is relative, and an area considered in e.g. Central Asia to be relatively small may be recognized in Europe as extraordinarily large.

Also IUCN (ANONYMUS 1994) categorization does not primarily consider the size of an area, but the goals. Practically, we will consider coherent protected areas of at least 5000 hectares. Smaller areas will be also taken

into consideration if they are homogeneous management units such as a larger forest complex within an agriculturally dominated landscape.

In addition, we should keep in mind that wildlife management concepts should not only include the protected area itself but also the surrounding cultural landscape. This aspect should be one of the major future challenges in ecological management.

### **Wildlife management-wildlife regulation- hunting ?**

The term „wildlife management“ often is mixed up with „hunting“ or „regulation“ (or, synonymous “control”), but we should clearly differentiate between these terms and their respective meanings.

Wildlife management includes all activities to influence wildlife population with respect of certain goals, and thus this term is the most comprehensive.

However, as CAUGHLEY & SINCLAIR (1994) assert, such a definition “may be too restrictive for some, who would argue that many of the problems of management deal with people and therefore that education, extension, park management, law enforcement, and land evaluation are legitimate aspects of wildlife management and ought to be included within its definition”.

In contrast, “hunting” is a traditional, extensive and –at least in most parts of Europe- sustainable form of land use (see HERZOG 2011).

So, any sustainable hunting activities need wildlife management measures.

*Vice versa*, hunting itself also may be included into the set of wildlife management tools. In that case, the biological and ecological effects of hunting, *i.e.* especially either the impact on abundance of a species or the benefits from *e.g.* habitat improvement will be used by and integrated into a management concept. “Regulation“ strives for influencing the number of individuals of a certain species in a certain area, either to make it increase or to make it decrease, mostly by increasing or decreasing mortality.

Regulation often, but not necessarily, occurs as a secondary effect of hunting activities. Contraceptive medicals, capturing and consigning animals, or killing animals by special extermination methods (as applied for *Anser anser* in The Netherlands, ANONYMUS 2008) are examples for regulation methods beyond hunting. On the other hand, *e.g.* vaccination of red fox (*Vulpes vulpes*) against rabies is not to be classified as a regulation method of the red fox, although it may also influence mortality.

Thus, “regulation” can be looked at as a subset of wildlife management. Also regulation may be carried out by using the mortality effects of hunting, but it is not equivalent to “hunting”.

### **Large protected areas: management objectives**

Large protected areas may have a wide spectrum of objectives, more or less derived from or connected to the six categories established by IUCN (ANONYMUS 1994). Categories I and II are mainly focussed on the preservation of biodiversity by minimizing utilization of natural resources, whereas the other four categories are to be managed for different objectives connected with the sustainable utilization of natural resources. Thus, different categories of protected areas need different concepts of wildlife management within and also outside the protected areas.

During the history of any large protected area, the objectives may be subject of change.

In dependence on CAUGHLEY & SINCLAIR (1994), we can disclose several categories of goals, as there are for example:

- Conservation of landscape and scenery, maybe in connection with several animal species of human interest (example: Lueneburger Heide reserve as one of the oldest large protected areas in Germany)
- Conservation of certain plant and/or animal associations (example: “beech national parks” in Germany and South-Eastern Europe)
- Conservation of biodiversity (including genetic variation)
- Conservation of a set of ecological, genetic, behavioral, evolutionary and physical processes and the coevolved compatible populations which participate in these processes (FRANKEL & SOULÉ 1981).

The latter approach typically is part of the IUCN categories I and II and was continuously modified and refined during aftermath. Later *e.g.* it was called „natural regulation“ (see PICKETT et al. 1992) or, in the German-speaking part “Prozessschutz” ( see. *e.g.* SCHERZINGER 1990, 1995, 1996, NEUSCHULZ 2000). This concept basically prohibits any utilization or active management. The idea is to exclude any anthropogenic influence. Obviously, this concept cannot be maintained consistently, due to *e.g.* nitrogen inputs from the atmosphere or climate change. Beside that, a consistent concept of “natural regulation” as it is a demand for the major part of any national park, should exclude any direct or indirect utilizations or even management influences. Thus, tourism, forestry, agriculture or agro-forestry, pest control, wildlife management, hunting, fisheries have strictly to be excluded. This demand often is foiled by national legislations, *e.g.* tolerating or even promoting tourism in national parks.

However, if the concept of natural regulation will have a stake in the future, it has to be applied either in a strict way or it should be abandoned, and the goals of the protected area have to be adapted or changed. Otherwise, the concept will be considered not to be a scientifically well-grounded approach.

## Wildlife management concepts

Wildlife management concepts are to be adapted primarily to the objectives of the protected areas.

The most interesting case might be that of “natural regulation”. This requires to abandon wildlife management completely within the protected area or at least within a defined “natural regulation” zone. However, because our protected areas in Central Europe are relatively small and animals are regularly wandering out of these areas, there will be a strong need to influence those animal populations that may lead to conflicts in the periphery. These are especially ungulates, large predators and invasive species.

Concerning large predators, as a first step a reintroduction program is worth to be discussed in many cases. Even such a reintroduction process is not covered by a “natural regulation” concept. Thus, reintroduction efforts are to be placed outside the “core areas” of natural regulation. Large predators are assumed not to be self-regulating in our densely settled countries. Thus, if we need some down-regulation of population sizes later on, this has also to take place outside these areas.

For large ungulates such as wild boar (*Sus scrofa*), red deer (*Cervus elaphus*), fallow deer (*Cervus dama*), mouflon (*Ovis ammon*) or even moose (*Alces alces*) or European Bison (*Bison bonasus*), we can determine that normally (exceptions see below) there will be no “damages” within protected areas. “Damages” by browsing or barking are a problem of cultivated landscape and are normally excluded by definition in protected areas. However, (apart from some interesting actual findings, MEIBNER et al. 2012) the home-ranges of these animals are covering hundreds or more of hectares. They will not respect the boundaries of protected areas and thus we face the risk of increasing damages in agriculture or forestry outside the area.

To maintain acceptance of the large protected areas, management measures should help to avoid those influences. Thus, either regulation or hunting should be integrated into management concepts. It would allow a down-regulation (or even up-regulations, if necessary) of population sizes of the species in question.

Regulation or hunting should take place outside the core (“natural regulation”) areas. If we decide to abandon hunting activities, a concept of ungulate regulation, typically based on professional hunters should be established. In many cases, it should be possible (and much less expensive than professional hunters) to establish or maintain traditional hunting as a management tool. In that case, the objectives of the hunters have to be adjusted to those of the protected area, especially hunting restrictions in space and time are to be defined and communicated to the relevant stakeholders.

To reach a balance between the different demands and interests, a well-moderated (!) participatory “bottom-up” process might be helpful. Wherever the national legislation will allow that way, it should be chosen. Instead of the obligatory (top-down) way, with involvement of policy makers and lobbyists, an approach that includes persons and parties directly involved seems to be more promising (HERZOG et al. 2010). This approach may also be chosen in other situations, e.g. the establishment of large protected areas or the establishment of natural regulation concepts, if conflicts with agriculture or forestry are imminent.

Roe deer as a small, territorial ungulate will normally not influence the surrounding areas, so there will be no need for hunting or regulating roe deer.

If there are protection objectives such as the maintenance or the establishment of certain phytocenoses, even roe deer and other wild ruminants may become a problem if it is present in high densities. In these cases, a well defined management concept including hunting should be helpful: e.g. a focal hunting concept, supported by an overwintering concept and a concept for wildlife rest areas and visitor direction is required. These last-mentioned tools in general are also applicable if conflicts with ungulates will arise along the external boundaries of a large protected area.

A special but also typical situation of large protected areas is the occurrence of introduced or even invasive species. This heterogeneous group, including a lot of taxa from Amphibia to Mammals, has to be treated individually. So, the story of mouflon is a very interesting one. Introduced to central Europe from the Mediterranean during the last centuries, this animal is not part of the local fauna. However, the Central European population is in fact a large *ex-situ* gene conservation project, since the “original” island populations are close to extinction. Additionally, this species would perfectly fit into grazing approaches, being part of nature protection concepts maintaining open landscapes (see e.g. BUNZEL-DRÜKE et al. 2008).

Another example is racoon (*Procyon lotor*), influencing several highly endangered species by predation. However, this species requires a very intensive predator regulation or hunting, but we do not know if it would be possible to extirpate this species.

Both examples share the problem, that there is no “right” or “wrong” solution. Any case should be considered thoroughly and any decision would be a very individual one.

## Monitoring

One important part of any wildlife management concept is monitoring. Especially in the last mentioned cases, monitoring often serves as a “stopgap”, but monitoring is more. It is an indispensable tool to evaluate any management measure in a large protected area.

So, if we decided to manage a species (and “management” may also be “leave-it-alone-and-keep-an-eye-on-it”), we should assess the management by an appropriate monitoring concept. There is a wide spectrum of methods, beginning with “classical” abundance monitoring such as hunting bag analysis (in protected areas often not

meaningful), snow tracking, pellet-count methods and many others. In addition, for maintenance of acceptance, a socio-economic or socio-cultural monitoring would be helpful.

As for the management concept, it holds also true for the monitoring concept that it has to be individually adapted to the objectives of the protected area in general.

### Consequences for establishing protected areas

As it has been shown in few words, wildlife management of large protected areas critically depends on the general goals. Thus, wildlife management cannot be easily adapted *ex-post* as an additional module.

Moreover, a clear zonal structure of a large protected area is an important precondition for operating certain wildlife management concepts, and this in turn is a precondition for certain protection objectives, such as natural regulation.

When establishing a protected area, it seems from our today's point of view indispensable, to develop an integrated approach covering the total set of objectives and the total set of management concepts and methods.

Integrating traditional land use such as hunting or fisheries into the wildlife management concept is possible in principle. However, we should not mix up different strategies. For example, hunters can help to reach certain objectives of a large protected area (not only regulation of abundance). In return, if we would like to integrate hunting into certain management concepts, we have to accept also the objectives, customs and traditions of hunters.

We should not leave the subject of large protected areas without talking about the question for the adequate category of such an area. Actually, we have a strong tendency in central Europe to higher categories (i.e. I and II following IUCN), leading to an increasing number of national parks and –latterly- wilderness areas. As discussed above, it seems often to be hard to fulfil the requirements of the respective category. This leads to the concept of “developing national parks”, what means that the area does not achieve the requirements e.g. for a national park. But because a national park is desired from political reasons, the large protected area will be declared to be a “developing national park” that maybe will fulfil the respective criteria in say 30 years. In these cases it often would be better to start with a lower category that may be managed adequately, and keep the option of an “upgrading” in mind. This would help us to concentrate our energy on adequate management efforts instead of wasting resources in long-lasting conflicts between stakeholders.

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