



Criteria and Indicators of Sustainable Hunting

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English Version
(available only in digital format)
Translation of Monograph No. 158 (2001)

MONOGRAPHIEN

Band 163

M-163

English Version
(available only in digital format)
Translation of Monograph No. 158 (2001)



Federal Ministry for Agriculture, Forestry,
Environment and Water Management

Project Management

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Acknowledgements

The Federal Environment Agency expresses thanks to everyone who contributed to the production of this report, in particular to the participants in the technical discussions, to the persons responsible for the hunting units where the practical tests were carried out, to the participants in the presentation of the set of criteria and indicators on the 28th of August, 2001, in the Federal Ministry of Agriculture, Forestry, Environment and Water Management, and all those who wrote comments and suggestions for this study.

Imprint

Published and edited by: Umweltbundesamt GmbH (Federal Environment Agency Ltd.)
Spittelauer Lände 5, A-1090 Wien (Vienna), Austria

Translation of Monography No. 158 (M-158), Vienna 2001

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ISBN 3-85457-688-9

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SUMMARY

Background

Hunting is one of the oldest ways of using natural resources and as such has an influence on animal and plant species as well as on ecosystems. It may also be a potential source of conflict with other forms natural resources use (e.g. forestry, agriculture, and fishing). In this context, the question of the sustainability of hunting must be addressed. Simplifying the problem often prevents an objective assessment and hinders the resolution of disputes. Creating a basis of mutual understanding is of fundamental importance for communication. The question, therefore, is which aspects must invariably be considered when a comprehensive, reasoned and solution-oriented discussion is to be achieved. In line with similar processes, this study sets out principles, criteria and indicators that have been developed by involving a large number of interested parties.

Establishing a set of principles, criteria and indicators (P, C, I) is a modern approach which allows the issue of hunting to be treated in an objective and transparent way by taking into account the three pillars of sustainability (ecology, economy and socio-cultural aspects). Sustainability in this context means that the use of the natural resources is possible now and will be possible in the future (for future generations).

The present study is solely concerned with the topic of hunting, always bearing in mind however that in the context of an overall aim of sustainability, the consideration of other, external influences on hunting is of vital importance. For these other individual sectors, specific principles, criteria, and indicators have to be developed.

Particular attention has been given to international agreements (CBD, IUCN, etc.)

Procedure

Based on previous work on principles, criteria and indicators of sustainable hunting (Federal Environment Agency, 1997), international requirements for environmental principles, criteria and indicators as well as on international initiatives such as the CBD, clear principles (11), criteria (20), and sub-criteria (39), with indicators and values have been defined. A process of participation that was gradually extended has allowed a large number of people from all relevant interests to express their views and contribute their own ideas and experience (topical discussions in smaller groups of experts, practical tests, larger group discussions).

Set of Principles, Criteria and Indicators for Sustainable Hunting

Assessment unit

The unit to be used for assessing sustainable hunting by means of principles, criteria, sub-criteria and indicators is the hunting ground or the hunting community. A definition of the individual assessment unit under investigation constitutes the fundamental basis for an examination of the sustainability of hunting. It has to include details such as geographic location, ownership and legal circumstances, natural conditions as well as management and monitoring methods.

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Ecology

As far as the ecological aspects are concerned, the P, C and I focus on the conservation and improvement of the diversity of game species, on the genetic diversity of game species, and on game habitats.

Particular importance is attached to the handling of “potentially natural” game species as well as newly appearing species. In order to adapt hunting to the way of life of game it is important to consider the life cycle, and above all the reproductive periods, of individual game species.

The indicators also give clues as to whether, along with hunting, other forms of land use (e.g. agriculture and forestry) are sufficiently considered.

Plans and lists for shooting are an absolute requirement for the documentation of hunting activities.

Watching the influence of game on vegetation is of particular importance. Fences and forest observation systems are considered to be useful instruments to control browsing. When assessing ecological sustainability, the prevention of a culturally unacceptable impact of game is of particular significance especially with regard to the protective effect of forests.

The last few decades have seen an increase in habitat loss and fragmentation, which was caused mainly by “cleared” agricultural areas and high-speed roads. It is therefore important for an assessment to find out whether the possibilities for linking up biotopes are exhausted. Game habitat capacities also have to be considered. In this context, the competition between different game species has to be taken into account as well as the annual growth rate of the species.

The set of indicators takes into account hunters’ aspirations concerning the form of antlers and horns (reducing the natural genetic diversity of game) as well as the introduction of non-native species of game.

Economy

To ensure that hunting activities are economically sustainable, it is important to consider their capability for yielding returns on investment and profitability. In this context indicators are defined for the marketing of game, the shooting of game, for efforts to promote and maintain the value of hunting through hunting activities and for paying attention to the weight of game species and their comparison in the long term.

For the economic aspects of damage caused by game, an indicator is used that describes the connection between hunting and the susceptibility of agricultural and forest crops to damage caused by game.

The basic requirement for the achievement of economic harmony between hunting and other forms of use (e.g. agriculture and forestry, tourism, transport and infrastructure) consists in regular contact and negotiations with the other users of the land or their representatives. Optimising changes planned in game habitats through interdisciplinary wildlife-ecological spatial planning can give valuable clues about the sustainability of hunting.

Socio-cultural aspects

With regard to the socio-cultural aspects, it is important that the public interest in hunting is considered (e.g. involvement of the local community). There are also criteria and indicators referring to the acceptance of hunting by the local community, and to how many local jobs available are accounted for by hunting.

Sustainable hunting must comply with the intentions of modern animal protection. Hunting must be carried out in such a way as to ensure that the pain caused to the hunted game is as little as possible. Here appropriate training in shooting is important. The normal behaviour of game can be regarded as an important indicator of its well-being.

Evaluation Scheme

In order to gain clear information on the sustainability of hunting, a structured evaluation scheme has been developed. The indicators for the individual sub-criteria are assigned between two and a maximum of four grades, with individual values ranging from + 4 to – 4 points. The results of the assessment are given for each of the categories ecology, economy and socio-cultural aspects (some criteria and sub-criteria, and thus evaluations, may be omitted for individual local conditions, if a reason is given) as percentages of the maximum number of points. The categorisation is carried out via five categories of percentages, with the first three categories counting as sustainable and the last two categories as not sustainable. For each of the categories ecology, economy and socio-cultural aspects there are grades ranging from “very good” to “very bad” and an assessment of “sustainable” or “not sustainable”.

Prospects

The methodical approach described here is aimed at providing the parties responsible for hunting with an instrument on site that can be used to check, with adequate transparency, the sustainability of hunting in the reference unit. Although this cannot replace the development of additional large-scale monitoring systems for measuring the sustainability of hunting, the results of the user-oriented scheme presented here can be used in combination with the statistical results of monitoring systems.

The set of principles presented here is designed in such a way as to allow an adaptation to specific regional conditions as well as continuous increase in sophistication. This can be achieved through its application by as many of the parties concerned as possible. For this purpose, the set of principles is made available in a user-friendly form on the internet.

1 INTRODUCTION AND OBJECTIVES

Hunting “makes use of” a part of nature’s resources. It thus influences, for example, the genetic diversity of individual game species, the composition of game species, and the game population. This influence may have effects on ecosystems and, in some cases, has a potential for conflicting with the interests of other users of natural resources (e.g. forestry, agriculture, fishery). The occurrence and behaviour of game, as well as its suitability for hunting, are also strongly influenced by changes in land use, physical infrastructure (e.g. roads, railway lines, overhead wires and conduits), and tourism. Interactions with these “non-hunting-related” aspects in terms of possibilities for sustainable hunting are given only brief mention in this study. Hunting, as a sector of sustainability, has thus to be interlinked and harmonised with other sectors of sustainability (agriculture and forestry, tourism, etc.), in order to facilitate an efficient integrated strategy for sustainability (“overall sustainability strategy”), which is also in line with the requirements of wildlife protection and conservation.

The present study deals exclusively with hunting, and that in the context of overall sustainable development as part of the implementation of the sustainability goals as defined at UNCED (United Nations Conference on Environment and Development), and subsequent processes, such as MCPFE (Ministerial Conference on the Protection of Forests in Europe). Furthermore, the sustainable use of the component of biological diversity is one of the three declared objectives of the CBD (Convention on Biological Diversity). This Convention mainly aims at the protection of the biological diversity of ecosystems, of species/populations and their genetic differentiation, and emphasises the sustainable use of biological diversity.

The intention of the study also corresponds to the Policy Statement decided upon at the World Congress of IUCN (International Union for Conservation of Nature and Natural Resources) in Amman/Jordan in 2000, which foresees the preservation and sustainable use of biological diversity and the protection of endangered species and ecosystems. According to this IUCN Resolution, the use of wild fauna and flora can also be defined as a form of nature conservation and/or the protection of biological diversity, provided it is sustainable. This is also valid for hunting. This definition does not include protected areas, such as wilderness areas, national parks, etc., in which any consumptive use is by definition excluded entirely or in parts of the protected area. The present study also intends to touch upon subjects contained in the Convention on the Protection of the Alps (Alpine Convention), such as, for example, the Protocols on the Conservation of Nature and the Countryside; Regional Planning and Sustainable Development; Mountain Forests, Tourism, or Transport.

The present study touches, though only marginally, upon aspects of the Austrian hunting law¹. It does, however, refer to the meaning of such concepts as “good, fair and legal hunting practice”² and “hunting ethics” (cf. ZEILER, 1996).

The objective of the present study is to give, with the help of a Set of Principles, Criteria, and Indicators, a concrete meaning to the concept of “sustainable hunting” and thus to make it more lively and tangible. The meaning of the concept of “sustainability” has been changing and has come to comprise ecological, economic, and socio-cultural aspects. These aspects are also termed the “three pillars of sustainability.” They are to be reflected in the structure of the Set of Principles, Criteria, and Indicators (see below). In this context, “sustainability”

¹ In Austria, hunting is governed by laws of the individual provinces.

² (Transl. comment:) The German term “Weidgerechtigkeit” (“good, fair and legal hunting practise”) describes a mode of hunting behaviour subject to changes in moral and ethical perspectives as well as in hunting techniques over the course of time. It relates to a practice of hunting in conformity with the general legal standards of hunting and has recently been expanded to comprise environmental considerations, dealing with natural resources, and behaviour vis-a-vis the ecosystem (HESPELER, 1990; LINDNER, 1979).

mainly means that the use of natural resources is possible now as well as in the future (for future generations).

From an ecological point of view, sustainable use means in particular preventing human action from exerting an irreversible impact on global material flows and from exceeding the local limits of capacity, as well as to preserve the diversity of species and of the characteristic natural scenery. Austria, too, has committed itself to integrating the recognised principles of ecological, social, and economic sustainability in all areas of social and economic policy and on all levels of decision-making (AUSTRIAN FEDERAL GOVERNMENT, 1995).

In accordance with the three pillars of sustainability, this study intends also to take into account the economic and socio-cultural components. The fundamental goal is to maintain, for example, the economic profitability of hunting, while at the same time preventing potential damage such as that caused by game management. It is also important for hunting to be in conformity with the objectives of the latest standards of animal protection.

On the basis of principles and subsequent criteria and sub-criteria, the study intends to establish indicators and provide them with an evaluation system that allows an assessment as to whether hunting is practised in accordance with the objectives of sustainability. The aim is to devise the set in such a way as to be as conclusive as possible regarding sustainability, while remaining viable and efficient. An instrument is to be created that contributes to the best possible integration of hunting in a comprehensive sustainable use of natural resources. The many external conditions which act upon game animals, their habitats and the possibilities for hunting them, and which often strongly overlap with the influence and scope of hunting, are not an object of this study.

A further objective is to allow for consideration of specific Austrian circumstances affecting an assessment of sustainability, which arise, for example, from the many small-structured hunting grounds³, the very diverse ecological setting (from chamois hunting ground in Western Austria to wild boars and small game hunting grounds in Eastern Austria), or the socio-cultural framework (e.g. the acceptability of hunting in rural areas compared with more urban regions).

The unit of reference for evaluation is to be the hunting ground or the hunting community. Forming larger units should be possible. Therefore it is important that the method of evaluation be uniform and consistent. The main objective is to provide those responsible for the unit of reference with an instrument which allows for a transparent examination of the sustainability of their own hunting practice. This instrument is intended to allow a description of the concept of sustainable hunting both for the community of hunters as well as for the land owner, and persons outside this context.

³ The minimum size of a "proprietor's hunt" is 115 hectares, while the habitats of red deer, for example, are much larger.

2 TECHNICAL REPORT

2.1 Organisational Procedure

The study “Fundamentals for Criteria and Indicators of Sustainable Hunting” was initiated with a revision of the criteria and indicators presented in the conference report, volume 21, of the Federal Environment Agency - Austria, “Hunting and Sustainability - Workshop Results” (AUSTRIAN FEDERAL ENVIRONMENT AGENCY, 1997). The existing set of criteria and indicators was examined as to its completeness, supplemented and/or re-formulated, and the entire spectrum of sustainable hunting was divided into three groups of aspects (ecology, economy, and socio-cultural aspects), and assigned to the categories of principles, criteria, and sub-criteria.

Furthermore, a profile of requirements for the criteria and indicators to be defined was established, reflecting the various different Austrian game habitats. This profile of requirements defines five characteristic types of game habitats, to which the set of principles, criteria, sub-criteria and indicators with evaluation is to apply (see box below). These types of habitats also include existing bodies of water.

1. Riparian areas and their riverside forests
2. Agricultural and industrial lowland territories and lowland areas characterised by settlements
3. Alpine foothills and hilly areas characterised by agriculture and forestry
4. Mountain regions characterised mainly by forestry
5. High mountain chains

In the next stage of the study, criteria, indicators, and sub-criteria for the above named three areas were defined and the already existing criteria, indicators, and sub-criteria were integrated. The resulting new set was then once again examined as to completeness and conclusiveness and revised. Then, each sub-criterion was provided with an evaluation scheme (cf. chapter 5).

The complete set was submitted for review and first reactions to a circle of experts, consisting of interest groups directly or indirectly concerned with hunting. In the autumn of 2000, this group of experts was invited to discuss the draft concerned at the Federal Environment Agency. This two-day meeting, at which the each point of the entire set was thoroughly discussed, took place in a very constructive atmosphere.

The set as well as comments sent in beforehand were made available to the audience in an interactive multimedia presentation. Disputed issues were settled by consensus and immediately and visibly incorporated into the presentation. The participants were:

- Prof. DI Alfred Fürst (Mayr-Melnhofsche Forstverwaltung Pfannberg, Steirischer Jagdschutzverein/Meyr-Melnhof Forest Management Pfannberg, Styrian Association for the Protection of Hunting)
- Norbert Gerstl (WWF)
- Dr. Peter Lebersorger (Zentralstelle Österreichischer Jagdverbände/Centre of Austrian Hunting Associations)

- Mag. Birgit Mair-Markart (Naturschutzbund/Austrian League for Nature Conservation)
- DI Hans Mattanovich (Landesjägermeister Stellv./Deputy Senior Representative of the Official Hunters' Association of the Province of Carinthia)
- DI Friedrich Prandl (Landesjägermeister/Senior Representative of the Official Hunters' Association of the Province of Burgenland)
- Dr. Karoline Schmidt, Ph.D. (wildlife biologist)
- Friedrich Völk, M.Sc., Ph.D. (Institute of Wildlife Biology and Game Management of the University of Agricultural Sciences, Vienna; Österreichische Bundesforste AG/Austrian Federal Forests)
- Hubert Zeiler, M.Sc., Ph.D. (Institute of Wildlife Biology and Game Management of the University of Agricultural Sciences, Vienna)

2.2 Statements Relating to Practical Application

Following the round of discussion among experts, the entire set was amended to take account of the results of the discussion. This “preliminary final version” was then sent for practical testing to those responsible for hunting matters in hunting units of varying size -hunting grounds, “hunting rings” (loose associations of hunting grounds), small and large-scale operations. The hunting grounds were selected in such a way as to comprise a broad spectrum of the hunting units and all types of game habitats represented in Austria.

The reactions to the “preliminary final version” of the study were very helpful for this final report. The set proved to be suitable for practical application to the hunting units included within the framework of the test. The reactions also contained some requests for changes, which were integrated in the set where they were found to improve its suitability for practical application. None of these changes, however, fundamentally altered the substance and findings of the preliminary final version agreed with the experts.

The following persons and hunting units participated in the test of the set's practical relevance:

- Ing. Martin Artner (Altzinger'sche Forstverwaltung/Altzinger Forest Administration)
- DI Josef Kerschbaummayr (Österreichische Bundesforste AG; Forstbetrieb Gmunden/Austrian Federal Forests; Gmunden Forestry Operation)
- Georg Krautgartner (Österreichische Bundesforste AG; Forstbetrieb Gußwerk/Austrian Federal Forests; Gußwerk Forestry Operation)
- L. Messner (Forschungsfonds für Umweltstudien/Research Fund for Environmental Studies, FUST-Achenkirch, the Tyrol)
- DI Hans Müller (Carinthian forest owner)
- DI Gottfried Pausch (Österreichische Bundesforste AG; Nationalpark-Forstverwaltung Eckartsau/Austrian Federal Forests/National Park - Forest Administration Eckartsau)
- DI Dr. Dieter Stöhr (forestry expert, the Tyrol)
- Ing. Josef Zandl (Gutsverwaltung Fischhorn/Fischhorn Estate Management, Salzburg)

2.3 Dealing with Individual Arguments

The reactions which arrived after the practical test contained several suggestions and requests for changes. A considerable number of the suggestions related to subject areas that had already been discussed extensively among the group of experts. Concrete requests for changes were integrated in the set where they improved its suitability for practical application. In one case, they referred to a change in the structuring of a principle (making two criteria out of one), and in a few cases, slight changes in the evaluation set of some sub-criteria were asked for. They brought about an improvement in clarity without changing the contents and substance of the sub-criteria.

2.4 Workshop

Following discussion among a restricted group of experts and the test of practical applicability, the study was summarised in a preliminary draft report. In order to present this draft report to a broader audience and to get their expert opinion, a workshop was held in the marble hall of the Austrian Federal Ministry of Agriculture and Forestry, Environment and Water Management at Stubenring, Vienna.

A diverse group of specialists and potentially interested participants were invited and sent copies of the draft report. The workshop focussed on the following four key subjects:

1. Giving an outline of the existing situation (legal and societal framework conditions in the context of aspects of sustainability, international conventions and processes, etc.)
2. Presentation of the set of principles, criteria, and indicators as well as the evaluation scheme developed
3. Discussion of groups of issues: framework conditions, structure of the set, Indicator with evaluation, analysis and application, communication and implementation
4. Summary and Conclusions

The discussion following the presentation was to the point and constructive. Suggestions, additional points, and requests for changes were to a great extent integrated into this final report. For the purpose of completeness, full versions of all suggestions and statements submitted in writing are given in the Appendix. Aspects that have not been integrated so far (contradictory views, etc.) can be tested during the planned “trial year” (cf. Prospects, chapter 6) as to their expediency and, if found suitable, integrated into the set of criteria.

Summary of the Discussed Issues

The discussion at the Workshop focussed on five thematic areas:

- Fundamental responses to the study

The present study was commended in various ways, and it was noted that it meets the problems at hand as well as making a valuable contribution to a more objective approach. The opening up of the subject of hunting to everyone was considered positive. The present model will for the first time make it possible for hunting to put itself to the test. Its aim is to address the involved personal responsibility of those who take part in hunting, rather than to lay down rules and regulations for every minute detail.

There was criticism of the lack of a political assessment of the model's application. In this context, a proposal was made to go beyond mere self-evaluation and also consider an examination by independent testing systems.

- Sustainability and Linking with Other Sectors

There was consensus at the Workshop that hunting should not be looked at in isolation when it comes to sustainability. Rather, the study should be integrated with other sectors of sustainability in an overall sustainability strategy. In particular, the impacts of tourism on hunting should be included.

On the one hand, there was a demand for sustainable hunting to allow sustainable forest management. On the other hand, the idea was expressed that the "forest" as habitat for game would be better placed in a set relevant to forestry.

In connection with the discussion as to whether "sustainable use" could only exist if there was actual "use," the following statement was made: Certain game species that jeopardise the population of other species (e.g. fox inoculated against rabies, whose population increases strongly), can be regulated without being used.

- Assessment Unit

At the Workshop, larger units of assessment (larger than 115 hectares) were called for in order to measure sustainability. On the one hand, the need to look beyond the limits of the hunting ground was recognised, even if the hunting ground does not contain a forest with a protective function. This is why a separation of evaluation units on the supra-regional, regional, and provincial levels and the level of individual operations was being considered. On the other hand, the participants insisted that the individual hunting ground had to remain the unit of evaluation. At any rate, however, the subject of "larger areas" ought to be dealt with in greater detail in the present study.

Finally, there was call for a list showing to which level of reference the respective principle, criterion, or indicator should apply. However, exceptions ought to be possible, provided they can be accounted for.

- Evaluation

Both when the principles, criteria, and indicators were worked out, and at the subsequent discussion among a smaller group of experts, as well as at the Workshop, the question as to whether the set should include so-called "KO" (knockout) criteria, was intensively debated. KO criteria would be individual criteria which, upon their non-completion, would immediately render a hunting practice non-sustainable, i.e. a negative result regarding one such criterion would not be compensated by scoring particularly well regarding other criteria. The introduction of KO criteria was discussed mainly with a view to game damage to forest vegetation. It is difficult to respond to this issue with the principle that the person under whose responsibility the damage falls should pay for it. What, if game damage occurring on one's own hunting ground, is, for example, due to wrong hunting practice in the neighbouring hunting ground? Or if, for example, game damage has been caused by forestry practices resulting in increased susceptibility to game damage? In the latter case, forest-related sustainability criteria would have to make this case a KO criterion, in order to allow sustainability also from that side (cf. also chapters 1,4,6 "Overall Sustainability Strategy"). In the course of numerous discussions, the prevailing opinion was that an evaluation using the above point system gave sufficient information for current hunting activity and made valuable suggestions for the future. As a result, the idea of introducing obligatory KO criteria was discarded.

Under special local or regional conditions and if it is justified, KO criteria or KO principles can, however, be specified in particular with regard to the ecological aspects. Individual sub-criteria, however, should not be used as KO criteria (with the exception of sub-criterion 4.1.2.2.1 in case of massive impairment of the ecosystem due to hunting-related game influence brought about by the fault of the responsible person and of relevance in terms of provincial culture.

We were further alerted to the fact that with regard to certain assessment units, certain aspects are not relevant, e.g. if the protective function of the forest is minimal. In this context, it was pointed out that the sum of points for one hunting ground do not have to be the same (e.g. if there is no protective forest). This then diminishes the maximum sum of points possible. A concluding proposal was to evaluate the three groups of aspects (ecology, economy, socio-cultural aspects) separately and to use the respective percentage of the maximum sum of points to be gained from each area for the classification.

- Further Issues

With reference to estate land, it was pointed out that a certain percentage of the hunting ground should be defined as “game-friendly” (e.g. grazing areas for game).

The term “nature protection” was considered significant and should thus be mentioned under criteria and explanations. In order to come closer to finding a real solution to the “forest/game” conflict, the economic aspects of forestry would have to be taken into account.

It was suggested the cultural aspect of hunting should be considered. In order for an individual hunt (one single hunter) to be continued, it might be listed as a cultural good under the socio-cultural aspects. It could be argued that the value of hunting ought to be documented also by means of the option for an individual hunter to hunt on his or her own. “Poaching” was another issue raised.

The subject of “feeding”, in particular in red deer hunting grounds, was repeatedly discussed. In this context, the issues of “winter fences” and “use of medication” were brought up. A proposal was made to consider these topics under chapter 4.1.2.4. It was pointed out that well-functioning examples for feeding and the use of winter fences actually existed.

Another suggestion was to examine connections and/or inconsistencies regarding game weights and the admission of natural population dynamics (e.g. also overpopulation).

Furthermore, a reference as to “What is our goal?” and “Can this be examined via monitoring?” was requested. Thus, all criteria should be examined to see whether they allow wild-life populations rich in species, genetically diverse, as close as possible to natural behaviour, and living in harmony with the ecosystem. Furthermore, all criteria and indicators ought to be examined as to whether they allow, for example a sustainable hunting of ducks (migrating species).

3 DESCRIPTION OF THE HUNTING GROUND – BASIS FOR THE SUSTAINABILITY TEST

The description of the assessment unit provides an important basis for the sustainability test of hunting and its interpretation. It is therefore to be made with the greatest possible completeness and exactitude. It refers to the past calendar year.

Date of data entry

(DMY)

3.1 Name, Geographical Position and Infrastructure of the Hunting Ground

Name of the hunting ground

--

Size of the hunting ground

(hectares)

Geographical position of the hunting ground

State:	_____
Province (Land):	_____
District:	_____
Community:	_____
Wildlife area, wildlife region:	_____

Extent of passable roads (e.g. forest roads)

low medium high

Red deer feeding in operation

yes no

Winter fencing in operationyes no **3.2 Ownership and Legal Situation****Land owner**

First name: _____
Last name (Institution): _____
Street: _____
Postal code and City/Town: _____

Owner of hunting ground

First name: _____
Last name (Institution): _____
Street: _____
Postal code and City/Town: _____

Exercise of hunting rightsProprietor's hunt (property larger than 115 hectares) Community/co-operative hunt
(sum of joint properties below 115 hectareson community level) Hunt leased yes : no **Protected area designations**percentage/nature conservation area: (%)percentage/landscape protection area: (%)

percentage/Natura2000-area: (%)

percentage-area: (%)

3.3 Area and Biotope Description, Biological Diversity, Land Use

Altitude above sea level of hunting ground

from (m) to (m)

Habitats

relating to overall hunting ground (figures in %); food patches/cultivated deer pastures (figures in hectares)

percentage/forest: (%)

percentage/protective forest: (%)

percentage/high mountain chains without forest: (%)

percentage/grass(pasture)land: (%)

percentage/arable land: (%)

food patches/cultivated deer pastures: (ha)

Does the hunting ground contain stagnant waters (lakes, ponds)?

yes no

Does the hunting ground contain riparian areas and riverside forests?

yes no

Main game species

(number shot/year)

Rare species

(name)

Habitat fragmentation (by roads, railways, etc.)low medium high **Tourism**low medium high **3.4 Management and Monitoring****Does a written management concept exist?**yes no **Measures to protect biological diversity**

Biological diversity is understood as the variety of genetic differentiation within a species, the diversity of species, and the diversity of habitats.

Number of huntersoverall professional hunters guest hunters hunters by permission of land owner/game tenant, who pay per shooting persons entitled to hunt a few times by permission of land owner/game tenant others **List of land owner's/game tenant's regular notes**

(nature of notes)

List of other data used

e.g. on fauna and flora

3.5 Remarks, Notes, Comments

4 SET OF PRINCIPLES, CRITERIA, SUB-CRITERIA AND INDICATORS WITH EVALUATION

Description of the Contents of the Set and Information Regarding its Application

The guiding principle for putting together the set was the sustainability of hunting, which is subdivided into three groups of aspects: Ecology, Economy, and Socio-cultural Aspects. In this context, “sustainability” is defined as allowing the use of natural resources both now and in the future (for future generations). The evaluation refers to the current status or, where necessary, to the past calendar year. The objectives of the evaluation are exclusively hunting activities. The numerous non-hunting-related influences, i.e. conditions created by agriculture, forestry, tourism, transport, housing development, industry, etc., which have an impact on wildlife, its habitat and huntability and may strongly affect the influence and scope of hunting, are not the object of the present study.

The authors would like to add in this connection that linking the set of hunting principles, criteria, sub-criteria and indicators with evaluation with respective principles, criteria, and indicators (for the most part yet to be developed) of other sectors (agriculture, forestry, tourism, transport and housing, area planning, etc.) would be necessary in order to guarantee effective implementation. As far as sustainability as an objective of society is concerned, the integration of the set of criteria and indicators of all sectors into an overall sustainability strategy is crucial.

Following the formulation of principles for sustainable hunting for the three groups of aspects, the relevant criteria and sub-criteria were established. Finally, each sub-criterion was assigned an evaluation scheme in order to permit a concrete assessment (points system) of the criteria, principles, and areas. The set is worded in such a way as to allow a questioning of the sustainability of one’s own hunting practice as well as a comparison with other hunting grounds or larger hunting units and/or a summary and presentation in an understandable way.

The hunting ground or hunting community has been chosen as the unit of reference for evaluation. Combining areas to form larger units is basically possible and meaningful. An enlarged perspective is particularly meaningful for large, connected wildlife habitats, wide-ranging game species such as for example red deer and brown bear, but also numerous bird species.

If certain criteria and sub-criteria are not applicable in a specific hunting ground, they may be omitted in the evaluation of the hunting ground, provided reasons are given. The omitted criteria and sub-criteria should, however, be evaluated at a higher level of reference (e.g. by combining several hunting grounds). In the list of points (cf. chapter 5), those criteria and sub-criteria that apply under certain preconditions are highlighted.

In order to be able to evaluate the sustainability of hunting, there has to be a “hunting concept.” In most cases, such a concept will exist in one way or the other, often simply in the land owner’s or game tenant’s mind. For an evaluation in accordance with the defined indicators, and, in general, for a long-term orientation of the hunting practice, there should, however, be a written hunting concept that gives clues as to the goals and steps regarding the area evaluated in terms of sustainable hunting. The drafting of such a hunting concept requires knowledge of factors and measures contained in the set of criteria and indicators in this chapter, and thus calls for dealing in depth with the interrelationships which are significant for sustainable hunting. For an assessment of sustainability, an evaluation scheme by points is being proposed (cf. chapter 5).

Systematic Structure of the Set

- **Sectors of Sustainability:** There are various points of view from which to look at and define the sustainability of hunting. The groups of aspects with regard to which the sustainability of hunting were defined in the present study are: ecology (chapter 4.1), economy (chapter 4.2), and socio-cultural aspects (chapter 4.3). This also corresponds to the international standard of categorising sustainability. There is need to take into account that the various areas differ as to their approaches and motives for the practice of sustainable hunting, and may therefore also be controversial. There may be cases where one and the same action has positive effects in terms of ecology and negative effects in terms of economy, which is consequently also reflected in the evaluation.
- **Principles of Sustainability:** For each of these categories, principles for sustainable hunting are defined. In the set, they are to be found under the 3-digit headlines, e.g. 4.1.1 Principle: The practice of hunting shall within its range ensure the preservation and improvement of the diversity of game species through protection and use.
- **Criteria of Sustainability:** The principles are defined by criteria to be found in the set under the 4-digit headlines, e.g. 4.1.1.2 Criterion: Hunting is oriented according to the behaviour of wildlife species.

Sub-criteria: The above criteria are specified by sub-criteria, to be found in the set under the 5-digit headlines, e.g. 4.1.1.2.1 Sub-criterion: Giving consideration to the undisturbed life cycle of wildlife.

Indicators with Evaluation: The operational examination and evaluation (in figures) with regard to whether the sub-criteria are met by the hunting practice is made via the Indicator with evaluation determined for each sub-criterion.

In some sub-criteria, a certain scope of subjective interpretation can, of course, hardly be avoided regarding the separation of various influences. The above-mentioned Sub-criterion 4.1.1.2.1. may be cited as an example: Giving consideration to the undisturbed life cycle of wildlife: Who would like to admit that he or she constitutes an element of disturbance (and sometimes a considerable one!) to wildlife through his or her own hunting pressure? A certain amount of honesty and ability for self-criticism is necessary and is expected from the persons making the evaluation.

Among the criteria, Criterion 4.1.1.1: Potential natural wildlife species inventory taking into account the current habitat situation (applies only to larger territorial units, e.g. an ecologically homogeneous area for wildlife or a province) is the only criterion that lends itself only to limited application, because for its evaluation, regional basic data transcending the limits of one hunting ground are needed. In many cases, however, these basic data are easily accessible.

In evaluating the individual sub-criteria, one should always be aware to which group of aspects (ecology, economy, socio-cultural aspects) the sub-criterion under evaluation pertains, in order to avoid an intuitively biased evaluation, e.g. an “economically slanted” evaluation of ecological sub-criteria (or vice versa).

The subject of feeding was, after long expert debates, not dealt with in greater detail, as feeding may have very diverse impacts on the indicators and thus is difficult to assess with precision as to its effect in terms of sustainable hunting. Feeding may also, depending on how and in which location it is carried out, reduce game damage (e.g. to forests), but may also cause such damage. Where natural winter habitats, e.g. for red deer, are no longer available (settlement areas), feeding may represent a technical “remedy” for the lost habitat, which allows a sustainable use of the respective animal species. If feeding contributes in a positive sense to a better completion of the sustainability criteria, it is automatically positively entered into the sustainability evaluation of hunting. Vice versa, negative impacts of feeding on sustainability are sufficiently reflected in the existing sustainability criteria.

Definitions of Terms

- The owner of a hunt (person permitted to hunt) shall mean, for the purpose of this study, the owner of a proprietor's hunt (property larger than 115 hectares) hunting on his or her own territory, or the tenant(s) of a proprietor's hunt or co-operative hunt (sum of joint properties below 115 hectares on community level);
- Tenant shall mean the lessee of a proprietor's or co-operative hunt;
- Lessor(s) shall mean the owner(s) or the representative(s) of the owner(s) of a proprietor's or co-operative hunt;

Use shall be understood in a comprehensive sense. It shall include all forms of consumptive or non-consumptive use of natural resources (cf. IUCN Policy Statement, Amman 2000). Sustainable hunting and/or sustainable use for hunting shall include the shooting of certain animal species without a requirement for the killed animals to be brought to use (utilised), (e.g. red fox, if its population increases on account of anti-rabies vaccination and thus endangers the populations of other species).

4.1 Ecology

4.1.1 Principle: The practice of hunting shall within its range ensure the preservation and improvement of the diversity of game species through protection and use

Explanation: By game we understand those wildlife species that are subject to hunting in accordance with the hunting laws. Other wildlife species (e.g. small mammals, insects, song-birds, amphibians, reptiles, fish) as well as micro-organisms that may interact with game could not be given specific consideration owing to the fact that it was not possible to define adequate indicators.

4.1.1.1 Criterion: Potential natural wildlife species inventory taking into account the current habitat situation (applies only to larger territorial units, e.g. an ecologically homogeneous wildlife area or a province)



Potentially natural groups of wildlife species subject to hunting laws comprise even-toed ungulates (hoofed game), lagomorphs, large rodents, carnivores (furred game of prey), ground, water and tree birds [including birds of prey and owls (strigiformes)].
(F. Heckl)

Explanation: “Potential natural wildlife inventory” is to be understood as a spectrum of wildlife species representing to the optimum situation in terms of biodiversity and near-natural conditions, taking account of the developmental history of the cultural landscape and under the given economic and socio-cultural influences on the wildlife habitat (cf. also 4.1.1.1.1). “Wildlife” species is for reasons of practicability to be understood as those wildlife species that are or were subject to hunting (e.g. regulations under hunting laws, hunting practice) as “hunnable” game.

4.1.1.1.1 Sub-criterion: Current and potential list of wildlife species

Explanation: The existence of a list of current or potential natural wildlife species available to the party responsible for wildlife management is an indication that the completeness of the potential natural wildlife species inventory represents a guideline for hunting and is aspired to and/or maintained.

In order to be able to compare the existing wildlife species inventory with the potential natural wildlife species inventory, it is necessary to draw up a regional list of the potential natural wildlife inventory. For this purpose, a species list of the wildlife inventory of the early stage of the existing types of regional cultural landscape should be consulted or put together. Bearing in mind the anthropogenic influence exerted on the cultural landscape since the early stage of the regional type of cultural landscape (agriculture, forestry, settlements and housing, transport rail/road, tourism, etc), the current inhabitability of the altered cultural landscape for the wildlife species originally present can be evaluated and thus a potential natural list of wildlife species prepared. The drafting of such a list is only foreseen and only makes sense for larger and fairly homogeneous territories in terms of the type of cultural landscape.

Indicator with Evaluation: 2 A current and a potential natural wildlife species list exists
0 A current and a potential natural wildlife species list does not exist.

4.1.1.1.2 Sub-criterion: Dealing with newly appearing species (in accordance with the potential wildlife species inventory)

Explanation: By checking the completeness of the inventory of potential natural species achievable through hunting (in accordance with the possibilities of the given economic and socio-cultural environment), the influence of hunting on the inventory of existing wildlife species is assessed. For this purpose, the current list of wildlife species is compared to the potential natural wildlife species list, and their completeness or incompleteness is assessed according to the subsequent evaluation scale.

The existence of certain wildlife species in the wildlife habitat allows conclusions to be reached about human influences in the wildlife habitat, including that of hunting. Significant in this context are sensitive wildlife species such as for example the capercaillie (wood grouse), black grouse, grey partridge, lynx, bear, as well as certain birds of prey and owls, which are good bio-indicators. It is for investigation not only whether these species are not impaired by hunting, but also, whether predators whose populations have grown unnaturally owing to the lack of natural enemies and/or epidemic control (e.g. that of fox as a consequence of anti-rabies vaccination), are hunted efficiently in the sense of indicator species (including endangered species). It must not be overlooked that vice versa, “use” in the sense of an optimisation of the potential wildlife inventory may arise if certain wildlife species are endangering other species. An example to the point is the extinction in some locations of the (non-native) muskrat by the old world otter as a result of its recovered distribution.

The balance of the frequency of wildlife species ought not to be measured only by the existence of a species, but also by its number of individuals and the time horizon of its presence. Thus, for every species (sedentary game, migratory, and seasonally present wildlife species), a time horizon of its presence can be given as a value providing orientation, and a list of sensitive indicator species and their potential habitat sizes can be drawn up specifically for the respective wildlife habitat.

- Indicator with Evaluation:**
- 2 All newly appearing wildlife species corresponding to the potential wildlife inventory are fostered.
 - 1 All newly appearing wildlife species corresponding to the potential wildlife species inventory are tolerated, sensitive species are fostered.
 - 0 All newly appearing wildlife species corresponding to the potential wildlife species inventory are tolerated.
 - 1 Newly appearing wildlife species corresponding to the potential wildlife species inventory are not tolerated.

4.1.1.1.3 Sub-criterion: Dealing with wildlife species not contained in the potential wildlife species inventory

Explanation: Non-native species often supersede native species and at the same time often have a lasting influence on the wildlife habitat, which is hard to predict at an early stage. To tolerate them in terms of hunting, or to foster them selectively does thus not fulfil the objective of the potential natural species inventory of flora and fauna, which should be as complete as possible. Dealing with non-native wildlife species is documented for example by trophies (fur/racoon, horns/mouflon, etc.) but also by game-keeping and preservation measures (e.g. feeding of moufflons). How to deal with non-native species is to be defined in the hunting concept and documented by way of a written record of what has been done in this regard.

- Indicator with Evaluation:**
- 2 Exclusively species of the potential wildlife species inventory are represented
 - 1 (A) wildlife species not contained in the potential wildlife species inventory is (are) represented despite counteraction through hunting.
 - 0 (A) wildlife species not contained in the potential wildlife species inventory is (are) represented and is (are) tolerated in terms of hunting though not selectively fostered
 - 2 (A) wildlife species not contained in the potential wildlife species inventory is (are) represented and is (are) selectively fostered in terms of hunting

4.1.1.2 Criterion: Hunting is oriented according to the behaviour of wildlife species

Hunting guidelines across the borders of hunting grounds, e.g. for wild boars, might contribute to a better orientation of hunting according to the wildlife species' behaviour.
(F. Heckl)



4.1.1.2.1 Sub-criterion: Taking into account the undisturbed life cycle of the wildlife species

Explanation: Hunting is rarely regarded as a factor of disturbance, in particular by the hunter him- or herself. Hunting pressure, however, has a strong impact on wildlife behaviour and thus indirectly upon its habitats. In cloven-hoofed game, for example, strong hunting pressure causes a reduced possibility of using open grazing areas (which in most cases are the best ones), which results in increased browsing damage of the forest vegetation providing cover. The selective fostering of the wildlife's undisturbed life cycle through hunting is to be documented in the hunting concept.

- Indicator with Evaluation:**
- 2 The undisturbed life cycle of the wildlife species is fostered on over 90 % of the area through keeping hunting pressure as low as possible (interval hunting)
 - 1 The undisturbed life cycle of the wildlife species is largely (>50 % of the area) guaranteed on account of low hunting pressure
 - 0 The undisturbed life cycle of the wildlife species is guaranteed only in parts of the areas (<50 % of the area) on account of hunting pressure
 - 1 The undisturbed life cycle of the wildlife species is not guaranteed on account of extremely strong hunting pressure (>75 % of the area)

4.1.1.2.2 Sub-criterion: Taking into account the reproductive periods of the individual game species

Explanation: The wrong moment for hunting an individual game species or certain individuals of one species may have an enormous impact on the reproduction of one game species, e.g. in the case of capercaillie (wood grouse): hunting of the alpha-cock before the hens' covering time. If hunting takes into account sensitive stages of the reproductive periods of certain sensitive game species, this is to be evaluated as a sustainable approach to hunting. The emphasis is here on sensitive game species as found in the game species inventory or on a separate list, e.g. pairing and hedging times for the hen capercaillie (wood grouse). This does not refer to the pairing time of deer, red deer, and chamois, though it does refer to the time of raising their young. Also to be taken into account is that the hunting of one species should not have a considerable impact on the reproductive period of another species. Giving specific regard in terms of hunting to the sensitive periods of reproduction of all game species is documented in the hunting concept.

- Indicator with Evaluation:**
- 3 The sensitive stages of the reproductive periods of the individually represented game species are taken into account in terms of hunting through area and time planning
 - 2 The sensitive stages of the reproductive periods of the game species hunted are taken into account in terms of hunting through area and time planning
 - 1 The sensitive stages of the reproductive periods of the game species hunted are partially taken into account in terms of hunting through area and time planning
 - 0 The sensitive stages of the reproductive periods of the game species represented are not taken into account in terms of hunting.

4.1.1.2.3 Sub-criterion: Existence of hunting guidelines across hunting grounds

Explanation: Wildlife species are not aware of the boundaries of hunting territories. The hunting of wildlife has thus to be oriented according to the wildlife's use of its habitats, rather than area limits drawn by man. The use of habitats by game can be best responded to by hunting guidelines that transcend the limits of individual hunting grounds. This is mainly true for widely ranging game species such as red deer, wild boars, and migratory bird species. The smaller the hunting ground, the more desirable are hunting guidelines across hunting grounds for all game species hunted. This objective can be fostered by forming hunting communities, but also, provided the relations with one's neighbours are good, on a less formal basis, simply by agreement. Both forms of a hunting strategy across hunting territories ought to be documented in writing.

- Indicator with Evaluation:**
- 4 There are hunting guidelines across the limits of hunting areas for widely ranging and most other game species hunted
 - 2 There are hunting guidelines across the limits of hunting grounds for widely ranging game species (e.g. migratory bird species, red deer, wild boars, etc.)
 - 0 There are no hunting guidelines across the limits of hunting grounds
 - 2 There are no hunting guidelines across the limits of hunting grounds; the owner of the hunt prevents a hunting strategy across the limits of the individual hunting ground

4.1.2 Principle: The preservation and improvement of wildlife habitats is an objective of the practice of hunting

Explanation: Hunting is here understood in comprehensive terms and does not relate to the shooting of game only.

4.1.2.1 Criterion: Hunting and its interrelationship with other forms of land use

Bottlenecks occurring within a certain period of time, such as in food availability, ought to be given consideration.
(Forschungsinstitut für Wildtierkunde und Ökologie/Research Institute of Wildlife Ecology, University of Veterinary Medicine, Vienna)



4.1.2.1.1 Sub-criterion: Existence of a strategy to harmonise hunting with other forms of land use

Explanation: Anthropogenic influences such as agriculture and forestry, tourism, road construction, housing, nature protection and conservation, etc., exert a lasting influence on wildlife habitats. In a study on criteria and indicators of sustainable hunting, however, the impact of these anthropogenic influences themselves cannot be verified. What can be done is to give consideration to the extent in which hunting takes into account in terms of its strategy anthropogenic influences in the wildlife habitat where hunting is practised. In this context, communication and mutual agreement between hunters and representatives of “other anthropogenic influences” are also to be evaluated. The harmonisation of hunting with other forms of land use through the existence of a specific strategy in the hunting concept is entered into the documentation. The legal designation of habitat protection areas, nature zones, etc. may be of advantage in this regard.

Indicator with Evaluation:

- 2 A strategy to harmonise hunting with other forms of land use exists in the hunting concept
- 0 A strategy to harmonise hunting with other forms of land use does not exist in the hunting concept

4.1.2.1.2 Sub-criterion: Considering seasonal bottleneck situations

Explanation: Bottleneck situations for wildlife are defined as shortages (mostly of food availability) over a limited period of time. These situations may be of anthropogenic origin (e.g. food shortage caused by full harvesting of agricultural lands in autumn) or of natural origin (e.g. food shortage over the winter in high altitudes). Here, too, it is not the bottleneck situation itself that is to be evaluated, but the extent to which it is being taken into consideration by hunting.

For example:

- Preventing the high autumn/winter mortality of brown hare in fully harvested agricultural lands bare of food and cover by way of early hunting in autumn, on account of which the remaining hare population remains in a better condition.
- Adjusting the stock of cloven-hoofed game in time in the relevant season to the low biotope capacity in winter, particularly of forests in hunting territories characterised by a mix of forest and agricultural land. If these annually returning capacity fluctuations, which vary among the individual hunting grounds, are captured by timely hunting before the capacity decreases, even lasting damage to the permanent vegetation (forest, small woody plant communities, boundaries, etc.) may be avoided and the remaining stock of game is able to survive the period of food shortage in a good condition.

Giving consideration to anthropogenic or natural bottleneck situations in terms of hunting ought to be reflected in a specific area and time-specific hunting strategy in the hunting concept. (The effects of this hunting strategy are evidenced later on by the winter condition of the remaining wildlife stock and the state of the vegetation; whether it has actually been carried out can be checked by the shooting times given in the shooting lists).

- Indicator with Evaluation:**
- 2 Anthropogenic or natural bottleneck situations are taken into account by way of an area and time-specific hunting strategy for all game species hunted
 - 1 Anthropogenic or natural bottleneck situations are taken into account by way of an area and time specific hunting strategy for some game species hunted
 - 1 Anthropogenic or natural bottleneck situations are not taken into account in terms of hunting
 - 2 Hunting aggravates anthropogenic or natural bottleneck situation

4.1.2.1.3 Sub-criterion: Existence of a shooting plan and a shooting list

Explanation: The existence of a shooting plan and a shooting list (as parts of a hunting concept) provides documentary evidence that influencing game populations by hunting is planned and (for the purpose of providing a starting point for future planning) documented. Owing to the fact that shooting plans in most Austrian provinces need the permission of the authorities, it is to be assumed that the authorities also seek to prevent overhunting of individual game species as well as to harmonise hunting with other land use interests. A hunting concept including a shooting list is, however, not only of advantage with regard to game species for which shooting plans and shooting lists are prescribed by the authorities, but also with regard to other, in particular sensitive game species (cf. 4.1.1.1.2, 4.1.1.2.2).

- Indicator with Evaluation:**
- 3 All shooting plans and shooting lists requested by the authorities exist, and such plans and lists also exist for all other game species hunted
 - 2 All shooting plans and shooting lists requested by the authorities exist, and such plans and lists also exist for another/some other game species
 - 1 All shooting plans and shooting lists requested by the authorities exist
 - 1 Shooting plans and/or shooting lists are deficient

4.1.2.1.4 Sub-criterion: Structure of shooting plan and shooting list

Explanation: Breaking down the shooting plans by sex and age class, and the shooting lists by date, location of the shooting, as well as sex and age, is of importance in order to be able to compare planned and actual shooting as well to make evident the area and time of the shooting in particular with regard to other forms of land use.

- Indicator with Evaluation:**
- 3 A subdivision of shooting plans and shooting lists by sex and age classes, and, in addition, of shooting lists by date and location of the shooting, is made for all game species hunted
 - 2 A subdivision of shooting plans and shooting lists by sex and age class, and, in addition, of shooting lists by date and location of the shooting, is made for all game species for which shooting plans and shooting lists are requested by the authorities, and, in addition, for another (some other) game species
 - 1 A subdivision of shooting plans and shooting lists by sex and age class, and, in addition, of shooting lists by date and location of the shooting, is made for all game species for which shooting plans and shooting lists are requested by the authorities
 - 1 There is no or only a deficient subdivision of shooting plans and shooting lists by sex and age class, and, in addition, of shooting lists by date and location of the shooting, for game species for which shooting plans and shooting lists are requested by the authorities

4.1.2.2 Criterion: Giving consideration to the influence of game on vegetation



Browsing of young trees is a significant part of the overall influence game exerts on vegetation.
(F. Kovacs)

Explanation: This criterion and the subsequent sub-criteria are meant to allow an evaluation of negative game influence on forests (and other forms of vegetation), while they do not question the forest as a wildlife habitat. Furthermore, in assessing negative game influence on vegetation, it is indispensable to look beyond the limits of individual hunting grounds, even if the hunting ground does not contain a forest with protective function, as wildlife is unaware of limits and borders. Hunting in one's own area, for example, may thus significantly influence the vegetation of the neighbouring hunting ground. For the evaluation of this criterion, the forest authorities ought to be consulted.

4.1.2.2.1 Sub-criterion: Existence of control fences to monitor browsing

Explanation: A proven method to take game influence on vegetation into account in terms of hunting is to install browsing control fences. They allow comparison of a small, fenced-in plot of vegetation, entirely free of browsing, with the surrounding vegetation areas that are not fenced in. If the location is adequately chosen, it is possible to determine the influence of actual browsing on the composition of the vegetation (attenuation of the forest, permanent vegetation in agricultural areas, such as boundary balks). It is important to note that the vegetation growing without any game influence within the fence is not to be regarded as the natural state, but is taken simply as a comparative area to determine game influence. It allows an objective check of whether this influence results in an increase or reduction in the diversity of vegetation, or none of the above.

Austria-wide forest surveys and biotope mapping in the agricultural area provide good data material for many areas of Austria on the current vegetation - at least forest vegetation - as well as on the potential natural vegetation, which allows a comparison of the status quo with a desired status.

The existence of certain indicator plants in the soil vegetation gives reliable clues as to the state of the biotope. An indication of a balanced relationship between game stock (in particular cloven-hoofed game and hares) and food supply is the existence of rare plants preferred for browsing, while the lack of such plants, in combination with the dominant appearance of certain (spiny/thorny/bitter/poisonous) plants resistant to browsing is characteristic of oversized game populations. A list of relevant indicator plants can be specifically drawn up for the

respective wildlife habitat. An orientation of the hunting strategy according to the potential natural plant societies ought to be a part of the hunting concept.

- Indicator with Evaluation:**
- 2 Control fences to monitor browsing damage to vegetation exist above a density of one fence per 100 hectares
 - 1 Control fences to monitor browsing damage to vegetation exist up to a density of one fence per 100 hectares
 - 0 Control fences to monitor browsing damage to vegetation do not exist

4.1.2.2.2 Sub-criterion: Giving consideration to the results of objective forest monitoring systems

Explanation: Forest monitoring systems such as tracts (control strips), spot checks, control fences, expert examinations of areas, population surveys (full surveys) provide - regardless of whether they are carried out by an authority or a forestry operation - an important orientation for the hunter, helping him or her to determine the influence of cloven-hoofed game on vegetation in the grazing area. Indirectly, these monitoring systems may also be consulted to verify the influence of hunting on cloven-hoofed game and vegetation and for clues how to optimise hunting. Existing forest monitoring systems should thus always become a part of hunting plans.

- Indicator with Evaluation:**
- 2 Existing forest monitoring systems are consulted for planning and optimising hunting
 - 0 Existing forest monitoring systems are not consulted for planning and optimising hunting

4.1.2.2.3 Sub-criterion: Giving consideration to the protective function of the forest

Explanation: In the field of ecology, it is the protective functions among the functions of the forest (protection, well-being and recreation) that is to be considered in terms of hunting. This means first and foremost that hunting must not impair the forest's capacity for self-preservation. (Locally) oversized game populations, which cause an ecologically harmful change in the vegetation composition (species inventory, structure, texture), for example, are detrimental to the protective effect of the forest. The hunting concept should give consideration to the protective function of the forest.

- Indicator with Evaluation:**
- 2 There is a hunting strategy to avoid detrimental effects of game damage on the protective function of forest habitats
 - 0 There is no hunting strategy to avoid detrimental effects of game damage on the protective function of forest habitats

4.1.2.2.4 Sub-criterion: Preventing game damage unacceptable in terms of provincial culture

Explanation: Provincial culture is here defined as comprising the protection of nature in general and thus also the protection of native animal species; it also comprises, however, the practice of hunting and fishing, agriculture, Alpine farming, and forestry, as well as the guarantee of the right of use of agricultural and forestry lands. We speak of game influence unacceptable in terms of provincial culture in particular if important functions of the forest (protection, well-being, recreation, use) are jeopardised. As a rule, damage to the forest ecosystem

has a negative impact on these functions, which is particularly serious if the protective function is affected.

Game influence unacceptable in terms of provincial culture is to be understood in this context as a primarily ecologically unacceptable (harmful) influence of game on vegetation. The influence of game on vegetation comprises food intake (grazing, browsing, barking) as well as fraying of velvet and fraying and beating of antlers. The aspect of provincial culture goes further than managerial economic considerations. The concept of “provincial culture” comprises ecology, economy, the protection of nature, as well as traditions, and in particular the functions of the forest going beyond that of timber production (protection, well-being, recreation, effect on biodiversity).

The lack of some significant natural enemies of our herbivorous wildlife as well as anthropogenic influences on our wildlife habitats (most of all land use) accounts for the fact that they are, seen from a larger perspective, mostly not semi-natural environments. This allows local densities and wildlife distribution patterns that provoke game influence on vegetation beyond the tolerable limits. This is then called game influence relevant in terms of provincial culture and/or damage to the ecosystem (ecologically relevant game damage). As a consequence of its spatial and time components as well as intensity, hunting exerts an influence on the extent and scope of game influence relevant in terms of provincial culture and may also be the cause of such influence.

The extent of ecologically relevant game damage can be mainly determined by way of game and hunting damage ascertained by the authorities on the basis of regulations under forest and hunting laws (monitoring systems, notified game damage, etc. cf. 4.2.3) as well as by means of control fences (cf. also 4.1.2.2).

- Indicator with Evaluation:**
- 0 There is no self-induced game influence due to hunting and relevant in terms of provincial culture
 - 1 Self-induced game influence due to hunting and relevant in terms of provincial culture exists to a minor extent (on up to 10 % of the forest area)
 - 3 There is considerable self-induced game influence (11 to 30 % of the forest area) due to hunting and relevant in terms of provincial culture
 - 4 Self-induced game influence due to hunting and relevant in terms of provincial culture results in a massive impairment of the ecosystem (over 30 % of the forest area)

4.1.2.2.5 Sub-criterion: Giving consideration to population fluctuations

Explanation: Under natural conditions, wildlife populations are subject to a certain amount of fluctuation, attributable to climatic influence (losses during winter), food supply, and the presence of enemies. Constant population densities, in turn, are unnatural. This does not relate to population fluctuations attributable to anthropogenically induced habitat deficits. Population fluctuations in huntable game species, and in particular in cloven-hoofed game and some small game species, can be traced back by reference to the annual game bag as well as, to a certain extent, by browsing damage to vegetation. Bearing in mind the game’s strong influence on the ground vegetation, it makes sense, in particular for commonly occurring cloven-hoofed game, to make the extent to which hunting “accepts” and takes into account population fluctuations an indication of sustainable hunting.

A naturally-induced population decrease of the hunted game populations (e.g. on account of weather influence) is tantamount to a decrease of browsing of the preferred grazing plants. Under near-natural conditions (completeness of wildlife species inventory even for large predators), the reduced wildlife population is not “spared” by its natural enemies immediately after the population decrease, as it is frequently the case in traditional hunting, but further reduced or kept low until the reduced populations of preyed-upon animals has had an effect on the reproduction rate and presence of natural enemies. Thus, in most cases, the period of time during which the vegetation experiences relief from ecological game damage lasts significantly longer than if man quickly reacts to a population decrease by reducing shooting.

For the vegetation however, a longer opportunity for recreation (browsing break) results, for example, in an increase in trees and shrubs whose leading shoots are able to grow out of the browsing area, and thus in an increase of grazing vegetation, cover, and protection against weather conditions for the recovering game population. Improved natural grazing conditions may, as a consequence, allow higher shooting rates.

A fast and too strong reduction of shooting immediately after a transient, naturally-induced population decrease in frequent game species, however, results in disadvantages to the ecosystem (including the hunted game). Counter-balancing population fluctuations to a major extent is thus not in line with ecological sustainability. It is thus also advisable to accept the opposite case of population fluctuations - i.e. an increase in population - with regard to sensitive species such as grouse, for example.

- Indicator with Evaluation:**
- 2 Stronger natural downward population fluctuations in common game species and upward fluctuations in scarce game species are admitted and/or made possible
 - 2 Stronger downward natural population fluctuations over several years in common game species and upward fluctuations in scarce game species are prevented by hunting.

4.1.2.3 Criterion: Preservation and fostering of linking biotopes

Open areas can be rendered more attractive by way of guiding lines providing cover and grazing opportunities (e.g. hedges, shelter belts (wind-breaks), riparian woods and woody plant communities, etc.)
(M. Forstner)



4.1.2.3.1 Sub-criterion: Giving consideration to existing wildlife habitat fragmentation

Explanation: The fragmentation of wildlife habitats through roads, railway lines, settlement and industrial zones as well as tourist establishments has a central influence on habitat quality. While it can only be mitigated by hunting to some extent - by exerting as little hunting pressure as possible on important game corridors and obligatory passages between habitats and parts of habitats - if practised consistently, it will make a significant contribution to sustainably usable wildlife habitats.

Indicator with Evaluation:

- 2 Fragmentation of the wildlife habitat is given consideration in terms of hunting as far as possible
- 1 Fragmentation of the wildlife habitat is given consideration in terms of hunting, though there is room for improvement
- 0 Fragmentation of the wildlife habitat is not given consideration in terms of hunting
- 1 Parts of habitats sensitive on account of fragmentation are preferred hunting areas

4.1.2.3.2 Sub-criterion: Increasing the attractiveness of important corridors and obligatory passages

Explanation: There are manifold ways of making important corridors and obligatory passages more attractive (in agreement with the land owners):

- In open areas, corridors and obligatory wildlife passages may be made attractive by planting guiding lines (hedges, riparian woods and woody plant communities, shelter belts/wind breaks, planted field and meadow boundaries, fallow lands) providing cover and grazing opportunities, which can be resorted to also during the day. If wide open stretches are being crossed, their attractiveness may be increased by planting strips of woody communities (providing interim cover).
- The usability and acceptance of game passages and “green bridges” can thus be increased.
- Greater attractiveness can also be achieved by planting strips of grazing land on agricultural land, and installing watering places (wallows), and salt licks.
- In arranging the hunting territory, it makes sense to apply instruments described under the Austrian Agri-Environmental Programme (Austrian programme to promote agricultural production methods compatible with the requirements of the protection of the environment, extensive production, and the preservation of natural habitats) as well as to co-operate with organisations for nature protection and conservation.

Indicator with Evaluation:

- 2 Several opportunities for making important corridors and obligatory passages more attractive have been put into practice
- 1 Some opportunities for making important corridors and obligatory passages more attractive have been put into practice, though there is potential for improvement
- 0 No opportunities for making important corridors and obligatory passages more attractive have been put into practice
- 1 Fragmentation increases on account of hunting

4.1.2.4 Criterion: Giving consideration to habitat capacity



Some wildlife habitats are incomplete, in particular with regard to grazing opportunities.
(F. Heckl)

4.1.2.4.1 Sub-criterion: Completeness of the wildlife habitat

Explanation: Our wildlife habitats are partly incomplete, which is mainly due to anthropogenic factors. Seasonal partial habitats, which only a few years ago used to be freely accessible for wildlife, are now no longer accessible, of difficult access, or only existing in the form of relics. Many of these limitations of habitat quantity and quality can be mitigated or even entirely remedied by way of measures of tending and arranging the biotope. Both the Austrian Agri-Environmental Programme ÖPUL (Austrian programme to promote agricultural production methods compatible with the requirements of the protection of the environment, extensive production, and the preservation of natural habitats) and respective action on the part of provincial hunting associations and some nature conservation and protection associations present many opportunities for the hunter to carry out, on the basis of agreement with the land owner, comprehensive steps for biotope improvement, in particular for sensitive species (cf. 4.1.1.1.2).

Indicator with Evaluation:

- 2 The wildlife's habitat needs are met in terms of hunting in an optimum fashion, e.g. by measures which care for and shape the arrangement of the biotopes or which maintain the biotopes intact
- 1 The wildlife's habitat needs are well met in terms of hunting, although there is room for improvement
- 0 The wildlife's habitat needs are not met in terms of hunting; there are significant habitat deficits
- 1 Counter-productive hunting practices have a massive negative influence on the wildlife's habitat needs

4.1.2.4.2 Sub-criterion: Giving consideration to competitive relationships of various wildlife species

Explanation: Natural regulatory mechanisms for our wildlife, such as (some) large predators, as well as diseases (e.g. rabies), no longer exist or currently have no regulatory effect on wildlife populations. Without regulating the wildlife populations via hunting, overpopulation tends to occur in most hunting areas of our cultural landscape, in particular of cloven-hoofed game, but also in fox and stone marten, for example, which would permanently change the diversity, frequency, and distribution of both flora and fauna species. A mode of hunting specific to the hunting territory, oriented according to the vegetation composition and diversity of wildlife species, which also takes into account varying seasonal habitat capacities, can largely avoid such negative impacts. Taking into consideration habitat capacity in the hunting strategy (“hunting concept”) is an indicator of sustainable hunting practice.

A habitat-related example for the above are “Hochraine” (low field or meadow boundary walls, about 0.5 - 1 m in width, formed of gathered stones piled up over centuries and partly overgrown with vegetation) for lowland black grouse populations. The permanent vegetation growing there is an important source of food for black grouse all through the year. If this vegetation is subject to over-browsing on account of an excessive roe deer density (in some cases only seasonally), the one and two-year-old shoots of low bushes, important for fructification, are largely or entirely missing. In spring, the flowers significant for the reproduction rate of black grouse do not appear, nor do berries, which constitute the main source of food in the summer. The protection against weather influence which low bushes offer the black grouse chicks is thus also significantly reduced. In many cases, over-browsing of this kind could be avoided by shooting cloven-hoofed game much earlier in the year.

Indicator with Evaluation:

- 2 There is a hunting strategy that takes into consideration habitat capacities by way of biotope-oriented wildlife regulation for all wildlife species existing in the area
- 1 There is a hunting strategy that takes into consideration habitat capacities by way of biotope-oriented wildlife regulation for some game species
- 0 Habitat capacity is not taken into consideration in terms of hunting
- 1 The hunting strategy is counter-productive with regard to the habitat capacity

4.1.2.4.3 Sub-criterion: Extent of annual growth rate in cloven-hoofed game

Explanation: The sub-criterion “extent of the annual growth rate” refers to ruminants. The annual growth rate is mainly determined by the quality of the habitat and the extent of interference through hunting. Whether the game density corresponds to the habitat, or whether it does not, can be determined, e.g. with regard to cloven-hoofed game, by game weights, browsing intensity, and the vegetation species inventory. These factors have both a direct and an indirect influence on the wildlife species inventory.

The density of the wildlife stock and the skimming off of its increase through hunting exert a significant influence - varying according to the game species - on the population’s growth rate. The extent of the usable increases per year can thus - provided the preservation of habitat quality is taken into account - give valuable clues as to the use of these increases for the purpose of hunting. If there is above-average food supply before the rutting season (period of heat), such as for example in mainly agriculturally dominated cultural landscapes or

as a result of intensive feeding, the annual rate of increase determined is no longer an indicator regarding the actual use of the increases for hunting purposes.

An example to illustrate the above: In a roe deer hunting territory with normal grazing conditions all through the year, where food supply before pairing time is not above average, a roe deer stock adjusted to high habitat quality in terms of its population density, has a tendency to produce two fawns per adult doe every year. However, if the same hunting ground has an excessive roe deer population - taking biotope capacity as a measure - the tendency is more and more towards one fawn per adult doe, and two-years-old does not in fawn are more common.

Indicator with Evaluation: 2 Average growth rate due to hunting

0 Below-average growth rate due to hunting

4.1.3 Principle: The natural genetic diversity of game species is preserved and fostered by means of an appropriate hunting practice

4.1.3.1 Criterion: There are no hunting-related limitations to the preservation and fostering of the natural genetic variability of game species



*Great variety should be allowed
with regard to the form of "trophies."
(M. Forstner)*

4.1.3.1.1 Sub-criterion: Existence of aims relating to the aesthetics of trophies (forms of horns and antlers) in shooting guidelines

Explanation: The fostering of genetic diversity within a species can also be measured by the extent to which it is taken into account by hunting. Shooting guidelines for cloven-hoofed game are thus to be evaluated with an eye to whether they foster the diversity of possible forms of horns and antlers, whether they accept it, or whether they are place importance on the aesthetic appearance of trophies.

- Indicator with Evaluation:** 2 The shooting guidelines do not contain goals concerning aesthetic appearance of trophies
- 0 The shooting guidelines contain goals concerning aesthetic appearance of trophies

4.1.3.1.2 Sub-criterion: Selective hunting of wildlife having certain natural characteristics

Explanation: Characteristics of outward appearance, such as horns and antlers, as well as modes of behaviour, have (or used to have) various purposes. From a biological point of view, it is of importance whether, for example, the form of horns or antlers is used to deter enemies, to impress female members of the same species, to fight members of the same species, to uncover food in winter, etc., or whether it does not serve such a purpose.

Hunters have been fascinated by the aesthetic aspects of trophies for a long time. The notion of an ideal form of trophy mainly of roe deer, chamois, and deer, developed mainly in the second half of the 19th and the first half of the 20th century. With regard to deer, antlers should be rich in points and wide, with regard to roe deer the ideal is a wide, richly-pearled six-pointer; chamois, too, should ideally have wide and high horns. Some forms of horns or antlers, which are not desirable in terms of aesthetic considerations, may, however, be of great advantage to their bearers from an ecological point of view. Narrow horns or antler beams, for example, are absolutely advantageous in a fight. Also a low number of points in roe deer and deer entails no disadvantage whatsoever for the bearer of the horns/antlers unless it is an expression of a bad overall constitution. Any form of selective hunting that may have genetic effects and thus entails a danger of reducing the genetic diversity of the game population, ought to be avoided. Another danger of “selective hunting of wildlife” exists for grouse species. In the spring hunt, the so-called “fighters” are selectively shot on the display ground, with the justification that their aggressive behaviour disturbs mating. In actual fact, however, it is mostly what is called the alpha cocks - the strongest cocks - that are the hens’ preferred mating partners. Particularly for capercaillies (wood grouse), the shooting of alpha cocks before hens are covered selectively prevents reproduction.

Whether the way hunting is practised is or is not selective in the sense above described is documented, for example, by existing trophies, taxidermal specimens, etc., gathered over a longer period of time, such as a hunting period.

- Indicator with Evaluation:** 2 Forms of horns and antlers, taxidermal specimens, etc. do not indicate consistent selective hunting of wildlife according to specific natural characteristics
- 0 Forms of horns and antlers, taxidermal specimens, etc. over a longer period of time indicate consistent selective hunting of wildlife according to specific natural characteristics

4.1.3.2 Criterion: Native wildlife populations are not altered by the introduction of and blending with non-native wildlife



The moufflon ranks among the non-native game species in Austria (Research Institute of Wildlife Ecology)

4.1.3.2.1 Sub-criterion: Introduction of non-native wildlife

Explanation: The introduction of non-native wildlife occurs mainly in two ways:

- 1 introduction of an entirely new, non-native wildlife species (moufflon, fallow deer, Sika deer, chukar partridge, etc.)
- 2 introduction of non-native species, sub-species or habitat-specific sub-species (site races) of an already existing native game species for “grafting” (Wapiti or maral deer to red deer; Siberian roe deer to the native deer, or transfer of lowland red deer *cervus elaphus* ssp. *Auhirsch* to mountain regions, etc.)

With regard to 1) it ought to be mentioned that populations of newly introduced, non-native species often surpass the populations of native species (at least in partial habitats) and at the same time frequently have a lasting influence on the wildlife habitat (game damage), which is hard to assess before it has occurred.

With regard to 2), it ought to be noted that it is particularly these introduced wildlife species which demonstrate that in the history of wildlife development, sub-species or site races develop that are specifically adapted to local climate and (seasonal) food conditions, which, as a result, pertain exactly to the habitat in which they have developed. Apart from the fact that the above-mentioned “grafting” attempts often fail (mainly because the number of individuals is too small), they entail a genetic alteration and may even cause pain, as native dams are unable to give birth to the oversized calves or fawns resulting from crossing with larger representatives of the species.

Both forms of introduction of non-native wildlife species are thus to be avoided in the quest for a sustainable preservation and fostering of (natural) genetic variability of our native wildlife, in particular in those regions for which negative effects are known (e.g. pheasants in low-lying black grouse regions).

Indicator with Evaluation: 1 No non-native wildlife species are introduced
-1 Non-native wildlife species are introduced

4.2 Economy

Explanation: An economic assessment of hunting may produce differing results, depending on whether the assessment is made a) from the point of view of the person “permitted to hunt” (game tenant, or land owner, if he or she hunts personally in his or her own hunting territory) or b) from the point of view of the person “licensed to hunt” (lessor of the hunt). Even though the assessment is basically made from the viewpoint of the person permitted to hunt (a), an assessment particularly with regard to economic criteria and indicators may also be interesting from the point of view of the person licensed to hunt (b). If the evaluation as to sustainability differs for the two different viewpoints, the lower rating shall count. If the person permitted to hunt (a) and the person licensed to hunt (b) are not identical, evaluations from both points of view are to be made for those criteria that produce differing results. This applies in particular to criteria pertaining to the principles 4.2.1 and 4.2.4.

4.2.1 Principle: Securing and/or improving the economic profitability of hunting is an objective of hunting

4.2.1.1 Criterion: The profitability of hunting is secured over a medium term



A marketing strategy for game may contribute to securing the profitability of hunting over the medium term (Research Institute for Wildlife Ecology)

4.2.1.1.1 Sub-criterion: Existence of a marketing strategy

Explanation: For the yield of hunting it is of significance whether the owner of a hunt gives consideration to the form in which he or she will market game, bag and shootings, trophies, etc. This includes the form of selling game, bags and trophies, or the form of their use for his or her own purposes.

Indicator with Evaluation:

- 2 A strategy for the marketing of game, bags and trophies, etc., exists
- 0 No strategy for the marketing of game, bags and trophies, etc., exists

4.2.1.1.2 Sub-criterion: Expense/yield ratio

Explanation: The “expense-yield ratio” summarises all monetary costs and yields of a hunting operation (for tenants and owners of the hunt). “Expenses” comprise the costs of installations on the hunting territory and their maintenance, costs of feeding, potentially accruing personnel costs; in case of hunting leases, the costs of the lease; game protection measures on agricultural and forestry land, as well as payment for damages, etc. “Yields” comprise mainly game yields, shooting fees, and lease proceeds, and may also include indirect payback, for example from business transactions initiated in the hunting environment. For the overall bag, the average bag over a prolonged period of time (e.g. the period of a lease) is to be taken as a basis for calculation, rather than - as a solitary event - a one-time peak bag achieved.

For a (future) optimisation of the yield side, the time effectively invested in hunting may be looked at. Effective time invested is here to be defined as the average hunting time invested per piece of game taken. Apart from the social aspects of hunting (which are not the object of this study), the following is to be borne in mind: the shorter the time needed for hunting, the lower the hunting pressure - the lower the hunting pressure, the less the impairment and/or disturbance of wildlife, which, again, increases their habituation, and thus makes it easier to achieve the desired yield objective.

- Indicator with Evaluation:**
- 2 The balance of the hunting period is positive and/or the indirect payback achieved through hunting yields a positive overall result
 - 1 The account of the hunting period is balanced and/or the indirect payback achieved through hunting yields a balanced overall result
 - 0 The balance of the hunting period is slightly negative
 - 1 The balance of the hunting period is strongly negative

4.2.1.1.3 Sub-criterion: Marketing of game

Explanation: Despite their high meat quality, the average proceeds from game are generally low. Experience has shown that proceeds from game can be increased far beyond the average regional prices by way of good marketing and special customer service.

- Indicator with Evaluation:**
- 2 Above-average proceeds from game (>30 %)
 - 1 Proceeds from game are 16 - 30 % above average
 - 0 Average proceeds from game (+/- 15 %)
 - 1 Below-average proceeds from game (< - 15 %)

4.2.1.2 Criterion: The value of hunting is maintained and/or fostered by the practice of hunting



*The infrastructure of a hunting ground can contribute to a higher market value of a hunt
(Research Institute for Wildlife Ecology)*

4.2.1.2.1 Sub-criterion: Hunting-related measures to increase the market value

Explanation: Apart from the influence of the average local market value (site-related factors such as proximity to a city or an attractive countryside), the assumed or actually attainable market value of a hunt results mainly from its variety in game species, the bag achieved, the (average) strength of trophies and the territory's huntability (how can it be reached; relief conditions, installations and equipment on the hunting ground). All these factors can be positively or negatively influenced by the management of the hunt, dependent on the size of the hunting ground.

"Customer friendliness," for example - looking particularly well after (paying) guest hunters - can raise the image and thus the value of a hunt. The selective fostering of less frequent game species, out of which bearers of rare trophies may then be taken - to an extent compatible with the species' population balance - may be a measure to raise the market value. Equally, a good infrastructure regarding installations and equipment on the hunting ground (hunting lodges, stalking trails, shooting boxes, hides and blinds, feedings, if desired) is in most cases a relevant factor for a hunt's market value.

- Indicator with Evaluation:**
- 2 The market value of the hunt is very high on account of far-reaching hunting-related measures taken (>30 % above the average of hunting grounds comparable in terms of location)
 - 1 The market value of the hunt is slightly above the regional average (10 - 30 % above the average of hunting grounds comparable in terms of location) on account of individual hunting-related measures

- 0 The market value of the hunt corresponds to the regional average (-10 to +10 % compared to the average of hunting grounds comparable in terms of location), no hunting-related measures are taken for its maintenance and/or fostering
- 1 The market value of the hunt is below the regional average on account of counter-productive hunting management (< -10 % below the average of hunting grounds comparable in terms of location)

4.2.2 Principle: Preserving and fostering the condition of the game is an objective of hunting

Explanation: The focus is on the overall condition of the entire population, not that of certain individuals.

4.2.2.1 Criterion: Average game weight



*The average game weight is a hunting territory's "shop sign."
(F. Heckl)*

Explanation: Evaluation of the average weight under comparable hunting territory conditions as well as those of comparable seasons and game bags.

4.2.2.1.1 Sub-criterion: Continuous, long-term comparison of game weights

Explanation: An evaluation of the maximum average game weights achievable can only be made by a retrospective comparison of game weights over several decades. Such a comparison should be made on the basis of a long-term documentation of game weights by separate categories of sex, age groups, and shooting date.

- Indicator with Evaluation:**
- 3 An exact documentation of game weights and a long-term retrospective comparison of game weights is made
 - 2 An exact documentation of game weights is made, a retrospective comparison of game weights, however, is only possible in fragments
 - 1 A fragmentary documentation of game weights, but no retrospective comparison of game weights is made
 - 0 Neither an exact documentation of game weights nor a retrospective comparison of game weights is made

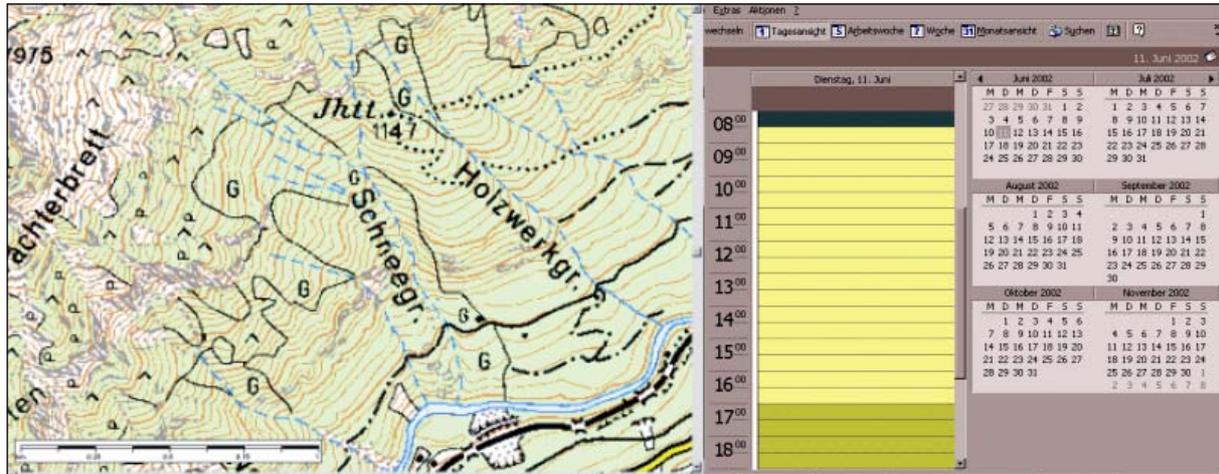
4.2.2.1.2 Sub-criterion: How high is the game weight?

Explanation: The average game weight is the “trademark” of a hunting territory: The higher the game weights, the better the overall constitution of the wildlife, and thus also of the trophies to be expected, hunting yields, etc. Differences in game weights due to the nature of the habitat, as for example between lowland red deer *cervus elaphus*, ssp. *Auhirsch*, and the mountain-inhabiting variety of the species.

Game weights can be influenced by the form of game management: A hunting strategy that is (also) oriented according to the (seasonal) food capacity of the wildlife habitat, does not impair the access to food by unnecessary hunting pressure, and also integrates natural regulatory mechanisms for wildlife (e.g. weather, natural enemies, etc.) as natural factors, will achieve permanently higher game weights than a hunting strategy that partly or entirely denies these aspects.

- Indicator with Evaluation:**
- 2 Very high game weights (>20 %)
 - 1 Game weights lastingly above the long-term regional average (11 - 20 %)
 - 0 Low game weights in relation to the long-term regional average (+10 to -20 %)
 - 1 Very low game weights in relation to the long-term regional average (< -20 %)

4.2.2.2 Criterion: Existence of a time- and area-specific hunting strategy



The efficiency of hunting can be improved by way of a hunting strategy with a time and area component (Federal Environment Agency - Austria)

4.2.2.2.1 Sub-criterion: Existence of an economically sound hunting strategy for time- and area-specific hunting, documentation of planning, and practice and evaluation of hunting

Explanation: From an economic point of view, a hunting strategy for time- and area-specific hunting is important particularly with regard to the efficiency of hunting, the game weights achieved, and the amount of potential feeding costs.

For the efficiency of hunting, it is important that the hunting strategy contain knowledge of the seasonal locations of a game species as well as the time when it can be best observed, thus minimising the time spent on hunting. One should see to it, however, that this is not counter-productive to planned periods of concentrated hunting.

For the overall constitution of wildlife, timely shooting is particularly of importance as it improves food conditions for the remaining wildlife. This is the case, for example, if in hunting areas in which agricultural land prevails, a major part of the shooting of cloven-hoofed game is carried out before meadows and fields have been fully harvested in autumn. If, however, a major part of the shooting of cloven-hoofed game takes place after the harvesting of meadows and fields, food and cover, which have become scarce on account of the harvest, is used by much more wildlife. Both the reduced quantity and quality of food, as well as the disproportionately high hunting pressure on the remaining grazing areas, result in a weakening of the game's constitution in a season when the game should actually gather strength for the winter, and thus to lower average game weights, which, again, makes itself felt in terms of money.

Another important cost factor in the above example may be feeding: the later in the year shooting takes place, the more wildlife is to be fed during the first months of winter, which makes for a significant increase in feeding costs.

The economic planning of time- and area-specific hunting is a central component of and to be documented in the hunting concept. The timing of hunting should be given in shooting lists, and the location of shootings on a map of the hunting territory, broken down by hunting years. Every single shooting should be marked.

- Indicator with Evaluation:**
- 3 A hunting strategy for time- and area-specific hunting exists; shootings are continuously documented and evaluated with regard to observance of the principle of sustainability described herein (cf. 4.2.2)
 - 2 A hunting strategy for time- and area-specific hunting exists; however, the documentation and evaluation of shootings is deficient
 - 1 A hunting strategy for time- and area-specific hunting exists only in fragments and not for all game species hunted; no evaluation of shootings is made
 - 0 No hunting strategy for time- and area-specific hunting exists, or shootings are evaluated for bearers of trophies only

4.2.3 Principle: Preventing damage to agriculture and forestry is an objective of hunting

4.2.3.1 Criterion: Hunting is oriented according to the susceptibility of agricultural and forestry land to damage by game



The protection of tree species susceptible to game damage should be taken into consideration in terms of hunting, in order that fences and individual protection measures may be the exception rather than the rule (F. Heckl)

4.2.3.1.1 Sub-criterion: Giving consideration to susceptibility to game damage

Explanation: Game damage can be avoided by orienting hunting according to the susceptibility of agricultural and forest lands to game damage. This should be documented in the hunting concept by means of a hunting strategy which takes into account foreseeable influences on agricultural and forest habitats.

- Indicator with Evaluation:**
- 4 The hunting strategy gives optimum consideration to the susceptibility to game damage of agricultural and forestry lands
 - 2 The hunting strategy gives consideration to the susceptibility to game damage of agricultural and forestry lands
 - 0 The hunting strategy gives only occasional consideration to the susceptibility of agricultural and forestry lands to game damage
 - 2 The hunting strategy gives no consideration whatsoever to the susceptibility of agricultural and forestry lands to game damage

4.2.4 Principle: Making use of synergies with other economic branches is an objective of hunting

4.2.4.1 Criterion: Hunting forms an economic unit with other foreseeable anthropogenic forms of use

Hunting puts its stamp on wildlife habitats, just as other forms of land use, such as for example agriculture, forestry, and tourism.
(F. Reimoser)



Explanation: Hunting, together with other anthropogenic forms of use (agriculture and forestry, tourism, housing and industrial areas, transport infrastructure, etc.) puts its stamp on the habitats of our wildlife. The aim of any anthropogenic form of use is to get an actual benefit out of it. It is thus meaningful for hunting management to form an economic unit with other foreseeable anthropogenic forms of use in a wildlife habitat. There are various ways to achieve this:

- By selective, concentrated hunting, forest attenuation planned by the forest owner can be carried out in the best possible way. In return, the forest owner can allow for time- and area-related aspects of hunting foreseen in the hunting strategy in his or her managing of the forest.
- In agricultural areas, leaving vegetated fallow lands can help the game to get over the winter. In return, the hunter is able to minimise damage to agricultural lands by following a good hunting strategy, etc.
- Harmonising hunting with regional tourism allows important concerns of both hunting and tourism to be addressed by way of co-ordination. (cf. also 4.2.4.2.1)

4.2.4.1.1 Sub-criterion: Confirming a common policy

Explanation: A fundamental requirement for forming an economic unit with other foreseeable anthropogenic forms of use is regular contact and co-ordination with the other land users and/or the persons representing their interests. The forming of an economic unit is documented by way of a confirmation on the part of other land users in the hunting territory and/or those who represent their interests that a joint economic policy is being pursued.

Indicator with Evaluation:

- 2 Other users of the wildlife habitat confirm an optimised, joint economic policy
- 1 A joint economic policy is confirmed by other users of the wildlife habitat, although possibilities for improvement are pointed out
- 0 There is no confirmation by other users of a joint economic policy
- 1 Other users of the wildlife habitat point to hunting management as being counterproductive

4.2.4.2 Criterion: Optimising planned changes in wildlife habitats by way of interdisciplinary area planning



*Including wildlife-ecological aspects at an early stage in the planning of large-scale area changes, such as e.g. road construction, is important.
(F. Heckl)*

Explanation: Most of the changes in our wildlife habitats that have a large-scale effect upon the area are not related to hunting (road and railway construction, settlements and housing development, tourism infrastructure, construction of power plants, etc.). In many of these changes that have a far-reaching effect upon the overall area, considering wildlife-ecological aspects at an early stage of planning might minimise detrimental effects upon our wildlife habitats, or even avoid them altogether.

4.2.4.2.1 Sub-criterion: Interdisciplinary wildlife-ecological area planning (WEAP)

Explanation: Interdisciplinary area planning allows the optimisation of planned changes in wildlife habitats, with regard to which wildlife ecology and hunting are equal partners. In most cases, however, it is the area of hunting that presents possibilities or imposes demands. Efforts to that effect on the part of the owner of a hunt and the community of hunters ought to be documented.

- Indicator with Evaluation:**
- 4 There is WEAP, and the hunting community actively supports it
 - 1 There is WEAP, although the hunting community is not actively supporting it
 - 1 There is no WEAP, but it is evident that the hunting community is working on developing the concept
 - 2 There is no WEAP, and it is evident that the hunters are not working on developing a concept of this kind

4.3 Socio-cultural Aspects

Explanation: Particularly in the socio-cultural field, the definition of clearly measurable indicators, which is indispensable for making sustainability in hunting evident, is difficult, and in some cases even impossible. How, for example, should the cultivation and development of hunting traditions be captured by and evaluated on the basis of clearly defined indicators?

4.3.1 Principle: The local population's interest in using territory for hunting is taken into account

4.3.1.1 Criterion: Hunting achieves a favourable position at regional level through an appropriate involvement of local hunters local environment



*Local hunters should be integrated
(Research Institute for Wildlife Ecology)*

Explanation: As a consequence of the close ties of hunting to the land, of hunting traditions and the (necessary) significance of the local environment, opportunities for local hunters to hunt in their own region are an important social and cultural aspect of hunting.

4.3.1.1.1 Sub-criterion: Reconciling the interests of local hunters permitted to hunt locally and local hunters not permitted to hunt locally

Explanation: A fair balance between the interests of local hunters permitted to hunt and those of local hunters not permitted to hunt is a necessary condition of socially sustainable hunting. This reconciliation is of importance also with regard to the acceptance of hunting by members of the population not engaging in hunting activities. This sub-criterion is evaluated by way of questioning the hunters concerned. The results will be documented.

N.B.: Aspects relating to “co-operative hunts” and “agricultural communities” should be especially borne in mind.

- Indicator with Evaluation:**
- 3 There is evident an ideal balance of the interests of local hunters permitted to hunt locally and local hunters not permitted to hunt locally
 - 2 There is a balance of interests of local hunters permitted to hunt locally and local hunters not permitted to hunt locally
 - 1 Reconciliation of the interests of local hunters permitted to hunt locally and those not permitted to hunt locally is only partly satisfactory
 - 0 There is no reconciliation of the interests of local hunters permitted to hunt locally, and local hunters not permitted to hunt locally

4.3.2 Principle: Securing local jobs in the field of hunting is to be an objective

4.3.2.1 Criterion: Hunting creates jobs and thus contributes to securing jobs



*Hunting can contribute to securing local jobs
(Research Institute for Wildlife Ecology)*

4.3.2.1.1 Sub-criterion: Providing jobs in the field of hunting

Explanation: The amount of work to be done in the hunting areas of various different habitats varies widely, ranging from the feeding of game over more than half a year to merely establishing and maintaining infrastructure in the hunting territory, from guiding guest hunters and intensive hunting ground management to the organisation of community hunts and the regular checking of trapping devices. The scope of work depends, of course, also on the size

of the hunting territory. This creates opportunities to hire further hunting personnel - apart from the obligation to hire professional hunters, for which legislation varies among the federal provinces. It is desirable in this regard to give preference to hiring locally, not least because local workers are well-acquainted with the surroundings.

- Indicator with Evaluation:**
- 2 The owner of the hunt makes full use of the opportunities to secure local jobs
 - 1 The owner of the hunt provides jobs in the field of hunting but does not make full use of the opportunities to secure jobs locally
 - 0 The owner of the hunt does not offer potential hunting-related jobs
 - 1 The practised hunting management is counterproductive with regard to the local job situation

4.3.3 Principle: Hunting should find broad acceptance among the local population

4.3.3.1 Criterion: Paying attention to the interests of the local population



*Talking to the local population can contribute to avoiding disagreement.
(J. Kessler)*

4.3.3.1.1 Sub-criterion: Documentation of disagreement at the local authority

Explanation: It is generally desirable for hunting to be practised with due regard to other social and economic fields. This applies in particular to co-operative hunts, where the game tenant hunts on property not his or her own. Whether or not this is the case can be evidenced by means of a documentation of disagreements at the local authority.

- Indicator with Evaluation:**
- 2 Hunting is practised with due regard to other social and economic fields; there is no evidence of disagreement with the local population
 - 2 Hunting is not practised with due regard to the population; disagreement has been documented at the local authority

4.3.4 Principle: Hunting is oriented according to the well-being of the game

Explanation: Hunting ethics are oriented according to the well-being of the game.

4.3.4.1 Criterion: Hunting is practised with as little impairment to the natural behaviour of wildlife as possible



Habituated behaviour of wildlife can be influenced by hunting pressure. (F. Heckl)

4.3.4.1.1 Sub-criterion: Habituated behaviour of wildlife

Explanation: The extent to which hunted and non-hunted wildlife is habituated to humans depends, among other factors, upon the hunting-related disturbance of the game: the lower the hunting pressure, the more habituated to humans the hunted and non-hunted wildlife. The disturbing effect of other forms of anthropogenic use is considerably influenced by the intensity of hunting pressure. In order for wildlife to be exposed to as little stress as possible in the areas of the wildlife habitat used by man, it is important that wildlife be as habituated to humans as possible. This is also true for the accessibility of important parts of habitats, such as good grazing areas on open terrain.

Habituated behaviour of wildlife does not by its nature, lend itself to exact measurements for any species. However, observing and comparing the habituated behaviour of wildlife in different sectors of the hunting territory with varying hunting pressure renders well-applicable species-specific standard values (such as escape distance) for the various game species.

Indicator with Evaluation:

- 2 Human-habituated behaviour of hunted and non-hunted wildlife is species-specifically very high on account of minimum hunting pressure
 - 1 Human-habituated behaviour of hunted and non-hunted wildlife is, with a few local exceptions, species-specifically high on account of low hunting pressure
 - 1 Human-habituated behaviour of hunted and/or non-hunted game species is species-specifically low on account of high hunting pressure
 - 2 Human-habituated behaviour of hunted and/or non-hunted wildlife is species-specifically very low on account of extremely strong hunting pressure

4.3.4.2 Criterion: Hunting is practised with as little pain for the animal as possible



*Specific training and observing of legal regulations should contribute to a hunting practice which produces as little pain to the animal as possible.
(F. Heckl)*

Explanation: The practise of hunting is to involve as little pain for the animal as possible. A good shooting ability and correctly installed and regularly checked trapping devices prevent unnecessary pain for wildlife. Training in shooting as well as the best possible installation and checking of trapping devices are also moral obligations for the hunter.

4.3.4.2.1 Sub-criterion: Violations of legal provisions regarding animal protection

Explanation: It should be a central aim of hunting not to cause pain or to cause as little pain as possible for the hunted game. Questioning local authorities as to court sentences regarding violations of legal provisions regarding animal protection allows a check on whether hunting is practised in conformity with animal protection requirements.

Indicator with Evaluation:

- 0 There is no evidence of violations of legal provisions regarding animal protection
- 4 There have been violations of legal provisions regarding animal protection

4.3.4.2.2 Sub-criterion: Training in Shooting

Indicator with Evaluation:

- 2 Successful training in shooting is documented annually
- 0 Successful training in shooting is not documented annually

5 EVALUATION SCHEME

The evaluation is made by means of three groups of aspects, 11 principles, and 20 criteria (maximum and minimum number of points cf. table). Thus, both consistencies and deficiencies with regard to certain areas of sustainability are made evident. Depending on the underlying conditions of the respective region, different evaluations of deficiencies can be made and the respective conclusions drawn (e.g. for protective forests, etc.) Point limits (minimum requirements) or KO (knockout) values may be established for individual principles or criteria (cf. list of points) if a justification is given. If there is an obvious violation of principles of sustainability, minus values (-1 or -4) are to be given, otherwise, the values are between 0 and 4.

Evaluation scheme for the points scored: The evaluation of the points scored shall be made separately for the three groups of aspects (ecology, economy, and socio-cultural aspects). The five evaluation categories shall serve the purpose of rating the current hunting practice as well as providing an orientation for the future.

Ecology	1 very good	2 good	3 intermediate	4 bad	5 very bad	minimum points	maximum points
	sustainable			not sustainable			
	76 % to 100 %	51 % to 75 %	25 % to 50 %	0 to 24 %	-minus value	-21	48
Economy	1 very good	2 good	3 intermediate	4 bad	5 very bad	minimum points	maximum points
	sustainable			not sustainable			
	76 % to 100 %	51 % to 75 %	25 % to 50 %	0 to 24 %	-minus value	-9	26
Socio-cultural aspects	1 very good	2 good	3 intermediate	4 bad	5 very bad	minimum points	maximum points
	sustainable			not sustainable			
	76 % to 100 %	51 % to 75 %	25 % to 50 %	0 to 24 %	-minus value	-9	11

If a low score in points is achieved for the ecological aspects, while at the same time, the score in the two other groups of aspects is high, one should bear in mind that the persons involved in hunting might refrain from a stronger economic orientation of the hunt for motives that go beyond mere economic considerations (high subjective value of hunting activities, improvement of the ecological and socio-cultural sustainability of hunting). In such a case, economic sustainability, evaluated in terms of the selected objective criteria, may be low on the rating scale or not exist at all. This, however, is not to be interpreted as an argument against hunting itself, as long as the hunting operation or the hunter are able to afford the expenses.

The authors would also like to add that in some hunting areas, the maximum points score given under principles and criteria cannot be reached on account of the fact that some criteria and sub-criteria are not applicable in that respective area. This would be the case, for example, in a small game hunting territory without a forest whose function is mainly one of protection - the sub-criterion relating to protective forests can thus not be applied. The maximum points score achieved may thus be lower. If only few sub-criteria are evaluated, the maxi-

imum score of the sub-criteria not evaluated have to be deducted from the overall maximum points score. Thus, the maximum points score specific to the respective hunting ground or region can be worked out. It is these maximum scores to which the percentage values given in the evaluation table relate.

Basically, the defined principles can be applied generally, i.e. internationally, while the criteria and in particular the sub-criteria are to some extent applicable only in a certain country, province, or area. Criteria and sub-criteria whose applicability depends on the situation in the unit under evaluation, and which may therefore also be omitted within Austria, are marked with an asterisk in the list of points.

Number of headline	Principle, Criterion, Sub-criterion	Maximum number of points	Minimum number of points	points limit (KO)
4.1	Ecology	48	-21	
4.1.1	Principle: The practice of hunting shall within its range ensure the preservation and improvement of the diversity of game species through protection and use	15	-6	
4.1.1.1 *	Criterion: Potential natural wildlife species inventory taking into account the current habitat situation (applies only to larger territorial units, e.g. a wildlife-ecologically homogeneous area or a Province)	6	-3	
4.1.1.1.1 *	<i>Sub-criterion: Current and potential list of wildlife species</i>	2	0	
4.1.1.1.2 **	<i>Sub-criterion: Dealing with newly appearing species (in accordance with the potential wildlife species inventory)</i>	2	-1	
4.1.1.1.3 **	<i>Sub-criterion: Dealing with wildlife species not contained in the potential wildlife species inventory</i>	2	-2	
4.1.1.2	Criterion: Hunting is oriented according to the behaviour of wildlife species	9	-3	
4.1.1.2.1	<i>Sub-criterion: Taking into account the undisturbed life cycle of the wildlife species</i>	2	-1	
4.1.1.2.2	<i>Sub-criterion: Taking into account the reproductive periods of the individual game species</i>	3	0	
4.1.1.2.3	<i>Sub-criterion: Existence of hunting guidelines across hunting grounds</i>	4	-2	
4.1.2	Principle: The preservation and improvement of wildlife habitats is an objective of the practice of hunting	28	-14	
4.1.2.1	Criterion: hunting and its interrelationship with other forms of land use	10	-4	
4.1.2.1.1	<i>Sub-criterion: Existence of a strategy to harmonise hunting with other forms of land use</i>	2	0	
4.1.2.1.2	<i>Sub-criterion: Considering seasonal bottleneck situations</i>	2	-2	
4.1.2.1.3	<i>Sub-criterion: Existence of a shooting plan and a shooting list</i>	3	-1	

4.1.2.1.4	<i>Sub-criterion: Structure of shooting plan and shooting list</i>	3	-1
4.1.2.2	Criterion: Giving consideration to the influence of game on vegetation	8	-6
4.1.2.2.1	<i>Sub-criterion: Existence of control fences to monitor browsing</i>	2	0
4.1.2.2.2 *	<i>Sub-criterion: Giving consideration to the results of objective forest monitoring systems</i>	2	0
4.1.2.2.3 *	<i>Sub-criterion: Giving consideration to the protective function of the forest</i>	2	0
4.1.2.2.4	<i>Sub-criterion: Preventing game damage unacceptable in terms of provincial culture</i>	0	-4
4.1.2.2.5	<i>Sub-criterion: Giving consideration to population fluctuations</i>	2	-2
4.1.2.3	Criterion: Preservation and fostering of linking biotopes	4	-2
4.1.2.3.1 *	<i>Sub-criterion: Giving consideration to existing wildlife habitat fragmentation</i>	2	-1
4.1.2.3.2 *	<i>Sub-criterion: Increasing the attractiveness of important corridors and obligatory passages</i>	2	-1
4.1.2.4	Criterion: Giving consideration to habitat capacity	6	-2
4.1.2.4.1	<i>Sub-criterion: Completeness of the wildlife habitat</i>	2	-1
4.1.2.4.2	<i>Sub-criterion: Giving consideration to competitive relationships of various wildlife species</i>	2	-1
4.1.2.4.3	<i>Sub-criterion: Extent of annual growth rate in cloven-hoofed game</i>	2	0
4.1.3	Principle: The natural genetic diversity of game species is preserved and fostered by means of an appropriate hunting practice	5	-1
4.1.3.1	Criterion: There are no hunting-related limitations to the preservation and fostering of the natural genetic variability of game species	4	0
4.1.3.1.1	<i>Sub-criterion: Existence of aims relating to the aesthetics of trophies (forms of horns and antlers) in shooting guidelines</i>	2	0
4.1.3.1.2	<i>Sub-criterion: Selective hunting of wildlife having certain natural characteristics</i>	2	0
4.1.3.2	Criterion: Native wildlife populations are altered by the introduction of and blending with non-native wildlife	1	-1
4.1.3.2.1	<i>Sub-criterion: Introduction of non-native wildlife</i>	1	-1
4.2	Economy	26	-9
4.2.1	Principle: Securing and/or improving the economic profitability of hunting is an objective of hunting	8	-3
4.2.1.1	Criterion: The profitability of hunting is secured over a medium term	6	-2
4.2.1.1.1	<i>Sub-criterion: Existence of a marketing strategy</i>	2	0
4.2.1.1.2	<i>Sub-criterion: Expense/yield ratio</i>	2	-1

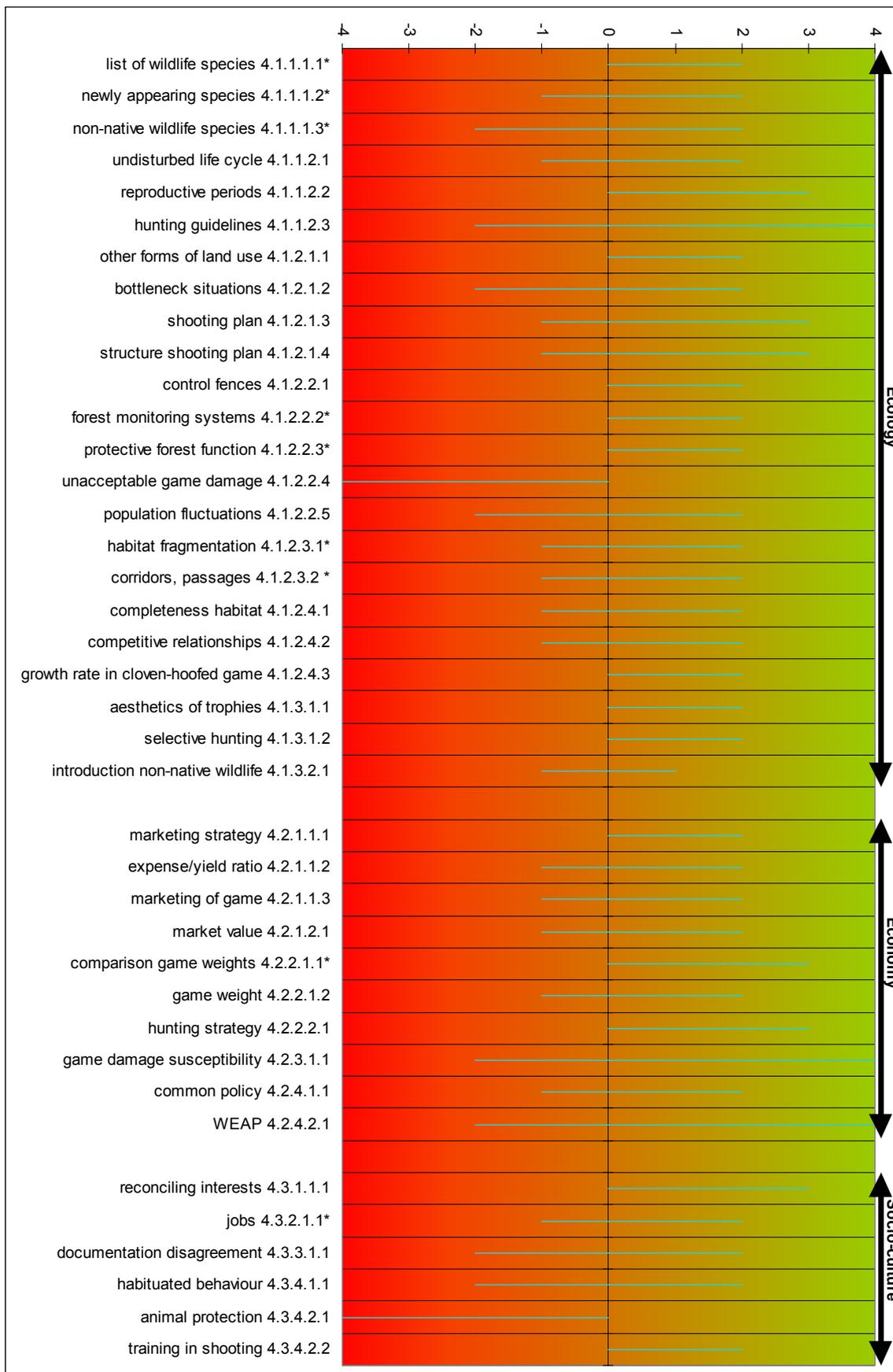
4.2.1.1.3	<i>Sub-criterion: Marketing of game</i>	2	-1
4.2.1.2	Criterion: The value of hunting is maintained and/or fostered by the practice of hunting	2	-1
4.2.1.2.1	<i>Sub-criterion: Hunting-related measures to increase the market value</i>	2	-1
4.2.2	Principle: Preserving and fostering the condition of the game is an objective of hunting	8	-1
4.2.2.1	Criterion: Average game weight	5	-1
4.2.2.1.1 *	<i>Sub-criterion: Continuous, long-term comparison of game weights</i>	3	0
4.2.2.1.2	<i>Sub-criterion: How high is the game weight?</i>	2	-1
4.2.2.2	Criterion: Existence of a time- and area-specific hunting strategy	3	0
4.2.2.2.1	<i>Sub-criterion: Existence of an economically sound hunting strategy for time- and area-specific hunting, documentation of planning, and practice and evaluation of hunting</i>	3	0
4.2.3	Principle: Preventing damage to agriculture and forestry is an objective of hunting	4	-2
4.2.3.1	Criterion: Hunting is oriented according to the susceptibility of agricultural and forestry land to game damage	4	-2
4.2.3.1.1	<i>Sub-criterion: Giving consideration to game damage susceptibility</i>	4	-2
4.2.4	Principle: Making use of synergies with other economic branches is an objective of hunting	6	-3
4.2.4.1	Criterion: Hunting forms an economic unit with other foreseeable anthropogenic forms of use	2	-1
4.2.4.1.1	<i>Sub-criterion: Confirming a common policy</i>	2	-1
4.2.4.2	Criterion: Optimising planned changes in wildlife habitats by way of interdisciplinary area planning	4	-2
4.2.4.2.1	<i>Sub-criterion: Interdisziplinäre wildlife-ecological area planning (WEAP)</i>	4	-2
4.3	Socio-cultural Bereich	11	-9
4.3.1	Principle: The local populations's interest in using territory for hunting is taken into account	3	0
4.3.1.1	Criterion: Hunting achieves a favourable position at regional level through an appropriate involvement of local hunters	3	0
4.3.1.1.1	<i>Sub-criterion: Reconciling the interests of local hunters permitted to hunt locally and local hunters not permitted to hunt locally</i>	3	0
4.3.2 *	Principle: Securing local jobs in the field of hunting is to be an objective	2	-1
4.3.2.1 *	Criterion: Hunting creates jobs and thus contributes to securing jobs	2	-1
4.3.2.1.1 *	<i>Sub-criterion: Providing jobs in the field of hunting</i>	2	-1

4.3.3	Principle: Hunting should find broad acceptance among the local population	2	-2
4.3.3.1	Criterion: Paying attention to the interests of the local population	2	-2
4.3.3.1.1	<i>Sub-criterion: Documentation of disagreement at the local authority</i>	2	-2
4.3.4	Principle: Hunting is oriented according to the well-being of the game	4	-6
4.3.4.1	Criterion: Hunting is practised with as little impairment to the natural habits of wildlife as possible	2	-2
4.3.4.1.1	<i>Sub-criterion: Habituated behaviour of wildlife</i>	2	-2
4.3.4.2	Criterion: Hunting is practised with as little pain for the animal as possible	2	-4
4.3.4.2.1	<i>Sub-criterion: Violations of legal provisions regarding animal protection</i>	0	-4
4.3.4.2.2	Sub-criterion: Training in shooting	2	0
sum total		85	-39

*...optional (may be left out provided a justification is given)

°...if there is no current or potential natural wildlife species list (4.1.1.1.1), 4.1.1.1.2 and 4.1.1.1.3 shall be omitted

Greater descriptiveness can be achieved by visualisation (graphic representation) of the evaluation results per indicator (cf. following page).



The individual evaluations are within the range of the horizontal turquoise lines. Evaluation results can, for instance, be represented by dots on these lines.

6 PROSPECTS

We plan to make the current status of the principles, criteria, and indicators of sustainable hunting available on the Internet for practical application. Commentary and suggestions for improvement will be collected for one year. Following this year of observation, the study will be revised and the result published anew. This process is to allow for the possibility of supplementing the principles with further criteria and sub-criteria, provided an operational Indicator with evaluation has been found for them (dynamic conception of the set). In doing so, it will be our aim to make application of the set as practicable, and its results as conclusive as possible.

At the same time, the present sector of sustainability is to be linked with the criteria of other sectors of sustainability (agriculture, forestry, tourism, transport), and successively worked into an “overall sustainability strategy.” The primary goal is, first, an analysis of interfaces: the extent to which these sectors have to be integrated to ensure that hunting is sustainable, and, equally, criteria relating to the sustainability of other sectors that have to be met if hunting is classified as sustainable.

The main objective of the methodical approach chosen to evaluate the sustainability of hunting is to directly address the local population concerned with the set of principles, criteria, and indicators, and to get them to deal with requirements of sustainability by using and applying the instrument of evaluation on their own. This cannot replace the development of additional monitoring systems that may be necessary for a large-scale objective evaluation of the sustainability of hunting from outside. The eventual aim is a combination of the evaluation set developed for the purpose of this study, which directs itself mainly to the person applying the set (primarily hunters), with monitoring methods for the development of wildlife species and their habitats (e.g. country-wide network of representative areas of investigation) that lend themselves to statistical evaluation. This would allow for the recording of the populations or population trends of the huntable game species in the area of observation and to compare them with supra-regional developments, and, consequently, to take the results into consideration regarding future shooting plans. Supra-regional checks should ideally be carried out on the basis of a programme harmonised internationally on a superior level, depending on the species (e.g. populations; flyway-level in case of migratory birds).

A further approach would be to examine hunting laws to see what provisions are relevant in terms of sustainable hunting. If hunters can be proved to violate such provisions, this should be automatically taken to amount to a non-completion of the sustainability criteria.

7 LITERATURE AND INTERNET REFERENCES

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Bonn Convention: www.wcmc.org.uk/cms

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Clearing-house MechanismUs Biodiversität – Österreich: www.biodiv.at

IUCN (2000): Policy Statement on Sustainable Use of Wild Living Resources at the World Congress of the International Union for Conservation of Nature and Natural Resources (IUCN) in Amman www.iucn.org/amman/

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8 APPENDIX – SUGGESTIONS AND COMMENT

The following are written suggestions and comment in the wake of the Workshop, which have, as far as possible, already been worked into the Criteria and Indicators

8.1 Forstliche Bundesversuchsanstalt, Institut für Forstschutz (Austrian Federal Office and Research Centre for Forests, Department of Forest Protection)

In the following, the Austrian Federal Office and Research Centre for Forests comments on the present concept of an evaluation system to assess the extent to which hunting is practised in accordance with the goals of sustainability. Owing to the fact that this concept is presented in a finished form, we limit ourselves to suggestions for amending or reconsidering individual items.

Ad 4.1.1.1.2: To attempt the fostering of “sensitive wildlife species” merely via their hunting and/or dealing with predators, is highly problematic, as most factors endangering such groups of animals are to be found in changes of their habitat, which should be first and foremost resorted to as a criterion.

Ad 4.1.1.2.1: An evaluation of the disturbance of the life cycle of wildlife in hunting territories would, in order to produce a picture which was reliable at least to a certain extent, require an enormous amount of time and personnel as well as confidence on the part of the owner of the hunting ground. Without such extensive monitoring, the results of this evaluation could not be produced with sufficient objectivity.

Ad 4.1.1.2.2: These requirements are for the most part considered under the provincial hunting laws and/or are demanded by what can be called “good, fair and legal hunting practise,” (*Transl. comment: for a definition, cf. 1 INTRODUCTION AND OBJECTIVES*) which appeals for hunters’ ethics. As stated above, an evaluation is difficult.

Ad 4.1.2.1.2: Taking this criterion into account in the proposed form is very problematic in terms of current legislation as well as hunting ethics. An objective assessment of the condition of the game population during the winter, as demanded under this item, would make shooting in winter necessary, which would be a highly disputed measure. The assessment of the vegetation status currently varies among the individual Austrian provinces. Even though the results thus gained are relevant with regard to the respective province or districts only, hunters (currently in the Tyrol) have expressed doubt as to their validity. Intensifying such surveys on the level of the hunting territory would, in addition, entail an enormous amount of costs and personnel.

Ad 4.1.2.1.3: Where shooting plans are prescribed, it will hardly, or only with the help of a court of law, be possible to find out whether they are deficient. The existence of shooting lists does not give sufficient clues as to their relevance or correct implementation, as long as an objective checking mechanism is not possible, the installation of which is very problematic (see above). The same is true for 4.1.2.1.4.

Ad 4.1.2.1: cf. 4.1.2.1.2

Ad 4.1.2.2.4: The scope for objectifying surveying methods within the provinces is not limited to control fences.

Ad 4.1.2.2.5: Particularly with regard to game species accounting for a major part of browsing, a population estimate based on the annual game bag is very problematic, as reflected also by the increasing shooting rate all over Austria without a concomitant decrease in game damage. If the shooting figures are taken as a basis of reference, roebucks would outnumber does in Austrian forests by 25 %. The native cloven-hoofed game populations cannot be kept lower by predators. Rather, the habitat and most of all the food supply are the limiting factors. Apart from that, feeding requirements exist in many cases, which means that the present evaluation would come close to a request for breaking the law.

Ad 4.1.2.4: The claim that natural regulatory mechanisms no longer exist or currently have no regulatory influence upon our wildlife populations must be contradicted. Where, for example, are the does, considering that in all of Austria, 25 % fewer does than roebucks are shot, and where is their offspring? It would be even more problematic to make an even partially reliable assessment of the proposed evaluation without surveying effort intensive in terms of scope, costs, and personnel.

Ad 4.1.2.4.1: The evaluation is very difficult to make, as hunters are unlikely to admit, let alone demonstrate, counterproductive hunting practices.

Ad 4.1.2.4.3: The annual growth rate is a hypothetical quantity for calculation models. An actual growth rate will vary from year to year and can at best be estimated. It is incorrect to mix it up with the birth rate, as the latter says little about the actual increase. In cloven-hoofed game in Austria, the annual growth is regulated mainly via the death rate of the fawns and calves in the first months of their lives. The suggested evaluation is thus at least questionable.

Ad 4.1.3.1.2: With regard to the Explanations, a few corrections of biological interpretations ought to be made: An important function of display behaviour with horns or antlers is that of impressing male representatives of the species, in order to avoid a strenuous fight; moreover, narrow horns or antlers may seem advantageous for their bearer in a fight. For the population, however, they are not, as the lesion or killing of an opponent means the loss of at least one precious element of the population. Horns and antlers have thus been developed rather for “comment” fighting than for inflicting injury. In addition, it is the biologically meaningful hunting of socially weak animals that is negatively rated in the “Indicator with Evaluation.”

8.2 Landesforstdirektion Salzburg (Forest Authority of the Province of Salzburg)

Fundamentals

The system presented provides a complex analysis on the subject of hunting and sustainability. The systematic structure of the catalogue of evaluations with its subdivision into three categories and their respective principles and criteria allows a detailed discussion of the subject matter. The evaluation that is to be made on the level of the hunting territory by the party responsible for the hunt calls for a self-critical reflection on the conditions within that party's own area of responsibility. A potential need to take action is to be met by the party responsible for the hunting territory. From this point of view, we favour the system.

Problems

Who will objectify the necessarily subjective assessment of one's own area? Is this task to be fulfilled by the organs of the hunters or the authorities? If the evaluation does not result in consequences and their implementation, the system will be ineffective.

Evaluation Scheme

Scale of points:

The evaluation is based on a system of points with a maximum achievable sum of points. The maximum sum of points characterises an ideal status of sustainability. If some points cannot be evaluated (e.g. protective forests), the maximum points score cannot be achieved. It is thus necessary to represent the possible number of points per evaluation unit as 100 % and the number of points actually achieved as %-share. Otherwise, a comparison of the results or a combination of several units is inadmissible.

Criterion 4.1.2.2: The mere existence of control fences is certainly not enough for distributing points. What counts is the results of recordings or at least an expert evaluation of the fenced plot and the area of comparison.

If game damage occurs in a hunting territory to an extent that puts the forest at risk, the territory cannot be one that is sustainably managed. Instead of introducing a KO (knockout) criterion which would upset the entire evaluation system, the sub-criterion "Preventing game damage unacceptable in terms of provincial culture" should be made the main criterion, and rated in such a way as to prevent an evaluation between "very good" and "intermediate" in the ecological sector if game damage putting the forest at risk occurs. Otherwise, the system will not be considered reliable and will not find acceptance among forest owners and forest authorities.

8.3 Birdlife

Unfortunately, I was not able to stay for the detailed discussion of the individual items following yesterday's presentation of the set of principles and criteria. Let me therefore attach some comment in writing.

I would like to start out by stating that I consider the study to be very good and useful, and I hope for a broad application of its results. Two self-imposed limitations may, however, pose problems.

First, the limitation to game species in the sense of huntable game as defined under provincial legislation - hunting can in various ways act upon other animal species as well, in particular as a factor of disturbance. This is why from the point of view of nature protection and conservation, the use of the term "wildlife species", in particular in sub-criterion 4.1.1.2.1., instead of the frequently used term "game species" actually goes beyond the definition of "game."

The second limitation is on the reference level of the hunting ground and/or the "hunting rings." (*Transl. comment: for a definition of the term "hunting ring" cf. 2.2*). Sustainability can be roughly described as the use of resources without their depletion. In order to achieve this, however, an efficient monitoring system is needed, which examines whether the objective has been attained. In the sector of hunting, this would be mainly the monitoring of populations (or representative spot checks) of huntable species and their tendencies. The present

draft, however, does not contain any direct reference to such population checks, even though some sub-criteria (e.g. 4.1.2.2.5) suggest that they are at least roughly known. In any case, a recording of populations and population trends of huntable wildlife species in the area of examination and their comparison with supra-regional developments (as far as they are known, as for example with regard to ducks), as well as the fact that they are being considered in terms of further shooting plans, ought to be made a (sub-)criterion!

The supra-regional checks should ideally be carried out within the scope of an internationally harmonised programme on a superior level, depending on the species (e.g. populations, in the case of migratory birds e.g. on flyway-level)

d sub-criteria 4.1.1.2.2 and 4.1.2.1.2: In the context of migratory birds, the sensitive period of the homeward migration to their breeding areas ought to be given special mention. The homeward migration is rapid, with few rests, and thus consumes a lot of energy. Additional strains “not in the plan” lead to an increase in energy consumption, which eventually causes lower breeding success on account of a reduction in physical fitness of the breeding birds and, to some extent, also late arrival at the nesting places. These are proven causal relationships. Such additional strains may be lasting periods of bad weather, but also massive disturbances (e.g. direct hunting, but also ongoing hunting at resting places of birds of passage in general, such as e.g. in wetlands). One of the two sub-criteria should thus mention the homeward migration of birds of passage as a particularly sensitive period in the course of the year.

Ad sub-criterion 4.3.4.1.1: This criterion may well have economic relevance in the sense of game damage prevention. Wildlife species with shorter escape distances are thus able to use larger areas for foraging than species whose scope of action is limited by great escape distances, in particular in areas of stronger impairment. Consequently, potential feeding damage will be more evenly distributed, and/or the feeding pressure on individual areas reduced. This existence of this correlation was proved e.g. in geese at their north-west European wintering areas.

8.4 Dr. Herbert Scheiring

Former Director of Provincial Forest Authority

The primary goal of sustainability in the sense of H1 is the preservation of the forest as a diverse ecosystem. All forms of use that claim to be sustainable have to be subordinated to that purpose.

Users of a forest - and this is also true for hunters - act sustainably only if they do not jeopardise the biological diversity of forests, their productivity, capacity of renewal and vitality, as well as their ecological, economic and social function.

However, in many regions, cloven-hoofed populations and thus the hunter determine the composition of tree species of the next forest generation to a greater extent than the forest expert would be able to. And thus, the hunter also decides about biological diversity, productivity, capacity of renewal and vitality of these forests, as well as about their ecological, economic, and social fitness and performance.

If we think about sustainable hunting, we first and foremost have to find out whether hunting meets the demand of a sustainable use of the forest. This presupposes that there is no impediment to natural forest attenuation - coming at least close to the potential natural vegetation - as demanded in numerous resolutions, conventions, as well as in all modern forest laws.

This is the key criterion for sustainable hunting, and only if this demand is met, the indicators presented in this project can be evaluated.

I suggest a weighting of the individual indicators (similarly as I have in my project for the Federal Ministry for Agriculture, Forestry, Environment and Water Management to assess performance in terms of provincial culture. I shall be happy to give more detailed explanations). Such a weighting would provide the criterion of “attenuation necessary in terms of provincial culture” with a kind of “blocking minority.”

8.5 Dipl.-Ing. Christian Schwaninger

Provincial Forest Authority of the Tyrol, Dep. of Forest Protection

Fundamentals

For an overall evaluation of sustainability, there has to be a so-called KO (knockout) criterion regarding the ecological aspects. In cases of game influence unacceptable in terms of provincial culture, as defined by expert opinion in accordance with § 16 (5) Austrian Forest Law, or game damage putting the forest at risk, as defined in the relevant provisions under the provincial hunting laws, the result of the evaluation of the ecological aspects must be that hunting is not practised sustainably. For narrowly confined winter habitats (southerly areas providing cover near feeding places), a threshold value (percentage of the area of the hunting ground) might be considered, up to which there shall be no KO.

Sub-criterion 4.1.1.1.3

Indicator with Evaluation: If there is a wildlife species not contained in the potential wildlife species inventory, which is selectively fostered through hunting, it is bound to create a problem. The evaluation of such a policy ought to be more distinctly negative. I suggest giving **-2 points**.

Sub-criterion 4.1.1.2.1

Indicator with Evaluation: In this context, too, a clearly negative evaluation seems necessary, if the undisturbed life cycle of wildlife is for a major part not guaranteed on account of extremely high hunting pressure. I suggest giving **-2 points**.

Sub-criteria 4.1.1.2.2 and 4.1.1.2.3

It seems inconclusive that these two sub-criteria should differ in points regarding the most negative indications. For both sub-criteria, the same points score should apply for the most negative indication.

Sub-criterion 4.1.2.1.2

Indicator with Evaluation: If the bottleneck situation is not taken into account in terms of hunting, a negative points score should be given. The negative score should be even more distinct if hunting aggravates the bottleneck situation. I suggest **-1 and -2 points**.

Criterion 4.1.2.2

This criterion should generally be evaluated under consultation of the forest authorities.

Sub-criterion 4.1.2.2.1

Indicator with Evaluation: Owing to the fact that the mere existence of control fences does not bring about an improvement of game damage, but only the consequences for hunting drawn on the basis of the interpretation of the results, we suggest giving only one point if control fences exist. The mere existence of control fences without an indication as to quantity will inevitably provoke misunderstandings. I therefore suggest the following formulation:

Control fences to monitor browsing exist up to a fence density of 1 fence/200 ha	1 point
Control fences to monitor browsing exist above a fence density of 1 fence/200 ha	2 points

Sub-criterion 4.1.2.2.4

Explanation: We speak of game influence unacceptable in terms of provincial culture in particular if important functions of the forest (protection, well-being, recreation, use) are jeopardised. As a rule, damage to the forest ecosystem has a negative impact on these functions, which is particularly serious if the protective function is affected. The term “provincial culture” comprises the protection and conservation of nature in general and thus also the protection of native animal species; it further comprises the guarantee to practise hunting and fishery, agriculture, Alpine farming, and forestry, as well as the guarantee of the right of use of agricultural and forestry lands.

Indicator with Evaluation: In this context, it would be advisable generally to speak not of “game influence” but of “game damage.” While the rest of the formulation can remain as it is, the points regime ought to be changed. If there is no “hunting-related game damage relevant in terms of provincial culture,” zero points should be given. Giving a reward for not causing severe damage does not seem to make sense. In the case of “considerable hunting-related game influence relevant in terms of provincial culture,” the negative scores for further grades of evaluation (minor, considerable, massive game damage) ought to be distributed in such a way as to render the entire criterion negative as soon as the maximum points score has not been reached in the other sub-criteria of this criterion. In the same way, “massive impairment of the ecosystem by hunting-related game damage relevant in terms of provincial culture” must render the entire criterion 4.1.2.2 negative - even if the maximum points score has been reached for the other sub-criteria of this criterion. If, however, criterion 4.1.2.2. is negative, the ecological aspects have to be evaluated entirely negatively.

The negative points might thus be distributed as follows:

Evaluation grade: “Game damage due to hunting and relevant in terms of provincial culture exists to a minor extent”	
Evaluation:	-3 points
Evaluation grade: “Game damage due to hunting and relevant in terms of provincial culture exists to a considerable extent”	
Evaluation:	-7 points
Evaluation grade: “Game damage due to hunting and relevant in terms of provincial culture exists to a massive extent”	
Evaluation:	-9 points

A definition of the designations minor, considerable, and massive game damage is indispensable; not least in order to prevent inequalities regarding the assessment of hunting territories differing in size.

Evaluation Scheme

In order to prevent unequal treatment of the various hunting territories on account of the fact that not all criteria and/or sub-criteria apply or can be evaluated in each individual case, I propose a percentage-scale of the evaluation grades “very good” to “very bad.” E.g.:

- Very good: above 75 % of the maximum points score
- Good: more than 50 % to 75 % of the maximum points score
- Intermediate: more than 25 % to 50 % of the maximum points score
- Bad: less than 25 % of the maximum points score achievable
- Very bad: negative value of a criterion or negative value of the sum of all criteria

I hope to have made a constructive contribution to securing the future existence of hunting management while avoiding the risk that it might put the preservation of forest habitats in doubt.