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umweltbundesamt^U



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ISWIMAN
**Integrated Sustainable
Wildlife Management**
Principles, Criteria and Indicators
for Hunting, Forestry, Agriculture, Recreation



Annex 1
PCI-Set for the Interface
HUNTING-RELATED ACTIVITIES
and Wild Animals / Wildlife
Habitats /Other Land Users
Full and Abbreviated Version

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Preliminary Remarks and Instructions for Use

The present Set of Principles, Criteria and Indicators (PCI) for sustainable hunting (focused on the Wienerwald Biosphere Reserve as a case study) relates to the range and activities of hunting, but also takes into consideration potential impacts of these activities upon other sectors of land use (forestry, agriculture, leisure and recreation), thus creating a possibility of evaluation both for hunters (the persons permitted to hunt) and for land ownership (the owner of land with a right to hunt). The Assessment Set is for self-evaluation by hunters (in particular by tenants of a hunt and those hunting by permission of land owner/game tenant) and land owners in their role as persons owning the right to hunt (lessors of a hunt, hunting co-operatives) and is designed to enable these persons to put the sustainability of their hunting-related activities to a test, with a view to sustainable development of native wildlife species and their habitats, as well as to provide a basis for making hunting sustainable. The way the concept of “sustainable hunting” underlying this study is understood includes in particular preventing hunting from infringing upon other land users’ sustainability interests.

Thus, this Set exclusively assesses the influence hunters (and land owners) may exert upon the sustainability of hunting, including the lasting preservation of wildlife populations rich in species, and wildlife habitats. For the assessment of possible impacts of other groups of users (forestry, agriculture and leisure and recreation management) on the sustainability of wild animals, wildlife habitats and hunting, separate PCI Sets with relevant principles, criteria and indicators have been developed.

For the Busy Reader

1. **Direct entry** with point scores accompanying the indicators (framed) for Ecology, Economy, and Socio-Cultural Aspects.
2. **Explanations** to be read only when needed.
3. **Simple Evaluation:** *Prepare an A4- format sheet of paper with three double columns (for ecological, economic and socio-cultural aspects). Read the maximum point scores of the indicators evaluated and enter them underneath each other on the left; on the right, enter the score you assign to your respective territory (scores should range from the maximum to the minimum given in the assessment framework). Finally, add the scores across the six columns and express the sum of the scores you assigned in terms of the percentage of the sum of the relevant maximum values (separately for ecological, economic and socio-cultural aspects). If you achieve 76-100 % of the sum of maximum point scores for an assessment aspect, your sustainability evaluation is “very good” for this aspect; in case of 51-75 % “good,” 25-50 % “intermediate,” 0-24 % “bad,” and in case of negative scores “very bad.”*
4. **Extensive User Information** for applying the PCI Framework as well as for a full evaluation of the self-assessment is given in the final report on the study.
5. **Quick Assessment:** A short version of the PCI Framework enables a limited assessment of sustainability. The numbers of the indicators foreseen for this purpose (most important indicators) are underlined and highlighted in grey (e.g. **Indicator 1**).

TABLE OF CONTENTS

Definition of Terms	6
1 ECOLOGY	10
1.1 Principle: The preservation and improvement of wildlife habitats is an objective of hunting	10
1.1.1 Criterion: Hunting and its interrelationship with other forms of land use	10
1.1.1.1 <u>Indicator 1</u> : Existence of a “hunting bag plan” and an “off-take list”	10
1.1.1.2 <u>Indicator 2</u> : Structure of hunting bag plan and off-take list	11
1.1.1.3 <u>Indicator 3</u> : Meeting official cull requirements for game species that need to be controlled	11
1.1.1.4 <u>Indicator 4</u> : Existence of a strategy to harmonise hunting with other forms of land use	13
1.1.2 Criterion: Giving consideration to the influence of game on vegetation	14
1.1.2.1 Indicator 5: Existence of exclosures to monitor game impact on vegetation	14
1.1.2.2 Indicator 6: Using forest monitoring to estimate wildlife impact	15
1.1.2.3 Indicator 7: Management takes account of the shelter-providing function of the forest	15
1.1.2.4 <u>Indicator 8</u> : Preventing game impact unacceptable in terms of regional culture	16
1.1.2.5 Indicator 9: Accommodating population fluctuations	17
1.1.3 Criterion: Preservation and creation of linking biotopes	18
1.1.3.1 Indicator 10: Giving consideration to existing wildlife habitat fragmentation	18
1.1.3.2 Indicator 11: Registration and mapping of important migration routes, wildlife corridors and other essential wildlife routes	19
1.1.3.3 <u>Indicator 12</u> : Increasing the attractiveness of important migration routes, corridors and other essential routes	20
1.1.4 Criterion: Giving consideration to habitat quality and capacity	21
1.1.4.1 <u>Indicator 13</u> : Active preservation and management of the wildlife habitat	21
1.1.4.2 <u>Indicator 14</u> : Handling of wildlife feeding	22
1.1.4.3 <u>Indicator 15</u> : Limitations on providing baits	23
1.1.4.4 Indicator 16: Avoiding increased competitive pressure upon threatened and sensitive animal species from strongly increasing game populations	23
1.1.4.5 Indicator 17: Annual productivity of game	24
1.2 Principle: The practice of hunting shall within its range ensure the preservation and improvement of the diversity of game species through protection and use/regulation	25
1.2.1 Criterion: Potential natural wildlife species inventory taking into account the current habitat situation	25
1.2.1.1 <u>Indicator 18</u> : Current and potential natural wildlife species list	26
1.2.1.2 Indicator 19: Dealing with recolonising species (in accordance with the potential natural wildlife species inventory)	27
1.2.1.3 Indicator 20: Dealing with wildlife species not included in the potential natural wildlife species inventory	28
1.2.2 Criterion: Hunting is sensitive to the behaviour of wild animals	30
1.2.2.1 <u>Indicator 21</u> : Giving consideration to the undisturbed life cycle of wild animals	30
1.2.2.2 <u>Indicator 22</u> : Limiting hunting of wildlife during the night (“night hunting”)	31
1.2.2.3 Indicator 23: Giving consideration to the reproductive biology of threatened and sensitive game species	32

1.2.2.4	Indicator 24: Coordination of hunting practises across hunting grounds	32
1.3	Principle: The natural genetic diversity of game species is preserved and enhanced by means of appropriate hunting practices	33
1.3.1	Criterion: There are no hunting-related limitations to the preservation and enhancement of the natural genetic variability of wildlife species	33
1.3.1.1	Indicator 25: Existence of aims relating to the aesthetics of hunting trophies in hunting guidelines	33
1.3.1.2	Indicator 26: Selective hunting of wild animals with certain natural characteristics	34
1.3.2	Criterion: Native wildlife populations are not altered by the introduction of non-native wild animals	35
1.3.2.1	Indicator 27: Introduction of non-native wild animals	35
2	ECONOMY	37
2.1	Principle: Securing and/or improving the profitability of hunting is an objective of hunting	37
2.1.1	Criterion: The profitability of hunting is secured over a medium term	38
2.1.1.1	Indicator 28: Existence of a marketing strategy for hunting in the Biosphere Reserve	38
2.1.1.2	Indicator 29: Marketing of regional game products	38
2.1.1.3	Indicator 30: Cost/income ratio (applies to lessors and owners)	39
2.1.1.4	Indicator 31: Expense/subjective benefit ratio (applies to hunting tenants and hunting customers)	39
2.1.2	Criterion: The value of hunting is maintained and/or increased by the practice of hunting	40
2.1.2.1	Indicator 32: Hunting-related measures to increase the market value	40
2.2	Principle: Efficiency and minimum disturbance of wildlife species is an objective of hunting	42
2.2.1	Criterion: Existence of a time- and area-specific hunting strategy	42
2.2.1.1	Indicator 33: Existence of an economically sound, time- and area-specific hunting plan	42
2.3	Principle: Preventing damage to agriculture and forestry is an objective of hunting	43
2.3.1	Criterion: Hunting is oriented according to the susceptibility of agricultural land and forestry to game damage	43
2.3.1.1	Indicator 34: Giving consideration to susceptibility to game damage	43
2.4	Principle: Creating synergies with other economic activities is an objective of hunting	43
2.4.1	Criterion: Hunting economically conforms with other anthropogenic forms of use ("economic unity")	43
2.4.1.1	Indicator 35: Confirming a common policy	44
2.4.2	Criterion: Interdisciplinary optimising of planned changes in the wildlife habitat	44
2.4.2.1	Indicator 36: Commitment of hunters to interdisciplinary wildlife-ecological spatial planning (WESP)	45
2.4.2.2	Indicator 37: Commitments of hunters regarding plans and projects that have an impact upon habitats	45
3	SOCIO-CULTURAL ASPECTS	47
3.1	Principle: Hunters take into account the interest of the local population in using land for hunting	47
3.1.1	Criterion: By way of involving local hunters, hunting enjoys a balanced position within the local community but also takes into account the interests	

of non-resident hunters	47
3.1.1.1 Indicator 38 : Reconciling the interests of local hunters permitted to hunt and local hunters not permitted to hunt locally	47
3.1.1.2 Indicator 39 : Adequate consideration is given to non-resident hunters	48
3.2 Principle: Offering local jobs in the field of hunting is an objective	49
3.2.1 Criterion: Hunting contributes to securing employment by creating jobs	49
3.2.1.1 Indicator 40: Providing jobs in the field of hunting	49
3.3 Principle: Hunting should find broad acceptance among the population	49
3.3.1 Criterion: Hunting is oriented to the aims of the Biosphere Reserve	50
3.3.1.1 Indicator 41 : Taking into consideration the guiding principles and management goals of the Biosphere Reserve	50
3.3.1.2 Indicator 42 : Design and distribution of hunting-ground installations	51
3.3.2 Criterion: Paying attention to the interests of the local population	52
3.3.2.1 Indicator 43: Documentation of disagreements by the local authority	52
3.3.2.2 Indicator 44 : Active involvement and information of local stakeholder and land user groups not directly related to hunting	52
3.3.2.3 Indicator 45 : Conflict management strategies	53
3.3.3 Criterion: Hunting is connected with society-at-large	54
3.3.3.1 Indicator 46: Social commitment of hunters and regular communication with the non-hunting population	54
3.3.3.2 Indicator 47 : Taking into account the opinion of the public at large	55
3.4 Principle: Hunting is oriented to the welfare of the game	56
3.4.1 Criterion: Hunting is practised with as little impairment to the natural behaviour of wildlife as possible	56
3.4.1.1 Indicator 48 : Habituated behaviour of wild animals	56
3.4.2 Criterion: Hunting is practised with as little pain for the animal as possible	57
3.4.2.1 Indicator 49: Violations of legal provisions concerning animal welfare	57
3.4.2.2 Indicator 50: Training in hunting	57
3.4.2.3 Indicator 51: Avoiding use of poison as part of the hunting practice	58
3.5 Principle: Hunting is of wild animals breeding naturally in the wild	58
3.5.1 Criterion: No animals raised in breeding or other enclosures are hunted	58
3.5.1.1 Indicator 52: Not selling (transferring) animals from enclosures or aviaries for the purpose of hunting	59
3.5.1.2 Indicator 53 : Not releasing animals from enclosures and aviaries for the purpose of hunting	59
3.6 Principle: Hunters are aware of the effects of their activities upon other land users' interests	59
3.6.1 Criterion: Hunters are aware of and give thought to the effects of their measures upon the interests of other land users	59
3.6.1.1 Indicator 54 : Improvement of knowledge and awareness of the effects of hunting-related measures upon other forms of land use	59
3.7 Principle: The way hunting traditions are dealt with is a characteristic of the socio-cultural sustainability of hunting	60
3.7.1 Criterion: Hunting traditions are cultivated and passed on to new generations of hunters	60
3.7.1.1 Indicator 55: Preserving hunting culture	61
3.7.2 Criterion: Traditional rules of hunting behaviour are being further developed and brought up to date	61
3.7.2.1 Indicator 56: Examining modes of hunting behaviour by regularly updating knowledge	61

Definition of Terms

- The term **game** refers to those wild animal species (furred and feathered) which are subject to hunting laws, including species with no open season. Unless indicated otherwise, the terms **game** and **wild animals** are used in the same sense. Conversely, the term wild animal species refers to those wild animal species that are (or were) “hunnable” as “game,” or otherwise influenced by hunting (e.g. on account of hunting laws, regulations and hunting practise).
- The term **threatened** refers to those wild animal species whose long-term survival within their natural range is endangered to varying degrees, or questioned. As a rule, these are species threatened with regional extinction, are declining continuously, are particularly rare, or have temporarily disappeared and are now returning, and are thus often classified as “protected species” under the nature conservation laws. The degree to which a species is threatened results, as a rule, from various risk factors that interact to varying degrees, and which, when combined, influence the conservation status of the species. If these factors occur, they are to be interpreted as warning signals suggesting that the respective species may be threatened. These risk factors are first and foremost: low population size; continuously declining populations (continuously decreasing number of populations and/or individuals of a species); small or decreasing range (contraction of distribution area); specialised habitat requirements of a species; habitat loss, habitat fragmentation, deterioration of habitat quality (low or decreasing availability of habitats); direct adverse human influence (e.g. on account of excessive hunting, excessive use, persecution, etc.) pressure by invasive, non-native species (e.g. Zulka et al., 2001; Primack, 1998). In varying combinations and with differing emphasis, most of the factors mentioned account for status of threatened species on red lists as well as their classification as protected species in accordance with nature conservation laws. The degree of endangerment that indicates, so to speak, the probability of survival or risk of extinction of a species in a certain area, is categorised through Red Listing processes. IUCN Red List categories include “extinct” and “extinct in the wild”, followed by categories of “critically endangered,” “endangered,” “vulnerable”, within which a species is considered threatened with extinction, and the pre-warning level of “near-threatened” (e.g. Zulka et al., 2001; IUCN, 1994, 1999). If a wild animal species is listed on a relevant red list – e.g. the Red List of Threatened Animals in Austria (Zulka, 2005) and Red Lists of the Federal Provinces – and classified into one of the above categories of endangerment, the respective species is to be considered a threatened species in the sense of this study¹. Equally, species protected by Austrian nature protection and conservation laws (species protection regulations), EU community laws (Bird Protection Directive, Flora-Fauna-Habitats Directive) and international species protection agreements (e.g. the Convention on the Conservation of European Wildlife and Natural Habitats – Bern Convention; Convention on the Conservation of Migratory Species of Wild Animals – Bonn Convention) are considered to be threatened species in this document.
- The term **sensitive** refers to those wildlife animal species to which one or more of the above endangerment factors apply, even if the respective species has not (yet) been red-listed as “threatened” or “near threatened.” In particular those wildlife species are to be

¹ http://www.umweltbundesamt.at/umweltschutz/naturschutz/artenschutz/oasis/oasis_abfrage gives access to an Internet databank compiled by the Federal Environment Agency – Austria that allows queries as to the endangerment classification of individual species on different red lists. With regard to species relevant in terms of hunting, regularly updated information relevant in terms of hunting laws (hunting and closed seasons) on the basis of the hunting laws of the Austrian Federal Provinces is made available.

considered sensitive which, on account of specific (population-) biological features such as specialised habitat requirements (including size and quality of habitat), low reproduction potential, low dispersal capacity, are particularly sensitive vis-à-vis additional endangerment factors such as excessive hunting pressure, decreasing distribution, strongly increasing predation and competitive pressure from other species, or rapid changes of environmental conditions. In a hunting context, however, also native huntable game species are to be classified as sensitive if hunting them sustainably cannot be considered guaranteed in a certain area on account of their unfavourable conservation status or unfavourable trends in the respective species and/or its habitat. These species may often only be taken in small numbers or demand particular consideration on the part of hunters.

- The term **person permitted to hunt** or **owner of a hunt** refers, for the purpose of this study, to the owner or tenant(s) of hunting rights. Additionally there are those who hunt by permission of land owner/game tenant and owners of stalking districts.
- The term **person owning the right to hunt** refers in Austria to the land owner.
- The term **tenant** refers to the tenant of a proprietor's or co-operative hunt (person permitted to hunt).
- The term **lessor** refers to the owner or representative of the owner of a proprietor's or co-operative hunt.
- **Potential natural wildlife species inventory** is to be understood as the spectrum of wildlife species representing the currently achievable optimum circumstances in terms of biodiversity and near-natural conditions, taking into account the irreversible changes that have occurred in the course of the development of the cultural landscape as well as the existing economic and socio-cultural impacts on wildlife habitats that cannot be influenced by hunting. The "potential natural wildlife species inventory" is thus the range of wildlife species possible under the current habitat conditions, which pertain to the native spectrum of species (autochthonous, typical for the region) of the respective geographic region. „Native wildlife species“ are, in the sense of the potential natural wildlife species inventory:
 - those species that have outlasted the latest Ice Age or have immigrated thereafter and before and/or without human intervention²;
 - recolonising species that used to be native in a certain area whose populations temporarily ceased to exist and which now are returning to their original ranges, either without human intervention (immigration of species, e.g. elk/moose (*Alces alces*), brown bear (*Ursus arctos*), wolf (*Canis lupus*), otter (*Lutra lutra*)), or through re-introduction into their original habitats (e.g. Alpine ibex (*Capra ibex*) and Alpine marmot (*Marmota marmota*) within their original ranges of distribution);
 - native species that have disappeared on account of human influence (eradication, habitat changes).

As far as today's cultural landscape basically still has habitat potential for the species mentioned, these species are to be considered part of the potential natural wildlife species inventory.

This is not to be confused with "**new residents**" (**alien species, neobiota**), which have arrived at a certain territory (in this case, Austria) later than 1492 through direct or indirect human influence. With regard to Austria, these are, among huntable wildlife species, e.g. fallow deer, Sika deer, moufflon, wild rabbit, racoon dog, racoon, nutria and wild turkey. These species are *not* considered part of the potential natural wildlife species inventory.

² So-called primary native or indigenous species

Those animal species that had become established under human influence in pre- and early history up to the end of the Middle Ages (1492) (such as, probably, the brown rat) are not relevant for hunting in Austria and thus need not to be considered for the purpose of this study.

- **Hunting management plan (hunting plan)** is to be understood as the planning ahead of any hunting-related activities, in particular in terms of time, area, and personnel. It comprises the goals and measures of hunting management for the respective hunting area and serves the purpose of providing long-term orientation for the hunting practice. Key components are e.g. to ensure that hunting accords with the needs of other land users, to take into account the optimum time and area for hunting the relevant game, and to give consideration to rare, non-hunted species. A hunting plan may exist in thought or in writing; with regard to sustainable hunting practice, however, a written hunting plan is preferable.
- **Hunting bag plan** (as a part of the hunting management plan) is a list of the numbers of each species (sex, age classes) planned to be shot or trapped (hunting bag planned before the hunting season starts).
- **Off-take list** (as a part of the hunting management plan) is a list of the numbers of each species (sex, age classes) really shot/trapped/killed by traffic accidents/ found dead by other reasons (hunting bag documented when the hunting season closes).
- **Culturally unacceptable game impact** is to be understood in this context primarily in terms of the ecologically unacceptable (harmful) influence of game on vegetation. The impact of game on vegetation comprises food intake (grazing, browsing, bark peeling) as well as rubbing to remove velvet from antlers and territorial tearing or gnawing. The concept of “culture” differs from economic considerations. Culture refers from an overall societal perspective to, in the case of forests, the functions beyond that of timber production, including shelter, leisure and recreation for people, but also to the provision of ecological value from other vegetation (e.g. orchid meadows rich in biodiversity). This is the fundamental view represented by the competent authorities on the basis of the respective (Austrian) legislation. The lack of some important natural enemies of our herbivorous wild animals as well as anthropogenic influences on our wildlife habitats (most of all land use) accounts for the fact that they are mostly not near-natural environments. This influences local densities and distribution patterns of wild animals, in particular ungulates, which damage vegetation beyond tolerable limits.
- **Wildlife habitat** is defined as the “living space” or “site” (the habitat) of wild species populations and/or individuals of a wild species. The habitat needs of the wild animals concerned define the area of wildlife habitat they require. The wildlife habitat must meet key habitat functions (food, cover and reproduction area). Environmental factors (such as noise, temperature, light, climate, soil, etc.) must neither exceed nor fall short of the species-specific limit of tolerance of the wild animals. The wildlife habitat may consist of several separate habitat sectors.
- **Migration and Dispersal** are movements of animals. Migration is the repeated movement of animal populations leading to seasonal changes of place and entails a change of range of a species. As well as seasonal habitat change (e.g. passing from summer to winter habitat in red deer) there may also be migration to breed. Dispersal is the lasting movement of individuals away from a natal area or subsequent point of settlement, and is often omnidirectional unless constrained in particular directions by topography . It plays a significant role in terms of the necessary gene flow within and among populations of a species, and thus in terms of the preservation of the species, its distribution, the colonisation or re-colonisation of habitats. In the absence of regular genetic exchange via such “gene flow corridors,” the risk of species and populations becoming regionally extinct will increase.

Landscape sectors in which migration or dispersal primarily happens are termed **migration axes (routes)**.

- **Wildlife corridors** are bottlenecks within a migration axis or the habitat of wildlife species caused by barriers or an unfavourable environment. A salient characteristic of a corridor is its favourable structure compared to the surrounding environment, allowing for a link between separate habitat sections.
- The term **constricted corridor** is used to describe a constriction of a wildlife corridor or wildlife route on account of natural or anthropogenic barriers to a minimum width without any possibility of bypassing it locally, i.e. wildlife species are forced to adhere to the corridor as a consequence of specific topographic conditions (forest corridors, steep slopes, canyons, water courses, etc.) or artificial obstacles (fences, road barriers, walls, settlements, etc.) which create local bottlenecks.
- **ÖPUL** is the “Austrian Agri-Environmental Programme.” The initials refer to the promotion of agriculture that is appropriate to the environment, extensive and favourable for nature. The programme is supported through the European Agricultural Fund for Rural Development as well as the Rural Development Programme of Austria. Along with ÖPUL, there are other publicly subsidised **agri-environmental measures** pursuing similar goals (e.g. the Ecopoint Programme).
- **Use:** Use is to be understood in the comprehensive sense of the IUCN Policy Statement on the Sustainable Use of Wild Living Resources (IUCN, 2000); it includes all forms of consumptive and non-consumptive use of natural resources. Sustainable hunting and/or sustainable hunting-related use includes hunting certain animal species without the animals that are killed having to be used in a consumptive way (e.g. red fox (*Vulpes vulpes*), if its population increases on account of anti-rabies vaccination and thus endangers the population of other species).
- **Farmer** refers to persons responsible for the planning and carrying out of agricultural measures on agricultural plots of land. As a rule, they are managers/cultivators or owners of agricultural land or managers of an agricultural enterprise.
- The term **forest manager** refers to persons responsible for the planning and carrying out of forestry-related measures. As a rule, the term includes the skilled personnel responsible for forest management (forester, head of a forest division), forest owner or manager of forest enterprises.
- **Leisure and Recreation management** covers persons active and organisations representing groups of people that benefit from the recreational use of the Wienerwald Biosphere Reserve. It also includes as stakeholders the officials and decision-makers responsible for the planning, regulation and control of leisure and recreational activities. This group of actors includes the Biosphere Reserve management, municipalities, regional managing bodies, tourism federations and associations, alpine associations, sports associations and other representatives of certain recreational user groups (horse riders, mountain bikers, hikers, etc.), land owners and representatives of relevant authorities.
- **Use** is to be understood in the comprehensive sense of the IUCN Policy Statement on the Sustainable Use of Wild Living Resources (IUCN, 2000); it includes all forms of consumptive and non-consumptive use of natural resources. Sustainable hunting and/or sustainable hunting-related use includes hunting certain animal species without the animals that are killed having to be used in a consumptive way (e.g. red fox (*Vulpes vulpes*), if its population increases on account of anti-rabies vaccination and thus endangers the population of other species).

Assessment Set for Integrated, Sustainable Wildlife Management

Part: HUNTING

Principles, Criteria and Indicator scoring

1 ECOLOGY

1.1 Principle: The preservation and improvement of wildlife habitats is an objective of hunting

Explanation: Hunting is understood comprehensively and does not refer exclusively to the shooting of game.

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

1.1.1.1 Indicator 1: Existence of a “hunting bag plan” and an “off-take list”

Explanation: The existence of a hunting bag plan and an annual off-take list (as parts of the hunting management plan; see Definition of Terms) records that impacts on game populations by hunting are planned in an operational way and that the realisation of the planned aims is well documented (as a basis for future planning). In Austria, hunting bag plans are normally³ subject to official permissions, so it is assumed that the authorities also seek to prevent overhunting of individual game species as well as to harmonise hunting with other interests of land use. A hunting management plan including an actual off-take list (documented hunting bag) is beneficial not only with regard to game species for which hunting bag plans and lists are prescribed by the authorities but also for other species, in particular for locally threatened or sensitive game (see Definition of Terms) and for game species that need to be reduced (see 1.1.1.3). It is important that hunting bag plans are species-specific, i.e. avoiding inaccurate collective names (general classifications according to species groups, such as ducks, geese, weasels, polecats, etc.).

³ In most Austrian federal provinces

Indication and score:	<ul style="list-style-type: none"> 3 All hunting bag plans and off-take lists requested by the authorities exist; beyond that, adequate planning and off-take lists also exist for <i>all</i> wildlife species hunted 2 All hunting bag plans and off-take lists requested by the authorities exist, and adequate planning and off-take lists also exist for <i>one or more other</i> wildlife species. 1 All hunting bag plans and off-take lists requested by the authorities exist -2 Hunting bag plans and/or off-take lists requested by the authorities are incomplete or deficient. -4 No hunting bag plans and/or off-take lists exist.
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1.1.1.2 **Indicator 2: Structure of hunting bag plans and off-take lists**

Explanation: Breaking down the hunting bag plans by sex and age and the off-take lists by individual species, date, sex and age and, if applicable, where bagged, is of importance in order to be able to compare planned and actual hunting as well as to make evident the time and area of the hunting in particular with regard to other forms of land use.

Indication and score:	<ul style="list-style-type: none"> 3 A subdivision of hunting bag plans and off-take lists (by individual species, sex and age and of off-take lists also by date) is made for <i>all wildlife species hunted</i>. 2 A subdivision of hunting bag plans and off-take lists (by individual species, sex and age and of off-take lists also by date) is made for all game species for which hunting bag plans and lists are requested by the authorities and, <i>in addition, for one or more other wildlife species</i>. 0 A subdivision of hunting bag plans and off-take lists (by individual species, sex and age and of off-take lists also by date) is made for <i>all wildlife species for which hunting bag plans and off-take lists are requested by the authorities</i>. -2 There is <i>no</i> or <i>only a deficient subdivision</i> of hunting bag plans and off-take lists (by individual species, sex and age) for game species for which hunting bag plans and off-take lists are requested by the authorities; subdivision of off-take lists by date is deficient.
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1.1.1.3 **Indicator 3: Meeting official cull requirements for game species that need to be controlled**

Explanation: The planning of the hunting bag is potentially one of the most effective control instruments of game management. When done correctly, drawing up a hunting bag plan provides an opportunity to respond flexibly to changes in game population, as well as to results of forest monitoring (see Section 1.1.2.2) by increasing or decreasing the hunting intensity. Hunting bag plans are, so to speak, the link hunting establishes between the status

of vegetation, the regulation of game populations, and aspects of nature protection and conservation. They serve both the preservation of game populations at levels usable for hunting in a sustainable way and the avoidance of culturally unacceptable game damage (see Section 1.1.2.4). In order for hunting bag plans to exercise this controlling function in practice, there is a need to draw up realistic hunting bag plans that are binding and can be complied with. The demand of a minimum or maximum bag size per game species and age-sex class is very much in line with this practical requirement. Along with hunting bag plans requested by the authorities, this Indicator also refers to additional hunting demands by the authorities for wildlife species documented to be strongly increasing regionally (or of “Least Concern” in Red Lists of Threatened Species) and supra-regionally not threatened or protected (e.g. by the EU Bird Protection Directive). Beyond that, this Indicator refers, along with the hunting requirements made by the authorities, to potential hunting obligations on the part of the land owner owning the right to hunt, for wildlife species which need reducing in numbers but for which there are no hunting requirements by the authorities. If, for example, tenants of a hunt, or hunters by long-term permission of land owner/game tenant, are urged by the forest owner owning the right to hunt, orally or by contract, to carry out a certain minimum cull for the purpose of regulating the wildlife population in the interest of regional culture (also considering the surroundings of the hunting area concerned) this, too, must be taken into account and evaluated. An example of a hunting target might be to hunt all animals of a species, or all of a permitted age-sex class (e.g. wild boars (*Sus scrofa*), red fox (*Vulpes vulpes*)).

In the Wienerwald Biosphere Reserve, wild boars are at this point in time a species needing reduction in terms of regional culture; however, neither the hunting laws of Lower Austria nor those of Vienna currently contain official hunting bag plans for this ungulate game species. In addition, invasive non-native species may be classed as in need of culling.

The subject of the assessment is the deviation of the actual bag from the target minimum or maximum bag stipulated in the hunting bag plan, or in other hunting requirements made by the authorities or by contract for the respective game species. If no minimum or maximum bag is stipulated, slight deviations from a single bag size may be tolerated. This Indicator refers to game species which need reducing in numbers. The period of reference is defined in the hunting plan.

Indication and score:	<p>2 Hunting requirements of the authorities or additionally for wildlife population regulation in the interest of regional culture were met for <i>all</i> relevant wildlife species within the period of reference.</p> <p>0 The hunting requirements of the authorities or additionally for wildlife population regulation in the interest of regional culture were met within the period of reference for <i>almost all (more than 90 %)</i> of the wildlife species concerned.</p> <p>-1 The official hunting requirements were met within the period of reference for <i>more than 50 %</i> of the wildlife species concerned.</p> <p>-2 The official hunting requirements were met within the period of reference for <i>less than 50 %</i> of the wildlife species concerned.</p> <p>-4 The official hunting requirements were <i>not met</i> within the period of reference <i>for any</i> of the wildlife species concerned.</p>
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1.1.1.4 **Indicator 4: 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 of criteria and indicators for sustainable hunting, the impact of these anthropogenic impacts is uncertain. However, consideration can be given to the extent by which a hunting strategy takes into account these anthropogenic impacts on the wildlife habitat where hunting is practised. In this context, communication and mutual agreement between hunters and representatives of “other anthropogenic influences” should also be assessed according to whether a strategy for harmonisation of hunting with other forms of land use is documented in the hunting management plan. Legal designation of habitat protection areas, nature reserves, etc. may be used to advantage in this regard.

Indication and score:	<p>3 The hunting plan contains a strategy to harmonise hunting with <i>all</i> other forms of land use (at least with agriculture and forestry, leisure and recreational activities, nature protection and conservation).</p> <p>2 The hunting plan contains a strategy to harmonise hunting with <i>a minimum of three</i> other forms of land use.</p> <p>1 The hunting plan contains a strategy to harmonise hunting with <i>two</i> other forms of land use.</p> <p>0 The hunting plan contains a strategy to harmonise hunting with <i>one</i> other form of land use</p> <p>-1 The hunting plan <i>does not contain any</i> strategy to harmonise hunting with other forms of land use.</p>
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1.1.2 Criterion: Giving consideration to the influence of game on vegetation

Explanation: This criterion and the subsequent Indicators are meant to assess the consideration given to negative impacts of game on forests (and other forms of vegetation), not the value of forests as a wildlife habitat. The attention given to negative impacts on vegetation, needs to look beyond the limits of individual hunting grounds, even if the hunting ground does not contain a forest with protective function. Wildlife is unaware of limits and borders, so hunting in one's own area may significantly influence the vegetation of the neighbouring hunting ground. For the assessment of this criterion, the forest authorities ought to be consulted.

1.1.2.1 Indicator 5: Existence of exclosures to monitor game impact on vegetation

Explanation: A proven method to assess game impacts on vegetation is to install browsing-control fences, for comparison of a small, fenced-in vegetation plot, entirely free of browsing, with the surrounding areas that are not fenced. If the spot is adequately chosen, it is possible to determine the influence of current browsing on the composition of the vegetation (forest regeneration, permanent vegetation in agricultural areas, such as headlands). It is important to note that the vegetation growing without any game influence within the fence should not be regarded as the natural state, but is taken simply as a comparative area to determine game impact. 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 agricultural areas also provide good data on the current vegetation of many parts of Austria – at least with regard to forest vegetation – for comparison of the status quo with a target status.

The existence of certain indicator plants in the ground vegetation gives reliable clues as to the state of the biotope. An indication of a balanced relationship between game (in particular cloven-hoofed game and hares (*Lepus europaeus*)) 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 excessive game populations. A list of relevant indicator plants can be drawn up specifically for the wildlife habitat concerned. Formulation of the hunting strategy according to the potential natural plant associations should be a part of the hunting plan.

Indication and score:	3	Control fences to monitor browsing damage to vegetation are at a density above one fence per 100 hectares of forest.
	2	Control fences to monitor browsing damage to vegetation exist above a density of one fence per 200 hectares.
	1	Control fences to monitor browsing damage to vegetation are at a density of up to one fence per 200 hectares).
	0	There are no control fences to monitor browsing damage to vegetation.
	x	Not applicable, no score (e.g. if the unit to be assessed does not contain forest areas).

1.1.2.2 Indicator 6: Using forest monitoring to estimate wildlife impact

Explanation Forest monitoring suited for the area of assessment, such as observation transects, spot checks, exclosures, expert examinations of areas, stand surveys provide – regardless of whether they are carried out by an authority or a forestry operation – important guidance for the hunter, helping him or her to determine the impact of cloven-hoofed game on vegetation at browsing levels. Indirectly, these monitoring systems may also be consulted to verify the influence of hunting on cloven-hoofed game and vegetation and for clues as to how to optimise hunting.

Existing forest monitoring systems should always become a part of hunting management plans. This Indicator is also applicable if no such systems have been established in the immediate area of one's hunting ground, because from the results of monitoring systems at the levels of hunting/forestry operations or regional level, conclusions can be drawn as to the situation of game impact within one's own hunting ground.

Indication and score:	2	Existing forest monitoring systems are consulted for planning and optimising hunting.
	-2	Existing forest monitoring systems are not consulted for planning and optimising hunting.
	x	Forest monitoring systems do not exist.

1.1.2.3 Indicator 7: Management takes account of the shelter-providing function of the forest

Explanation: In the field of ecology, it is the sheltering property of forests (which also provide well-being and recreation) that is to be considered in terms of hunting. Apart from shelter for particular sites ("site protection forests"), forests give shelter to humans and buildings. According to the AUSTRIAN FOREST ACT of 1975 as amended in 2002 (Federal Legal Gazette No. I 59/2002), "forests providing protection for humans and technological objects" are forests that shelter humans, human settlements or installations or cultivated land, in particular against weather hazards or other harmful environmental influence, and whose preservation requires specific treatment (§ 27 of the quoted legislation). In terms of hunting, this demands that the self-preservation and self-regeneration capacities of shelter-providing forests must not be impaired by hunting-related activities. Impairments to the

protective function of forests are, for example, (regionally) excessive game population densities that cause ecologically detrimental alterations of the vegetation (species inventory, structure, texture). To identify forests whose major function is that of shelter, in Austria, for example, the following documents provide a basis: the Forest Development Plan (functional areas with protection as the priority function), the “areas with protective function” as defined under the Torrent and Avalanche Control as well as the Provincial Protection Forest Concepts. The competent Forest Authority may also provide support. Consideration of the shelter-providing function of forests should be included in the hunting plan. This Indicator is in principle also applicable if one’s own hunting territory does not include shelter-providing forests, but they do exist on neighbouring hunting grounds in the region (see explanations on Criterion, Section 1.1.2).

According to the existing forest development plans, the Wienerwald Biosphere Reserve includes a relatively small area share of shelter-providing forest; however, these areas are particularly important for harmonising hunting with the shelter-providing function of a forest.

Indication and score:	2	There is a hunting strategy to prevent game damage to the shelter-providing function of forest habitats.
	-2	There is no hunting strategy to prevent game damage to the shelter-providing function of forest habitats.
	x	Not applicable, no score (there is no shelter-providing forest within or near the area of the assessment unit).

1.1.2.4 **Indicator 8: Preventing game impact unacceptable in terms of regional culture**

Explanation: Regional culture is here defined as comprising nature conservation in general and thus also conservation of native animal species; it also includes hunting and fishing rights, agriculture and forestry, as well as the right of access to farmland and forests. We speak of game impact unacceptable in terms of regional culture in particular if important functions of the forest in which there is a public interest (for shelter, well-being, recreation, use, animal and plant habitat) are jeopardised. The core zones of the Biosphere Reserve comprise almost exclusively forest areas, where use for forestry has been stopped in order to allow for as natural a forest development as possible. For this zone, we therefore cannot speak of vegetation and/or forest damage in economic terms. Nevertheless, forest ecosystems may be subject to negative impacts from unnaturally large wildlife populations, especially in the smaller core zones of the Wienerwald Biosphere Reserve. Whether such impacts are relevant in terms of regional culture should, in these areas, to be judged according to the development goal of near-natural forest ecosystems. Game impacts unacceptable in terms of regional culture may arise there not only from herbivorous cloven-hoofed game species but also from wild boar, which, among other impacts, may damage the nests of ground-nesters ((such as Eurasian woodcock (*Scolopax rusticola*) and hazel grouse (*Tetrastes bonasia*)) or, e.g., eat nestling owls (see 1.1.4.4). We may thus speak of undesired game impacts in particular in core zones of the Biosphere Reserve if nature protection and management goals are put at risk.

However, damage in the open country may also be relevant in terms of regional culture – for example the damage wild boars cause when ploughing-up large areas of ecologically valuable grassland.

Game impact unacceptable in terms of regional culture is to be understood in this context primarily in terms of the ecologically unacceptable (harmful) influence of game on vegetation.

The impact of game on vegetation comprises food intake (grazing, browsing, bark peeling) as well as rubbing to remove velvet from antlers. The concept of “culture” differs from economic considerations. Culture refers from an overall societal perspective to, in the case of forests, the functions beyond that of timber production, including shelter, leisure and recreation for people, but also to the provision of ecological value from other vegetation (e.g. orchid meadows rich in biodiversity). This is the fundamental view represented by the competent authorities on the basis of the relevant (Austrian) legislation.

The lack of some important natural predators of our herbivorous wild animals 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 near-natural environments. This influences local densities and distribution patterns of wild animals, in particular ungulates, which damage vegetation beyond tolerable limits. Hunting, depending on where and when as well as how intensely it is practiced, may influence the extent of regionally relevant game impacts.

The extent of game impacts can mainly be ascertained by monitoring game damage objectively (see Section 1.1.2.1).

Indication and score:	1	Objectively assessed, game impact (on forests, grassland, rare animal and plant species) from hunting is <i>unacceptable in terms of regional culture</i> on a <i>maximum of 1 % of the area</i>
	-1	Objectively assessed, game impact due to hunting is unacceptable in terms of regional culture on <i>up to 10 % of the area</i>
	-3	Objectively assessed, game impact due to hunting is <i>important</i> in terms of regional culture on <i>more than 10 % and up to 30 % of the area</i> .
	-4	Objectively assessed, game impact due to hunting <i>creates massive</i> impairment of the ecosystem that is unacceptable in terms of regional culture on <i>more than 30 % of the area</i> .

1.1.2.5 Indicator 9: Accommodating population fluctuations

Explanation: Under natural conditions largely free of anthropogenic influence, wildlife populations are subject to a certain amount of fluctuation attributable to climatic influence (losses during winter), food supply, and the presence of predators. Conversely, constant population densities are unnatural as are fluctuations attributable to habitat changes induced by humans. Population fluctuations in huntable game species can be traced back historically 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 accommodates population fluctuations an indication of sustainable hunting.

A naturally-induced population decrease of the cloven-hoofed game populations (e.g. on account of weather) leads to reduced browsing of the preferred vegetation. Under near-natural conditions (a complete wildlife species inventory including large predators), the reduced wildlife population is not “spared” by its natural enemies immediately after the population decrease, as is frequently the case in traditional hunting, but may be further depressed until the low populations of prey have an effect on the reproduction rate and

abundance of natural predators. Thus, in most cases, the period of time during which the vegetation experiences relief from ecological game damage lasts significantly longer than if humans quickly react to a population decrease by reducing hunting.

For the vegetation however, a longer browsing break may result, for example, in an increase in trees and shrubs whose leading shoots are able to grow above the browsing level, and thus in an increase of vegetation, cover, and protection against weather conditions for the recovering game population. Improved natural feeding conditions may then, as a consequence, allow higher hunting rates.

An excessive reduction of hunting immediately after a transient, naturally-induced population decrease in common game species, however, may result in disadvantages to the ecosystem (including the hunted game). Counter-balancing population fluctuations to a major extent through hunting, in particular of ungulate game species, is thus not in line with ecological sustainability.

Indication and score:	2	Strong natural downward population fluctuations over several years in common ungulate game are enabled.
	-2	Strong natural downward population fluctuations over several years in common ungulate game are prevented by reduction in hunting.

1.1.3 Criterion: Preservation and creation of linking biotopes

1.1.3.1 Indicator 10: Giving consideration to existing wildlife habitat fragmentation

Explanation: The fragmentation (severing) of wildlife habitats through roads, railway lines, settlements and industrial zones as well as tourist establishments has a strong impact on habitat quality. This can be mitigated, to some extent, by, exerting as little hunting pressure as possible on important wildlife corridors, migration routes and other essential routes⁴ between fragmented habitats, or by making them more effective. However, if practised consistently, these measures will make a significant contribution to a sustainable use of wildlife habitats. Conversely, existing wildlife habitat fragmentation can be aggravated by hunting-related measures, e.g. on account of increased hunting pressure in sensitive areas, fences built in order to prevent game from drifting to a neighbouring hunting ground, or large-scale enclosures on unfavourable sites. Owing to the fact that the effects of habitat fragmentation mostly transcend the local level, as a result of the wide-ranging behaviour of many game species, the application of this Indicator may also make sense in hunting areas without fragmentation.

⁴ Essential route: Routes that game is forced to take as a result of specific conditions of the terrain (forest corridors, scarps, gorges, watercourses, etc.) or artificial obstacles (fences, high-capacity roads, walls, settlements, etc.); in other words, terrain-induced bottleneck situations.

Indication and score:	2	Hunting takes into account wildlife habitat fragmentation as far as possible.
	1	Hunting takes into account wildlife habitat fragmentation, although there is room for improvement.
	0	Hunting does not take into account wildlife habitat fragmentation.
	-1	Parts of habitats particularly sensitive on account of fragmentation are preferred hunting areas.
	-3	Hunting-related measures aggravate wildlife habitat fragmentation.
	x	Not applicable, no score (there is no relevant wildlife habitat fragmentation in the assessment unit).

1.1.3.2 Indicator 11: Registration and mapping of important migration routes, wildlife corridors and other essential wildlife routes

Explanation: Knowing about locations, course and use of important regional, supra-regional or cross-country axes of game movement (including those of large predators such as bear (*Ursus arctos*), lynx (*Lynx lynx*) or wolf (*Canis lupus*)) is a prerequisite for being able to establish measures for preserving or reinstalling links between habitats, as well as including migration routes into spatially relevant planning. In particular with regard to transport planning, especially of large-scale or high-capacity transport, it is important to take into account the mobility needs of wild animals as early as possible in order to be able to include them in the route and location planning process, as well as to estimate the need for “green bridges” (routes across railways, motorways, etc.) and artificial game routes in good time. It is mainly the choice of location as well as the right dimension that are decisive as to whether such artificial game routes are effective and accepted by the game. Reliable information on the course of significant long-range routes or historical routes as well as their use by the individual game species remain an indispensable basis of planning. Equally, expert knowledge on migration routes, corridors and other essential routes is a prerequisite for these routes to be entered into spatial plans, considered and treated as legally binding and kept free from construction.

Given their detailed knowledge of their hunting areas and their experience, hunters are on-site experts able to make valuable contributions to identifying migration routes, corridors and essential game routes. Even if no corridors and/or essential routes are found on a specific hunting ground, this is important information. Co-operation with wildlife biologists thus ought to be a major goal. Existing long-range, main and essential routes ought to be mapped as part of the hunting concept, and persons involved in planning activities as well as other land users ought to be informed when necessary. Communication with hunters of neighbouring hunting grounds to this effect is absolutely necessary in order to be able to assess this indicator.

Indication and score:	2	Hunters actively contribute to registering important migration routes, wildlife corridors and other essential routes; if they exist, they are mapped as part of the hunting management plan, and this information is made available to other land users.
	0	Hunters do not actively contribute to registering important migration routes, wildlife corridors and other essential routes.

1.1.3.3 **Indicator 12: Increasing the attractiveness of important migration routes, corridors and other essential routes**

Explanation: There is a wide range of possibilities of making important migration routes, corridors and other essential routes more attractive (in agreement with the land owners):

- On open terrain, routes of movement, corridors and other essential routes can be made more attractive by planting guiding lines (hedges, riparian woods and woody plant communities, shelter belts/wind breaks, planted field and meadow boundaries, set-aside) providing cover and grazing opportunities which can be used by day and night. If wide open stretches are being crossed, their attractiveness may be increased by planting strips of woody communities (providing interim cover).
- Such measures of biotope management can also increase the usability and acceptance of artificial game routes and “green bridges.” It is essential that hunting be prohibited within a minimum radius of approximately 200 m around artificial game routes.
- Greater attractiveness can also be achieved by planting strips of grazing land on agricultural land, and installing watering places (wallows) and salt licks.
- It makes sense in terms of hunting territory management to make use of agri-environmental programmes, such as the instruments described under the Austrian Agri-Environmental Programme (ÖPUL), as well as to co-operate with organisations for nature protection and conservation.

Indication and score:	2	<i>Numerous</i> opportunities of making important migration routes, corridors and other essential routes more attractive have been realised.
	1	<i>Some</i> opportunities of making important migration routes, corridors and other essential routes more attractive have been realised, although there is room for improvement.
	-1	<i>No</i> opportunities of making important migration routes, corridors and other essential routes more attractive have been realised.
	-2	Fragmentation increases on account of hunting.
	x	Not applicable, no score (There are no important migration routes, corridors and other essential routes within the unit of assessment.)

1.1.4 Criterion: Giving consideration to habitat quality and capacity

Explanation: Habitat capacity is, for the purpose of this study, defined as the capacity of a certain habitat to maintain a maximum number of wild animals of a population and/or a biotic community without major alterations in the composition of species and without damage to the habitat concerned (biotic carrying capacity). It results on the one hand from the demands of game on its habitat and, on the other hand, from the availability of food and necessary habitat structures – e.g. cover, watering places, wallows, sleeping places, etc. Along with the nature and number of these biotope elements, their spatial distribution pattern is important. Habitat capacity is a dynamic quantity that may change over the course of time. If habitat capacity changes over the course of a year, we speak of “seasonal habitat capacity.”

1.1.4.1 **Indicator 13:** Active preservation and management of the wildlife habitat

Explanation: Mainly for anthropogenic reasons, the suitability of our wildlife habitats for native wildlife species is limited to some extent. Along with an increased narrowing of habitats on account of the sprawling of settlement and transport areas, areas subject to strong anthropogenic influence in the Wienerwald can also no longer, or only to a limited extent, be used by species sensitive to noise or outward interference. Many of these limitations of habitat quantity and quality may be remedied or even fully removed by way of biotope care and management measures. Agri-environmental programmes such as ÖPUL, the Austrian Agri-Environmental Programme (to promote agricultural production methods compatible with the requirements of protection of the environment, de-intensification and the preservation of natural habitats), as well as subsidising programmes by the provincial hunting associations and some nature protection and conservation associations, give hunters a multitude of opportunities for comprehensive biotope improvement, in particular for threatened and sensitive species (see Definition of Terms). Such measures of biotope improvement should, however, be harmonised with the Biosphere Park Management. Measures of landscape management and preservation, as well as conservation of the cultural landscape in the cultivation zone, may contribute significantly to improving habitat quality, provided they are geared to the habitat needs of wildlife. While measures of biotope improvement as a rule require the consent of the land owner, they mostly need the commitment and active involvement of hunters themselves.

In terms of assessment, it is important for improvement measures not to benefit exclusively species that are economically important or otherwise attractive to hunters (e.g. wallows). These measures ought to be directed in particular to covering habitat requirements of threatened, sensitive or less hunted native game species. Management measures for economically important species must not have a negative impact on threatened species such as may be caused, e.g., by baiting or feeding. Regional lists of current wildlife species, of the potential natural wildlife species inventory as well as of threatened wildlife species (e.g. on the basis of relevant Red Lists) and of protected species (according to nature protection and conservation laws, the Flora-Fauna-Habitats-Directive, Wild Birds Directive, etc.) may be valuable tools in this regard. Measures to improve and preserve wildlife habitats that benefit native game species as a rule also benefit non-hunttable animal species.

Indication and score:	<ul style="list-style-type: none">4 Existing possibilities for improvement and preservation of wildlife habitats are exploited in the form of biotope care and management measures or preservation of intact biotopes; measures are geared mainly to the habitat needs of <i>threatened</i> native wildlife species and the management goals of the biosphere park.2 Existing possibilities of improvement and preservation of wildlife habitats are exploited in the form of biotope care and management measures or preservation of intact biotopes; measures are geared mainly to the habitat needs of native wildlife species.–2 No measures to improve and preserve wildlife habitats are taken; the wildlife habitat reflects considerable ecological deficits.–4 The habitat needs of wild animals are substantially impaired by counterproductive hunting-related measures (e.g. excessive provision for individual species or inappropriate control measures).
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1.1.4.2 **Indicator 14: Handling of wildlife feeding**

Explanation: Providing feedstuff for wild animals at certain feeding spots to supplement the locally available natural feed as well as to influence wild animal behaviour, in particular for avoiding game damage, may in some cases result in a positive balance of advantages and disadvantages in the cultural landscape, but may in different conditions, have results that are on balance negative. Feeding creates dependencies for wildlife as well as costs for the hunters. Given that in the Wienerwald Biosphere Reserve region, severe naturally induced winter bottlenecks in feed occur only in years with very harsh winters, in the long term there is only a limited need for winter feeding. Thus, in the Wienerwald Biosphere Reserve, wildlife feeding should on principle be only carried out restrictively and limited according to the species fed as well as in accordance with the period of time and location where the feedstuff is provided. This Indicator does not refer to providing baits (see Indicator 15; section 1.1.4.3). If feedstuff is provided, it should be adjusted to the season as well as the needs of the species and ought to originate from agricultural production in the Wienerwald Biosphere Reserve. In this context, the reader is also referred to the general remarks on wildlife feeding in connection with the sustainability of hunting.

Indication and score:	1	There is no feeding of wildlife, or feedstuff is provided exclusively to red deer in winter (November to April), or roe deer <i>only for short periods of time in years of exceptionally severe hardship during winter.</i>
	0	Feedstuff is provided for roe deer or roe and red deer in winter (November to April).
	-2	Feedstuff is also provided to species other than red and roe deer.
	-4	Feedstuff is (also) provided during the summer (May to October)

1.1.4.3 **Indicator 15: Limitations on providing baits**

Explanation: “Baiting” is defined as providing minor amounts of attractive feed in certain spots in order to make it easier to meet hunting requirements (“baiting” of game). The amount of feedstuff provided (with the exception of salt) must be limited in terms of quantity, location and timing. Limitations must be made in such a way that baiting, as opposed to feeding, does not constitute a significant contribution to the game’s food intake. The feedstuff must be provided in such a way as to guarantee that it cannot be reached by species other than wild boar.

Indication und score:	1	There is no baits or baits are for wild boars only.
	0	Baits are provided not only for wild boars but also other species.
	-4	Baiting is not limited in terms of quantity, location, timing or nature of the feedstuff provided.

1.1.4.4 **Indicator 16: Avoiding increased competitive pressure upon threatened and sensitive animal species from strongly increasing game populations**

Explanation: Some natural regulatory mechanisms for our wildlife, such as (some) large predators, but also diseases (e.g. rabies), no longer exist or presently have no regulatory effect on game populations (e.g. on account of eradication, inoculation). Without regulating the game populations via hunting, overpopulation would occur in most hunting areas of our cultural landscape, in particular of cloven-hoofed game, but also of fox and stone marten. These would then exert unnaturally high pressure on their food species and thus have enduring impacts on 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, with consideration also for varying seasonal habitat capacities, can largely avoid such negative impacts. Such regulation of regionally common, non-endangered wildlife species is particularly significant if the strong increase in their populations threatens the preservation of populations of endangered and sensitive native animal species. Taking into consideration habitat capacity in the hunting management plan is an indicator of sustainable hunting practice.

A habitat-related example from the Wienerwald is the threatening of nestling owls by the

partially strongly increased wild boar populations. After leaving their nests, flightless young owls often sit for a couple of days on the forest floor and are, during this period of time, helpless prey for foraging wild boar.

Indication and score:	<p>2 Regionally frequent non-threatened game species with strongly increasing populations that directly or indirectly (habitat changes) threaten the continued existence of populations of threatened and sensitive native animal species are selectively regulated in favour of the threatened species (as proved by adequate hunting management strategies in the hunting concept).</p> <p>0 Regionally frequent non-threatened game species with strongly increasing populations that directly or indirectly (habitat changes) threaten the continued existence of populations of threatened and sensitive native animal species are <i>not</i> selectively regulated in favour of the threatened species (<i>no</i> adequate hunting strategy in the hunting management concept).</p> <p>-2 The hunting management strategy applied to regionally frequent not-threatened game species with strongly increasing populations is counterproductive with regard to the preservation of threatened and sensitive animal species.</p>
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1.1.4.5 Indicator 17: Annual productivity of game

Explanation: This Indicator refers to ruminants. The term “productivity” refers to the annual number of young animals per female animal. The productivity is mainly determined by the quality of the habitat and the extent of interference through hunting. Whether or not the game density corresponds to the habitat 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 off-take through hunting exert a significant influence – varying according to the game species – on the productivity. As a rule, we can assume that in case of high (in relation to habitat capacity) population densities of ruminant game, e.g. as a consequence of insufficient hunting, the average productivity will decrease, while it will increase in case of intensive reduction. Changes in annual productivity can thus – provided the preservation of habitat quality is taken into account – give valuable clues about hunting pressure. However, if there is above-average food supply before the rutting season, such as for example in mainly agriculturally dominated cultural landscapes or as a result of intensive feeding, the productivity is no longer a useful indicator of hunting pressure. In most cases, productivity can be estimated with a satisfactory degree of accuracy.

An example illustrates the above. In a roe deer (*Capreolus capreolus*) hunting territory with normal grazing conditions throughout the year, where food supply before pairing 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-year-old does not in

fawn are more common.

Indication and score:	1	Average productivity on account of hunting
	-1	Below-average productivity on account of hunting

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

Explanation: By game we understand those wildlife species that, in accordance with hunting laws, are subject to hunting. The study does not give specific consideration to other wildlife species (e.g. small mammals, insects, song-birds, amphibians, reptiles, fish) as well as micro-organisms that may interact with game.

1.2.1 Criterion: Potential natural wildlife species inventory taking into account the current habitat situation

Explanation: “Potential natural wildlife species inventory” is to be understood as a spectrum of wildlife species representing the currently achievable optimum circumstances in terms of biodiversity and near-natural conditions (see Indicator 18, Section 1.2.1.1), taking into account the irreversible changes that have occurred in the course of the development of the cultural landscape as well as the existing economic and socio-cultural impacts on wildlife habitats that cannot be influenced by hunting. The “potential natural wildlife species inventory” is thus the range of wildlife species possible under the current habitat conditions and acceptable in terms of regional culture, which pertain to the native spectrum of species (autochthonous, typical for the region) of the geographic region concerned. “Native wildlife species” are, in the sense of the potential natural wildlife species inventory:

- those species that have outlasted the latest Ice Age or have immigrated thereafter and before and/or without human intervention⁵;
- recolonising species that used to be native in a certain area whose populations temporarily ceased to exist and which now are returning to their original ranges either without human intervention (immigration of species, e.g. elk/moose (*Alces alces*), brown bear (*Ursus arctos*), wolf (*Canis lupus*), otter (*Lutra lutra*)), or through re-introduction into their original habitats (e.g. Alpine ibex (*Capra ibex*) and Alpine marmot (*Marmota marmota*) within their original ranges of distribution);
- originally native species that have disappeared on account of human influence (eradication, habitat changes).

As far as today’s cultural landscape basically still has habitat potential for the species mentioned, these species are to be considered part of the potential natural wildlife species

⁵ So-called primary native or indigenous species

inventory.

This is not to be confused with “new residents” (alien species, neobiota), which have arrived at a certain territory (in this case, Austria) later than 1492 through direct or indirect human influence⁶ (see Indicator 20, Section 1.2.1.3). With regard to Austria, these are, among huntable wildlife species, e.g. fallow deer, Sika deer, moufflon, wild rabbit, racoon dog, racoon, nutria and wild turkey (Lebersorger & Zeiler, 2005). These species are not considered part of the potential natural wildlife species inventory.

Those animal species that had become established under human influence in pre- and early history up to the end of the Middle Ages (1492) (such as, probably, the brown rat)⁷ are not relevant in Austria in terms of hunting and thus need not to be considered for the purpose of this study. Pheasant (common pheasant, *Phasianus colchicus*) is dealt with specifically within this study (see Indicator 20, Section 1.2.1.3).

By “wildlife species” we refer to those wildlife species that are or were “huntable” or, as “game,” in other ways subject to hunting (e.g. to regulations under hunting laws, hunting practice).

1.2.1.1 **Indicator 18:** Current and potential natural wildlife species list

Explanation: Current wildlife species list: those wild animal species currently present. Potential wildlife species list: all wild animal species that should be represented. 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. Such lists may, for example, be put together by the Biosphere Reserve management.

In order to be able to compare the existing wildlife species inventory with the inventory of potential natural wildlife species, it is necessary to draw up a regional list of the potential natural wildlife inventory. Bearing in mind the anthropogenic influence upon the cultural landscape (agriculture, forestry, settlements and housing, transport rail/road, tourism, etc), the current inhabitability of the modified cultural landscape for the original wildlife species can be evaluated and thus a potential natural list of wildlife species prepared (see Criterion, Section 1.2.1). Wildlife-ecological spatial planning binding in terms of regional culture (see Indicator 36, Section 2.4.2.1) may also provide an important basis for drawing up a list of potential natural wildlife species. Comparing the current with the potential natural wildlife species list allows conclusions as to the completeness of the potential natural species inventory achievable through hunting (in accordance with the given economic and socio-cultural environment), as well as, *inter alia*, an assessment of the impact of hunting on the species inventory.

Drawing up wildlife species lists may require considering comparatively minor variations of habitat conditions. In the Wienerwald Biosphere Reserve, for example, differing site-specific conditions of the limestone and flysch Wienerwald regions result in the predominance of differing vegetation types in both regions, which, in turn, may entail differences in the potential natural and the current composition of wildlife species. In addition, we can assume that the intended development of forest ecosystems as near-natural as possible in core

⁶ “New residents” among animals are also termed “neozoes.”

⁷ termed “archaeozoa”

zones will change the habitat conditions prevailing in these zones (returning towards a more near-natural forest situation), which in certain cases will have an impact upon the potential natural as well as, possibly, on the current wildlife species inventory. It thus makes sense to examine regional wildlife species lists on a small scale and, if necessary, adapt them to the local habitat conditions and the inventory of wildlife species present in the respective location. In the Wienerwald Biosphere Reserve, this is desirable at least for core zones and hunting regions outside core zones (manipulation and development zones).

Drawing up and updating wildlife species lists requires regular monitoring, in particular of endangered, sensitive and recolonising species. Hunters can contribute to this by way of systematic observation and recording in combination with their knowledge of the local habitat conditions.

Indication and score:	4	There is a current and a potential natural wildlife species list, which <i>takes into consideration local conditions</i> , as well as systematic monitoring for the purpose of updating the list.
	2	There is a current and a potential natural wildlife species list as well as systematic monitoring for the purpose of updating the list.
	1	There is a current and a potential natural wildlife species list but no systematic monitoring.
	0	There is no current and potential natural wildlife list, but hunters prove that they <i>are planning</i> to draw up such lists.
	-2	There is no current and potential natural wildlife species list, <i>nor are hunters planning</i> to draw up such lists.

1.2.1.2 Indicator 19: Dealing with recolonising species (in accordance with the potential natural wildlife species inventory)

Explanation: The term “recolonising species” refers to wildlife species native to a certain area whose populations temporarily ceased to exist and which, with or without human influence, are returning to inhabit their original habitats, whether by re-immigration (e.g. Eurasian otter (*Lutra lutra*), beaver (*Castor ssp.*)), or by selective re-introduction (e.g. ural owl (*Strix uralensis*)). The existence of certain wildlife species within a habitat gives clues as to anthropogenic impacts on the wildlife habitat, including hunting. Threatened and sensitive wildlife species need special mention in this context, including capercaillie (*Tetrao urogallus*) as well as ural owl, an animal somewhat shy by nature, which are good bio-indicators of the wildlife ecological habitat quality and hunting impacts on it. The assessment should consider not only whether these species are not impaired by hunting, but also whether predators whose populations have grown unnaturally large 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 favour of rare recolonising species (as a rule red-listed species), without risk to the recolonising species (e.g. through traps and snares). It is worth remembering that “benefit” from optimising the potential wildlife species inventory may also be generated through some recolonising native wildlife species displacing other less desired species. The extinction of the (non-native) musk rat (*Ondatra zibethica*) as a result of the renewed spread of otter (*Lutra lutra*) is an example.

Supporting a potential natural wildlife species through hunting ought to aim at creating

conditions that allow populations of the respective species to survive over an extended period of time in harmony with regional culture, without impairing the viability of other native species nor their long-term sustainable use for hunting.

Indication and score:	<p>2 There is support for viable populations of all recolonising wildlife species (herbivores, carnivores, etc.) corresponding to the potential natural wildlife species inventory .</p> <p>1 All recolonising wildlife species (herbivores, carnivores, etc.) corresponding to the potential natural wildlife species inventory are tolerated, and there is support for viable populations of sensitive wildlife.</p> <p>0 All recolonising wildlife species (herbivores, carnivores, etc.) corresponding to the potential natural wildlife species inventory are tolerated.</p> <p>-2 Recolonising wildlife species (herbivores, carnivores, etc.) corresponding to the potential natural wildlife species inventory are not tolerated.</p> <p>x Not applicable, no score (current and potential natural wildlife inventory is not fully known.)</p>
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1.2.1.3 Indicator 20: Dealing with wildlife species not included in the potential natural wildlife species inventory

Explanation: For various reasons, non-indigenous species (non-native species, alien to the region or fauna) may appear in habitats: by way of deliberate introduction, unintentional introduction, directly or indirectly (e.g. habitat change) anthropogenically induced immigration, escape from enclosures, preserves, or fur farms, etc. As compositions of species have, for natural or anthropogenic reasons, always been subject to change, a more exact definition is called for, as well as setting a time limit starting from which a newly appearing species may be defined as “non-indigenous” in the sense of the potential natural wildlife species inventory. “Neobiota in Österreich” (Essl & Rabitsch, 2002), a study published by the Austrian Environment Agency, brings up to date the scientific debate regarding the situation in Europe: Non-indigenous species (“new residents”) or neobiota are defined as species that have arrived in Austria later than 1492 through direct or indirect human influence. 1492 marks the discovery of the American Continent by Christopher Columbus and thus marks a start of intense intercontinental trade, resulting in a strong increase in the number of intentionally or unintentionally introduced species. This point of reference is also approximately the time of relatively reliable documentation of faunal changes. As nature itself is unaware of such thresholds, this date is simply a matter of scientific agreement. The same definition also forms the basis of the Austrian Action Plan on Invasive Alien Species (FEDERAL MINISTRY OF AGRICULTURE, FORESTRY, ENVIRONMENT AND WATER MANAGEMENT, 2004). Those animal species that have become established under anthropogenic influence in pre- and early history up to the end of the Middle Ages (1492) are not relevant in Austria in terms of hunting and thus need not to be considered for the purpose of this study.

For reasons of lack of adaptation, higher competitive potential, lack of natural enemies and introduction of diseases, non-native species often crowd out native species and, at the same time, have a lasting impact on the wildlife habitat that is difficult to project at an earlier stage.

Tolerating these species in terms of hunting or selectively supporting them is thus not in the interest of a potential natural flora and fauna species inventory which aspires to be as complete as possible. Documents of the treatment of non-native species are, for example, trophies (fur/racoon (*Procyon lotor*), horns/mouflon (*Ovis ammon musimon*), etc.) or, for that matter, measures of biotope management (e.g. feeding of moufflon).

Some wildlife species were, more or less individually, introduced for hunting purposes earlier than the above defined period, but, according to current knowledge, had not become established in the wild.⁸ Thus, for example, the common pheasant (*Phasianus colchicus*), whose origins are in Asia, became naturalised in Southern Europe as early as in Roman times, and was introduced in some Central and Western European regions as hunting game around 1000 A D (Dvorak et al., 1993). First references to its existence in Austria date back to the 15th and 16th centuries. It is assumed, however, that these were feral specimens rather than free-living birds (Glutz v. Blotzheim & Bauer, 1973). It was not until much later that the species became established in Austria as a consequence of strong support through hunting (management and care, regular new releases). Today, pheasants have free-breeding populations able to maintain themselves at least over intermediate periods of time in climatically favoured lowlands without external management (Schuster 2005). According to the above definition, the common pheasant is to be classified as a non-indigenous “new resident” in Austria (Lebersorger & Zeiler, 2005).

In these circumstances, the way the pheasant is dealt with in terms of sustainable hunting ought to be evaluated in an area-specific manner. In those Austrian wildlife habitats where its populations are able to survive on their own, the pheasant may be evaluated as a potential natural wildlife species. In the sense of the present Criterion, in practice, attention should be given to abstaining from supporting pheasant through the practice of hunting in sensitive areas where undesired competition vis-à-vis threatened native species (e.g. vis-à-vis partridge (*Perdix perdix*) or, in some locations, black grouse (*Tetrao tetrix*)). If wildlife-ecological expert opinions, etc., prove that there is undesired competition with native species, pheasants ought not to be tolerated in the relevant areas. Where pheasant populations are not able to maintain themselves without measures of care and management or stocking, this species cannot be classified as potentially natural. Supplementing or increasing the stocks of pheasants for reasons of hunting and/or breeding and releasing pheasants for the purpose of more or less immediate hunting in hunting areas would have to be evaluated according to Indicator 27 “Introduction of non-native wild animals” (see Section 1.3.2.1) and/or Principle “The natural genetic diversity of game species is preserved and supported by means of appropriate hunting practices” (see Section 1.3). This is also true for any other wildlife species of similar status.

The introduction of non-native sub-species or habitat-specific sub-species (site races) of a native wildlife species (e.g. Siberian roe deer or North-Caucasian roe deer; transfer of lowland red deer *Cervus elaphus* ssp. "Auhirsch" to mountain regions) is to be evaluated according to Indicator 27: “Introduction of non-native wild animals” (see Section 1.3.2.1). The way non-native wildlife species are to be dealt with is defined in the hunting concept and documented by written records of the measures taken.

⁸ In order for a species to be classified as established there has to be proof of at least three generations reproducing freely over a minimum period of 25 years.

Indication and score:	<p>2 Only wildlife species contained in the potential natural wildlife species inventory are represented.</p> <p>1 (A) wildlife species not contained in the potential natural wildlife species inventory (is) are represented, despite hunting-related counter-measures.</p> <p>0 (A) wildlife species not contained in the potential natural wildlife species inventory (is) are represented and (is) are tolerated in terms of hunting, although not selectively fostered.</p> <p>-1 (A) wildlife species not contained in the potential natural wildlife species inventory is (are) represented and is (are) tolerated in terms of hunting, although not selectively supported, despite proven negative impacts on one or several native wildlife species.</p> <p>-2 (A) wildlife species not contained in the potential natural wildlife species inventory (is) are represented and selectively supported in terms of hunting.</p> <p>x Not applicable, no score (current and potential natural wildlife species inventory is not fully known.)</p>
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1.2.2 Criterion: Hunting is sensitive to the behaviour of wild animals

1.2.2.1 **Indicator 21:** Giving consideration to the undisturbed life cycle of wild animals

Explanation: Hunting is rarely regarded as a source of disturbance, in particular by the hunter him- or herself. Hunting pressure, however, often has a strong impact on wildlife behaviour and thus indirectly upon its habitats. In cloven-hoofed game, for example, strong hunting pressure causes, among other effects, a reduced tolerance of open grazing areas (which in most cases are the best ones), which results in increased browsing damage of the forest vegetation that provides cover. The selective support of an undisturbed life cycle for wildlife through hunting should be documented in the hunting plan. In small-game areas (hare, pheasant, etc.), such considerations might take effect e.g. by limiting hunting activities to a few days per hunting year. The designation of low-interference zones should be geared to the zoning concept of the Biosphere Reserve. Particularly in core zones, there should be as little as possible disturbance of wild animals. From the point of view of hunting, this can be realised particularly well if hunting can be concentrated outside core zones, with core zones mainly serving the purpose of rest.

Indication and score:	<p>4 The undisturbed life cycle of wild animals is supported on more than 90 % of the area by exerting as little hunting pressure as possible (e.g. interval hunting, short hunting periods). The designation of low-interference zones is harmonised with the zoning concept of the Biosphere Reserve (<i>wide areas in core zones remain largely undisturbed</i>)</p> <p>2 The undisturbed life cycle of wild animals is guaranteed <i>on more than 90 % of the area</i> on account of low hunting pressure (e.g. interval hunting, short hunting periods).</p> <p>1 The undisturbed life cycle of wild animals is guaranteed <i>on a majority (> 50 %) of the area</i> on account of low hunting pressure.</p> <p>0 The undisturbed life cycle of wild animals is guaranteed <i>only on parts (< 50 %) of the area</i> on account of hunting pressure.</p> <p>-2 The undisturbed life cycle of wild animals is <i>not guaranteed on a majority (> 75 %) of the area</i> on account of extremely high hunting pressure.</p>
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1.2.2.2 **Indicator 22: Limiting hunting of wildlife during the night (“night hunting”)**

Explanation: Night hunting causes an additional disturbance of wildlife even during the night hours, thus impacting their use of space and their feeding rhythm, which may result in game damage of both forest vegetation and in settled areas. Frequent night hunting also makes it more difficult to hunt the species as the game’s shyness increases. In addition, night hunting makes selective hunting of wildlife more difficult, which may result in hunting “wrong” species – possibly even species for which the season is closed or non-huntable species. On the other hand, the necessary regulation of some species, in particular wild boar, requires night hunting (e.g. at a bait site) in some areas. This is mainly true for areas of game damage with concentrated hunting (wild boar); these areas are exempt from limitation of the number of night hunting days (normally a maximum of 40 night hunting days per year; see Indication and score). In areas with wildlife species particularly sensitive to disturbances (e.g. red deer) as well as in hunting areas remote from settlements (where it is easy to opt for driven hunting during the day), it is, however, advisable to cease night hunting entirely, or to introduce a greater limitation. The number of night-hunters should also be adjusted according to the size of the hunting territory.

Indication and score:	<p>2 There is no night hunting of wildlife (in particular in red deer areas and hunting territories remote from settlements), or only wild boars and red fox are hunted during the night, in which case night hunting is limited to a maximum of 40 hunting days per year (with the exception of areas of concentrated hunting).</p> <p>–1 Only wild boars and red fox are hunted during the night. Night hunting is not limited in terms of time.</p> <p>–4 Also other wildlife species are hunted during the night.</p>
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1.2.2.3 Indicator 23: Giving consideration to the reproductive biology of threatened and sensitive game species

Explanation: Poor timing when hunting an individual game species, or a particular age-sex class, may have an enormous impact on reproduction (e.g. in the case of capercaillie (*Tetrao urogallus*): hunting of the hens). If hunting takes into account sensitive stages of the reproductive biology of certain threatened and sensitive wildlife species, this is to be evaluated as a sustainable approach to hunting. The emphasis is here on threatened and sensitive game species as found in the game species inventory or on a separate list.

This does not refer to the pairing season of cloven-hoofed game species, 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 during the reproductive periods of other species. Giving specific regard in terms of hunting to the sensitive factors of the reproductive biology of game species should be documented in the hunting management plan.

Indication and score:	<p>2 Hunting takes into account the critical factors of the reproductive biology of sensitive game species by way of spatial and/or time planning.</p> <p>1 Hunting takes into account the critical factors of the reproductive biology of sensitive game species to some extent by way of spatial and/or time planning.</p> <p>–2 Hunting does not take into account the critical factors of the reproductive biology of sensitive game species.</p>
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1.2.2.4 **Indicator 24:** Coordination of hunting practises across hunting grounds

Explanation: Wildlife species are not aware of the boundaries of hunting territories. The hunting of wildlife ought therefore 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 (*Cervus elaphus*), wild boar (*Sus scrofa*), 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 supported by forming hunting communities, but also, provided relations between neighbours are good, on a less formal basis, simply by agreement. In the Wienerwald Biosphere

Reserve, hunting currently principally takes place in all three zones (development, cultivation and core zone). The establishment of wildlife rest zones across hunting territories, but also of organised hunting across hunting territories (e.g. driven hunts) should be considered particularly sustainable, especially when core zones are involved. Any form of hunting planned across hunting territories ought to be documented in writing.

Indication and score:	<p>4 There are <i>written</i> hunting agreements across hunting grounds for wide-ranging wildlife species. They are in line with the <i>zoning concept of the Biosphere Reserve</i> and there is <i>proof that they are being observed</i> (confirmation by all hunting units involved).</p> <p>2 There are hunting agreements across hunting grounds for wide-ranging wildlife species (e.g. migratory bird species, red deer, wild boars, etc.)</p> <p>1 There are no hunting agreements across hunting grounds, even though the owner of the hunt⁹ would support them.</p> <p>-1 There are no hunting guidelines across hunting grounds, nor does the owner of the hunt support such guidelines.</p> <p>-2 There are no hunting guidelines across hunting grounds, and the owner of the hunt prefers no hunting strategy across hunting grounds.</p>
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1.3 Principle: The natural genetic diversity of game species is preserved and enhanced by means of appropriate hunting practices

1.3.1 Criterion: There are no hunting-related limitations to the preservation and enhancement of the natural genetic variability of wildlife species

1.3.1.1 **Indicator 25:** Existence of aims relating to the aesthetics of hunting trophies in hunting guidelines

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

⁹ The hunting owner of a proprietor's hunt or the tenant(s) of a proprietor's or co-operative hunt.

Indication and score:	<p>2 Hunting guidelines do not contain aims relating to the aesthetics of hunting trophies.</p> <p>–2 Hunting guidelines contain aims relating to the aesthetics of hunting trophies.</p> <p>x Not applicable, no score (criterion cannot be applied because regulations under hunting law demand e.g. that hunting follow criteria relating to the aesthetics of trophies.)¹⁰</p>
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1.3.1.2 Indicator 26: Selective hunting of wild animals with certain natural characteristics

Explanation: Animals evolved for their outward appearance, such as horns and antlers, as well as modes of behaviour, to have a variety of functions. For example, the form of horns or antlers is used to deter predators, 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 (*Capreolus capreolus*), chamois (*Rupicapra rupicapra*), and red deer (*Cervus elaphus*), developed mainly in the second half of the 19th and the first half of the 20th century. With regard to red 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 perspective. Narrow horns or antler spans, for example, are advantageous in a fight. 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 entail a danger of reducing the genetic diversity of the game population ought to be avoided.

Another risk from “selective hunting of wildlife” exists for grouse species. In the spring hunting of capercaillie (*Tetrao urogallus*), 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 the alpha cocks – the strongest cocks – that are the hens’ preferred mating partners. Particularly for capercaillie, the hunting of alpha cocks before hens are covered selectively prevents reproduction.

Whether the way hunting is selective, in the sense above, can be investigated, for example, by examining trophies, mounted specimens, etc., gathered over a long period of time.

¹⁰ See also comment on hunting law in the Final Report, section “Limitations of Application”

Indication and score:	<p>2 Forms of horns and antlers, mounted specimens, etc., gathered over a hunting period of several years, do not indicate consistent selective hunting of wildlife according to specific natural characteristics.</p> <p>–2 Forms of horns and antlers, taxidermal specimens, etc., gathered over a hunting period of several years, indicate consistent selective hunting of wildlife according to specific natural characteristics.</p> <p>x Not applicable, no score (criterion cannot be applied on account of regulations under hunting law demanding e.g. selective hunting.)¹¹</p>
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1.3.2 Criterion: Native wildlife populations are not altered by the introduction of non-native wild animals

1.3.2.1 Indicator 27: Introduction of non-native wild animals

Explanation: “Non-autochthonous” (“non-native”) refers to those species, sub-species or habitat-specific sub-species (site races) that are or were not indigenous to a certain area (species alien to a region or fauna). This comprises all wildlife species not contained in the potential natural wildlife species inventory of a wildlife habitat (see Criterion, Section 1.2.1). It refers in particular to wild animals of those species which, according to agreement among a majority of the relevant scientific community, arrived in Austria after 1492 – the year of reference marking the discovery of the American continent – upon direct or indirect anthropogenic influence (see Essl & Rabitsch, 2002, 2005; Federal Ministry of Agriculture, Forestry, Environment and Water Management 2004; see also Explanations/Indicator, Section 1.2.1.3). The present Indicator does not refer to the re-establishment of originally indigenous species of the potential natural wildlife species inventory that had become extinct for a certain period of time (see Indicator, Section 1.2.1.2). The introduction of non-native wildlife occurs mainly in two ways:

1. Introduction (for the first time or re-stocking of an introduced population) of a non-native wildlife species (mouflon (*Ovis ammon musimon*), fallow deer (*Dama dama*), Sika deer (*Cervus nippon*), chukar partridge (*Alectoris chukar*), etc.) (see Indicator, Section 1.2.1.3),
2. Introduction of non-native sub-species or habitat-specific sub-species (site race) of a native wildlife species (e.g. maral deer, Siberian or North-Caucasian roe deer in Central Europe; *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, transmission of new diseases and parasites), which is hard to assess before it has occurred.

With regard to 2., it ought to be noted that particularly these introduced wildlife species

¹¹ See also comment on hunting law in Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, section “Limitations of Application”

demonstrate that in the history of wildlife development, sub-species or site races have developed 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. Any blending of genetic material through hybridisation of sub-species causes an eventually irreversible genetic alteration and may entail the loss of locally native races and even of native species (e.g. on account of changed mating periods of winged game) (Lebersorger & Zeiler, 2005). 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.

Any form of introduction of non-native wildlife species is thus to be avoided in the quest for sustainable preservation and fostering of (natural) genetic variability of the native wildlife.

Indication and score:	1	No non-native wildlife species are introduced.
	-4	Non-native wildlife species are introduced.

2 ECONOMY

Explanation: For the purpose of this study, the economic sustainability of hunting is dealt with mainly from the perspective of the individual hunting operation and/or hunting area. Aspects transcending operational limits, i.e. macroeconomic aspects, are only included in so far as they can be immediately influenced by the individual hunting operations.

An economic assessment of hunting may produce differing results, depending on whether the assessment is made from the perspective 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 from the perspective of the person “owning the right to hunt” (lessor of the hunt, land owner, owner of a proprietor’s hunt). Even though the assessment is basically made from the viewpoint of the person permitted to hunt, an assessment, particularly with regard to economic criteria and indicators, may also be interesting from the perspective of the person owning the right to hunt. If the sustainability assessment produces differing results for the two viewpoints in terms of individual economic indicators, the lower rating shall count. If the person permitted to hunt and the person owning the right to hunt are not identical, assessments from both points of view are to be made for those criteria that produce differing results. This applies in particular to criteria pertaining to Principles 2.1 and 2.4.

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

Explanation: The applicability and assessment of some Indicators within this principle depend to a large extent on the individual point of view. For an economic assessment of hunting, a lessor and/or land owner will thus, for example, focus on other balance-sheet entries than a tenant or hunting customer. What for one group of actors becomes relevant as return or yield, the other group will charge as an expense. What is more, realistically, the result of economic balancing in a strictly monetary sense can rarely produce positive results for the tenant or hunting customer. For these groups of persons, it is as a rule much rather aesthetic values, such as the subjective recreational value of hunting, which are decisive as to whether the material costs are considered reasonable and justified, while the lessor will focus much more on a financially positive balance-sheet. In order to respond better to the differing subjective viewpoints of the two groups of hunting actors, Indicator 30: Cost/income ratio (applies to lessors and owners) and Indicator 31: Expense/subjective benefit ratio (applies to hunting tenants and hunting customers) are to be assessed individually by one of the relevant groups of persons. Indicator 30: Cost/income ratio (applies to lessors and owners) is foreseen for lessors and land owners, and assesses the material cost/income ratio. Alternatively, Indicator 31: Expense/subjective benefit ratio (applies to hunting tenants and hunting customers) is meant to be evaluated by tenants and hunting customers (hunters by permission of land owner / game tenants who pay per hunt), and includes aesthetic aspects in the ratio of expenses and subjective benefit. Owners of a proprietor’s hunt who hunt on their own hunting ground will rather use Indicator 31: Expense/subjective benefit ratio (applies to hunting tenants and hunting customers) for their self-assessment. Indicator 32 (see Full Version) evaluates hunting-related measures to enhance the market-value of hunting and is, for similar reasons, mainly relevant for persons owning the right to hunt (lessors/land owners).

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

2.1.1.1 Indicator 28: Existence of a marketing strategy for hunting in the Biosphere Reserve

Explanation: For income from hunting it is of significance whether the owner of a hunt gives consideration to the form in which he or she will market game, hunting access, bags, trophies, etc. – whether and in what form they are sold or used for the owner’s own purposes, for example. The marketing of game is assessed by means of Indicator 29 (Section 2.2.1.1.2) and is not included in the application of the present Indicator. The use of the “Biosphere Reserve” for marketing purposes also in the field of agriculture is best achieved by way of a (future) quality brand (label/product definition) for “hunting in a biosphere reserve”; regardless of this aspect, however, the biosphere park status of the Wienerwald region, however, may also be used for the purpose of marketing. Both aspects may contribute significantly to the success of a hunting operation’s marketing strategy, as well as foster regional identity in the sense of the biosphere reserve concept.

Indication and score:	2	There is a marketing strategy for hunting leases, hunting access, trophies, etc.; the biosphere reserve concept is used for the purpose of marketing.
	1	There is a marketing strategy for hunting leases, hunting access, trophies, etc.
	0	There is no marketing strategy for hunting leases, hunting access, trophies, etc.

2.1.1.2 **Indicator 29:** Marketing of regional game products

Explanation: The consumption of game establishes an indirect link between a significant share of the non-hunting population and hunting. A targeted marketing strategy for game can contribute to create a positive image for game as well as give hunting broader acceptance within society, and thus a more sustainable future. In doing so, the focus is on the quality of the products and the health of customers. The product should distinguish itself from mass products in supermarkets. A promising option would be the voluntary renouncing of lead-containing hunting ammunition (both small shot and bullets) and (where feeding cannot be avoided) using feedstuff produced in the biosphere reserve only, to give two examples. This would guarantee particularly high game quality to the consumer. Creating a regional game label for the Wienerwald Biosphere Reserve would allow to transport such special qualities, increase the consumers’ identification with the product and its provenance as well as promote sustainable regional development.

Indication and score:	<p>4 There is a recognised quality brand (“label”) for regional game products, which is specifically used for marketing at prices above the regional wholesale price, or the hunter supports the creation of such a quality brand.</p> <p>1 Game products are marketed via different channels at prices above the regional wholesale price (e.g. direct marketing).</p> <p>–2 Game products are not marketed at prices above the regional wholesale price.</p> <p>x Not applicable, no score (game is used for hunters’ own purposes only).</p>
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2.1.1.3 **Indicator 30: Cost/income ratio (applies to lessors and owners)**

Explanation: This Indicator is to be evaluated by lessors and/or owners of a hunting ground (land owners, non-hunting owners of a proprietor’s hunt). From the point of view of the lessor, “cost/income ratio” summarises all monetary expenses and income of a hunting operation, including the expenses of time and work immediately in connection with the tenancy relationship. In this case, aesthetic aspects are assessed.

“Cost” refers to all expenses of money, material and time. This comprises e.g. additional expenses on account of game damage (game protection measures for cultivations, restoration of game damage), losses of agricultural or forestry returns on account of game damage, potential personnel costs, expenses for communication (with the tenant) and organisation (drafting of contracts, checking and control, etc.). Depending on the nature of the tenancy or hunting contract, costs for setting up and maintenance of installations on the hunting ground as well as infrastructure (e.g. paths), feeding costs, etc., may accrue. “Income” refers mainly to: returns from tenancy, hunting, compensation for game damage.

Indication and score:	<p>2 The cost/income balance of a hunting period is positive.</p> <p>1 The cost/income balance of a hunting period is even.</p> <p>0 The cost/income balance of a hunting period is slightly negative.</p> <p>–1 The cost/income balance of a hunting period is strongly negative.</p> <p>x Not applicable, no score (assessor is not a lessor/land owner but tenant or hunting customer.)¹²</p>
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2.1.1.4 **Indicator 31: Expense/subjective benefit ratio (applies to hunting tenants and hunting customers)**

Explanation: This Indicator is to be evaluated by tenants of a hunting area or hunting customers (hunters by permission of land owner/game tenant who pay per hunting, stalking customers, etc.). Owners of a proprietor’s hunt who hunt on their own hunting ground will

¹² In this case, the assessment under indicator 31 applies.

also use this Indicator rather than Indicator 27 (see Section 3.2.1.1.2) for their self-assessment.

From the perspective of game tenants and hunting customers, the cost/benefit ratio is produced by drawing the economic and aesthetic balance of all inputs and gains (material aspects), and subjective benefits. In evaluating the subjective benefit, it is mainly the aesthetic gain (immaterial values) along with monetary returns that counts and is to be weighed against the costs and expenses.

"Expenses" comprise costs for: tenancy and/or hunting license, taxes and fees, hunting permit, costs of feeding, installations on the hunting ground, compensation for game damage, personnel costs, if applicable, equipment, travel expenses, in some cases hunting time (e.g. to meet hunting requirements), organisation and communication (with the lessor), etc.

Material and immaterial "benefit" summarises: subjective recreational value (enjoying, nature experience, in part time spent for hunting, etc.), game and proceeds from game, returns from selling huntings, image values, businesses concluded, etc.

As long as the sum of aesthetic gain and economic income outweighs the expenses of money, material and time, and subjective benefit is drawn from hunting, the balance is positive from the perspective of the tenant and/or hunting customer.

Indication and score:	2	The economic and aesthetic expense/benefit balance of the hunting period is positive.
	1	The economic and aesthetic expense/benefit balance of the hunting period is even.
	0	The economic and aesthetic expense/benefit balance of the hunting period is slightly negative.
	-1	The economic and aesthetic expense/benefit balance of the hunting period is strongly negative.
	x	Not applicable, no score (assessor is not a hunting tenant/hunting customer but lessor/land owner.) ¹³

2.1.2 Criterion: The value of hunting is maintained and/or increased by the practice of hunting

2.1.2.1 Indicator 32: Hunting-related measures to increase the market value

Explanation: The assessment of this Indicator makes sense in particular from the perspective of persons owning the right to hunt (land owner, lessor, owner of a proprietor's hunt).

Apart from the influence of the average local market value (site-related factors such as proximity to a city or attractive surroundings of a biosphere reserve), the assumed or actually

¹³ In this case, the assessment under indicator 30 applies.

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 scope for hunting (how can it be reached; how well is it developed and accessible; 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" – looking particularly well after (paying) guest hunters – for example, can raise the image and thus the value of a hunt. The selective encouragement of less common game species, from which 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, hunting seats, hides and blinds, feedings, if required) is in most cases a relevant factor for a hunt's market value. It is worth noting that hunting-related measures that contribute to increasing the market value may at the same time have negative impacts in terms of ecological requirements of sustainability – e.g. over-intensive game management resulting in unnaturally high game populations with impacts on the vegetation unacceptable in terms of regional culture.

Indication and score:	2	The market value of the hunt is very high on account of far-reaching hunting-related measures (> 30 % above the average of hunting grounds in the Wienerwald region)
	1	The market value of the hunt is slightly above the regional average (10 to 30 % above the average of hunting grounds in the Wienerwald region)
	0	The market value of the hunt corresponds to the regional average (–10 % to +10 % above/below the average of hunting grounds in the Wienerwald region); no hunting-related measures are taken for its maintenance and/or enhancement.
	–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 in the Wienerwald region).
	x	Not applicable, no score (assessor is not a lessor/land owner but a tenant/hunting customer.)

2.2 Principle: Efficiency and minimum disturbance of wildlife species is an objective of hunting

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

2.2.1.1 Indicator 33: Existence of an economically sound, time- and area-specific hunting plan

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

For the efficiency of hunting, it is important that the hunting strategy contain knowledge of the seasonal locations of each game species as well as the time when it can be best targeted, thus minimising the time spent on hunting. However, this should not conflict with planned periods of concentrated hunting (e.g. for controlling damage).

The planning of time and area-specific hunting should be documented in the hunting plan as an integral component of an economically sound hunting strategy. The hunting seasons should be given in hunting lists. The location of every single bagged animal should be marked on a map of the hunting territory, separately for each hunting year. For driven hunting (small game), the relevant territories should be marked.

Indication and score:	2	A hunting strategy for time- and area-specific hunting exists for all game species hunted; bagged animals are continuously documented and evaluated as to whether the respective principle of sustainability is observed.
	1	A hunting strategy for time and area-specific hunting exists for all game species hunted; however, the documentation and evaluation of bagged animals is deficient.
	0	A hunting strategy for time and area-specific hunting exists only in fragments and not for all game species hunted; bagged animals are not evaluated, or only evaluated for animals bearing trophies.
	-1	There is no hunting strategy for time and area-specific hunting; bagged animals are not evaluated.

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

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

2.3.1.1 **Indicator 34:** Giving consideration to susceptibility to game damage

Explanation: Game damage can be avoided by orienting hunting according to the susceptibility of farmland and woodland, fishery cultures and other natural sites and assets (e.g. meadows rich in orchids) to game damage. This should be documented by integrating foreseeable impacts of agriculture, forestry and fisheries on habitats in the hunting plan, paying attention to where and concentrating hunting where such impacts will be made.

As core zones are free of agriculture and forestry, they are unaffected by economically-related game damage. The present Indicator can thus not be applied to core zones.

Indication and score:	4	The hunting strategy and its practical implementation can be proved to give <i>best possible attention</i> to the susceptibility of agriculture and forestry lands to game damage.
	2	The hunting strategy and its practical implementation can be proved to give attention to the susceptibility of agriculture and forestry lands to game damage.
	0	The hunting strategy only sometimes pays attention to the susceptibility of agriculture and forestry lands to game damage or is only in some cases implemented in this way.
	-2	The hunting strategy pays no attention whatsoever to the susceptibility of agriculture and forestry lands to game damage.

2.4 Principle: Creating synergies with other economic activities is an objective of hunting

2.4.1 Criterion: Hunting economically conforms with other anthropogenic forms of use (“economic unity“)

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 wild animals. 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, such as:

- By selective, concentrated hunting, forest regeneration measures 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 forest management activities.
- In agricultural areas, leaving vegetation on set-aside for a longer period of time can help game to get over the winter. Considerate timing of mowing/cropping helps to avoid losses of young mammals or bird nests and broods. In return, the hunter is able to minimise damage to agricultural lands by following a good hunting strategy.
- Harmonising hunting with regional tourism allows important concerns of both hunting and tourism to be addressed in a co-ordinated manner (see also Indicator, Section 2.4.1.1).

2.4.1.1 **Indicator 35: 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.

Indication and score:	2	Other users of the wildlife habitat confirm an optimised common economic policy.
	1	Other users of the wildlife habitat confirm an optimised common economic policy but can see scope for improvement
	0	There is no confirmation by other users of the wildlife habitat of an optimised common economic policy
	-1	Other users of the wildlife habitat consider hunting to be counterproductive for them

2.4.2 **Criterion: Interdisciplinary optimising of planned changes in the wildlife habitat**

Explanation: Most of the changes in our wildlife habitats with far-reaching impacts upon the area are not related to hunting (road and railway construction, settlements and housing development, tourism infrastructure, construction of power plants, etc.). With regard to many of these changes and their area-related impacts, considering wildlife-ecological aspects at an early stage of planning might minimise detrimental effects upon our wildlife habitats, or even avoid them altogether. Interdisciplinary spatial planning that looks upon wildlife ecology/hunting as an equal planning partner allows for optimising planned changes in the wildlife habitat.

2.4.2.1 Indicator 36: Commitment of hunters to interdisciplinary wildlife-ecological spatial planning (WESP)

Explanation: Wildlife-ecological spatial planning is an instrument of integrated management of wildlife populations and habitats to re-establish a balance between the habitat needs of wild animals, the capacity of ecosystems for wildlife populations, and the various different user interests on the part of society (hunting, agriculture and forestry, tourism, general spatial planning). Along with the preservation of habitats of native wildlife species and guaranteeing their sustainable use, avoidance of user conflicts and unacceptable game-induced forest damage remain ulterior goals. WESP may be carried out on the basis of legal provisions, on a voluntary basis on the regional level, as well as on the basis of individual initiative on the part of the hunter. Integrating WESP into general spatial planning ought to be an objective.

In most cases, however, WESP has to be assisted as well as required by the hunters. Aspirations to this effect on the part of owners of a hunt and hunters in general should be documented.

Indication and score:	4	Wildlife-ecological spatial planning (WESP) exists, and hunters actively support its implementation.
	2	WESP does not exist, but hunters can prove their aim to establish it.
	-1	WESP does not exist, nor is there any indication that hunters aim at establishing it.
	-3	WESP exists, but hunters do not actively support its implementation.

2.4.2.2 **Indicator 37:** Commitments of hunters regarding plans and projects that have an impact upon habitats

Explanation: On account of their expert knowledge of the hunting ground, hunters should be called upon to contribute their territorial and wildlife-ecological expertise to plans and projects that have a potential to impair wildlife habitats. This can contribute significantly to reducing or avoiding negative impacts on wildlife ecology as well as on the hunting operation, practical hunting and the economic and aesthetic value of hunting.

Road construction projects serve as an example in this context: Along with their barrier effects on wildlife ecology, they may also result in a dissection of hunting grounds, economic devaluation of separated parts of hunting territories, and a reduction of the recreational value of hunting. When it comes to building new roads, the local community of hunters is more often than not the prime source of information for assessing the impact of projects upon hunting and wildlife ecology (see also Indicator, Section 1.1.3.2). Citizen participation as part of environmental impact assessments provides further formalised opportunities to comment on projects and influence them to some extent. Legally established ecological compensation and mitigation measures to reduce negative impacts of projects provide another basis for considering hunting-related aspects (artificial game routes, planting of vegetation structures, creation of substitute biotopes, etc.) Consolidation of properties in the course of agricultural planning, protective forest restoration plans, forest development plans, larger-scale clearing/deforestation and afforestation, forest-pasture regulation projects, designation of industrial and commercial areas, restoration of water courses or nature protection and conservation projects are further examples for habitat-changing measures which give scope

for involvement/commitment of persons owning the right to hunt and persons permitted to hunt, which makes sense in everyone's interest. Wildlife-ecological spatial planning (WESP) (see Indicator, Section 2.4.2.1) may be resorted to as an instrument to represent interests relating to hunting and wildlife ecology vis-à-vis other planners. In most cases, it will be necessary for individual hunters to actively offer and/or call for co-operation, even if they as stakeholders do not have formal organisational status.

This Indicator is not to be interpreted as a commitment of hunters regarding routine forest operation planning (form of forest use, etc.), which may also have a significant impact on the habitat quality of wild animals, the susceptibility of the forest to game damage and the scope for hunting of game. This aspect is not considered here.

Indication and score:	2	Hunters can be proved to actively get involved in plans and projects relevant for wildlife and hunting in order to avoid negative impacts on wildlife habitats and hunting.
	-2	Hunters do not actively get involved in plans and projects relevant for wildlife and hunting.
	x	Not applicable, no score (no habitat-changing plans and projects during the last three years).

3 SOCIO-CULTURAL ASPECTS

Explanation: The socio-cultural aspects we are looking at refer to the needs of persons who have a direct or indirect relationship to hunting (hunters, land owners and non-hunters), to the relationships of hunters with each other, as well as to relationships between hunters and non-hunters. They also refer to the needs (the well-being) of huntable wildlife.

With regard to socio-cultural aspects, the definition of clearly measurable indicators, which is indispensable for understanding and pursuing sustainability in hunting, is particularly difficult and sometimes even impossible. The pursuit and development of hunting traditions, for example, does not lend itself easily to an assessment within the narrow confines of clear-cut and verifiable indicators.

3.1 Principle: Hunters take into account the interest of the local population in using land for hunting

3.1.1 Criterion: By way of involving local hunters, hunting enjoys a balanced position within the local community but also takes into account the interests of non-resident hunters

Explanation: As a consequence of the close ties of hunting to land, of hunting traditions and the (necessary) relation of hunting to the local environment and the local community, opportunities for local hunters to hunt in their own region are an important social and cultural aspect of hunting. At the same time – given adequate specific hunting ground conditions – even creating hunting possibilities for non-resident hunters, in particular from urban areas, may foster a lasting interest of the population in hunting.

3.1.1.1 **Indicator 38:** Reconciling the interests of local hunters permitted to hunt 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 – including hunters by permission of land owner/game tenant – is a necessary condition of socio-culturally sustainable hunting. This reconciliation is of importance also with regard to the local acceptance of hunting by members of the population not engaging in hunting activities. This Indicator is evaluated by way of questioning the hunters concerned and recording the results.

(N.B.: Aspects relating to “co-operative hunts” and “agricultural communities” should be especially borne in mind. With regard to owners of large properties with several hunting grounds, aspects transcending the boundaries of hunting grounds need to be considered).

Indication and score:	3	There is a perfect balance of interests (“no problems”) between local hunters permitted to hunt and local hunters not permitted to hunt locally is evident.
	2	There is a balance of interests between local hunters permitted to hunt and local hunters not permitted to hunt locally.
	1	Reconciliation of the interests of local hunters permitted to hunt and local hunters not permitted to hunt locally is only partly satisfactory.
	-1	There is no reconciliation of interests between local hunters permitted to hunt and local hunters not permitted to hunt locally.

3.1.1.2 **Indicator 39: Adequate consideration is given to non-resident hunters**

Explanation: Offering sufficient hunting possibilities to local hunters is to be considered a prime objective in terms of socio-cultural sustainability (see explanations in Section 3.1.1). We should also consider that meeting ecological requirements of sustainability needs a sound knowledge of the hunting territory and the local natural environment. Local residents have an advantage there.

Nevertheless, the needs of non-resident hunters (hunting guests, hunters without local hunting opportunities) ought to be considered adequately and in accordance with the local conditions and possibilities (e.g. size of hunting ground and hunting plan), in order not to entirely preclude this group of people from practising hunting. Non-resident hunters are expected in this context to be willing to give thorough consideration to local conditions; in countries with hunting tenure systems which tie the right to hunt to land ownership, seeking technical advice from local hunting experts is recommended.

Indication and score:	1	Non-resident hunters are adequately included in the practice of hunting
	0	Non-resident hunters are not on principle precluded from hunting
	-1	Non-resident hunters are on principle precluded from hunting, even though there are, for example, enough hunting possibilities and there is demand; or non-resident hunters are overrepresented vis-à-vis resident hunters.

3.2 Principle: Offering local jobs in the field of hunting is an objective

3.2.1 Criterion: Hunting contributes to securing employment by creating jobs

3.2.1.1 Indicator 40: 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 establishing and maintaining infrastructure in the hunting territory, guiding guest hunters, and intensive hunting ground management and biotope care, to the organisation of community hunts and the regular checking of traps. The scope of work depends, of course, on the size of the hunting territory. This creates opportunities to hire further hunting personnel, from full time to casual labour – 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.

Indication and score:	2	The owner of the hunt makes full use of the opportunities to offer hunting-related jobs to the local population.
	1	The owner of the hunt provides jobs in the field of hunting but does not make full use of the opportunities to secure local incomes.
	0	The owner of the hunt does not offer potential hunting-related jobs.
	-1	The hunting management practised is counterproductive to the local job situation.

3.3 Principle: Hunting should find broad acceptance among the population

Explanation: The acceptance of hunting among the population is desirable both on the local level and in terms of overall public opinion. Particularly in times when understanding of hunting is decreasing among a number of population groups or hunting is even rejected altogether, it is paramount for hunters to seek an exchange of opinions and to be integrated in society in order to secure the future of hunting. This also includes dealing with the arguments of those who oppose hunting. Sectorally-orientated group thinking is often counterproductive to this objective. Acceptance and tolerance has to be developed by all parties involved and demands a readiness for open communication. If hunting opens itself towards the wider society, persons critical of hunting can be presented with arguments in favour of hunting; the discussion will be taken to a more factual level, and many an altercation will lose its sting. "Talking to each other" is, of course, to be seen as a two-way process – readiness has to be there on both sides. For the purpose of this study, however, only the contribution on the part of hunters will be evaluated.

3.3.1 Criterion: Hunting is oriented to the aims of the Biosphere Reserve

Explanation: Biosphere Reserves are committed to the guiding principles of sustainable development. UNESCO foresees three main objectives and functions for biosphere reserves: conservation of biological diversity (landscapes, ecosystems, species, genetic diversity); promotion of ecological and socio-cultural sustainability; and support of research, observing of the environment and educational activities for a better understanding of the interrelationship of man and nature (UNESCO/MAB, 1996; UNESCO & MAB-ICC, 1996). The Wienerwald Biosphere Reserve was recognised by UNESCO in 2005 because its management and zoning concept met the UNESCO requirements and pursues a sustainable development concept. This includes the division of the Reserve into three zones: core zones (~5 % of the area), in which the focus is on the protection of nature (in the case of the Wienerwald, almost entirely forest ecosystems) and its development as unaffected as possible by anthropogenic influences; buffer (cultivation) zones (~19 % of the area) with a buffering effect upon the core zones and measures of cultural landscape conservation; and transition zones (~76 % of the area) for the purpose of providing sustainable living, economic and recreational space for the population. Thus, in each zone, the objective of sustainability is pursued in different ways.

3.3.1.1 **Indicator 41:** Taking into consideration the guiding principles and management goals of the Biosphere Reserve

Explanation: With regard to hunting in the Biosphere Reserve, there are presently no legal limitations referring to hunting itself and persons permitted to hunt. However, especially in a biosphere reserve, public awareness of how nature is used – including hunting – is high. Strong public interest in the biosphere reserve and its goals justifies special care in dealing with wildlife and nature as well as being particularly regardful of the interests of other land users. As hunters consider the attaining of the biosphere reserve objectives and, wherever possible, support these aims, they eventually contribute to securing a long-term acceptance of hunting-related activities among the overall society. Hunting should, for example, contribute supporting the objective of achieving a forest development as near-natural as possible in the core zones. With regard to the firing ranges in the core zones, this includes tending to the forest and the vegetation in a way in line with the objective of the most natural development of forest ecosystems possible. Along with defined management goals of the Biosphere Reserve management in the core zones, hunting should also bear in mind further guiding principles and objectives of biosphere reserve development in buffer and transition zones. This includes nonbinding guiding principles for individual forms of use worked out in co-operation with user groups of the Biosphere Reserve, such as the Guiding Principles for Hunting for the Wienerwald Biosphere Reserve.

Giving best possible consideration to the guiding principles and management goals of the Biosphere Reserve may on some occasions entail hunters voluntarily changing habits or not following certain elements of previous practice. However, it is ultimately the hunters and wild animals that particularly benefit from several other management measures in the Biosphere Reserve, such as shielding sensitive forest ecosystems from disturbance in certain areas, etc. Core zones may be integrated into the hunting concept as rest zones for game. For animals sensitive to disturbance (e.g. red deer and hazel grouse), habitat thus become more attractive and, in turn, hunters will find interesting hunting territories rich in species.

Paying particular regard to core zones in terms of hunting strategies, establishment and maintenance of hunting installations, gamekeeping, etc. should be documented in hunting plans. This may make sense even if one's own hunting territory does not include core zone

areas.

Indication and score:	<ul style="list-style-type: none"> 4 Hunting is <i>optimally</i> (“no problems”) oriented according to the guiding principles, management goals and zoning of the Biosphere Reserve. 2 The practice of hunting pays regard only to some aspects of the management goals and zoning of the Biosphere Reserve. –4 The practice of hunting pays no regard to the management goals and zoning of the Biosphere Reserve.
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3.3.1.2 **Indicator 42: Design and distribution of hunting-ground installations**

Explanation: Installations on the hunting ground, in particular high seats (deer-stands), make hunting easier. However, if constructed noticeably and not adapted to the surrounding landscape, with eye-catching building materials (e.g. steel, aluminium, etc.) and distributed in a way that catches the eye, they may leave an unfavourable and undesirable stamp on the landscape. This may negatively affect the public acceptance of hunting.

Indication and score:	<ul style="list-style-type: none"> 2 There are no high seats (deer-stands) or other building installations on the hunting territory, or <i>all</i> such installations are designed unobtrusively (e.g. from untreated round timber) and distributed so as not to attract too much attention (not stand-alone but camouflaged) 1 Only <i>some</i> of the installations on the hunting ground (in particular high seats) are designed so as not to attract too much attention. –2 <i>A major part</i> of the installations on the hunting ground (in particular high seats) are designed and distributed in an eye-catching manner.
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3.3.2 Criterion: Paying attention to the interests of the local population

Explanation: From a socio-cultural point of view, giving due regard to the interests and opinions of the local population is of major importance, as it is the local level from which disagreement over the practice of hunting may arise. This calls for a fair balance of diverging interests that includes all non-hunting stakeholders (representatives of other forms of use). Hunting must pay special attention to safeguarding justified interests on the part of land owners.

3.3.2.1 Indicator 43: Documentation of disagreements by the local authority

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

Indication and score:	2	Hunting is practised with due regard to other social and economic spheres; there is no evidence of disagreement with the local population.
	-2	Hunting is not practised with due regard to the local population; the local authority has evidence of disagreement

3.3.2.2 Indicator 44: Active involvement and information of local stakeholder and land user groups not directly related to hunting

Explanation: Involving and paying attention to interests not related to hunting is essential when it comes to seeking long-term acceptance of hunting, in particular with regard to areas of intense public use such as the Wienerwald Biosphere Reserve. An indicator of acceptance is, for example, whether other land users, stakeholders and groups of society and/or their respective representatives are actively invited to co-operation, co-ordination or, at least, are being informed, in order to contribute to the acceptance of hunting-related measures by the society-at-large. This is not to be confused with co-determination in the sense of a formal right to vote in purely hunting-related bodies. Moreover, it is necessary to give land owners a right to participate in decisions on hunting management questions in order to guarantee a balance of interests between land owners and persons permitted to hunt.

Any form of involvement requires regular communication between all parties and stakeholders concerned, e.g. land owners, persons permitted to hunt, all (potentially) concerned land users as well as the local population. Regular exchanges of information and arrangements can help to avoid a lot of disagreement early on or settle disputes as soon as they arise. Examples of groups of actors who closely interrelate with hunting in the Wienerwald region are, along with land owners: the Biosphere Reserve management, foresters, farmers, Alpine and tourism associations, mountain biking and horse riders associations, nature protection and conservation organisations, municipal political officials, road administrations or various project operators but also owners of adjacent plots of land and neighbouring hunting grounds. While oral arrangements may also be made on an irregular and informal basis, organised and regular meetings provide a better framework and

indicate that hunters openly and actively support a positive climate of exchanges of opinion and thus a favourable climate of debate. Organisational methods for an exchange of views and mutual arrangements are, for example: invitations to meetings of hunting bodies, enlarged gatherings of “hunting rings” (loose associations of hunting grounds), communication platforms, regular information and discussion events but also regular informal meetings or get-togethers. The “Counselling Forum on Hunting” (Beratungsforum „Jagd“) called into life when the Biosphere Reserve was established may, for example, provide a platform for debate on the regional level.

Indication and score:	3	Non-hunting local population groups are <i>actively invited</i> to a regular mutual exchange of information on measures relevant for wildlife and hunting.
	2	Non-hunting local population groups are <i>actively informed</i> about hunting-related activities.
	-1	Non-hunting local population groups are informed about hunting-related activities <i>only upon request</i> .
	-2	Non-hunting local population groups are neither actively invited to a mutual exchange of information, nor actively informed.

3.3.2.3 **Indicator 45: Conflict management strategies**

Explanation: This Indicator does not aim at avoiding differences in opinion altogether. Sometimes, differences in opinion, if dealt with in a respectful and factual manner, harbour potential for creative, innovative and efficient solutions. An indicator of whether a conflict is settled in a solution and fact-oriented, respectful manner is whether an “escalation scale” is observed, e.g. by seeking direct conversation as a first step (e.g. on the spot or at an informal get-together); as a next escalation grade, an impartial third person is involved to act as a moderator; and only as a last step will the matter be taken to court. Even in the case of conflicts between smaller groups on the one hand (e.g. hunters) and larger groups on the other (e.g. persons seeking recreation such as mountain bikers, horse riders, etc.), this indicator may be applied by getting in touch with relevant stakeholders from the other side and raising the matter with them.

Indication and score:	<p>2 In coping with conflicts related to hunting, hunters have, over the last three years, <i>always</i> sought the means with the least escalation potential (escalation step with the lowest possible escalation intensity, e.g. direct personal conversation ahead of conversation moderated by an impartial third person, ahead of taking the matter to court).</p> <p>–1 In coping with conflicts related to hunting, hunters have, over the last three years, <i>not always</i> sought the means with the least escalation potential (escalation step with the lowest possible escalation intensity, e.g. direct personal conversation ahead of conversation moderated by an impartial third person, ahead of taking the matter to court).</p> <p>–2 In coping with conflicts related to hunting, hunters have, over the last three years, <i>never</i> sought the means with the least escalation potential (escalation step with the lowest possible escalation intensity, e.g. direct personal conversation ahead of conversation moderated by an impartial third person, ahead of taking the matter to court).</p> <p>x Not applicable, no score (There has been no conflict over the last three years).</p>
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3.3.3 Criterion: Hunting is connected with society-at-large

Explanation: The integration of hunters into society is a fundamental prerequisite for hunting activities to find broad acceptance and understanding. The relationship between hunters and overall society is, in terms of hunting policies, important for the future framework within which hunting will take place.

3.3.3.1 Indicator 46: Social commitment of hunters and regular communication with the non-hunting population

Explanation: The frequency, intensity and quality of social contacts and interchange of thoughts and views with the non-hunting population substantially influence the opinions hunters and non-hunters hold of each other. Prejudices on both sides may best be assuaged by way of regular communication. This requires an effort from both sides; the present assessment framework, however, only evaluates an active commitment on the part of the hunters. To evaluate other land users, special assessment sets are available such as for farmers and forest managers or for recreation and tourism managers. An adequate context and events designed to further this objective may clearly stimulate such communication. Indicators of how intensively hunters enter into contact with society-at-large are, for example, the frequency of joint public or semi-public social events, such as St. Hubert's Day celebrations, information booths at village festivals, game-marketing events, wildlife-training events, etc. Further indicators are active membership of hunters in non-hunting related social bodies such as associations, political bodies, organisations, etc. Activities of this kind provide opportunities to make contributions to public understanding of hunting and foster the social integration of hunting.

Indication and score:	1	Hunters involve themselves actively in social life and engage in regular communication with the non-hunting population (e.g. by way of joint events or active memberships in social bodies not related to hunting).
	0	Hunters are engaged in society only to a minor extent or not at all; communication and interchange with the non-hunting population is rare.

3.3.3.2 **Indicator 47: Taking into account the opinion of the public at large**

Explanation: Justified objective criticism of certain forms of hunting practice ought to be responded to by considering and discussing it. Changes within society may call for a re-consideration of some traditional hunting practices or thinking patterns. This does not refer to short-lived fashions, but to an active examination of changed patterns and conditions of society which hunting cannot ignore. This may, for example, be documented by discussing the views of the broader public, represented e.g. by considering the point of view of the Biosphere Reserve Management and other important organisations when there are gatherings of hunters or hunting circles, and recording this in the minutes of such meetings.

Indication and score:	1	There is evidence that relevant points of view of society and/or representative organisations are given consideration.
	0	Publicly relevant points of view of society and/or representative organisations are not given consideration.

3.4 Principle: Hunting is oriented to the welfare of the game

Explanation: Hunting ethics involves an awareness of the responsibilities of hunters vis-à-vis animals and nature in general. Ethical hunting practice gives central importance to the well-being of game.

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

3.4.1.1 **Indicator 48:** Habituated behaviour of wild animals

Explanation: Wild animals are “habituated” when they display little shyness vis-à-vis humans. Species-specific differences are, however, to be borne in mind. 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. 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 use by wildlife of important parts of habitats, such as good grazing areas on open terrain.

“Habituated behaviour” does *not*, however, refer to behaviour which is atypical of wild animals and may occur as a result of excessive habituation to humans (e.g. animals tamed through feeding which become aggressive).

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, including comparison with wild animals not hunted, produces practical species-specific standard measures (such as flight distance) for the various game species.

Indication and score:	2	Human-habituated behaviour of hunted and non-hunted wild animals is species-specifically very high on account of minimum hunting pressure.
	1	Human-habituated behaviour of hunted and non-hunted wild animals is species-specifically high on account of low hunting pressure, with a few local exceptions.
	-1	Human-habituated behaviour of hunted and/or non-hunted wild animals is species-specifically low on account of high hunting pressure.
	-2	Human-habituated behaviour of hunted and/or non-hunted wild animals is species-specifically very low on account of extremely high hunting pressure.

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

Explanation: The practice of hunting should involve as little pain for the animal as possible. Good hunting ability and correctly installed and regularly checked trapping devices as well as avoiding inadequate or illegal trapping devices prevents unnecessary pain for wildlife. Training in hunting as well as the best possible installation and checking of trapping devices are also moral obligations for the hunter, as is refraining from the use of poison in hunting.

3.4.2.1 Indicator 49: Violations of legal provisions concerning animal welfare

Explanation: It should be a central aim of hunting to cause the hunted wildlife animal no pain or as little pain as possible. Hunting in accordance with animal welfare standards requires adherence to the relevant provisions of hunting laws (provisions and prohibitions regarding hunting, certain aspects of hunting ethics and “good, fair and legal hunting practice” regarding e.g. snares, spring-traps and box-traps, use of ammunition, searching for wounded game, etc.).

Indication and score:	0	There are no violations of legal provisions regarding animal welfare
	-4	There are violations of legal provisions regarding animal welfare.

3.4.2.2 Indicator 50: Training in hunting

Indication and score:	2	Successful training in hunting is documented every year.
	-2	Successful training in hunting is not documented every year.

3.4.2.3 Indicator 51: Avoiding use of poison as part of the hunting practice

Indication and score:	0	No poison is used as part of the hunting practice.
	-4	Poison is used as part of the hunting practice.

3.5 Principle: Hunting is of wild animals breeding naturally in the wild

Explanation: The hunting of game in small enclosures under conditions of intensive agricultural production is not defined as hunting here, and thus the present criteria evaluating the sustainability of hunting do not apply. Hunting enclosures with extensive natural breeding can be subjected to the present sustainability assessment of hunting (bearing in mind, however, that certain indicators are not applicable on account of the fencing).

3.5.1 Criterion: No animals raised in breeding or other enclosures are hunted

Explanation: In some hunting areas, game from (breeding) enclosures or aviaries is released before the hunt in order to achieve higher game bags already during the year of the release. This is particularly common for pheasant (*Phasianus colchicus*), mallard (*Anas platyrhynchos*), wild boar (*Sus scrofa*), and, in some Western European countries, red-legged partridge (*Alectoris rufa*) (see also Indicator, Section 1.3.2.1). Sometimes, the animals are even brought into close proximity of the hunts in single cages to be released within hunting range. There may even be “ordering” beforehand of the number to be bagged as well as – for wild boar – the weight of the animals to be shot. Pheasant and red-legged partridge released that way and surviving the hunt have little chance of surviving in the wild later on.

Both the selling of game from breeding or captivity for the purpose of hunting sports and the release of such animals for hunting should be rejected from a hunting-ethical perspective.

This criterion does not apply to the re-introduction or re-stocking of wild animals of native species for the purpose of building up self-reproducing wildlife populations (e.g. grouse (*Tetrao sp.*), otter (*Lutra lutra*), beaver (*Castor ssp.*)). Nor does it include the hatching of eggs and raising of chicks from nests destroyed or threatened to be destroyed through mowing, followed by the release of these wild animals.

Releases immediately before hunting for the purpose of increasing the game bag are, however, not compatible with socio-cultural sustainability. Meeting this criterion thus requires that hunting be suspended for an adequate period of time after the release, and that it refrain from taking a majority of the released animals soon thereafter.

3.5.1.1 Indicator 52: Not selling (transferring) animals from enclosures or aviaries for the purpose of hunting

Indication and score:	0	No animals raised in enclosures or aviaries are transferred for the purpose of hunting.
	-4	Animals raised in enclosures or aviaries are transferred for the purpose of hunting.

3.5.1.2 **Indicator 53**: Not releasing animals from enclosures and aviaries for the purpose of hunting

Indication and score:	0	No animals raised in enclosures or aviaries are released for the purpose of hunting.
	-4	Animals raised in enclosures or aviaries are released for the purpose of hunting.

3.6 Principle: Hunters are aware of the effects of their activities upon other land users' interests

Explanation: In Austria, the right to hunt is linked with land ownership. If hunters do not hunt on their own territory, the land owner must, as a rule, be compensated for the practice of hunting on his or her land (e.g. lease, hunting contracts, etc.) Along with hunting, there are, however, also claims of other land users to the use of areas (e.g. agriculture and forestry, leisure and recreational activities). Hunting may impair other parties' claims to using a territory. One significant element of socio-cultural sustainability of hunting is to respect the legitimate interests of other land users, just as hunters may expect the same from other land users.

3.6.1 Criterion: Hunters are aware of and give thought to the effects of their measures upon the interests of other land users

Explanation: Respecting the legitimate interests and needs of other groups of land users (in particular agriculture and forestry, leisure and recreation) indicates that hunters keep their knowledge up to date on the needs of non-hunting-related users (e.g. those of agriculture and forestry or leisure and recreation) and on potential impacts of hunting-related activities.

3.6.1.1 **Indicator 54**: Improvement of knowledge and awareness of the effects of hunting-related measures upon other forms of land use

Explanation: Hunting-related activities may limit the quality of other stakeholders groups' modes of use and activities (e.g. leisure and recreational activities). It is thus desirable for

hunters to make themselves aware of the conscious and unconscious consequences of hunting for other forms of land use via interdisciplinary education, and regularly update their knowledge to this effect. This may be documented by activities contributing to high-quality education and training. One measure is regular attendance at educational events (lectures, expert meetings, discussion events, excursions, etc.) but also relevant literature – in general, any available means of imparting knowledge directly or indirectly related to the needs of other interest/stakeholder groups.

In applying this Indicator, it should not be overlooked that educational efforts with general hunting-related contents may be a valuable aid to solve problems of conflicting claims to use of the same area. Generating such material may thus be an entry on the positive side of the assessment, provided there is a direct or indirect reference to the needs of other interest/stakeholder groups.

Indication and score:	2	Knowledge of potential effects of hunting-related measures upon other land users has been <i>regularly</i> brought up to date over the last three years (e.g. via educational events, lectures, relevant literature, excursions, expert information exchange); there is thus evidence of dealing regularly with these issues (e.g. in the hunting plan, hunting meetings, etc.)
	1	Knowledge of potential effects of hunting-related measures upon other land users has been <i>occasionally</i> brought up to date over the last three years (e.g. via educational events, lectures, relevant literature, excursions, expert information exchange); there is no evidence of a regular dealing with these issues.
	-1	Knowledge of potential effects of hunting-related measures upon other land users <i>was last updated three years or even longer ago</i> .

3.7 Principle: The way hunting traditions are dealt with is a characteristic of the socio-cultural sustainability of hunting

Explanation: Dealing with hunting traditions includes both the nurturing and further development of hunting-related customs and traditions and, on the other hand, unwritten rules of conduct which, as a whole, establish a sort of hunting code of conduct and shape the concept of “good, fair and legal hunting practice” and “hunting ethics.”

3.7.1 Criterion: Hunting traditions are cultivated and passed on to new generations of hunters

Explanation: Hunting culture and traditions are an integral part of the way hunters understand themselves and conserve their identity, but also of rural areas per se. In order to preserve them, they have to be lived, practised, and stay abreast of changing times. A loss of traditions is often irreversible.

3.7.1.1 Indicator 55: Preserving hunting culture

Explanation: By “hunting culture,” we understand in this context all hunting-related customs and traditions manifesting themselves in cultural activities and forms of expression, including traditional events, music, art, literature, figures of speech, etc.

Indication and score:	1	There is evidence that cultural hunting traditions are nurtured on a regular basis.
	-1	Cultural hunting traditions are not nurtured.

3.7.2 Criterion: Traditional rules of hunting behaviour are being further developed and brought up to date

Explanation: Rules and modes of hunting behaviour as well as ethical norms of hunting are subject to changing times and societies. Values change over time, and new scientific findings continuously broaden ecological knowledge of wildlife. This may call for questioning and, if necessary, adjusting traditional rules of hunting behaviour – in other words, the unwritten code of hunting ethics. Reverence for animals and nature can require subordination of old ideas about good and fair hunting practice (hunting ethics), which may no longer be in line with current ideas and findings, to modern ecological requirements and criteria for animal and nature protection. Thus, for example, hunting wild animals exclusively for the aesthetics of their trophies (see Indicator , Section 1.3.1.1) or generally not tolerating predators (see Indicator, Section 1.2.1.2) are problematic positions from today’s point of view.

3.7.2.1 Indicator 56: Examining modes of hunting behaviour by regularly updating knowledge

Explanation: For traditional concepts of hunting ethics and good, fair and legal hunting practice to be further developed, there has to be a regular review and integration for practical hunting of recent scientific findings and research results from wildlife-biology and hunting science. While science needs to make increased efforts to pass on information to the parties involved in practical hunting, hunters themselves should actively *seek* such information. The responsibility of the hunter vis-à-vis the wild animals entrusted to him or her demands that the best available knowledge be translated into hunting practice.

High qualifications in terms of wildlife ecology, hunting economy and hunting ethics are also particularly significant for hunting officials. In their capacity as elected representatives of the community of hunters, they have major responsibilities: They exert considerable influence in determining how hunting is practiced within their range of competency and are, to a certain extent, able to influence hunting legislation. At the same time, they shape the public image of hunters, both with regard to everyday hunting practice as well as at events and in the media. Moreover, they are role models for their own community.

Thus, regular training and further education of all persons involved in hunting is desirable. This may be documented in the form of all adequate activities contributing to a high-quality imparting of knowledge. Examples for this assessment are regular attendance at relevant events of education and further education (lectures, meetings of hunters, discussion events, excursions, etc.), but also relevant literature.

Indication and score:	2	<i>Several</i> activities of training and further education (events, excursions) have been undertaken over the past three years.
	0	<i>One</i> of the educational activities described above was attended over the past three years.
	-1	<i>None</i> of the educational activities described above was attended over the past three years.