



Wildlife Management in Sardinia: Between Biodiversity Conservation and Conflicts with Human Activities

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Abstract

Wildlife management represents an increasing challenge in Mediterranean ecosystems. Biodiversity conservation must be reconciled with agricultural activities, public safety, and the sustainable use of natural resources. Sardinia provides a particularly relevant case study because of its high biodiversity, insular endemism, extensive protected areas, and the recent expansion of several wildlife populations. This study provides a preliminary assessment of human-wildlife conflicts in Sardinia, focusing on three representative species: the Sardinian deer (*Cervus elaphus corsicanus*), the Sardinian wild boar (*Sus scrofa meridionalis*), and the hooded crow (*Corvus cornix*). Information was collected through a multi-level approach combining a structured search of scientific databases (PubMed, Web of Science, and Scopus), analysis of institutional and administrative sources, a broader web-based search, and direct field observations in an area adjacent to the Gutturu Mannu Regional Natural Park. Available data indicate a marked recovery of the Sardinian deer, currently estimated at approximately 13,000 individuals, whereas reliable regional population estimates for wild boar and hooded crow remain unavailable. Administrative data nevertheless indicate increasing wildlife-related impacts, including damage to agricultural production and a substantial rise in road accidents. Field observations also suggested heterogeneous spatial distributions of deer and wild boar and highlighted the limitations of currently available population estimates. Overall, the results reveal a major lack of standardized long-term population data, which limits the assessment of population density, habitat carrying capacity, and ecological imbalance. Wildlife management in Sardinia should therefore move from predominantly compensatory and reactive measures toward an adaptive, science-based strategy integrating systematic population monitoring, habitat and agro-silvo-pastoral management, conflict-prevention measures, ecological connectivity, and, where scientifically justified, targeted population control. Such an approach is essential to achieve a sustainable balance among wildlife conservation, ecosystem functioning, animal welfare, public safety, and human activities.

Keywords: Wildlife Management; Deer, Wild Boar, Hooded Crow, Human Activities, Biodiversity

Introduction

Sardinia covers around 25,000 km², of which 50% is municipal territory, and the remaining 50% is woodland [1]. Since the early 20th century, the Sardinia Region has pursued a unique forest acquisition policy to preserve these areas and

make them available to local communities.

This attention to wildlife heritage stems from the island's particular geographical position in the center of the western Mediterranean, which gives it a significant role along the main migratory routes of Eurasian-African birds [2], and

from the presence of endemic species [3].

Hundreds of bird species use wetlands, coastal ponds, and forest environments as resting, feeding, nesting, and wintering areas, and Sardinia is home to one of the largest flamingo colonies in the Mediterranean basin. Among the numerous endemic faunas, the Sardinian deer (*Cervus elaphus corsicanus*), the Sardinian hare (*Lepus capensis mediterraneus*), the Sardinian weasel (*Mustela nivalis boccamela*), and the mouflon (*Ovis gmelini musimon*) are species of higher naturalistic value and are subject to conservation policies [2,3].

In addition, at least 20% of the area is designated as SIC (Site of Community Importance), ZSC (Special Area of Conservation), and ZPS (Special Protection Zone). Among the protected areas are two national parks, four regional natural parks, six marine protected areas, around thirty natural monuments, approximately 130 Natura 2000 sites, and eight areas of the Geo-mining historical and environmental Park of Sardinia. In addition, there are three WWF oases and two future protected areas: the Gulf of Orosei and the Gennargentu National Park [4].

In recent decades, reintroduction programs have been implemented for endangered species such as the Sardinian deer, which has grown from a few hundred individuals in the 1970s to several thousand today, and is distributed across numerous areas of the island [5], and the griffon (*Gyps fulvus*), rising from around 30 pairs in 2014 to the current 120 nesting pairs [6].

Improvements in environmental conditions for wild animals have also favored the expansion of other opportunistic species, such as wild boar (*Sus scrofa meridionalis*) and various corvids.

The European and national regulatory framework recognizes wild fauna as an invaluable heritage of the community; therefore, wildlife management today represents one of the main challenges for the conservation of biodiversity and the sustainable development of rural areas.

One of the cornerstones of biodiversity management is balancing fauna, flora, and human activities, rather than reducing animal populations based on ecosystem carrying capacity. The European Biodiversity Strategy 2030 integrates scientific monitoring, adaptive management, habitat protection, conflict prevention, and the participation of local stakeholders [7].

At the community level, Directive 92/43/EEC "Habitats" and Directive 2009/147/EC "Birds" constitute the main instruments for the protection of biodiversity, requiring Member States to guarantee a favorable conservation status for species and natural habitats [8,9].

In Italy, the central regulatory framework is Law No. 157 of February 11, 1992, "Regulations for the Protection of Homeothermic Wild Fauna and for Hunting," which defines wild fauna as a non-disposable heritage of the State and establishes that management must aim to maintain biodiversity, protect habitats, and regulate hunting, the responsibility for wildlife and hunting planning, population monitoring, and preventing wildlife-related damage to agricultural production is assigned to the Regions [10].

In the Sardinia Region, these principles are implemented by Regional Law No. 23 of July 29, 1998, "Regulations for the Protection of Wild Fauna and for Hunting in Sardinia," which established the Regional Institute for Wildlife (IRFS) that establishes appropriate collaborations with the Higher Institute for Environmental Protection and Research (ISPRA), academic institutions in Sardinia, national and international university departments, with public and private research institutions, and with the committees of international organizations [11].

Sardinia's natural heritage requires adopting management strategies based on the principle of coexistence, avoiding both excessive human impact on ecosystems and the uncontrolled increase in animal populations that could compromise economic activities and public safety. In this context, this paper aims to provide a preliminary scientific analysis of the main species involved in the conflict between human activities and biodiversity conservation in Sardinia.

The objective is to examine the dynamics of these conflicts, identify their causes and key issues, and discuss possible management strategies to promote a sustainable balance among wildlife protection, ecosystem conservation, and human activities.

Materials and Methods

Selection of the Species

The species selected are represented by the Sardinian deer, the wild boar, and the hooded crow (Figure 1) these species have a high impact on human activities nowadays.



Figure 1: Species selected for the analysis of conflict between human activities and biodiversity conservation: *Cervus elaphus corsicanus*, *Sus scrofa meridionalis*, and *Corvus cornix*.

The Sardinian deer represents one of the most significant successes of conservation policies in Italy and on the island. After risking extinction in the 1960s, thanks to protection, reintroduction, and management programs, the population has increased progressively and expanded significantly in range [12]. This achievement poses new challenges due to the impact on numerous agricultural facilities such as vineyards, olive groves, young forest plantations, forage crops, and agricultural infrastructure. Moreover, it has also increased road accidents far from its protected areas.

The wild boar is the species with the greatest economic impact on the regional agricultural sector. Its high birth rate, the absence of natural predators, and its remarkable adaptability to agricultural environments have favored a significant increase in population numbers [13].

Damage includes cereal crops, vegetable crops, vineyards, olive groves, pastures, and farm fences. This is compounded by the indirect effects of the spread of animal diseases, including African Swine Fever, and the increased risk of road accidents. The hooded crow represents an increasingly significant component of human-wildlife conflict. Thanks to its high adaptability, it successfully colonizes agricultural, peri-urban, and urban environments, causing damage to vegetable crops, orchards, vineyards, seed crops, fruit and vegetable production, as well as exerting significant predation pressure on small vertebrates and species of conservation interest [14].

Data collection from scientific databases, public administration databases, and public search engines.

Three levels of research were conducted to collect information on the populations of the animal species

considered in this study. The first level consisted of a systematic search of the main scientific databases, including PubMed, Web of Science, and Scopus. The initial search terms were: (a) *Cervus elaphus corsicanus*, (b) *Sus scrofa meridionalis*, and (c) *Corvus cornix*. Records retrieved from the different databases were imported into Zotero (version 9.0.6) to remove duplicate records.

The remaining publications were screened according to predefined inclusion and exclusion criteria (Table 1). The full texts of the selected articles were subsequently examined to extract information relevant to the paper's objectives, with particular attention to data on population size, distribution, and temporal trends. The second level of research focused on identifying official and institutional sources providing data on wildlife population estimates and wildlife-related damage. Documents, reports, and datasets produced by the Autonomous Region of Sardinia, provincial authorities, ISPRA, and the Regional Forestry Agency for the Development of the Territory and the Environment of Sardinia (FoReSTAS) were searched and examined.

The third level consisted of a broader web-based search aimed at identifying additional information on damage associated with the species considered. Since these sources were not necessarily subject to scientific peer review or institutional validation, the information retrieved through this search was considered supplementary and was critically evaluated before use.

Finally, an additional field survey was conducted to obtain direct observations of wildlife presence in a selected study area. The survey was conducted at night using a Hikmicro - Thunder 2.0 TH35P Thermal Riflescope (HikMicro, Rome,

Italy). The observed area represents the geographical front of the Gutturu Mannu Regional Natural Park, particularly the portion of the territory facing the municipalities of Pula, and Domus de Maria (within the triangular area defined by the coordinates 38°59'46.4"N 8°59'38.8"E, 38°56'01.5"N 8°55'30.8"E and 38°58'57.2"N 8°57'47.1"E). This area is characterized by an important level of human activity during the summer season and is located adjacent to the protected natural area. The area covers a surface of around 12 Km² with an average length of 6.5 Km and a width of 2.5 km; it was divided into four homogeneous quadrants along the length. The observation started in March, one month after

the hunting season, to cool the animals, and finished at the beginning of August. It consisted of five hours of observation, starting one hour after sunset, each week, changing the days to verify any changes related to the influence of the road movements of the inhabitants during the week. In total, almost one hundred hours of observations have been made. The field survey was intended to provide complementary information on the occurrence and relative abundance of the species considered and to support comparison with the information obtained from scientific, institutional, and web-based sources.

Exclusion criteria	Motivation
Inappropriate population	Different species or populations from those considered in the study
Inappropriate geographical area	Study conducted in geographical areas not relevant to the study objectives
Inadequate data reporting	Population density or abundance not evaluated or not clearly reported
Incomplete impact assessment	Effects on human activities and/or biodiversity not evaluated
Insufficient or non-disaggregated data	Data pooled across species or types of impact, preventing species-specific or impact-specific interpretation

Table 1: Exclusion criteria for publications extracted from the databases.

Results

A search of the main scientific databases was conducted to identify peer-reviewed publications concerning the species considered in this study (Table 2). The literature search covered a broad time span, from 2000 to 2026. The number of available publications varied considerably among species, with the lowest numbers recorded for wild boar and deer. In contrast, a substantially higher number of publications on the hooded crow was identified across the three databases. This greater scientific coverage may be attributed to the geographical distribution of *Corvus cornix* and its remarkable adaptability to diverse climatic and

environmental conditions.

After duplicate records were removed, the number of papers decreased consistently. The remaining papers were read carefully, and only those that fit the exclusion criteria were retained for the discussion section, accounting for 16 articles for *Sus scrofa meridionalis*, 14 for *Cervus elaphus corsicanus*, and 23 for *Corvus cornix* (Table 2). The high reduction in studies on crows is related to the use of this species in risk assessment trials for assessing heavy metal pollution and their function as a carrier of avian and human diseases.

Species		<i>Cervus elaphus corsicanus</i>	<i>Sus scrofa meridionalis</i>	<i>Corvus cornix</i>
Database 2000-2026	PubMed	5	8	80
	Web of Science	34	13	191
	Scopus	24	15	83
Total		63	36	354
Duplicate records removed		35	20	200
Full text screening		28	16	154
Final included studies		14	12	23
references		Jan-14	15-26	27-49

Table 2: Results of the bibliographic search in scientific databases.

Population consistency was researched in institutional sources. The project LIFE One Deer Two Islands (LIFE16 NAT/IT/000816), managed by AGENZIA FORESTAS, reported the actual *Cervus elaphus corsicanus* population in Sardinia at approximately 13,000 individuals; data were also confirmed in other internal reports of the Sardinia Region. Considering that in the 1960s, estimates of 150–200 individuals had been reached, the reintroduction process represents one of Europe's greatest conservation successes [12].

No official documents can be found regarding the actual population of *Sus scrofa meridionalis* and *Corvus cornix*. The official data available are from reports of crop damage and road accidents. However, no comprehensive regional report has been made, and data on damage to property or people, as well as road accidents, are dispersed among the offices of the competent administrations. An estimate by the Sardinia Region indicates approximately 7,000 road accidents caused by the movement of wildlife between 2020

and 2025, with a clear preponderance of damage due to deer and wild boar. These data showed an increase of more than double the previous five-year period, when approximately 3,000 accidents were estimated [15]. Data collected from the database of the Metropolitan City of Cagliari regarding compensation requests for the years 2022–2025 showed the main damage attributed to wild boar (26), followed by crows (16) and deer (16); only minor damage could be related to other species (Table 3). The analysis of the table showed an increasing trend from 11 requests presented in 2022 to 53 in 2025. The most affected crops were vineyards, olive groves, horticultural crops, melons, orchards, pastures, and fences, with total financial losses recognized exceeding €35,000, with over €15,900 related to damage caused by crows, approximately €11,000 attributable to wild boar, and nearly €10,000 to deer (Table 3). These data represent only the direct damage formally requested and do not include indirect production losses, prevention costs, or the economic effects resulting from reduced production quality.

	2022	2023	2024	2025
Grapes/vineyards				
Deer	2	2	2	3
Wild boar	2		3	9
Crow	1	2	2	3
Sparrows/starlings/birds	2	3	2	6
Fox			1	6
Legumes/herb				
Deer			1	6
Wild boar			1	11
Vegetables				
Crow	1		3	4
Sparrows/starlings/birds	1		1	
Sheep/calves				
Fox				2
Bees				
Bee-eaters	2	1		3

Table 3: Number of complaints received in the years 2022–2025.

The web-based search provided information mainly related to three broad areas: case law concerning liability and compensation, regional legislation governing compensation procedures, and technical approaches to damage assessment. Sufficiently complete information is available on protection and reimbursement procedures, providing detailed information on damage to crops and production activities, as well as information on road accidents. Direct field observations showed separated groups of deer near the

roads, with an average of 40 individuals per group, including stags, hinds, and fawns. Recorded nocturnal wildlife sightings showed a predominant number of hinds and fawns compared with stags, disagreeing with the official set ratio of 5 hinds vs stags.

An apparent inverse spatial pattern was observed between deer and wild boars, with areas characterized by higher deer densities generally showing lower wild boar

occurrence, and vice versa. However, this observation should be interpreted with caution, as no direct causal relationship between the distribution of the two species was assessed. The highest wild animal densities were observed in areas close to water bodies and cultivated fields.

Discussion

The species *Cervus elaphus corsicanus* is genetically poor, showing a recent insular lineage of peninsular origin, which should be managed as an evolutionarily significant unit [16-23]. Because of low genetic diversity, connectivity is crucial both ecologically (dispersal) and genetically (avoiding inbreeding depression) [17]. Kidjo, et al. (2007) confirmed the feasibility of reintroduction, which leads to viable populations supported by ex situ breeding and careful site selection [24]. The most devoted areas are represented by evergreen scrub/forests with cover and water; however, fragmentation (roads, agricultural areas) represents the bottleneck for expansion and connectivity [25-27].

Literature data support the success of the reintroduction and expansion; however, long-term sustainability depends on ecological and genetic connectivity, the integration of health risks, and the management of the agricultural landscape, particularly the edges, with targeted infrastructural measures, such as corridors and fine interventions on the landscape maximising coexistence with agriculture. Moreover, recent reintroduction programs have highlighted substantial post-release dispersal and possible health risks from overpopulation, such as the spread of bluetongue [5,24].

The impact of deer on vegetation can be modulated by the mosaic (poorly palatable species and cover reduce damage), and in cultivation it tends to concentrate on the edges [18,25,27].

Climate change (water/shading management) could be a critical issue, and the management of tourist activities, particularly during the rutting season and in winter, should involve selecting areas distant from the core habitats.

Recent estimates of the population size in Sardinia indicate approximately 13,000 individuals, representing a more than 65-fold increase over the past 50 years [12]. However, the actual population size cannot be precisely determined using the currently available monitoring methods. Population estimates are primarily based on counts of males during the rutting season; 5–15 females per male are considered, depending on the studied area.

Although this approach provides useful information on population trends and distribution, the resulting estimates should be interpreted with caution, as methodological assumptions and local variability may introduce uncertainty

into the assessment of the actual population size. Moreover, field observations revealed a high proportion of hinds and fawns compared with the relatively small number of stags, further highlighting a potential limitation of population estimates primarily based on counts of males during the rutting season.

Genetic evidence on *Sus scrofa meridionalis* in Sardinia supports the persistence of a distinct genetic identity; however, the population has been affected by anthropogenic introgression, the extent of which varies spatially and temporally [28]. Landscape characteristics, land-use patterns, and anthropogenic infrastructures may also influence genetic connectivity among populations. A certain degree of introgression from domestic pigs has been documented in Sardinia, highlighting the need for careful genetic monitoring [29-32].

A study based on 16 microsatellite markers showed that the investigated populations could not be considered genetically pure Sardinian wild boar. The detected introgression was mainly attributable to domestic pigs, although genetic contributions from historical introductions of non-native wild boar populations were also identified. Based on these findings, the authors recommended rigorous genetic monitoring and, where feasible and appropriate, the removal of individuals showing evidence of non-native or domestic introgression [33].

Regarding population dynamics and ecological impacts, Sardinian wild boar populations show a high potential for demographic increase, particularly in predator-free environments and protected areas, where relatively high population densities may occur [34,35]. Such conditions can result in substantial impacts on vegetation and soil and, locally, on species of conservation concern [36-38]. Physical disturbance caused by rooting, together with trophic pressure, may contribute to the alteration of sensitive or specialized habitats, potentially interacting with the effects of climatic variability [39-42]. Moreover, the considerable mobility of this species (even several ten kilometers in a day) makes population estimation difficult [43], and only technical estimates derived from the aggregation of provincial data are available, which do not represent official data from the Region or ISPRA. Field observations revealed a distinctive spatial pattern in the area surrounding Gutturru Mannu, where a substantial proportion of *Sus scrofa meridionalis* and *Cervus elaphus corsicanus* individuals appeared to occur predominantly outside the boundaries of the protected area, particularly in gardens and rural areas. Despite the occurrence of both species within the same broader area, their spatial distributions showed limited overlap. Areas characterized by a higher presence of deer generally showed a lower occurrence of wild boar, and vice

versa, with simultaneous observations of the two species in the same locations being relatively uncommon.

This pattern suggests a possible spatial segregation between the two species, although further systematic observations would be required to determine the ecological mechanisms underlying this distribution. In addition, data provided by the hunting offices of the municipalities examined indicated an estimated annual hunting bag of approximately 2,000–3,000 wild boars. A comparison with the forested macro-areas of central-northern Sardinia, characterized by Mediterranean scrub and forest ecosystems broadly comparable to those of the Sulcis area but historically lacking established deer populations, revealed a markedly higher estimated annual hunting bag of approximately 12,000–15,000 wild boars.

Although hunting bag data cannot be directly interpreted as a measure of population abundance, this substantial difference may suggest higher wild boar densities in areas where competition with deer for ground-level trophic resources is absent or reduced. This pattern could be consistent with greater availability of food resources and, consequently, more favorable conditions for wild boar population growth. On the other hand, in areas with high wild boar populations, there is a sharp decline in the populations of the noble sedentary wildlife. Wild boars, thanks to their sense of smell, can locate partridge nests and hare chicks, destroying future generations, in particular *Alectoris Barbara* and *Lepus capensis mediterraneus* [36,37].

Urban expansion of *Corvus cornix* is favored by reduced ineffective persecution/lethal control, urban structures that provide nesting sites and shelters, and the presence of widespread anthropogenic trophic resources (waste, feed, crops). In urban environments, hooded crows show adaptability to humans with reduced flight initiation distances (FID) under certain conditions; furthermore, vocal communication is potentially influenced by changes in the soundscape, which can alter the transmission and perception of acoustic signals between individuals [44,45]. Some authors have focused their research on the nesting of the hooded crow, emphasizing that the quality of the arboreal microhabitat, the availability of pre-existing nests, and the reduction of disturbance during nesting are practical levers for modulating reproductive success and, indirectly, local densities [46–48]. However, the social behavior of hooded crows has highlighted their predisposition to predation in nests, both of eggs and chicks of other birds [49–51].

Hooded crow observations in Austria have linked the great increase in number to anthropogenic food resources, and hunting activities do not influence the population [52]; on the contrary, this activity can decrease the number of

migrating birds using the corvid old nest [53]. A survey carried out in Slovenia showed that the residents have different approaches to the increased number of crows. They are mostly divided into three parts: one wants the reduction, but without death; another does not want to interfere, and the last wants to know more information before deciding [54].

The pursuit of a proper balance between fauna, flora, and human activities is the cornerstone of modern wildlife management. Biodiversity conservation cannot be separated from the protection of agricultural production, public safety, and the socioeconomic development of rural areas. The legislative framework governing wildlife in Europe has been implemented by the Birds Directive, Habitats Directive, and the recently adopted EU Nature Restoration Law [8,9,55,56].

These directives focus on preserving and protecting wildlife, imposing stringent prohibitions (capture or killing of protected species, destruction of breeding or resting sites, and collection of eggs), but also invite member states to balance ecological objectives with economic, social, and cultural requirements, turning protection into an exception-based system strictly related to specific areas. With Resolution No. 52/56 of October 8, 2025, the Sardinia Regional Council approved the Guidelines for the preparation of Provincial and Metropolitan City Plans, implementing Article 19-ter of Law No. 157/1992 and in accordance with the Extraordinary National Plan adopted by the Ministry of the Environment and Energy Security [10,57].

The Guidelines represent an indispensable operational tool for Sardinia, aimed at ensuring a consistent and scientifically based approach to wildlife management, particularly for species that, due to their widespread or concentrated populations, can significantly impact agriculture, road safety, and the balance of ecosystems.

The Sardinia Region has adopted management and eradication plans in specific territorial contexts. The Guideline for the management of ungulates has allowed population increases, regardless of the effect of restoration efforts on the welfare of individual animals and the impact on other wildlife and human activities [58]. The Province of Oristano and the Province of Sulcis Iglesiente have issued specifications for the management and control of wild boar populations and hooded crow [59–61].

The containment plans serve a dual purpose: on the one hand, they aim to rebalance the density of wild populations within the limits of the ecological carrying capacity of the territories, and on the other, they serve to mitigate the economic and social impacts of opportunistic or invasive species. The implementation of these plans should be done

only when preventive scientific monitoring conducted by the competent bodies in collaboration with ISPRA determines that the social and economic tolerability threshold has been exceeded, leading to health and epidemiological emergencies, the spread of zoonotic diseases transmissible to domestic livestock, concrete risk to public safety, damage to livestock, agriculture, and forestry, threats to ecosystem balances and native biodiversity.

The legitimacy and necessity of implementing containment plans lies in finding a dynamic balance between biodiversity conservation and the sustainability of human activities. The increase in wildlife-related road accidents recorded over the past five years, resulting in wildlife injury or mortality as well as damage to vehicles and, in some cases, injuries to people, highlights the growing importance of managing wildlife-human interactions.

These events appear to occur more frequently during dry periods and may be associated with several factors. Seasonal changes in resource availability may represent the primary contributing factor. Limited ecological corridors and physical barriers along roadsides can restrict animal movement, while road infrastructure itself contributes to habitat fragmentation and increases the likelihood of wildlife-vehicle collisions. During the dry Mediterranean summer, the reduced availability of water and food resources in shrublands and forests may encourage wildlife to move towards cultivated areas, residential zones, and tourist sites, where these resources are more readily available.

Such movements are predominantly observed during periods of increased wildlife activity, particularly around sunset and during the early morning hours, potentially increasing the risk of encounters with road traffic in hours of lowest visibility for motorists and often with moments of greatest driver fatigue [62].

The management of protected natural areas, such as regional parks and wildlife sanctuaries, represents a critical issue. The actual regulatory framework does not indicate how to manage these areas, and these spaces are not subjected to constant and targeted environmental improvement, cultivation, and active land management interventions. Therefore, while the legislator intended these areas, free from hunting pressure, to ensure the maintenance of biodiversity, representing the ideal place for the survival of species, in reality, in the absence of an internal agronomic planning that includes the restoration of existing water sources, the creation of strategic artificial watering points, and the cultivation of non-returnable crops specifically dedicated to wildlife, these areas are unable to meet the primary needs of the wildlife present.

On July 1, 2014, the new European Union Guidelines for State Aid in the Agriculture and Forestry Sectors in Rural Areas 2014-2020 were approved, published in the Official Journal of the European Union C 204.

The Autonomous Region of Sardinia, through the Department of Local Authorities, has taken out an insurance policy for road accidents involving wildlife in Sardinia; moreover, with Regional Law No. 4 of 2006 transferred to the provinces the competence for the payment of compensation for damage caused by wild fauna to Crops, livestock production, and, finally, Regional Law No. 3 of 2008 extended compensation to damage caused to fish production.

These Guidelines regulate aids intended to compensate for damage caused by protected animals and indicate certain conditions that such aids must meet for the European Commission to consider it compatible with the internal market pursuant to the Treaty on the Functioning of the European Union (TFEU). With Regional Council Resolution 44/21 of July 25, 2016, damage caused by wild fauna was classified as “de minimis” aid. Unfortunately, despite the compensation having been settled, there has not been a decrease in damage but rather a clear increase in the last 5 years, with almost double the value of motorway accidents or damage to crops. This evidence confirms that a simple compensation system is insufficient to ensure effective management of the conflict between wildlife and production activities. It is therefore necessary to develop an integrated approach based on continuous population monitoring, assessment of habitat carrying capacity, the use of preventative measures (fences, deterrents, crop protection), selective population control when scientifically justified, conservation of natural habitats, and the active involvement of farmers, management bodies, the Forestry Corps, the hunting community, and the scientific community. Defining management interventions requires in-depth reflection based on sound scientific foundations, not intuition or deductive processes.

The presence of an ecological imbalance must be demonstrated based on scientifically conducted monitoring to assess the actual presence of an uncontrolled increase in animal populations or an uneven distribution across the territory that leads to temporary increases in some areas and depopulation in others.

Conclusion

This study highlights how wildlife management requires a science-based approach, emphasizing that it should no longer be considered a matter of financial compensation alone. The pursuit of a proper balance between fauna, flora, and human activities is the cornerstone of modern regional

wildlife management. Biodiversity conservation cannot be separated from the protection of agricultural production, public safety, and the socioeconomic development of rural areas.

Systematic population assessments should be initiated, allowing for an “assessment” over time, i.e., an evaluation of abundances per unit of land area. This criticality is one of the problems defined as “Data-Poor Assessment Methods (DPAMs),” a phenomenon that often occurs, for example, with many fish stocks for which historical catch data are lacking, making it nearly impossible to determine stock size and plan catches. The core of the problem lies in the lack of time series necessary to apply models demonstrating habitat overcrowding. Indeed, overcrowding in habitats is an unfavorable condition for wildlife welfare, which suffers the negative effects of density, related to intraspecific competition for food, the possible rapid transmission of parasites and pathogens, and the reduction of genetic identity.

It is therefore essential to implement active management strategies aimed at restoring ecological balance through well-defined operational and management measures. A first step could involve re-establishing a sustainable balance between wildlife populations and the vegetation of their habitats through integrated agro-silvo-pastoral planning and, where necessary, implementing appropriate population control measures. In a territory like Sardinia, the absence of large natural predators capable of regulating ungulate demographics, combined with the enormous presence of opportunistic species such as hooded crow and wild boar, makes human regulatory intervention the only suitable tool to prevent the collapse of eco-pastoral balances.

Allowing overpopulation dynamics to develop unchecked not only damages the local economic fabric but also triggers degradation of forest habitats due to overgrazing and increases the risk of animal diseases.

Reducing the number of excess animals does not represent a punitive act but a conservation measure necessary to guarantee the health of the remaining animals, protect the renewal of vegetation, and allow a real adaptive coexistence between Man, Fauna and Flora. However, this solution needs a scientific basis, as the term “excess” must necessarily be linked to other faunal, environmental, and anthropic information.

This type of solution should only be considered when there is certain data on populations and other management activities are not effective. Nature and biodiversity conservation is not about saving every single individual, but about keeping processes, populations, and habitats in balance. Moreover, wildlife and environmental management is not

a moral attitude, but a scientific criterion based on precise data and information which is often incomprehensible to the common observer.

Author Contributions

Conceptualization, G.L., A.A.; investigation, G.L.; formal analyses, G.L., A.A.; writing—original draft preparation, A.A.; writing—review and editing, A.A.; P.A.; project administration, A.A.; All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

Ethical review and approval were waived for this study. In the relevant interstate standards, our research type does not require ethical approval. Our study is non-clinical, non-medical, and non-invasive; it involves no health or personal data and uses only anonymous information and data concerning individual differences in the perception of limited sensory characteristics.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The original contributions presented in the study are included in the article; further inquiries can be directed to the corresponding authors.

Conflicts of Interest

The authors declare no conflicts of interest.

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