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## Collaborative Partnership on Sustainable Wildlife Management

The Collaborative Partnership on Sustainable Wildlife Management (CPW) is a voluntary partnership of international organizations with substantive mandates and programmes for the sustainable use and conservation of wildlife resources. The mission of the CPW is to increase cooperation and coordination among its members and other interested parties on sustainable wildlife management to promote the sustainable use and conservation of terrestrial vertebrate wildlife in all biomes and geographic areas.

## Sustainable wildlife management

Sustainable wildlife management (SWM) is the sound management of wildlife species to sustain their populations and habitat over time, taking into account the socioeconomic needs of human populations. This requires that all land-users within the wildlife habitat are aware of and consider the effects of their activities on the wildlife resources and habitat, and on other user groups. In this factsheet, the term “wildlife” refers to “terrestrial or semi-terrestrial vertebrates”.

In view of its ecological, social and economic value, wildlife is an important renewable natural resource, with significance for areas such as rural development, land-use planning, food supply, tourism, scientific research and cultural heritage. If sustainably managed, wildlife can provide continuous nutrition and income and contribute considerably to the alleviation of poverty as well as to safeguarding human and environmental health.

The objective of the fact sheets produced by the CPW is to inform decision-makers, stakeholders and the general public about issues and opportunities relating to the sustainable use and conservation of terrestrial and semi-terrestrial vertebrate wildlife.

## What is at stake?

Human-wildlife conflict (HWC) occurs when the needs of wildlife encroach on those of human populations or the needs of human populations encroach upon those of wildlife. More broadly, interactions between wildlife and humans can cause damage or costs to both, and lead to conflicts between different groups of people (human-human conflicts) over wildlife and how it should be managed.

Conflicts between humans and wildlife, and between humans over wildlife, have occurred since the dawn of humanity. However, in many regions these conflicts have intensified over recent decades as a result of human population growth and the related expansion of agricultural and industrial activities. Conflicts have also arisen due to the growth of some wildlife populations and the presence of certain species (e.g. red fox, wild boar) in urban environments,<sup>1</sup>

as well as a recurrent inability of institutions to manage such conflicts effectively. Climate change is exacerbating these conflicts through, for example, increased competition for water and habitats. Changing human values and attitudes are also shaping wildlife management approaches, where ecocentric, protectionist views of wildlife may not recognize or accommodate the needs of those living with wildlife.

HWC cannot be detached from the context of conflicts between groups of people about how to manage wildlife, which have marked the history of conservation. For example, centuries of urbanization have led to radical agrarian dissent and resistance to dominant urban cultures and values in many places. The implementation of protectionist conservation policies has often aggravated feelings of disenfranchisement and injustice among rural communities, as

well as frustration toward wildlife authorities. Problems are particularly severe when the wildlife species concerned are of major conservation importance and the conservation objectives are at odds with those of local communities.

Impacts of HWC can range from injury and death, loss of crops and livestock, damaged infrastructure, disease transmission (to humans and also to wildlife) and school absenteeism of children to guard crops at home or too scared to walk to school, to reduced farm productivity for farmers who are spending more time guarding their crops, and other intangible social costs such as stress. As a result of these negative impacts, wildlife species may be killed in retaliation, with a risk of population declines.<sup>2 3 4</sup> In certain cases, indiscriminate killing of non-problematic wildlife or habitat destruction may also take place as an expression of resentment or hostility toward conservation and wildlife management authorities.

Local solutions should therefore take into account the histories of past interventions and their outcomes, including monitoring to enable appropriate modifications because perceptions, as well as the populations and activities of both humans and wildlife, change over time.

## Key issues

### Safety and security

Large carnivores and large herbivores are responsible for most attacks on humans, often leading to injury or death. Deaths may occur when people are in or near waterways, for example when travelling, fishing or fetching water; while protecting crops and water against wild animals (usually at night); or when people encounter injured animals whose normal sense of caution is impaired. The fear of conflict restricts people's freedom of movement and access to resources and can induce high levels of stress and feelings of insecurity.

Road accidents caused by wildlife and bird–aircraft collisions occur worldwide, and can also result in human death and injury.

### Food security and livelihoods

**Across the world, crops are subject to damage caused by wildlife**, from deer to kangaroos, geese or elephants. While crop damage can have a negative impact on economies and livelihoods, food security is typically most vulnerable in developing countries, where it can depend on the result of a single cropping season. The fear of loss of crops to wildlife can also be a severe limitation for growing specific crops (for example, where birds feed on sunflower seeds just before cultivation), with consequences for land-use practices and commercialization of food products at local, regional and national level. Consequences are particularly serious where government responses (such as compensation) are non-existent, inadequate or ineffective.

**A high density of large ungulates** (hoofed mammals) in forests can endanger the sustainability of forest management by eating tree bark as well as small trees, which can affect forest succession and lead to a polarization between forest and wildlife management.

**The loss of livestock can also damage livelihoods.** For rural populations, domestic animals may be an important resource or the only source of income. Predation on livestock often forces rural communities to adopt new mechanisms to protect stock, such as building enclosures or introducing guard dogs.

**Large herbivores often compete for food or water**, particularly in arid regions. This is the case for guanacos in South America, deer in North America, and wildebeest in Africa. Actions taken to decrease native herbivore populations can significantly change population sizes and predators, and affect the people who also rely on the resources, such as local pastoralists.

### Transmission of diseases to livestock and/or humans

**Many wild species can play a major role in disease transmission to/from domestic animals** due to their abundance, wide distribution, and close proximity to these animals with which they frequently share pasture and watering points. Common livestock diseases such as brucellosis and bovine tuberculosis can adversely affect wildlife populations and in some cases lead to infections that are much more difficult to control than in livestock. Diseases in wildlife can cause severe problems for domestic animals but diseases in domestic animals can also devastate wildlife populations and threaten biological diversity.

**Of the growing list of human pathogens, 61 percent are zoonotic.** Of emerging infectious diseases, 75 percent are zoonotic, originating principally from wildlife. Over the past four decades, agents responsible for pandemics such as Human Immunodeficiency Virus (HIV) and other diseases that cause high case-fatality rates (e.g. Ebola virus (EBOV), Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome Coronavirus (MERS-CoV), other coronaviruses and brucellosis) have been reported to have emerged from wildlife reservoirs through consumption of wild meat.

**As the populations of many wildlife species decline, their conservation importance increases.** In such cases, needs of local communities may clash with conservation objectives. For example, some species of large carnivores such as lions, hyenas, and wolves have been eliminated from extensive parts of their former ranges due to HWC. Today, illegal killing, including poisoning, shooting and trapping, remains a major threat to these species. It can not only affect population viability, but may also have broader environmental impacts.



## Experience and knowledge

### Causes of human–wildlife conflict

In dealing with HWC, it is crucial to address both the relationship between wildlife and humans and the underlying conflicts over wildlife among people with different values, objectives and experiences. Reducing impacts may not reduce conflict if the underlying causes are not addressed.

An important source of conflict lies in the competition between growing human populations and wildlife for the same declining resources. The transformation of forests, savannah, wetlands and other ecosystems into agricultural or urban areas as a consequence of increasing demand for land, food production, energy, water and raw materials, has led to a dramatic loss of wildlife habitats. War, civil unrest and climate change can force people to seek shelter in, or procure resources from, protected areas, in which they may exert a strong pressure on natural resources and enter into competition with wildlife.<sup>5 6 7 8</sup> Illegal hunting for food and/or the death of herbivores as a result of drought can reduce prey populations, forcing predators to turn to livestock. The growing interest in ecotourism and increasing presence of humans in protected areas may exacerbate conflicts between humans and wildlife.

In some areas, by contrast, conflicts between wildlife and local communities have been sparked by success in species recovery such as for crocodiles,<sup>9</sup> and by efforts to reintroduce large carnivores and raptors, as well as a recurrent inability of institutions to mitigate such conflicts effectively.

The conflicts between people over wildlife often reflect real or perceived injustices around who bears the cost of living with wildlife and who benefits from its conservation. Where local communities who experience HWC do not have a say in management decisions, concerning hunting or fencing for example, they may resent wildlife management and conservation authorities and



organizations and retaliate by killing wildlife. This may be exacerbated by being excluded from the tangible benefits of conservation, for instance where communities adjacent to protected areas are excluded from using natural resources in these areas and see benefits flowing to others, while they bear the risks and livelihood impacts of wildlife.

***The intrinsic or learned characteristics of wildlife, such as food preferences, migration patterns, wariness, or predation behaviour*** can also influence conflicts. Generally, lower tolerance is ascribed to wildlife with larger body sizes, that occur in large groups or herd sizes, forage or hunt nocturnally, chronically raid, that are habituated to human environments, and/or cause extensive damage per incident (e.g. raiding on mature crops, predation on adult livestock, surplus killing). Moreover, the risk of wildlife damage is higher when (i) crops/livestock are unconfined and/or unprotected, (ii) natural prey is scarce or well-defended, (iii) landscapes provide adequate cover for predatory wildlife (e.g. are forested),<sup>10</sup> and (iv) when wildlife and crops/livestock are in close proximity.<sup>11</sup>

### Addressing human–wildlife conflict

There are various approaches that may be taken to address conflicts over wildlife and the costs imposed by wildlife on humans. Approaches to addressing the human dimensions of the problem are addressed here first, followed by a summary of technical approaches to reducing impacts of wildlife. In most cases, however, the process of developing a response jointly with local communities affected by wildlife will be crucial. Important aspects of the process include identifying and meaningfully engaging key stakeholders (including conservationists and veterinarians) throughout the process, mapping out the conflict and ensuring it is well understood, testing and adapting strategies, ensuring effective communication, building trust and coproducing knowledge, and working closely with the affected local communities.

### ***Shared governance, education and awareness-raising is crucial.***

Communities are likely to be less resentful and more tolerant of wildlife populations and the damage they cause where they are involved in the related planning and management, and/or where the costs of living with wildlife are offset by benefits from their sustainable use and conservation. For instance, communities may be granted co-management rights over protected areas. They may be consulted in or given responsibilities for the development of wildlife management plans. They may be legally recognized as stewards of wildlife on their own land and enabled to retain the benefits from tourism (including hunting tourism). They may be granted rights to hunt wildlife themselves or to harvest fuelwood, timber, mushrooms or fodder in wildlife areas. They may be entitled to receive a proportion of revenue from tourism in neighbouring protected areas,

or be supported in selling handicrafts or other goods and services to tourists, among other strategies. Such approaches may foster more positive attitudes to wildlife and toward wildlife management and conservation agencies and organizations, cooperation in conservation actions, and willingness to tolerate impacts of wildlife.

Education about wildlife and particularly the benefits of wildlife populations may also lead to changed attitudes with an increased appreciation of wildlife and tolerance of wildlife damage. However, education alone is unlikely to change attitudes where wildlife populations impose significant net costs.

**Recognizing the often extensive knowledge of wildlife held by local communities can improve the management of wildlife** and inform conservation efforts. Empowering rural communities with a shared understanding of animal behaviour and information about past conflicts, patterns in seasonality, breeding seasons and habitat preferences, as well as practical skills and tools, may help them to deal with dangerous wild animal species and acquire new approaches for defending their crops, water and livestock. Over time, more effective engagement of the local populations may result in a change of behaviour, and contribute to reduced risks, improvements in local livelihoods and a reduction in their vulnerability.

**The payment of compensation** in the event of loss is usually confined to a specific category of loss, such as human death, livestock loss, or area and type of crop loss. These schemes may be funded by governments or conservation organizations. All are designed to increase damage tolerance levels among the affected communities and prevent them from taking direct action themselves. Such schemes, however, do not always function effectively in practice, due to factors such as lack of resources, low compensation, inbuilt incentives to abuse the system, excessive transaction costs, delays in acknowledging damage or processing claims, or failure to address the root causes of the conflict.

Insurance schemes are an innovative compensation approach where farmers pay a premium for cover against a defined risk, such as livestock depredation. Those who suffer damage are then compensated from the accumulated pool of resources.

**Voluntary relocation of local communities**, where appropriate land alternatives and incentives are available, to areas offering better access to natural resources and improved socioeconomic opportunities, may offer a solution to managing conflict. This approach is virtually never used in developed regions. Great care must be taken to ensure that justice and human rights are fully respected, and that communities give free prior informed consent to relocation and that their socioeconomic needs are met in the new area in the long term.

**Good land-use planning will be critical in the long term** in managing human–wildlife impacts. Land-use planning techniques for managing human–wildlife interactions may include relocating agricultural activity out of wildlife range, grouping crop fields and moving them from the forest edge closer to dwellings, and reducing the encroachment of human settlements into wildlife range by repositioning the boundaries of protected areas or creating buffer zones.

Land-use interventions can alter environmental resources for wildlife in ways that decrease impacts on human activities. For instance, the natural prey base of carnivores can be improved by protection, or alternative water sources for wildlife species can be established.

**Where herdsmen are present to guard livestock, the rate of depredation is generally lower** than in unsupervised free-ranging herds. Likewise crops can be protected against wildlife incursions. In both cases, however, people acting as guards may themselves become vulnerable to attack. Guard animals provide an alternative to a herder monitoring a flock.

**Barriers**, including fences (electric, normal wires, stone walls, steel bars), hedges and moats, if well designed, constructed and maintained, can be almost completely effective in preventing wildlife impacts. However, this approach is not always feasible, and may prevent wildlife migrations or access to water resources.

**Growing alternative crops** that are less palatable to wildlife is an option in some contexts. Changes to livestock husbandry practices may reduce impacts, such as herding during the day, avoiding predators' home ranges, keeping livestock in predator-proof enclosures at night, and (for example where crocodiles are present) watering them in secure enclosures.

**Deterrents** can be used to repel animals from the targeted resource. They can target several senses – hearing, sight, smell, taste and touch – and include smearing chili on wires, beating pots, and letting off firecrackers. However, intelligent animals such as elephants may become quickly accustomed to such deterrents, which then cease to be effective.

**Wildlife translocation**, involving moving animals from a problematic zone to a new site, has been used with animals such as elephants, crocodiles and big cats. While sometimes effective, it is expensive, may simply export the problem elsewhere, and, for animals with strong homing instincts, may lead to animals returning to the same area. In some cases where animals are territorial, another animal will often simply take its place.

**Lethal control**, through the killing of problem-causing animals can be carried out by three main groups of actors: public services, local communities and trophy hunters. Killing of individual animals, however, is often ineffective in reducing ongoing conflicts over, and with, wildlife populations.



## Challenges and opportunities

Considering the current human population growth rate, the increasing demand for natural resources and the growing pressure for access to land, conflicts over human–wildlife interactions pose ongoing challenges that are likely to escalate.

Expectations of management should not be raised to the level of eliminating conflict. Rather, we need to learn how to effectively reduce or offset such conflicts to bring them to a level where communities are willing to tolerate long-term coexistence with wildlife.

No single approach is adequate to address HWC. Clear policies to prevent and deal with HWC may help establish options that can be implemented either by administrations (national or local), wildlife authorities, farmers and communities and/or the private sector. Policies should be designed through a joint approach involving all stakeholders and particularly local communities. Inclusive approaches, while often resource-intensive in terms of time and effort, are likely to be the best in designing transparent and workable strategies to prevent, reduce and manage HWC.

Conflict management should be an adaptive process. From a practical point of view, in order to carry out informed and cost-effective management decisions, the following aspects should be addressed in cooperation with affected local communities:

- collection and analysis of information on HWC and on possible underlying causes, including scientific and local knowledge;
- joint communication of findings to locals, managers and other stakeholders;
- collective setting of objectives (and expectations) for management actions;
- choice and implementation of conflict management approaches;
- informed monitoring and evaluation of management decisions and processes, leading to adjustments where needed.

## What is still to be learned?

A key question to be addressed is under what conditions coexistence between humans and wildlife is still possible in the twenty-first century, as population and resource pressures, economic growth and globalization become ever more intense.

Key underlying questions include:

- To what extent are bottom-up and top-down approaches (or combinations thereof) effective in the management of conflict?
- How are good social outcomes such as reduced human–human conflict related to good biodiversity outcomes?
- Under what conditions can rural communities, particularly poor communities, legitimately be expected to bear the burden of conflict with wildlife?



- How can local rural communities benefit more from sustainable use and conservation of wildlife, in order to enable coexistence and offset the costs of living with wildlife?
- How do we design effective context-specific interventions and what role should local communities and conservation interests play in these processes?
- How can conservation strategies and interventions such as species recovery and reintroductions fully recognize and address the costs for local communities of living with wildlife?
- Given that most countries do not have the resources to manage their protected areas effectively, under what conditions can they be expected to also effectively manage wildlife living in inhabited areas?
- How can the voices of rural communities affected by HWC, as well as those of the scientific communities, be effectively heard among policymakers and donors, to ensure that interventions address needs and interests and promote wildlife as assets rather than liabilities?

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## KEY MESSAGES

- Impacts of wildlife on humans and conflicts between groups of humans over wildlife conservation and management are two very different issues that require different approaches.
- The development of a HWC response must be created together with the local communities affected by wildlife.
- HWC can negatively affect human safety and food security, as well as having broader social, economic and political implications.
- HWC management needs to be flexible, adapted to local circumstances and approached as a social, as well as a technical, problem.
- Reducing the impact of wildlife or offsetting it through benefits from conservation and sustainable use is likely to improve social outcomes and biodiversity conservation by increasing tolerance towards wildlife.