



LIFE WOLFALPS EU



NON-CONSUMPTIVE USE OF WOLVES IN TOURISM:

GUIDELINES FOR RESPONSIBLE PRACTICES



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1. Introduction

In many early European cultures, humans shared an overall positive view of the wolf (Boitani, 1995; Boitani and Ciucci, 2009). But this changed with the anthropocentric view of nature brought about by Christianity as well as with the process of domestication and the advent of extensive animal husbandry (Boitani, 1995). Wolves were then strongly persecuted, leading to their extirpation in almost all their former range across the continent.

In the last few decades, however, wolves have returned to many parts of Europe from which they had been absent for centuries. Their recovery impacts a range of human activities and interests and is accompanied by a variety of social conflicts and diverging points of view on how wolves should be managed (Boitani and Linnell, 2015; Linnell and Cretois, 2018).

Conflicts and the negative economic impacts of wolf damage to livestock are the most pressing problems for wolf management today. Public debate and academic research on wolf–human relations tend to focus on these issues (Rode et al., 2021). The ecological roles of wolves in ecosystem structure and functioning are increasingly recognized (Hebbelwhite et al., 2005; Kuijper et al., 2013). However, although predator–prey interactions are highly context-dependent, most studies on this topic have been undertaken in large, natural landscapes. In most of Europe, human actions attenuate the ecological effects of large carnivores (Kuijper et al., 2016). Nevertheless, new values and the potential social benefits of human–wolf coexistence are underappreciated.

Wolves are an important generator of culture, ethnography and tradition (Álvarez et al., 2011) and their presence brings educational and research benefits, income from regional and product marketing, as well as socio-economic benefits from wildlife tourism (Rode et al., 2021). Different forms of tourism associated with wolves, such as wolf watching, photographing, or observing signs of their presence have already been practiced for a couple of decades in North America (Wilson and Heberlein, 1996) and to a lesser extent in Europe (Koščová and Koščová, 2016; Bavo and Villar Lama, 2020; Notaro and Grilli, 2021). Although tourism can increase the value of the species locally, such activities can also have negative impacts on wolves and their habitat, especially with the growing demand for wildlife tourism (Curtin and Kragh, 2014).

The following guidelines were prepared by members of the LIFE WOLFALPS EU project group and the Large Carnivore Initiative for Europe expert group of the IUCN/SSC to set specific recommendations for responsible non-consumptive use of wolves in tourism which has as little impact on wolves as possible. The aim of these guidelines is to promote tourism activities that go beyond direct sightings of wildlife by focusing on wolf presence and wolf-related cultural heritage, creating economic opportunities for local communities in areas with wolves and consequently leading to increased tolerance towards this species.

*The wolf: a threat or an opportunity for sustainable rural development?
(Photo: Francesco Panuello, Maritime Alps Protected Areas archive)*

2. Wolf recovery and opportunities for tourism

The wolf originally ranged over the entire northern hemisphere. Organized efforts aimed at exterminating wolves drove them to the brink of extinction in the 19th century in several countries (Mech and Boitani, 2003). The last century has seen a dramatic reversal in the status of large carnivores in Europe. Currently, there are probably more than 17,000 wolves in continental Europe excluding Russia and Belarus (Linnell and Cretois, 2018). They occur, either regularly or occasionally, in all countries except the island states (Ireland, Iceland, the United Kingdom, Cyprus and Malta).

In the past, the wolf was believed to have a mainly negative economic impact, because it killed livestock and game animals (Mech and Boitani, 2003). Today, there is growing understanding of the important roles that wolves can play in ecosystems: they may limit wild ungulate numbers, changing prey behaviour and distribution and thereby reducing pressure on vegetation (Hebbelwhite et al. 2005, Kuijper et al. 2013), while also providing carrion for scavengers (Selva et al., 2005), delaying wildlife disease transmission (Tanner et al., 2019, Szewczyk et al., 2021) and reducing the number of midsize carnivores (Krofel et al., 2017; Martins et al., 2020). Furthermore, many people that assign value to the existence and preservation of wolves in the wild consider that it is society's responsibility to hand a complete and healthy ecosystem onto future generations (Weiss et al., 2007).

The wolf is considered to be the most charismatic of all terrestrial wildlife species living in Europe (Albert et al., 2018), showing its potential to attract tourists and develop wolf-related tourism activities. Wolf presence can increase the natural value of an area and form the core of a marketing strategy for a region, diversifying existing nature-based tourism offers or creating new ones. Wolf tourism can generate direct income and gains in employment, as well as indirect income for hotels, restaurants and other tourist infrastructure. A study conducted in Yellowstone National Park (USA), for example, estimated that more than \$35.5 million are generated annually by visitors to the three-state region (Wyoming, Montana, Idaho) specifically to see or hear wolves in the park (Duffield et al., 2008).

Moreover, the wolf has shaped the cultural heritage and local identity of many regions and brings educational and research benefits (Rode et al., 2021). Alternative income for local communities generated through wolf tourism can lead to increased tolerance toward wolves at the local level (Álvares et al., 2011). Moreover, tourism can educate visitors about wolf ecology and coexistence, raising awareness and promoting conservation efforts on an international level.

The wolf is an elusive species, usually avoiding humans, and opportunities to see wolves without professional guides are rare (Mech and Boitani, 2003). To meet the demands of tourists, wolves are sometimes tracked in the wild, attracted to areas by artificial feeding (Nowak et al., 2021a) and encouraged to respond to human howling (Wilson and Heberlein, 1996), all of which can cause negative impacts on the species. Considering the growing number of people interested in wildlife tourism, guidelines for tourism organizations, tourist guides and representatives of protected areas on how to develop responsible wolf-related tourism are needed.

The presence of wolves provides opportunities to generate economic benefits through ecotourism (Photo: Francesco Panuello, Maritime Alps Protected Areas Archive)



3. From conflicts to coexistence

Understanding threats to wolf conservation is crucial for the development of sustainable and responsible wolf tourism programmes. Inappropriate practices can lead to conflicts, which often result in low tolerance towards wolves and illegal killing (Suutarinen and Kojola, 2017), one of the most important causes of wolf mortality. Responsible wolf tourism programmes should raise awareness about the most common threats to wolf populations, help improve understanding of human–wolf conflicts and provide objective and accurate information about wolves.

The following sections outline the most relevant threats to wolves in Europe, followed by specific recommendations on how to create wolf tourism programmes that cause minimal disturbance to the species, create alternative income streams for local communities and tap into a rich cultural heritage relating to the long history of coexistence between wolves and humans in Europe. Additional information about wolves and their complex relationship with humans is given in Annex 1.

The need to protect livestock from wolves and other predators has given rise to a cultural heritage associated with pastoralism that can enrich wolf-related tourism activities (Photo: Christine Sonvilla, www.sonvilla-graf.at)



3.1. Livestock husbandry

Wolf depredation on livestock is a source of conflict in most areas where wolves and livestock overlap. Attacks on domestic animals, which in Europe involves mostly sheep but also goats, cattle, horses, donkeys and semi-domestic reindeer, can have a significant negative influence on levels of public tolerance and acceptance of wolves, with important implications for their conservation. Measures are available which can reduce or mitigate the impact of wolf depredation on livestock. Most Member States of the EU have compensation systems for economic losses caused by large carnivores. However, preventing damage is better than paying compensation after it occurs. Electric fences, fladry¹, livestock guarding dogs and human surveillance appear to be the most effective approaches, particularly when two or more of them are combined (Rigg et al., 2001; Iliopoulos et al., 2009, 2019; Reinhardt et al., 2012; Bruns et al., 2020).

Tourism programmes can help raise awareness of effective measures for damage prevention and the complexity of coexistence between carnivores and people. Tourists should be informed about appropriate behaviour in regions with livestock guarding dogs (AGRIDEA, 2016), especially when walking through pastures. Livestock and working dogs should be disturbed as little as possible. Tourists should keep their distance from herds so that livestock guarding dogs do not perceive them as a threat and attack them. Tourist visits to best practice farms and direct dialogue with interested farmers are to be encouraged to improve understanding of human–wolf relationships and to offer opportunities associated with wildlife-based tourism to farmers and locals. Tourists can participate in specific activities for protecting livestock, such as installation or removal of electric fences, surveillance of livestock and help with livestock guarding dogs.

¹ Fladry consists of a line of flags hung from a rope, intended to deter wolves.



3.2. Public acceptance and fear

Human–wolf conflicts often lead to negative public attitudes toward wolves and can present a potential threat for the survival of wolves (e.g. more illegal killing, increasing demands for reduction of wolf numbers in the area, etc.). In addition to conflict over livestock depredation, conservation of wolves in human-dominated landscapes has to grapple with other types of human–wolf conflict, such as perceived competition with hunters for wild prey, killing of hunting dogs (Bassi et al., 2021; Iliopoulos et al., 2021) and fear of being attacked (Bisi et al., 2010).

Although the degree to which wolves pose a threat to human safety has been heavily debated in Europe, the number of confirmed wolf attacks is very low. In Europe and North America, during the period from 2002 to 2020 there were 12 confirmed attacks on humans with a total of 14 victims, two of whom were killed (Linnell et al., 2021). In many cases, attacks were associated with situations where wolves demonstrated habituated, fearless behaviour and had been utilising anthropogenic food sources before the time of the attacks (see section 3.6 Habituation). Food-conditioning and habituation is often the result of intentional feeding by people or illegal keeping of wolf pups in captivity (Nowak et al., 2021a). However, one fatal attack documented in Alaska involved healthy wolves with no signs of unusual behaviour or food attractants (Butler et al., 2010). Nevertheless, considering that there are close to 60,000 wolves in North America and more than 17,000 in Europe outside Russia, all sharing space with hundreds of millions of people, it is clear that the risk of being attacked by a wolf is vanishingly small (Linnell et al., 2021).

Perceptions and attitudes towards wolves are influenced by knowledge of the species (Ericsson and Heberlein, 2003; Gosling et al., 2019). Tourism can therefore act as an educational platform to increase public awareness of, among other topics, the potential ecological value of wolves, the low risk of attacks on humans and effective measures to protect livestock as well as the importance of keeping safe distances and never feeding wildlife in order to avoid habituation.

3.3. Illegal killing

Due to conflicts with human activities, wolves continue to be perceived as pests and are often illegally shot, snared and poisoned (Fritts et al., 2003; Galaverni et al., 2016; Musto et al., 2021; Nowak et al., 2021b). Reports from EU Member States under the Habitats Directive indicate that

illegal killing is a major pressure and threat for the conservation of wolves (FACE, 2021). This situation is worrying given the fact that poaching is very difficult to detect compared to other causes of death so its prevalence probably tends to be underestimated (Liberg et al., 2011). Tourism can help to conserve wolves and reduce illegal killing by making animals more valuable alive than dead.

3.4. Habitat loss due to infrastructure and human disturbance

As the human population continues to grow, fragmentation and habitat loss pose important threats to wildlife including wolves. Human activities, including mass tourism, reduce the availability of potential refuges and reproductive sites, which are the most vulnerable places for wolves. Responsible wolf tourism programmes must take into consideration the need to prevent further habitat loss and fragmentation, as well as human disturbance in sensitive areas for wolf conservation, especially denning areas and rendezvous sites². All activities must be done in such a way as to minimize disturbance of wildlife, preferably in close cooperation with researchers, wildlife managers or other personnel responsible for the management of the species.

3.5. Free-ranging dogs

A growing body of literature demonstrates that free-ranging and feral dogs can have significant detrimental effects on natural environments. For example, they may prey on a variety of wildlife species and hence compete for prey and carrion with sympatric carnivores such as wolves (Wierzbowska et al., 2016; Conceição-Neto et al., 2017). Dogs can carry pathogens transmissible to wildlife and humans. Additionally, dogs can interbreed with wolves and produce viable hybrid offspring. Such hybridization may compromise the genetic identity of wolf populations, potentially affecting their physique, behaviour, physiology, ecology and conservation value (Mech and Boitani, 2003). Free-ranging and feral dogs therefore represent a serious threat to wolf conservation.

Moreover, pet dogs running free can also trigger a wolf attack on dogs (Linnell et al., 2021). Although in such situations wolves are mainly interested in the dog (MacNay, 2002), it can be extremely stressful for any person involved. Dogs roaming in core areas of wolf territories may disturb wolf pups and force parental pairs to move litters to other, less suitable places. In areas also frequented by bears, free running dogs may even provoke a bear attack. Tour operators can help raise awareness about the hybridization threat and about the importance of keeping dogs on a leash when hiking in wild areas to avoid wildlife disturbance and the risk of triggering large carnivore attacks.

3.6. Habituation and food conditioning

Habituation is a learning process where an animal becomes used to repeatedly occurring stimuli which have neither positive nor negative consequences. Habituated wolves have learned that humans pose no threat to them and become used to the presence of humans. This level of habituation is not problematic if wolves tolerate people, buildings, vehicles and human activities at a certain distance without taking any direct interest in people themselves (Reinhardt et al., 2020).

However, strong habituation, when wolves tolerate the immediate presence of people at close distance (within 30 m), is a behaviour that may become problematic. Habituation may be reinforced by food conditioning, where animals connect the presence of humans or places of human presence (e.g. camp grounds, backyards, feeding areas in front of hunting blinds or wildlife photography hides) with the availability of food (Nowak et al., 2021a).

In contemporary Europe, the most likely cause of problematic wolf behaviour toward humans is strong habituation to the immediate presence of humans in connection with food conditioning. Most of the few reported wolf attacks since the middle of the last century in Europe and North America had a history of wolves showing signs of strong habituation (Reinhardt et al., 2020; Nowak et al., 2021a). It is therefore crucial for tourism operators to understand that any form of deliberate feeding of wolves for the purpose of wolf tourism is potentially harmful for the species and can lead to the death of the wolf.

Wolves normally avoid people and are not considered a dangerous species for humans (Photo: Augusto Rivelli, Maritime Alps Protected Areas archive)

4. Guidelines for responsible wolf tourism

The following guidelines are designed to enable the provision of high quality, educational programmes for tourists which at the same time have as little negative impact as possible on wolves, the surrounding nature and local people living in the area. They are not exhaustive and should be adapted to the local circumstances in each country. We distinguish between general guidelines that apply to all forms of wolf tourism and specific guidelines for wolf tracking, wolf howling and wolf watching activities.

4.1. General guidelines for all forms of wolf tourism

4.1.1. Legal frameworks

The legal status of wolves in Member States of the European Union is specified in the Habitats Directive (92/43/EEC) with the main objective to maintain or achieve a “favourable conservation status” for the species. Due to a significant number of country-specific exceptions, different legal regimes apply to wolves depending on their location within the EU (Trouwborst and Fleurke, 2019). By default, wolf populations are listed under Annexes II and IV. Annex II requires the establishment of “Special Areas of Conservation” for the species while Annex IV requires strict protection, prohibiting any destruction or damage to the population (but with derogations still possible under Article 16) (Kaczensky et al., 2013). Wolves in Bulgaria, Estonia, Latvia, Lithuania, Poland, Slovakia and parts of Greece (north of the 39th parallel), Finland (reindeer management area) and Spain (north of the Duero River) are listed in Annex V, which gives significantly more leeway to authorities regarding the tools they can use to manage wolf populations (Trouwborst and Fleurke, 2019).

Almost all European countries have also ratified the Bern Convention. In most signatory countries, the wolf is listed under Appendix II, which stresses the need for strict protection and minimization of disturbance in wolf reproduction areas. However, many Central and Eastern European countries have filed reservations from strict protection (Linnell et al., 2017).

Legislation differs between countries and regions. Organizations and enterprises offering wolf tourism services must ensure that all necessary permits, notices and other arrangements have been secured and that all planned activities are carried out in full compliance with the applicable national, regional and local legislation (e.g. park regulations, national legislation, conservation measures of Natura 2000 sites, etc.).

4.1.2. Training guides

To achieve visitor satisfaction and to ensure that the tourism experience does not negatively impact wolves or other wildlife, it is very important that all forms of such tourism are conducted with the assistance of a well-trained, experienced guide who can guarantee safety and provide detailed and accurate information on the biology, ecology and behaviour of wolves. Guides offering wolf-related tourism programmes should have received formal training offered by official organisations that train outdoor tourism or nature guides. Such training should be conducted in close cooperation with large carnivore experts, biologists, foresters or park rangers and should cover basic aspects of wolf biology, ecology and behaviour, human–wolf interactions (see also Annex I) and guidelines for responsible tourism.

4.1.3. Health and safety

To ensure the safety of visitors in large carnivore areas and reduce impacts on wolves and other wildlife, safety recommendations on proper behaviour in large carnivore areas should be the mandatory starting point for all forms of wolf-related tourism. A maximum of eight visitors per guide are recommended to optimize the wildlife experience and ensure safety. Visitors should always stay close to the guide and use trails or marked paths.

If wolves follow humans or approach them to within 30 metres, guides should react aggressively: speak loudly, shout and/or clap their hands to intimidate the animal. Precautions should be taken when handling wolf scats (e.g. smelling, touching, taking samples) to avoid potential infestation of parasitic diseases (e.g. *Echinococcus*).

4.1.4. Preventing habituation and food-conditioning

It is essential that all precautions are taken to prevent wolves from developing bold behaviour, which is usually a consequence of strong habituation (see section 3.6). Deliberate artificial provisioning of food for wolf watching or photographing is strongly discouraged (Council of Europe, 2018). In case of encounters with wolves, they should be treated according to the principle: do not approach, do not feed.

Visitors should never be encouraged to get close to animals. They should never feed wolves or use bait for photography. Left-over food or other organic waste should not be disposed of in the forest, to prevent food conditioning.

Wolf-based tourism activities should not be conducted in areas of known or suspected dens and rendezvous sites during the pup rearing season, between mid-April and mid-September, in order to prevent habituation of pups to human presence during this sensitive period and to avoid potential abandonment of dens and rendezvous sites. If there is any evidence that tourism activities are disturbing wolves or other wildlife, or that wolves are becoming habituated to people (which, ultimately, will be harmful for them), tourism activities should be temporarily cancelled.

4.1.5. Preventing threats from dogs

It is not recommended to bring dogs to activities aimed at observing or tracking wolves. If tourists are accompanied by their dogs, they should keep them on a leash at all times. When visiting pastures with working livestock guarding dogs, dogs should be left at home.

4.1.6. Interpretation and benefits for local communities

For many visitors, interpretation and learning about wildlife are major components of the experience. Interpretation should include an overview of wolf biology, ecology, behaviour, impact of wolves on ecosystems and wolf-related cultural heritage (see Annex 1). Large carnivore tourism in Europe is not practiced in secluded wilderness areas, but in human dominated landscapes where various forms of land use overlap (e.g. forestry, agriculture, livestock grazing, hunting and tourism). Besides explaining the benefits of wolf presence, interpretation therefore also needs to cover problems that arise and possible mitigation measures. Meetings and guide-mediated discussions with representatives of different stakeholder groups can be included in wolf tourism activities to illustrate the complexity and diversity of perceptions of wolf conservation and management: for example, meeting a sheep breeder who uses electric fences or livestock guarding dogs for herd protection, or meeting a shepherd on alpine pastures. If this is not possible, simulated discussions with visitors on the topic of management and human–wolf coexistence are encouraged (e.g. role-playing as a form of experiential learning that allows visitors to relate to other stakeholders; Oražem and Tomažič, 2019).

Cultural heritage related to wolves should be promoted within wolf tourism activities: seeing old traps built to catch wolves (Álvares et al., 2011) or measures implemented to protect livestock from attack (e.g. night enclosures, livestock guarding dogs), among others, will allow visitors to better contextualize the long and dynamic interactions between wolves and people. Responsible tourism programmes should prioritise local services and products including accommodation, guides, food, handicrafts and other souvenirs. Where possible, products or services labelled as large carnivore friendly should be promoted.

Large carnivore friendly labels are awarded to practices that reduce large carnivore damages or promote coexistence between large carnivores and people: for example, the bear friendly label in Slovenia and Croatia (Kavčič and Majič Skrbinšek, 2019) and the Terre di Lupi label in Italy (Borgna et al., 2018).

All forms of wolf tourism should engage local residents, generate alternative income streams and maximize benefits for local communities (Karamanlidis et al., 2016). Where possible, locals should be invited to actively participate in monitoring activities with researchers (e.g. tracking or howling surveys; Ražen et al., 2020; Rigg et al., 2014) to build trust and improve tolerance towards wolves in the area.

4.1.7 Linking tourism and conservation

Volunteering tourism is a leisure activity whereby tourists pay to participate in research, monitoring and other activities related to the conservation of species and habitats under the guidance of qualified personnel. Tourists can, under supervision of researchers, protected areas staff or other appropriate personnel, participate in tracking wolves, checking remote cameras, collecting samples for DNA analysis (Rigg et al., 2014), simulated howling surveys (Ražen et al., 2020) or helping farmers implement livestock protection measures (Richter et al., 2018; Soethe, 2020).

A recommended good practice for all forms of wolf-based tourism could be the development of a tourism user fees, where a portion of revenue from each wolf-related tourism programme is put towards a special fund to support local initiatives for reducing conflicts or other conservation efforts.

An old trap built to catch wolves in Portugal is an example of wolf-related cultural heritage (Photo: Francisco Álvares)





4.2. Wolf tracking guidelines

Wolves generally avoid humans and usually respond to human encounters by fleeing and retreating to cover. Therefore, wolf tourism activities often require knowledge about the movements of wild animals and an ability to track them by searching the habitat for fresh signs of presence. However, this must be balanced with consideration of potential negative impacts. For example, following recent wolf tracks can lead to – and disturb – wolves on a fresh kill, resting site, denning or pup-rearing site (see Annex I for details). Moreover, activities that encourage walking off trails may disturb other wildlife, cause conflicts with local people and breach regulations or disrupt wildlife monitoring and other activities.

In particular, disturbing fresh kill sites risks deterring wolves or other species from returning to feed. The wolf pup-rearing season takes place between April and September. There is concern about the potential adverse effects of human activities near wolf dens and rendezvous sites. Wolves may abandon such sites if disturbed. Pups less than six weeks old have limited mobility, which makes them more vulnerable to disturbance than older pups that are able to follow adults to safety (Frame et al., 2007).

*Wolf footprints have four toe pads and one larger palm pad. Small impressions made by claws are usually visible. Tracking wolves off trails should only be done by backtracking, i.e. following prints back towards where they came from
(Photo: Miha Krofel)*

4.2.1. Specific guidelines regarding tourist activities that include looking for wolf tracks

- Wolves are highly vulnerable to human disturbance during pup-rearing season, so all **wolf tracking activities between 15th April and 15th September** should be **limited to forest roads, tourist trails and other established paths**. If the location of a den or rendezvous site is known or suspected, then that area should be avoided during this period.
- We recommend conducting wolf tracking in autumn and winter, when it is less disturbing for reproduction. This also creates tourism opportunities outside the main season. If in full compliance with the applicable national, regional and local legislation, and particularly in areas with snow cover, **winter is recommended for wolf tracking** tourism. To avoid disturbance of other wildlife or conflicts with other land users, artificial winter-feeding sites for wild ungulates should not be approached.
- To avoid disturbance, **wolf tracks should not be followed off trail in the direction of travel** but backwards only.
- If this is not in conflict with local regulations, **wolves can be backtracked off roads and trails** but only **outside the pup-rearing period** (i.e. before 15th April and after 15th September).
- If a **fresh kill** is found, it **should not be approached** or touched as this may deter animals from returning to feed.
- **Baiting and feeding of wolves** to attract them to a certain location **should not be conducted as part of responsible tourism**.
- Due to possible health risks, **scats and other samples should not be collected** by tourists unless accompanied by qualified personnel or a trained guide. Participants are strongly encouraged to report any signs of wolf presence they might find to researchers or authorized monitoring personnel.
- If **wolves** are sighted, they **should not be approached** or disturbed with loud noises or bright lights.

Wolf scats often contain a lot of hair and bone fragments and are usually left in prominent places such as on forest roads (Photo: Francisco Álvares)

4.3. Wolf howling guidelines

Howling is a form of long-distance communication. It serves several purposes, the most important being to enable members of a pack to maintain or establish contact with each other, to help a pack to re-join after hunts, to localise pups or for pups to alert adults in case of emergency. Pack howling is also frequent before setting out on a hunt and after reunion (Nowak et al., 2007).

Another role of howling is to inform neighbouring packs that a territory is occupied (Harrington and Asa, 2003), helping residents and intruders to avoid confrontations. Howling is usually more intense during summer, when packs occupy restricted areas (home-sites) and there is an increased need for communication between growing pups and pack mates (Nowak et al., 2007).

Wolves respond to simulated howling, particularly during summer and early autumn. The elicited howling survey is a common method to monitor wolves in some areas (Nowak et al., 2007; Potočnik et al., 2010). This approach consists of acoustic stimulation produced through human-simulated wolf howls by trained humans that wolves may respond to, allowing the presence of territorial wolves and reproductive events to be confirmed (Nowak et al. 2007; Ražen et al., 2020).

Simulated wolf howling sessions are a popular ecotourism activity, but no exhaustive evaluation has been made on potential impacts (Leblond et al., 2017). It may be invasive to residential wolf packs and could provoke negative reactions from local people, especially in places where the recent return of wolves is causing problems for sheep herders (Suter et al., 2017). Moreover, howling can enable poaching as it reveals the position of the pack. Therefore, simulated howling should not be conducted in the framework of tourist activities due to the possible negative impact on wolves. In Piedmont, Italy, Natura 2000 conservation measures have banned this activity for tourism purposes within Sites of Community Importance (SCI) and Special Areas of Conservation (SAC) in alpine areas where wolves are established.

Nevertheless, tourists can be involved in wolf howling surveys where these are conducted within official wolf monitoring programmes (e.g. Slovenia, France, Italy). In Slovenia, howling surveys are implemented to monitor wolves on a national scale using the citizen science approach, with trained volunteers involved in collecting data (Potočnik et al., 2010; Ražen et al., 2020). Because howling surveys are conducted only in favourable weather conditions, traditional tourism programmes, tied to certain dates, would be hard to implement. However, limited numbers of small-scale, individual tourism programmes could be implemented in which tourists accompany researchers during national monitoring surveys. We encourage cooperation between tourism organization and wolf researchers and managers to find appropriate solutions for individual countries.

As an alternative to simulate howling, guided night walks are recommended to give tourists the opportunity to listen for spontaneous wolf howling. In cooperation with wolf researchers or managers, and taking all possible measures to avoid causing disturbance, passive acoustic sensors could be set up in the proximity of rendezvous sites to obtain recordings of local wolf packs that can be played to tourists who are not lucky enough to hear spontaneous howling during guided walks.

Simulated wolf howling sessions can disturb wolves and should only be conducted in connection with official wolf monitoring activities (Photo: Alessio Barale, Maritime Alps Protected Areas archive)



4.3.1. Specific guidelines regarding activities that include howling

- **Wolf howling as a tourism activity should be avoided**, unless the activity relates to official wolf research or monitoring and is directly managed by qualified and authorized personnel. In some areas, simulated wolf howling as a tourism activity is forbidden (e.g. in Natura 2000 sites in Piedmont, Italy).
- The activity can be performed only if the group is **passively listening** to hear wolf spontaneous howls **without inducing** them.
- If the activity includes night walks to listen for spontaneous howls, visitors are required to always stay close to the guide and not stray off established trails to reduce disturbance of wildlife. In areas with bears, briefings on safety and awareness of appropriate behaviour in case of bear encounters are necessary.

4.4. Wolf watching and photography guidelines

There are several locations across Europe with open landscapes and good visibility where wolves can be observed at long distances. Various parts of Spain, such as the Sierra de la Culebra (Zamora) or the reserve of Riaño (León), have become national and international destinations for wolf watching tourism in recent years (Almarcha and Pastor-Alfonso, 2020). General recommendations for responsible wolf tourism in Spain are given in the manual “Best practice for bear, wolf and lynx watching in Spain” (MAPAMA, 2017).

Wolf watching activities should be performed only in open landscapes, where wolves can be observed from long distances in order to avoid disturbance and habituation. The recommended distance for responsible wolf watching depends on the landscape characteristics of the area. An appropriate distance is one in which the watcher remains unnoticed by the animal, enabling it to act according to its natural behaviour. Where topography and vegetation cover do not allow long-distance observations, wolves can sometimes be observed from wildlife photography hides. These should be built from soundproof materials to silence movements inside and have proper ventilation, for example a high chimney that does not disperse human scent at ground level (Karamanlidis et al., 2016).

Special attention should be given to wolf watching and photography carried out around rendezvous sites, as such activities can have potential impacts on wolf reproduction and increase the risk of poaching if such locations become public knowledge.

Wolves can be observed from long distances in open landscapes (Photo: Miha Krofel)

Use of binoculars and telescopes facilitates observation from long distances to avoid disturbing wolves (Photo: Francisco Álvares)



4.4.1. Specific guidelines for wolf watching and photography activities

- Wolf watching and photography should not be conducted near dens or rendezvous sites.
- **Wolves should be observed and photographed from a distance**, using binoculars or telescopes, or sound- and smell-proof wildlife photography hides.
- An appropriate **distance for open-landscape wolf watching is around 800–1,000 m** and never closer than 500 m.
- Wolf observation points must be chosen with sensitivity and preferably located within areas already used for human activities.
- Access to wolf observation points must be done so as to minimize disturbance. Noise and movement should be kept to a minimum and critical wolf habitat (e.g. rendezvous sites) must be avoided, therefore close cooperation with researchers, wildlife managers or other experts is necessary.
- Use of bait, simulated howling, sound recordings or other **techniques for attracting animals should not be used**.
- Use of spotlights or any other kind of lighting at night should not be used and may be forbidden in critical areas.

5. Best practice example of wolf-related tourism programmes

Best practice wolf tourism does not focus primarily on observing wolves, but on experiencing their habitat and the presence of wolves in their natural environment. This is done through guided walks, where visitors search for signs of wolf presence (tracks, scats, scent-marks, howls). Guides should provide information on wolf biology and help to raise awareness about the effect of the species on other animals, forests and humans. The local culture of the areas where wolves are present or are recolonizing should be presented and opportunities to meet local people who are directly affected by wolf presence can be offered to improve visitor understanding of the complex situation of coexisting with wolves.

Below we provide specific recommendations on what to include in wolf tourism programmes to help tour operators design responsible itineraries that promote good practices of coexistence and bring benefits to both local communities and wolves.

WHAT TO INCLUDE:

- Informational briefing at the beginning to share scientific information about wolf biology, explain threats to wolves and improve understanding of human–wolf conflicts and challenges of coexistence.
- Explanation on how to identify and interpret animal tracks of different animals living in areas with wolves.
- Wolf tracking. This should be done in the opposite direction of travel and, between 15th April and 15th September, should be restricted to forest roads, tourist trails or other established paths (see section 4.2.1).
- Wolf watching from long distances if the landscape allows.
- Sensory experiences such as listening for sounds of wildlife at night, including spontaneous wolf howls. From 15th April to 15th September, night walks should be restricted to forest roads, tourist trails or other established paths to avoid disturbance during the pup rearing season.
- Viewing images (photos, videos) of wolves and other wildlife obtained by camera-trapping in the region. Taking part in setting and checking camera traps on forest roads frequented by wolves. When possible, taking home the obtained video-footages.
- Listening to sound recordings of wolf howls. Recordings should not be used for elicited howling.

- Visiting pastures or farms where damage prevention methods are used, helping farmers to install wolf-proof electric fencing. Visiting wolf-related rural architecture such as old wolf traps, corrals and shepherd huts for livestock protection against wolf attacks.
- Direct dialogue between visitors and local people, large carnivore experts, foresters, hunters and other stakeholders affected by wolf presence.
- Simulated discussions (e.g. role-play) with visitors on the topic of management and human–wolf coexistence to illustrate the complexity and diversity of perceptions about wolf conservation and management.
- Promotion of local accommodation and other services, souvenirs and products (e.g. wolf-friendly products, refreshments from farms, cheese from shepherds, local handicrafts) to maximize benefits for local communities.

Winter is the recommended time for tracking wolves to avoid disturbing them during the reproduction period (Photo: Miha Krofel)



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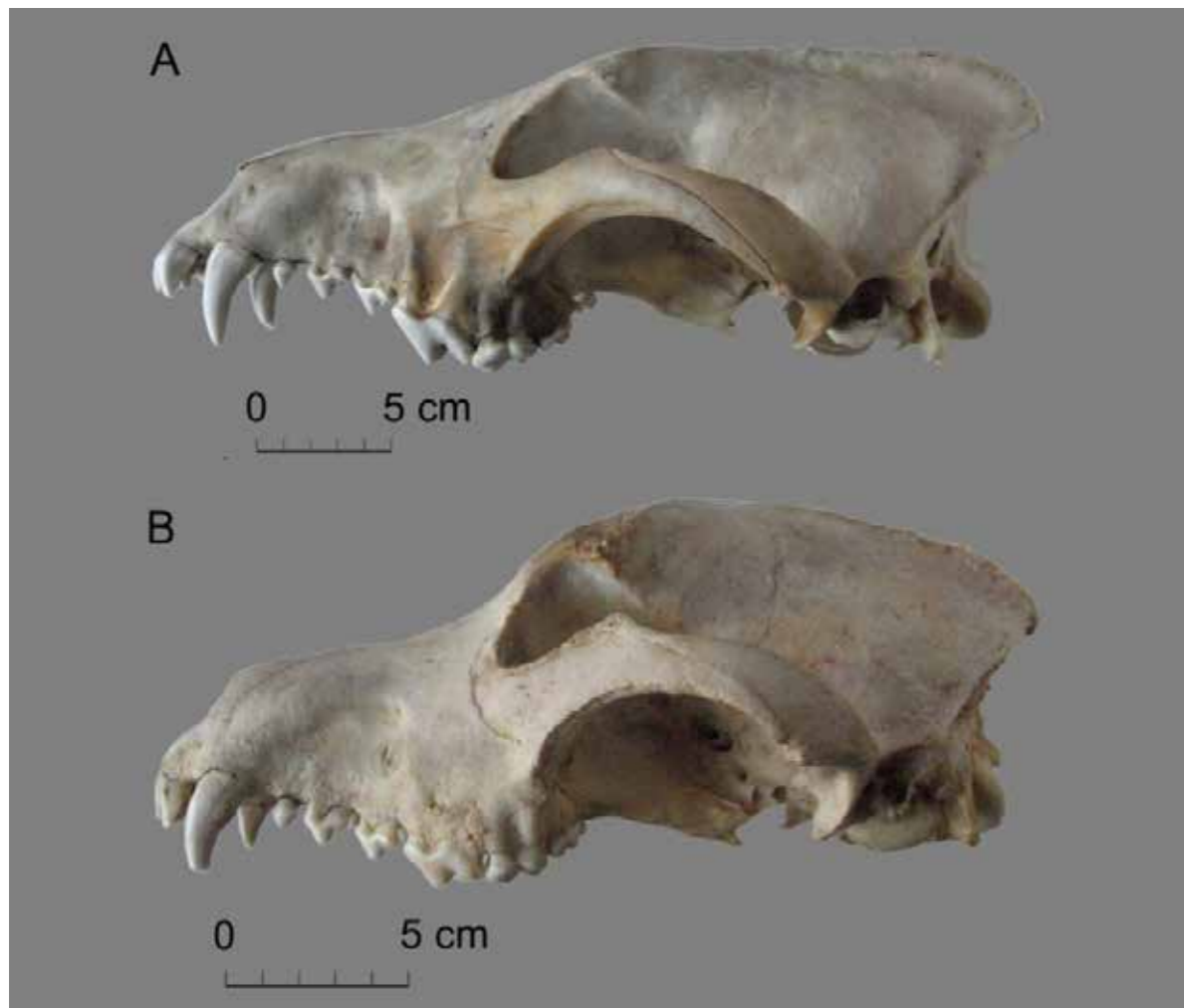
Annex 1: Facts about wolves

WHAT DOES A WOLF LOOK LIKE?

The wolf (*Canis lupus*) is the largest member of the dog family and the second largest predator in Europe, after the brown bear. European wolves are about the same size as a German shepherd dog: 100 to 120 cm in length, with a shoulder height from 60 to 90 cm. Adults have an average weight of 30–50 kg but this varies geographically, with wolves in northern Europe being generally bigger and heavier. Females weigh about 20% less than males. The tail of the wolf is on average 40–45 cm long and extends to the ankle joint of the hind limbs.

Morphologically, the wolf is distinguished from the dog by its narrow chest, long limbs with big paws, strong neck, large skull with wide forehead, powerful but elongated jaws with long canines and strong, well-developed molars (called “carnassials”). If we observe the head of a wolf, it appears frontally triangular, flattened and wide. In profile, the head of a wolf is almost flat from the top of the skull to the tip of the nose. The head of a dog in profile has a steeper angle with a more evident “frontal stop” (jump between forehead and nasal rostrum). The eyes are slanting and typically yellow, but in various shades from bright yellow to amber.

The colour of the coat of European wolves tends to be beige, with tawny or dark shades of brown on top of the neck, shoulders and back. Only the forehead is very grey, the back of the ears reddish and the bottom of the muzzle, throat and belly are significantly lighter, beige or cream. Depending on the population of origin, the shade of the coat varies, which can be diagnostic for some populations allowing phenotypic recognition (e.g. black tip of the tail, white mask and black bands are present on the forelimbs for the Iberian and Apennine populations). In central and southern Europe, wolves change between summer and winter coats, being almost short-haired and lighter in summer and with a dense, more contrasted winter coat that most people associate with the typical wolf appearance.



Comparison of wolf (A) and dog (B) skull morphology (Pitulko and Kasparov, 2017)

SIGNS OF PRESENCE: TRACKS AND SCATS

A wolf leaves tracks that are typical of large canids. A wolf's footprint is similar to that of a large dog, consisting of four toe pads and one larger palm pad. It is elongated and symmetrical, 8–11 cm long (without claws) and 7–10 cm wide. Four distinct, long, and strong claws are usually visible in a wolf's paw print. When moving across soft snow or wet ground, a wolf will spread its toes as far apart as possible. When it does this, its tracks might get confused with those of a lynx. However, lynx paws are smaller, typically 7–8 cm long and 6–7 cm wide. Moreover, lynx have retractable claws, like a domestic cat, which are therefore usually not visible in lynx footprints except, for example, in steep or slippery terrain. Fox prints are similar in shape to those of wolves but are much smaller, usually measuring about 5 cm in length and 4 cm in width. Golden jackal prints are smaller and the forelimbs often have the two middle toe pads partially merged.

Many dogs have clearly different paw prints to those of wolves. Often, they are smaller and some have clearly rounder paws. But there are also dog breeds where you cannot distinguish single paw prints from wolves. Dog tracks often lead in zigzags, circles, bows, jumping off the road and back, while wolves move with purpose and determination, which means the footprints are in line with each other and the steps are narrow. Nevertheless, wolf tracks are sometimes hard to distinguish from dog tracks, especially in human dominated areas, and guidance of an experienced researcher or tracker is often needed. To distinguish a wolf track from a dog track with certainty, it is often necessary to collect biological samples (e.g. scats, urine) for molecular genetic analysis or obtain an image of the animal from camera trapping.

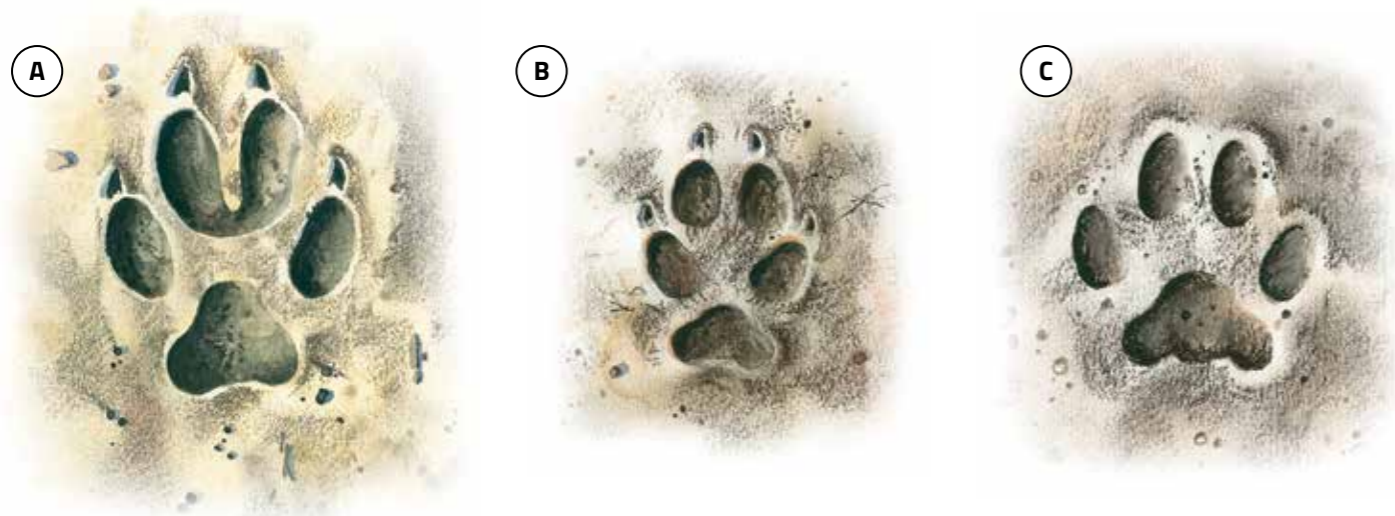
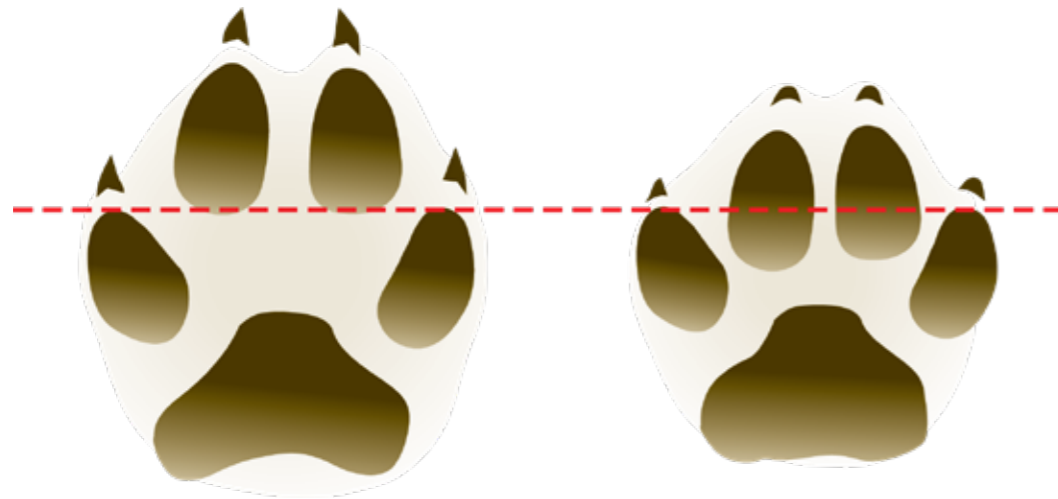
Wolf scats are usually composed of hair, bone fragments and other material of their predominantly carnivorous diet. Adult wolf scats are similar in size to those of a large dog, often with visible hair, whereas domestic dog scats are generally more uniform in texture and shape without noticeable hair or bone fragments. Wolf scats are also characterized by a strong and characteristic smell.



The footprint of an adult wolf and wolf trail (Drawings: Igor Pičulin)



Usually a wolf print has more space than a dog print between the middle two toe pads and the larger metacarpal (palm) pad. A line connecting the front edges of the outer toe pads may not even touch the back edges of the middle toe pads of a wolf, whereas in the case of a dog this line usually runs through the centre of the middle two toe pads (Černe et al., 2019, drawings: Igor Pičulin)



Golden jackal footprint, with connected front pads (a), footprint of a fox (b) and lynx (c) (Drawings: Igor Pičulin)

WHAT DO WOLVES EAT?

Wolves are generalist, opportunistic carnivores: they feed on the most available and accessible species in their habitat, so their diet can vary both geographically and seasonally. However, they have a clear preference for wild ungulates. They mainly feed on large prey, particularly red deer, roe deer, fallow deer, wild boar, chamois and mouflon. Beavers form a large proportion of wolf diet in some areas where they coexist (Nowak et al. 2011; Mysłajek et al., 2021).

Wolves may supplement their diet by feeding on carcasses, small vertebrates, invertebrates and even plants. If not properly protected, domestic animals, both livestock and dogs, are also attacked. Wolves are thought to provide important ecosystem services, for example by eating medium-sized carnivores such as feral dogs (Martins et al., 2020) or golden jackals (Krofel et al., 2017).

An adult wolf needs about 3–5 kg of meat per day. Wolves travel daily distances of 20–30 km, sometimes even up to 40–70 km, patrolling their territory and searching for food, aided by their extraordinary hearing and well-developed sense of smell. Although wolves live in packs (family groups) even a single wolf is able to kill a full-sized red deer. When hunting, they usually wear down prey by persistent pursuit, achieving speeds of up to 50–60 km/h. As a result, wolves mainly kill animals in poorer physical condition and so they have an important ecological role in maintaining the health and fitness of prey populations.

WOLF REPRODUCTION

Wolves reproduce once a year. A pair mates between January and March, depending on the latitude and gestation lasts about 63 days, the same as in dogs. Usually three to six blind pups, covered in short, almost black fur are born in a den between March and May. Pups' eyes open at 10 to 14 days after birth and they start venturing out of the den and exploring the surroundings after four weeks. At 14 weeks, pups are usually big enough to abandon the den and are taken to a rendezvous site, where they remain until they are old enough to join the pack on hunting trips, usually from September or later. Wolves reach their adult size at 10 to 12 months of age and are sexually and socially mature by the age of two years.

WOLF HABITAT

Wolves can survive in a broad range of habitat types with diverse food sources. In North America and Asia, they are found in tundra, prairies, steppes, semi-deserts, mountains and northern forests. In Europe they primarily occur in a mosaic of forests and open habitats, including agricultural landscapes. This adaptability to diverse habitat types has ensured wolf resiliency; however, it has also increased conflicts with human interests and made it difficult to keep wolves separated from areas used by people. The segregation of large carnivore habitats from human landscapes that has been proposed by several North American authors is not an option in Europe (Boitani and Ciucci, 2009). In Europe, wolves frequently occur in human-dominated landscapes with high road density and multiple human-related activities. In these areas, each pack territory may comprise several human settlements and even cities. Therefore, refuge conditions in the form of dense vegetation (e.g. forests and scrublands) with limited human disturbance, are a key habitat factor for wolves, particularly for resting and breeding. There is no alternative for management other than to try to integrate wolves as much as possible within human-dominated landscapes.

BEHAVIOUR

Wolves are strongly territorial animals that live in packs whose members cooperate in hunting, reproduction and protection of their territory. The pack is a reproductive unit: it is a family group of two parents and their offspring. Generally, only the two parents reproduce, however double reproductions may occur in certain circumstances. The pack is composed, on average, of between three and eleven individuals, depending on the region. Usually, packs are larger from summer to the beginning of winter, when pups of the year and some young wolves of the previous year might be present at the same time. Yearlings often disperse during the winter.

The size of wolf pack territories varies greatly and is dependent on the prey availability in each area, the geography of the region and the degree of human activity. Once a wolf pair settles in an area, it occupies an exclusive territory and founds a family group that regulates itself annually. Wolf population density cannot increase indefinitely, as each pack actively defends its territory from wolves of a neighbouring pack. Scent marking and howling are used to establish the borders of their territory. Internal use of the territory is different within the year, depending mainly on the supply of prey and reproductive activities. During the breeding season wolves stay close to, or regularly return to, the den and to rendezvous sites. At other times of year they roam more widely over their territory but there are always certain preferred trails and locations which they use more frequently.

Wolves are usually most active at night and during twilight, in correspondence with the foraging activity of their prey and when human disturbance is lower. However, wolves can also be active during the day, especially in areas with low human activity.

WHY DO WOLVES HOWL?

Howling is a form of direct, long-distance communication and plays different roles in the social life of the pack and between packs. Wolves howl to keep contact between pack members, especially the parental pair and pups, to strengthen social relationships within the pack or to defend the territory against intruders. Howling also has a gregarious meaning for members of a pack and helps coordination of departures, meetings and movements of individuals within the territory (e.g. hunting events). Howling is also a mechanism with which wolves affirm their presence and possession of territory in real time, thereby reducing antagonistic encounters with dispersing wolves or wolves from a nearby pack.

▪ **WOLF-HUMAN INTERACTIONS**

Due to legal protection together with improved habitat conditions and prey base, wolves are returning to areas in Europe from which they have long been absent. This process brings many conflicts due to attacks on domestic animals, mostly sheep but also goats, cattle, horses, donkeys and reindeer.

The conflict between large carnivores and humans dates back to the origins of domestication. In an attempt to minimize wolf predation on livestock, rural communities developed several tools and techniques, including livestock guarding dogs (Rigg, 2001). Shepherds sometimes fit these dogs with special collars to protect their throats from wolf bites. Various types of enclosures have been used to keep livestock safe during the night. Pastoral communities have also developed several devices and structures to catch and kill wolves, usually on paths frequently used by wolves near villages or grazing areas (Álvares et al., 2011). Wolf parts were used as a source of medicine, to cure diseases in humans or domestic animals (González et al., 2019) and symbolic image of the wolf is expressed in a number of different tales, beliefs and practices.

This shows that wolves have generated substantial culture, ethnography and traditions. These cultural traits can be a valuable resource for wolf-based tourism and an opportunity to maximize benefits for local communities, which can potentially increase tolerance towards wolves.

▪ **WOLF ATTACKS ON HUMANS**

The danger that wolves represent for human safety is often discussed in the public and media. Wolf attacks are rare and mainly associated with one or more risk factors (Linnell et al., 2002):

- most cases of wolf attacks worldwide are attributable to **rabies**. As such, this represents a very low risk for Europe due to regular vaccination actions conducted in forests areas,
- **habituation**, when wolves lose their fear of humans, increases the risk of attack,
- **highly modified environments**, with little or no natural prey, high densities of humans living in poor socio-economic conditions and unprotected anthropogenic food sources that wolves can feed upon, can also increase the risk of attack.

A recent review (Linnell et al., 2021) found evidence of a total of 12 wolf attacks (with 14 victims) in Europe and North America during the period 2002–2020, two of which (both in North America) were fatal. Considering that there are close to 60,000 wolves in North America and 17,000 in Europe outside Russia and Belarus, all sharing space with hundreds of millions of people, the risk of a wolf attack is clearly extremely low.

Most wolves are not dangerous, but there are risks from habituated (by keeping by humans in captivity from early age) and especially food-conditioned (by unintentional or intentional feeding) individuals, and on some rare occasions unpredictable and unprovoked incidents will occur. It is crucial to prevent the development of dangerous situations and to properly react to such situations when they appear. It is very important to remove food sources that are near human settlements or permit association with humans (LCIE, 2019; Linnell et al., 2021). This includes garbage dumps as well as deliberate feeding of wolves, for example for the purpose of wolf watching or photography (Nowak et al., 2021a).

Where literature sources are not listed, the summary in this annex was based on information available on the LIFE WOLFALPS EU and CARNIVORA DINARICA project websites. For further reading about wolves, please visit:
<https://www.lifewolfalps.eu/en/wolf-faq/>
<https://www.dinapivka.si/en/large-carnivores/wolf/biology-ecology-and-behaviour/>

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