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AND NATURAL HABITATS

Group of Experts on Conservation of Large Carnivores

Oslo, 22-24 June 2000

Action Plan for the conservation of the wolves *(Canis lupus)* in Europe

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The process behind the elaboration of the action plans

Each Action Plan was first elaborated by the author in early 1998. These first drafts included input and comments from many experts throughout Europe. In October 1998, governmental experts then discussed the Plans at a meeting organised by the Council of Europe in Slovakia, after which the authors incorporated the comments received.

The Plans were then reviewed by the Bern Convention Contracting Parties in December 1998 and again by the European Commission and EU governmental experts at a meeting of the Habitats Directive Scientific Committee in September 1999. All the comments received (and forwarded to the authors by the Commission via the Bern Convention Secretariat) were included in the final draft version presented at the Bern Convention Meeting of The Contracting Parties in December 1999. At this meeting, some governments advised that they still wished to comment on National Actions related to their respective countries and they were given until end February 2000 to send their comments to the Council of Europe.

The authors have made every effort to incorporate all the comments received into the final Action Plans and apologise unreservedly should any have slipped through the net. It is clear from the above that these Plans have been through an exhaustive, collaborative process and received a wide consensus, culminating in Recommendation No. 74 (Dec 1999) of the Bern Convention Contracting Parties, December 1999. Where differing figures have been given by various national experts (in particular as regards population numbers), every effort has been made to include both (or all) totals.

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Mission statement

The Large Carnivore Initiative for Europe (LCIE)

"To maintain and restore, in coexistence with people, viable populations of large carnivores as an integral part of ecosystems and landscapes across Europe"

A LARGE CARNIVORE INITIATIVE FOR EUROPE

Background

Europe, once a broad mosaic of natural habitats ideal for large carnivores, is now left with only scattered tracts of suitable "wildland". Brown bear, wolf, wolverine, Eurasian lynx and Iberian lynx still occur in Europe but they are forced to live in highly fragmented and human-dominated landscapes.

There was widespread and bitter opposition to large carnivores in the past but today there is increasing public interest in their conservation. However, the predatory behaviour of large carnivores often conflicts with local economic activity, especially livestock farming.

Their current distribution is often confined to border areas, which therefore requires cross border co-operation in order to conserve and manage populations.

The presence of large carnivores is a measure of regional biodiversity. Viable populations of large carnivores demonstrate Europe's contribution to the conservation of global biodiversity.

The political development within Europe, particularly within the European Union, with the partial disintegration of national borders and more unified legal and planning requirements, creates new and promising opportunities for the successful management of large carnivores populations on a European wide scale.

Implementation of the Natura 2000 sites in Europe, the increased priority to the conservation of natural areas, and the Pan-European Biological and Landscape Diversity Strategy (PEBLDS), give exciting opportunities for enhancing Europe's biodiversity.

It is clear that the challenge of conserving large carnivores is complex and dynamic, involving ecological, economic, institutional, political, and cultural factors and any attempt to solve this conservation issue must take this into account. Realistically, no single agency, organisation, or institution will be able to solve the carnivore conservation issue alone. No single plan or strategy can be completely comprehensive and correct as a guide for action and continual monitoring is required.

Recognising these opportunities, and the need to build strong partnerships with land managers, researchers, citizens, government officials and international organisations and Conventions, the World Wide Fund for Nature (WWF) . together with partner organisations and experts in 17 European countries, has decided to get to grips with the issue so that the future for large carnivores (brown bear, Eurasian lynx, Iberian lynx, wolf and wolverine) can be substantially improved, while the opportunity still exists. The first steps towards the development of a "Large Carnivore Initiative for Europe" were taken at a meeting in Abruzzo National Park, Italy in June 1995. Based on input from two subsequent workshops in Neuchatel, Switzerland (September 1995) and Oberammergau, Germany (January 1996), a programme plan has been developed building a network of interested parties and activities.

Actions

- Create a network of interested parties including land managers, researchers, citizens, government officials and international organisations and Conventions;
- Act as a focal point for information relative to large carnivore conservation in Europe;
- Develop and implement new ideas and methods to ensure the coexistence of brown bears, lynx, wolves and wolverines with people;
- Support and build on existing initiatives and projects within Europe, and encourage Europe-wide co-operation in order to avoid duplication of effort.;
- Disseminate valuable experience and knowledge from different countries;
- Encourage public discussion on the future of large carnivores within Europe, especially with regard to rural support systems, which maintain the economic and social well being of local people as well as conserve viable populations of large carnivores.
- Address issues in four important fields of activity:

. Conservation of Large Carnivore populations and their habitats;
. Integration of large carnivore conservation into local development in rural areas;
. Support for large carnivores through appropriate legislation, policies and economic instruments;
. Information and public awareness with the aim of obtaining the acceptance of large carnivores by all sectors of society;

Preface – Species Action Plans

Large Carnivores in Europe

Europe once offered a wide range of natural habitats for its large carnivore species. Today, however, relict brown bear populations are dangerously small and highly fragmented in Southern, Central and Western Europe. The Iberian lynx has recently been labelled by the IUCN as the most critically endangered cat species world-wide. Wolf populations are under intense human pressure throughout most of their range. The Eurasian lynx has disappeared in much of Europe and even though wolverine numbers in Fennoscandia appear to have stabilised since it became protected, illegal hunting is still a constant threat.

Like many conservation issues, the future of Europe's large carnivores is dependent on cross-border co-operation between nations and, importantly, on managing their interaction with human activities. The challenge of conserving large carnivores is complex and must involve a wide range of stakeholders including land managers, local communities, governments, international Conventions and NGOs.

In response to this challenge, WWF International (the World Wide Fund for Nature), together with partner organisations and experts in 17 European countries, launched a Large Carnivore Initiative for Europe (LCIE) in June 1995. Since its inception the Initiative has grown rapidly with experts from 25 countries actively involved and many others expressing interest. The aim of the LCIE is to support and build on existing initiatives or projects across the continent, avoid duplication of effort and make the most efficient use of the available resources. One of the many activities that was identified as being of priority for the conservation of Europe's large carnivores was the elaboration of Pan-European Conservation Action Plans for the five species.

Species Action Plans for the conservation of the Brown Bear, Wolf, Eurasian Lynx, Iberian Lynx and Wolverine

This Plan is one of a series of Pan-European Action plans elaborated for each of the five species at present dealt with under the LCIE (Brown Bear *Ursus arctos*, Wolf *Canis lupus*, Eurasian Lynx *Lynx lynx*, Iberian Lynx *Lynx pardinus* and Wolverine *Gulo gulo*). The plan should be seen as complimentary with the other four plans and actions should be co-ordinated with those taken under the other plans since in many cases a natural guild of native predators is desirable.

The plans go beyond detailed analysis of local populations' needs and focus on the specific issue of managing the species throughout Europe, stressing the necessity for a continental approach and co-ordinated national efforts. It is hoped that one of the great values of these Plans will be that they generate coherence to actions throughout the whole range ofeach given species.

These Plans are not management plans per se, but rather aim to form the basis for decisions at international level pointing at the importance of using populations as the management unit, which are often transnational. These Pan-European plans stress the need for national management plans to be drawn up in collaboration with neighbouring States where necessary, and in order to facilitate this process a volume on Guidelines for developing Large Carnivore Management Plans (D. Hofer and C.Promberger 1998) has just been produced by the LCIE.

These Plans serve as an important communication tool and their recommendations should be used to influence players in the conservation sphere at local, national, and international levels. They also provide a baseline record against which to measure change in future years as well as a common framework and focus of action for a wide range of players.

The responsibility for the elaboration of the plans was assigned to teams working under some of the top European experts for each species. During the preparation of these action plans the authors consulted a wide spectrum of sources including management authorities, researchers, NGOs and the literature. This open process included a workshop for governmental experts in Slovakia organised by the Council of Europe (Bern Convention Secretariat) specifically to discuss the five Action Plans in October 1998.

Endorsement

The Council of Europe document "Guidelines for Action Plans for Animal Species" (T-PVS-(ACPLANS)(97) 8) underlines the importance of producing Action Plans for large carnivores at a Pan-European level: "It also makes good ecological sense to choose species that serve as protective "umbrellas" for other species. Such a single species effort avoids many bureaucracies and provides many "inclusive benefits". Umbrella species are species whose own area requirements provide some index on the area requirements of the ecological systems that support them. Top carnivores or other large-bodied, long-lived slowly reproducing species at the top of their ecosystems food-chain are good examples…." The document states that " The Council of Europe through its Committee of Ministers or the Bern Convention's Standing Committee are in excellent position for endorsing such Plans."

Common Themes

All five Action Plans have clearly identified a number of important common themes, which include the following fundamental guiding principles:

- there is a need to concentrate conservation efforts at the population level, which often requires cross-border co-operation;
- the principle of management of large carnivore through a system of zoning including core areas, buffer zones and corridors;
- where re-colonisation of areas by large carnivores is desirable, the following principles should be applied:
  . priority should be to firstly support natural re-colonisation,
  . secondly to work on the augmentation on non-viable populations,
  . thirdly to release animals into areas in order to join up non-viable populations, and
  . finally, to carry out releases into new areas.
- it would be highly desirable that each country sets up a specific body that is responsible for large carnivore management issues, and who would be charged with the preparation of national management plans (A single body that is responsible for all large carnivore species is desirable);
- wherever compensation systems are in place, these should be tied to prevention incentives;
- with regard to identified "problem" animals, which create local damage, emphasis should be given to maintaining populations and not by concentrating on individuals (apart from rare exceptions);
- in-depth and scientific human attitude studies (including work on conflict resolution) have to be initiated;

The points made above just give a brief indication of some of the more important common themes or principles that are shared by all five action plans that have been elaborated as part of the series.

Implementation

It is very important that these Action plans once “endorsed” are acted upon. These Action Plans should guide national authorities in the elaboration of National Plans and the implementation of these plans must be carried out by professional teams that involve a wide range of appropriate interest groups. The plans themselves can act as important fund raising tools to help spark off the implementation. In countries where more than one of the large carnivore species is present the elaboration of National Action Plans (as recommended by these Pan-European Action Plans) for each species should be in harmony with one another.

Conclusion

Finally we would like to thank the authors, all those who have provided data and comments and the Council of Europe for all the hard work and support that has been put in to this. We would also like to thank WWF Netherlands, Sweden, Norway, Mediterranean Programme and the Council of Europe for providing the funding for the elaboration of the Plans. We hope that these plans will form the basis for collaborative pan-European conservation work for these species over the next ten years, and that the success can be an example to other Initiatives.

Magnus Sylven (WWF International, Chair, LCCG)
William Pratesi Urquhart (LCIE Co-ordinator)

Executive summary

The wolf is the most important European predator. It has always had a special place in the relationship between humans and their natural environment. Similar social systems, hunting needs and techniques, territoriality and great behavioural and ecological flexibility have made the wolf a companion and competitor of humans since early history. Human attitudes toward the wolf have ranged from fierce competition and extermination to admiration, rarely indifference.

Wolves have been exterminated from most of Europe in the last two centuries and they probably reached a minimum number around the middle of this century. Not all European wolf populations were hunted to extermination and small but healthy populations survived in all three Mediterranean peninsulas. Larger populations survived in many east-European and Balkan countries. Today there is a great variation of wolf numbers in various European countries, but often these populations are isolated and still show negative numerical trends. Wolves need large areas to roam around and they can disperse over large distances: these two features call for a large-scale conservation strategy that would encompass entire European regions, above and beyond national boundaries.

In the last 20 years wolves are returning to a few areas where they had been exterminated decades ago: some of these areas, such as the Alps or the Scandinavian peninsula, require an international co-operation that can best be achieved at European level. This, together with the need for an integrated conservation strategy that includes consideration for the Common Agricultural Policy, is the main reason for proposing this paneuropean approach to wolf conservation.

Wolves can survive anywhere where there is something to eat, from large wild preys to garbage, and where they are not killed by humans. They can adapt to live close to human activities as long as they are not disturbed. In their search for food, they can attack and cause serious damage to livestock (but no documented case has ever been found of an attack to human in Europe in the last century). The conflict with human economies has been the main reason for wolf control and it is still today the single most important cause of wolf mortality. Wolves are protected in most European countries (Bern Convention and the Council Directive 92/43/EEC on Conservation of Natural and Wild Fauna and Flora of the European Union) but there are important exceptions in Spain, Greece and Finland, and also in some east-European country where it is still managed as a game species.

The management and conservation of the wolf is not an easy task because of the intricacies of serious facts, such as predation of livestock and wild preys, and irrational facts such as prejudices, legends and misinterpretation of its biology. The wolf has been extensively studied in North America, but little scientific data is available for Europe and the high flexibility of the species calls for ad-hoc research programmes to be implemented on the most representative European populations. It is of paramount importance to implement a good monitoring programme throughout Europe with the aim of collecting reliable and continuous records of wolf numbers, activities, and economic impact on livestock. Trans-border co-operation will be essential to sound wolf conservation and to manage the likely return of the species over most of central and western Europe. Public opinion will have to be managed on the basis of a honest, rational and fair treatment of all aspects of the conflicts involved in wolf conservation.

This Action Plan summarises the basic facts of wolf biology that are relevant to its management, then it analyses the main threat and problems of wolf management in Europe.

Within the overall goal of maintaining and restoring, in coexistence with people, viable populations of wolves as an integral part of ecosystems and landscape across Europe, this Action Plan has identified three specific objectives: i) To allow the wolf to recover and live throughout Europe wherever it is biologically and economically feasible; ii) To ensure wolf-human coexistence and a sustainable compromise by limiting the conflicts; and iii) To achieve a paneuropean perspective in managing wolf recovery and to help ensure wolf conservation/management on a continental scale.

The Action Plan presents the principal actions that should be taken for ensuring a long term coexistence between wolves and humans in Europe: it underlines the need for an approach at continental level and then articulates a number of actions under the following main themes:

- Co-ordination of management across borders
- Planning wolf management in Europe
- National Wolf Management Plans
- Habitat, corridors and food supply
- Damages to livestock and the problem of competition with hunters
- Public involvement in wolf management
- Education and information
- Applied research

Wolf conservation will be best achieved if carried out in a global approach that includes considerations for all other large carnivores of Europe: bear, wolves and lynxes often share the same geographical areas and they rely of healthy ecosystems. Their integrated conservation should become a priority for all European countries.

. Introduction

In the last few years the wolf populations in several European countries have been increasing in number and distribution range. Wolves from some eastern countries have expanded west and at the same time Italian wolves have migrated north. Countries like France, Germany and the Czeck Republic now have wolves again. The same development has taken place twice before in this century; wolves expanded into large parts of Europe after the First and after the Second World War. The most recent expansion has had several causes: a change in people's attitude in favour of wolves and changes in population density and human activities in mountain and rural areas. Both have contributed to opening new potential areas to wolf re-colonisation. The big difference with respect to the past is that wolves are now allowed to expand willingly; the wolf is fully protected in many countries.

Wolf populations have potentially high rates of increase and dispersing animals can re-colonise distant areas. While these biological aspects are significant in re-establishing the wolf in parts of its former ranges, they can also result in having wolves in areas where local ecological and socio-economic conditions seriously conflict with its presence.

Across Europe this process is being met with different responses from the public and public administrations. Wolf population dynamics and dispersal easily encompass the small size of most European countries, and co-ordination of national management approaches appears necessary. Survival of small local wolf populations may depend on the health of neighbouring populations; the highly patchy European habitat calls for careful evaluation and management of population fragments. We need to know how to manage the return of the wolf in order to minimise the conflicts and optimise the potential distribution. How far can we expect to integrate human activities and wolf presence?

The Wolf Specialist Group of Experts of the IUCN is concerned with wolf conservation world-wide and its "Manifesto and Guidelines on Wolf Conservation" is the general reference for managing wolf populations. Within these general guidelines a Wolf Conservation Strategy for Europe was adopted in 1992 by the European Wolf Network, and its principles, guidelines and action plan deal with the specific European situation. In September 1995 many scientists and administrators interested in wolf management in various European countries gathered in Neuchâtel (Switzerland) for a meeting organised by J. M. Landry and D. Roth with financial contribution from WWF-Switzerland, Bernd This Foundation, FOFEL, and Pro Natura. Recovery and conservation options for wolf recovery throughout Europe were discussed in view of adopting a common management policy. These documents form the conceptual background and framework for the present Action Plan. From this basis, a large number of researchers and managers from throughout Europe have been contacted for additional information. Questionnaires have been sent to at least one wolf expert in each European country and then a first draft of this Action Plan was sent to the same people for comments and revision. Data and information have been verified for accuracy and reliability trough cross-checking all available sources. Errors and inaccuracies are nevertheless sole responsibility of the compiler.

The Action Plan is based on a country by country approach to facilitate its implementation at country level and according to national legislation: however the Action Plan goes beyond detailed analysis of local populations' needs and focuses on the specific problem of managing the wolf throughout Europe, stressing the necessity for a continental approach and co-ordinated national efforts. The wolf might recover naturally or be helped by specific actions: in both cases movements across borders are to be expected and must be managed properly.

Europe is here defined as all countries east of the former Soviet Union and excluding Turkey: as wolves move over large areas and populations spread across borders, information on wolf populations of the countries east of our study area.

2. Background information

2.1. Description of the species

The wolf (*Canis lupus* L., 1758, ord. *Carnivora*, fam. *Canidae*) is the second largest predator in Europe, after the brown bear. It looks like a large German Shepherd dog. Since the species has a large distribution area and lives in a variety of habitats, its phenotype variation (size, color, and weight) is remarkably high. On the basis of this variability, several subspecies of *Canis lupus* have been described. Differences in external morphology and skull characteristics in various geographic areas have led to the identification in the Eurasian area of up to 8 subspecies. More recently, however, new taxonomic methods have suggested reducing them to 6, although the small genetic variation among wolf populations does not support a clear subdivision into subspecies.

Preliminary mithocondrial DNA analyses on European wolves have shown 6 genotypes in 7 different sampling areas, suggesting that European populations are geographically strongly structured. The high level of isolation of the European wolf populations, their small size and their consistent decline over recent decades may have favoured genetic drift processes and the fixation of exclusive genotypes in populations that are geographically isolated.

An adult male wolf weighs from 20 to 80 kg; females are smaller (15-55 kg). Larger animals are found in more northern latitudes; the average weight of Mediterranean wolves is 25-35 kg, rarely as much as 45 kg. Total head and body length of an adult wolf is 110-148 cm; the tail is usually less than a third of body length (30-35 cm). Height at shoulder averages 50-70 cm. Ears are 10-11 cm long and triangular. Wolves walk on their fingers and their tracks are similar to those of a large dog, showing 4 fingers and their nails. The fifth finger is found only on the front legs and does not touch the ground.

Pelt color is extremely variable, from pure white in the arctic areas to brown, reddish, gray, pale gray and silverish. Individual variation in other body and head markings complicate colour patterns, although wolves tend to maintain a more uniform color locally. Age, sex, season and health condition affect pelt colour. Moulting occurs in spring and the new pelage grows in early fall.

The wolf skull is wide and heavy, marked by a long rostrum and a well developed sagittal crest. Wolves have 42 teeth: I 3/3, C 1/1, P 4/4, M 2/3. The carnassial teeth (P_4 and M_1) are particularly strong. Deciduous teeth are replaced within six months.

2.2. Distribution and population numbers

The wolf is the terrestrial mammal that had the largest distribution area in recent historical times. It occupied the whole Northern Hemisphere north of 20° N, including the entire North American continent, Eurasia and Japan. Following extermination efforts by man, the species' range is greatly reduced today. Originally found throughout Europe (Map 1), at the end of the 18th century, wolves were still present in all European countries with the exception of Great Britain and Ireland. During the 19th century, and especially in the years following the Second World War, wolves were exterminated from all central and northern European countries. During the sixties, wolf distribution was similar to what it is today, with small remnant populations in Portugal, Spain, Italy, Greece, and Finland, and more numerous populations in the east.

In the last twenty years, the species has been recovering naturally in several parts of Europe: a positive, though uncertain trend in number and range size is behind the signs of re-colonisation of France, Germany, Switzerland, Sweden and Norway.

The present situation in each European country is summarised in Table 1. The largest populations are found in eastern countries, particularly Romania, the Balkan area, Poland and its neighbouring countries on the eastern border. Distribution in central-western Europe largely reflects mountain areas with lower human densities and less intensive agricultural utilisation; the distribution pattern is very irregular and remaining patches are often small and isolated. Three smaller sub-populations can be identified in the Iberian peninsula, in Scandinavia and in Italy/France: they appear to be relatively isolated from other wolf populations and are expected to remain distinct for long time. The main European population is distributed across several countries in the eastern part of Europe and the Balkan region, but is far from being compact and continuous: many small fragments of various sizes are found throughout Europe (Map 2) The overall number of wolves living in European countries is relatively high, however, only 6 countries have a population of more than 1000 wolves, only 11 have more than 500 and 8 countries have very small populations of less than 50 animals.

Small numbers of wolves in a few countries (i.e. France, Portugal, Germany, Czech Republic, Hungary, etc.) are due to the presence in mountainous areas along the borders with neighbouring countries. The presence of these small populations appears strongly dependent on the health of neighbouring populations and their ability to produce a sustained flow of dispersing animals.

Several countries of continental Europe do not have any wolf at the present time (Austria, Belgium, Denmark, Netherlands, Luxembourg) but wolf dispersal can cause a recolonisation of these areas at any time (see below). All these countries, and especially Austria, might be re-colonised soon and action should be taken to prepare the legislative and management ground in view of the wolf arrival. Wolf reintroduction plans are not a priority in Europe (see below), although in the United Kingdom there are preliminary evaluations of a possible reintroduction in Scotland.

2.3. Life history

Food ecology

The wolf has a very diversified diet and is a true generalist that feeds opportunistically on what is most available in its habitat. The wolf diet may include large prey, such as moose, deer and wild boar, or small vertebrates, invertebrates, vegetables and carcasses. Diet composition throughout the geographic range and seasonal variations depends on the relative abundance of potential prey, as well as their accessibility and availability. A wolf typically requires 3-5 kg of meat per day, although it can fast for several days when food is not readily available.

The impact of the wolf on prey populations has been debated for the past 50 years and yet only a few generalisations are possible:

. As to wild species, the wolf generally preys on young, old or sick animals, although climatic, geographic and habitat factors may deeply affect the proportion of prey taken.
. Predation impact may depend on the numerical wolf-prey relationship, habitat conditions, hunters' harvest and climatic limiting conditions, especially those of the winter months.
. The outcome of wolf-prey interactions varies from cases where wolf impact on prey populations is irrelevant to cases where the wolf is among the principal factors maintaining prey populations at a low level: the outcome depends on
. the number of wolves (which is also a function of prey densities)
. the number of prey killed by the predator per unit time (function of both wolf and prey numbers)
. the ability of prey populations to support predation (function of the prey's biotic potential and the mortality due to predation).

. Prey species with a high rate of population increase and a low mortality rate are less affected by wolf predation.
. Predation is normally (but not always) largely compensatory, contributing to overall density-dependent mortality factors.
. In some cases the numerical decline of ungulate populations due to climatic or other habitat factors may be increased by wolf predation; in similar situations wolf predation may delay the numerical recovery of prey populations.

Habitat

Wolves live in the most diverse types of habitat and their broad distribution ranges show the species' adaptability to the most extreme habitat conditions. The wolf habitat has been described as everywhere where humans do not kill the species and where there is something to eat. Where wolves depend on wild ungulate prey, their habitat is that of their prey. Habitat quality should then be interpreted in terms of human disturbance, prey densities and range size. In general, large forest areas are particularly suitable for wolves in Europe, although wolves are not primarily a forest species.

Road density has been used as a critical habitat factor and it has been shown that wolf density in North America is a function of a road density threshold: however, this relationship assumes the stability of an unknown series of other habitat factors hidden in the variable "road density", e.g. human use of roads, human attitudes, the effect of roads on prey, etc. This assumption should be verified in Europe before North American results are taken as valid.

Social behaviour and reproduction

Wolves live in social units (packs) that co-operate in hunting, reproducing and defending their territories. A pack is fundamentally a family unit that originates when a pair establishes a territory and reproduces. Strong social bonds among the pack components regulate internal stability and the dynamics of the pack. A linear hierarchy among pack members is built and maintained through ritualised aggressive behaviour. Individuals at higher dominance level take most of the initiative and have most of the privileges in feeding and reproducing. The dominance hierarchy changes constantly depending on the relative strength of pack members. Most changes occur before and during the breeding season.

Young animals stay in the pack up to the age of two years, when they face the alternative of dispersing in search of a new partner and new territory, or staying in the pack and attempting to reach higher dominance levels. Prey densities, wolf density and availability of free territory play a role in determining what reproductive strategy to follow.

A pack averages 7 wolves (2-15), the number depending on its productivity, the success of dispersion, and prey density. In Europe, pack size is mostly a function of human control, and large packs are extremely rare.

A wolf is sexually active when it is two years old. Oestrus lasts 5-7 days once a year, generally in January-March. Parturition occurs after 60-62 days and litter size varies from 1 to 11 pups. Generally only one litter is produced in each pack, although data is available from North America of more than two litters being produced within the same pack: usually the dominant pair reproduces, but several exceptions have been observed. Recent genetic analyses of intra- and inter-pack relationships have shown that significant genetic exchange occurs among neighbouring packs.

Territoriality and dispersion

Wolves are territorial and each pack actively defends its own territory from wolves of neighbouring packs. Territory size varies greatly, depending on wolf and prey densities, geographical features, human disturbance, and human-related infrastructures, whereas territory size in North America ranges from 80 to 2,500 km2, in Europe it is generally from 100 to 500 km². Territories are actively advertised by wolves, through markings with urine and faeces left in strategic sites within the territory and along the boundaries. Territory boundaries are rarely trespassed; when this occurs, it may lead to violent aggressions and intra-specific mortality.

Internal use of the territory varies throughout the year, depending on prey seasonal distribution and wolf reproduction activity. During spring and summer, when the entire pack contributes to feeding and caring for the young, wolves tend to return more frequently to the den or the rendezvous sites. The latter, of which there may be several in each territory, are traditional sites to which the pack returns after hunting. Wolves can travel many km per day (up to 38 km in southern Europe), depending on the pattern of territory used as a function of food resource dispersion and human disturbance.

A small number of wolves live with no territory: these animals are dispersing from their parent territory in search of a new area in which to settle, or they may be animals that have been rejected by a pack (as when a dominant loses its status). They move mostly along the periphery of existing territories and hunt alone. Dispersal distance can be substantial and in North America has been found to be from 8 to 354 km (886 km maximum).

Territoriality, social behaviour and dispersal are the intrinsic mechanisms regulating wolf density. Territoriality limits the number of social units, social behaviour limits the number of reproducing females, and dispersal contributes to expanding the population and increasing its genetic exchanges.

Demography and population dynamics

Sex ratio is usually slightly biased in favour of males, but it can be in favour of females in populations that are substantially controlled by man or are at very low densities. Young animals of the year make up to a third of the total population – or more when the population is expanding rapidly or it is heavily exploited. Non-territorial and dispersing wolves have been estimated at no more than 5-20% of the total population.

In areas without human influence, natural mortality (intra-specific aggression, illness, wounds from hunting accidents, starvation and malnutrition) can affect up to 50% of the total population. However, human action is by far the most important cause of mortality for European wolves. It can be accidental or intentional (shooting, poisoning, trapping) and is particularly significant where wolves cause damage to human economic activities. Local mortality can account for temporary local extinction of small populations.

Adult wolves have the highest survival rates (80%), followed by the young of the year (55%) and then pups (6-43%). In natural environments, pup survival after the first winter is strongly correlated with prey density. Dispersing animals have lower survival rates. Wild wolves can live up to 10 years, whereas in captivity they can reach 16 years of age.

Wolf density is clearly related to the density of available food; higher prey biomass allows for larger litter sizes and greater pup survival. The numerical response of the wolf to variations in prey numbers lags behind by 3-5 years. Where wolf populations are controlled by man, it has been found that a mortality rate of over 35% of the total population in autumn may cause a decline and eventually extinction.

Densities vary significantly. In North America they are generally from 0.3-4.3 wolves/100 km^2, and appear to be regulated essentially by the prey biomass. In Europe the densities are generally 1-3 wolves/100 km^2 (Table 1), although a comparison is extremely difficult due to the differences in methods and time of the year to which the estimates refer. In Europe, wolf density is positively related to food availability and negatively related to wolf-human conflicts, that usually increase in free-ranging livestock areas.

2.4. Wolves and humans

Public attitudes

The negative image of the wolf is widespread, although with many differences and complexities depending on local cultures and traditions. Central European countries are more negative than southern ones and people from the countryside are generally more negative than urban dwellers, but local conditions can be quite different. A comprehensive review of public opinion toward the wolf at European level and stratified per social and economic groups is not available, and even local attitudes are known only from "expert" opinion rather than from appropriate scientific research.

Threat to humans

The question whether wolves can be dangerous to humans is relevant in view of the many legends and false stories that have enriched this topic. The perception of the wolf as a dangerous beast varies with cultures; European and Asian literature up to the present century abounds with accounts of wolf attacks. There can be little doubt that a portion of these reports are based on true information, since the former ecological conditions were very different from contemporary ones, i.e. rabies was common and wolves had fewer occasions to have negative experiences with humans and learn to avoid them. However, there is no hard evidence that wild non-rabid wolves pose any danger to humans in Europe today and in this century there is no reliable documentation of cases of a non-rabid, free-ranging wolf killing a human in Europe.

The reason for this is not very clear as wolves would have ample opportunity to attack, as bears do in various parts of Europe. Today wolves live very close to human activities without causing problems; millions of tourists visit and camp in national parks where wolves also live, but negative encounters have never been reported. Rabid wolves, of course, may be able to attack and kill a human, but this possibility pertains to a different range of animal-human interactions. Nevertheless, the case of an healthy wolf attacking a human cannot be excluded.

Wolves tend to be tolerant of close human contacts if the latter do not exert a negative impact on the wolves' lives. Wolf dens have been found very close to human settlements and wolves have been watched or followed by radio tracking at night inside small villages and towns.

Damage to livestock

Depredation on domestic animals is as old as domestication itself. It is the most serious problem in wolf management because depredation has been the main reason for controlling or exterminating the wolf. Depredation occurs in every part of the wolf range and a final means of eliminating it has not yet been found. In spite of the critical need to have reliable information on the amount and type of damage to the livestock industry caused by wolves, little research has been carried out.

Although the damage may be significant to the farmer who suffered it, the overall damage as a percentage of the livestock industry is almost always irrelevant (<0.5%). Indeed, the damage to livestock caused by wolves is very low when compared with other causes of livestock mortality and is often perceived as excessively important. This may to some extent be due to the psychological impact of this type of mortality (caused by a predator) and the fact that it is hard to distinguish clearly the attacks of wolves from those of stray and feral dogs.

Sheep and goats are generally more vulnerable than cattle and horses. Lack of an efficient guarding system (guard dog, human vigilance, enclosure) is the main reason for recurrent attacks and significant losses. Mass killing by wolves is extremely rare, the loss of just a few animals is more common. In addition to the animals killed in an attack, wounded and dispersed animals are also reported, adding to the magnitude of the loss. Farmers also complain that abortions and loss of milk are a frequent consequence of wolf attacks. Of particular interest for management is that wolf attacks tend to be recurrent on the same sheep flocks and farms. Focusing and solving those particular situations may be more fruitful than applying large-scale plans of damage prevention. Damages are reported throughout the year, but there seems to be a tendency to peak in late summer and autumn. Free-ranging livestock are particularly affected by wolf predation and surplus killing is frequent.

Compensation is provided by many European countries, either with the state or private insurance companies paying for the claimed damages. Methods for verifying the damage and for compensating it are very different, but the aim of all schemes is the same; to alleviate social tensions and support the farmer who has lost capital. Compensation programmes are, however, far from being the solution to the problem and must be used with extreme caution to avoid creating a dependency on yet another economic incentive. They should be used in conjunction with more efficient prevention measures.

Monitoring the pattern and amount of depredation by wolves is of paramount importance in managing the conflict.

In some countries, wolves that have been shown to cause particularly great damage are persecuted and killed. Special shooting permits are issued to kill a wolf when damages are recurrent in the same area. Removal of these “problem wolves” has been pioneered in Minnesota (US) as a good compromise between conservation and conflict resolution, but with controversial results: high costs and limited efficacy.

2.5. Threats, limiting factors and obstacles to conservation

The wolf in Europe lives in many different ecological contexts, from the plains of central Spain to the tundra of Finland and the forests of Lithuania or Romania. The social, economic and political contexts are also extremely diverse, as is the conservation status: from the few highly endangered animals of France to the vast populations of the eastern countries.

As the scope of this Action Plan is European, the major threats and limiting factors refer to the areas where wolf populations are endangered and/or vulnerable. These areas are more common in the western states but are also found in some eastern countries (Table 1). Threats are therefore intended at the local (national) level and in the perspective of a full recovery of a healthy wolf population in most of Europe.

Hunting and poaching

Where wolf hunting is legal it is often carried out without a sound biological understanding of local population dynamics: quotas, seasons and methods are applied without sufficient supporting data. In a few countries, unrestricted hunting is allowed – an unacceptable policy applied only to the wolf. Poaching is widespread and is probably the single most important mortality factor for the European wolf. Even protected populations are sometime poached to an estimated 15-20% and more of the total (e.g., Italy), threatening their survival or recovery. Wolf killing is often the accidental result of other hunting and poaching practices (snares for and shooting of wild boar).

Habitat quality and food availability

Human encroachment is the most significant threat to wolf habitat. Yet disturbances caused by roads, vehicles and tourism are tolerated by wolves as long as they also have safe retreat areas where they can escape human pressure. Human use of the land is not, however, planned with consideration for the wolf's simple need for small but safe retreat areas. Although wolves may survive in the most diverse types of habitat, there seem to be at least two limiting environmental factors: vegetation cover in which to hide from human sight, and availability of some food resources. Wolves are rarely found where human density is above 30-40 persons/km^2. This would suggest that other habitat components are critical to wolf presence and that they are somehow linked to human presence. Most of the economic conflicts occur in areas of high livestock production, and this habitat feature will have to be taken into account when planning wolf management. Habitat quality appears to be described best in terms of several environmental features that should be analysed using criteria and models under multivariate statistics.

Prey populations are generally of high quality in Europe and only few areas suffer from a shortage of natural prey. Nevertheless, competition with hunters is often a reason for eliminating wolves. Prey species are generally managed from the hunters' perspective alone without accounting for the needs of the wolf, and temporary or seasonal shortages may occur. Alternative food resources are generally also available, but their poor quality is a threat to the long-term survival of the wolf.

Small numbers, low densities and demographic fluctuation

The total number of wolves in many European countries is well below the threshold of a viable population; small numbers are the primary source of threat to survival due to stochastic events that may eventually drive the population to extinction. Wolves normally live at low densities (1-3/100 km^2), more rarely at higher densities, and this contributes to making them more vulnerable to ill-planned harvest schemes. Little is known of population dynamics in European contexts, but numerical fluctuations are frequent and they often annihilate the entire local population. These fluctuations are caused or favoured by excessive hunting or poaching. If wolf populations fluctuate too widely, their survival probability will be significantly lower, and their dispersal and re-colonisation rates will also be lower.

Range shape and fragmentation

Several distribution ranges of the wolf throughout Europe have narrow, elongated and fragmented shapes that decrease the probability of local survival. Fragmentation increases the possibility of dispersion into an unsuitable habitat and reduces the size and viability of small populations. Isolated small populations will have significantly higher extinction rates unless suitable corridors are maintained to connect distant fragments.

Genetic identity

Little is known of the genetic identity and dynamics of the European wolf. Preliminary research indicates normal levels of genetic variability, but we do not know the identity of distant and isolated populations. This information is of extreme importance in order to manage connecting corridors and evaluate the relative conservation importance of each distinct population. Furthermore, little is known of the potential interbreeding of wolves and dogs although the preliminary results of an on-going research indicate that wolf-dog crosses do not incorporate into wolf populations.

Legislation

Current legislation on the wolf is not always clear. Full protection cannot be a conservation goal *per se*, if it is not flexible enough to allow for the most suitable management action to implement the species' long-lasting survival. Conversely, maintaining the wolf in a sort of outlawed position is not a solution for controlling over-abundant populations. Legislation will have to be adjusted at the national level following approval of a European Management plan. The former will have to include protection regimes, hunting criteria, compensation for livestock depredations and other economic incentives and policy criteria. The present fragmentation of legislation on the wolf must be overcome; it is very difficult practically to manage a species when it is protected by the Ministry of the Environment, hunted under permit from the Game Board, managed by the Ministry of Health for all health-related issues (rabies, etc.), and its damages are compensated by the Ministry of Agriculture.

Management Authority (fragmentation)

Fragmented legislation is often implemented by an even greater fragmentation of management authorities: in many European countries the Forestry Service, Game Boards, Regional or Provincial Boards, various ministries, as well as the Veterinary Services all have a say in wolf management. This fragmentation makes any real implementation of a national plan very difficult and will have to be overcome. Moreover, many offices that are in charge of some aspect of management are technically unsuited or not trained for the job.

National and sub-national management

In several European countries wolf management is carried out at regional (provincial) level without co-ordination among the various regions. In these cases, national legislation is only a general umbrella without much effect. Wolf management is more difficult to implement at sub-national level; the temporal and spatial scales of the wolf are such that a national management plan should provide a unitarian approach. Sub-national management authorities may be left in charge of applying the national plan. Indeed, this European Action Plan stems from recognition that a continental approach is required to overcome the diversity of approaches implemented at national level. In perspective, there should also be a European Management Plan to provide a unitarian approach for the different management needs of the various countries.

Law enforcement

Conservation or hunting laws are often poorly enforced when it comes to the wolf. Several countries in western Europe have adopted a policy of "benign neglect" in dealing with wolf management; conservation laws are in place but not enforced. Obviously this approach is irrational and negative for both the wolf and the humans dealing with the problem of wolf presence. In several European countries (but not all), illegal hunting of wolves is tolerated by the authorities as an acceptable method of wolf control. They rather prefer not to face the strong opposition of wolf advocates for a more rational and organised wolf culling.

Lack of enforcement is among the most important factors limiting wolf survival and recovery in Europe.

Economic conflicts (damage to livestock)

From the little research that has been done on livestock depredation and the scarce data available from local authorities, it is known that damages are distributed in a very irregular way over time and territory. This depends on several factors, such as the species and densities of domestic animals, husbandry methods, flock size, availability of prey species or other food resources, etc. However, the lack of a co-ordinated and permanent monitoring system does not allow for analysis of the issue in its full terms.

Compensation is strategically limited if it is not part of a more comprehensive plan of action to solve the problem of livestock depredation. European countries are using a variety of approaches, but none of them appear to be satisfying.

As a consequence, wolves are killed even when compensation is paid and when economic incentives are provided for better damage prevention.

Public opinion

In spite of a coexistence that has lasted millennia, most people in Europe have an erroneous idea of wolf biology. The wolf is known from legends and prejudices and true facts about it are difficult to instil permanently in the public opinion. This poses a serious problem of obtaining people's support for a rational management plan. The lack of an *ad hoc* survey of European public opinion toward the wolf makes it impossible to prepare and implement an efficient plan to inform and educate the public, and yet no significant conservation objective can be reached without the full support and participation of local people.

Several conservation organisations have wrongly decided that conservation can be achieved by selling the wolf as an innocent victim of human ferocity. This opposite image does as much harm to rational wolf conservation as the bad image built on traditional folklore. Public opinion management will have to be based on a sound understanding of the attitudes of various social and economic segments of the population.

2.6. Conservation status and recent conservation measures

At international level the wolf is included in several conservation agreements. The 1996 Red List of the IUCN – World Conservation Union classifies the wolf as vulnerable. The IUCN has also approved a Manifesto of Wolf Conservation, initially drafted in 1973 and later revised to incorporate the changes in wolf status, public attitudes and management techniques.

CITES (Convention on International Trade in Endangered Species of the Wild Fauna and Flora (3.3.1973)) lists the wolf in Appendix II (potentially endangered species), with the exception of Bhutan, Pakistan, India and Nepal where it is listed in Appendix I (species in danger of extinction).

The wolf is also included in Appendix II (strictly protected species) of the Bern Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 19.9.1979). The wolf and its habitat receive full protection from the convention, although enforcement relies on the Contracting Parties which may not fully apply their obligations. Moreover, individual parties may make reservations and the wolf will not be protected by them: of the countries that have signed the Convention, Bulgaria, Czeck Republic, Finland, Latvia, Lithuania, Poland, Slovenia, Slovakia, Spain and Turkey have made an exception for wolf protection. The Standing Committee of the Bern Convention adopted an articulate Recommendation on the protection of the wolf in Europe (Rec. No. 17/1989).

The EC Habitats Directive (92/43 of 21.5.1992)(European Union members only) also lists the wolf in Appendix II (needs habitat conservation) with the exception of the populations in Spain north of the river Duero, the populations in Greece north of 39° longitude and the populations in Finland. The wolf is also listed in Appendix IV (fully protected) with the exception of the populations in Spain north of the river Duero, the populations in Greece north of 39° longitude and the populations in Finland in areas of reindeer management. Finally, the wolf populations in areas of reindeer management in Finland are listed in Annex V.

The European Parliament has approved (24.1.1989) a resolution (Doc. A2-0377/88, Ser.A) which calls for immediate steps in favour of wolf conservation in all European States, adopts the IUCN Wolf Manifesto and invites the European Commission to expand and provide financial means to support wolf conservation.

The legal status and management in each European country are summarised in Tables 2. The damage prevention methods and compensation scheme are summarised in Table 3. The information on monitoring, conservation and research activities are given in Table 4.

3. Goals and objectives

The overall goal is to maintain and to restore, in coexistence with people, viable populations of wolves as an integral part of ecosystems and landscape across Europe. The restoration and conservation of the wolf and of all large carnivores are an essential part of the effort to conserve the European biodiversity and to ensure the functionality of the European ecosystems.

Specific objectives are:

. To allow the wolf to recover and live throughout Europe wherever it is biologically and economically feasible.
. To ensure wolf-human coexistence and a sustainable compromise by limiting the conflicts.
. To achieve a pan-European perspective in managing wolf recovery and to help ensure wolf conservation/management on a continental scale.

4. Actions required to meet goals and objectives on an European level

For a conservation strategy to be sustainable and efficient on a long term, it must be articulated in a variety of strictly integrated actions and they should all be implemented concurrently.

In relation to the international treaties they have signed and ratified, the countries should feel obliged to report on the results of their implementation: each country may have its own distinctive approach and solution to wolf management, but it should feel committed to obtain the conservation goals set by the international treaties and conventions.

4.1. Co-ordination of management across borders

One of the most important conditions for a successful management of wolves in Europe is to co-ordinate the wolf protection efforts in the different European countries.

Knowing that the wolf is a highly mobile species and that the dynamics of its management can only be handled at large spatial and temporal scale, there is first of all a need for a continental agreement. Wolf densities, distribution and mobility are such that, for a sound strategy, it is imperative to broaden the perspective to the whole European continent. As wolf conservation is best achieved at a pan-European scale, an European Wolf Management Plan will be effective only if prepared and adopted at the highest European level.

At the moment the Bern Convention, managed by the Secretariat of the Council of Europe, appears to be the sole opportunity to bring most Western and Eastern European Countries under the same legislative forum. Therefore, it is suggested that the Bern Convention undertake the task of preparing and adopting a detailed European Wolf Management Plan along the guidelines suggested by the present Action Plan.

The Bern Convention will be asked to appoint an ad-hoc Group of Experts on Wolf Management with the task of producing a detailed proposal for discussion by the Standing Committee to the Convention. The Group of Experts should include experts representing all concerned European Governments. The Group of Experts will find it practical to articulate the Plan in separate Management Plans for each distinct wolf population (i.e., the Iberian, the Italian-French, etc.).

This approach would make wolf recovery/conservation a political goal of all member countries. The Plan should be discussed and adapted bi- or tri-annually by a mixed group of scientific and governmental representatives. The objectives of such meetings would be: report and discuss success and problems of wolf recovery/management in different countries in Europe, refresh the continental co-ordination and exchange information of general interest. The co-ordination of national plans, scientific studies and management actions between neighbouring countries must be strongly encouraged.

Actions

. The Bern Convention adopts this Action Plan and establishes a Group of Experts on Wolf Management.

. The Group of Experts will produce a detailed European Wolf Management Plan following the process outlined in the following section and it will submit the Plan to be discussed and formally approved by the Bern Convention.

4.2. Planning wolf management in Europe

In a long term strategy, it appears unrealistic to propose to maintain the wolf in all areas that the species potentially may be able to re-colonise in the future. It is understood that the wolf presence might be incompatible with some intensive economic activities, and it is necessary to plan for the best possible integration of human activities and sound biodiversity conservation. As regulating the presence of the wolf on the national territory cannot be left up to the individual reaction of exasperated shepherds or of poachers, it follows that a Management Plan must set up the objectives, criteria and methods by which to modulate the presence of the species.

Without prejudice to the aim of conserving viable wolf populations, not threatened by the most probable risk factors, it would appear that zone management can be contemplated today. This would involve protecting the wolf totally in only a part of the territory, thereby alleviating the recurrent conflicts with farmers in the more severely hit areas. This would mean applying a number of measures, both preventive and reductive, including local removal of a few individuals.

The feasibility of such an approach can be evaluated on the biological, social, administrative, conservationist and ethical planes. Biologically, it seems feasible; in fact, the high annual mortality caused by illegal takings is mainly found in the areas in which the density of domestic livestock is highest. The wolf populations seem to be able to tolerate these takings and could certainly tolerate lower rates, especially if managed correctly with attention to timing and other criteria.

Whereas the legal obstacles can easily be eliminated, at the operational level the main unknown is whether the States and the sub-national Administrations are capable of enforcing such a zone arrangement. It is clear, in fact, that a regime involving differentiated protection is based on the assumption that poaching has been totally eliminated or reduced to occasional occurrences. From a conservation point of view, it is important to test this innovative – and possibly permanent – solution.

On an ethical plane, the approach proposed seems well within the limits set by the Manifesto on Wolf Conservation adopted by the IUCN's Wolf Specialist Group of Experts. In fact, removal/killing is accepted once the inapplicability or the failure of other measures for preventing damage has been ascertained. Moreover, the participation of the public in the decision-making process of wolf management would guarantee the most socially acceptable ethical approach.

A general guideline of actions is given here to help in preparing a detailed Management Plan, and more is to be found in the following chapters of this Action Plan.

Actions

. The Group of Experts will first identify at large scale all areas of Europe where wolves or their potential wild prey are still present with viable populations. A set of criteria will be defined to guide the identification: minimum size of the area, its isolation/connection with other areas, the level of conflict with human activities, the diversity and total number of prey populations. GIS technology will presumably provide a powerful support to explore alternatives and planning.

. All current and potential connection areas will also be identified. In particular, all areas where wild prey populations are not anymore present, but could be re-established, will be identified. Through this process, wolf recovery and management will be linked to the overall planning for the restoration of European ecosystems.

. Each area will be evaluated for its contribution to the whole network of potential wolf areas and particularly within the overall Natura 2000 network. Each area will also be evaluated in the context of existing land-use plans and potential conflict with development. On the basis of its role and potentiality, each area or group of areas (at regional, national or sub-national level) will be provided later with a more detailed Management Plan at smaller scale, which will be drafted by national authorities in co-ordination with neighbouring countries. Regional plans are strongly suggested for those areas where wolf ranges stretch across several neighbouring countries and where geographical features are homogeneous: the Alps, the Balkans and the Scandinavian countries are areas where regional plans appear particularly obvious. This Management Plan will provide indications to mitigate the conflict and it will include the identification of a zoning system for wolf management; a core area and a surrounding buffer area will presumably be reserved for different level of wolf management and conservation actions. Outside these areas, the wolf will be removed when no other satisfying management policy can be implemented (article 16 of the Habitat Directive). This approach should allow for effective conservation of viable wolf populations even within multiple-use areas. Zoning would be used to calibrate a flexible management system which will react with different measures depending on the level of livestock depredation, public attitudes, and other economic activities. Biological criteria

will be applied to identify the minimum fragment size and the corridors to link distant areas.

. The national as well the local public will be involved in the process of area identification and drafting of the preliminary Management Plans. An intensive information campaign will be implemented at local level and there will be opportunities for the public to provide its input in the decision process.

. The final European Wolf Management Plan, composed by all national and/or regional Plans will be submitted to the Standing Committee to the Bern Convention for approval, and national legislation will be adjusted to accommodate its provisions.

4.3. Influencing European policy on wolves

The above proposals cannot be fully implemented in absence of a few changes of the existing laws. The European Union policy with its programmes (towards Eastern and Southern Europe) can strongly influence wolf management (and wildlife protection in general). Local, national and international governments (i.e., EU) must be lobbied. Through enhanced education and information dissemination, the European Citizen will dictate the policy through their national and EU governments. The wolf must therefore become a political issue, but the information must be there before this happens, to enable the European Citizen to make an informed decision. The EU has been funding several wolf conservation projects (LIFE program) in Italy, France and Greece and they have had remarkably positive effects that have significantly improved wolf status.

Political lobbying must be linked with good promotional campaigns. This can achieve a change in public attitude and could include the use of a professional PR agency. Through a change in public perception, it becomes easier to influence the politicians, but political lobbying must be directed at state governments and EU civil servants. To add effectiveness, this lobbying must be integrated and regular in its approach. Through the provision of information to NGO's, political lobbying can be enhanced and more widespread.

State and EU governments that ignore international laws and directives should be exposed. Those countries bound by the obligations in the EU Habitats Directive and the Bern Convention (for example) must be made accountable for their actions that ignore their commitment. This requires a focused publicity campaign to highlight the inefficiencies in the treaties, the fact that there appears to be little monitoring of the conventions' effectiveness and therefore no accountability.

National and international networking is vital if this exchange of information is to take place. A central, core fund is required to ensure that the appropriate people can attend on a regular basis. These networks must include government and non-government organisations, but credibility is paramount. The European Wolf Network and/or the WWF Large Carnivore Initiative for Europe must be just that, but without a budget it is almost impossible. A network means all people involved in wolf management being consulted and requires an exchange of ideas, technological advances and information.

Actions

4.3.1 Design a national PR campaign with the aim of informing the public opinion and making the wolf a political issue.

4.3.2 Prepare a document on the ways the European States and the EU are implementing the international treaties and directives they have signed; and use the document to influence on governments.

4.3.3 Organise logistics and funding for national and international networks of government and NGO representatives on wolf management issues.

4.3.4 Ask the European Union to review and correct the economic incentives policies to shepherds in areas with wolves under the two following principles: a) shepherding in wolf areas implies a loss of profit due to management techniques in order to avoid or reduce damages caused by wolves (having Livestock Guarding Dogs, enclosures, shepherds, small flocks, etc.); b) supporting non-intensive livestock practices in areas with wolves must be viewed in the context of the European Union policy as an agro-environmental measure.

4.4. National Wolf Management Plans

To implement the European continental policy on the national level, it is essential to work out a National Wolf Management Plan, designed and approved within the guidelines of the present Action Plan and within the co-ordination of the European Group of Experts established by the Bern Convention. By doing so, each national authority shall take into account the strategies adopted by neighbouring countries. It will be most important to include from the beginning all authorities and organisations interested or affected by the arrival or presence of wolves in the process of elaborating such a national strategy. Especially interest groups like hunting organisations, sheep keepers and regional authorities must be taken seriously.

A national plan will include detailed regulations on legal matters concerning damage assessment, prevention and compensation, on the education of specialised staff, on ways to inform the public, on the implementation of a monitoring system and finally on promoting scientific research. The National Wolf Management Plan will also identify and suggest all changes to the national and/or sub-national legislation that will be necessary to implement the plan. To initiate, co-ordinate, enhance and supervise all this work each country should form its own “wolf management group”.

In order to set up a realistic, feasible and effective wolf management plan, the government should first identify priorities. A working group, which includes several interested groups or persons (NGO’s, Administrators, scientists, shepherds, hunters, etc.) may help the government to identify priorities towards wolf management.

The proposed priorities are listed below:

. To analyse the specificity and the dimension of the problems with the collaboration of specialists in order to collect the best information.
. To analyse the feasibility of the wolf management plan. This analysis should take into account at least the ecological and socio-economic conditions and the logistical capacity to handle such a project.
. To analyse the cost of different wolf management strategies without forgetting such indirect expenses as ecological costs. This analysis should also take into account the available resources at disposition which include time, man-power, logistics, etc.
. To analyse all political constraints before proposing a wolf management strategy.

National Wolf Management Plans should be prepared also by the European countries where wolves are currently absent but where they may return through natural dispersal movements: this would ensure the co-ordination with neighbouring countries and the participation to the continental planning. The National Wolf Management Plan is also of paramount importance for the countries planning to reintroduce wolves.

Actions:

4.4.1 Identify and establish national wolf management groups and empower them to design the national wolf management plan

4.4.2 Co-ordinate the work at national level with that of the international Group of Experts established by the Bern Convention.

4.4.3 Prepare the legislative and management framework needed for the recolonisation of the wolves or reintroduction in countries planning to do so.

4.5. Habitat, corridors and food supply

4.5.1. Habitat restoration

Even though the wolf is highly flexible in its habitat choice, a few factors are important in determining the density of wolves and their mobility in the territory, and therefore they should be considered carefully, especially when designing the Natura 2000 network.

. The stable and sustainable presence of the wolf cannot be planned in an area if it does not offer healthy and vital wild ungulates as natural prey for the wolves. If the recovery of ungulates does not occur naturally, re-introduction and/or re-population of roe and red deer and boar – depending on the local ecology – must be undertaken in accordance with the rest of the planning for hunting and environmental restoration (see 4.5.3). Already existing populations, including the wolf, will have to be managed and in any case poaching of wolves will have to be controlled in an effective manner.

. Large transportation infrastructure does not seem *per se* to have a decisive effect on the presence of the wolf, but this finding must be confirmed by better data. It may be assumed that whereas the effect is rather insignificant for highways and railroads in mountainous areas where tunnels and viaducts facilitate crossing, on flatter land, guard rails, fences and "new jersey" lane dividers can constitute effective barriers to the movements of both wolves and prey. Extensive industrial and residential areas must also be planned with caution and verified case by case, even if it is rather unrealistic to think that those kinds of undertakings can be conditioned by arguments concerning the wolf. In any case, such areas, like large-scale transportation infrastructures, must be kept in mind while identifying the areas suitable for the presence of the wolf.

. The current forest management regime does not seem to present notable risks for the wolf. Forest management of areas in which the presence of the wolf is stable, especially if in small fragments, will have to take account of any warnings that critical thresholds are being reached from researchers or technical personnel gathering information on the state of the fauna in the area. This could involve suspending activity for a few months. A broader topic, on the other hand, is the role forest management plays in maintaining and improving pastures, for both domestic livestock and wild animals.

4.5.2. Identifying linkages (corridors)

Many ecologists believe the effects of fragmentation can be reduced with the maintenance or provision of landscape linkages among sub-populations. Much recent literature in conservation biology supports the concept of providing "corridors" of suitable habitat between population centres. Corridors provide travel lanes to accommodate daily, seasonal, and dispersal movements from one large habitat block to another. In theory, corridors greatly reduce the possibilities of inbreeding and chance environmental catastrophes by providing opportunity for the introgression of new genetic materials and the exchange of individuals from source populations. Persistence times for populations that inhabit fragmented landscapes are thought to be greater where connectivity (among habitats e.g. via corridors) enhances the exchange of individuals.

The practical challenge is to delineate wildlife corridors given current understanding and knowledge. There are no formulas or mathematical computations from which to draw, and there is little empirical work on corridor design. The identification of existing corridors and design of new corridors is complicated because different corridors are appropriate for different landscapes, corridors have varying functions, and requirements for different species vary with the degree of habituation to humans and their activities. When evaluating the potential for travel corridors, we must consider: first, the effect of physiography on the size, geometry, and juxtaposition of habitat patches; second, the degree of behavioural fidelity exhibited by different species; third, the potential influences of wildlife management policies, land use policies, and human activities.

All these theoretical issues are made almost trivial by the great dispersal ability of the wolf even through hostile terrain. Nevertheless, corridors are an important conceptual framework in environmental management and should be kept under close scrutiny. Thus, they are maintained as a component of this wolf Action Plan.

Because of the inherent complexities of corridor design, it is impractical to rigorously address corridor requirements of wolves in all of Europe. In addition to the above, we suggest the following principles to guide in discussing the issue of corridors for wolves and, indeed for all wildlife species:

. Without landscape disturbance, travel routes become highly traditional over ecologically significant periods. Thus, the exact position of a corridor may be crucial.

. Animals using established corridors may be already close to a “threshold level” of disturbance. This is particularly true of re-colonising populations, which may be blocked at various “pinch points” along dispersal routes. We need to identify these “pinch points.”

. A corridor must conform to the needs of the species it is designed to serve (e.g., wolves), but must not compromise the viability of other species. A poorly functioning corridor can do more harm than good because it can become a mortality sink, siphoning off healthy animals from a source area. We refer to such corridors as “sink corridors” because they are a net drain on the target population and/or other species.

. There should be no impediments to movement. Novel structures should not be placed within traditional corridors.

. The width of a corridor will affect the ecological integrity of an established community, and the level of influence of the developed “edges” of the corridor (edge effects). There is no minimal corridor width because it will depend on many variables (e.g., species using the corridor, volume of use, habitat types, level of habituation of individuals, seasons of use, level of activity outside the corridor, duration of time that corridor is required, etc.). Optimal width may vary depending on whether we are attempting to protect an established corridor or design a new corridor.

. Segments of corridors are likely to vary in function and importance, influencing the rate of flow from segment to segment along the route. Long linear routes require segments of larger habitat patches.

. The width of a corridor may be particularly important to allow for unimpeded movement of wildlife. Although there is no specific study to support any guideline for wolves, it appears that a cautionary approach would take in account the width of a corridor in relation to its length. Effective corridors may be narrow if they are short enough.

h. In addition, a network of connecting corridors is preferred to a single corridor in that it allows wildlife a greater choice of movement patterns and the avoidance of barriers. In this respect, habitat emerges as a critical design parameter of corridors. For example, there is evidence that topographic features such as lakes, mountain passes, and valleys may affect dispersal paths locally.

4.5.3. Ensuring food supply

As in many wolf areas their natural prey are under strict control by hunters and farmers, the Management Plans will have to analyse the actual availability of food resources throughout the entire year. Possible bottlenecks should be avoided and overall food quantity and quality should be ensured.

On a short-term basis only, and as an emergency management tool, artificial feeding sites might be planned in restricted areas. As this technique is very likely to cause unwanted behavioural adaptation and also may facilitate poaching, it should be discouraged as much as possible.

It has been shown that in many areas wolves rely on garbage found around villages and farms. Whereas this source of food might be the sole available for a certain area for a certain period, it should not be allowed to be a permanent living condition for the wolves. Open dumps and garbage disposal should be controlled so that they will not be available to the wolves. These actions should implemented on a careful and gradual plan to allow the wolves to have or find alternative natural food supplies in the same areas.

Reintroductions of potential wild preys should be considered when the wolf natural prey base have been depleted. Large ungulates populations have been exterminated or reduced to low level in several European areas, forcing the wolves to alternate food supplies. Selected reintroductions could improve the wolf diet and re-establish its natural hunting ecology and behaviour. Reintroductions of natural prey should parallel or anticipate the removal of garbage sources.

Actions

. Identify all potential corridors among population fragments, as well as other potential wolf areas to be re-colonised far from existing populations, also by experimenting new methods and testing for their effectiveness.
. Evaluate the status of the food supply for the wolf in various regions and identify the needs for specific actions (reintroductions, managing hunting seasons and quotas, artificial feeding).
. Evaluate the presence and impact of existing and planned infrastructure in zones where the wolf is present or recovering.

4.6. Wolf recovery and its spatial, temporal and biological dynamics

Wolves are returning naturally to many parts of Europe, but during any recovery of a wolf population, people will ask how many wolves is enough. This is because, even though by law or by public consent wolf recovery is ongoing, the public has concerns regarding the impact increased wolf numbers will have on livestock, game animals, access to land, etc. To support and have faith in the ability of wildlife managers to “keep control” of the recovery and balance the positive and negative values of wolves, criteria must be developed that indicate when wolves have been “recovered”, that is, how do we determine that no more increase in wolf numbers or distribution is warranted or desired? Once this level is reached, management is needed to ensure that wolf numbers maintain some kind of stability for a long period. However wolf densities will be different in different areas.

There are two aspects to defining wolf population; one concerns wolf biology and the other concerns human attitudes.

4.6.1. Biological aspects of recovery

To ensure that a small population of wolves is viable and can be sustained for a long period, it must either have a sufficiently large number of individuals to overcome problems with genetics and natural population changes, or well-connected enough such that a decreasing population can be replenished with wolves from elsewhere. Small populations, because of random normal variability in demographics, are more likely to become extinct than larger populations. Moreover, these small sub-populations are thought to be vulnerable because of deleterious effects of inbreeding and chance environmental disturbances such as forest fires, disease or infestations that affect a species or its prey. In theory, the interaction of these factors increases the probability of extinction. However, the Isle Royale population of 2-50 wolves has survived inbreeding for 45 years.

Given the fact that wolves live in social groups and only part of the population contributes to reproduction, it is difficult to extrapolate experience from other species. Therefore, although there are no definitive studies or tests of how small a completely isolated population of wolves could be and still survive for a long period, wolf experts suggest that as few as 15 breeding pairs (perhaps 100 wolves) might suffice. Even under the best of circumstances (i.e., a density of 1 wolf per 20 km^2), this would mean a contiguous area of some 2,000 km^2 of occupied wolf habitat. Where prey densities are relatively low, an even larger area would be needed to ensure that a population of 100 wolves could survive. On the other hand, if a wolf population was "connected" with another population, fewer wolves in a smaller area could likely survive, the number of which would be directly proportional to the degree of isolation of the population.

Given these estimates it seems clear that, for wolves, populations will need to be defined not by political boundaries, but ecological boundaries that cross political borders. There could be many such populations in Europe, and some would undoubtedly connect with others. A "connection" would most likely mean some kind of natural habitat corridor through which dispersing wolves would successfully disperse, but could also mean human-assisted translocation of wolves.

A central concern to wolf conservation anywhere is the preservation of source populations. These are historically, well-established populations, or even "recovered" populations, whose numbers are such that significant emigration or dispersal from them occurs. These emigrating wolves serve as a source of increase to "sink" areas 1) where wolves are harvested heavily and numbers need to be replenished to maintain a stationary population, 2) where wolves were extirpated but now recovering, or 3) where wolf numbers are low due to limited habitat (or tolerance by human) and need of occasional genetic and/or demographic supplementation. These source populations are therefore essential to overall wolf conservation.

4.6.2. Recovery and human attitudes

Conversely, the level of a recovered wolf population might also be defined by the humans who live in an area. The biological number of wolves that could sustainably live in an area might be compromised by the attitudes of the resident public. The residents might, for example, feel that there are enough wolves around when human tolerance for livestock depredation by wolves or the killing of game animals by wolves was a limit. Clearly, these attitudes vary with the values and attitudes that the public has, and such values and attitudes may be influenced through education. Nevertheless, biological definition of recovery will just be words on paper, and thus meaningless, to people whose income or recreation is noticeably reduced by the presence of "too many" wolves.

4.6.3. Natural and assisted recovery (re-introduction)

Wolf recovery may take a long time. Even within portions of North America having nearby wolf populations and a majority of the human population supporting wolf recovery, it has not been unusual for wolves to take 10-20 years to expand their range several hundred kilometres. This duration is due to a mix of factors, including fragmented and isolated habitat, and poaching and legal takings due to personal negative attitudes of some individuals. However, it seems clear that long-term recovery is often more assured when wolves decide where and when they will move into new areas. Human-assisted recovery (i.e., translocation and re-establishment) is often perceived as too manipulative, too fast, and not natural. Wolf recovery in much of Europe is happening at a relatively rapid rate without direct human assistance and it is likely to continue. In concert with habitat management and public education efforts, there is every reason to think that it will continue until wolves become either biologically or culturally recovered in a majority of their potential range.

Actions

. Assessment of the status of all recovering and small populations, including counting or monitoring wolf abundance, identifying wolf habitat quality and quantity (i.e., prey distribution and abundance). Wolf populations in the adjacent areas should also be taken in account to understand their potential to provide immigrants into the area. If a population has reached at least 100 individuals (about 10-12 breeding pairs), or less if "connected", and if it is clear that prey abundance could support that number, that particular population can be considered recovered.

. Identification and proper management of source populations to ensure their continued existence. It is important to monitor wolf abundance, regulate wolf mortality, provide enough food (i.e., ungulate prey), and maintain good public relations concerning wolves.

. Assessment of the attitudes of humans in wolf recovery areas is, therefore, an essential component of wolf recovery and management. Education efforts focused on values, combined with economic incentives (e.g., depredation compensation, tourism, sport hunting of wolves and their prey), might increase the "cultural" carrying capacity of wolves in an area.

4.7. Damages to livestock: problem wolves, feral dogs and wolf hybrids

Conflicts between wolves and farmers are the main limitation to the spread of the species over the entire European territory. Most countries, if not all, where the wolf coexists with livestock industry, are concerned about damages on livestock. Solving or at least mitigating these conflicts is an essential condition for hypothesising the acceptance or permanence of the wolf. In the areas in which the wolf is (or will be) present, a certain degree of damage to livestock is inevitable, whatever the preventive measures taken. The problem, therefore, is to manage this aspect of conservation in the best possible manner. The mitigation of conflicts must take place (and in some States already takes place to some extent) by means of three different but parallel stages.

4.7.1. Wolf damage to livestock: prevention

Coexistence of wolf and livestock requires a certain degree of compromise for both: a certain amount of livestock damages will have to be faced as well as the possibility of killing some wolves. The compromise will shift in favour of one or the other side depending on the balance of local economic, ecological and conservation considerations. A limited amount of depredation appears to be unavoidable in wolf country and it can be acceptable for conservation purposes, but extensive damages can hardly be tolerated.

In some countries the size of flocks can be a consequence of a new economic situation. For example several subsidies given by the European Union depend on the size of the flock (without these subsidies shepherds would have disappeared from entire areas): the more sheep you have, the bigger the subsidy. In some places this causes the flocks to increase to thousands of animals, and this is inconsistent with efficient guarding. At a national or international level the presence of a predator should be integrated with subsidies already given.

Damage can be important when there is no efficient prevention system. Shepherds have developed several different techniques in order to protect their herds from predators and more particularly from the wolf. These ways are still present in areas where the wolf never disappeared but the knowledge of these techniques has been rapidly lost in absence of a wolf population.

Among the techniques to protect livestock, the most efficient seems to be a combination of the use of livestock guarding dogs (L.G.D.) and corrals/barns/electric fences. In some areas L.G.D. alone can be sufficient to protect the flocks. It requires very specific breeds of dogs and it is efficient only with specific breeds of sheep. They have been selected over centuries to remain and live within flocks without disturbing them and to keep wolves and bear away. They are extremely attentive and bark whenever an intruder shows up.

A program of L.G.D. promotion should be undertaken including:

. An specific information program (involving for example a newsletter for farmers in countries concerned, papers in agriculture press, etc.) on the use of L.G.D. (highlight the difference with herding dogs).
. A national and European network on L.G.D. allowing an information exchange and also the possibility to obtain pups already imprinted on sheep, which are needed in areas where this technique has been lost.
. Research programs in order to make the use of L.G.D. more efficient.
. The development of pilot education projects for the proper use of L.G.D. in areas where new populations of wolves cause problem to farmers.

Although L.G.Ds. (helped by the presence of a shepherd) are the most efficient way to protect livestock from wolf attacks, this technique will not be suitable in every area in Europe at a local scale or for some species of livestock. Therefore, the utilisation of other techniques should be strongly encouraged, and research and tests are extremely useful.

4.7.2. Wolf damage to livestock: compensation

One of the most important steps in helping mitigating the conflict between farmers and wolves is a system of compensation of the damages caused by the wolves. Some countries oppose a compensation systems, arguing that compensation can create dependency. It is also important to take into account that most farmers do not want any livestock killed. In that way the question is not only financial but also emotional. This is why prevention is fundamental. However, a compensation/insurance system is also fundamental, especially when dealing with protected wolf populations, and it should be designed with certain precautions and conditions:

a. Compensation alone is totally passive when used only to refund damages after they occur, whereas prevention is active and is the only system that will help to diminish damages. This is why compensation has to be linked with preventive measures

b. It is extremely difficult to distinguish animals killed by wolves or by dogs as both animals can cause very similar kind of damages (not necessarily feral dogs but also dogs escaping from their owners even for a few hours). To try to distinguish wolf and dog damages is considered a waste of time by several wolf specialists. The present knowledge only allows us to give a level of probability on the responsibility of wolves or of dogs, and certainty will rarely be attained. Although giving a probability estimate requires long experience and practice, it is however necessary to have a minimum number of trained people able to work as experts.

c. In areas where a protected wolf population is present, it appears necessary to pay all canid damages (including those which are doubtful). To distinguish wolves and dog damages is not only a problem of technique; trying to identify the predator create many problems on the human side because shepherds generally believe that those responsible are wolves and never dogs. Nevertheless, it is still necessary to be sure that animals have been killed by a canid and have not died from other causes to prevent cheating and fakes.

d. The prices paid as compensation should be equal for damage done by different predators that can be present in the area, although distinguishing the predator which is responsible is very important (bear, lynx, wolverine, canids).

e. The compensation system should be connected with the system of national and European subsidies.

f. Payment of compensation should be tied to the level of preventive measures used by the sheep owner.

There are several ways of establishing a compensation system; these are just a few:

a. A system of compensation with insurance (including the promotion of prevention).

b. To pay only for a short period until predation prevention is being established, and stop compensation if nothing is done by the farmer to protect their livestock.

c. To provide a subsidy to farmers living in a wolf area allowing them to buy good prevention systems. In addition damages can be paid or not.

d. To provide a subsidy for each animal produced in wolf areas (if the farmer wants to produce he will have to protect his herds from attack and will receive a price for this through his production) without paying any further compensation in case of losses.

e. To pay an amount to the shepherds when there is proof that wolves have reproduced successfully.

f. To pay all damages only within protected areas.

g. The possibility to withdraw the compensation when negligence of the shepherd can be proved.

h. To provide incentives to establish livestock protection methods. Material or L.G.D. should be given to those who are the poorest.

i. To establish a system that detect the proper application of the compensation scheme

Providing compensation to all damages occurring over the entire wolf distribution range can be very costly. The system should probably be limited to the areas that have been identified as critical for wolf survival by the European or each National Wolf Management Plan and where coexistence of wolf and livestock is unavoidable and/or desirable for lack of wild prey.

4.7.3. Wolf damage to livestock: problem wolves in protected populations

In large parts of the wolf distribution, the species strongly depends on livestock (Spain and Portugal) and cannot be removed only because a few wolves can cause significant damage. Therefore, when dealing with small or protected wolf populations, it is not acceptable to plan the removal of a wolf simply because it feeds on livestock. In fact, removal could lead to situations where people demand to remove more and more animals. In some cases, however, the taking of a few individuals will benefit the species more than trying to protect all individuals.

Removed animals can be killed, translocated or kept in captivity, depending on local legislation: however, translocations do not appear to be feasible in Europe for lack of sufficiently large suitable areas.

The feasibility of removing a wolf from protected populations should always be put in this general perspective. Consider the problem wolf within the context of the whole area and assess whether there is lack of prevention or of wild preys. Consider the overall distribution of the species and not only the local presence. When populations are very small and isolated (particularly those with no immigration source) all individuals are essential and removal is excluded.

Legislation should be implemented to allow removal of wolves only under very specific conditions :

a. The decision has to be made by the government at a national level and never locally.
b. The decision has to be made after the advice of national or international wolf specialists and according to the IUCN Manifesto and Guidelines on Wolf Conservation and the European Wolf Conservation Strategy.
c. The decision should be made after a period of observation following the return of the wolf in a new area, and after a period of testing prevention systems.
d. The decision should be made according to the identification of areas of planned wolf presence.

4.7.4. Data gathering

The constant availability of reliable data on the level of conflicts (magnitude of damages, spatial and temporal models, etc.) is essential to be able to manage the problem of conflicts effectively. In fact, the competent persons will have to be able to compare the costs of damages with those of possible removal, and verify the effectiveness of the ordinary or extraordinary measures of prevention and compensation adopted.

4.7.5. Feral and stray dogs, and wolf hybrids

Feral and stray dogs can be a danger for the wolf as some cases of hybridisation may occur. They can also be a pest not only for livestock but also for wildlife. Moreover, all damages they cause are generally considered as wolf damages in areas where the two species coexist.

It seems obvious that dogs must have owners keeping them under control. However, the situation is very different from country to country and even in different regions of each country. In some areas or countries there are strong laws allowing the culling of any dog which is not under control. In others (more particularly in southern Europe) dogs are free to go where they want without control and they can sometime become feral.

Considering all damages they cause, it appears necessary to remove these feral and stray dogs. Laws must therefore be reinforced in that way. At the same time an education program must be prepared for dog owners. The following point may help in managing the problem:

a. It is not acceptable to allow everybody to kill these dogs because wolves will be also killed (for example if shepherds were allowed to do it).
b. Trapping or killing feral dogs is not a simple task.
c. Animal rights groups can oppose strongly any dog killing. In order to avoid a strong opposition, the question has to be well addressed, including a well-organised campaign, based on scientific and ethical principles concerning humane methods of capture or removal of these dogs. This campaign must stress the necessity of controlling the origins of these dogs and also their importance in spreading diseases potentially harmful to human health.

4.7.6. Captive wolves and wolf-dog hybrids

Knowing that a clandestine release of captive wolves may never be excluded even if it is strictly forbidden, a control of owners of captive wolves is absolutely necessary. All owners must obtain an authorisation from the government and each captive wolf (or hybrid) must be individually marked (digital marking using microchips or tattooed). Sterilisation can be recommended.

If there is any evidence that some individuals are hybrids, it can be considered to remove them. Removing such individuals seems however to be even more difficult than for feral dogs as the recognition of hybrids might be impossible in the field. However further genetic studies are needed to quantify the phenomenon and its possible consequences for the species.

Keeping wolf-dog hybrids as pets should not be allowed anymore and crossbreeding should be discouraged: they are not good pets and they are a permanent threat to people as well as to wolves.

Actions

4.7.1 Assess the feasibility and desirability of adopting the management approach of removing selected problem wolves.
4.7.2 Assess the problem of feral and stray dogs and the efficiency of existing legislation to control them. Where necessary, prepare a plan to control them.
4.7.3 Prepare a census of existing facilities with captive wolves
4.7.4 Assess the genetic identity of local wolves in view of assessing/preventing wolf/dog hybridisation.
4.7.5 Review and correct the economic incentives policies to shepherds in areas with wolves
4.7.6 Establish a sound scientific programme for assessing and getting the most out when using Large Guarding Dogs.
4.7.7 Establish a permanent monitoring programme for damages caused by wolves and other predators.
4.7.8 Define the most suitable compensation scheme for each national/regional group of wolf areas.

4.8. Wolves and hunters

The wolf is a game species in several European countries and its population status there can often support some harvest. Hunting can also contribute to the management of the wolf by taking a pre-determined quota of wolf populations if these need to be controlled, and hunting is often an important component of local social and economic activities. However, in some countries the wolf is hunted without any real control, any bag limit or any method limitation. This will be no longer acceptable and wolf hunting must be brought within the limit of any biologically sound harvest scheme. Also any payment of premium for killing wolf, even in

populations that are overabundant, is not acceptable anymore and should be abolished. Hunting wolves, whenever biologically acceptable, must always be considered within the existing national and international regulations. In general, hunters have four main misconceptions about wolves:

– Wolves will always reduce prey greatly;
– There is no habitat for wolves anymore;
– Wolves will kill all valuable trophy animals;
– Wolves will reduce human hunting.

In most Europe countries, human hunters see wolves as competitors and are not willing to share the game with them. If wolves are not accepted, a lobby against wolves will be started and wolves will be illegally killed.

In order for hunters to accept wolves education-programs should be made especially for hunters. In these programs, the participants should learn more about wolf ecology, wolf prey relations and the improvement wolves have on the natural ecosystem (e.g., scavenging, spatial organisation of prey population; less forest damage, general health of prey populations). These education programs should also address clear understanding of hunter expectations and that human and natural hunters can harvest prey populations in good harmony. However, any illegal shooting of wolves is unacceptable and should be heavily punished. Hunters should be formally involved in local planning and asked what they see as a reasonable amount of game to share. On the other hand, it should be clear that wildlife is not owned by hunters, although in many countries it is on a *de facto* sense. Hunters should learn that recovers of wolf populations is desirable to obtain healthy wolf populations that can be subject later to controlled hunting.

Hunting wolves may have important potential side-effects on wolf populations such as weakened prey-catching efficiency of the pack when some members are removed or increased dispersal and consequent higher mortality. These effects should be taken in account when managing small populations.

Actions

4.8.1 Assess the quality of wolf hunting in its biological and social perspectives.
4.8.2 When necessary, prepare a new proposal for hunting regulations including areas, quota seasons and methods
4.8.3 Abolish any form of bounty.
4.8.4 Establish strong and credible fines for illegal hunting of wolves and enforce them.
4.8.5 Implement more research on the impact wolves and hunters have on local prey populations and on the effects of wolves spatial organisation on ungulate populations and forest damage. More research on the hunter/wolf/prey-relation in the ecosystem is also urgent.

4.9. Making the wolf economically profitable

To the environmentalists, there are three main reasons to conserve wolf population or to support wolf recovery across Europe: philosophical, ecological and sociological. However, these reasons are not often shared by local people who constantly live close to natural environments. Pointing out some economic benefit that may be gained from the presence of the wolf might help in finding new ways of making wolves more acceptable to local communities.

However, in order to be effective, economical benefit should be a return for the whole community and not only for few locals. Presenting the wolf in terms of advantages, it will be important to explain the potential benefits that can occur due to the presence of the wolf. Especially tourism (eco-tourism) will have a greater chance to develop and may give rise to more employment in the region. However, making the wolf economically profitable thorough tourism will be feasible only where the wolf is rare, as the market would easily become overloaded.

Three examples are given here to show the potentialities of the image of the wolf for an economical exploitation as they may fit different local socio-ecological situations. Hunting wolves is also an obvious way of obtaining an economic return (see 4.8).

4.9.1. Guided tours

The goal is to bring tourists to a region where wolves exist and provide an opportunity for first hand contact with the wolf presence and its conservation problems. In doing so the whole region would benefit from the tourists' presence. An attractive program should include several choices and activities as night or day sighting of animals, possibilities to practice sport or to fish in the wolf area, etc. This program should also involve people in information gathering and lectures with slides or films. As the observation of wolves is rare, other activities linked to wolves should be available (taking plaster molds of tracks, howling during night, etc.). The tourists should be also able to bring something from the field (i.e., tracks made of plaster or sculptures made by local people).

The success of a guided tour will partly depend on the performance of the nature guides. Therefore, it is preferable if they have, added to their own knowledge, certain notions of communication, organisation, and field techniques (i.e., recording sounds). All these notions could be learned in special schools for nature guides (which already exist in some countries). The guided tours should be developed in collaboration with professionals, who could help to take advantage of such idea.

4.9.2. Wolf label/logo

A wolf logo could be created to be easily identified by consumer and customer (such as labels used to identify biological products). To be more effective, it should be recognised by local, and even national government and controlled by a committee.

The label could be distributed to hotels and shops which are participating to wolf conservation in the region. It should be easier to sell the tourists local produce with such a label. However, to be more effective, the label should be attached to villages or to the whole region. This kind of label could be used to make publicity for the region (as the St-Bernard is used in some part of Switzerland).

4.9.3. Wolf centre

A wolf centre adapted to the local situation could also be established. This centre should provide information about all wildlife as well as the wolf. When possible, souvenir shops, a museum, enclosures with captive animals, and other infrastructures could be added. Opportunities of employment could also be created. The support of local government is probably necessary to establish this activity.

Actions

4.9.1. Assess the feasability for an economic exploitation of the wolf.

4.10. Public involvement in wolf management

Wolf conservation is most successful when it is accepted by the local community. If the affected people oppose the presence or return of wolves on a large scale, they will try to kill the wolves. Either the eradication of wolves is the result, or an expensive guarding system is necessary to enforce legal protection. We believe that local acceptance of the wolf, especially when the species is recovering after a period of absence, can not be achieved without a damage compensation program. All suggestions therefore are based of the assumption that there is compensation for livestock and dog losses, at least in an initial phase.

Acceptance by locals is more likely, if they have been part of the management process. Also, responsible wolf management has to take local attitudes in account if it is supposed to be for wolves and people. The following suggestions are made to incorporate the needs and attitudes of the local community for successful management of wolf recovery.

As clearly pointed out by the "Guidelines for Action Plans for Animal Species" Recommendation No. 59/1997 of the Standing Committee to the Bern Convention), local involvement is best achieved through a public participation program. This programme includes a management board, which is involved in the planning process. A public participation program was successfully used in setting up Wolf Management Plans in the Yukon Territory (Canada), in Wisconsin (U.S.A.) and in Brandenburg (Germany), and in the development of the management regulations for wolves in the northern Rocky Mountains of the U.S.A. The idea is that people support decisions they helped make. It will ensure that the planning process is responsive to local conditions and can help to generate new ideas through the input of specific know-how.

Wolf recovery potentially affects thousands of persons. It is therefore not possible to involve all these people and communicate with them. But in every community there are opinion leaders, which have much influence. The focus should therefore be on reaching these opinion leaders. One of the most important steps is getting all the stake-holders together so that none of the parties would feel neglected and in obtaining a balanced representation of all stakeholders to avoid the overcoming of the boards by the most organised and voiced groups. This involvement shouldn't be restricted to passive hearing. An active contribution of all movements towards the management of the wolf in the region would facilitate the process in that every representative gets involved in the decision-making process. It is a necessary step for all the stake-holders to sense each others' attitude about the wolf.

Before setting up such a management board, we recommend that different values that exist in the society be identified. For each of these values a local representative should then be selected. If the board is established, it should be involved in the planning process, decide methods for compensation, control, or monitoring, participate in workshops and help promote the planning to the locals.

Acceptance through locals will also be easier, if the interactions with them are maximised. It is necessary that locals win confidence to the responsible wildlife managers if they know them as persons and the interactions then are not limited to problem cases only (e.g. if a depredation occurred).

Funding restrictions usually do not allow wildlife managers to spend most of their time in the communities staying in touch with locals. Therefore use of NGO's is recommended wherever feasible (especially these persons within the NGO's that are spending most time with the locals) and in co-operation with local authorities. The important function of the contacts to locals are to inform them about the overall management plan and about every action that is coming up. Through this, misconceptions can be corrected and the local community might win confidence in the planning process if they become informed about what the future might look like.

Actions

4.10.1 Identify opinion leaders and stakeholders in wolf management; set up local management boards and involve them in management planning and implementation.

4.10.2 Establish a permanent protocol of consultations with local people about their needs and the management actions to be implemented in their area.

4.11. Education and information

Wolf protection in most countries of Europe is definitely not a problem of lacking scientific knowledge, weak law restrictions or poor habitat; it is or will be a problem of attitudes towards a big predator who is killing other animals for living. Wolf myths with their mostly irrational basis have to be replaced by proper knowledge. Educational campaigns have to be initiated. It will be especially important to not only try to change opinions in urban areas, but also to make efforts to educate the people in rural areas about the role of wolves (or big predators in general) in ecosystems. Special interest groups as livestock-owners or hunters (and environmentalists as well !) should by no means be left out; to the contrary, they need special consideration and support with the help of anthropologist and sociologist.

A good educational campaign should be prepared and conducted by going through the following steps:

a. Start: At the beginning we must find a lead agency, group or person, who raises the funding for all the other necessary steps following.

b. Baseline data: We then need to identify target groups, their existing knowledge levels and attitudes, as well as assess the current educational information. Target groups could be: children, city people, local people, shepherds, hunters, elected officials, etc.

c. Evaluation: The existing educational efforts have to be evaluated: What effects did they have? What was good, what has to be improved? How far were attitudes of the target group changed? What brought the change? etc. If possible, these evaluations should be carried out research based.

d. Design new efforts: Knowing who needs what kind of information, we now can define the goals of future educational campaigns and design new messages targeted by group.

e. Implementation: In order to have a good chance of success we then should try to identify individuals within the different target groups to deliver the messages. Here we should always keep in mind that content and vehicle need to be specific.

f. Monitoring: Attitudes and beliefs of the target groups as well as the goals of the campaign have to be reassessed in a continual process. In other words, after running an educational campaign for some time we have to go back to step “b” and start the process over again.

At the end we should gain “different informed publics”. This will be one of the best and most effective way to manage and protect the wolf and other big predators as well.

An important goal is to have the public understand about the natural history of wolves so as to prepare them properly. Formal and informal education, through universities with research and through informal education such as lectures and talks on wolf conservation and ecology, should be encouraged.

A campaign to inform the public will be an integral part of the conservation programme. As its action must be continuous and widespread, it could be assigned to a credible association, which would follow a plan previously agreed upon in terms of content, instruments and personnel with the ministries and regional administrations concerned. The more precisely the information has been tailored - with the help of experts - to the various social strata, the more effective it will be. Special tactics may be helpful in dealing with particular situations in certain localities. An information campaign will cover several aspects:

a. The first type of information to be disseminated must concern the biology of the wolf. The objective is to destroy the host of prejudices and legends surrounding the image of the wolf and replace it with a body of information that corresponds to reality.

b. The second set of data to be provided to the public must concern the real magnitude of the damage caused by wolves to domestic livestock (and, as prejudice will have it, to other human activities), and the real facts about the way in which these damages occur (where, when, why, under what conditions, etc.). The statistics gathered by the offices will have to be disseminated to explain the distribution of the phenomenon over time and space and to indicate concomitant environmental and socio-economic causes. It will also be helpful to provide the public with better information about the economic and cultural aspects of farming and sheep herding so that people are aware of the socio-economic problems involved and can fit the problem of conflicts with the wolf into the right context.

c. In particular, information will have to cover the methods that can be used to prevent and limit damages. This will involve more technical information directed, above all, at people working in the sector. The information will have to be exhaustive and the instruments and methods used will have to be calibrated to the target audience.

4.11.1. Informing the media and asking to report in favour of the wolf

The goal is to inform the media and keep them informed about the wolf and its management. Different forms of media can be applied to deal with more complex issues. In addition to that, a marketing plan should be developed with wolf information to keep the stream of current information going.

Personal contacts with the media enable to inform them and to spread this issue in a more accurate way. It is very important to provide them with scientific information about the species and its effect on the environment as a whole. One must be aware that “honest” information will last the longest. Reference to other countries which dealt with similar problems can put forward as a representative example. But we have to bear in mind that every region asks for specific treatment and some opponents will use these differences to form ideas against any wolf management.

Therefore several credible and known persons should represent the wolf case because through their knowledge and reputation, it will be a powerful tool to capture and hold the people’s support. They can be biologists, specialists or experts, but must be aware of the particularities concerning the specific area. Their communicative skills must be used in a proper way to deal with crisis situations and media tricks.

Actions

4.11.1 Identify the need/desirability of an educational campaign at local or national level.

4.11.2 Design and implement a project.

4.11.3 Design and implement a press campaign.

4.11.4 Identify and empower credible wolf managers to represent the case of the wolf in front of the public and the press.

4.12. Applied research

Although the wolf is one of the most studied species, much scientific research continues to be dedicated fruitfully to basic aspects of the wolf’s natural history. In fact, its behavioural and ecological flexibility leads to local adaptations, which result in new data allowing for greater knowledge of the limits of this adaptability.

A study of the way in which ecological conditions change can be useful in evaluating all possible management options. Even the basic research carried out on a national scale can be used to produce reliable estimates (censuses and vitality assessments) on the demographic situation and changes (spontaneous or induced) in the distribution range.

This document highlights only those aspects that appear to be most urgent for obtaining data that can be used immediately to improve the Action Plan. This does not mean that only those aspects of the research deserve attention.

4.12.1. Genetics

Studying the genetic identity of the European wolf is of prime importance, not only for taxonomic and academic reasons, but also in order to be able to evaluate the need for and functionality of management actions, such as possible translocation programmes for individuals from one portion of the range to another, captive breeding, etc.

Knowledge of the identity of the wolf in Europe is also of critical importance for controlling possible future encounters with other populations and for co-ordinating conservation activity with bordering countries.

Particular attention will have to be given to ascertaining whether and to what degree the wolf has hybridised with the domestic dog and to the distribution of genetic variability in the various parts of its distribution range.

4.12.2. Dispersal

The survival of the wolf is in large part due to the species' ability to disperse and to re-colonise even distant areas, crossing less favourable habitats and terrain. Whereas good data are available on dispersal of the wolf in North America, almost nothing is known of the phenomenon in Europe. This should be the prime objective of any research on free-ranging wolf populations, even if it calls for a large research programme (method, staff, time and costs).

4.12.3. Mortality and population dynamics

Among the factors that determine the survival of the wolf is its ability to increase in numbers. It is important to ascertain the population's sustainable harvest threshold. This is essential for assessing the incidence of poaching in various environmental and demographic contexts, for planning the possible removal of animals as a management instrument in particular conflict situations, and for managing hunting.

4.12.4. Wolf-prey relationship

Various studies have been carried out on the feeding habits of wolves in Europe, but they have all used indirect methods based on analysis of digestive remains. While this provides greater knowledge of the breadth of the wolf's feeding spectrum, it contributes little to clarifying the relations (both numerical and functional) between the wolf and its prey.

In view of the management objective of maintaining domestic prey as secure as possible from predation and increasing the autonomy of wild prey-predation systems, knowledge of these aspects is the initial step in planning. Furthermore, a study of the impact of the wolf on individual wild prey populations must be begun, especially in view of re-colonisation in the Alps, in an attempt to be able to provide the hunting world with clear and scientifically valid answers.

4.12.5. Tolerance of human disturbance

The wolf in Europe has shown a formidable capacity for coexistence with human activity, unheard of in North American scientific literature. Detailed knowledge of this capacity, above all in terms of flexibility and environmental context, is a key element in planning the presence of the wolf. In fact, the wolf has proven that it can survive in habitats that are in close contact with humans without entering into conflict with human activity. In the European environmental context, characterised by the widespread presence of human beings, it is important to be able to take full advantage of this capacity.

4.12.6. Habitat and corridor models

We do not have totally reliable models with which to evaluate the minimum number of wolves needed for survival of the populations, the carrying capacity of the environment (or the maximum number of wolves that the suitable habitat can host), the quality of the habitat, and potential dispersion corridors. The theoretical models currently available are often simplistic and too rough for the small scale demanded by the European environment. This remains an open research field, but it is an important sector for conservation in that it constitutes one of the most effective methods of data validation.

4.12.7. Monitoring

When a new conservation strategy is implemented, especially one that is based on a philosophy of active intervention and multi-level co-ordination, one of the most essential programmes that has to be put into place is a plan for monitoring the state of the environmental components and the positive and negative aspects of the strategy's application.

Monitoring is essential for evaluating the progress of the new course, for adjusting and correcting erroneous actions, and for suggesting new ones. A monitoring programme must be implemented at the same time, if not before, other actions called for by the Action Plan. It should be underlined that these are not expensive and intensive research programmes, but activities that could to a large extent be carried out directly by the technical offices of the regional or provincial administrations or by NGOs.

The evolution of the populations of wolves and their wild prey will have to be monitored, at least for their demographic factors, but also for the indexes of physiological and health conditions. Monitoring the evolution of the system wolf-wild prey-domestic prey will also be very important in relation to indexes of habitat quality and under models of resource utilization by humans. In particular, all damages made by wolves to the livestock will have to be closely monitored (number of animals killed, sex, age, race).

Actions

4.12.1 Co-ordinate a programme of scientific research at European level, distributing research topics along with funds availability and local priority

4.12.2 Maintain a close link among all researchers working on the wolf in Europe

4.12.3 Co-ordinate the regular gathering of all necessary data to monitor the management and biological conditions of the wolf in all European countries.

5. Actions required in each European country

The actions required in each European country are summarised in Table 5. The first 7 actions (1.1 – 2.5) are common to most of the countries as they call for a) participation to the process of establishing the European Group of Experts and planning wolf presence at continental level, and b) drafting the National Wolf Management Plan. The following lists have been edited by all European governments through a formal review process.

Albania

1.1. The Bern Convention adopts this Action Plan and the Country participate in establishing a Group of Experts on Wolf Management.

1.2 The Group of Experts produces a detailed European Wolf Management Plan and submits the Plan to be approved by the Bern Convention.

2.1 The Group of Experts identifies at large scale all areas of Europe where wolves or their potential wild prey are still present with viable populations.

2.2 The Group of Experts identifies all current and potential connection areas. Through this process, wolf recovery and management will be linked to the overall planning for the restoration of European ecosystems.

2.3 Each area (or group of areas at regional, national or sub-national level) is provided with a detailed Management Plan (National or Regional) drafted by national authorities in co-ordination with neighbouring countries.

2.4 The national and local public is involved in the process of area identification and drafting of the preliminary Management Plans.

2.5 The final European Wolf Management Plan, composed by all national and/or regional Plans is submitted to the Bern Convention for approval, and national legislation is adjusted accordingly.

Austria

1.1 The Bern Convention adopts this Action Plan and the Country participate in establishing a Group of Experts on Wolf Management.

1.2 The Group of Experts produces a detailed European Wolf Management Plan and submits the Plan to be approved by the Bern Convention.

2.1 The Group of Experts identifies at large scale all areas of Europe where wolves or their potential wild prey are still present with viable populations.

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2.4 The national and local public is involved in the process of area identification and drafting of the preliminary Management Plans.

2.5 The final European Wolf Management Plan, composed by all national and/or regional Plans is submitted to the Bern Convention for approval, and national legislation is adjusted accordingly.

3.1 Design a national PR campaign with the aim of informing the public opinion and making the wolf a political issue.

3.3 Organise logistics and funding for national and international networks of government and NGO representatives on wolf management issues.

3.4 Ask the European Union to review and correct the economic incentives policies to shepherds in areas with wolves
4.1 Identify and establish national wolf management groups and empower them to design the national wolf management plan.
4.2 Co-ordinate the work at national level with that of the international Group of Experts established by the Bern Convention.
4.3 Prepare the legislative and management framework needed for the recolonization/reintroduction of the wolves
5.1 Identify all potential corridors among population fragments.
6.1 Assess the status of all recovering and small populations, including counting or monitoring wolf abundance, identifying wolf habitat quality and quantity (i.e., prey distribution and abundance).
6.3 Assess the attitudes of humans in wolf recovery areas.
7.3 Prepare a census of existing facilities with captive wolves.
7.5 Review and correct the economic incentives policies to shepherds in areas with wolves.
7.7 Establish a permanent monitoring programme for damages caused by wolves and other predators.
7.8 Define the most suitable compensation scheme for each national/regional group of wolf areas.
8.5 Implement more research on the impact wolves and hunters have on local prey.
9.1 Assess the feasibility for an economic exploitation of the wolf.
10.1 Identify opinion leaders and stakeholders in wolf management; set up local management boards and involve them in management planning and implementation.
10.2 Establish a permanent protocol of consultations with local people about the management actions to be implemented in their area.
11.1 Identify the need/desirability of an educational campaign at local or national level.
11.2 Design and implement an educational and information programme.
11.3 Design and implement a press campaign.
11.4 Identify and empower credible wolf managers to represent the case of the wolf in front of the public and the press.
12.1 Co-ordinate a programme of scientific research at European level, distributing research topics along with local priority.
12.2 Contribute to maintaining a close link among all researchers working on the wolf in Europe.
12.3 Contribute to the regular gathering of all necessary data to monitor the management and biological conditions of the wolf in all European countries.

Belgium
None.

Bulgaria
1.1 The Bern Convention adopts this Action Plan and the Country participate in establishing a Group of Experts on Wolf Management.
1.2 The Group of Experts produces a detailed European Wolf Management Plan and submits the Plan to be approved by the Bern Convention.
2.1 The Group of Experts identifies at large scale all areas of Europe where wolves or their potential wild prey are still present with viable populations.

2.2 The Group of Experts identifies all current and potential connection areas. Through this process, wolf recovery and management will be linked to the overall planning for the restoration of European ecosystems.

2.3 Each area (or group of areas at regional, national or sub-national level) is provided with a detailed Management Plan (National or Regional) drafted by national authorities in co-ordination with neighbouring countries.

2.4 The national and local public is involved in the process of area identification and drafting of the preliminary Management Plans.

2.5 The final European Wolf Management Plan, composed by all national and/or regional Plans is submitted to the Bern Convention for approval, and national legislation is adjusted accordingly.

3.1 Design a national PR campaign with the aim of informing the public opinion and making the wolf a political issue.

3.2 Prepare a document on the ways the Country and the EU are implementing the international laws and directives they have signed.

3.4 Ask the European Union to review and correct the economic incentives policies to shepherds in areas with wolves

4.1 Identify and establish national wolf management groups and empower them to design the national wolf management plan.

4.2 Co-ordinate the work at national level with that of the international Group of Experts established by the Bern Convention.

5.1 Identify all potential corridors among population fragments.

5.2 Evaluate the status of the food supply for the wolf in various regions and identify the needs for specific actions.

6.1 Assess the status of all recovering and small populations, including counting or monitoring wolf abundance, identifying wolf habitat quality and quantity (i.e., prey distribution and abundance).

7.1 Assess the feasibility and desirability of the management approach of removing selected problem wolves.

7.2 Assess and manage the problem of feral and stray dogs, and the existing legislation to control them.

7.3 Prepare a census of existing facilities with captive wolves.

8.1 Assess the quality of wolf hunting in its biological and social perspectives.

9.1 Assess the feasibility for an economic exploitation of the wolf.

11.1 Identify the need/desirability of an educational campaign at local or national level.

11.2 Design and implement an educational and information programme.

11.3 Design and implement a press campaign.

11.4 Identify and empower credible wolf managers to represent the case of the wolf in front of the public and the press.

12.1 Co-ordinate a programme of scientific research at European level, distributing research topics along with local priority.

12.2 Contribute to maintaining a close link among all researchers working on the wolf in Europe.

12.3 Contribute to the regular gathering of all necessary data to monitor the management and biological conditions of the wolf in all European countries.

Czech Republic

1.1 The Bern Convention adopts this Action Plan and the Country participate in establishing a Group of Experts on Wolf Management.

1.2 The Group of Experts produces a detailed European Wolf Management Plan and submits the Plan to be approved by the Bern Convention.

2.1 The Group of Experts identifies at large scale all areas of Europe where wolves or their potential wild prey are still present with viable populations.

2.2 The Group of Experts identifies all current and potential connection areas. Through this process, wolf recovery and management will be linked to the overall planning for the restoration of European ecosystems.

2.3 Each area (or group of areas at regional, national or sub-national level) is provided with a detailed Management Plan (National or Regional) drafted by national authorities in co-ordination with neighbouring countries.

2.4 The national and local public is involved in the process of area identification and drafting of the preliminary Management Plans.

2.5 The final European Wolf Management Plan, composed by all national and/or regional Plans is submitted to the Bern Convention for approval, and national legislation is adjusted accordingly.

3.1 Design a national PR campaign with the aim of informing the public opinion and making the wolf a political issue.

3.2 Prepare a document on the ways the Country and the EU are implementing the international laws and directives they have signed.

3.3 Organise logistics and funding for national and international networks of government and NGO representatives on wolf management issues.

3.4 Ask the European Union to review and correct the economic incentives policies to shepherds in areas with wolves

4.1 Identify and establish national wolf management groups and empower them to design the national wolf management plan.

4.2 Co-ordinate the work at national level with that of the international Group of Experts established by the Bern Convention.

4.3 Prepare the legislative and management framework needed for the recolonization/reintroduction of the wolves

5.1 Identify all potential corridors among population fragments.

5.2 Evaluate the status of the food supply for the wolf in various regions and identify the needs for specific actions.

5.3 Evaluate the presence and impact of existing and planned infrastructure in zones where the wolf is present or recovering.

6.1 Assess the status of all recovering and small populations, including counting or monitoring wolf abundance, identifying wolf habitat quality and quantity (i.e., prey distribution and abundance).

6.2 Identify and manage source populations to ensure their continued existence.

6.3 Assess the attitudes of humans in wolf recovery areas.

7.1 Assess the feasibility and desirability of the management approach of removing selected problem wolves.

7.2 Assess and manage the problem of feral and stray dogs, and the existing legislation to control them.

7.5 Review and correct the economic incentives policies to shepherds in areas with wolves.

7.6 Establish a sound scientific programme for assessing and implementing the optimal use of Large Guarding Dogs.

7.7 Establish a permanent monitoring programme for damages caused by wolves and other predators.
7.8 Define the most suitable compensation scheme for each national/regional group of wolf areas.
8.4 Establish strong and credible fines for illegal hunting of wolves and enforce them.
8.5 Implement more research on the impact wolves and hunters have on local prey.
9.1 Assess the feasibility for an economic exploitation of the wolf.
10.1 Identify opinion leaders and stakeholders in wolf management; set up local management boards and involve them in management planning and implementation.
10.2 Establish a permanent protocol of consultations with local people about the management actions to be implemented in their area.
11.2 Design and implement an educational and information programme.
11.3 Design and implement a press campaign.
11.4 Identify and empower credible wolf managers to represent the case of the wolf in front of the public and the press.
12.1 Co-ordinate a programme of scientific research at European level, distributing research topics along with local priority.
12.2 Contribute to maintaining a close link among all researchers working on the wolf in Europe.
12.3 Contribute to the regular gathering of all necessary data to monitor the management and biological conditions of the wolf in all European countries.

Croatia

1.1 The Bern Convention adopts this Action Plan and the Country participate in establishing a Group of Experts on Wolf Management.
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2.2 The Group of Experts identifies all current and potential connection areas. Through this process, wolf recovery and management will be linked to the overall planning for the restoration of European ecosystems.
2.3 Each area (or group of areas at regional, national or sub-national level) is provided with a detailed Management Plan (National or Regional) drafted by national authorities in co-ordination with neighbouring countries.
2.4 The national and local public is involved in the process of area identification and drafting of the preliminary Management Plans.
2.5 The final European Wolf Management Plan, composed by all national and/or regional Plans is submitted to the Bern Convention for approval, and national legislation is adjusted accordingly.
3.1 Design a national PR campaign with the aim of informing the public opinion and making the wolf a political issue.
3.2 Prepare a document on the ways the Country and the EU are implementing the international laws and directives they have signed.
3.3 Organise logistics and funding for national and international networks of government and NGO representatives on wolf management issues.
3.4 Ask the European Union to review and correct the economic incentives policies to shepherds in areas with wolves

4.1 Identify and establish national wolf management groups and empower them to design the national wolf management plan.
4.2 Co-ordinate the work at national level with that of the international Group of Experts established by the Bern Convention.
5.2 Evaluate the status of the food supply for the wolf in various regions and identify the needs for specific actions.
5.3 Evaluate the presence and impact of existing and planned infrastructure in zones where the wolf is present or recovering.
6.1 Assess the status of all recovering and small populations, including counting or monitoring wolf abundance, identifying wolf habitat quality and quantity (i.e., prey distribution and abundance).
6.2 Identify and manage source populations to ensure their continued existence.
6.3 Assess the attitudes of humans in wolf recovery areas.
7.1 Assess the feasibility and desirability of the management approach of removing selected problem wolves.
7.2 Assess and manage the problem of feral and stray dogs, and the existing legislation to control them.
7.3 Prepare a census of existing facilities with captive wolves.
7.4 Assess the genetic identity of local wolves.
7.5 Review and correct the economic incentives policies to shepherds in areas with wolves.
7.6 Establish a sound scientific programme for assessing and implementing the optimal use of Large Guarding Dogs.
7.7 Establish a permanent monitoring programme for damages caused by wolves and other predators.
7.8 Define the most suitable compensation scheme for each national/regional group of wolf areas.
8.1 Assess the quality of wolf hunting in its biological and social perspectives.
8.4 Establish strong and credible fines for illegal hunting of wolves and enforce them.
8.5 Implement more research on the impact wolves and hunters have on local prey.
9.1 Assess the feasibility for an economic exploitation of the wolf.
10.1 Identify opinion leaders and stakeholders in wolf management; set up local management boards and involve them in management planning and implementation.
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11.1 Identify the need/desirability of an educational campaign at local or national level.
11.2 Design and implement an educational and information programme.
11.3 Design and implement a press campaign.
11.4 Identify and empower credible wolf managers to represent the case of the wolf in front of the public and the press.
12.1 Co-ordinate a programme of scientific research at European level, distributing research topics along with local priority.
12.2 Contribute to maintaining a close link among all researchers working on the wolf in Europe.
12.3 Contribute to the regular gathering of all necessary data to monitor the management and biological conditions of the wolf in all European countries.

Estonia

1.1 The Bern Convention adopts this Action Plan and the Country participate in establishing a Group of Experts on Wolf Management.

1.2 The Group of Experts produces a detailed European Wolf Management Plan and submits the Plan to be approved by the Bern Convention.

2.1 The Group of Experts identifies at large scale all areas of Europe where wolves or their potential wild prey are still present with viable populations.

2.2 The Group of Experts identifies all current and potential connection areas. Through this process, wolf recovery and management will be linked to the overall planning for the restoration of European ecosystems.

2.3 Each area (or group of areas at regional, national or sub-national level) is provided with a detailed Management Plan (National or Regional) drafted by national authorities in co-ordination with neighbouring countries.

2.4 The national and local public is involved in the process of area identification and drafting of the preliminary Management Plans.

2.5 The final European Wolf Management Plan, composed by all national and/or regional Plans is submitted to the Bern Convention for approval, and national legislation is adjusted accordingly.

7.4 Assess the genetic identity of local wolves.

7.7 Establish a permanent monitoring programme for damages caused by wolves and other predators.

8.5 Implement more research on the impact wolves and hunters have on local prey.

12.2 Contribute to maintaining a close link among all researchers working on the wolf in Europe.

Finland

In order to fit the existing national management plan of all large carnivores and to parellel the same numerical order of the action plans on other large carnivores, Finland preferred the national actions to be reworded as follows (corresponding actions of the present plan are in bracket):

4.1 Adoption of Action Plan by Bern Convention (1.1).

4.2 Establishment of national large carnivore management groups and management plans (4.1)

4.3 Protection of wolf by law and hunting should only be allowed in populations that are documented to be viable and hunting used to reach population goals identified by management plans.

4.4 Intensification of law enforcement and appropriate penalties in populations where poaching is identified as an important threat or limiting factor for the population (8.4)

4.5 Evaluate the status of the food supply for the wolf in various regions and identify the needs for specific actions (5.2)

4.6 Assess the status of all recovering and small populations, including counting or monitoring wolf abundance, identifying wolf habitat quality and quantity (6.1)

4.7 Identify and manage source populations to ensure their continued existence (6.2)

4.8 Assess the attitudes of humans in wolf recovery areas (6.3)

4.9 Establish a permanent monitoring programme for damages caused by wolves and other predators (7.7)

5.0 Improving existing compensation programmes (7.8)

5.1 Assess the feasibility and desirability of the management approach of removing selected problem wolves (7.1)

5.2. Removal of problem wolverines in viable populations if preventive efforts have failed
5.3 Evaluation of costs and benefits before removing problem wolverines in threatened populations
5.4 Regulating hunting in viable populations where hunting is listed as an action to reach management goals
5.5 Implement more research on the impact wolves and hunters have on local prey (8.5)
5.6 Establishment of consultation protocol when necessary with locals about their needs and necessary management actions
5.7 Initiative information campaigns designed for different target groups (11.1)
5.8 Co-ordinate scientific research on wolves in Europe
5.9 Co-ordination of gathering necessary data to monitor management and biological conditions of wolves in the European countries (12.3)

France

1.1 The Bern Convention adopts this Action Plan and the Country participate in establishing a Group of Experts on Wolf Management.
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2.1 The Group of Experts identifies at large scale all areas of Europe where wolves or their potential wild prey are still present with viable populations.
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3.3 Organise logistics and funding for national and international networks of government and NGO representatives on wolf management issues.
3.4 Ask the European Union to review and correct the economic incentives policies to shepherds in areas with wolves
4.1 Identify and establish national wolf management groups and empower them to design the national wolf management plan.
4.2 Co-ordinate the work at national level with that of the international Group of Experts established by the Bern Convention.
4.3 Prepare the legislative and management framework needed for the recolonization of the wolves
5.1 Identify all potential corridors among population fragments.
5.2.1 Evaluate the status of the food supply for the wolf in various regions and identify the needs for specific actions

5.3. Evaluate the presence and impact of existing and planned infrastructure in zones where the wolf is present or recovering.
6.1 Assess the status of all recovering and small populations, including counting or monitoring wolf abundance, identifying wolf habitat quality and quantity (i.e., prey distribution and abundance).
6.2 Identify and manage source populations to ensure their continued existence.
6.3 Assess the attitudes of humans in wolf recovery areas.
7.1 Assess the feasibility and desirability of the management approach of removing selected problem wolves.
7.2 Assess and manage the problem of feral and stray dogs, and the existing legislation to control them.
7.5 Review and adapt the economic incentives policies to shepherds in areas with wolves.
7.6 Establish a sound scientific programme for assessing and implementing the optimal use of Large Guarding Dogs and other preventive measures.
7.7 Establish a permanent monitoring programme for damages caused by wolves and other predators.
7.8 Define the most suitable compensation scheme for each national/regional group of wolf areas.
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9.1 Assess the feasibility for an economic exploitation of the wolf.
10.1 Identify opinion leaders and stakeholders in wolf management; set up local management boards and involve them in management planning and implementation.
10.2 Establish a permanent protocol of consultations with local people about the management actions to be implemented in their area.
11.2 Design and implement an educational and information programme.
11.3 Design and implement a press campaign.
11.4 Identify and empower credible wolf managers to represent the case of the wolf in front of the public and the press.
12.1 Co-ordinate a programme of scientific research at European level, distributing research topics along with local priority.
12.2 Contribute to maintaining a close link among all researchers working on the wolf in Europe.
12.3 Contribute to the regular gathering of all necessary data to monitor the management and biological conditions of the wolf in all European countries.

FYR Macedonia

1.1 The Bern Convention adopts this Action Plan and the Country participate in establishing a Group of Experts on Wolf Management.
1.2 The Group of Experts produces a detailed European Wolf Management Plan and submits the Plan to be approved by the Bern Convention.
2.1 The Group of Experts identifies at large scale all areas of Europe where wolves or their potential wild prey are still present with viable populations.
2.2 The Group of Experts identifies all current and potential connection areas. Through this process, wolf recovery and management will be linked to the overall planning for the restoration of European ecosystems.
2.3 Each area (or group of areas at regional, national or sub-national level) is provided with a detailed Management Plan (National or Regional) drafted by national authorities in co-ordination with neighbouring countries.

2.4 The national and local public is involved in the process of area identification and drafting of the preliminary Management Plans.
2.5 The final European Wolf Management Plan, composed by all national and/or regional Plans is submitted to the Bern Convention for approval, and national legislation is adjusted accordingly.

Germany
2.1 The Group of Experts identifies at large scale all areas of Europe where wolves or their potential wild prey are still present with viable populations.
2.2.1 The Group of Experts identifies all current and potential connection areas. Through this process, wolf recovery and management will be linked to the overall planning for the restoration of European ecosystems.
11.2 Design and implement an educational and information programme.
11.3 Design and implement a press campaign.

Greece
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3.4 Ask the European Union to review and correct the economic incentives policies to shepherds in areas with wolves
4.2 Co-ordinate the work at national level with that of the international Group of Experts established by the Bern Convention.
5.2 Evaluate the status of the food supply for the wolf in various regions and identify the needs for specific actions.
6.1 Assess the status of all recovering and small populations, including counting or monitoring wolf abundance, identifying wolf habitat quality and quantity (i.e., prey distribution and abundance).
6.2 Identify and manage source populations to ensure their continued existence.
7.2 Assess and manage the problem of feral and stray dogs, and the existing legislation to control them.
7.4 Assess the genetic identity of local wolves.
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7.6 Establish a sound scientific programme for assessing and implementing the optimal use of Large Guarding Dogs.
7.7 Establish a permanent monitoring programme for damages caused by wolves and other predators.
7.8 Define the most suitable compensation scheme for each national/regional group of wolf areas.
11.2 Design and implement an educational and information programme.
12.1 Co-ordinate a programme of scientific research at European level, distributing research topics along with local priority.

12.2 Contribute to maintaining a close link among all researchers working on the wolf in Europe.
12.3 Contribute to the regular gathering of all necessary data to monitor the management and biological conditions of the wolf in all European countries.

Hungary
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6.3 Assess the attitudes of humans in wolf recovery areas.
8.4 Establish strong and credible fines for illegal hunting of wolves and enforce them.
11.1 Identify the need/desirability of an educational campaign at local or national level.
11.3 Design and implement a press campaign.
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Italy
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3.2 Prepare a document on the ways the Country and the EU are implementing the international laws and directives they have signed.
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7.1 Assess the feasibility and desirability of the management approach of removing selected problem wolves.
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8.4 Establish strong and credible fines for illegal hunting of wolves and enforce them.
8.5 Implement more research on the impact wolves and hunters have on local prey.
9.1 Assess the feasibility for an economic exploitation of the wolf.
10.1 Identify opinion leaders and stakeholders in wolf management; set up local management boards and involve them in management planning and implementation.
10.2 Establish a permanent protocol of consultations with local people about the management actions to be implemented in their area.
11.2 Design and implement an educational and information programme.
11.3 Design and implement a press campaign.

11.4 Identify and empower credible wolf managers to represent the case of the wolf in front of the public and the press.
12.1 Co-ordinate a programme of scientific research at European level, distributing research topics along with local priority.
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Latvia

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8.1 Assess the quality of wolf hunting in its biological and social perspectives.
8.2 Prepare a new proposal for hunting regulations in wolf areas.
8.3 Abolish any form of bounty.
8.5 Implement more research on the impact wolves and hunters have on local prey.
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11.1 Identify the need/desirability of an educational campaign at local or national level.

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Lithuania

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Luxembourg
None

Netherlands
None

Norway
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Romania

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SFR – former Yugoslav (Serbia and Montenegro)

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Slovakia

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2.4 The national and local public is involved in the process of area identification and drafting of the preliminary Management Plans.
2.5 The final European Wolf Management Plan, composed by all national and/or regional Plans is submitted to the Bern Convention for approval, and national legislation is adjusted accordingly.

3.1 Design a national PR campaign with the aim of informing the public opinion and making the wolf a political issue.
3.2 Prepare a document on the ways the Country and the EU are implementing the international laws and directives they have signed.
3.3 Organise logistics and funding for national and international networks of government and NGO representatives on wolf management issues.
3.4 Ask the European Union to review and correct the economic incentives policies to shepherds in areas with wolves
4.1 Identify and establish national wolf management groups and empower them to design the national wolf management plan.
4.2 Co-ordinate the work at national level with that of the international Group of Experts established by the Bern Convention.
5.1 Identify all potential corridors among population fragments.
5.2 Evaluate the status of the food supply for the wolf in various regions and identify the needs for specific actions.
5.3 Evaluate the presence and impact of existing and planned infrastructure in zones where the wolf is present or recovering.
6.1 Assess the status of all recovering and small populations, including counting or monitoring wolf abundance, identifying wolf habitat quality and quantity (i.e., prey distribution and abundance).
6.2 Identify and manage source populations to ensure their continued existence.
6.3 Assess the attitudes of humans in wolf recovery areas.
7.1 Assess the feasibility and desirability of the management approach of removing selected problem wolves.
7.2 Assess and manage the problem of feral and stray dogs, and the existing legislation to control them.
7.3 Prepare a census of existing facilities with captive wolves.
7.4 Assess the genetic identity of local wolves.
7.5 Review and correct the economic incentives policies to shepherds in areas with wolves.
7.6 Establish a sound scientific programme for assessing and implementing the optimal use of Large Guarding Dogs.
7.7 Establish a permanent monitoring programme for damages caused by wolves and other predators.
7.8 Define the most suitable compensation scheme for each national/regional group of wolf areas.
8.4 Establish strong and credible fines for illegal hunting of wolves and enforce them.
8.5 Implement more research on the impact wolves and hunters have on local prey.
9.1 Assess the feasibility for an economic exploitation of the wolf.
10.1 Identify opinion leaders and stakeholders in wolf management; set up local management boards and involve them in management planning and implementation.
10.2 Establish a permanent protocol of consultations with local people about the management actions to be implemented in their area.
11.1 Identify the need/desirability of an educational campaign at local or national level.
11.2 Design and implement an educational and information programme.
11.3 Design and implement a press campaign.
11.4 Identify and empower credible wolf managers to represent the case of the wolf in front of the public and the press.
12.1 Co-ordinate a programme of scientific research at European level, distributing research topics along with local priority.

12.2 Contribute to maintaining a close link among all researchers working on the wolf in Europe.
12.3 Contribute to the regular gathering of all necessary data to monitor the management and biological conditions of the wolf in all European countries.

Spain

1.1 The Bern Convention adopts this Action Plan and the Country participate in establishing a Group of Experts on Wolf Management.
1.2 The Group of Experts produces a detailed European Wolf Management Plan and submits the Plan to be approved by the Bern Convention.
2.1 The Group of Experts identifies at large scale all areas of Europe where wolves or their potential wild prey are still present with viable populations.
2.2 The Group of Experts identifies all current and potential connection areas. Through this process, wolf recovery and management will be linked to the overall planning for the restoration of European ecosystems.
2.3 Each area (or group of areas at regional, national or sub-national level) is provided with a detailed Management Plan (National or Regional) drafted by national authorities in co-ordination with neighbouring countries.
2.4 The national and local public is involved in the process of area identification and drafting of the preliminary Management Plans.
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3.4 Ask the European Union to review and correct the economic incentives policies to shepherds in areas with wolves
4.1 Identify and establish national wolf management groups and empower them to design the national wolf management plan.
5.3 Evaluate the presence and impact of existing and planned infrastructure in zones where the wolf is present or recovering.
6.1 Assess the status of all recovering and small populations, including counting or monitoring wolf abundance, identifying wolf habitat quality and quantity (i.e., prey distribution and abundance).
6.2 Identify and manage source populations to ensure their continued existence.
6.3 Assess the attitudes of humans in wolf recovery areas.
7.3 Prepare a census of existing facilities with captive wolves.
7.5 Review and correct the economic incentives policies to shepherds in areas with wolves.
7.7 Establish a permanent monitoring programme for damages caused by wolves and other predators.
7.8 Define the most suitable compensation scheme for each national/regional group of wolf areas.
8.1 Assess the quality of wolf hunting in its biological and social perspectives.
11.1 Identify the need/desirability of an educational campaign at local or national level.
12.1 Co-ordinate a programme of scientific research at European level, distributing research topics along with local priority.
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Sweden

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2.2 The Group of Experts identifies all current and potential connection areas. Through this process, wolf recovery and management will be linked to the overall planning for the restoration of European ecosystems.

2.3 Each area (or group of areas at regional, national or sub-national level) is provided with a detailed Management Plan (National or Regional) drafted by national authorities in co-ordination with neighbouring countries.

2.4 The national and local public is involved in the process of area identification and drafting of the preliminary Management Plans.

2.5 The final European Wolf Management Plan, composed by all national and/or regional Plans is submitted to the Bern Convention for approval, and national legislation is adjusted accordingly.

3.1 Design a national PR campaign with the aim of informing the public opinion and making the wolf a political issue.

3.2 Prepare a document on the ways the Country and the EU are implementing the international laws and directives they have signed.

3.3 Organise logistics and funding for national and international networks of government and NGO representatives on wolf management issues.

3.4 Ask the European Union to review and correct the economic incentives policies to shepherds in areas with wolves

4.1 Identify and establish national wolf management groups and empower them to design the national wolf management plan.

4.2 Co-ordinate the work at national level with that of the international Group of Experts established by the Bern Convention.

5.1 Identify all potential corridors among population fragments.

5.2 Evaluate the status of the food supply for the wolf in various regions and identify the needs for specific actions.

6.1 Assess the status of all recovering and small populations, including counting or monitoring wolf abundance, identifying wolf habitat quality and quantity (i.e., prey distribution and abundance).

6.2 Identify and manage source populations to ensure their continued existence.

6.3 Assess the attitudes of humans in wolf recovery areas.

7.1 Assess the feasibility and desirability of the management approach of removing selected problem wolves.

7.5 Review and correct the economic incentives policies to shepherds in areas with wolves.

7.6 Establish a sound scientific programme for assessing and implementing the optimal use of Large Guarding Dogs.

7.7 Establish a permanent monitoring programme for damages caused by wolves and other predators.

7.8 Define the most suitable compensation scheme for each national/regional group of wolf areas.

8.4 Establish strong and credible fines for illegal hunting of wolves and enforce them.

8.5 Implement more research on the impact wolves and hunters have on local prey.

10.1 Identify opinion leaders and stakeholders in wolf management; set up local management boards and involve them in management planning and implementation.
10.2 Establish a permanent protocol of consultations with local people about the management actions to be implemented in their area.
11.1 Identify the need/desirability of an educational campaign at local or national level.
11.2 Design and implement an educational and information programme.
11.3 Design and implement a press campaign.
12.2 Contribute to maintaining a close link among all researchers working on the wolf in Europe.

Switzerland
1.1 The Bern Convention adopts this Action Plan and the Country participate in establishing a Group of Experts on Wolf Management.
1.2 The Group of Experts produces a detailed European Wolf Management Plan and submits the Plan to be approved by the Bern Convention.
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6.1 Assess the status of all recovering and small populations, including counting or monitoring wolf abundance, identifying wolf habitat quality and quantity (i.e., prey distribution and abundance).
10.1 Identify opinion leaders and stakeholders in wolf management; set up local management boards and involve them in management planning and implementation.
10.2 Establish a permanent protocol of consultations with local people about the management actions to be implemented in their area.
12.1 Co-ordinate a programme of scientific research at European level, distributing research topics along with local priority.
12.2 Contribute to maintaining a close link among all researchers working on the wolf in Europe.
12.3. Contribute to the regular gathering of all necessary data to monitor the management and biological conditions of the wolf in all European countries.

Ukraine

1.1 The Bern Convention adopts this Action Plan and the Country participate in establishing a Group of Experts on Wolf Management.

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3.1 Design a national PR campaign with the aim of informing the public opinion and making the wolf a political issue.

3.2 Prepare a document on the ways the Country and the EU are implementing the international laws and directives they have signed.

3.3 Organise logistics and funding for national and international networks of government and NGO representatives on wolf management issues.

4.1 Identify and establish national wolf management groups and empower them to design the national wolf management plan.

4.2 Co-ordinate the work at national level with that of the international Group of Experts established by the Bern Convention.

5.2 Evaluate the status of the food supply for the wolf in various regions and identify the needs for specific actions.

5.3 Evaluate the presence and impact of existing and planned infrastructure in zones where the wolf is present or recovering.

6.2 Identify and manage source populations to ensure their continued existence.

6.3 Assess the attitudes of humans in wolf recovery areas.

7.2 Assess and manage the problem of feral and stray dogs, and the existing legislation to control them.

7.4 Assess the genetic identity of local wolves.

7.7 Establish a permanent monitoring programme for damages caused by wolves and other predators.

7.8 Define the most suitable compensation scheme for each national/regional group of wolf areas.

8.1 Assess the quality of wolf hunting in its biological and social perspectives.

8.2 Prepare a new proposal for hunting regulations in wolf areas.

8.3 Abolish any form of bounty.

8.4 Establish strong and credible fines for illegal hunting of wolves and enforce them.

8.5 Implement more research on the impact wolves and hunters have on local prey.

9.1 Assess the feasibility for an economic exploitation of the wolf.

10.1 Identify opinion leaders and stakeholders in wolf management; set up local management boards and involve them in management planning and implementation.

10.2 Establish a permanent protocol of consultations with local people about the management actions to be implemented in their area.
11.1 Identify the need/desirability of an educational campaign at local or national level.
11.2 Design and implement an educational and information programme.
12.1 Co-ordinate a programme of scientific research at European level, distributing research topics along with local priority.
12.2 Contribute to maintaining a close link among all researchers working on the wolf in Europe.
12.3 Contribute to the regular gathering of all necessary data to monitor the management and biological conditions of the wolf in all European countries.

United Kingdom
None

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8. Tables

Table 1. Number and distribution of wolves in Europe. (?) = data unknown or poor. (--) = no answer. Estimation methods: ES = expert estimates; TC = track counts; DE = density extrapolation; KW = killing wolves; HD = harvest data; TR = transects; QU = questionnaires. Population trend: → = stable; ↗ = increasing; ↘ = decreasing. (**: government data)

Country	# wolves	Total area (Km2)	Densities/ 100km2 (max)	Estimation method	Population trend	Fragmentation: # fragments
Portugal	200-300	18000	2 (5)	ES	→	one in the south
Spain	2000	100000	2 (5-7)	ES	↗	2-3 in the south
France	30-40	1000	2-3	TC	↗	No
Italy	400-500	25000	2 (5)	DE	↗	Elongated range
Switzerland	No					
Germany	5 ?	--	?	ES	→	No
Norway	5-10	--	?	TC	↗→	No
Sweden	50-70	50000	?	TC	↗	No
Finland	100	--	0.5-1	TC	↗→	No
Poland	600-700	--	?	TC	↗	No
Estonia	<500	20000	?	TC	↘→	No
Lithuania	600	whole country	(5-8) in forest	TC	↗	No
Latvia	900	64600	?	TC	→	No
Belarus	2000-2500	whole country	?	TC	↗→	No
Ukraine	2000	?	?	TC	↗→	No
Czech Republic	<20	1500	?	TC	↗	2
Slovakia	350-400	16000	2.5	TC	→	No
Slovenia	30-50	3500	?	TC	↗	3-4
Croatia	100-150	10000	0.5-1	ES	↗	No
Bosnia-Herzegovina	400 ?	37000	1-1.2	TC	↘	No
Yugoslav Federation	500 ?	--	--	--	--	--
Hungary	<50	6000	?	TC	→	Several
Romania	2500	70000	2-3	TC	↗	No
Moldavia	--	--	--	--	--	--
Bulgaria	800-1000	24000	3-5	HD,QU,TC	→	Many
Greece **	1500-2000	50000	1-3	KW	→	No
SFR – former Yugoslavia	1000	61000	2-10	KW, ES	↗→	2 main ranges
FYR- Macedonia	>1000	whole country	?	ES	↗	No
Albania	250	7000	?	TR	↗	No

Table 2. Legal status and management of wolves in Europe. (?) = data unknown or poor. (--) = no answer. Legal status: FP = fully protected; PP = partially protected; GS = game species; NP = hunted throughout the year. Management level: N = national; R = regional; P = provincial; L = local.

Country	Legal status	Enforcement	Institution in charge	Management level	Legally killed /year	Illegally killed /year
Portugal	FP	only in some areas	Min. Environment	N	0	20-25
Spain	GS (FP in the south)	no	9 autonomous regions	R	ca. 100 (each region decides season, quotas)	ca. 400 (60% shot, 20% pups at den)
France	FP (since 1993)	Yes, but some killings	Min. Environment	N	0	1-5, shot and poisoned
Italy	FP (since 1976)	no	Regional Govern., Min. Environment	N,R	0	50-70 (shot and poisoned)
Switzerland	FP	--	Federal Forestry Off., Cantonal Governmens	N,R	0	0
Germany	FP	yes, but some killings	Min. Environment or Agriculture of each Laender	R	0	0-4
Norway	FP	yes	Min. Environment	N	0	--
Sweden	FP	yes	Envir. Prot. Agency	N	0	<5
Finland	PP	Yes	Min. Agriculture	N,R	5-10	--
Poland	FP except Bieszczady (1.11-28.2)	not always	Min. Nature Protection, local governments	N,P,L	set every year by local government.	?
Estonia	NP (the only outlawed species)	--	Min.Envir., Forest Dept, Game Board	N,L	200-300/year	0
Lithuania	NP	--	Game Board and Ministry of Environment	N,L	125 (july to april)	?
Latvia	NP	--	State Forest Service	N,L	380 (premium = 110Euro/wolf)	0
Belarus	NP	--	Min. Natural Resources	L	1600-1800 shot (premium)	0
Ukraine	GS	Not always	Min. Env.	N	7-800	?
Czech Republic	FP	Yes	Min. Environment	N	0	?
Slovakia	FP since 1995 (exceptions)	very weak	Min. Environment and Min. Agriculture	N	a new law to be approved to grant shooting permits	20-30
Slovenia	FP	yes	Min. Environment	N	0	?
Croatia	FP (since May 1995)	no	Dir. Cultural and Natural Heritage	N	0	10-20
Bosnia-Herzegovina	NP	no	?	--	--	--
Yugoslav Federation	--	--	--	--	--	--

Country	Legal status	Enforcement	Institution in charge	Management level	Legally killed /year	Illegally killed /year
Hungary	FP (exceptions)	yes	Local Conserv. And Hunters' Organizations	N, L	Shooting permits	?
Romania	FP (hunting permits)	weak	Min. Water, Forest & Env. Protection	L	>500	?
Moldavia	--	--	--	--	--	--
Bulgaria	NP	only in protected areas	Min. Environment, Min. Agriculture	L	400 (1996), 200(1997) (premium = 10Euro/wolf)	?
Greece	FP/P (since 1991)	Yes (not always)	Min. Agric., local forestry services	N, R, P, L	(3-5) after Prefect authorization	Unknown
SFR – former Yugoslavia	NP except in Vojovodina	only in Vojovodina	Min. Agric, Min. Envir., local services	N, L	220-240 (premium = 10-50 Euro/wolf)	-
FYR Macedonia	NP	no	?	L	--	0
Albania	NP	yes	Min. Agriculture	N	With special authorization	?

Table 3. Damage prevention and compensation. (?) = data unknown or poor. (--) = no answer. Prevention methods: GD = guarding dogs; SH = shepherd; EN = enclosures; EF = electric fences; KW = killing wolves; NO = none. E = Euro.

Country	Estimated yearly total loss in 1997	Compensation	Total paied 1996	Prevention method
Portugal	245-275000E	by Inst. Conser. Natureza	260000E	GD
Spain	ca. 900000E (1988)	it varies with regional laws	ca. 450000E	GD,SH
France	850 sheep	yes	155000E	GD,EN,SH,EF
Italy	ca. 5-1000000E	by Regional Gov.	Ca. 1800000E	GD,EN
Switzerland	0	by Cantons	0	
Germany	0	only in Brandenburg	no depredation yet	EF
Norway	--	yes	2000000E (prevention)	--
Sweden	195 reindeer, 10 sheep	yes	74000E (1995)	EF
Finland	Ca. 135000E	by the State and insurance companies	ca. 131000E	EF, KW, EN
Poland	?	since 08/97	--	GD
Estonia	--	no (insurance policies too expensive)	0	KW
Lithuania	--	no (only if animals were insured)	0	KW
Latvia	Important on sheep and dogs	no	0	No
Belarus	--	no	0	None
Ukraine	?	no	--	KW
Czech Republic	--	no	0	GD
Slovakia	not very serious	no (in preparation)	0	GD
Slovenia	120 sheep, 20 goats	by the State	21000E	EF,GD
Croatia	163 sheep&goat, 8 cattles, 5 equids	by the State	32000E	GD (only 6%)
Bosnia-Herzegovina	--	No	0	?
Yugoslav Federation	--	--	--	--
Hungary	?	No	0	No
Romania	?	No	0	GD,KW
Moldavia	--	--	--	--
Bulgaria	?	State Insurance Institute	?	SH,GD
Greece	--	80% paied by ELGA (Greek Org. Farmers Insurance)	--	GD, KW, EN, SH
SFR – former Yugoslavia	--	No	--	GD, KW
FYR Macedonia	--	No	0	GD
Albania	--	No	0	GD

Table 4. Monitoring, information and research activities. (?) = data unknown or poor. (--) = no answer.

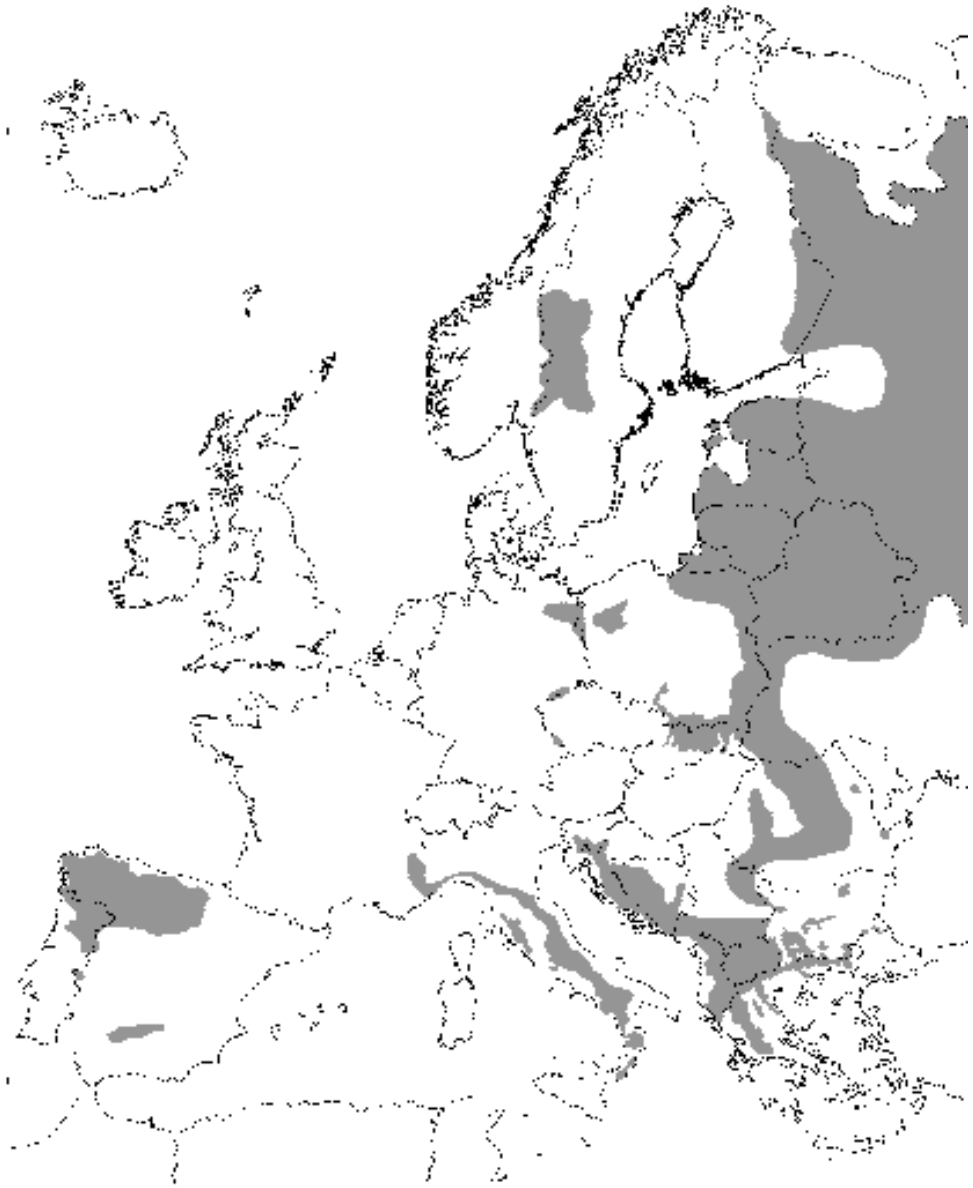
Country	Monitoring programmes	Research programmes	Information programmes	Conservation activities
Portugal	Yes	Yes	Yes	Yes
Spain	not formally organized	Yes	small programs by local groups	Yes
France	Yes	Yes	Locally	Yes
Italy	not formally organized	Yes	national, by conserv. Organizations	Yes
Switzerland	No		Yes	
Germany	No	No	Locally through NGO's	Yes
Norway	Yes	No	Yes	Yes
Sweden	yes, not formal	Yes	yes, not formal	Yes
Finland	Yes	Yes	Yes	Yes
Poland	none (yearly census by summing counts from hunting units)	Yes	None	Yes
Estonia	yes (tracks, scats at monitoring stations)	No	none	No
Lithuania	Official census	No	none	No
Latvia	official census on March 1 by summing counts from forestry units	No	starting	No
Belarus	yes, yearly snowtracking census in February	No	none (only negative press articles)	No
Ukraine	track counts	No	none	Yes
Czech Republic	track counts	No	none	No
Slovakia	none (only hunting statistics)	Yes	none	Yes
Slovenia	track counts	No	yes	Yes
Croatia	yes:depredation, tracks	No	yes	Yes
Bosnia-Herzegovina	No	?	no	?
Yugoslavia	--	--	--	--
Hungary	None	No	none	No
Romania	none, national census by summing local estimates	Yes	locally	Yes
Moldavia	--	--	--	--
Bulgaria	official harvest data	no, but planned in 1998 in two NP	yes	Yes
Greece	LIFE programme in central Greece	LIFE programme in central Greece	LIFE programme in central Greece	LIFE programme in central Greece
SFR – former Yugoslavia	Planned in the near future	no	Hunting literature	Plans to close hunting
FYR Macedonia	None	no	none	No
Albania	None	no	none	No

Table 5. Actions required in selected European countries: see text for full explanation of each action. (?) = actions are inferred as information is poor.

Actions	P	S	F	I	CH	D	N	S	ES	LA	LI	PL	SLW	CZ	H	SL	HR	BH	RO	UKR	BU	SFR	MAC	AL	GR	AU	Actions
																		?					?	?			
1.1	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**1.1**
1.2	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**1.2**
2.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**2.1**
2.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**2.2**
2.3	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**2.3**
2.4	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**2.4**
2.5	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**2.5**
3.1	*		*	*	*		*	*			*		*	*		*	*		*	*	*	*				*	**3.1**
3.2	*		*	*			*	*		*	*		*	*		*	*		*	*	*	*					**3.2**
3.3	*		*	*			*	*					*	*		*	*		*	*			*			*	**3.3**
4.1	*	*	*	*			*	*		*	*		*	*		*	*		*	*	*	*				*	**4.1**
4.2	*		*	*	*		*	*		*	*		*	*		*	*		*	*	*	*			*	*	**4.2**
4.3																										*	**4.3**
5.1			*	*			*	*				*		*	*	*					*					*	**5.1**
5.2			*	*				*						*		*	*		*	*	*	*			*		**5.2**
5.3	*	*	*	*								*	*	*		*	*		*	*		*					**5.3**
6.1	*	*	*	*	*		*	*						*	*	*	*				*	*			*	*	**6.1**
6.2		*	*	*			*	*		*	*	*	*	*	*	*	*		*	*		*			*		**6.2**
6.3	*	*	*	*			*	*			*	*	*	*	*	*	*		*	*		*				*	**6.3**
7.1			*	*			*	*				*	*	*		*	*				*	*					**7.1**
7.2			*	*						*	*			*		*	*		*	*	*	*			*		**7.2**
7.3		*	*	*						*			*				*				*	*				*	**7.3**
7.4			*	*					*	*	*					*	*		*	*					*		**7.4**
7.5	*	*	*	*			*	*				*	*	*		*	*								*	*	**7.5**
7.6			*	*			*	*				*	*	*		*	*								*		**7.6**
7.7	*	*	*	*			*	*	*	*	*	*	*	*		*	*		*	*					*	*	**7.7**
7.8		*	*	*			*	*		*	*	*	*	*		*	*		*	*					*	*	**7.8**
8.1		*								*	*		*				*		*	*	*	*					**8.1**
8.2										*	*	*	*						*	*							**8.2**
8.3										*									*	*							**8.3**
8.4	*		*	*			*	*					*	*		*	*		*	*							**8.4**
8.5	*		*	*			*	*	*	*	*	*	*	*		*	*		*	*						*	**8.5**
9.1			*	*							*		*	*		*	*		*	*	*	*				*	**9.1**
10.1			*	*	*		*	*		*	*		*	*		*	*		*	*						*	**10.1**
10.2			*	*	*		*	*			*		*	*		*	*		*	*						*	**10.2**
11.1	*	*					*	*		*	*	*	*		*	*	*		*	*	*	*				*	**11.1**
11.2	*		*	*		*	*	*			*		*	*		*	*		*	*	*	*			*	*	**11.2**
11.3	*		*	*		*	*	*			*		*	*	*	*	*					*	*			*	**11.3**
11.4	*		*	*							*		*	*		*	*					*	*			*	**11.4**
12.1			*	*	*	*				*	*		*	*		*	*		*	*	*	*			*	*	**12.1**
12.2	*	*	*	*	*		*	*	*	*	*	*	*	*		*	*		*	*	*	*			*	*	**12.2**
12.3	*	*	*	*	*					*	*		*	*	*	*	*		*	*	*	*			*	*	**12.3**

Map 1. Original wolf distribution in Europe

Map 2. Present wolf distribution in Europe



Annex 1

Manifesto on Wolf Conservation

(Wolf Specialist Group of the Species Survival Commission of IUCN – The World Conservation Union)

This Manifesto comprising a Declaration of Principles for Wolf Conservation and recommended Guidelines for Wolf Conservation was adopted by the IUCN/SSC Wolf Specialist Group at its meeting in Stockholm, Sweden on 5-7 September 1973, and has been endorsed by the Survival Service Commission and the Executive Board.

The Stockholm meeting was attended by official delegates and observers from 12 countries having important wolf populations. It was the first international meeting on the conservation of the wolf.

Since then the Manifesto was revised by the Group on January 31, 1983; November 20, 1996; and February 23, 2000.

Declaration of Principles for Wolf Conservation

1. Wolves, like all other wildlife, have a right to exist in a wild state in viable populations. This right is in no way related to their known value to mankind. Instead, it derives from the right of all living creatures to co-exist with man as a part of natural ecosystems.
2. The wolf pack is a highly developed and unique social organisation. The wolf is one of the most adaptable and important mammalian predators. It has one of the widest natural geographical distributions of any mammal. It has been, and in some areas still is, the most important predator of big-game animals in the Northern Hemisphere. In this role, it has undoubtedly played an important part in the evolution of such species and, in particular, of those characteristics which have made many of them desirable game animals.
3. It is recognised that wolf populations have differentiated into entities, which are genetically adapted to particular environments. It is of first importance that these local populations be maintained in viable populations in their natural environments in a wild state. Maintenance of genetic identity of locally adapted races is a responsibility of agencies, which plan to reintroduce wolves into the wild.
4. The response of man throughout most of recorded history, as reflected by the actions of individuals and governments has been to try to exterminate the wolf, although some societies held neutral or positive attitudes toward wolves. In more than one-third of the countries where the wolf existed, man has either succeeded, or is on the verge of succeeding with wolf extermination. This is an unfortunate situation because the possibility now exists for the development of management programs, which would mitigate serious problems, while at the same time permitting the wolf to live in many areas of the world where its presence would be compatible.
5. This harsh judgement on the wolf has been based, first, on fear of the wolf as a predator of man and second, on hatred because of its predation on domestic and semidomestic animals and on large wild animals. It is now evident that the wolf can no longer be considered a serious threat to man. It is true, however, that the wolf has been, and in some cases still is, a predator of some importance on domestic and semidomestic animals and wildlife.
6. Conflict with man sometimes occurs from undue economic competition or from imbalanced predator-prey ratios adversely affecting prey species and/or the wolf itself. In such cases, temporary reduction of wolf populations may become necessary especially when it can contribute to maintaining positive or neutral attitudes toward wolves, but reduction measures should be imposed under strict scientific management. The methods must be selective, specific to the problem, highly discriminatory, and have minimal adverse side effects on the ecosystem.

Alternative ecosystem management, including alteration of human activities and attitudes and non-lethal methods of wolf management, should be fully considered before lethal wolf reduction is employed. The goal of wolf management programs must be to restore and maintain a healthy balance in all components of the ecosystem. Wolf reduction should never result in the permanent extirpation of the species from any portion of its natural range.
7. The effect of major alterations of the environment through economic development may have serious consequences for the survival of wolves and their prey species in areas where wolves now exist. Recognition of the importance and status of wolves should be taken into account by legislation and in planning for the future of any region.
8. Scientific knowledge of the role of the wolf in ecosystems has increased greatly, although it is inadequate in many countries where the wolf still exists. Management should be established only on a firm scientific basis, having regard for international, national and regional situations. However, existing knowledge is at least adequate to develop preliminary programs to conserve and manage the wolf throughout its range.
9. The maintenance of wolves in some areas may require that society at large bear the cost e.g. by giving compensation for the loss of domestic and semidomestic animals; conversely there are areas having high agricultural value where it is not desirable to maintain wolves without some form of control and where their recovery would not be feasible.
10. In some areas there has been a marked change in public attitudes towards the wolf. This change in attitudes has influenced governments to revise and even to eliminate archaic laws. It is recognized that education to establish a realistic picture of the wolf and its role in nature is most essential to wolf survival. Education programs, however, must be factual and accurate.
11. Socio-economic, ecological and political factors must be considered and resolved prior to reintroduction of the wolf into biologically suitable areas from which it has been extirpated. Natural recovery, however, should be given priority according to the IUCN Reintroduction Guidelines.
12. Wolf-dog hybridization is potentially detrimental to wolf conservation and is therefore opposed because of its possible negative effects.

Guidelines on Wolf Conservation

The following guidelines are recommended for action on wolf conservation.

A. Management

1. Where wolves are threatened locally, nationally or internationally, full protection should be accorded to the surviving population. (Such threatened status is signalled by inclusion in the Red Data Book or by a declaration of the Government concerned.)
2. Each country should define areas suitable for the existence of wolves and enact suitable legislation to perpetuate existing wolf populations or to facilitate recovery. These areas could include zones in which wolves would be given full legal protection, e.g. as in national parks, reserves or special conservation areas, and additionally zones within which wolf populations would be regulated according to ecological principles to minimise conflicts with other forms of land use. Another option is to manage wolves without zoning but react according to certain events or degrees of conflicts with livestock. Whenever wolves and livestock are allowed to be in the same area, wolf regulation should go together with livestock management plans.
3. Sound ecological conditions for wolves should be restored in areas through the rebuilding of suitable habitats and the re-introduction of large herbivores.
4. In specifically designated wolf conservation areas, extensive economic development likely to be detrimental to the wolf and its habitat should be excluded.

5. In wolf management programs, poisons, bounty systems and sport hunting using mechanised vehicles should be prohibited.
6. Consideration should be given to the payment of compensation for damage caused by wolves, and for incentives to prevent damage.
7. Jurisdictions in every country are encouraged to require the registration of each wolf killed and to provide an adequate number of specimens from those wolves for research.

B. Education

Dynamic educational activities should be promoted to obtain the support of all sectors of the population through a better understanding of the values of wolves and the significance of their rational management.

Public information should be co-ordinated and should be implemented with the help of professionals. Specific tools and approaches should be designed for different cultural and social settings.

C. Tourism

Where appropriate, general public interest in wolf conservation should be stimulated by promoting wolf-related tourist activities.

D. Research

Research on wolves should be intensified, with particular reference to:

a. Surveys on status and distribution of wolf populations;
b. Studies of feeding habits, including especially interactions of wolves with game animals and livestock;
c. Investigations into social structure, population dynamics, general behavior and ecology of wolves;
d. Taxonomic and genetic work, including studies of possible hybridization with other canids;
e. Research into the methods of reintroduction of wolves and/or their natural prey;
f. Studies into human attitudes about wolves and on economic effects of wolves; and
g. Research into the adaptability of wolves to human presence.

E. International Cooperation

A program of international cooperation should be planned to include:

a. Periodical official meetings of the countries concerned for the joint planning of programs, study of legislation, and exchanging of experiences;
b. A rapid exchange of publications and other research information including new techniques and equipment;
c. Loaning or exchanging of personnel between countries to help carry out research activities; and
d. Joint conservation programs in frontier areas where wolves are endangered.

The IUCN (World Conservation Union) Wolf Specialist Group

The Wolf Specialist Group is an international organization of authorities on wolves, currently including members from Canada, China, Croatia, the Czech Republic, Finland, France, Germany, Hungary, India, Israel, Italy, Japan, Kazahkstan, Mexico, Mongolia, Norway, Poland, Portugal, Romania, Russia, Saudi Arabia, the Slovak Republic, Spain, Sweden, and the U.S. The group deals with wolf conservation matters of international significance, especially situations involving endangered populations. As such, the Wolf Specialist Group is one of 100 specialist groups comprising the Species Survival Commission (SSC). The SSC in turn is one of six commissions that carry out the main activities of the World Conservation Union (IUCN).