



Key actions for Large Carnivore populations in Europe

SECTION 3: WOLVES

DRAFT

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PART I

1.1. Populations

In Europe, wolves occur in all countries except in the island states (Ireland, Iceland, United Kingdom, Cyprus, Malta) and the Benelux countries, Denmark and Hungary (in these countries a number of dispersing individuals have been reported). Based on a combination of distribution and social, ecological and political factors wolves are categorized into 10 populations (Fig.1): North Western Iberian, Sierra Morena, Alpine, Italian Peninsula, Carpathian, Dinaric-Balkan, Baltic, Karelian, Scandinavian and Central European Lowlands. All populations are the results of natural dynamics as no wolf reintroduction has ever been carried out in Europe.

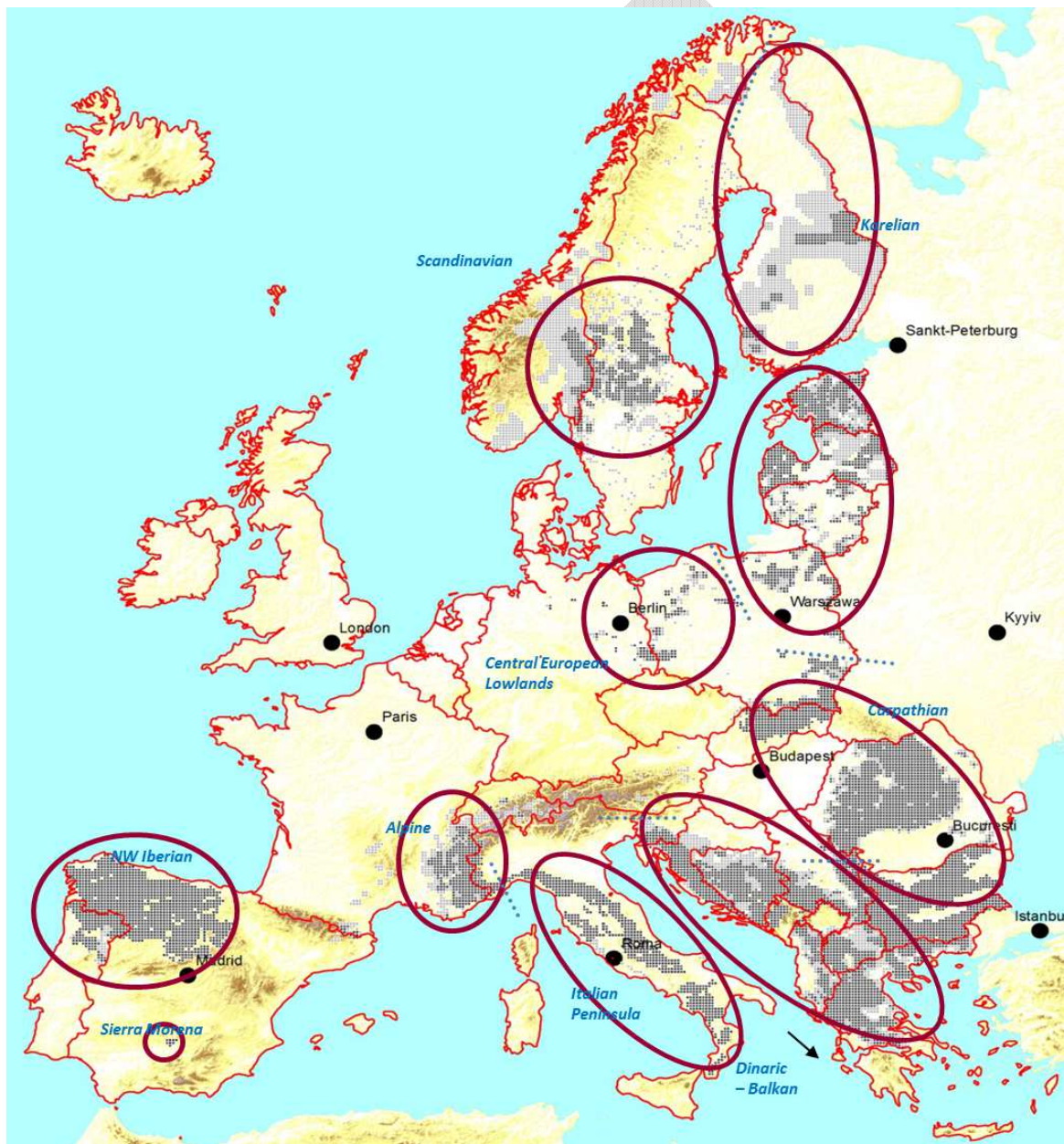


Figure 1. The 10 wolf populations of Europe

1.2. Status

The estimated total number of wolves in Europe is larger than 10,000 individuals (excluding Russia and Belarus). Based on reported and updated census data, the largest populations are the Carpathian population and the Dinaric-Balkan population (> 3,000 wolves), followed by the Baltic population (>1,000 wolves). Other populations are an order of magnitude smaller (Italian Peninsula ~800 wolves, Scandinavian ~ 300 wolves, Central European Lowlands ~ 200 wolves, Alpine ~ 160 wolves, Karelian > 165 wolves). The Sierra Morena population in southern Spain is the only one on the brink of extinction with only one pack detected in 2012. For the North Western Iberian population, there is no updated data but the population is believed to have remained stable (~ 2,200-2,500 wolves).

Most populations have been increasing or stable since 2005. All population ranges have been either increasing or stable except the Finnish part of the Karelian population and the Sierra Morena population in southern Spain.

Monitoring is based on a variety of methods, often combined depending on local ecological contexts, institutional support and technical capability: snow tracking, genetics, telemetry, harvest data, damage statistics, wolf howling, camera trapping, and interviews with local people and expert assessments. Overall, the small populations are subject to more intense and costly monitoring methods aimed at accurately counting individual packs (Scandinavian, Alpine, Central European Lowlands) than the larger populations where monitoring largely attempts to document wolf presence or relative densities.

Population	Population size 2011	Countries (and approx. % share of population)	Trend	Red List assessment
Scandinavian	250-300	SE (90%), NO (10%)	Increase	EN
Karelian	150+	FI (100%)	Decrease?	EN
Baltic	~ 900-1400 (5000 with BY and RU)	EE (20%), LV (20%), PL (30%), LT (30%)	Stable	LC
Central European Lowlands	~ 170	DE (40%), PL (60%)	Increase	EN
Carpathians	~ 3500	RO (70%), SK (20%), PL (10%), CZ (0.1%)	Stable	LC
Dinaric-Balkan	4-5000	BG (30%), BO (20%), FYROM (5%), HR (15%), SL (2%), AL (5%), GR (3%), SRB (20%)	Stable	LC
Italian Peninsula	~ 800	IT (100%),	Stable	VU
Alpine	32 packs (> 160)	FR (47%), IT (45%), CH (5%), AT (3%)	Increase	EN
NW Iberia	~ 2500	SP (90%), PO (10%)	Stable- Decrease ?	NT
Sierra Morena	1 pack	SP (100%)	Decrease	CR

1.3 Legal status and management

The legal status of wolves in the European Union countries is specified in the Habitats Directive (92/43/EEC). By default wolf populations are listed under Annexes II (requiring the establishment of Natura 2000 sites for the species) and IV (requiring strict protection but with derogations still possible under Article 16). However, there are some notable exceptions (Bulgaria (Annex V), Estonia (only in Annex V, not in II or IV), Finland (not in Annex II; wolves in reindeer husbandry zones in Annex V instead of IV), Greece (wolves north of 39th parallel only in Annex V, not in II or IV), Latvia (wolf only in Annex V, not in II or IV), Lithuania (wolf only in Annex V, not in II or IV), Poland and Slovakia (wolf in Annex V instead of IV), Spain (wolf north of river Duero in Annex V instead of IV). As non-EU countries, Norway and Switzerland are only signatories of the Bern Convention. A growing number of countries have a management plan or are in the process of endorsing one. Management can be centralized (e.g. France, Sweden) or decentralized (e.g. Spain, Germany) leading to the same population facing different management regimes within a country as well as among countries.

Quite a few advances in population level management have been reported in many transboundary populations. Agreements between countries include some degree of coordinated management (Slovenia-Croatia), sharing information (e.g. Italy-France-Switzerland, Germany-Poland, Sweden-Norway-Finland), or most commonly working groups between scientists or managers. For some populations however, little or no progress has been made, either between countries (Karelian, Carpathian) or within the same country (North Western Iberian). In no cases are there yet any formally binding population management plans between different countries.

1.4 Threats

The most relevant threats (grouped in 19 main categories) for wolves in Europe are: low acceptance, habitat loss due to infrastructure development, persecution, Hybridization with dogs, poor management structures and accidental mortality. Most threats were expected to become slightly more important in the future.

1.5 Conflicts and conflict management

Wolves and livestock are associated with conflicts over the whole species range. The rough economic cost (based on reported compensation only, i.e. excluding countries where no data were available) can be estimated at reaching >8 M€ per year resulting from at least 20,000 domestic animals being predated. Sheep account for the vast majority of livestock deaths, but some populations have particular depredation issues (e.g. reindeer in the Scandinavian and Karelian populations). However, in countries where the absence of wolves has resulted in extensive sheep grazing with minimal supervision, re-establishing former mitigation measures (e.g. shepherding, livestock guarding dogs) or establishing new measures (e.g. electric fences) can cost many times the amount spend on compensation, e.g. in France compensation in 2011 amounted for ~1 M€, whereas mitigation amounted for ~7 M€.

The acuteness of the resulting social conflict is not necessarily always directly proportional to the number of animals lost as illustrated by the Scandinavian case, where an annual loss of ~20 hunting dogs is a major driver of a low acceptance of the wolf in rural communities. An increasing number of countries offer a compensation system (with the exception of Albania, "The former Yugoslav Republic of Macedonia", Latvia and Lithuania), although who pays the compensation, and under what conditions, varies greatly.

PART II

2.2. Objectives of this list of actions

- To identify the most critical (i.e. important and urgent) actions for the conservation and management of the wolf populations in Europe in coexistence with local stakeholders for the next 5 years.
- To provide the authorities responsible for the conservation and management of wolf in the European countries a strategic planning tool for relevant future activities in the next 5 years.
- To improve collaboration and relationship amongst relevant stakeholders for wolf conservation and management in Europe by integrating them into the process of planning and implement Actions/activities.
- To raise awareness amongst authorities and the public for the most urgent needs for wolf conservation and management in Europe.

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PART III – Actions for all populations

Note :

Level of urgency:	(scale of 1-5: 1 = high urgency, 3 = medium urgency, 5 = low urgency)
Benefit:	(scale of 1-5 = 0-20, 20-40, 40-60, 60-80, 80-100%; how much this action is expected to improve the level of population conservation and/or coexistence with local stakeholders)
Cost	< 100K; 100k-500k; 500K-1000K

ACTION 1	
Title of the Action:	Standardised census and monitoring of wolf population
Objective:	Establish a standardised set of techniques to survey, census and monitor wolf distribution, numbers, demography, and genetic status, based on shared protocols to merge transboundary information and optimize effort.
Description of activities:	<p>Census methods used differ very much, from genetic monitoring, simultaneous, coordinated snow-tracking, year round collection of wolf presence signs in order to distinguish between packs and count wolves in packs to simple summing of rough estimates in hunting grounds, which may multiply the wolf number in the country. It makes impossible to get estimations of population numbers and trends for entire populations or to assess the impact of different management systems. Thus establishing a common transboundary monitoring system for at least the most similar wolf populations, using the same or comparable standards synchronised in time within all countries sharing the population is very urgent. Sound conservation of the wolf requires first of all a detailed evaluation of the state of the population.</p> <p>Activities:</p> <ol style="list-style-type: none"> 1) Review and compare present national monitoring systems, identify differences and gaps, assess possibilities for alignment and national capacity for improvement; 2) Define a shared protocol for the transboundary survey and monitoring of the distribution, demography, and genetic status of the wolf population, considering wolf packs as sampling units. Establish transboundary, population wide, standardized monitoring system, based on each national/regional on going monitoring system and including estimate of the number of wolves using DNA extracted from non-invasive samples (scats); 3) Approve guidelines on the preferred field techniques and analytical approaches and provide an annotated list of reference for comparing experience across Europe and for further technical

	discussion; 4) Update national monitoring schemes and facilitate a regular exchange of monitoring data between States to allow for a population level assessment every 2 years.
Expected results:	<ul style="list-style-type: none"> • Transboundary monitoring protocol agreed at least at population level • A national technical guideline published on techniques to survey and monitor trends in wolf numbers and distribution • Size of wolf populations are known • Population level assessment every 2 years • Trends are known • Demands for report to the EU every 6 years fulfilled
Responsibility for implementation:	Governmental bodies responsible for environment and nature conservation of the relevant countries sharing the wolf populations in cooperation with research institutes and organisations. National wildlife institutes, national/regional wolf monitoring networks
Timing of the activities:	Two meetings of wolf experts in the first year. Production of the shared monitoring protocol in the first year. Operating of system: continuous. Population level assessment every 2 years.
Level of urgency:	1
Cost and potential funding sources:	Workshops to define protocol: < 100K Establishment of the monitoring system: different in every country/region, depending on extent of area to be monitored and wolf presence (estimated range: <100K – 100/500K) Funding sources: National/regional agencies
Benefit:	4

ACTION 2	
Title of the Action:	Transboundary cooperation and population- level Management Plan
Objective:	To develop effective cooperation and transboundary management of wolf populations. To produce population level wolf management plans based on technical and scientific guidelines and on results from facilitated workshops with stakeholders. To reaching highest possible degree of consensus on key management principles, responsibilities and mechanisms for implementation
Description of activities:	Almost all wolf populations are shared by several Member States and many wolf packs have trans-border territories. Management decisions not based on population- level approach may seriously hinder the progress towards national population goals and impede to achieve the species favourable conservations status. These problems can be recognised and resolved only within transboundary cooperation framework. Therefore, formal a Transboundary Wolf Committee should be set up to coordinate and oversee population-level conservation and management activities, composed of two bodies: a technical (scientific) committee tasked to provide scientific and technical support by wolf

	<p>experts, and a policy committee composed of regional and national authorities to ensure an exchange of information, and provide a platform to discuss management decisions.</p> <p>Activities:</p> <ol style="list-style-type: none"> 1. Establish population-level working groups 2. Identify and invite the relevant stakeholders in each country that may act as national management boards. These groups should be consulted in the international process and work out the more detailed / concrete national management strategies 3. Develop population based management plans considering “The guidelines for population level management plans for large carnivores in Europe” in order to <ul style="list-style-type: none"> • define the transboundary cooperation for wolf conservation and • provide guidance and a framework for the national management plans. <p>The population-level strategy should state the population goal, measurable objectives, and actions to be taken.</p> 4. Launch a consultation, review and endorsement process. 5. Implement the plan through national management plans / strategies. 6. Review and revise the plan e.g. every 6 years.
Expected results:	<ul style="list-style-type: none"> • A transboundary management plan for each population defining the goal, measurable objectives, and actions to be taken. • A common, regularly updated document defining the transboundary cooperation and guiding the national management approaches endorsed by the national management authorities and the local stakeholders.
Responsibility for implementation:	Ministries of environment, nature conservation agencies and local stakeholder groups.
Timing of the activities:	2 years for the development of the strategy 1 – 3 workshops for the subsequent updates.
Level of urgency:	1
Cost and potential funding sources:	< 100K per population. Funding sources: National conservation agencies.
Benefit:	5

ACTION 3	
Title of the Action:	Prevention and compensation measures to reduce livestock depredation.
Objective:	Prevention measures are effectively adopted by all livestock breeders who suffer a disproportionate amount of losses from wolves. Programmes for livestock depredation prevention and compensation are implemented. Livestock farmers are informed about the best practices for each local context focused on damage reduction/prevention. Methods for estimating and verifying damage level in different regions are improved.

Description of activities:	<p>Unmitigated wolf-human conflicts, particularly damage to livestock, can have a significant negative influence on levels of public tolerance and acceptance of wolves, with important implications for species conservation. Measures are available which have proven effective in reducing such conflicts, including electric fencing and livestock guarding dogs, and damage compensation. Killing depredating wolves may prevent further damage for a short period but is not effective in the longer term as the area can be repopulated by wolves within two-three years or even earlier.</p> <p>Activities:</p> <ol style="list-style-type: none"> 1. Set up a platform for livestock owners and technicians to exchange information on effective depredation preventive strategies. 2. Organize workshops within the platform to define balanced (i.e. financially, technically, and sustainable) preventing measures differentiating between a first recolonizing phase and the long term strategies in stable wolf areas. 3. Evaluate the case of "un-protectable" husbandry methods. 4. Produce guidelines for breeding, training, use, and husbandry of livestock guarding dogs and integrate it with the adoption of other preventive measures, favouring a system of self-supporting exchange of LGD among livestock owners. 5. Establish an optimal composite system of depredation prevention and damages mitigation using economic incentives, including EU subsidies and insurance for livestock farms supporting coexistence with predators. 6. Share and disseminate the best animal husbandry practices and the optimal preventive strategies defined by the platform through workshops with livestock owners. 7. The breeders suffering the most significant losses (above average) will receive priority attention for the deployment of prevention measures: guarding dogs, electric fences, extra shepherd salary, and other measures will be implemented depending on the local ecological and socio-economic contexts. Distribution of prevention aids will then be extended to all livestock breeders who lost heads to wolf attacks. All distributed measures will be followed up by a monitoring plan aimed at controlling their effective utilization and the outcome on loss prevention.
Expected results:	<ul style="list-style-type: none"> • All livestock breeders suffering above average losses will receive aids in implementing prevention measures • Effectiveness of the program closely monitored for outcome in terms of loss reduction • The amount of damages is decreased by at least 30% • The decrease of amount paid for damage compensations is bigger than the cost of protective measures applied • People have less negative attitude towards wolves
Responsibility for implementation:	<p>Governmental bodies responsible for environment and nature conservation in cooperation with local authorities and NGOs and management units such as national parks or forestry districts.</p>

Timing of the activities:	Workshops and development of guidelines: in 2 years Establishing measures: 3 - 5 years. Operating: continuous.
Level of urgency:	1
Cost and potential funding sources:	100K-500K per country for the set-up period
Benefit:	5

ACTION 4	
Title of the Action:	Measures against illegal killing and control of poison baits
Objective:	To develop actions to detect and reduce the illegal mortality of wolves. To establish a national system to compile records of dead wolves, determine death causes, conduct efforts to prevent and penalize the illegal killing of wolves caused by snaring, trapping and poisoning, increase the surveillance and implement education campaigns
Description of activities:	<p>Illegal killing of wolves can have serious impacts on wild populations disrupting the natural dynamics of production and dispersal of the young. Illegal killing is one of the main obstacles to planning a coherent strategy of population management that include legal hunting.</p> <p>Activities:</p> <ol style="list-style-type: none"> 1. A renewed effort to control all abuses of the current rules of protection and legal hunting. 2. In the relevant countries (and especially in southern Europe), a national strategy to end the illegal use of poison baits is launched under the national umbrella of the ministry of environment and with support from the regional governments. The strategy will include a revision of the current rules on the use of herbicides and pesticides in agriculture. 3. In well-known areas affected by illegal poisoning, conduct field surveys among local hunters and livestock farmers in order to better understand the causes, frequency and consequences of illegal use of poison baits. 4. Promote a workshop for a close cooperation between forest rangers, the nature protection inspectors and the national or regional authorities in order to collect and compile information on the use of poison. 5. Establish several team of dogs (at least 2 in each country) trained to find poison baits in order to operate throughout wolf range and mainly in wolf core areas chronically affected by illegal poisoning. 6. Promote workshops for a close cooperation between nature conservation authorities and jurisdictional authorities in order to increase intelligence services to counteract illegal actions and deliberate them as criminal lawsuits. 7. Promote a wide and impactful national campaign in media for public awareness against illegal poisoning, focusing not only the impact on wolves but also in biodiversity and public health.
Expected results:	<ul style="list-style-type: none"> • Increase of knowledge on the causes and frequency of illegal use of poison baits. • Early detection of poison by the trained dogs and increase

	<p>intelligence services to counteract illegal actions discourages local people to use poison.</p> <ul style="list-style-type: none"> • Increased cooperation and awareness of jurisdictional authorities towards illegal poisoning and other topics related to nature conservation • Stronger public awareness concerning the penalties and legal consequences for illegal poisoning • Database of known dead wolves. • Stronger awareness concerning the penalties and legal consequences for killing illegally a wolf
Responsibility for implementation:	National or regional nature conservation agencies. Wolf researchers. Nature conservation inspectors
Timing of the activities:	<i>Establishment of system:</i> 1 year <i>Operation of system:</i> continuous
Level of urgency:	2
Cost and potential funding sources:	<100K per country per year <i>Funding sources:</i> National and regional nature conservation agencies
Benefit:	4

ACTION 5	
Title of the Action:	Control of free-ranging dogs and wolf-dog hybridization
Objective:	<p>To reduce by at least 80% of the current levels the number of owned free-ranging and stray dogs in the wolf range.</p> <p>To approve at national level policy and technical guidelines for the management of the hybridization between dogs and wolves.</p> <p>To prevent and reduce the frequency of hybridization.</p>
Description of activities:	<p>Free-ranging and feral dogs and wolf-dog hybridization are frequent threats to wolf populations, especially (but not exclusively) to populations of southern and eastern Europe. The direct threats are: wolf-dog hybridization and transmission of parasites and other diseases to wolf population, but there are also indirect ones like attacks of dogs on livestock for which wolves are mostly blamed and what increases the compensation amount, or killing of wild ungulates which may cause a shortage in the wolf prey base. Removal of free-ranging dogs can be complicated by their legal status (in some countries very protective) and procedures that exclude lethal methods. Dogs' hybridization with wolves is a major threat to wolf conservation. However, lack of appropriate legislation, conflicts among different offices, opposition by animal rights groups and a general indifference on the problem have so far prevented the production of a coherent guideline for management of all aspects of the problem. A renewed effort is necessary to reduce the number of free-ranging dogs in wolf areas.</p> <p>Activities:</p> <ol style="list-style-type: none"> 1. Free ranging dogs can be feral, stray or owned by someone who let them free to roam. Each of the three categories requires an appropriate method to reduce its numbers. Feral and stray dogs will be captured and brought to captivity where they will be neutered and

	<p>possibly given in adoption to volunteers. A national effort needs to be launched to eradicate the free ranging dogs in a concerted program at national scale. Owned dogs will be the subject of an intensive campaign of permanent marking and control; their owners will be targeted with information material on the potential impact of free ranging dogs.</p> <ol style="list-style-type: none"> 2. A set of policy guidance for actions on hybrids will be approved by the relevant governmental offices. The guidelines will include provisions on studying and monitoring the spread and prevalence of hybridization and dog introgression into the wolf population, removal of hybrids, control of free-ranging dogs, and control of wolf-like dog breeds. The guidelines will be given legal strength through the longer process of approval of a dedicated law. 3. Set up emergency teams responsible for dogs and wolf-dogs hybrids removal from the wild. 4. Develop the procedures for a standardized genetic sampling (from dead and alive animals) and analyses (e.g. molecular markers) in order to monitor the incidence of hybrids in both wolf and dog populations and evaluate the effects of hybridization in the wolf genetic pool and demography. Define the research institutes responsible for the genetic analyses, and establish a common database and cross validation system for agreement on a common interpretation of the data in each laboratory and on threshold values for considering a hybrid individual. 5. Establish awareness campaigns and legal support to control the number of feral and free-ranging dogs in wolf range, to decrease the risk of hybridization (among other negative effects to wolf conservation).
Expected results:	<ul style="list-style-type: none"> • Better scientific knowledge of the incidence and effects of hybridization in wolf populations to support efficient management actions. • A set of national policy guidelines produced on the issue of hybridization • Guidance to veterinary services, forestry personnel, protected areas, agricultural organizations, Regional governments on the management of wolf-dog hybrids. • Technical guidance on capturing, handling and captivity of hybrids • Decrease in the number of free-ranging dogs in wolf range
Responsibility for implementation:	Ministry of Health (Veterinary Service) and Ministry of Environment for the national guidance and coordination.
Timing of the activities:	The objectives could be reached in three years.
Level of urgency:	1
Cost and potential funding sources:	<100K per country per year <i>Funding sources:</i> National and regional conservation agencies. European Commission (e.g. LIFE projects).
Benefit:	4

ACTION 6	
Title of the Action:	Habitat fragmentation and connectivity
Objective:	Identify and map priority connectivity areas for wolf populations in order to avoid habitat fragmentation. Population-wide map of the most important ecological corridors, dispersal barriers, high-mortality road sections, and other important landscape features pertaining to fragmented nature of wolf distribution. Guidelines and recommendations for mitigation actions published.
Description of activities:	<p>In most countries, the development of new infrastructure within or intersecting wolf habitat (transport routes, residential and industrial buildings, recreation areas such as ski resorts) or local husbandry systems (e.g. reindeer) are impeding the natural movements of wolves across regions.</p> <p>There is an important need for common Guidelines for Environmental Impact Assessments (EIA) in order to properly assess and mitigate the impact of these new infrastructures on the wolf population in each country. There is a need for immediate mitigation measures to facilitate connectivity.</p> <p>Activities:</p> <ol style="list-style-type: none"> 1. Identify potential areas for expansion of wolf populations by spatial-explicit modelling using both ecological and social factors to predict future areas for natural recolonization and forecast the level of conflict that may arise. 2. Implement measures to improve social acceptance of wolves in the best selected areas for wolf expansion, by implementing damage prevention measures and education campaigns. 3. Promote habitat restoration (e.g. defragmentation of infrastructure) and higher levels of social acceptance in areas identified as potential corridors. Particular focus should be given to finding possible ways for coexistence between extensive reindeer herding and wolves. These activities should be conducted in a participatory process with facilitated workshops to aim for highest possible agreement with Sámi villages regarding tolerance levels and compensation measures. 4. Evaluate the relevance for wolf translocations whenever potential corridors for natural expansion are lacking, and always considering genetic, ecological and social concerns. 5. Prepare recommendations and guidelines for land use activities, infrastructure development, and wildlife management to allow wolf dispersal and to mitigate human-caused mortality. 6. Demand to introduce population distribution and habitat fragmentation concerns and recommendations for mitigation measures as an obligatory part of environmental impact assessment (EIA) of the major transport infrastructure development.
Expected results:	<ul style="list-style-type: none"> • An accurate and up-dated knowledge on wolf natural expansion patterns, in both a temporal and spatial scale. • Recommendations to support decision-making for wolf management,

	<p>by selecting the best areas for wolf expansion.</p> <ul style="list-style-type: none"> • Achieve a lower level of conflict in future areas of wolf occurrence. • Improved knowledge of the degree of connectivity between different portions of wolf populations. • Restore the connectivity between wolf population segments. • Assessment of the impact of infrastructure buildings and locations on wolf population. Evaluation of movement corridors, landscape and population connectivity. • Evaluation of fragmentation effects on loss of habitat for reproductive sites
Responsibility for implementation:	GOs, NGOs, experts - scientist, wildlife and park managers, foresters and hunting associations in cooperation with highways authorities, local authorities etc.
Timing of the activities:	2-3 years
Level of urgency:	4
Cost and potential funding sources:	<100K
Benefit:	2

ACTION 7	
Title of the Action:	Education, information and data accessibility
Objective:	<p>To improve public knowledge of wolves, their needs and behaviour - with particular attention paid to hunters and livestock breeders.</p> <p>To improve understanding of wolf predation on wild ungulates and livestock.</p> <p>To challenge positive attitudes to poaching of wolves.</p> <p>To provide public database on wolf packs and breeding pairs, dispersal, monitoring methods, genetics, legal and illegal killing, traffic accidents, depredation on livestock and attacks on domestic dogs The objective is to improve public outreach.</p>
Description of activities:	<p>Human attitude towards wolves is highly influenced by the knowledge about various aspects related to wolf presence or absence in the ecosystems. The main sources of knowledge about this species for wide public are stories, anecdotes, gossips or information published in popular magazines, not always professional. Therefore, a program for education about wolf ecology, impact of wolves on ecosystem, benefits connected with wolf presence, problems connected with wolf presence and possible mitigation measures has to be implemented.</p> <p>Activities:</p> <ol style="list-style-type: none"> 1. Carry out public attitude and quantitative opinion surveys in each country among the general public, interests groups, and journalists using a semi-structured questionnaire with multiple choices and categorical scales of responses. This allows understanding factors influencing tolerance of people, to determine what represents a conflict, and the large-scale mechanisms behind this.

	<ol style="list-style-type: none"> 2. Develop a shared communication strategy, based on results from the opinion surveys, among local authorities to spread correct information through the Media on wolf-human interactions. 3. Develop educational materials suited for the selected media, social networks, local opinion makers and politicians in order to get objective information from scientists to public. 4. Spread and share the knowledge through different means like websites, lectures, workshops, training, personal contacts, which are the most suitable for the key groups 5. Monitor success (questionnaires before and after, etc.). Work with media, social networks, local opinion makers and politicians in order to get objective information from scientists to public. 6. Preparation of a system of education programs and field trips in schools, guidelines for teachers. 7. Promotion of eco-tourism related to wolves, which brings income to local societies. 8. Include lectures on large carnivores into the system of hunters' education. Talks will be conducted by wolf experts at least in areas of known wolf presence. Prepare a variety of talks, seminars and events with stakeholders among the community of hunters.
Expected results:	<ul style="list-style-type: none"> • Educational and informational material; • Ongoing educational programs; • Improved public knowledge about wolves; • Channels for society to express their concerns, fears and problems; • Improved wolf acceptance within certain groups. Enhancement of acceptance for wolves among society.
Responsibility for implementation:	NGOs, National authorities on Environmental Protection, regional directorates for environmental protection, education centres in national parks.
Timing of the activities:	Ongoing,
Level of urgency:	2
Cost and potential funding sources:	<100K per population
Benefit:	3

PART IV - SPECIFIC ACTIONS FOR EACH POPULATION

4.1 Alpine population

List of actions:

1. International Alpine Wolf Committee
2. Spatial models for managing the wolf population above the Favourable Conservation Status (FCS)
3. Quality improvement and correct use of livestock guarding dogs (LGD)

ACTION 1:	
Title of the Action:	International Alpine Wolf Committee
Objective:	Set up an International Alpine Wolf Committee composed of two bodies: <u>a technical- scientific committee</u> and <u>a policy committee</u> to provide a platform to discuss management approaches at the population scale.
Description of activities:	Set up the International Wolf Alpine Committee composed of two bodies: <u>a technical- scientific committee</u> tasked to provide unbiased scientific and technical support, <u>a policy committee</u> composed of national/regional authorities. Organize regular meetings together with thematic workshops, alternating each Country in the organization, to ensure an exchange of information, and provide a platform to discuss management approaches at the population scale. The already existing WISO platform could be an opportunity to combine the efforts of EU and the Alpine Convention.
Expected results:	<ul style="list-style-type: none"> • “Transboundary” dialogue about wolf conservation issues, both between national/regional authorities as well as scientists • Shared decisions among authorities, based on scientific inputs, regarding objectives of wolf conservation • Agreement on management principles • Regular exchange of information
Responsibility for implementation:	Technical- scientific committee: wolf experts (the already existing Wolf Alpine Group could be involved) Policy committee: national and regional authorities
Timing of the activities:	One meeting every 1-2 year
Level of urgency:	2
Cost and potential funding sources:	Costs for the meetings: €20K + travel costs Funding sources: Regional/National authorities
Benefit:	4

ACTION 2	
Title of the Action:	Spatial models for managing the wolf population above the Favourable Conservation Status (FCS)

Objective:	Model spatially explicit scenarios to manage the population at and above the FCS level, explicitly addressing distribution among the Alpine countries.
Description of activities:	Evaluate the FCS, with detailed spatial analysis that take into consideration the Favourable Reference Range and demographic parameters. Use a multi-model approach that accounts for uncertainty of model structure to predict the spatial and temporal development of the Alpine wolf population and to identify, under different management scenarios, the role of each country and define priority areas for wolf conservation in the Alps where resources should be concentrated to maintain the wolf source areas, restore sink areas, favouring the connectivity with neighbouring populations (i.e. Apennine and Dinaric).
Expected results:	<ul style="list-style-type: none"> • A multi-model analysis of the spatial, demographic, and genetic wolf population development under different scenarios • Map of priority connectivity areas for wolf populations • Assessment of the impact of dissimilar management regimes in different wolf population areas in terms of viability, genetic diversity, main directions of dispersal, locations of source populations and possible sinks.
Responsibility for implementation:	National and international scientific teams
Timing of the activities:	Models and reports developed in <2 years
Level of urgency:	1
Cost and potential funding sources:	Costs: <100K Private Foundations
Benefit:	4

ACTION 3	
Title of the Action:	Quality improvement and correct use of livestock guarding dogs (LGD)
Objective:	Evaluation of quality and acceptance of LGD concerning breed, effectiveness and conflict potential. Review, adapt and standardise requirements and protocols for breeding, training, use, and husbandry of LGD.
Description of activities:	<p>Coordination/exchange among different organisations which take care of the cynology of working LGD for the development of a shared protocol for breeding, training, use, and husbandry of LGD (F:Pastorale Pyrénéene, Société centrale canine, CH: HSH-CH, I:MO.TU.CI.P.A, Centro Alpi Cozie)</p> <p>Establishment of a protocol for monitoring incidents with LDG</p> <p>Identification of requirements for the breeding, training, husbandry and the use of livestock guarding dogs in all participating Alpine countries.</p> <p>Creation of a recognized label breed of LGD working lines according to specified minimal standards</p> <p>Definition of one or more requirement profiles for future livestock guarding dog generations.</p> <p>Maintenance of a stud book for the pure breeding of working lines of different LGD breeds</p> <p>Implementation of the breeding standards in the different Alpine</p>

	<p>countries</p> <p>Raise awareness of the best approaches to breed and train LGD among livestock owners</p> <p>Informing tourists via national, regional and local tourism organisations about appropriate behaviour in regions with livestock guarding dogs.</p>
Expected results:	<ul style="list-style-type: none"> - Shared protocol for breeding, training, use, and husbandry of LGD and for monitoring incidents with LGD - Increase correct use of livestock guarding dogs - Standardisation of a high breeding standard of LGD in the Alps - Appropriate conflict management among livestock owners, LDG and tourism.
Responsibility for implementation:	<p>Livestock guarding dogs centres and livestock organizations</p> <p>Organisations which take care of the cynology of working LGD (F:Pastorale Pyrénéene, Société centrale canine, CH: HSH-CH, I:MO.TU.CI.P.A, Centro Alpi Cozie)</p>
Timing of the activities:	Start <i>soon</i>
Level of urgency:	1
Cost and potential funding sources:	<p>Costs for the meetings: €20K + travel costs</p> <p>Funding sources: projects</p>
Benefit:	4

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4.2 Baltic population:

List of actions:

1. Establishing an International Baltic wolf population Working Group
2. Comparing impact of different wolf management regimes in countries sharing the population

ACTION 1	
Title of the Action:	Establish an International Baltic wolf population (BWP) working group (BWP-WG).
Objective:	In one year, the Baltic wolf population working group is fully functional: representatives from 4 EU states formally nominated, the Core Group designated, and the working principles and long term goals agreed on.
Description of activities:	<p>The Baltic wolf population is shared by 4 EU states (Estonia, Latvia, Lithuania, Poland) and 3 non-EU countries (Russia, Belarus, Ukraine). Uncoordinated management decisions in neighbouring countries may seriously impede the progress towards national population goals. The population-level goals may be recognised and achieved only within transboundary cooperation framework. Therefore, the International Baltic wolf population working group (BWP-WG) will be established to coordinate and oversee population-level management activities.</p> <p>Activities:</p> <ol style="list-style-type: none"> 1) Expand the already existing Baltic Large Carnivore Initiative (BLCI) to include wolf experts (researchers, NGO representatives) and management authorities from all 4 EU countries; 2) Establish BWP-WG in a dedicated BLCI meeting; 3) Discuss and agree on the working scheme, main principles, and long term goals for BWP-WG; 4) Designate the Core Group of 3-5 experts to coordinate agenda, activities, reporting, etc.; 5) Claim for the formal acknowledgement of BWP-WG as authoritative technical body from national management authorities; 6) Attempt to include representatives from non-EU countries.
Expected results:	<ul style="list-style-type: none"> • Established working group of experts from EU states sharing BWP; • Platform and process for sharing data and knowledge; • Framework to address population-level management issues; • Technical guidance and expertise for national management authorities; • Improved the transboundary cooperation; • Body responsible for population-level activities, including all actions listed in this document.
Responsibility for implementation:	Baltic Large Carnivores Initiative (BLCI)
Timing of the activities:	Establishing of BWP-WG (steps 1–4): 1 year, starting from 2014. Operating of the group: continuous.

Level of urgency:	1
Cost and potential funding sources:	€5,000 for the initial meeting. Financed from national environmental funds.
Benefit:	5

ACTION 2	
Title of the Action:	Assess the impact of dissimilar management regimes in different territorial population units on BWP as a whole.
Objective:	Comprehensive scientific report on management regimes, their differences, and impact of these differences is published.
Description of activities:	<p>The management approaches in each of 7 countries that share BWP are vastly different, ranging from strict protection to intensive exploitation, without gradual transitions or buffer zones between closely located distinct management units. There has been virtually no assessment of the impact of this management diversity on the population, namely its viability, age and sex structure, genetic diversity, main directions of dispersal, locations of source populations and possible sinks. Such impact assessment has to be carried out. Activities:</p> <ol style="list-style-type: none"> 1) Review of management practices (legal status and law enforcement, regulation of use, harvest statistics, other mortalities, conservation actions, status of prey species populations, important habitat characteristics, main threats, etc.); 2) Collect and compile available data on population status (abundance, distribution) in each country for the last 3-5 years; 3) Review scientific research in the BWP sharing countries pertaining to the management and its impact on the population; 4) Identify gaps in data and research, prepare a preliminary research plan to fill them (the research is outside the scope of this Action); 5) Prepare recommendations for amendments to national management approaches; 6) Update the assessment regularly (each 3-5 years). <p>The assessment must cover all 4 EU states and should attempt to cover 3 non-EU countries as much as possible.</p>
Expected results:	<ul style="list-style-type: none"> • Comprehensive knowledge base on the national management systems of BWP sharing countries; • Knowledge on the impact of fragmented management on the BWP, especially – risk and problem areas; • Background information for planning research and conservation projects; • Conclusive arguments to negotiate changes in national policies.
Responsibility for implementation:	BWP-WG
Timing of the activities:	2 years, starting from 2014-2015.
Level of urgency:	2
Cost and potential funding sources:	25K (for 4-6 experts preparing a report). Governmental fundings
Benefit:	4

4.3 Carpathian population

List of actions:

1. Sanitary veterinary monitoring of the wolf population
2. Improving the prey base for wolf population

ACTION 1	
Title of the Action:	Sanitary veterinary monitoring of the wolf population
Objective:	Establish a common protocol for identification of the mortality causes / vet screening of the wolf population to the Carpathian level.
Description of activities:	Collection of all carcasses and identification of the sanitary veterinary causes of mortality. Identification of exposure to Care and distemper disease. Identification of internal and external parasites. Identification of impact of anti-rabies vaccination campaign.
Expected results:	<ul style="list-style-type: none"> • Identification of the sanitary veterinary status of the wolf population and mortality causes. • Identification of measures to be taken in order to reduce mortality due to exposure to diseases (for example distemper is carried in the forest by the stray dogs and affect wolf pops)
Responsibility for implementation:	Sanitary Veterinary authorities at the regional level.
Timing of the activities:	Permanent
Level of urgency:	3
Cost and potential funding sources:	No extra cost: covered by institutional bodies
Benefit:	3

ACTION 2	
Title of the Action:	Improving the prey base for wolf population
Objective:	Ensure, through game management objectives, that wolf population has enough natural food.
Description of activities:	<p>Increase or maintain optimum ungulate number from ecological, economic and social point of view. Wild ungulates populations in the wolf territories are essential food base and reduce the pressure of wolf on livestock.</p> <p>Cooperation with hunting organisations in order to reduce ungulates mortality (better survival rates in winter, poaching reduction, stray dog reduction Action 7 etc.)</p>
Expected results:	Natural food basis for wolves exist in order to reduce the conflicts with livestock and to allow existence of a viable wolf population
Responsibility for implementation:	Government and hunting organisations
Timing of the activities:	Permanent
Level of urgency:	3
Cost and potential funding sources:	No cost Government and Hunting associations

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4.4 Central European lowlands population

List of actions:

1. National wolf competence centre (DE, NL, and DK?)
2. Information platform for livestock owners
3. Knowledge transfer to hunters

ACTION 1	
Title of the Action:	National wolf competence centre (DE, NL, DK?)
Objective:	To provide up to date information and consultancy for regional and national nature conservation authorities on wolf related issues.
Description of activities:	<p>Set up a national wolf competence centre (WCC) in DE to ensure a contemporary information flow regarding the national wolf situation and provide science based consultancy for regional and national nature conservation authorities.</p> <p>Tasks: The WCC</p> <ul style="list-style-type: none"> • provides contemporary updates in numbers and figures on population size (no. packs / pairs), mortality cases and causes; • prepares an annual national status report and cooperates in preparing the population status report • ensures an annual national data compilation of wolf caused damages on livestock, prevention and compensation payments and the actual prevention and compensation schemes in place in the different federal states; • assists on demand in data evaluation especially in regard to confirmation of reproduction, new wolf establishments, possible hybridization events; • provides consultancy and where required on-site operation in cases of possible problematic wolf behaviour; • provides specialist consultancy on wolf related issues for conservation authorities.
Expected results:	<ul style="list-style-type: none"> • Consistent access to all wolf related information for regional and federal conservation authorities. • Knowledge base for intra-national cooperation between the different regional conservation authorities and for harmonization of regional / national management decisions. • National data required for a transboundary wolf management.
Responsibility for implementation:	National and regional nature conservation authorities.
Timing of the activities:	Establishment of WCC: one year. Operation: continuous.
Level of urgency:	2
Cost and potential funding sources:	100K/year Funding sources: national and regional conservation authorities.
Benefit:	3

ACTION 2	
Title of the Action:	Information platform for livestock owners
Objective:	<p>Ensure information exchange between livestock owners in areas with long term wolf experience and newly colonized wolf areas (wolf expectation areas) on best practice husbandry techniques and effective prevention measures.</p> <p><i>Self help approach / helping livestock owners to help themselves</i></p>
Description of activities:	<p>Set up an information platform for livestock owners in order to provide knowledge and exchange information of best practice husbandry techniques and effective prevention measures in wolf areas in order to reduce wolf – livestock conflicts especially in areas newly colonized by wolves. Steps:</p> <ul style="list-style-type: none"> • Identify relevant and interested target groups (e.g. owners of sheep, cattle, game enclosures). • Establish an information platform and organize an appropriate way of information exchange. <p><i>This could be a side effect / a special forum of the population level management strategy.</i></p>
Expected results:	<ul style="list-style-type: none"> • decreased level of damage on livestock caused by wolves especially in areas newly colonized by wolves. • Increased tolerance towards wolves by livestock owners. • Lowered costs of maintaining the CEWP.
Responsibility for implementation:	<p>DE, PL, CZ, NL, DK: Sheep breeder association, cattle breeder association, game keeper associations and other involved groups of livestock keepers.</p> <p>PL: General Directorate for Environmental Protection, regional directorates for environmental protection, NGOs</p>
Timing of the activities:	ASAP. Parallel to action 2
Level of urgency:	3
Cost and potential funding sources:	<p>10K/year/country.</p> <p>Funding sources: Ministries of agriculture of DE, PL, CZ, NL, DK and livestock keepers associations.</p>
Benefit:	3

ACTION 3	
Title of the Action:	Knowledge transfer to hunters
Objective:	Improved understanding and tolerance of wolves among the community of hunters. Decreasing of illegal killing of wolves.
Description of activities:	Include lectures on large carnivores into the system of hunters' education. Prepare a variety of talks, seminars, events a. m. with stakeholders among the community of hunters.
Expected results:	Hunters

	<ul style="list-style-type: none"> • understand the ecological function of wolves, • appreciate the role of wolves as part of the ecosystem and of the evolution of wild ungulates, • take part in the monitoring of wolves, • adapt their game management to the presence of wolves, • tolerate wolves as exploiters of the same group of game animals, • cease illegal killing of wolves.
Responsibility for implementation:	<p>DE: Hunters' associations together with WWF and private agencies.</p> <p>PL: Regional directorates for environmental protection, State Forest Service, NGOs, Polish Hunting Association</p> <p>CZ: Czech-Moravian Hunter Association, NGOs.</p>
Timing of the activities:	ASAP
Level of urgency:	1
Cost and potential funding sources:	20.000 EUR per country. Funding sources: DE: Hunting fees – Jagdabgabe;
Benefit:	3

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4.5 Dinara-Balkan population

List of actions:

1. Training and establishment of Wolf emergency team and damage inspectors in all 10 countries sharing Dinara-Balkan wolf population
2. Systematic wolf mortality monitoring (natural and human caused)
3. Health status of wolves (including zoonotic agents)

ACTION 1	
Title of the Action:	Training and establishment of Wolf emergency team and damage inspectors in all 10 countries sharing Dinara-Balkan wolf population
Objective:	Train and equip a group of local professionals and/or experts to act properly in any event related to wolves and covering the entire wolf range in the country. Any country with a wolf population needs its own Wolf Emergency Team (WET).
Description of activities:	Inviting the representatives from wolf occupied regions of the country for a two-day workshop to train them to act properly in any unusual wolf related event. Theoretical sessions systematically review the scope and importance of situations as: inspection of wolf damages, survey of protective measures applied, evaluation of risk for human safety and expertise on eventual need for lethal removal. Practical training includes the work on the bodies of dead wolves and on handling the immobilized ones on how to do the measurements and take samples.
Expected results:	Trainees will: <ul style="list-style-type: none"> - acquire the legal status of Team member with signed contract with the government body - Team members will officially inspect the site of each wolf related problem situation, act accordingly: urgently if case requires or prepare the report and propose next steps - advise on prevention of problem with wolves - advise on eventual need for lethal removal of certain wolf - know how to properly take samples of dead wolves - know how to properly take measurements of wolf body
Responsibility for implementation:	Wolf experts for training and relevant governmental agency for organizing and contracting trainees
Timing of the activities:	Two day workshops once per year
Level of urgency:	1
Cost and potential funding sources:	20 participants for 2 days by 100 EUR = 4000 EUR per 9 country/year NGOs
Benefit:	4

ACTION 2	
Title of the Action:	Systematic wolf mortality monitoring (natural and human caused)
Objective:	Full information of all dead wolves in a country with data on location, dates and causes of death. Special efforts to track illegally killed animals.
Description of activities:	With the help of Wolf emergency team and all other sources of

	information (traffic service, farmers, hunters, and opportunistic findings) the hard data on each dear wolf is recorded. When possible, the body is retrieved to the Veterinary Faculty for necropsy. Nature protection inspectors and hunting inspectors are promptly informed on each suspected case of illegal wolf killing and requested the information on findings.
Expected results:	<ul style="list-style-type: none"> - list of all dead wolves in a country in the given year - known distribution of causes of deaths - modelling for calculations on real rate of illegal killing - known trends in the total mortality - orientation in estimating the population size - base for deciding on hunting quota on wolves - sex ratio and age (from tooth sections from dead wolves) of population known
Responsibility for implementation:	Wolf researchers, inspectors and responsible government agency.
Timing of the activities:	Continuous for each new year.
Level of urgency:	5
Cost and potential funding sources:	20K/year/country
Benefit:	4

ACTION 3	
Title of the Action:	Health status of wolves (including zoonotic agents)
Objective:	Reliable insight in disease agents circulating within the wolf population: viral, bacterial and parasitic, as well as other potential disorders. Special attention to agents that may affect humans and domestic animals.
Description of activities:	The bodies of all dead wolves that died from other reasons than hunting are retrieved for the necropsy. Hunted wolves are inspected briefly and necropsy is performed when something unusual is seen. The live-captured wolves are blood sampled for immunological tests. Scat samples are analyzed for parasites.
Expected results:	<ul style="list-style-type: none"> - list of microbial agents (viruses, bacteria) - list of parasites (internal and external) - list of diseases that caused eventual wolf death - list of zoonosis confirmed (like rabies and trichinellosis cases) - management recommendations to mitigate certain diseases
Responsibility for implementation:	Wolf researchers, veterinary specialists and responsible government agency.
Timing of the activities:	Continuous retrieval of dead wolves and collection of other diagnostic materials. Work on diagnosis (identification of pathogens) 1 month per year.
Level of urgency:	3
Cost and potential funding sources:	10K/year/country
Benefit:	3

4.6 Italian Peninsula population

List of actions:

1. Identify and map priority areas and their functional connectivity for wolf conservation where management actions and resources should be concentrated
2. Implement a national (link to the Alpine wolf population) database to organize, store and make public all data on wolf populations (distribution, genetics, census, monitoring, etc.), illegal and accidental killings, depredation on livestock, compensation paid
3. Approve a national guideline to reduce the diversity of damage verification and compensation protocols and provide a protocol to monitor the efficacy of mitigation policies

ACTION 1	
Title of the Action:	Identify and map priority areas and their functional connectivity for wolf conservation where management actions and resources should be concentrated
Objective:	In one year, a map of priority wolf areas is drafted accounting also for functional connectivity, and key management issues defined for each area.
Description of activities:	The wolf population in the Italian Peninsula has grown to occupy most of its former and suitable range. A more articulated management regime is necessary, beyond the full protection over the entire range. The current wolf range in Italy will be examined using a range of variables such as habitat suitability maps, distribution of various livestock and husbandry types, economic and social conflicts, prey availability, connectivity across the range, evidence of wolf-dog hybridization, etc.; large areas of similar value for wolf management will be defined and qualified for the used variables. In particular, the key areas where most urgent is the implementation of management actions (prevention of conflict, control of hybridization, damage compensation, wolf population management, etc.) will be identified in a prioritization rank to be used in a revised version of the National Wolf Action Plan. The aim of this exercise is to provide a basis for an informed discussion between the national and Regional governments on differential management across the wolf range. It will also allow more appropriate management responses at local scale.
Expected results:	<ul style="list-style-type: none"> - A map of key areas is identified and draft on a GIS support - Each area qualified for the key issue(s) to be addressed - Large consensus of wolf experts is obtained on the draft - The map is the basis for a revised wolf action plan at national scale
Responsibility for implementation:	ISPRA (Istituto Superiore Ricerca Ambientale) supported by a team of external experts
Timing of the activities:	One year, starting as soon as possible
Level of urgency:	3
Cost and potential funding sources:	<100K. Ministry of Environment
Benefit:	4

ACTION 2	
Title of the Action:	Implement a national database (linked to the Alpine wolf population) to organize, store and make public all data on wolf populations (distribution, genetics, census, monitoring, etc.), illegal and accidental killings, depredation on livestock, compensation paid.
Objective:	A comprehensive national database is built to accommodate all data related to wolf numbers, ranges, trends, damages, genetics in Italy, and data are continuously flowing from Regional governments and research centers.
Description of activities:	There is no central office in Italy that regularly collects and organizes all existing data on wolf population status, trends and conflicts in the 20+ Regional governments. Data quantity and quality varies greatly among Regions but no effort has ever been made to bring this vast information to a unifying system. Data at national scale is necessary as the spatio-temporal dynamics of wolf populations require large scales and because any report to the EU is made at national level. Also, any exception to the HD requires robust data at national level. A database will be structured to organize all sorts of data relative to wolf numbers and areas, genetic analyses done by several labs, conflicts compensated by the Regional governments, etc. The database will be operational at ISPRA as the key scientific and technical support of the Ministry of Environment, and will be continuously updated with data flowing from the variety of peripheral sources.
Expected results:	<ul style="list-style-type: none"> - Database built and operational - All existing data entered - A system of contacts in place for the continuous gathering of data from Regional offices and research centers - A yearly or ad-hoc newsletter synthesize the data
Responsibility for implementation:	ISPRA (Istituto Superiore Ricerca Ambientale) with support from external consultant
Timing of the activities:	Starting as soon as possible; database structure completed in 4 months; database populated ongoing
Level of urgency:	3
Cost and potential funding sources:	Database in place <100K; data collection and input estimated at 25K/year. Ministry of Environment
Benefit:	2

ACTION 3	
Title of the Action:	Approve a national guideline to reduce the diversity of damage verification and compensation protocols and provide a protocol to monitor the efficacy of mitigation policies
Objective:	Within two years, all Regions will align their damage compensation policies to a nationally adopted guideline.
Description of activities:	Damages by wolves to livestock are verified and compensated in a variety of approaches by the 18 Regions that currently host part of the wolf range. There is no unifying approach and the national Ministry has never attempted to provide a national guidance to the Regional

	<p>authorities. This action will be mastered by the Ministry of Environment and will bring all Regional authorities dealing with damage compensation to confront their different approaches and discuss ways to minimize them and possibly adopt one approach common to all. The Ministry will provide support in terms of a background paper describing the differences, explaining the legal and financial opportunities (also offered by the new EU Common Agricultural Policy) and indicating a potential unifying approach.</p> <p>The Regional authorities will discuss and adopt the common approach and will then accordingly modify their regional norms.</p>
Expected results:	<ul style="list-style-type: none"> - The Ministry of Environment convenes a meeting of all Regional Governments to coordinate the approval of a common policy on damage compensation. - All Regional governments adopt the common policy and accordingly modify their current policies.
Responsibility for implementation:	Ministry of Environment with support from ISPRA and external consultants.
Timing of the activities:	<p>In the first year, the Ministry of Environment will prepare a background paper that will report on the variety of regional policies, and will convene a first meeting of all Regional authorities to prepare the process toward a consensus on a common national policy.</p> <p>The second year will be used to convene a series of meetings to reach the consensus and agree on a common policy to be implemented at regional scale.</p>
Level of urgency:	3
Cost and potential funding sources:	No cost except for a short consultancy (<100K) to prepare a background paper and facilitate the consensus. Ministry of Environment.
Benefit:	3

4.7 Finnish-Karelian population

List of actions:

1. Risk-mapping: A basis for fine-grained regional management
2. Nudges for improved coexistence
3. Survey of human attitudes

ACTION 1	
Title of the Action:	Risk-mapping: A basis for fine-grained regional management
Objective:	Management planning in which human densities, landscape structures, livestock herding and other relevant human activities and wild ungulate populations are taken into account.
Description of activities:	Data collection and spatial analysis of risks on wolf territories in Finland.
Expected results:	Improved targeting of the mitigation and compensation measures.
Responsibility for implementation:	Finnish Game and Fisheries Research Institute, Finnish Wildlife Agency, Academy of Finland
Timing of the activities:	2014
Level of urgency:	1
Cost and potential funding sources:	appr. 30K -- Ministry of Agriculture and Forestry; Finnish Wildlife Agency; Finnish Game and Fisheries Research Institute; Academy of Finland
Benefit:	5

ACTION 2	
Title of the Action:	Incentives for improved coexistence
Objective:	Identify the limits and possibilities of compensation schemes, tolerance payments and novel institutional adjustments for the improved coexistence.
Description of activities:	Critical evaluation of current compensation schemes; identify the essential conditions for the tolerance payment; establish the collaborative arenas for identification and design of incentives, i.e. ways to modify the social-ecological features of wolf territories for better coexistence. These entail explorations, discussions and collaboration of local actors, experts and authorities.
Expected results:	New means to reduce the concern, harm and risk imposed by the presence of the wolf; reduced conflict with wolves
Responsibility for implementation:	Finnish Wildlife Agency, Finnish Game and Fisheries Research Institute
Timing of the activities:	2014 – 2015
Level of urgency:	1
Cost and potential funding sources:	appr. 20K/year -- Finnish Wildlife Agency, voluntary payments, Finnish Game and Fisheries Research Institute; Academy of Finland
Benefit:	4

ACTION 3	
Title of the Action:	Survey of human attitudes
Objective:	The public survey on general attitudes, values, beliefs and norms on the presence of the wolf and the conditions of coexistence in Finland
Description of activities:	Designing and carrying out a mail survey to inquire the general attitudes, values, beliefs and norms on the presence of the wolf and alternatives for future actions.
Expected results:	Improved understanding about general habits of thought and action
Responsibility for implementation:	Finnish Wildlife Agency, Finnish Game and Fisheries Research Institute, international research institutes
Timing of the activities:	2013 -2014
Level of urgency:	1
Cost and potential funding sources:	<100K Finnish Wildlife Agency, Finnish Game and Fisheries Research Institute, Academy of Finland
Benefit:	4

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4.8 North Western Iberia Population

List of actions :

1. Promote regular and alternative food resources for wolves in agriculture-dominated areas
2. Use the wolf image to promote economic benefits with ecotourism

ACTION 1	
Title of the Action:	Promote regular and alternative food resources for wolves in agriculture-dominated areas
Objective:	Promote wild prey populations, especially in Portugal, and assess the viability and legal support to recover the traditional management of livestock carcasses in areas with very low abundance of wild prey, subject to recent European Union regulations.
Description of activities:	<p>1) In areas where wild prey are almost absent or at very low abundance, promote the increasing range and density of their populations through habitat improvement and reintroduction, and focused mainly in ungulate species with lower levels of conflict with agricultural and forestry interests (e.g. selecting roe deer instead of red deer).</p> <p>2) Promote a population monitoring programme of wild ungulates across wolf range (namely in protected areas or core-areas for wolf conservation) and define potential reintroduction sites for wild ungulates by spatial-explicit modelling.</p> <p>3) Promote vigilance efforts and public awareness to reduce poaching on wild ungulates.</p> <p>4) Activate the legal and logistic mechanisms to restore the traditional disposal of carrion or livestock products in certain agricultural areas where wild prey are almost absent or at very low abundance. This action should be based on the recent European Union regulation EC 1069/2009 in Portugal and for wolf populations South of Duero River in Spain (in both cases the species is listed in Annex II of EU Habitats Directive). However, for Spanish wolf populations North of Duero River (Annex V) it should be recommended to assess the legal mechanisms and viability to extend this regulation where necessary.</p>
Expected results:	<ul style="list-style-type: none"> - Higher densities of wild prey allowing a regular food resource for wolves and, indirectly, the promotion of hunting of ungulates. - Decrease the current trophic dependence of some Iberian wolf populations on livestock, thus attenuating the need for livestock depredations and, therefore, the human-wolf conflict. - Preserve the traditional cultural service provided by rural people in Iberia to wildlife allowing the availability of carrion and livestock products on certain wolf populations that are highly dependent on this food resource.
Responsibility for implementation:	National and Regional Governments. Local wildlife and hunting authorities.
Timing of the activities:	<i>Establishment of system: 1 year. Operation of system: continuous.</i>
Level of urgency:	2
Cost and potential	<i>Costs: 100-500K per year, for reintroduction of wild prey</i>

funding sources:	<i>Funding sources:</i> Governmental agencies for nature conservation. Hunting authorities. European Commission (e.g. LIFE projects).
Benefit:	5

ACTION 2	
Title of the Action:	Use the wolf image to promote economic benefits with ecotourism
Objective:	To promote eco-tourism business and activities related to wolves and establish best practices guidelines on wolf tourism in order to maximize income to rural economy and minimize impact on wolf disturbance.
Description of activities:	<ol style="list-style-type: none"> 1) Review the literature and the current tourism activities related to wolves in the Iberian Peninsula to prepare a technical document with guidelines and best practices on compatible wolf tourism in human-dominated landscapes, in order to maximize income to rural economy and minimize disturbance on wolves, especially during the breeding season. 2) Promote the high potential for touristic use of the ethnographic heritage related to wolves in Iberian Peninsula, by considering the full structural reconstruction of the architectural legacy (e.g. traditional structures for livestock protection, stone-made wolf traps) and the recompilation of local beliefs and practices. 3) Conduct awareness campaigns to general public and to local inhabitants and tourist operators for showing the potential of wolves and their cultural heritage to attract tourism, generate economic income and promote rural development. 4) Develop sustainable activities in wolf range including wolf educational trails and interpretation centres, wolf observation and wolf friendly products. 5) Encouraging tourist operators and protected areas services to incorporate wolves in their programs.
Expected results:	<ul style="list-style-type: none"> - Establish the wolf image as an important element in the cultural identity of rural communities and as a promoter for economic income and rural development. - Prompt the economic value of wolves, improve tolerance towards the species, attenuate the conflict with rural people. - Regulate wolf based tourism activities related to watching and photographing wild wolves, in order to minimize impacts on wolves and potential conflicts with local people.
Responsibility for implementation:	National and Regional Governments, managers of protected areas, Ministry of the Environment, wolf experts, nature conservation and tourism agencies and local inhabitants.
Timing of the activities:	<i>Establish of system</i> (guidelines with best practices): 6 months <i>Operating of system:</i> continuous.
Level of urgency:	2
Cost and potential funding sources:	<i>Costs:</i> <100K, to prepare guidelines and promote activities. <i>Funding sources:</i> Governmental and private agencies for nature conservation and tourism. European Commission (e.g. LIFE projects).
Benefit:	4

4.9. Scandinavian population

List of actions :

1. Establish science-based estimates for Favourable Conservation Status
2. Develop instruments or practices to address attacks on hunting dogs

ACTION 1	
Title of the Action:	Establish science-based estimates for Favourable Conservation Status
Objective:	Define and agree upon what is FCS for wolves in Scandinavia
Description of activities:	Establishing peer-reviewed science-based estimates for FCS that include genetic aspects (low inbreeding, increased allelic diversity) long-term viability and connectivity with other populations.
Expected results:	<ul style="list-style-type: none"> - A peer-reviewed FCS based on scientific consensus established - Included as a goal in management plan - Ensured compliance with Habitats Directive - Management becomes more adaptive
Responsibility for implementation:	Swedish Environmental Protection Agency delegating to relevant scientists
Timing of the activities:	6 months
Level of urgency:	4
Cost and potential funding sources:	<100K
Benefit:	4

ACTION 2	
Title of the Action:	Develop instruments or practices to address attacks on hunting dogs
Objective:	Provide hunters with instruments or practices to address attacks on hunting dogs
Description of activities:	Developing possible tools (such as protective vests) to avoid dogs being killed in case of an encounter with wolves and assessing the efficiency of alternative hunting practices that would expose less dogs to wolf encounters
Expected results:	<ul style="list-style-type: none"> - Decreased number of dogs killed by wolves - Keep hunting traditions when possible and/or adopt alternative practices instead if desirable - Reduced conflict with hunters
Responsibility for implementation:	Wildlife Damage Center in collaboration with hunter associations
Timing of the activities:	Continuous
Level of urgency:	4
Cost and potential funding sources:	<100K. Very much dependent on which actions are developed
Benefit:	4

4.10 Sierra Morena population

List of actions :

1. Set up a specific Committee for the Recovery of the Wolf in Sierra Morena
2. Debate within the Committee the opportunity and feasibility of reinforcing the Sierra Morena wolf population
3. Identify the elements of the conflict between the wolf and the red-deer hunting in Sierra Morena, and propose measures to alleviate it

ACTION 1	
Title of the Action:	Set up a specific Committee for the Recovery of the Wolf in Sierra Morena
Objective:	Discuss the status and the future of the wolf in Sierra Morena in a specific committee formed by the relevant agencies of the regional and national governments, the scientists and the stakeholders.
Description of activities:	<ol style="list-style-type: none"> 1) To reach a consensus between the autonomous regions of Andalusia, Castilla-la Mancha and The Ministry of the Environment to establish the Committee. 2) To agree the representatives of the two regional governments and of the Ministry of the Environment. 3) To agree the details on the coordination of the group. 4) To agree on the composition of the group of experts 5) To agree on the composition of the group of stakeholders 6) To discuss the current status of the wolf population, how to improve the population monitoring, the options facing a likely imminent extinction of the population, and the social and economic problems that the recovery of the population can cause, and to reach a consensus with the stakeholders. 7) The Committee will be composed of 1) representatives of the regional government of Andalucía, the regional government of Castilla-La Mancha and the Spanish Ministry of the Environment; 2) national and international experts; and 3) representative of stakeholders (land owners, hunters, livestock breeders, environmentalists, etc.).
Expected results:	<ul style="list-style-type: none"> - An interregional, multidisciplinary and specific Committee on the recovery of wolves in Sierra Morena is established - The actual status of the wolf population is discussed by a team of independent experts - The options facing the extinction of the population are considered - Independent experts and stakeholders contribute to the recovery of wolves in Sierra Morena
Responsibility for implementation:	Regional governments of Andalusia and of Castilla-La Mancha, Ministry of the Environment. Wolf experts, stakeholders.
Timing of the activities:	Three months since the agreement to establish the Committee.
Level of urgency:	1
Cost and potential funding sources:	<p><i>Costs:</i> No cost to establish the Committee; 2,000-6,000 EUR each meeting (depending of the number of the international experts).</p> <p><i>Funding sources:</i> Regional governments of Andalusia and of Castilla-La Mancha. Ministry of the Environment.</p>

Benefit:	5
ACTION 2	
Title of the Action:	Debate within the Committee the opportunity and feasibility of reinforcing the Sierra Morena wolf population
Objective:	The current wolf population of Sierra Morena might need to be reinforced in order to recover, by introducing individuals from the Iberian population, considering the demographic, genetic, ecological, legal, economic and social aspects. This very hot issue should be debated within the Committee for the Recovery of the Wolf in Sierra Morena and a decision must be made.
Description of activities:	<ol style="list-style-type: none"> 1) After the establishment of the Committee for the Recovery of the Wolf in Sierra Morena, the actual status of the wolf population must be assessed. 2) To decide if the wolf population can recover by itself considering wolf numbers, the genetic variability, the distance to the main Iberian wolf population and the physical and social barriers which hampers the connectivity. 3) Debate the legal obligations of the Spanish State under the Habitats Directive if the wolf population in Sierra Morena becomes extinct. 4) Debate the human dimension aspects related with the reinforcement (or reintroduction) of wolves in Sierra Morena. 5) Debate the impact of a full recovery of the wolf population of Sierra Morena on the local economy. 6) Debate the feasibility of a reinforcement or a reintroduction of wolves in Sierra Morena. 7) Make a decision on the reinforcement or reintroduction of wolves in Sierra Morena and prepare a detailed project if appropriate.
Expected results:	<ul style="list-style-type: none"> - The Committee for the Recovery of the Wolf in Sierra Morena appoints a group of experts to debate this topic. - After being debated, a report on the need and the feasibility of a reinforcement is produced, considering many different perspectives and with the input of government officials, experts on wolf demography, genetics and conflicts, and stakeholders. <p>A decision is eventually made and integrated in the Wolf Recovery Plan of Sierra Morena.</p>
Responsibility for implementation:	Mainly, regional governments of Andalusia and Castilla-La Mancha. In addition, Ministry of the Environment, wolf experts and stakeholders.
Timing of the activities:	One year
Level of urgency:	2
Cost and potential funding sources:	10K EUR for two meetings with international experts. 15K EUR to prepare the report. Funding sources: Regional governments of Andalusia, Castilla-La Mancha and Ministry of the Environment. European Commission (Life + project)
Benefit:	5

ACTION 3	
Title of the Action:	Identify the elements of the conflict between the wolf and the red-deer hunting business in Sierra Morena, and propose measures to alleviate it
Objective:	Obtain detailed information on the economic and social impacts of wolves on the hunting business carried out by private owners and the municipalities in Sierra Morena, and to look for ways to mitigate or to compensate them, if appropriate.
Description of activities:	<ol style="list-style-type: none"> 1) To select a multidisciplinary team, composed at least by an economist, a sociologist and a biologist to conduct the research 2) To carry out personal interviews and/or mail enquiries with private owners, representatives of the municipalities and other local and regional agencies, hunting managers, hunters, biologists and other stakeholders involved in the red deer hunting business in Sierra Morena, in order to assess the economic and social impact of the wolf on this industry, proposing measures to minimize it. 3) To submit the report to the Committee and to peers for review. 4) To integrate the main conclusions in the Recovery Plan of the Wolf in Sierra Morena.
Expected results:	<ul style="list-style-type: none"> - A report is produced with detailed information on the wolf impact on the hunting business in Sierra Morena. - The results of the report allow to implement measures to minimize or to compensate the conflict.
Responsibility for implementation:	Autonomous region of Andalusia and of Castilla-La Mancha. Ministry of the Environment, economists, sociologists and wolf experts.
Timing of the activities:	18 months to conduct the research and to write the first manuscript.
Level of urgency:	2
Cost and potential funding sources:	<100K Funding sources: Regional governments of Andalusia and of Castilla-La Mancha, Ministry of the Environment, European Commission (Life + project).
Benefit:	4