

WOLFALPS – Obiettivi e azioni di progetto

The ultimate goal of the WOLFALPS project is to implement and coordinate wolf conservation actions in key core areas and beyond in the Alps ecosystem, from West to East, to further support the natural wolf alpine recolonization process.

The lack of any form of coordinated management adopted at the Italian alpine scale is one of the most crucial challenges (Threat 1). Therefore, the implementation of the overall organization of the WOLFALPS project, which is build up on a shared and coordinated conservation program implemented within the different administrative divisions in Italy and Slovenia, and shared with other alpine countries, is the first objective to support wolf conservation over the Alps addressing Threat 1.

At the same time, to be highly efficient and realistic, conservation measures will be firstly applied in key core areas distributed from West to East over the Alps. A spatial model, developed in a previous ECONNECT project, indicated the wolf core areas important for the long term persistence of the wolf population within the alpine ecosystem. We adopted these indicated core areas, which are either already occupied by wolf packs, as in the Western Alps, or just recently recolonized by few individuals in the Central-Eastern Alps. Important coordinated conservation actions will be conducted with the main objectives to:

- Decrease the level of poisoning and poaching (Threat 2)
- Decrease the impact of livestock husbandry through the implementation of effective preventive methods (Threat 3)
- Increase acceptance and knowledge on wolves among hunters, shepherds, local communities, students, and citizens (Threats 3,4,5)
- Contain habitat loss that causes loss of reproductive sites (Threat 6)
- Detect and control wolf-dog hybridization events (Threat 7)
- Guarantee long term wolf genetic viability (Threat 8)

A2 Kick off meeting and implementation of the coordinated wolf groups over the Alps for conservation and monitoring actions

Soon after the signature of contractual relationship between the project beneficiary and the EU for co-funding of the project, all project beneficiaries will meet to discuss the following:

1. Administrative procedure: A draft partnership contract that regulates the relationships between the coordinating beneficiary and each partner will be prepared and discussed;
2. General introduction to administrative procedures: The Common Administrative Provisions will be illustrated and discussed and critical rules for financial reporting will be highlighted. A demonstration will be given;
3. Project action plan: A detailed action plan will be prepared with formal agreement on methodologies to be adopted and means of coordination, frequency of reporting activities, focal persons to be identified for specific issues.
4. Timing: a detailed timeplan for each action to be developed in the first year, subaction, deliverable and milestone will be revised, discussed and agreed upon.
5. Creation of the coordinated wolf groups in the Alps: 2 coordinate wolf alpine working groups will be created, one that will deal with the implementation of the conservation actions within core areas and beyond, and with the monitoring of the wolf alpine population, which will be called Wolf Alpine Conservation Group, and a second one which will define the coordinated communication strategies

and will deal with the implementation of the communication actions, which will be called Wolf Alpine Communication Group. Every group will have a leader. A detailed list of meetings will be planned in order to build over the years a strict relationship and working operation within and between the members of the 2 groups and to list specific inter and intra group goals and timelines. The meeting will be held in Italy in Torino within the first month of the project and will be attended by at least two representatives per each partner institution.

A3 Definition of the strategies and methodologies to evaluate the conservation status and trend of the wolf population in the Alps

A series of preparatory actions will be conducted to start implementing the complex monitoring of the status of the wolf alpine population in the Italian part of the Alps, and subsequently to join the data with the other States of all the Alpine range. Every activity of this action will be directly related to Action A.4., which is the actual ex-ante evaluation of the population status and experimental implementation of the subsequent monitoring programme, and are related to Action A.4., which prepares operators, in particular for transferring the best monitoring and preventive practices developed in the West part of the Alps to the Central-East, involving also the staff of hunter districts in monitoring activities where applicable. In particular within the action we will organize:

- A first workshop of the Wolf Alpine Conservation Group to define and locally adapt the overall sampling strategies in the Italian side of the Alps beyond the core areas, and the relative sampling design and effort within Italian institution and personnel, that will take action only in 2014-2015 as an ex-ante evaluation of the wolf conservation status (Action A4), and the last year as an ex-post evaluation of the Actions (Action D.1.). The transects monitoring will be concentrated in 4-6 months only during the winter season, and by wolf-howling sessions during the summer period only for documented wolf packs (see Action A.5.). The workshop will be held in Italy, in Torino.

- A second workshop to define the approaches to integrate the monitoring information collected in every State over the Alps beyond the Wolf Alpine Conservation Group, which will be done the second and last year of the WOLFALPS project, respectively after Action A.5. and D.1.. The second year workshop will be held in Italy, in Parco Nazionale Stelvio, regione Lombardia; the last year workshop will be held in Slovenia. Institutions involved in wolf monitoring from other States in the Alps not directly involved in the project support this action of the WOLFALPS project (see Form A8).

- A third workshop for the definition of the Network of people involved in the wolf monitoring activities in the Italian Alps (with Corpo Forestale dello Stato (CFS) and Park personnel, representatives of participating hunting districts, volunteers, students, locals) and for the organization of the network of people involved in future monitoring activities such as snow tracking / non invasive sampling. A workshop will be held in each core area.

A4 Transfer of best practices from Western to Eastern Alps: training of operators of the Network for wolf monitoring techniques, for detecting depredations, and for preventive measure implementation

The exchange and transfer of experiences will be implemented from the most wolf-experienced CFS and Park personnel of the areas where wolves have been present for at least a decade in the Western Alps, to the new recolonized areas in the Central-Eastern Alps. Within the Progetto Lupo Piemonte who locally worked on wolves from 1999-2010, 15-20 highly specialized operators have been prepared over the years within the CFS and Park personnel. They will directly transfer acquired experiences, in the framework of specific coordinated training courses and field trips, to the selected and highly motivated CFS and Park personnel in the core areas of the Central-Eastern Alps or to new ones. This procedure will be cost effective, and stimulating for the specialized operators who will be recognized as such. For these activities it is essential that personnel who know the territory very well and are used to walk long hours will be selected. This can be done with selected technical staff from the administrative institutions, so as to ensure the

sustainability of the action and its long term effect after the end of the project. Topics of the training courses will be: 1. Principles of wolf biology, ecology and behaviour; 2. Detection and identification of wolf tracks and scats; 3. Estimation of number of wolf individuals from tracks; 4. Optimal collection of non-invasive samples; 5. Documentation of dead wolves; 6. Direct observations; 7. Photographic trapping. Audience will include interested hunters or volunteers who would like to increase their own knowledge on wolves and contribute to the monitoring of the species. Therefore, this preparatory activity will include at least 8 training courses, one in each core area, but if required by new detected wolf dispersals, also beyond, and will be done in (or before) each monitoring session as required for implementation of activities in Actions A.5. and D.1. In each training course a minimum of 20 new operators will be selected in each core area. The repetition is needed to include new CFS and Park personnel, volunteers, staff from hunter districts, and to renew interest of these monitoring operators for accurately implementing Action D.1.

Training sessions will include 3-days field trips to Western Alps core areas where wolf is abundant and there is abundance of signs. Field trips will allow a intensive practical training on snowtracking and wolf howling techniques, as well as on the recognition of wolf depredations and on the implementation of preventive measures.

A5 Ex Ante evaluation of the wolf population conservation status in the Alps

Following the "Guidelines for Population Level Management Plans for Large Carnivores" endorsed in 2008 by the European Commission's DG Environment and after the requirement of the assessment of the Favourable Conservation Status (FCS) of the entire population, required by the Habitat Directive, the WOLFALPS project will establish a robust surveillance system of the conservation status of the alpine wolf population. In particular, the Italian and Slovenian alpine wolf population (which currently form the majority of the all alpine population) will be directly monitored within the WOLFALPS project, enabling a direct EX-ante and EX-post (Action D.1.) evaluation of the Concrete Conservation Actions (C.1., C.2., C.3., C.4., C.5.). Then, in Action A.3., specific workshops will be organized to allow the integration of the monitoring information at the Alps-wide scale (especially for the number of reproductive units).

The evaluation of the conservation status of the alpine wolf population will be based on the estimation of these primary population parameters:

1. Number of reproductive units (i.e. packs)
2. Wolf population size (i.e. the minimum number of wolves detected)
3. Distribution
4. Wolf population mortality and dispersal rates
5. Wolf effective population size (i.e. the measure of an index showing the genetic status of the population, as an evaluation of the level of heterozygosity of the population indicating its resistance to genetic stochasticity and its evolutionary potential, directly indicating long-term viability of the population).
6. Other genetics information: genetic diversity, level of connectivity with the Dinaric and Apennine population, detection of hybrids and of genetically important breeders

As already mentioned, the surveillance system developed within the WOLFALPS project will be directly applied to the Italian and Slovenian Alps, and after, in the framework of the Wolf Alpine Conservation Group, the results will be joined at the entire alpine population level (see Action A.3.). Within the Italian Alps, it will mainly include Forest and Park Service personnel (see Action A.3 and A.4.), Province personnel (see Form A8), and it will also involve, when applicable, staff from the Hunters Districts, volunteers, locals, and students as indicated by Action A.3. One of the goals is to achieve synergy of this organisations and tap into the potential of an interdisciplinary approach. A similar system will be organized by Slovenian partners in the Slovenian Alps and will include a wide network of the national park personnel, hunters and volunteers.

All surveillance activities will be organized into winter surveillance sessions, which will last 4-6 months within a winter season. An integrated sampling design based on a coordinated approach will be developed in Action A.3, to collect data to estimate simultaneously and cost-effectively the primary population parameters. The integrated sampling design will be defined to simultaneously collect non-invasive data on the entire Italian and Slovenian part of the Alps beyond the core areas, only where wolf presence have been documented and/or reported (see Action A.13). The winter session will be from November 1st until April 30th of winter 2014-2015. An effective surveillance of an elusive species like the wolf must include several different methodological approaches to obtain a realistic picture of the population conservation status needed for effective management. The general methods that will be used are a synergy of 3 non invasive techniques:

- snow-tracking,
- genetic analysis conducted on non-invasive and tissues sample,
- wolf-howling techniques.

A series of systematic transects to collect wolf signs (i.e. tracks, scats, or urine in snow), will be travelled during the winter season. The detailed sampling design will be discussed and defined in Action A.3. Intensive effort will be implemented in areas where wolf packs or stable solitary wolves have been already detected, and a minor effort will be implemented in areas with no wolf detection, where evidence of occasional wolf presence collected also by the general public might help identifying the first wolf appearance in new areas. Systematic transects will be organized where wolf presence is documented or indicated by indirect signs, and will follow trails and roads which are generally used by wolves for their movements, and intersected ungulate winter ranges and rugged areas when possible. Winter ski- or snowshoe-based surveys will be carried on with several crews of 5-15 observers (generally one observer per transect) to search for wolf tracks and non-invasive samples, travelling systematically along every transect of the study area each winter month. Observers are prepared before the winter season with an intensive field and theoretical course to increase consistency in data collection (see Action A.4). The objective of travelling the transect is to find wolf tracks, once the wolf track is found, it is followed to collect every scat along the wolf travel route, and estimate each pack size as the maximum number of wolves travelling together. A genetic capture-recapture (CR) approach, which use the recaptured genotypes over time, is required to estimate population size and mortality rate of year 2014-2015. To do this, another short winter session will be organized the year after (winter 2015-2016) over 4 months to collect at least 400-500 scats samples to allow the estimate of the mortality rate of the wolf population of winter 2014-2015 using the CR approach, important to monitor the impact of Action C.1.. We will be able to estimate undetected mortality and emigration, which should give us a feeling for the level of illegal killing. Individual genotyping and recaptures of individuals over time, together with snow-tracking information and parentage analysis, will allow the identification of wolf packs and eventually of new dispersals. When a wolf pack is detected, a systematic wolf howling survey will be conducted in the area to document the reproduction in the summer (July-August). Camera traps will be used to document the wolf presence in new areas, as well as reproductions. We will also opportunistically collect fresh scats or urine in snow when encountered during every all other field activities. Each non-invasive sample will be stored with appropriate media (silica gel, 95% ethanol, EDTA-NaOH buffer etc.) to facilitate its safe storage until analysis. Fresh samples will be prioritized for the genetic analysis to optimize laboratory success, as well as groups of scats and urine samples found along the same snow-tracking session to increase the probability of characterizing each individual in the pack, and single scats/urine samples found in territories where the presence of a wolf pack was not documented. Moreover, non-invasive genetic samples of predator saliva will be taken from the surrounding of bite wounds on killed animals especially for areas where a potential new dispersal is present, to determine species (wolf or dog) and recognize individual wolves from genotypes (see Action C.2 and C.3). Genetic databases will be calibrated and integrated with the larger Italian dataset managed by ISPRA (Italy), and with the Slovenian database. A direct collaboration with the SLOWOLF Project, will be structured in order to integrate

and calibrate the results and compare the genotypes obtained to document direct dispersals from the Dinaric population, as referred in the provided declaration of support (see Form A8).

All confirmed data will be plotted in GIS to quantify the wolf distribution, and organized in a common database to quantify the other primary parameters. Moreover, all collected genetic data will be used for further genetic investigations. The DNA analyses will be undertaken using a minimum of 10 loci in order to assess the extent of hybridization with free ranging dogs and the level of inbreeding. In case of a detected or hypothesized hybridization case, camera traps will be intensively used in the area, and Action C.5. will be implemented.

A6 Training of wardens for illegal hunting activities in the alpine core areas and formation of anti-poisoning specialized teams

For these activities it is essential that technicians who know the territory very well and are used to work operatively in the field will be selected. This can be done with selected personnel from the administrative institutions, so as to ensure the sustainability of the action and its long term effect after the end of the project. The personnel from the CFS, Park Service, and Provincial Police will be selected for this task. Although illegal hunting activities are well known by the CFS and Park Service Police, the use of specific tools for detecting poisoned baits, such as management of trained dogs and detection of snares or poisoned baits, may not be among the specialities of the personnel. For this reason, a group of minimum 10 particularly motivated operators per core area will be specifically trained so as to set up at least one team per core area of dedicated staff for the detection of such environmental crimes. We are willing to include also the staff of Hunter Districts in the training sessions when applicable (see Forms A8). Training sessions will be done twice in the first 12 months in the Western Alps and in the Eastern Alps. In particular, a set of 2 training session will be conducted both in Ceva (Western Alps), and in Tarvisio (Eastern Alps). The training will include aspects related to the detection of illegal hunting activities, like the use of snares or poisoned baits and any other signs of illegal activity that threaten the survival of wolves. Collaboration will also be established with the Anti-poaching Nucleus of the CFS, a police task force recently created in Piemonte by the CFS, responsible for the control of illegal activities affecting nature conservation, namely poaching and poisoning.

Particular links will be made with the ANTIDOTO Program actions currently being developed in Italy (see forms A8). This Program was created with the goal of controlling the use of illegal poison, acting as coordinator of the efforts of several entities, gathering the existing information, raising awareness and training authorities to deal with such cases. Personnel from the ANTIDOTO Program coordinated by the Parco Nazionale del Gran Sasso e Monti della Laga will also provide training on how to detect such illegal activities and how to train dogs during the training sessions (see form A8). Detection dogs are a very promising technique for conservation projects, especially in the detection of poisoned baits (the experience of Project ANTIDOTO in Italy and Spain is a good example). Due to the highly technical skill required to carry out this type of tasks, these dogs need specialized training. The dogs used will have a dedicated keeper, and at least 5 experimental dogs should be present both in the Western Alps and in the Eastern Alps. The dogs used for detection of poisoned baits of carcasses are extremely sensible and need special continuous training. The start up for the training of the dogs will be done during the training courses, and a specific protocol of action will be built to be followed by dog keepers over the years. Dedicated dog keepers might come from the CFS, Park Service, Province Service, as well as from the Hunter Districts and from volunteers already employed in similar activities (e.g. in the Soccorso Alpino). Moreover, trained dogs already employed for other searching activities in the Soccorso Alpino, or in the CFS, might be also trained for this specialty. The dogs kept without dedicated dog keeper are more likely to be ineffective, behave unexpectedly and be less productive. For this there is the need to select these persons and follow them for at least the first 2 years by an expert. The relation between dog and handlers has an important role and this must be learned from people with experience in this matter, including different habitats and situations. It is also needed that instructors have a sound knowledge on dog behaviour and training.

Moreover, a workshop per core area with all the Entities which should deal locally with the poisoning issue, will allow the definition of a coordinated, shared, and multidisciplinary detailed strategy to be locally applied, and it will also communicate the creation and preparation of the specific specialized team to the all actors. Hence, a strategy will be developed for dealing with illegal actions and search of poisoned baits to be applied long term after the WOLFALPS project.

A7 Ex Ante poisoning survey and identification of illegal killing or poisoning hot spot areas

Data will be collected on every illegal killing action documented, especially on wolves but on other species as well, and on every documented poisoning case, also to other species, but within mountain areas, from every Entities that might have this information. This information will represent the poaching detections previous to implementation of Action C.1, and help identifying particular problematic areas.

When poisoning is conducted in mountain areas, also private, hunting, or shepherds' dogs might be killed as well. These poisoning events are often reported to private veterinaries services.

Hence, every private and public veterinary service present in or close to mountain areas will be surveyed first with questionnaires, and if needed with interviews, to detect poisoned dogs in mountains areas. Interviews will be conducted to shepherds to document shepherd's dogs poisoned in the mountain. Local reports will be made by each partner, and a final report will be put together by the CFS. Data collected will be integrated in a geographical information system (GIS) in order to have a spatial representation of hot spot areas, per type of information, using the WEB PORTAL developed in Action A.13.

A8 Ex Ante survey of damages caused by wolves to livestock and analysis of existing farming systems and vulnerability analysis in the alpine core areas

All data stored at the provincial level as well as in the relevant offices of the Public Health Service (ASL) will be surveyed and collected into a database. Up-to-date data will be integrated whenever needed. Individual farmers and livestock owners will be contacted, in collaboration with farmer associations (e.g. COLDIRETTI) to integrate databases on information needed by the WOLFALPS project (e.g. adoption of preventive measures), but not required by the ASL. Such information will be integrated with interviews directly on pastures structured in such a way to assess damages suffered, predation risk, pastures vulnerability, and the willingness of the livestock owners and shepherds to collaborate in the project and be eventual beneficiaries of damage prevention measures. Data collected will be integrated in a geographical information system (GIS) in order to have a spatial representation of hot spot areas with indication of frequency of damage, also using the WEB PORTAL developed in Action A.13. A comprehensive analysis of the damage cases with respect to the type of the damage-prevention measure applied, pasture-surrounding habitats, number of animals raised and other characteristics, which could influence the incidence of the damages will be carried within core areas, and eventually in new areas where dispersals wolves will appear. The ultimate goal of the action is to identify and assess the best and the worst practices, to assess the financial consequences of both types of practices (investment needs, farmers management costs, society (State) costs due to compensations for carnivores caused damages and compensation measures or investments support for farming system change) and to prepare the recommendations to implement the identified best farming practices. Local databases and reports with recommendations will be made by each partner, and a final database and document will be put together by the Regione Veneto

A10 Ex Ante analysis of attitudes of the general public, hunters and farmers toward wolves and wolf management

Baseline opinion surveys will be carried out among the general public, hunters and sheep farmers in each wolf core areas. A quantitative survey through personal interviews and via post will be done using a semi-structured questionnaire with multiple choices and categorical scales of responses. The questionnaires will be prepared and interviews held within the first 8-12 months of the project in each core area, addressing mainly local people and interest groups including hunters, livestock breeders and local authorities. A sample of 50-100 questionnaires per core area will be implemented randomly among the general public from selected villages in the study area. In terms of the different interest groups, a sample of 100 high school students (as future decision-makers) will be interviewed. Hunters, livestock owners, and environmentalists will be sampled through the associations that represent these groups, in order to have a minimum of 50 interviews of each interest group. In total: 100 general public + 100 students + 50 hunters + 50 livestock owners + 50 environmentalists = sample size of at least 350 per core area. The results obtained will be used as a baseline for evaluations planned within the Action D.4. The questionnaire will include questions on general attitudes toward the species, knowledge on the ecology and the status of the species, fear of wolves, opinions about the different management options, willingness to accept the presence of the species in the area, willingness to accept more wolves in the area, knowledge about and attitudes toward damage prevention measures, etc. The questionnaires will be developed by a human dimensions expert from the University of Ljubljana and in consultation with all project group members to ensure the quality of the collected data. We will send them via post to randomly selected potential participant of general public and hunters and carry out personal structures interviews with sheep farmers and other identified interest groups All the data will be statistically analysed and interpreted, including the analysis of social carrying capacity for wolves in the project area In addition, based on this data we will prepare recommendation for targeting the public awareness campaign.

A common report will be prepared in English language with relevant parts and summaries in the national languages. The report will be published on the project's web site and distributed via e-mail to the relevant decision-makers and stakeholders

A11 Local land management plans within Parks to protect the species and its reproductive sites and optimize wolf eco-tourism

Local Park's land management plan are developed within core areas to, among other duties, allow a better coexistence of wolf and human activities at a local scale. Local land management plan of Parks might include local strategies to stimulate the use of preventive methods in Park's pastures (see Action C.3), or optimize wolf eco-tourism general strategies. Tourism development can be further enhanced taking into account wolf conservation, and specific strategies for fund raising using wolf friendly products or approaches could allow direct earnings transferred to local communities. On the other hand tourism might have a negative impact on wolf conservation, if not correctly managed, especially considering the potential disturbance to wolf reproductive sites.

The development of a model on wolf reproductive sites, based on data collected previous to the start of the present project, is necessary to identify particular suitable habitat for reproduction sites within Parks in the core areas. A weighted logistic regression will be used to evaluate the habitat variables that more affect the presence of documented reproductive sites, given their availability. This model will therefore allow the identification of potential reproductive sites to be protected over the years from human activities that might diminish them, within the local land management plan of Parks. Therefore, WOLFALPS aims to support the development of local land management plans (e.g. Park's management plans) to protect the species and its reproductive sites from habitat loss, in coexistence with tourism development and human activities

A12 Wolf alpine population spatial connectivity analysis

Wolves frequently move across many unfavourable areas, but establishment success is restricted to higher quality habitats. Regional landscape analysis and prediction of favourable wolf packs

habitats has been conducted in the Alps within the ECONNECT project, developing a spatial explicit, individual-based model (SE-IBM) model (Figure 3). In particular in the Alps, where intense anthropogenic habitat modification has occurred over hundreds of years, a large-scale spatial analysis and the development of this wolf habitat model were important to understand and identify the most important alpine core areas for long term wolf persistence. The spatial analysis of potential habitats, and the development of a habitat suitability model for wolf packs over the Alps, were developed following the work published by Marucco and McIntire (2010). The final GIS map was a habitat suitability map of wolf packs, which was based on demographic processes such as dispersal, social structure, and habitat selection of wolves. Following the outputs of this analysis conducted in the framework of the ECONNECT project, we identified the most important wolf core areas in the alpine ecosystem, where our main conservation actions are implemented within our WOLFALPS project over the Alps (Figure 3). Now, one of the main step is to further use this model, integrating new habitat models developed or that will be developed (e.g. Falcucci et al. 2012), to spatially analyze the wolf population in an adaptive management and conservation approach that will help implementing Actions C.4. and C.5., and defining Action E.12. Data collected over the years of the project will be directly used in the model. We will model the entire wolf alpine population and test how different level of poaching applied in different areas will influence the overall survival of the population over the years, and the overall connectivity of the population. The outputs will be directly used in Action E.12. to define optimal guidelines for the wolf alpine population management on the long term and at the large scale, with indications of where the Action C1 should be more important to be conducted on the long term after the end of this LIFE project. Moreover, connectivity will be evaluated over a wider context than ECONNECT, taking into consideration the connection with the Apennine and Dinaric populations. In fact, the alpine wolf population was naturally generated 20 years ago through natural dispersal from the south-western Apennines. The connection with the Apennine population is constituted by an ecological corridor represented by the Ligurian Apennines Mountains, which is fundamental to be maintained in order to guarantee enough genetic diversity in the wolf alpine population. Moreover, an interesting first slight connection has been documented with the Dinaric population from Slovenia. Therefore, the WOLFALPS project will implement a spatial analysis, using the same updated version of the SE-IBM model, to evaluate the potential connectivity of the Apennine and Dinaric wolf populations to the Alpine one, the characterisation of the barriers by their origin, size, shape and degree of permeability with an assessment of possibilities to diminish them. Action A.11. will directly used the output of this model and implement land use restrictions where corridors will be identified in core areas. Finally, in this modelling framework we will incorporate the genetic information and other data collected in Action A.5., to correctly model the current wolf alpine population. In particular we will incorporate the genetic information that every wolf brings and evaluate the different levels of genetic improvement given by a given wolf. For example wolves that arrive directly from either the Dinaric population from Slovenia or the Apennine population of Italy will give higher genetic improvements to the overall population. This will be quantified within the model, to provide an evaluation of the important improvement that a single special wolf might bring. The identification of these "important" wolves will help building the Action C.4. around them. For this aspects the WOLFALPS project has a direct exchange and comparison of genetic data with the SLOWOLF project of Slovenia (see Form A8), and with the Alessandria Province from the Ligurian Apennines Mountains (see Form A8). In this way, we will also estimate the need of certain level of connectivity for the maintenance of a given genetic alpine population level status on the long term, in order to give important indications for the guidelines of the long term conservation of the species which will be developed in Action E.12.

A13 Wolf WEB GIS Portal

The action involves the construction of a Geographic Information System (GIS) portal via WEB, applied to the entire area covered by the project, which brings together information about the presence of the species, on cases of poisoning, poaching, and wolf depredations, which can be immediately visualized on a GIS map.

The Regione Lombardia, within the project LIFE ARCTOS, has already developed a WEB GIS portal for bear data management in the region, in collaboration with the CFS. This model would now be adapted to the wolf management needs for the entire area of WOLFALPS. Moreover, the University of Ljubljana developed a wolf WEB portal for Slovenia within the project LIFE SLOWOLF, which will be taken as an example to better implement the wolf alpine WEB GIS portal in the Alps, to which it will be directly connected. The data entry of the WEB GIS portal can be performed by each partner, with immediate availability of the data by other partners.

A call number (1515) will be promoted to receive general public poisoning detections, wolf sightings, depredations detections, etc. Therefore, the CFS, through their own operations rooms 1515, whose staff will be properly trained in coordination with the Partners involved, can act as a collector of information coming both from technicians, citizens, and general public, contributing to successfully implement the system. All this information will be directly inserted in the WEB GIS portal.

The wolf WEB GIS portal will then provide a useful tool for collection and dissemination of knowledge about wolves within Partners, and among the general public in real time. Submission of data will be open to everyone, just at different levels. Therefore, the WEB GIS portal is aimed to ensure and facilitate contacts and updating of data among partners of the project, and for collection of information on wolf sightings, on other occasional collected wolf sign and poisoned data from the general public at the large scale. Added benefit of this infrastructure will be that it will be possible to present project results (e.g. results of non-invasive genetic sampling) through a WEB GIS (mapping) interface to the wider public, educating and informing the public about actual wolves living in the area. The Wolf WEB GIS Portal will be linked to the project web page, developed in Action E.9.

A14 Definition of the communication strategies and coordination on the educational campaign on wolves

A preparatory action is needed to organize, and start implementing the complex communication strategy, which will involve every partner but will be coordinated by the Museo delle Scienze di Trento (MUSE). The communication strategy will involve two main sectors, which will give ad hoc types of information, in particular the Western side of the Alps where wolves have stabilized since a decade, and therefore the type of information is based also on past actions and should start from there; and the Central-Eastern side of the Alps, with preparatory communication in order to set the stage for the recolonization of wolves even in areas where wolves did not appear yet. The communication strategy in the Western Alps will be under the responsibility of the PNAM, whereas in the Central-Eastern Alps will be under the responsibility of the MUSE. Every activity of this preparatory action will be directly related to Action E.2 to E.14. which are the actual communication actions, and will be based on output and data that come from Actions C.1., C.2., C.3., C.4. and C.5. A starting meeting to define the coordination between the different partners on the communication strategy within the Wolf Alpine Communication Group, will be done at the beginning of the WOLFALPS project. The meeting will be held in Italy in Trento at the MUSE within the first 3 months of the project and will be attended by at least one representatives per each partner institution involved in communication strategies, and by at least one representative per each supporter institution that will divulgate communication products or be involved in communication events and campaigns. In this meeting a common decision will be made to soon realize the logo of the WOLFALPS project and the common letterhead, as well as the common graphic style for every product with the logo of the WOLFALPS project, of the LIFE projects, and of every partner.

In particular, for the logo of the WOLFALPS project, a competition of ideas organized by the MUSE, interesting areas of every partner institution and beyond within the Alps, aimed at young people (15-35 years) could ask participants to conceive and design graphic solutions for the logo

identifying the project. If possible, the competition should provide a cash prize (at least symbolic) or an experiential prize (e.g. a significant experience within an art foundation -if the winner is an artist- or inside a scientific institution partner of the project -if passionate of science). A mixed jury of artists and scientists will evaluate the proposals, together with the Wolf Alpine Communication Group.

C1 Control of poaching and anti-poisoning actions in the alpine core areas and beyond

First it is necessary to intensify the level of detection of poisoning and poaching events.

Hence, operators of the Forest Service, Parks, and Provincial Police personnel, will be started up on a team per each core area, focused on poison detection and anti-poaching action. One team (see Action A.6.) will be set up in every core area for the detection of illegal use of lethal means for controlling wolf populations. The teams will operate on a regular manner and the project will only cover the expenses for setting them up and fine-tuning their operational services over the first 3 years of the WOLFALPS. A minimum of three test sessions organized to look systematically for poisoned baits per core area will be held during year 2 and 3 of the project, focusing in areas identified by Action A.7., A.12., and A.13., in order to start using also the experimental canine team that will be established in Action A.6., with dogs trained by the professional trainers and through an exchange of experience with people from ANTIDOTO Project. The teams shall control the territory to locate the potential poisoned baits or corpses of wild or domestic animal dead for suspicious poisoning. After, anti-poaching and anti-poison actions will be regularly organized throughout the project areas. Moreover, WOLFALPS plans to organize actions for local veterinaries and wardens and distribute several Kits for collecting poisoned animals/baits. Detailed toxicological analyses on predator carcasses or on baits will be undertaken in order to assess the type and incidence of poison used. This will also increase the level of poisoning detections. Moreover, detections will be improved using camera traps and night vision devices when needed.

Secondly, after increasing detection and knowledge on the problem, all the entities will also participate and develop awareness raising sessions, mainly directed to hunters and farmers, but also to the local and general public. This will increment knowledge of the problem and on the deleterious effects of the poisoning on ecosystems but on pets as well. Therefore, a call number (1515) will be promoted to receive general public poisoning events or baits sightings, or poaching detection. Then these sightings will be directly viewed in a spatial GIS map, directly using the WEB portal (see Action A.13.). In this way a general negative attitude towards poachers will be developed and also a general public control over these events. A public campaign will be developed to help in this objective (see Action E.2.).

Thirdly, assuming better detections, the action will provide a start up phase for legal persecution, which falls in ordinary Forest and Park Service competence, beyond this project. WOLFALPS will also enable to speed up the judicial process when suspects are identified, covering the costs of the necessary detailed toxicological analysis to confirm the presence of poison and identify the toxics, and, if needed, contracting for this purpose a lawyer. The considerable price of detailed toxicological analysis is also often a strong reason for those indirectly affected to drop the accusations, as well as the costs of specialized environmental lawyers.

Finally, the development of a coordinated and interdisciplinary strategy to be adopted at the end of the WOLFALPS project is fundamental to integrate the findings and the experienced developed within the WOLFALPS in ordinary activities by the different Entities involved. This strategy will be elaborated involving authorities and Italian entities that are interested to this topic and will be the first reference in the fight against this harmful practice, giving the tools for investigation on this phenomenon and offering measures to be adopted at several fronts. Therefore, a final workshop will be held to develop the strategy, organized by the CFS in Ceva (Western Alps).

C2 Preventive efforts in new recolonized wolf areas

In new recolonized or potential wolf areas, preventive methods are usually totally missing. The knowledge and experiences in preventive methods developed in the core areas of the Western part of the Italian Alps, where wolf packs have been present for more than a decade, are important to be transferred to the new recolonized areas. In particular, the two most effective preventive measures to be firstly adopted are the use of livestock guarding dogs (LGD), and of electric fences for livestock confinement over night. At the beginning the farmers are usually reluctant to apply livestock protection measures. By providing a "good practice" example and demonstrating effectiveness of damage prevention measures from shepherds of the Western Alps who optimally adopt such measures reducing the wolf attacks, we aim to stimulate farmers to start implementing effective protection measures if their livestock is likely to be attacked by wolves. At least 3 field trips of shepherds from the Eastern Alps to the Western Alps will be organized. In this manner the action directly addresses the problem behind the threat.

First, on the basis of information gathered in Action A.8, a list of potential livestock owners willing to participate in the project will be drafted from new recolonized areas, where no or few preventive measure are present yet. Depending on the characteristics of their husbandry type and methods, considerations will be made on what kind of damage prevention measure would be most appropriate. In case of expressed willingness to receive a livestock guarding dog or fences, a contract will be signed for regulating the responsibilities and duties of the beneficiary. The contracts are signed between the entity responsible for donating the dog or fences and the owner of the livestock. It identifies both parties, the dog (microchip) donated or all the equipment of the fence given, and states the terms of education of the dog or adequate use of the fences as well as the rules the farmers should observe regarding dog welfare, breeding, maintenance, health, mortality and legal responsibility or fence maintenance. It enables the exclusion of the farmer from the project and the restitution of the dog/fence in case of breach of agreed conditions. The contract will also include a statement saying the farmer will report any wolf damage/observation and will not incur into any illegal activity. The contract will also include an article that will require the recipient of devices to commit themselves to use them following good practices for at least 5 years after project end, reporting their status yearly to the other contractual party.

LGDs: the Parco Naturale Alpi Cozie (PNACozie) in the Western Alps developed over the years a large experience with selecting, preparing and donating LGDs. Therefore, the (PNACozie) will be in charge of preparing and selecting the first group of LGDs to be given in recent recolonized areas, in connection with local partners, who will after take in charge the measure. Particularly, dogs will be assisted by the Parco's staff at least during the first year of their life, providing basic veterinary care and vaccinations as well as appropriate food. Dogs will be integrated into new flocks/herds when 5-6 months old, purchased from assessed dog owners, and possibly from owners who have benefited from livestock guarding dogs previously during the Wolf Project in Piemonte, thus establishing an amplification mechanism for transfer of experience and a network of dog breeders that would be self-sustainable after the end of the project. Regular visits will be made in order to monitor the physical and behavioural development of the dog, its raising conditions and welfare as well as the appropriate owner's attitude by local partners. Livestock guarding dogs are extremely effective when raised appropriately, as working dogs instead of pets. It is thus important that the dog stays all the time with the livestock it will have to guard and its sanitary condition is well looked after by the owner. The dogs will be given during years 2 and 3 of the project, but the farmers will be assisted by the personnel of the project partners also during the last two years in order to help them in solving possible problems that may appear and ensure the correct development of the dogs and their efficiency. Moreover, a new centre for preparing and donating LGDs will be started in Regione Veneto in the Eastern Alps, and the PNACozie will assist in correctly implementing the new centre. Informative panels that will inform on LGDs presence in pastures and on general attitudes to maintain in case of encounter will be realized and distributed to every pasture that implement LGDs.

Fences: electric fences are usually best suited for confining flocks at night and in limiting small/medium pasturelands. Also electric fence might be of various types (e.g., wire or net), depending on the mobility of the flock and the terrain it will be set up on. For nets, two heights will be used: conventional nets of 90 cm, and a higher net of 145 cm, which is a stronger electric net to improve the safety, but as it is heavier, it is less suitable for frequent replacing of the enclosure and for use in zones not served by roads. Eventually, nets developed within the ARCTOS project will be adopted (see Form A8). Therefore, both fences will be used according to farmers' need. The perimeter of the fences will vary depending on the needs of each holding and discuss together with the shepherds. After the WOLFALPS, and for at least 5 years, the recipients will be requested to report about their functionality. The Parks are ready to commit about the long term use of the devices.

Fladry and acoustic devices or other aversive conditioning devices, successfully tested in Action C.3., will be applied when needed, especially concerning cases of cow and calf deprecations.

Moreover, non-invasive genetic samples of predator saliva will be taken from the surrounding of bite wounds on killed animals just for areas where a potential new dispersal is present, to determine species (wolf or dog) and recognize individual wolves from genotypes. This will be conducted to confirm wolf responsibilities in doubt deprecations, and further concentrates preventive efforts in a cognitive manner. To increase genetic laboratory success rates (which are particularly low in such cases) and decrease costs for genetic analysis, an extraction laboratory at the Headworkers of the Coordinating Beneficiary will be set, in order to immediately extract DNA after collection and improve DNA preservation, thus improving success rates and decreasing costs. Then, extracted DNA will be sent to the contracted genetic laboratories

C3 Test of new techniques and ad hoc pastures management plans implementation in the Western alpine core areas

In the core areas in the Western Alps where wolves have been present for a decade (Maritime Alps core area 1 and Cozie Alps core area 2), preventive measure have been widely adopted, especially LGDs and electric fences by sheep/goats herders. However, also if in the majority of cases preventive methods proved useful, in some cases the preventive methods did not reduce the number of attacks. It is very difficult to actually test preventive measures, because we can easily document when they did not work because of a successful attack, but we never have the ability to directly demonstrate when the measure effectively worked. Therefore, we want to test the methods to better understand the mechanism behind it for these particular cases, as well as we want to test new preventive measures, especially in relation to new documented cow deprecations.

A first test will be to select, on the basis of obtained results in _____, approximately 20 pairs of farms with the similar production system and structure, size and location, where on one farm the damages from wolves present a serious problem and on the other one not. We will conduct a structured interview and farm business analysis on all selected farms, to assess the management strategies, costs of damages vs. costs of prevention, and estimate the levels of vulnerability per pastures. Then we will carried out statistical analysis to scientifically understand the most important variables which can affect vulnerability of a pasture, to more efficiently use the combination of different preventive methods and provide general recommendations for it.

Secondly, in farms where, notwithstanding the use of LGD and fences, wolf attacks still occur, we will implement an ad-hoc pasture management plan in collaboration with the shepherds to actually analyse the other potential causes for livestock losses (e.g. few water places, presence of highly bushed areas, etc.) and try to improve them. If this has been already elaborated within local land management plans (Action A.11.), this Action will directly implement the Local land management plan.

Thirdly, in the Western Alps, in areas where shepherds already decreased sheep losses due to the implementation of preventive measures, wolves recently switched to cow deprecation. Few preventive methods are adopted with cows, and new approaches should be developed in the

alpine context for this new issue. In particular, fladry and acoustic devices or other aversive conditioning devices that produce sounds and combinations of them will be tested, as well as an improvement of pastures management strategies (i.e. calves should be born in low land pastures and not in the mountains). Moreover, fladry and acoustic devices or other aversive conditioning devices, will be tested in the Parco Naturale Alpi Marittime wolf captive facility with captive wolves first. Specific LGDs from Action C.2. will be prepared to defend cows, based on the same strategy.

In the core area 1 of the Maritime Alps, where these 3 different approaches will be implemented, wolves will be captured and radiocollared, to effectively test the measures adopted and be able to effectively quantify the decrease in livestock depredation, especially in relation to given variables. An experimental design to test the methods will be developed and applied. Moreover, at least 5 selected locations will be equipped with autonomous infrared video cameras to be used to record the potential wolves' presence, their behaviour and reactions to the prevention measures. This will allow to make a cost/benefit ratio of the protection measures, given a decrease in livestock depredation.

These activities will be mainly developed where wolf packs are stable, in particular in the core areas in the Western Alps where wolves have been present for a decade (Maritime Alps core area 1 and Cozie Alps core area 2), and implemented by the Parco Naturale Marguareis, Parco Naturale Alpi Marittime, and Parco Naturale Alpi Cozie

C4 Develop Wolf Eco-tourism

Objectives of local land management plans developed in Action A.11, which concern development of wolf ecotourism, are fulfilled.

To enhance wolf eco-tourism within core areas, wolf friendly products will be sustained, like cheese or meat from shepherds who belong to the preventive program and have succeeded in reducing depredations, with the logo of the local Partner, the LIFE project, and the wolf friendly one. Other wolf friendly products might be special wolf pastries, bread, and other local products which help to increase local wolf acceptance.

Moreover, eco-tourism might be developed with tourist visits in the summer period to Park's pastures and shepherds that adopted good preventive measures. Explanations will be given on the effects of preventive measures and the coexistence between human activities and natural predators.

In the winter period wolf tourism based on snow-tracking is promoted locally to have local communities benefit from wolf presence, thus contributing to improvement of socio-economic conditions of local communities. Specific trails within Parks will be named after wolves, and panels information set along the trails, as well as promotion of the trail and the sites.

Few wolves, of which we know the detailed story and might be of particular conservation importance (especially if dispersing from the Dinaric or Apennine population), detected and evaluated in Action A.12, will be named, and a public campaign – like "adopt an important breeder" – will be developed to improve ecological tourism which directly gives money to local activities to support the presence of such important wolves

C5 Management of detected wolf-dog hybrids and injured wolves

Description (what, how, where and when):

In case of a detected and genetically proved hybridization case from Action A.5., the action will be implemented. The present action aims to capture, sterilize and release wolf-dog hybrids, or to capture, sterilize, and keep in captivity those individuals, depending on the local context. The Wolf Conservation Group, in collaboration with local authorities, will discuss about those 2 possibilities, in a case by case manner, and properly decide. Not always the removal of the wolf-dog hybrid is the best action to implement, because the removal of individuals that are included in the social

structure of the stable packs could negatively impact the social and territorial dynamic of the local wolf population; so the action could include the possibility of the release of the sterilized hybrid, if this is thought to be of less impact in the present population dynamic, but essential for the long term conservation of the species. Nevertheless these actions seem to be ineffective if not coupled with an important effort in awareness campaign and a decisional process shared with different social parts. This will be achieved in Action E.2. and E.8. Moreover, a strict coordination with the IBRIWOLF project developed in the Apennines (see Form A8), will allow to acquire and adapt to the Alpine scale all the suggested management recommendations developed in the framework of the IBRIWOLF project. The wolf captive facility of the Parco Naturale Alpi Marittime, which already hosts 2 rescued and not releasable wolves of the Apennine population, is the reference facility for every Partner and for the entire area of the WOLFALPS project. A special trained team of at least 5 Park rangers of the Parco Naturale Alpi Marittime will be prepared to urgently operate in such detected cases.

Moreover, injured wolves detected over the entire area of the WOLFALPS project will be rescued by the Parco Naturale Alpi Marittime team and at the moment put in the captive facility for veterinarian assistance and sudden released if possible, depending on the wolf ability to come back to the wild, as well as on the local social acceptance. Also those 2 possibilities (release or kept in captivity) will be evaluated in the framework of the Wolf Conservation Group.

An official wolf captive facilities coordination between the Alps and the Apennines, in the framework of the Stdbook of the CFS, will be implemented, with the formation of a working group composed by a representative of the wolf captive facility over the Alps (Parco Naturale Alpi Marittime (Italy), Saint Martin Vesubie (France), Adamello Brenta (Italy)), and in connection with the captive facilities over the Apennines (i.e. Amiata, Civitella Alfedena, Popoli). This will allow an integration and coordination between those to be used in a wolf conservation manner. Annual workshops will be implemented to developed a shared protocol of operations with recommendations.

The optimal management of the hybrids and injured wolves and the use of captive facilities for conservation purposes in coordination with Apennine findings and regulations will all be integrated within the Guidelines developed in Action E.12.

D1 Ex Post evaluation of the wolf population conservation status and its trend in the Alps, with a particular focus on the mortality rate

In order to have a benchmark value to compare with at the end of the project, an analysis of the trend in the parameters defined in Action A.5. is conducted. A survey, as described in Action A.5., is undertaken in the last year of the project (winter 2017-2018) for obtaining a measure of the effects of the actions implemented on the wolf population targeted. Technicians which already implemented Action A.5. that have received ad hoc training for the most appropriate techniques (Action A.3. and A.4.) take part at the monitoring. Systematic monitoring will be implemented in the same areas of Action A.5. and in every other new area where sightings or depredations have been reported through the use of the WEB portal (see Action A.13.). Methods applied will be the same as those adopted in Action A.3. in order to yield comparable results. A minimum of 800 samples will be collected and genotyped. Transects will be done searching for wolf signs and non-invasive samples will be collected for genetic analysis. Photographic trapping will be used and genetic analyses on non-invasive samples will also be done to detect the presence of packs and new individuals

D2 Assessment of the efficacy of damage prevention structures and livestock guarding dogs in key alpine core areas

The implementation of damage prevention measures (fences and dogs) has high potential for producing a positive impact on the local population. Their impact will be assessed both in terms of amount of damage and attacks suffered, but also in terms of satisfaction of the beneficiary. In fact such measures also contribute to the trust building process between local communities and local authorities, and to improve the conditions of shepherds. A questionnaire will be prepared for assessing the degree of satisfaction of beneficiaries and for assessing the status of awareness of the local populations on issues related to alpine wolf distribution. The activity will be developed in the last year of the project. Livestock owners in the project area will be interviewed in order to gather information both from those who benefited from damage prevention measures and those who didn't and to have a control sample in areas where wolf is not present yet, in order to compare the awareness level in different wolf presence situations. A questionnaire about the behavioural evaluation of LGD and the problems and solutions encountered also during the use of fences will be made. Interviews will be conducted to the 30 farmers involved that implemented prevention measures (dogs and fences) as well as to a total of 100 other livestock owners, 50 inside and 50 outside the alpine core areas range. Questionnaires will be prepared on a 5-point scales close-ended questions, so as to provide data that can be quantitatively analysed. Local reports with recommendations will be made by each partner, and a final database and document will be put together by the Regione Veneto

D3 Ex-post survey on the knowledge level and attitudes towards wolf presence in alpine core areas

After the information campaign and the implementation (Actions E.2., E.3., E.4., E.5.) of the various management measures within the project (Actions C1, C2, C3, C4), a survey on knowledge and attitudes toward wolves and wolf management will be needed for analysing: i) changes over time, ii) the nature of the change iii) to evaluate the success of management activities in improving acceptance of wolves in the project areas, and iv) to assess visibility of the project among the targeted interest groups. The opinion poll will be undertaken in the last year of the project with the general public and the interest groups, in areas where practical conservation measures were applied. Those who agree on being followed up at the final stage of the project will be included in the project and interviewed again under this action using the same questionnaire. The same approach for sampling will be used as in Action A.10. The number of cases recorded for the general public and the interest groups will be the same as in Action A.10.

D4 Assessment of socio-economic impact of the project and ecosystem functions in the core areas

A study for evaluating the impact of the project on the socio-economic situation in the study area will be conducted, and to be effective should be structured from the first year. The study will gather data during the whole project duration, using indicators such as: % of economic losses each year for livestock producers, % increase in production and sale of local products, increase rate of tourists in the areas, etc.

The assessment of the impact the project will have on the ecosystem will also be evaluated through the use of indicators such as the balance between the number of wolves present in the area, the number of wild prey and the number of losses due to attacks to livestock, although the latter is not to be considered an indication of ecosystem unbalance as wolves are very generalists and do not shift to domestic prey only in case of lack of wild prey, together with the economical improvement that the species will bring.

E2 Public awareness and education campaign about wolves on national and local levels

Relations with media: We will use the possibility of promoting wolf conservation and the project through the media. We will prepare press releases or organize press conferences on all major occasions with regards to the project implementation. Newsletters will be regularly sent to the journalists and the media.

Several initiatives will be implemented for the general public.

These initiatives will be realized and started by the MUSE, and after locally adopted and adapted by every partner, and eventually by interested supporters (see Form A8).

Promotion of a drawing competition (*In my opinion... the wolf*)

Targeted to families, a drawing competition called "*In my opinion... the wolf*" will be carried out among children aged 6 to 10 years (frequenting the primary school in the Alps) with the aim to collect and measure the "image" that children associate to the figure of the wolf before, during and after the process of awareness achieved with the school activities.

The competition will consist of three phases: beginning (2013), mid-project (2015), conclusion (2017). The drawings collected will be posted at the museum, building a "growing" traveling-exhibition (to organize in the middle years of the project, 2014 to 2016) which is aimed to detect the possible (desirable) changes of perception. Of course, the collection of drawings should also be exhibited by the partners interested that are involved in the project, and organizations who have supported the project or are sensitive to the preservation of the wolf.

Production of a theatrical scientific entertainment (*On the tracks of the wolf*) dealing with the "discovery" of the wolf and the knowledge of the project *Life Wolf*, as well as with the socio-historical context of its presence in the Alps:

Communicating through the language of emotions has the advantage to be often capable to contact even such a groups of citizens which are typically not involved in the topic. The introduction of this zoological focus into an artistic area (the theatrical one) means, in other words, to offer the argument to a different audience.

For script and staging professional directors and playwrights will be involved, whereas the scientific explainers MUSE could play as actors.

The show lasts for 1 hour and will be adaptable to different spaces, therefore it may be repeated in various theaters as well as in museum spaces or during festivals. As a prosecution of the performance, it can be evaluated to propose to the public a dynamic engaging and interactive role-play managed to collect the opinions with the aim of creating a report of the different points of view. Characters of the performance will be used as "mascotte" in other products, with the wolf friendly products developed by Action C4, as well as adopted by partners in their educational activities.

Photo contest (*The eye of the wolf, the eye of the man*) and photo exhibition, in collaboration with the local newspaper:

A wide-range collection of photos and images on the theme of the relationship between wolf and man (some of which to be published in the local newspaper) could provide a valuable material for a visual exhibition inside the museum, which can then also itinerate through the territory concerned by the project. A jury of experts will monthly evaluate the photographs and decide the three "ultimate" winners as well as the first 30 players. This action maintains the public vigilant on the issues of *Life Wolf*, as the newspaper will publish new images during the complete duration of the contest (a "refreshed" photo-gallery every month) as far as periodic "recalls" to stimulate a continuative relationship with their readers. The proposal could be scheduled at the beginning of the project (2013) and the conclusion of the same (2017) it could be evaluated if the perception of wolf has undergone a change over time thanks to the *Life Wolf*.

Outdoor site-specific exhibition of art installations (*Lupus en plein air*):

In the "middle" of the project (2015) a competition for young artists (under 40) could be successful in raising awareness about the project *Life Wolf* through high impact actions (and impressive objects) on local and national public. The competition asks artists to create site-specific art installations (inspired to contents and the objectives of the project *Life Wolf*) to be built up in the historic centers of the cities involved in the project. Through the competition 8 project ideas have to be selected, allowing the realization of the corresponding art installations in some open places of the cities (4 in each one), and giving the possibility to 8 young Italian artists to express their art and give their contribution to the spread of the contents of the project. Of course the eight selected artists will realize their works dialoguing directly with scientists. *Lupus en plein air* aims to bring the public closer to the scientific content of the project through an aesthetic experience and at the same time to strengthen the social function of scientific institutions

E3 Promotion of coexistence of wolves with agriculture

Promotional materials, including brochure about use of the electric fences in damage prevention, brochure about use of the guarding dogs in damage prevention, and brochure about use of fladry and acoustic deterrents, will be prepared and distributed to the farmers through the agriculture advisory service.

Local meeting with shepherds will be taken in year 2 and year 3 in each core area to explain the project, and the strategy in the adoption of preventive measure, with invited shepherd of known well developed preventive measures experiences. Sheep farmers which are successful in preventing the damages will be an important part of the communication strategy, because usually shepherds tend to believe to other shepherds more than on researchers or managers.

This Action will be carried out in accordance and simultaneously with Action C.2. and C.3

E4 Promotion of coexistence of wolves with hunters in wolf areas

We will organize lectures for hunters in each core area about the wolf, its biology and role in the ecosystem, as well as on the results from the project. Following lecture will be one-hour discussion about current wolf conservation issues in the Alps. Lectures will be organized together with the regional associations of hunting clubs in the wolf range, the local hunting districts, and interested hunters. The effect of the lectures on knowledge and attitudes will be assessed through questionnaires. An informative publication on predator prey behaviour and on the wolf impact on ungulate populations will be produced and distributed to the hunters at a local scale.

E5 Education campaign on wolves for schools and educational activities

A series of different activities for the schools and children, varied depending on the features of the target (age, cultural background, etc.) will be designed and organized with the aim to raise the knowledge and the awareness about the wolf and to improve the acceptance of wolf inside areas where its appearance seems to be very close. Every initiative and product will be realized and started by the MUSE, and after locally adopted and adapted by every partner, and eventually by interested supporters (see Form A8).

"Work-packages" for school:

The Wolf Alpine Communication Group will co-operate to project and realize concerted educational programs specifically dedicated to this species and generally dealing with the return of great carnivores on Alps.

Specific "work-packages" for school, comprehending laboratory activities and indirect research experiences, will be developed for students of all levels: obviously, the contents will vary depending on the different school-level (elementary, middle and high). The museum will also provide for the preparation of teaching tools, the assembly of educational kits, and the

implementation of simulations of field researches and analysis techniques, including the identification and classification of natural findings like tracks, scats, remains of predation and other signs of presence. Analyzing the wolf behavioral patterns showed in documentary movies, deepening on ethological topics will be also carried out.

These work packages will be adapted and adopted by every partner in their local activities with schools.

Moreover, every Park will organized local visits to wolf areas for schools, in combination with the activities of the MUSE, which will be promoted at the alpine scale. Exchanges between schools in the Western and Eastern part of the Alps will be promoted and carried on.

Children's book

Writing a story with the aim of creating a book with illustrations is another way to reach children aged 5 to 8 years on the issues of the project. To propose the themes of *Life Wolf* with the language of written and drawn narration and design meets the mindset that identifies the wolf as the "enemy" of many fairy tales, and allows the repositioning of its image under a different point of view.

The drama of the story would be created through the co-operation a working-group made up of scientists (experts zoologists) and writers, as well as expert communicators in languages of childhood and illustrators, each taking his own skills in this collective work.

E8 Education campaign through captive facilities on wolf conservation and hybrids

In Italy, wolf captive facilities are used as an important instrument for educational campaigns. Since 2010, at the PNAM is open to the public the Centre "Men and Wolves", which is an educational centre on wolves-human issues joined to a wolf captive facility, where wolves can be occasionally observed. This action involves the implementation of new communication activities, in synergy with other communication activities developed within the WOLFALPS, in order to ensure an important communication strategy on all issues addressed within the WOLFALPS (e.g. hybrids, poisoning, poaching, prevention systems).

The communication will be direct to visitors and schools through an animator who will welcome visitors and schools, help in understanding particular wolf-related issues, collect impressions and suggestions, as well as make targeted interviews.

Specific products on wolf-related issues, faced within the WOLFALPS project, will also be prepared, in particular dealing with:

- The role of wildlife areas that keep wolves in captivity (related to Action C.5.)
- The problem of the presence of wolf-dog hybrids for the long term conservation of the wolf population in the Alps (related to Actions A.5. and C.5.)
- The problem of poisoning and poaching (related to Actions A.7. and C.1.)
- Evaluation of the prevention systems (related to Actions C2 and C3)

E9 Project web page

PNAM and MUSE will co-operate (supported by web specialists) in the planning, design and realization of a "dynamic" (user-friendly and easily updatable) website, which allows operative access to all the partners who can care for and implement the information on the various actions and results of the project, upload photographic and filmic documentation as far as technical and educational material and act as a forum able to give scientific answers stimulate participation among citizens .

Informative and educational material has to be freely downloadable for everybody.

The site will be directly linked to the WEB GIS portal for collection of information on wolf sightings or other occasional collected wolf sign, as indicated in Action A.13.

E10 Touring exhibition starting from the Museum

A touring exhibition dedicated to the wolf and its return to the Alps will be arranged to be housed in a semi-permanent (at least one year) and upgradeable form in the MUSE. After that, the contents and objects (fitting to the situation of the two areas and the needs of the various partners, e.g. Parks) will be replicated in an itinerant version to be hosted in other locations. A final permanent exhibition will be housed in the Parco Nazionale Val Grande.

The preparation of the exhibition will obviously include the stages of documentation, drafting and layout of texts, the finding of images, the drawing of illustrations, maps and other graphics, the project and realization of exhibits, the recovery, purchase or loan of specimens, eventually their preparation, the compilation of an exhibition catalogue, the assembly of multimedia or videos using footages provided in Action E2, the carrying out of educational activities for visitors and schools.

Partners will host the touring exhibition, and eventually in Parks smaller permanent exhibitions at the local level will be set.

E11 Touring annual thematic conference

An annual thematic conference will be held in 3 consecutive years, in a main area over the Alps.

The area in every year which will host the conference will be:

- 2015: Regione Lombardia
- 2016: Parco Naturale Alpi Marittime - Parco Naturale Marguareis (2 days)
- 2017: Regione Veneto

E12 Guidelines for wolf alpine population management and conservation and workshops on best practices

The goal of this action is the elaboration of specific Guidelines for the wolf alpine population management and conservation on the long term, under the supervision of the Environment Ministry of Italy (see Form A8). These Guidelines will be built following the multidisciplinary protocols, reports and recommendations developed within the WOLFALPS LIFE Actions. In particular, the outputs of Action A.3., A.5., A.7., A.8., A.9., A.12., A.14., C.1., C.5., D.2., D.3., D.4. will be directly used to build up the Guidelines for wolf population management and conservation over the Alps. The Guidelines will be produced, in an iterative process, with the contribution of every partner of the WOLFALPS LIFE project, following suggestion by every official Supporter of the WOLFALPS LIFE project, and with contribution by other organizations of France, Austria, Swiss, and Germany in the Alps. The main objective of the Guidelines is to establish a coordinated system of conservation and management of wolf in the Italian Alps and in the overall Alps, thereby increasing the potential for their long-term conservation while minimizing the number of human – wolf conflicts. To achieve this it is crucial to highlight the communication among the stakeholders involved. ~~By including species experts and stakeholders directly in elaboration of the Guidelines,~~ the quality of the Guidelines on wolf management will be improved, and their implementation eased. In order to better synchronize the actions on the international, population level, colleagues from other States within the Alps will be invited to participate in elaboration of the Guidelines as this will ensure better coordination and synchronization of conservation activities at the population level. The final version of the Guidelines will be presented to the public at the Alpine Wolf Congress (Action E.14.) and on the web page, and printed and distributed.

Finally, managers must be made aware of the Guidelines. Three workshops will be held in Italy with managers of the relevant authorities in the regions where wolf presence is recorded in order to provide them with the best practices regarding wolf management and conservation. Topics treated will include: production of reliable and trusted estimates of wolf distribution and abundance, adoption of techniques for estimating hot spots of conflicts between wolf and humans, anti-poaching actions implementation, adoption and efficacy of damage prevention measures, potential impact of development infrastructures, adoption of collaboration approach with local livestock owners, formulation of coordinated strategies across administrative units, development of sound management plans. The 3 workshops will be held in Torino, Milano, and Padova

E13 Layman report

A final report of 5-10 pages long, produced in paper and electronic format, that will contain information on all activities of the project and the status of the wolf in the Alps. It will be an easy publication with a simple but correct use of the terms and the results, suitable for an audience of non-experts and the world of school. The report will describe the different stages of development of the WOLFALPS LIFE project, update on the several action taken and contain a summary of the various cultural products created for outreach activities and for the general public.

E14 Alpine Wolf Congress

One Alpine congress will be organised during the last year of the project in 2018, inviting wolf experts from the Alps and Italy, but also other foreign specialists. The Large Carnivore Initiative for Europe will be invited to host their annual Core Group meeting during the same days, thus ensuring a high level international participation. The congress will be the opportunity to set the status quo of the Alpine wolf research and management activities. The congress will last three days out of which two days will be devoted to presentations and a workshop dealing with a major wolf conservation topic and one day to a fieldtrip. Poster session will also be included, giving the possibility to students and researchers to present their results from work around the Alps. Topics around which the meeting will be developed include:

1. Transboundary monitoring and management measures
2. Antipoaching and antipoisoning issues
3. Methods for increasing co-existence between wolves and human activities
4. Any other factor that threatens wolf conservation (e.g., hybridisation with stray dogs, road accidents, etc...)

The meeting will be held in Trento and organized by MUSE

F1 Coordination of the project

Project coordination between the different partners will be under the responsibility of Parco Naturale delle Alpi Marittime (PNAM). Staff of PNAM is experienced in managing EU-funded projects at national and international level and has a long standing experience in wolf conservation (acquired through the Progetto Lupo Piemonte). WOLFALPS will enjoy the presence of a senior part time project responsible (PR), a full time project technical manager (PM), a part time administration and accounting responsible (AR) who will only be responsible for project financial management with the support of a consulting body specialised in LIFE administration and reporting (AC). The PR will ensure effective and timing implementation of all project activities, will hold meetings and discussions for assessing project progress and eventually discuss the strategic actions to be taken. She/he will oversee the work of the AR and will hold the formal communication

with the EU. The PM will follow the technical implementation of all project activities, under the overall guidance of the AR, and will work in tight collaboration with her/him in order to make sure that needed contracts and agreements for consultants and project participants will be prepared in due time, and that the project budget is being used effectively and expenses made in due time. PNAM staff will prepare and sign partnership agreements with the project partners and will regularly visit project sites. Coordination video- and teleconferences will be held on a constant basis, while meetings will be held every six months. The PR will also supervise the preparation of all reports by the PM to the EC and the preparation/revision of ToRs for all consultants and subcontractors. Each partner will have staff dedicated to financial administration of the Life budget and the technical implementation of activities under their responsibilities, particularly devoted to the necessary administrative procedures for LIFE project implementation. Staff will hold continuous communication with the respective responsible people in PNAM for seeking advice and get guidance on timing implementation of all activities.

All the partners will meet every six months to put in common the experiences done over the last few months and to set up common approaches for the development of the future actions to be implemented.

In accordance with art. 32 of the Common provisions, an external financial audit will be performed at the end of the project. The auditor shall verify compliance with national legislation and accounting rules and certify that all costs incurred comply with this grant agreement. The auditor report will be delivered following the guidelines set by the Commission.

F2 Overall evaluation and monitoring of the project conservation achievements

A detailed action plan will be developed at the beginning of each year, with contribution from all partners, to whom a request for planning the development of activities under their responsibility will be sent. Such detailed action plan will include a time table for the year and a «comments» column, where detailed description of activities developed or problem arisen will be reported. The PM will ask monthly updates on the progress of actions implementation and will check the involvement of each partners, as well as the action timing with regards to the project proposal. Monthly meetings will be held among PRAM staff (PM, PR, AR and MC) in order to assess the monthly updates against the project objectives and action implementation.

A set of indicators will be developed for assessing implementation and achievement of expected conservation results from each action.

F3 Networking with other LIFE and non LIFE projects

Description (what, how, where and when):

Wolf conservation in Europe is a critical issue as the species is controversial and locally faces different situations (from expanding to local extinction). Many activities are being developed throughout Europe and the project will establish contacts with most of them. Particular links will be made with the Large Carnivore Initiative for Europe (LCIE), an IUCN Specialist Group, which is represented by a group of independent experts from 18 countries in Europe (including some countries not member of the EU, e.g., Croatia, Norway and Switzerland). The LCIE is a collector of information and the members are aware of all wolf (and other large carnivores) management issues-undergoing-in-Europe. Members of the LCIE will be invited at the Alpine Wolf Congress. Ongoing Life projects (e.g., ARCTOS, MEDWOLF, ANTIDOTO, SLOWOLF, IBRIWOLF) will be contacted and invited to our areas, as well as visits to their project areas will be done if necessary (see form A8). In these visits, issues particularly relevant to wolf conservation in their respective countries will be discussed and exchanges of information, experiences and opinions will be ensured. Experts from other countries will be invited to join the Alpine Wolf Congress (Action E.14.) in order to discuss specific issues and bring in the experience from other countries that host wolf populations stretching across administrative boundaries

F4 After LIFE plan

The after Life plan will be produced during the last trimester of the project, in order to organise those activities that will need to be continued after the end of the project. They will include: the assessment of wolf presence (Action D.1.), the assessment of damage caused by wolf (Action D.2.), the coordination of the working groups (Action A.3.), and the control of illegal activities (Action C.1.). Responsibilities and means for undertaking these actions will be detailed and agreed upon. The plan will include two sections, one per region stratified according to wolf presence, and most likely targeting Western and Eastern Alps separately, and a section for the activities in common (e.g. Working Groups management).

Beneficiary short name	Cost category in Euro										Total
	Personnel	Travel	External assistance	Infrastructure	Equipment	Prototype	Land	Consumables	Other	Overheads	
PNAM	802.235	32.050	507.500	50.000	60.000		121.000	11.100	120.000	1.703.885	
CFS	978.850	114.622	48.950		278.670		119.760	29.425	110.000	1.681.277	
MUSE	269.820	37.700	174.300		30.000		44.000		38.500	594.320	
PNACozia	69.366	4.840	149.900		14.000		19.425	30.000	19.700	307.231	
PNMerg	154.271	9.720	164.000	35.000	49.800		29.400	7.600	20.000	469.791	
PNCissola	27.374	4.799	31.200				18.914		5.760	88.047	
PNSalvio	34.905	12.436	73.160				74.600		16.000	214.101	
PNVG	26.031	5.235	75.500		5.000		23.500		6.000	141.266	
RLombardia	98.407	48.560	491.000		154.600		12.720	3.000	56.590	895.077	
RVeneto	231.415	9.262	190.500		110.300		13.260	55.500	42.500	652.757	
TNP	94.050	17.500	55.000		20.050		10.000		13.782	210.382	
UL	140.124	23.502	17.362		5.900		25.300		14.863	227.041	
Vealvatori									0	0	
Total	2.926.848	320.248	1.979.372	85.000	728.520	0	511.879	136.825	466.685	7.155.155	

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