

## LIFE+11 NAT/IT/069

### MIDTERM REPORT

**Covering the project activities from 1/09/2012 to 30/11/2017**

Reporting Date:

**15/06/2018**

### LIFE MEDWOLF

#### Data project

<b>project location</b>	Italy and Portugal
<b>project start date:</b>	01/09/2012
<b>project end date:</b>	30/11/2017
<b>Total project duration (in months)</b>	64 months
<b>Total budget</b>	€ 3,278,021
<b>Total eligible eligible budget</b>	€ 3,278,021
<b>EC contribution:</b>	€ 2,452,150
<b>(%) of total costs</b>	€74,8
<b>(%) of eligible costs</b>	€74,8

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# 1. List of key-words and abbreviations

ALDEIA	Acção, Liberdade, Desenvolvimento, Educação, Investigação, Ambiente
AUSL	Azienda Unità Sanitaria Locale
BACI	Before and After Control Impact
CDPN	Carnivore Damage Prevention Newsletter
CEASG	Centro de Educação Ambiental da Senhora da Graça-Environmental (Education Centre of Malcata Mountain Natural Reserve)
CERVAS	Centro de Ecologia, Recuperação e Vigilância de Animais Selvagens (Centre for the Study and Recovery of Wild Animals)
Cexp	Communication expert
CFS	Corpo Forestale dello Stato
CIA	Confederazione Italiana Agricoltori Grosseto
COLDI	Coldiretti Grosseto
CONFAGRI	Confagricoltura Grosseto
CREA	Consiglio per la Ricerca in agricoltura e l'analisi dell'Economia Agraria
CUTFAA	Comando Unità Territoriale
DR	Detection Rate
EC	European Commission
ENCI	Ente Nazionale Cinofili Italiani
FCUL	Faculdade de Ciências Universidade de Lisboa
FESTAMB	Circolo Festambiente
FT	Field Technician
GL	Grupo Lobo – Associação Para a Conservação do Lobo e do Seu Ecossistema
GR	Provincia di Grosseto Dipartimento Sviluppo Sostenibile
HWD	High Wolf Density
ICNF	Instituto da Conservação da Natureza e das Florestas
IEA	Istituto di Ecologia Applicata
INIAV	Instituto Nacional de Investigação Agrária e Veterinária, I.P. (ex INRB)
INRB	Instituto Nacional de Recursos Biológicos
IPCB – ESACB	Instituto Politécnico de Castelo Branco – Escola Superior Agrária
IR	Inception Report
IT	Italy
IUCN/SSC	International Union for Nature Conservation /Species Survival Commission
IW-WG	Iberian Wolf Working Group
LCIE	Large Carnivore Initiative for Europe
LGD	Livestock guarding dogs
LPN	Liga para a Protecção da Natureza
LWF	Low Wolf Density
MTR	Mid Term Report
MUHNAC	National Museum of Natural History and Science of University of Lisbon
NGS	Non-invasive genetic samples
PAP	Programa Antídoto Portugal
PM	Project manager
PR	Project responsible
PR1	First Progress Report
PR2	Second Progress Report
PT	Portugal
SA	Scientific advisor
SDDT	Scat Detection Dog Team
SEPNA-GNR	Serviço de Protecção da Natureza – Guarda Nacional Republicana
TD	Technical director
US	United States
WAC	Wolf Apennine Center
WWF	World Wide Fund Italia Onlus

## 2. Executive Summary

The LIFE MEDWOLF project was realized to promote the stable presence of wolf in two rural areas of Mediterranean (in Italy and Portugal), where cultural habits of coexistence have been lost, through reduction of conflicts with human activities. The project started in September 2012 and ended in November 2017. The partnership included thirteen beneficiaries of different legal status, thus fostering the collaboration between the private and public sector.

The main objective of the LIFE MEDWOLF project were:

1. The reduction of conflict between wolf presence and human activities. The presence of wolf in rural areas is often associated to conflicts with human activities since the wolf can easily prey on livestock when it is inadequately protected (or unprotected) in the pasture lands. The conflict can become particularly acute in areas of recent wolf recolonization, where livestock owners lost traditional husbandry practices to cope with the predator, and it can degenerate in wolf persecution by humans thus posing an obstacle for wolf expansion and long term establishment of specie. The LIFE MEDWOLF project aimed to minimize this conflict situation through the implementation of damage prevention methods and reducing the human-caused mortality.
2. The increase of suitable habitat for wolf presence. The fragmentation of suitable habitat for wolf presence, particularly the presence of “social barriers” constituted by a high level of intolerance toward wolf, have a strong negative effect for predator survival since it doesn't allow the stable presence of viable populations. The LIFE MEDWOLF project intended to identify the most suitable areas for wolf presence, both ecologically and socially, and their level of connectivity, and to assess the incidence of illegal killing in order to focus the concrete and the communication actions in these areas to minimize the negative effect of such barriers for wolf survival.
3. Establishment of international dialogue for granting coherence of conservation and monitoring strategies for the Iberian wolf population. It is important that the shared population is managed according to shared objectives and using shared technical methodologies. The LIFE MEDWOLF project intended to share methods at technical level and gather inputs internationally on issues that are cross-cutting for wolf management.
4. Evaluation of efficacy of damage prevention strategies. Although damage prevention is considered a best practice approach for wolf conservation, a detailed analysis of efficacy of these instruments was never carried out in Italy and Portugal. The LIFE MEDWOLF project aimed at filling this gap of data through the assessment of effects of damage prevention measures provided with the concrete actions, by the implementation of national and international working groups for damage prevention measures and promoting the exchange of knowledge and experience with other projects with similar objectives.
5. Increasing the knowledge and the awareness about different views and the local situations associated to wolf presence, that often lead to conflicts between groups of interest holdings different positions. The LIFE MEDWOLF project has fostered exchanges of experience, participatory meetings among interest groups in order to share difficulties and stimulate understandings for ultimately share commonly agreed interventions.

The present report includes the following parts, after a brief **introduction** to the topic tackled by the project (**Section 3**):

**Administrative part (Section 4):** In this section the management system of the LIFE MEDWOLF project is presented. A description of the three project implementation phases –

preparatory, concrete and evaluation – is also provided.

The preparatory phase (realized through the implementation of 12 actions) has allowed the collection of preliminary data on wolf presence, areas potentially suitable for its future expansion, damages suffered by farmers and characterization of the conflict. These data were used to define both the management activities and the concrete conservation actions. In addition a communication strategy was defined and actors involved in wolf management and conservation were trained. The concrete phase was realized through the implementation of 6 concrete actions that delivered prevention measures (livestock guarding dogs and fences) and the implementation of anti-poaching activities.

Finally, the evaluation phase was realized in the last year of the project through seven actions and with the aim to evaluate the efficacy of actions implemented during the previous phases. The organigramme of the LIFE MEDWOLF project is described in detail and the changes due to three amendments to the grant agreement, are also described. Communication with the EC was undertaken through formal and informal channels mainly for requesting approval for minor or major modifications. Some critical points encountered during the implementation of the LIFE MEDWOLF project are exposed, and the most relevant ones are related to extraordinary efforts required to ensure coordination among the many project partners, lack of capacity of some beneficiary's staff in implementation of project activities that has required increased efforts from the coordinating beneficiary and modifications in the technical role of some beneficiaries. Particularly, the partnership was modified in 2015 when the Corpo Forestale dello Stato, CFS, became a new associated beneficiary of the project and was made responsible for the implementation of action C6. In addition, the associated beneficiary WWF has reduced its participation to the project due to internal reorganisation and this has requested a reallocation of roles and funds, and in 2016 the Provincial administration underwent major changes due to the application of National Law that planned the transfer of competences to the Regional Administration.

**Technical part (Section 5):** In this section the description of results achieved and ways of implementation of each technical action (preparatory, concrete and evaluation) is presented. In brief, the results achieved are:

- Development of reliable surveys of wolf presence and status, with comparison to previous data available (A2: Ex ante wolf survey presence, D3 – D4: assessment of wolf presence in Italy and Portugal). Action A2 was prolonged in order to test the effectiveness of detection dog and allow the full use of this new method during wolf survey. The wolf range and population appear to be increasing in both project areas.
- Promotion and implementation of damage prevention measures in holdings with high levels of damage or in areas at higher risk of predation as resulting from preliminary surveys (A3 – A4: Ex ante survey on wolf damages). Testing and experimentation for correct implementation of effective damage prevention measures, such as fences and high-quality and well-trained livestock guarding dogs, and livestock management in order to reduce wolf predation risk. A total of 114 fences and 103 livestock guarding dogs were delivered in the project areas, increasing the level of security for over 100 holdings (actions C1 – C4: selection of beneficiaries and allocation of livestock guarding dogs and fences in Portugal and Italy).
- Assessment of ecologically optimal wolf areas where social conflicts do exist and represent barriers to expansion, using GIS techniques (A5 – A6: Estimation of potential barrier to wolf expansion and risk of conflict). Results were presented for management purposes highlighting areas with higher risk of predation and used for the development of anti-

poaching strategies.

- Actions devoted to the training of the local actors involved in wolf conservation focused in particular on: (i) monitoring of wolf population, (ii) assessment of damages and (iii) trust-building with the livestock owners and hunters (A7 – A8: Training on detection of wolf presence and illegal activities; A9 – A10: Training on damage assessment). More detailed data on damage assessment were available.
- Acquisition on knowledge on attitude towards wolf presence for both the general public and livestock owners (A11 – A12: Ex ante survey on knowledge) and comparison with the situation at the end of the project (D5 – D6: assessment of knowledge levels). The implementation of the action A12 was slightly modified respect to the Project proposal, and seven focus group meetings with livestock owners were undertaken instead of direct interviews. The results show that some groups remain fixe din their position regardless to knowledge level or hard facts: their positions are based on values rather than opinions. Generally the involved people have a positive opinion about the project and damage prevention measures.
- Mitigation of social barriers for wolf survival and expansion (C5 – C6: Control of poison and anti-poaching activities). Support was provided to existing team in Portugal in order to make them efficient and fully operational. One anti poison dog team was set up in Italy and agents were trained and operative for anti-poaching activities.
- Assessment of efficacy of damage prevention measures promoted by the project. Damage decreased in holdings with prevention measure from 42 to 88%. Fences and LGDs reduce losses if used adequately, but in rural areas with semi-extensive grazing it is sometimes impossible to implement them at all times. They also are associated to higher production costs.
- Awareness campaigns focused on possible coexistence between wolf and human activities (E1: Website; E2 – E3: Communication campaign). The Project's website was realized and regularly updated. A project's communication strategy was developed and several communications activities were undertaken in Italy and Portugal. The main objective was to promote an understanding that tools to achieve a less conflictual coexistence with the Promotion of products and labour from farms that adopted damage prevention measures. Eco tourism activities (7 in Portugal and 12 in Italy) and promotion of best practices at local fairs and markets, as well as school programmes and activities (total over 2,500 students involved).
- Exchange of experiences with similar projects and experts on different aspects of wolf conservation (E4: 34 initiatives for national and international networking; E5: Iberian Wolf Congress with around 140 participants; E6: 7 Workshops for management at population level; E7: Symposium on wildlife damage prevention with over 220 participants). These activities also include the the establishment of national and international coordination groups on damage prevention techniques and wolf conservation methods (E8: 5 meetings of the Working Groups on wolf assessment and damage prevention). Both the Iberian Wolf Working Group (IW-WG) and the Carnivore Damage Prevention Working Group (DP-WG) were created and 8 issues of the Carnivore Damage Prevention Newsletter were published.

The results achieved show that implementation of prevention measures effectively decreases the impact of wolves on livestock but in rural areas mainly vocated to agricultural productions this implies modifications in the management systems at sometimes high costs. Moreover, damages are not reduced to zero, although significant reductions can be achieved (from 42% to



88% decrease in attacks). Wolves in the project areas are expanding and their distribution range and density estimate at the end of the project had increased since the period prior to project implementation. Anti poison and poaching control can be effective if well structured and have an effect as deterrent for behaviour that potentially lead to conservation threats (e.g., use of illegal means for killing and/or lack of control of property dogs, etc.).

The project's impact at socio-economic and ecosystem levels is also discussed. The project was implemented adopting the state-of-the-art techniques and analytical procedures. We sometimes experimented and tested efficacy of novel approaches (e.g., the use of Scat Detection Dog for wolf monitoring, the treatment-control approach for evaluation activities, the modelling approaches for estimating habitat suitability and population size, the participatory and MCDA approach, etc.). A collaborative approach was adopted throughout the project, and this has led to a trust building process that is still in place. This resulted in some changes also in the social contexts, for example in Italy the modification of rules for compensation based on results from action A4 and the collaboration with National Health System Veterinaries after completion of action A10. In Portugal the project has actively contributed to the National Wolf Action Plan development with regards to the issues related to damage prevention and wolf monitoring.

The project experience was replicated in other areas in Italy (e.g., Regione Emilia Romagna, Provincia Autonoma di Trento for damage prevention tools; Liguria and Trento for farmers association) and support for use of LGDs was included in RDF programmes in Portugal.

**Financial Part (Section 6):** in this section a detailed account of all the expenses for project implementation reported since the beginning of the project is given. Costs incurred amount to 99% of the total project budget and are summarised both in cost categories and by action. Comments are provided for each cost category per beneficiary, providing justifications for each incurred cost that was not explicitly included in the provisional project budget.

### 3. Introduction

The LIFE MEDWOLF project aimed at improving the conservation status of wolf (*Canis lupus*) in two European areas characterised by Mediterranean environment. Wolf is protected both in Italy and Portugal (Annex II and IV of the Habitats Directive) and the populations in those countries are expanding into areas where they have been absent for decades, often generating conflicts among interests of different groups of people. In particular, the two project sites, the province of Grosseto (around 4,500sqkm) in Central Italy and the districts of Guarda and Castelo Branco in Portugal (around 7,000sqkm), are dominated by semi agricultural landscapes, where productive activities represent a good share of the local economies. The presence of wolf in such areas is associated to conflicts as livestock is subject to management approaches clearly inadequate for facing the presence of a top generalist predator as the wolf is. Wolf generally preys on vulnerable ungulates (mainly wild boar, roe deer, red deer and chamois) as well as sheep, goats and calves when they are unprotected in the pasture lands. Although the general trend of wolf population in most European countries is a positive one, with populations expanding into areas where the species was absent for many decades, locally there can be conflictive situations that prevent this positive trend and the stable presence of wolf in expanding areas.

The LIFE MEDWOLF project specifically aimed at the reduction of conflicts with livestock raising activities through the implementation of damage prevention measures and sharing experiences and knowledge from all over Europe and beyond; the establishment of partnership with the rural sector, empowering selected holdings in management of entrepreneurial activities linked to damage prevention and livestock management; the contrast to illegal activities that directly or indirectly cause the death of wolves and intensive communication campaigns including activities developed by project partners from the agricultural and environmental sectors, and optimization of management efforts through identification of potential areas for expansion. To reach these objectives, a reliable characterization of conflicts caused by wolf presence in the project areas was undertaken and a geographical analysis aimed at defining the extension and the degree of connectivity between suitable areas was made. Several actions have been implemented in order to first train the local actors involved in wolf conservation, then to implement damage prevention measures and anti-poaching activities, and finally to assess the efficacy of the implemented actions, by adopting a participatory approach that empowers the different stakeholders and makes them more aware of their responsibilities. Moreover, focused awareness campaigns for both the general public and livestock owners have been developed, and exchanges of experiences with similar projects and with experts in the different aspects of wolf conservation have been promoted. We valued the exchange of experiences as a tool for amplification of essential knowledge and increase of efficiency in implementation of specific measures, thus have fostered the creation of national and international coordination groups on damage prevention techniques and wolf monitoring methods, in order to promote the standardization of methodologies and decrease the possibility of producing misleading data. Finally, the social aspects that contribute to the conflict ought not to be underestimated and we valued them through many meetings and participatory occasions that were positively assessed by the involved parties. On the long term, the project expected results were an increased awareness about the use and efficacy of damage prevention tools and available information on wolf presence, together with augmented capacity both by agricultural technicians and control authorities on the different issues tackled by the project. These will be discussed after the description of the results obtained through the implementation of the foreseen actions.

## 4. Administrative part

The LIFE MEDWOLF project involves two countries and thirteen beneficiaries listed below:

Non profit private organisation	Istituto di Ecologia Applicata (IEA); Grupo Lobo (GL); Acção, Liberdade, Desenvolvimento, Educação, Investigação, Ambiente (ALDEIA); World Wide Fund for Nature Italy (WWF); Circolo Festambiente (FESTAMB)
Public administrations	Provincial administration of Grosseto (GR); Corpo Forestale dello Stato (CFS) nowadays Carabinieri Forestale (CUFAA)
Research institutions	Faculdade de Ciências Universidade de Lisboa (FCUL); Escola Superior Agrária de Castelo Branco (ESACB) Instituto Nacional de Investigação Agrária e Veterinária (INIAV)
Agricultural associations	Coldiretti Grosseto (COLDI ); Confederazione Italiana Agricoltori Grosseto (CIA); Confagricoltura Grosseto (CONFAGRI).

The bilateral agreements among the coordinator beneficiary and the associated beneficiaries were drafted in accordance with the Common Provisions for LIFE+ projects (as stated on <http://ec.europa.eu/environment/life/toolkit/pmttools/lifeplus/cp.htm>).

All the agreements were signed by the end of December 2012 (see Annexes 1-11 of IR ), with the exception of the one between IEA and CFS that was signed on 28.01.2015. After suppression of CFS a new partnership agreement was signed between IEA and Carabinieri Forestali (CUFAA) in October 2017. CFS joined the project as a new associated beneficiary following the approval of the request of amendment to the grant agreement we received from the EC on 17/09/2014, and an addendum to the bilateral agreements that contained the updated information on budget, partnership and names of new beneficiaries, was signed with the other beneficiaries. A second amendment was signed by all project beneficiaries once the project duration was extended to 30/11/2017:

<b>PARTNERSHIP</b>	<b>Date of Signature</b>	<b>Signature of amendment nr 1</b>	<b>Signature of amendment nr 2 (Annex 43)</b>
IEA-CFS / CUFAA	28/1/2015 (Annex 8 MTR)		20/10/2017
IEA-FESTAMB	8/10/2012 (Annex 1 IR)	6/11/2014 (Annex 9 MTR)	17/01/2017
IEA-GR	8/11/2012 (Annex 2 IR)	04/11/2014 (Annex 10 MTR)	20/02/2017
IEA-CIA	8/11/2012 (Annex 3 IR)	6/11/2014 (Annex 11 MTR)	20/02/2017
IEA-COLDI	8/11/2012 (Annex 4 IR)	6/11/2014 (Annex 12 MTR)	19/01/2017
IEA-CONFAGRI	8/11/2012 (Annex 5 IR)	6/11/2014 (Annex 13 MTR)	20/02/2017
IEA-WWF	8/11/2012 (Annex 6 IR)	7/11/2014 (Annex 14 MTR)	18/01/2017
IEA-GL	8/11/2012 (Annex 7 IR)	10/11/2014 (Annex 15 MTR)	21/02/2017
IEA-FCUL	8/11/2012 (Annex 8 IR)	6/11/2014 (Annex 16 MTR)	20/02/2017
IEA-INIAV	12/12/2012 (Annex 9 IR)	2/10/2014 (Annex 17 MTR)	22/02/2017
IEA-ALDEIA	12/12/2012 (Annex 10 IR)	12/11/2014 (Annex 18 MTR)	28/10/2016
IEA-ESACB	07/12/2012 (Annex 11 IR)	6/11/2014 (Annex 19 MTR)	24/02/2017

The activities foreseen in the LIFE MEDWOLF project were implemented in three major phases:

**1) Preparatory phase.** In management terms, this phase included the developing of partnership agreements, the definition of a detailed action plan for the first year of the project and the definition of the project's organigramme and timeplanning (A1, F1, F2). The establishment of the Scientific Advisory Board (SAB) was also sought for. A set of action implementation plans were defined for all preparatory actions planned and support by the coordinating beneficiary and the SAB was provided. During the first year of the project 11 technical actions (A2-A12) were carried out in the two project areas collecting preliminary data on: wolf presence; areas of potential expansion for the specie; damages suffered by farmers and characterization of the conflict (identification of critical area with high depredation risk, evaluation of willingness of livestock owners to collaborate, analysis of local habits in rearing domestic animals). Data collected were used to plan the implementation of concrete conservation actions (C1-C6) and communication actions (E2-E3).

**2) Concrete phase.** The implementation of concrete conservation actions (C1-C6) started mainly during the second year of the project. These were undertaken until end of 2016 and included delivery of prevention measures (livestock guarding dogs - LGDs - and fences) and the implementation of anti-poaching activities.

**3) Evaluation phase.** Evaluation and monitoring of project implementation was continuously and constantly undertaken through actions F1 and F2. At the end of each project year a detailed plan of activities was drafted for the following year, and was used for highlighting any eventual delay or difficulty. Technical evaluation of project implementation was undertaken in the last year of the project through the implementation of seven evaluation actions (D1-D7).

## 4.1 Management actions description

### 4.1.1 Action F1: Project Coordination and Management

*Beneficiary responsible for implementation: IEA*

*Expected costs: 716,321€*

*Incurred costs: 759,025€*

Each phase of project implementation was carefully planned and monitored by the coordinating beneficiary, whose staff was responsible for assisting each beneficiary in the production of detailed programmes for each activity to be developed, according to the action's objectives and expected results, to undertake a feasibility analysis of the activities needed to reach the objectives planned and evaluate eventual additional efforts needed to ensure the tasks are accomplished.

The project team of the coordinating beneficiary (IEA) was composed (as originally foreseen) of a part time project manager (**PM**, Chiara Braschi), a senior part time project responsible (**PR**, Valeria Salvatori), a part time technical director (**TD**, Simone Ricci), a part time accountant fully dedicated to the project financial and administrative management (Maria Antonietta Mameli). Given the complexity of the project partnership structure and geographical asset, support was provided by Grupo Lobo (with Silvia Ribeiro acting as support for local technical coordination) in the coordination of Portuguese partners, who are often in the field and find it hard to reply efficiently to administrative and technical requests from the coordinating beneficiary. In addition to the core team, a communication expert (**CExp**, Maximilian Lombardi) provided his assistance on a voluntary basis for the first year and then was incorporated into OIKOS s.r.l., and was

initially in charge of main communication tasks, such as production and evaluation of a common communication strategy and action plan, drafting and coordinating press releases, organizing press office activities, overviewing communication texts. Ad hoc communication experts were later consulted for topical activities.

On average a coordination meeting of PR with PM and TD took place every other week in order to assess the technical development of project actions and eventual extraordinary intervention needed. Meetings of PR were also held with the administrative responsible of IEA to monitor the expenses made by all the beneficiaries and to oversee the financial trend of the project. A monthly meeting took place among the IEA staff and the Italian scientific advisor to evaluate and discuss the feasibility of project actions before they started and to assess the need for eventual modifications while actions were being implemented, without losing the robustness and replicability character. Meetings between IEA staff and the referents of the Italian partners occurred regularly both at the beginning of the preparatory phase (to coordinate the implementation of the preparatory activities) and at the beginning of concrete phase (to analyse the results of preparatory actions in order to plan the concrete conservation actions). Moreover, IEA staff (mainly the TD) participated to most of the field surveys to monitor the implementation of assigned fences and the management of delivered LGDs and to assess the efficacy of their use. The kick off meeting was held in Grosseto on 8/11/2012, and the Portuguese beneficiaries GL and FCUL were present. Ten coordination meetings with the representatives of the Italian partner were realized (21/09/2012; 14/05/2013; 30/01/2014; 02/10/2014; 03/03/2015; 6/10/2015; 14/1/2016; 20/11/2016; 18/1/2017; 10/10/2017). IEA staff travelled to Portugal eight times for coordination purposes (11-12/12/2012; 20-22/05/2013; 30/10-03/11/2013; 18-22/05/2015; 26/2/2016; 23-27/5/2016; 9/2/2017; 3/10/2017). The project was visited by the external monitoring team on six occasions (05-07/03/2013; 26-27/05/2014; 22-23/06/2015; 23-27/5/2016; 6/11/2016; 12-13/2/2018), and always the presence of at least one representative of the Portuguese beneficiaries was present.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/09/2012	01/09/2012
End	30/11/2017	30/11/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Minutes of 2 <sup>nd</sup> internal coordination meeting	31/05/2013	
Minutes of 3 <sup>rd</sup> internal coordination meeting	28/02/2014	31/10/2012 (Annex 12, 13, IR)
Minutes of 4 <sup>th</sup> internal coordination meeting	31/08/2014	
Minutes of 5 <sup>th</sup> internal coordination meeting	31/03/2015	
<b>Other Annexes</b>		
Financial reports		Annexes 44-57
<b>Indicators of action implementation</b>	Project managers identified; administrative personnel identified; administrative procedures; coordination meetings.	

#### 4.1.2 Action F2: Project implementation monitoring and efficacy assessment

*Beneficiary responsible for implementation: IEA*

*Expected costs: 209,878€*

*Incurred costs: 157,406€*

Project implementation was closely overviewed and progress assessment was made continuously, also with the support of the monthly reports requested by the project monitor. In order to ensure the robustness of the approach used for actions implementation, scientific advisors (SA) were identified for Italy (Dr. Paolo Ciucci, from Sapienza University of Rome) and for Portugal (Prof. Francisco Petrucci Fonseca, University of Lisbon). For ensuring the production of good quality documents, thus increasing the probability of documents to be used for future reference, a scientific advisory body (SAB) was created. The SAB included the two SAs (Paolo Ciucci and Francisco Petrucci Fonseca), the TD (Simone Ricci) and the support for technical coordinator for PT (Silvia Ribeiro). The implementation of each action was assessed through a series of indicators, already identified in the project proposal, and used throughout the project (Annex 35)

During the first trimester of 2015 a mid term evaluation of all the projects actions was performed by IEA staff aimed at assessing results achieved, identify difficulties encountered and potential solutions; possible delays and their impact on the project implementation.

In May 2014 a request of amendment to the grant agreement was submitted to the EC and subsequently approved on 17/09/2014 (ENV E.3/EDR/TF/ib ARES (2014).3050133). The amendment included two substantial changes to the agreement concerning project's partnership and organization. More specifically they included:

- the addition of a new associated beneficiary (CFS) who became responsible of the implementation of the action C6;
- the modification of a legal status of the associated beneficiary Instituto Nacional de Recursos Biológicos (INRB). This beneficiary underwent a process of internal restructuring which led it to change its name to Instituto Nacional de Investigação Agrária e Veterinária, INIAV (see also the IR).

In June 2016 a second request for amendment was submitted to the EC for extending the project duration from 31/03/2017 to 30/11/2017. The approval was received on 22/09/2016 (ENV.D.4/IB/ML/ib ARES(2016)5507505). A final amendment to the grant agreement was made in order to include the Carabinieri Forestali (CUFAA) in the partnership, replacing CFS. The amendment was received on 08/08/2017 and the partnership agreement with CUFAA was signed on 20/10/2017.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/09/2012	01/09/2012
End	30/11/2017	30/11/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>

-		
<b>Other Annexes</b>		
Amendments to partnership agreements		Annex 43
<b>Indicators of action implementation</b>	Scientific committee established; technical coordination committee established; meeting reports; technical evaluations of action implementation.	

#### 4.1.3 Action F3: After LIFE plan

Beneficiary responsible for implementation: IEA

Expected costs: 0€

Incurred costs: 0€

The activities to be continued after the project implementation were identified and agreed upon with project partners. In addition to the ones originally identified in the project proposal, a set of communication and awareness raising activities were considered to be fundamental for the long term sustainability of the project results. The after LIFE plan was produced with the contribution of all partners.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/09/2017	01/11/2017
End	30/11/2017	28/02/2018
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
After LIFE plan	30/11/2017	28/02/2018 (Annex 18)
<b>Indicators of action implementation</b>	Plan elaboration; plan consolidated	

## 4.2 Project staff organisation

The responsible referents for all the associated beneficiaries were identified in the first few months of the project (see **Annex 41**), and for some of them there were some modifications, namely:

CFS: administrative responsible was Stefano Vagniluca until 31/07/2015, replaced by Fausto Fabrizzi from 01/08/2015;

CIA: administrative and technical responsible was Aldo Pollini until 30/08/2015, replaced by Cristian Annoli from 01/09/2015;

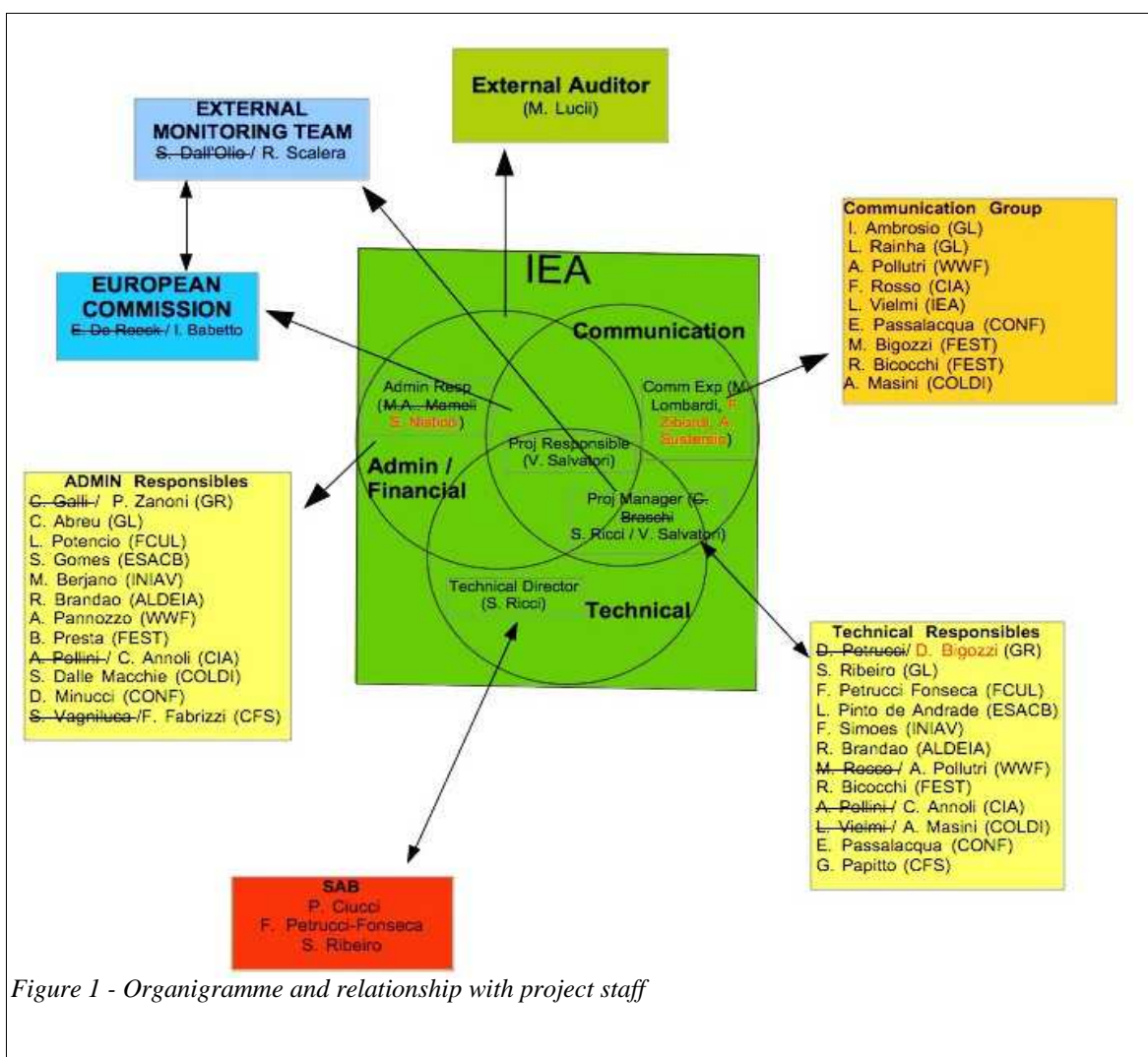
WWF: technical responsible was Massimiliano Rocco until 27/06/2013, replaced by Antonello Pollutri from 01/07/2013.

IEA: Administrative responsible was Maria Antonietta Mameli until December 2015, replaced by

Sandra Nisticò from January 2016; Project Manager was Chiara Braschi until December 2015, replaced by Project Responsible Valeria Salvatori from January 2016.

The organization of project staff is depicted in the organigramme below (Figure 1), where different groups are coordinated by different members of IEA staff, and communication among them is granted by IEA staff. Project Responsible oversees the overall project implementation.





### 4.3 Evaluation of the management system

The management structure implemented by IEA staff required some improvements as since the first year of the project it was acknowledged that for some project partners the project implementation from both technical and administrative points of view was found more difficult than expected. Particularly, we detected the following critical points that required particular attention:

- Technical staff from associated beneficiaries CIA, Coldiretti and Confagricoltura were not experienced in the technical issues tackled by the project. Although they are aware of the difficulties faced by the farming sector when wolf presence is detected at high densities, they were not aware of the measures to be adopted, the importance of monitoring and the need for authoritative attitude with the livestock raisers. This required investment of resources beyond what was originally planned by IEA and Province of Grosseto technical and administrative staff. A close support to associated beneficiaries was granted through frequent coordination meetings, training, joint field visits and detailed activity planning.
- The international coordination with associated beneficiaries ALDEIA and ESACB was

extremely poor due to lack of time of the relevant people and limited English language fluency. This has required extra efforts from the associated beneficiary Grupo Lobo, whose technical staff Silvia Ribeiro provided most valuable support to IEA staff for ensuring communication flow, collection of information and stimulating prompt replies to requests formulated by IEA staff.

- The fragmentation of project management within IEA staff has sometimes caused some difficulties in efficient management of specific issues. In consideration of this, and in addition to the fact that the LIFE MIRCo-lupo project (LIFE13NAT/IT/728) started in January 2015, the staff organization in 2016 was modified, reducing the project management team from 4 to 3 people: a project manager/responsible (Valeria Salvatori), a technical coordination support (Simone Ricci) and a financial manager (Sandra Nisticò). Chiara Braschi and Maria Antonietta Mameli were hired exclusively for the LIFE MIRCo-lupo project. Additional support were sought occasionally in specific cases such as report preparation. It is believed that such re-organisation has greatly improved the efficacy of project management. We specify that Valeria Salvatori was involved in other projects until June 2015 (LIFE 09NAT/IT/160 Arctos and LIFE10NAT/IT/265 IBRIWOLF) and had a larger share of her time available since 2016. Her experience in LIFE project management renders her work highly efficient and she has ensured overview of technical and financial project management in an effective manner. Likewise, the replacement of the administrative responsible half-way through the project life has demanded the selection of an expert and independent person, which was luckily found in Sandra Nisticò.

Thanks to the extra effort invested, the implementation of the project actions was satisfactory and a very cooperative relationship had been established between the coordinating beneficiary and the associated beneficiaries. The scope of the project and the implementation of concrete actions has given concrete results and has high practical relevance in local management and socio-economic context. Individual beneficiaries, particularly those from the agricultural sector, who were somehow skeptical at the beginning of the project, got fully involved and worked in a collaborative way with each other for the implementation of actions that required the involvement of more than one beneficiary (for example Actions C1, C2, C3, C4, C5, C6). Every month, through a brief report, all partners were made aware of the progress of the project. The coordinating beneficiary requested all the associated beneficiaries to promptly communicate any delays, changes and difficulties, working in coordination with them for the identification of possible solutions. A procedure for assessing any modification needed to the single beneficiary project budget was set up and each proposal put forward was assessed in both technical and financial terms, before being approved. It remained clear and reminded at each occasion, that every deviation from the original project budget had to be finally assessed for eligibility by the EC in occasion of the project Final Report evaluation. The coordinating beneficiary sought solutions also in occasions where associated beneficiaries encountered difficulties in spending budget for administrative procedures (e.g. CUFAA) or lost capacities due to internal re-organisation (e.g., WWF, GR), often assuming the responsibility to undertake additional tasks, or reaching agreements with other beneficiaries for sharing tasks.

Given the complexity of the Italian partnership, which was effectively composed of different interest groups, an Italian communication working group was established, although not originally planned. This was required in order to ensure direct involvement of all project partners in a delicate issue as the communication of topics related to wolf conservation in the area of Grosseto, affected by particularly high social pressure. The communication working group was composed by the representative of all the Italian beneficiaries, worked for jointly planning communication activities and approved any communication or awareness raising product. School

programmes and activities were also modified according to the consideration of the suggestion provided by the working group. This coordination activity also required extra effort by the project responsible, who had sometimes the role of moderator for granting the achievement of compromises and agreements that would ensure the delivery of project objectives. The communication group is in constant contact with the Portuguese communication referents (Isabel Ambrosio and Luis Rainha).

Furthermore, the involvement of the agricultural association has required, from the very beginning of the project, an intense coordination process by the coordinating beneficiary and the Provincial administration of Grosseto in order to make them more aware of their responsibilities and to increase their interest to collaborate. The management of this situation was difficult and very demanding also because the agricultural associations are required to fulfil a political and social role in the territory. As a consequence the presidents and/or directors of the agricultural associations have sometime made ambiguous declarations that went against the interests of the project (see also CE letter of 26/05/2014 and our reply on 27/06/2014). IEA has always continued to play a strong coordination activity without ever questioning the important role assumed by the agricultural associations as associated beneficiaries of the project.

The wide participation of livestock holders that we found during the implementation of concrete actions of the LIFE MEDWOLF project undoubtedly constituted the evidence of how the working process implemented by IEA has provided very positive results.

The presence of the SAB guaranteed that the technical reports and documents were prepared following a rigorous scientific approach. Italian beneficiaries worked independently from the Portuguese beneficiaries, although the methodological approach of similar actions (for example action A5 and A6, action C1 and C2, Actions C3 and C4) was shared between them, in order to work in a coherent manner. In several occasions Italian and Portuguese beneficiaries had the opportunity to meet each other. The visit of the Portuguese technical responsible to the Italian study area in several occasions and the visit of the representatives of all the Italian beneficiaries to Portugal in two occasions have undoubtedly created important opportunities of exchange of experiences and of comparison and learning about the different local context.

The LIFE MEDWOLF project partnership was modified in 2015 when the CFS became a new associated beneficiary of the project and was in charge of the implementation of the action C6. This measure was taken in consideration of the fact that the implementation of action C6 as originally planned foresaw the involvement of the Provincial Police, which originally declared its availability to contribute to the project, but underwent a reorganization and had to withdraw its availability. IEA took the responsibility to pay in advance the 40% co-financing to CFS, despite the sum had already been transferred to the original responsible beneficiaries for the implementation of the action (Province of Grosseto and WWF).

An additional challenge was represented by the structural changes that the associated beneficiary WWF underwent, whereby most staff was made no longer available for internal restructuring reasons, thus the need of reducing its commitment to the project. Such modification, although not affecting the overall implementation of the project, required the adoption of extraordinary measures by IEA through the evaluation of activities to be developed by WWF and the search for suitable solutions that ensured the project was not affected. Given that WWF had the responsibility for actions A12 and D6, as well as part of activities within action E3, a process of reallocation of responsibilities and funds was undertaken. Other modifications were required in consideration of some changes in staff availability occurred in COLDIRETTI, which required the responsibility for most activities within action C2 to be transferred to the coordinating beneficiary, and in order to do so the person who was hired by Coldiretti (Luisa Vielmi) was hired by IEA since March 2016 so as to ensure continuity and capitalise the knowledge and

capacity acquired. It has to be noted that this was an extraordinary coordination effort given that funds were transferred from Coldiretti to IEA in order to ensure sustainability and capacity for implementation of C2 action. Finally, the implementation of National Law nr 56/2014 on reorganization of local authorities, which implied the transfer of responsibilities from Provincial to regional Administrations in December 2015, thus less technical staff was available within GR staff and IEA provided strong support for the implementation of actions under responsibility of GR, which continued to be actively involved in the project.

The social context of the project sites was particularly challenging. In Province of Grosseto the damages suffered by livestock owners were registered daily, and conflicts have assumed a political character, that went well beyond the scope of the project. Although the actual facts highlight that wolf damages chronically affected a minority of holdings, and that in most cases attacks were suffered in absence of preventive measures, social protests were instrumental for political pressures dealing with issues that have little to do with wolf presence. In recognition of such mechanism the project press office adopted a low profile that did not engage in a media battle. In Portugal the density and range of wolf had increased (see action D3) and so has the incidence of damages. This situation has greatly increased the level of social conflict in the region, which became one of the focus of man-wolf conflict in the country. The role of the media gained increasing importance in Portugal (causing misinformation and alarm) and focal meetings with the editors/staff of each local and main journals/radios were held as well as an increased intensity of communication activities.

In both areas (Italy and Portugal), characterised by their agricultural potential, livestock is easily accessible to wolf depredation because of lack of habits to protect domestic animals from the wolf. This context has requested from the very beginning a significant effort in order to create the basis for a trustful and collaborative relationship with farmers, and has resulted in a partial modification of the two concrete actions which foreseen the deliver of fences (Actions C3 and C4) to meet the needs of farmers in terms of livestock management. The reason behind this modification was the belief that a cooperative approach would guarantee an increased efficacy of the actions.

As previously reported, the project hosted the external monitoring team in six occasions. The opportunity was always grabbed for discussing eventual difficulties and possible solutions, including eventual modifications needed to the original project actions. Continuous communication with the monitor was maintained through skype© and e-mail, also requesting assistance for ensuring correct compilation of the new financial reporting forms provided by the EC, including Time Sheets. The last monitoring visit was held in February 2018 after the project end, and also involved the Financial Desk Officer. In such occasion useful comments and suggestions on how to prepare the final report were received.

Communication with the EC was undertaken through formal and informal channels: the EC always sent a comment letter after any report or monitoring visit, and the replies to requests of clarifications were discussed in occasion of the monitoring visits and sent in written in occasion of eventual reports to be sent after the letter. Other communications, mainly regarding small technical modifications that involved also budget changes, for requesting authorization to proceed, were held by email. All replies received remarked that the final assessment of such changes will be done in occasion of final project report evaluation. Communication about change of project Technical Desk Officer was received on 15/04/2015.

On 26/05/2014 the project received a letter from the EC requesting for clarifications regarding an issue related to an anonymous letter sent to OLAF suggesting the financial resources allocated to the LIFE projects MEDWOLF and IBRIWOLF (LIFE10NAT/IT/265) was a waste of money. An informal communication was held with project desk officer at the time Mrs. Els de Roeck and the

head of LIFE Unit Mr. Angelo Salsi by project responsible Valeria Salvatori and IEA president Luigi Boitani.

A written explanation was also sent to the EC on 27/06/2014, providing evidence that the project was being implemented at its best often with initiatives that go well beyond the project single activities.

## 5. Technical part

The LIFE MEDWOLF project foresaw the implementations of twelve preparatory actions, which were completed between the last quarter of 2013 (Actions A3, A4, A7, A8, A11) and the beginning of 2014 (A7, A9, A12) without particular difficulties. The actions A5 and A6 were formally concluded at the end of the project when the data collected within actions D3 and D4 were made available and a final map for wolf suitability was delivered.

All the six concrete actions of the project were concluded as planned, although the expected results of concrete actions which foresaw the delivery of prevention measures (Actions C1, C2, C3, C4) were slightly modified in order to adapt these results to the current scenarios, which were different respect to what was assumed during project proposal preparation both in Italy and Portugal. For this reason, mainly fixed fences instead of electric fences were delivered, in order to respect the needs of livestock breeders and considering both their interest and the current husbandry systems in place in the project areas. A total of 80 fences in Italy and 34 in Portugal were delivered (instead of the expected 130 and 15, respectively).

As regard the action C5, the canine team was not established but anti poison activities were insured through *ad hoc* interventions of Spanish expert in poison detection dogs Jesus Valladolid, who also collaborates with other LIFE Projects.

Action C6 was concluded thanks to the participation of CFS and Carabinieri Forestali and an anti poison canine team is now fully operational, as well as focused anti-poaching operations.

The evaluation actions (Actions D1-D7) were developed and some modifications were required in order to ensure trustful results in the delicate social contexts of the project areas. Intensive communication activities were performed (E1-E8), even more articulated than expected.

Deliverable products achieved until the end of the project are the following:

### DELIVERABLES PRODUCTS OF THE PROJECT

NAME OF THE DELIVERABLE	ACTION	EXPECTED DEADLINE	EFFECTIVE DEADLINE	COMMENT
Minutes of the 1 <sup>st</sup> internal coordination meeting	F1	31/10/2012	22/09/2012	Annexes 15 and 17 IR
Internal project Action Plan	A1	31/10/2012	8/11/2012	Annexes 12 and 13 IR
Website	E1	31/05/2013	31/05/2013	Regularly updated
Issue I of the Carnivore Damage Prevention News	E8	30/09/2013	15/04/2014	Annex 1 PR1
Training Material	A10	30/07/2013	18/04/2014	<a href="http://www.medwolf.eu/index.php/documenti-46.html">http://www.medwolf.eu/index.php/documenti-46.html</a>
Training Material	A11	30/07/2013	15/12/2013	<a href="http://www.medwolf.eu/index.php/documenti.html">http://www.medwolf.eu/index.php/documenti.html</a>
Brochures on wolf distribution	E2	30/04/2014	30/04/2014	Annex 6 PR1
Brochures on wolf distribution	E3	30/04/2014		This deliverable has not been produced because not useful but replaced by a leaflet on general presentation of the project and one on how to behave in presence of LGDs
Exhibition and brochures LCIE	E2	31/05/2014	31/10/2014	Annexes 7 and 8 PR1 Annex 1 MTR
Notice boards	E2	30/11/2013	30/11/2013	Annex 11 PR1
Notice boards	E3	30/11/2013	25/01/2014	Annex 12 PR1
Minutes of the 2 <sup>nd</sup> internal coordination meeting	F1	31/05/2013	15/05/2013	Annexes 18 ad 19 IR
Report of wardens training sessions	A7	31/10/2013	31/05/2014	Annex 2 PR1
Brief Report	A11	31/12/2013	31/12/2013	Annex 13 PR1 and Annex 3 MTR
Brief Report	A12	31/01/2013	31/01/2014	Annex 14 PR1
Minutes of the 3 <sup>rd</sup> internal coordination meeting	F1	28/02/2014	31/01/2014	Annex 15 PR1
Map of estimated wolf presence	A2	31/03/2014	31/01/2014	Annex 16 PR1
Report of assessment of extent of damage	A3	30/04/2014	31/03/2014	Annex 17 PR1
Report of assessment of extent of damage	A4	30/04/2014	31/12/2013	Annex 18 PR1
Minutes of the first meeting Damage Prevention WG	E8	31/03/2014	31/10/2015	Annex 16 PR2
Issue II of the Carnivore Damage Prevention News	E8	31/03/2014	20/01/2015	Annex 4 MTR

NAME OF THE DELIVERABLE	ACTION	EXPECTED DEADLINE	EFFECTIVE DEADLINE	COMMENT
Proceedings of the Iberian Wolf Congress	E5	31/12/2016	31/10/2016	Annex 12
Maps of suitability for wolf presence	A5	30/06/2014	31/11/2013	Annex 19 PR1
Maps of suitability for wolf presence	A6	30/06/2014	31/11/2013	Annex 20 PR1
Issue III of the Carnivore Damage Prevention News	E8	31/03/2016	23/04/2016	Annex 17 PR2
Minutes of the second meeting Damage Prevention WG	E8	31/12/2016	31/12/2016	Annex 13
Issue IV of the Carnivore Damage Prevention News	E8	30/11/2016	31/12/2016	Annex 14
Report of study tours to other EU project	E4	31/03/2015	31/05/2015	Annex 5 MTR
Report on detection dog efficiency	A2	31/05/2015	31/05/2015	Annex 1 PR2
Report on damage assessment	A10	31/08/2015	31/07/2015	Annex 1 PR2
Minutes of the 4 <sup>th</sup> internal coordination meeting	F1	31/08/2014	03/10/2014	Annex 21 PR1
Dog database	C1	31/12/2015	31/12/2015	Annex 1
Dog database	C2	31/12/2015	31/12/2015	Annex 2
Minutes of the third meeting Damage Prevention WG	E8	31/08/2017	31/12/2016	Annex 15
Issue V of the Carnivore Damage Prevention News	E8	31/3/2017	30/04/2017	Annex 14
Guidelines on best practices	E6	30/09/2015	30/09/2015	Annex 6 MTR
Minutes of the 5 <sup>th</sup> internal coordination meeting	F1	31/03/2015	03/03/2015	Annex 7 MTR
Issue VI of the Carnivore Damage Prevention News	E8	30/9/2017	31/07/2017	Annex 17
Press clippings	E2	30/9/2016	30/11/2017	Annex 7
Press clippings	E3	30/9/2016	30/11/2017	Annex 8-9
Scientific publication	E2	30/9/2016		
Scientific publication	E3	30/9/2016	24/02/2016	Annex 13 PR2, Annex 10
Report	D1	30/9/2017	30/11/2017	Annex 3
Report	D2	30/9/2017	30/11/2017	Annex 4
After LIFE plan	F3	30/11/2017	30/11/2017	Annex 18
Layman's report	E3	31/10/2017	30/11/2017	Annex 6, 11



Milestones of the project achieved until the end of the project are the following:

### **MILESTONES OF THE PROJECT**

<b>NAME OF THE MILESTONE</b>	<b>ACTION</b>	<b>EXPECTED DEADLINE</b>	<b>EFFECTIVE DEADLINE</b>
KOM Report and year 1 Action Plan	A1	18/11/12	08/11/12 Annex 16 IR
Survey Plan approved and field work starts	A2	30/11/12	31/12/2012 Annex 14 IR
First training course	A7	30/06/13	12/06/13
First training course	A8	30/06/13	27/06/13
First dog delivered	C1	31/12/13	07/02/14
First dog delivered	C2	31/12/13	18/07/14
First fence installed	C3	30/09/13	19/06/13
Experimental design developed	C4	31/08/13	31/12/13 Annex 22 PR1
Detection team set up in PT	C5	30/06/14	This milestone has not been realized (see section 5.2.5 for further details)
Detection team set up in IT	C6	31/12/14	20/06/2015
Website on line	E1	31/05/13	03/03/13
Exhibits printed	E2, E3	31/08/13	31/10/14
First experience exchange	E4	30/06/13	21/02/13

## 5.1. Preparatory actions

### 5.1.1 Action A1: Kick off meeting and detailed project plan preparation

*Beneficiary responsible for implementation: IEA*

*Expected costs: 6,913€*

*Incurred costs: 8,556€*

The action foresaw the signature of partnership agreements and the production of a detailed action plan and a detailed timeplan for project implementation. These expected results were achieved through two different meetings held in Grosseto the 21<sup>st</sup> of September 2012 and the 8<sup>th</sup> of November 2012.

The first national coordination meeting of the LIFE MEDWOLF project was held on the 21<sup>st</sup> of September 2012 in Grosseto. All the Italian beneficiaries attended the meeting except for the beneficiary FESTAMB. During the meeting the draft partnership agreements were discussed and the implementation plan of all the actions to be developed during the years 2012 and 2013 was revised.

On the 8<sup>th</sup> of November 2012, all the Italian beneficiaries and the technical referent for Portugal, GL, met in Grosseto for the kick off meeting. The main specifications of the project were described, and all the beneficiaries briefly reported the technical approach adopted for the implementation of the actions for which they are responsible. The Common Provisions were illustrated and the rules for financial reporting were highlighted. A detailed project action plan with all the actions to be developed during the years 2012 and 2013 was approved by all the beneficiaries attending the meeting. The partnership agreements were signed by all the Italian partners and GL during the kick off meeting.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/10/2012	01/09/2012
End	31/12/2012	08/11/2012
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
Kick off meeting and year 1 action plan	18/11/2012	8/11/2012
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Minutes of first internal coordination meeting	31/10/2012	22/09/2012 (Annex 15, 17, IR)
Internal project action plan	31/10/2012	31/10/2012 (Annex 12, 13, IR)
<b>Indicators of action implementation</b>	Action plan with contribution from all partners; Partner agreements signed by all partners; Mailing list partners; List of needed administrative procedures; Guidelines for the financial project management.	

### **5.1.2 Action A2: Ex-ante detailed survey of wolf presence in the Portuguese project areas**

*Beneficiary responsible for implementation: GL in collaboration with INIAV*

*Expected costs: 118,901€*

*Incurred costs: 160,833€*

Within action A2 results expected were a wolf survey and a detailed map of estimated wolf presence (4x4 km grid), as well as a genetic database for wolf characterisation. The aim of the action was to obtain a detailed knowledge of the presence and distribution of wolf in the project area in order to understand its potential expansion and for the proper implementation of concrete conservation actions (C1, C3, C5, E8). The foreseen monitoring program included the sampling of 65 UTM units (10x10 Km), a minimum of 20 howling stations, the collection of 100 genetic samples the use of 10 camera traps and the test of a new technique based on the use of a detection dog. Respect to this we realized a more intensive sampling program with 24 howling stations and the analysis of 198 genetic samples. All the expected results were fully achieved.

This action was planned to end in June 2013 but was extended for one year, with the field work developed in January-October 2014 (request approved on 17/09/2014, see ENV E.3/EDR/TF/ib ARES (2014).3050133) in order to implement and test the application of the experimental Scat Detection Dog Team (SDDT). The second year aimed at testing the SDDT effectiveness and allow the full use of this new method during wolf survey, which had not been entirely possible in the first year since the SDDT training was done late in the wolf survey season (May-June 2013). The dog team (including the dog and the handler) was trained with captive and genetically confirmed wild Iberian wolf scat samples in collaboration with a professional trainer, Mr. Heath Smith (Conservation Canines, University of Washington, USA). The dog, Zeus, was selected from public dog shelters and trained to detect Iberian wolf scats in the wild in the scope of action A7. The effectiveness of the SDDT was assessed by comparing its scat detection and accuracy rates with the ones of a field technician (FT) (in different seasons, landscapes and ecotypes), as well as by comparing detection results with data collected with camera trapping in the study area. Furthermore, this allowed to increase the information obtained in the first year, which is beneficial in low wolf density areas. Results show the stable presence of a pack and a slight increase in wolf range towards south west. A brief summary of results are provided below, and for more details please refer to the final report (Annex 16 PR1).

#### **Results obtained in the year 2013 (without detection dog):**

Camera traps recorded wolves in 6 events and 52 wolf attacks were forensically investigated. No wolf responses were obtained in 24 howling sessions and no wolves were observed in one watching session. No confirmed records of reproduction or mortality were obtained. 292 interviews were done to locals resulting in information on 49 wolf sightings. A total of 281 samples were analysed: 198 swabs from wolf kills, and 88 scats. Scat analysis identified 23 dogs and 9 wolves, and from the 73 swabs analysed (18 kill sites) 37 were assigned to wolves and 30 to dogs. Integrated results, from the genetic analysis and camera-trapping, confirmed wolf presence in 10 cells of the sampled grid, corresponding to 20% of the project area, North and Centre. One pack was confirmed based on the higher presence of scats (male and female), high frequency and regularity of attacks to livestock in 2013, and previous records from 2012 of two individuals obtained with camera trapping. Average wolf density ranged from 0.6-1.4 wolves/100 Km<sup>2</sup>.

### Results obtained in the year 2014 (with scat detection dog team - SDDT):

Training sessions (n=54) were done *in situ* (high density wolf areas) and *ex situ* (using genetically confirmed wolf scats from the study area) to reinforce the dog's accuracy and familiarity with wolf scats as well as team communication and skills. The results from the Detection Rate trials (16 sites, 17km surveyed) showed that SDDT was more effective in locating scats (DR=96%) than FT (DR=26%), with differences being higher in Summer. SDDT positive alerted scats in 17 of the sites, but only in 5 (15%) were the scats genetically assigned to wolf. 43% of the scats were correctly identified by the SDDT as belonging to wolf, and 29% were "false positives" (5 dog, 1 fox). This could be due to the recent creation and thus reduced experience of the SDDT as well as to double marking behaviour common in canids - where dogs or foxes deposit scats or urine over wolves' scent markings. Camera trapping provided records in 5 UTM - in 4 wolf presence was also confirmed by the SDDT. SDDT was used in 17 kill sites, alerted wolf scat in 11, but only in 2 was possible to assign them to wolf. Genetic analyses of Wolf presence was confirmed by hair and swabs in 6 of those 11 events.

### Comparison of results obtained in the two years (with vs. without detection dog):

The methods used in the 2013 survey were used in 2014, allowing data comparison. The same transects to look for wolf signs were done in the same 65 UTM surveyed in 2013. 15 wolf pictures (single adults) were obtained in 7 events (1 more than in 2013). Techs visited 41 kill sites and collected samples (swabs) in 85%, while ICNF wardens collected samples from another 40 (average 3.7 swabs/kill site). In the kill sites where species assignment was successful (73%, n=55) wolf presence was confirmed in 44, and the single presence of dogs in 6. SDDT increased the spatial detail whereas transects provided data outside the SDDT surveyed area. NGS (Non Invasive Genetic Samples) and camera trapping allowed to confirm wolf presence in 14 UTM (22% of the study area), 4 more than in 2013. Forensic analysis was the most effective method for confirming wolf presence, providing 62% of the records (9% more than in 2013), confirming wolf presence in 12 UTM. Nevertheless, this information is dependent on the claims to the authorities, which may not always occur (see action A3), and in recent wolf expansion areas damages may be assigned to dogs and the knowledge about the existence of the compensation system may be reduced.

The minimum population size was 9 individuals: 7 males, 1 female and 1 undetermined individual in Castelo Branco. Spatial and temporal analysis of assigned wolf samples suggest the presence of a breeding pair in the area where 2 wolves had been recorded by a camera trap in 2012 (Almeida pack). The estimated home range of Almeida pack was 205.85 sqkm (within known ranges in Portugal: 88-376 sqkm), with a minimum wolf density of 3.4 wolves/100 sqkm (higher than 0.8 wolves/100 sqkm estimated in 2013). It was not possible to confirm other packs, despite the regular presence of wolves south of Vilar Formoso. For the whole wolf range, 775 sqkm (130 sqkm larger than in 2013), we get a minimum wolf density of 1.03 wolves/100 sqkm, higher than in 2013 (0.6 wolves/100 sqkm). Wolf range increased to the north/east, along the border with Spain, and to the south (Figure 2). The increase in damage and wolf signs suggests the intensification in the use of the territory by the wolf. The range and density increases indicate a higher stability of this nucleus.

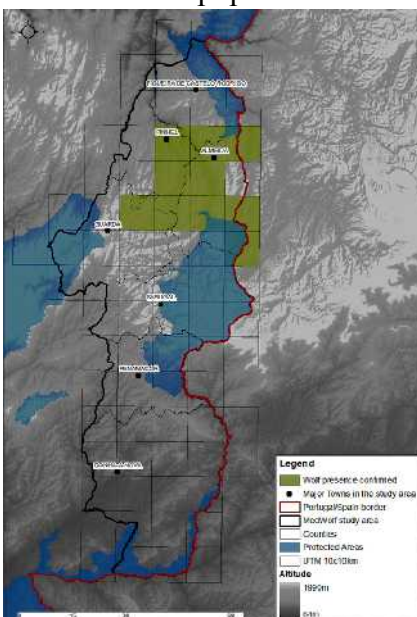


Figure 2 – Wolf range in Portugal project area with data from 2013-2014

surveys.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/10/2012	01/12/2012
End	31/12/2014	21/01/2015
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
Survey plan approved and field work starts	30/11/2012	31/12/2012 (Annex 15 IR)
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Map of estimated wolf presence	31/03/2014	31/10/2014 (Annex 16 PR1)
Report on Detection Dog efficiency	31/05/2015	31/05/2015 (Annex 1 MTR)
<b>Indicators of action implementation</b>	Equipment purchased; collaborators contracted; protocols prepared; reports from field missions.	

### 5.1.3 Action A3: Ex-ante survey of damages suffered in the Portuguese project areas

Beneficiary responsible for implementation: GL in collaboration with ESACB.

Expected costs: 46,088€

Incurred costs: 41,885€

The action was concluded as planned and the expected results (a comprehensive database on wolf damages, including a GIS module) and the Final Report, providing an assessment of damages suffered in the Portuguese project area, was delivered (Annex 17 PR1). The 50 interviews proposed were conducted to holdings in the study area that reported wolf damage in previous years (including 27 holding that reported damage to ICNF). The data gathered allowed the selection of livestock breeders to be involved in actions C1 and C3, and the correct implementation of Action C5 and E8.

Results revealed that most farms (84%) are family-based with no employed labor, having a productive activity with more than 20 years (over 70% of them), with most farmers being of advanced age (mean age: 48 years) and devoting most of their time to agricultural activities (82% of them are full time producers). The average holding area is around 160 ha, with most of the farmers renting part of the grazing and agricultural lands, and having an average of 168 head. Around half produce cattle, with an average of 100 head per holding, and 76% produce sheep and goats, with sheep being most common and with an average size of 200 head. Almost half produce also donkeys/horses, averaging 5 animals per holding. And there is the ostrich farm with 70 head.

Almost all farmers registered predation events during the last 6 years, and had an average of 3 attacks in the last two years, mainly attributed to wolves, resulting in 11 animals killed/injured per farm. In 9 holdings, throughout the study area, the numbers were higher, reaching almost 30 animals. Of the farms suffering wolf attacks, 17% did not reported the attacks to ICNF, but these correspond to occasional events and small damage values. The damage data were filed in a data base and a geographic representation of their distribution was produced through a map (Fig. 3).

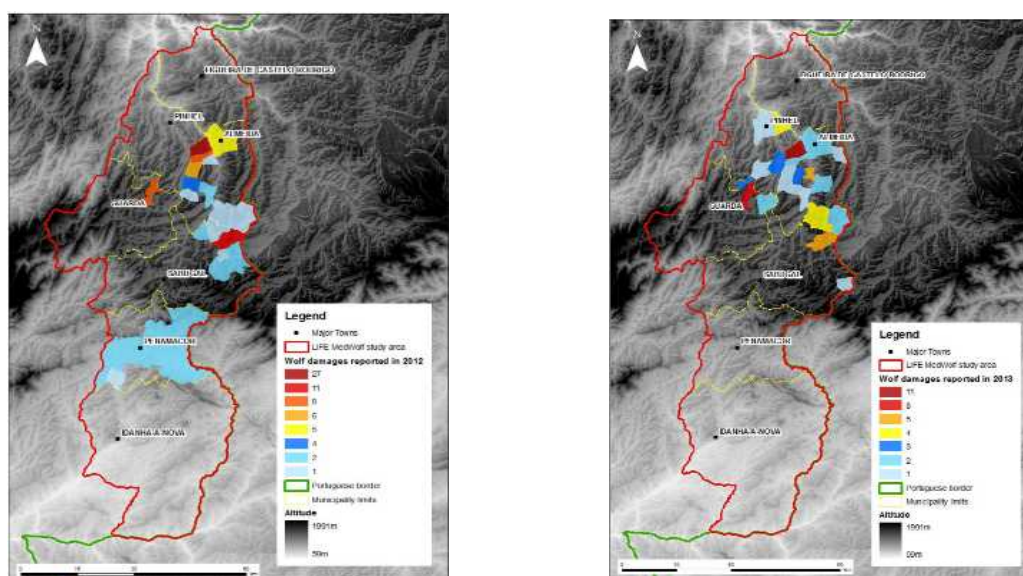


Figure 3 - Distribution of reported damages per parish, in 2012 and 2013.

Only 42% are shepherded during the day and almost never during the night and only in half of

the cases had LGDs, mostly in sheep flocks. Nevertheless, almost 88% considered dogs to be important to protect livestock.

In the project area livestock production is based on extensive to very extensive systems (1 cow/10 ha) essentially by grazing, where the size and scale of farming are effective determinants of the economic viability (especially for the meat component, in both sheep and cattle). Those systems are mainly characterized by low inputs of capital but also by low productivity. Predation can easily derail the survival of these production units. Predation problems seem to be related with deficient protection and inadequate management and husbandry: the absence of livestock guarding dogs, especially during the night, when the herds are left in fenced pastures, and the fact that cattle is kept in a free-ranging system, and calves are born outdoors, in the pasture, being thus extremely vulnerable to predators.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/01/2013	01/04/2013
End	30/06/2013	31/12/2013
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Report of assessment of extent of damage	30/04/2014	31/03/2014 (Annex 17 PR1)
<b>Indicators of action implementation</b>	Collaborators contracted; interviews compiled; database; report.	

#### **5.1.4 Action A4: Ex-ante survey of damages suffered in the Province of Grosseto**

*Beneficiary responsible for implementation: GR, in collaboration with IEA*

*Expected costs: 14,640€*

*Incurred costs: 24,486€*

The aim of the action was to obtain a baseline assessment of the extent and intensity of livestock damages caused by wolf, in order to correctly implement Action C2 C4 and C6,. The action foresaw the analysis of the existing data related to livestock damages, the realization of 50 interviews with local farmers, and the set up of a specific database of the damages caused by wolf.

All the expected results were achieved with 90 interviews more than originally foreseen and the final report, providing an assessment of damages suffered in the Italian project area, was delivered (Annex 18 PR1). The ex-ante situation of damages suffered in Grosseto province was particularly challenging due to the fact that responsibility for formally collect such data does not rely on one institution only. At the time when the data collection started, compensation for depredation damages could be claimed only if an insurance was subscribed by the livestock owner, and managed by an agricultural consortium (Co.Di.Pra.). Depredation report was not obligatory, sometimes reported to local forestry service officers or local police, but declaration of dead heads was compulsory and to be submitted to the National Health Service (AUSL). For this reason a considerable effort was made for integrating data coming from different sources, and yet the results achieved suggested that the size and amount of depredation events was considerably underestimated and insufficient for achieving a description of the conditions most frequently associated to the depredation events. For this reason detailed data were collected within the scope of action A10 by trained veterinarians (see section 5.1.10). Collection was made through (a) 140 direct interviews, (b) the insurance company for the damages caused by predators (Co.Di.Pra.) and (c) the veterinary health service. The choice of carrying out more interviews than was originally planned (50) was due to the fact that a preliminary analysis of the official data brought to light a situation in which damages are widely under reported (only about 3% of the livestock holders are insured). Therefore, the comparison between the damages claimed to the insurance, those claimed to the veterinary ASL, and those declared by the interviewed holders, allowed to obtain a more complete picture on the level of conflict. The analysis of data suggests that most holders (76%) manage their livestock by allowing it to graze in open range pastures and by corralling it at night or in the colder seasons. Moreover, only 26% of holders use predator safe enclosures and only 27% use livestock guarding dogs. The number of holders that declared to have suffered damages was much greater than those that officially declared them, however the situation is hopeful, as many holders (68%) were willing to implement damage prevention measures. The data collected were merged in a single database and a map of the distribution of damages was produced (Figure 4).

The action served to identify management priorities for the Provincial administration, to better adapt the planning and implementation of the concrete conservation activities (actions C2 and C4) and to inform the process undertaken by the Regional administration for the revision of compensation system. The information gathered were also useful for the implementation of Action C6, respect to the identification of the areas characterized by an higher level of conflict between wolf and livestock raising activities. The preliminary results were presented and discussed with the Italian associated beneficiaries during one meeting in Grosseto (20/11/2013, Annex 26 PR1) and at the IX Italian Congress of Mammalogy (07/05/2014) and published on the European Journal of Wildlife Research in 2016 (see Annex 13 PR2).



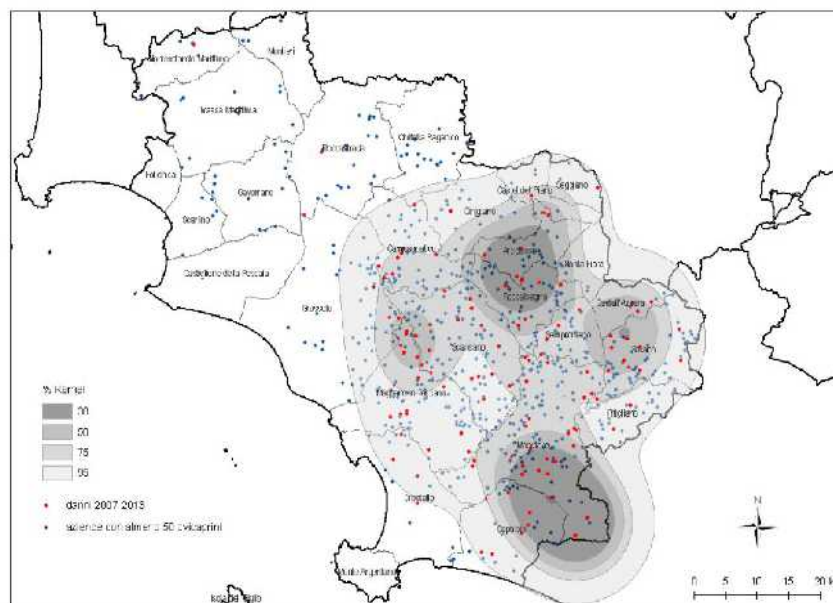


Figure 4 - Spatial distribution of depredations at the municipal level during the period 2007 – 2012 (data source Co.Di.Pr.A).

The final results, including the analysis of insurance system, were presented to the Italian associated beneficiaries in a second meeting in Grosseto (22/10/2014, Annex 27 of the PR1). This meeting was also attended by the representative of Province of Siena and the representative of the veterinary health service of Grosseto (AUSL 9). It is noticeable that the results achieved were used by the project beneficiaries and the AUSL to take action and request a change to the Regional Administration, which modified the rule in late 2014. Since November 2014 the compensation for losses due to depredation is provided directly by the Regional Offices, and no insurance is required, but after the first attack claimed, the presence of damage prevention measures is obligatory for receiving compensation. ASL also implemented the “Provincial Depredation Registry”, collecting in one place only all the claims, thus rendering the management of the depredations more efficient.

In addition, a database was implemented within the scope of action A4. This database was originally produced in collaboration with LIFE IBRIWOLF project, and an integration was made to make it more efficient in its analytical module, so as to render it a useful management tool. It includes data related to damages suffered by farmers in the Italian project area (location, presence/absence of prevention measures, adhesion/not adhesion to insurance system, amount of compensation cost paid, utilization/not utilization of public funds for the implementation of damage prevention measures, number and specie of animals killed) in the years 2007 – 2017.

Timing	Foreseen	Actual date
Start	01/01/2013	01/10/2012
End	30/06/2013	30/06/2013
Milestones	Deadline	Actual date
-		

<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Report of assessment of extent of damage	30/04/2014	31/12/2013 (Annex 18 PR1)
<b>Indicators of action implementation</b>	Collaborators contracted; interviews compiled; database; report.	

### 5.1.5 Action A5: Estimation of potential expansion areas in Portugal

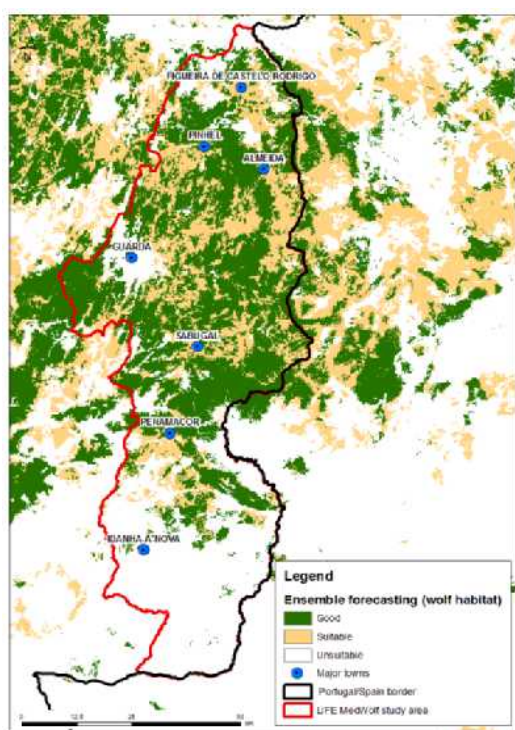
Beneficiary responsible for implementation: GL

Expected costs: 47,251€

Incurred costs: 28,496€

The action foresaw the elaboration of a map of environmental suitability for wolf presence in order to identify potential expansion areas in the project area, and a technical report for being used by local administrations.

The action was concluded in its preliminary form and the Final Report, including the preliminary maps of suitability for wolf presence, was delivered after being revised by the SAB (Annex 19 PR1). For the modelling analysis the data set used has confirmed wolf presence data from different sources (scats with genetic validation, camera-trapping photo records, and den sites), and entailed an expanded area to accommodate more data and more variability in the predictors' values range. Two models were created using different presence data sources and a consensus map was made. Finally, potential dispersal areas for the wolf within, from and to the study area were identified, with the definition of ecological corridors.



An update of the wolf habitat modelling was produced in March 2015. New wolf data obtained in the project area in 2014 (29 new records collected during the action D3) were added to create a new wolf habitat suitability map. This map, in conjunction with the den model (ensemble forecasting), resulted in a new map (Figure 5) where the optimal and good classes from the previous analysis were merged. The new map has 3 classes (Good, Suitable and Unsuitable) and was inserted in the booklet on Iberian Wolf (Annex 2 PR2). The booklet was produced in order to provide general information about the Iberian wolf, and represents an improved version of the leaflet foreseen in action E2 with the wolf distribution. The pages 25-28 report the geographical analyses undertaken in action A5 and they are commented with texts accessible to both technical management staff and the interested general public. The level of information provided requires some level of technical knowledge, thus it is not to be considered a popular only publication.

Figure 5 - Environmental suitability map for wolf presence in Portugal updated with 2014 data for the MEDWOLF area

Timing	Foreseen	Actual date
Start	01/01/2013	01/02/2013
End	30/09/2013	30/11/2013 (for preliminary maps), 31/03/2016 for final products
Milestones	Deadline	Actual date
-		

<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Map of suitability for wolf presence	30/06/2014	30/11/2013 (Annex 19 PR1)
<b>Indicators of action implementation</b>	Geographic data pre-processed; Collaborators contracted.	

### **5.1.6 Action A6: Estimation of potential expansion areas in Estimation of potential expansion areas between Apennines and lowlands in Grosseto Province**

*Beneficiary responsible for implementation: IEA*

*Expected costs: 22,560€*

*Incurred costs: 23,494€*

The action foresaw the production of maps associated to different degrees of suitability for wolf presence and a technical report for being used by local administrations. The results were achieved in two phases, as originally planned. The first phase included a preliminary map of habitat suitability using available data (Annex 20 PR1) and the final refined map produced in 2017 together with the expected report (Annex 19). The preliminary map was used to guide the sampling strategy for action D4, in order to optimise resources and time available. The final map were produced using data collected during action D4 and the analyses provided extremely useful results. An inductive modelling approach was used for estimating areas most frequently associated to wolf presence, as indicated by wolf location points. Environmental variables used include land cover and human presence. Data collected in action D4 (n = 1836) were integrated with data from the depredation events and other socio-economic indicators, such as the density of farms and the local share of the Domestic Gross Production (GDP) at municipality level, in order to estimate a map depicting the risk of predation (Fig. 6). Overall the main products developed by these analyses were:

- ✓ continuous and binary map of wolf habitat suitability
- ✓ continuous and binary wolf distribution range
- ✓ potential human-wolf risk of conflict map

The resulting risk map indicates that areas with higher risk are those with (1) higher number of holdings; (2) higher contribution to the internal gross production index, established presence of predators. The outputs were also tested for accuracy using the reported depredation events. The resulting information was also integrated in the protocol for implementation of anti-poison and anti-poaching activities to be implemented within action C6.

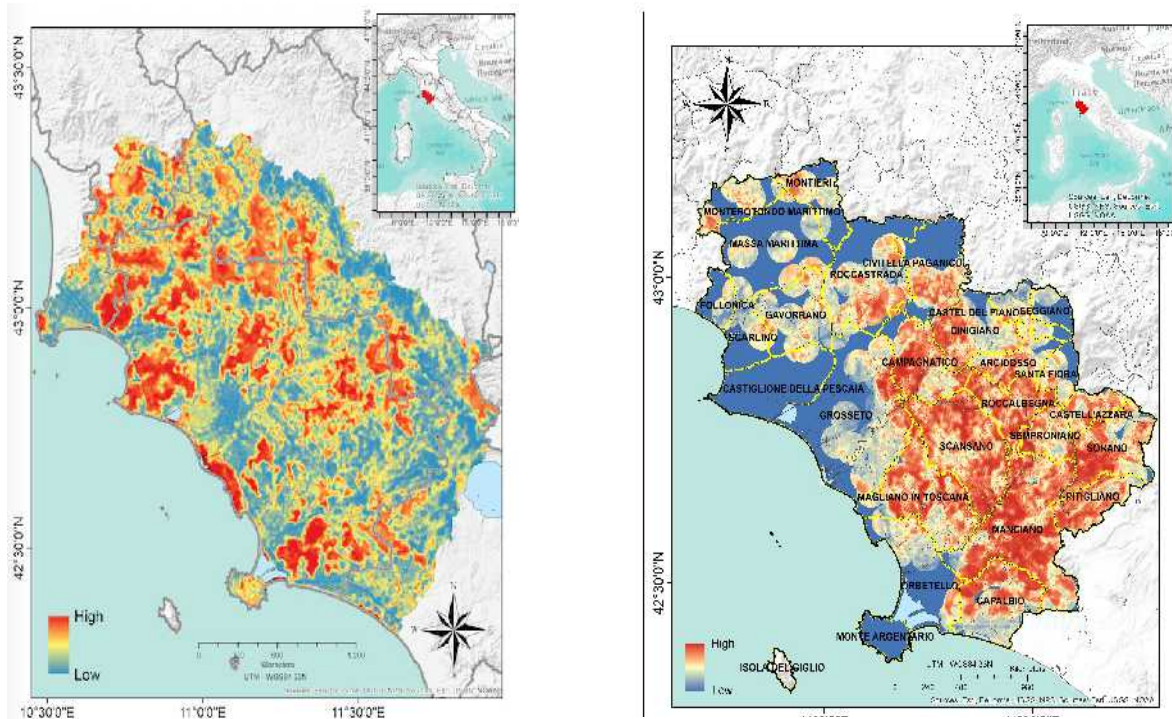


Figure 6. Wolf suitability (left) and risk map (right).

Timing	Foreseen	Actual date
Start	01/01/2013	01/02/2013
End	30/09/2013	30/11/2013 (for preliminary map) 30/11/2017 (for final map and risk map)
Milestones	Deadline	Actual date
-		
Deliverables	Deadline	Actual date
Map of suitability for wolf presence	30/06/2014	30/11/2013 (Annex 20 PR1) 30/11/2017 (Annex 19)
Indicators of action implementation	Geographic data pre-processed; Collaborators contracted.	

### **5.1.7 Action A7: Training of wardens for detection of wolf presence and illegal hunting activities in Portugal**

*Beneficiary responsible for implementation: GL*

*Expected costs: 15,865€*

*Incurred costs: 15,025€*

The action A7 was aimed at training a minimum of 6 people on techniques for detection of wolf presence and illegal activities in the project area.

The action, realized by GL, was concluded and the Final Report, including the program of the training course and the list of people involved, was delivered (Annex 2 of the PR1, 30/11/2014), and the training material was uploaded to the project's website (<http://www.medwolf.eu/index.php/documenti-46.html>). The results obtained were more important respect the ones foreseen because over 30 participants attended the two training sessions organised. Two training actions (detection of wolf presence and of illegal hunting activities) were done with participants among SEPNA agents and ICNF wardens/technicians. The first part of this training action involved 38 participants and was held on the 12<sup>th</sup> of June 2013 (theory class), at the CEASG (Centro de Educação Ambiental da Senhora da Graça), in Sabugal and the field trip regarding the application of the knowledge acquired, occurred from 13 to 14 November 2013 at the Montesinho Natural Park. The second training course was held on the 30<sup>th</sup> of April 2014, at the CEASG and it was attended by 33 participants. The date of the second training course was slightly later than expected due to reduced availability of the QUERCUS staff to be present between November 2013 and April 2014. Despite this delay, the expected results of the action A7 were completely achieved. In both courses the presence of invited dog trainers (Heat Smith - wolf scat detection; Jesus Valladolid – poison detection) was very appreciated, as well as the presence of the K9 units of SEPNA/GNR, revealing the high interest of this authority, that is expected to develop in future collaborations in what concerns wolf monitoring and control of poaching and poisoning. The active cooperation with the LIFE project Innovation Against Poison (09/NAT/ES/533), developed by Quercus in Portugal, resulted in the presentation of the project results, in the last training action. This collaboration extends also to other actions (C5, C1 and E2).

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/04/2013	01/04/2013
End	31/12/2013	30/04/2014
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
First training course	30/06/2013	12/06/2013
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Report of wardens training sessions	31/10/2013	31/05/2013 (Annex 2 PR1)
<b>Indicators of action implementation</b>	Personnel attending courses identified; Trainers contracted; training material developed.	



### **5.1.8 Action A8: Training of wardens for detection of wolf presence and illegal hunting activities in Italy**

*Beneficiary responsible for implementation: GR*

*Expected costs: 20,504€*

*Incurred costs: 16,383€*

The action A8 was aimed at training at least six local police agents involved in wildlife management and conservation in the techniques used to monitor wolf presence and the actions undertaken to contrast poaching. In fact a total of over 15 people were trained among police agents and forestry agents (later Carabinieri Forestale, CUFAA). The first part of the action, realized by GR, was concluded as originally planned and the report, including the program of the training course and the list of people involved, was delivered (Annex 3 PR1), while in order to fully achieve the objectives set a second training session was needed after the CFS was included in the project partnership and responsible for the implementation of action C6. The first module took place on 27/06/2013 and covered the monitoring techniques used to survey wolf presence. The second module took place on 05/11/2013, and was aimed at presenting the actions undertaken to contrast wolf poaching in Italy. The instructors responsible of teaching the first module were selected according to their background in wildlife monitoring, while those responsible for teaching the second module, we involved the staff of the LIFE Antidoto project (LIFE07NAT/IT/436) as stated in the IR. In the first module, 4 hours were dedicated to the theoretical introduction to wolf monitoring and 4 hours to the practice exercise. In the second module the theoretical introduction lasted 6 hours, and was followed by a practical application of the activities carried out by the anti-poison canine unit. The course was attended by 14 technicians coming from Provincial Police, voluntary guards, and Forestry Service, all of them involved in eventual intervention in case of illegal hunting. The course materials were uploaded on the project website (<http://www.medwolf.eu/index.php/documenti.html>).

Given the fact that action C6 has undergone a re-organisation for being developed under the responsibility of the CFS (nowadays Carabinieri Forestali), a new specific training course was realized later, and it took place the 16-18.06.2015. This training course was realized in coordination with the LIFE Pluto (LIFE13NAT/IT/000311) and LIFE MIRCo-lupo (LIFE13NAT/IT/728) projects, that foresee similar training actions, and it has included theoretical and practical lessons. Thirty-seven members of CFS (coming from Pollino National Park, Appennino Tosco Emiliano National Park, Tuscany Region) and members of police force of Province of Grosseto were trained (12 for the LIFE MEDWOLF project). The instructors were selected according to their expertise in anti poaching activities and they were members of SEPRONA Guardia Civil de Andalucia (2 people, previously involved for the training activities implemented in the LIFE Antidoto project), members of Istituto Zooprofilattico Sperimentale (IZS) of Lazio and Toscana (2 people experts in techniques of medicine veterinary forensic) and referents of the LIFE Pluto project. The lectures given by the members of SEPRONA were provided with a simultaneous translation in order to facilitate and maximize the understanding of topics exposed.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/04/2013	01/04/2013
End	31/12/2013	18/06/2015
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>



First training course	30/06/2013	27/06/2013
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Indicators of action implementation</b>	Personnel attending courses identified; Trainers contracted; training material developed.	

### 5.1.9 Action A9: Training of relevant personnel for damage assessment and trust building

Beneficiary responsible for implementation: GL

Expected costs: 2,408€

Incurred costs: 1,792€

The action aimed at training at least 6 veterinarians and was concluded as planned, with a much higher participation than expected because a total of 56 people were involved in the training activities. The Final Report, including the program of the training course and the list of people involved was delivered (Annex 4 PR1). The training material was uploaded to the project's website (<http://www.medwolf.eu/index.php/documenti-46.html>).

Two training sessions were implemented, both including theoretical and practical components, with hands-on experience. The first training course, on wolf damage assessment, was held on the 12<sup>th</sup> of March 2014, at the Trás-os-Montes e Alto Douro University, in Vila Real and it was attended by 44 participants. The second training course, on behavioural competences and conflict resolution, was held on the 16<sup>th</sup> of April 2014, at the CEASG and it was attended by 12 ICNF wardens. Soft-skills development plays an important role in highly challenging scenarios, as those of damage assessment, contributing to improve wardens' approach to local populations and job performance. This type of training is considered to be very valuable, especially if we take into consideration the increasing social conflict registered in the project area, correlated with the increase of wolf damage on livestock. The training about behavioural competences was novel to the ICNF wardens working in the project study area and aimed at specific problems encountered during wolf damage assessment (evaluated during a pre-questionnaire). The work was structured to strengthen the identification of the wardens with their function and the public body they belong to, and progressively focus on the different dimensions that contribute to the regulation of conflict situations and the establishment of trustful relationships with the local population. The dates of the two training courses were slightly later than expected due to some difficulties to find an adequate and available trainer for the courses. Despite this delay, the expected results of the action A9 were completely achieved and both training courses were very successfully evaluated by the participants. In particular, the training about damage assessment provided by Dr. Simone Angelucci, from Majella National Park, who participated in the projects LIFE COEX (04 NAT/IT/144) and LIFE WOLFNET (08/NAT/IT/325), that included the examination of livestock carcasses attacked by wolves was met with high interest. Training material also included the handbook prepared by Dr. Umberto di Nicola, within the LIFE EX-TRA project (07 NAT/IT/502), and which was adapted to Portuguese.

Timing	Foreseen	Actual date
Start	01/07/2013	01/08/2013
End	31/03/2014	16/04/2014
Milestones	Deadline	Actual date
-		
Deliverables	Deadline	Actual date
Training material on web site	31/07/2013	15/12/2013
Indicators of action implementation	Personnel attending courses identified; Trainers contracted; training material developed.	

### **5.1.10 Action A10: Training of relevant personnel for damage assessment and trust building in Italy**

*Beneficiary responsible for implementation: GR*

*Expected costs: 32,857€*

*Incurred costs: 43,289€*

The objective of action A10 was to train at least 6 technicians (possibly veterinarians) for damage assessment procedures. The training activities, implemented by GR, were concluded earlier than planned (December 2013 instead than March 2014) and were attended by 18 people. The training Report, including the program of the training course and the list of people involved, was delivered (Annex 5 PR1). The course materials were uploaded on the project website (<http://www.medwolf.eu/index.php/documenti.html>). The action was aimed at training the staff responsible of interacting with livestock holders when they suffer damages, so that holders can be provided with the attention and technical competence that they require. It consisted of two modules developed in different occasions (03/12/2013 and 09/12/2013) that covered topics related to wolf biology, social and legislative contexts, legislation regulating damage compensation, evaluation of the types of damage prevention measures, veterinary diagnostic analysis of carcasses, forensic elements, the identification of fraud cases, and an evaluation of the attitudes of livestock holders towards predators. The instructors were selected according to their experience in assessing cases of depredation caused by large canids and their knowledge of the social and legal issues related to wolf conservation. Most of them had participated in other LIFE projects dealing with wolf conflicts with human activities. They were: Dr. Lorenzo Manghi from LIFE IBRIWOLF project (10 NAT/IT/265), Dr. Willy Reggioni from LIFE EX-TRA project (LIFE07 NAT/IT/502), Dr. Simone Angelucci from LIFE Wolfnet project (LIFE08/NAT/IT/325) and Dr. Duccio Berzi. Given that the course was highly specific on technical issues, it was only open to technicians who would make use of the training received. The course was advertised on the LIFE MEDWOLF project website, through specific press releases and through contacting potentially interested parties, and was attended by 18 (first module) and 15 (second module) people.

After concluding the planned training, permission to the EC was asked and obtained for extending the action (request approved on 17/09/2014, see ENV E.3/EDR/TF/ib ARES (2014).3050133) in order to implement the training and hire two veterinarians for collecting ancillary data on damages to complement action A4. Two of the veterinarians that were trained in this action (Dr. Adriano Argenio and Dr. Andrea Di Pascasio) were hired in the project for a period of ten months (May 2014 – February 2015) to conduct field inspections to verify damages, identify fraud cases and investigate the attitudes of livestock holders towards the predator. The activities undertaken by the two veterinarians were realized in collaboration with the veterinary health service of Grosseto (AUSL 9). A total of 140 surveys (70,70% of all damages officially declared) were realized in 84 farms who suffered damages in the reference period in the project area. The analysis of data has showed that, within these, most holders do not use livestock guarding dogs (57,14%) and adequate fences for livestock protection (85,71%). Most of the depredation events (98,6%) occurred in absence of farmer, in absence of adequate fences (98,4%) and in absence of dogs (84,3%). In 71% of cases livestock was killed by canids, and in some occasions (6%) animals was surely killed by dogs since the farmer was present during the depredation event.

It is to be noted that one of the two veterinarians who were trained had the possibility to be contracted by the local AUSL in Grosseto during the years 2014-2018.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/07/2013	01/08/2013
End	28/02/2015	31/07/15
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Training material on the web site	30/11/2013	15/12/2013 (Annex 5 PR1)
Report on damage assessment	31/08/2015	31/07/2015 (Annex 1 PR2)
<b>Indicators of action implementation</b>	Personnel attending courses identified; Trainers contracted; training material developed.	

### 5.1.11 Action A11: Ex-ante survey on the knowledge level and attitudes towards wolf

Beneficiary responsible for implementation: GL

Expected costs: 20,615€

Incurred costs: 11,103€

The objectives of this action were to obtain a baseline estimate of the level of knowledge on wolf and the most relevant related issues in the Portuguese project area, through submission of at least 400 questionnaires. The action, realized by GL, was concluded and the Final Report, describing the attitudes toward wolf presence in Portugal, was delivered (Annex 13 PR1 and Annex 3 MTR), after having been revised by the SAB.

A total of 530 interviews were undertaken with different interest groups, including 171 interviews to students that were analysed in action D5. In particular the interviews were made to 150 people from the general public, 62 to livestock owners, 52 to hunters, 20 to media workers, and 75 to environmental police officers. Students were interviewed during the education activities developed in 2014 through action E2, thus avoiding the need to visit students twice.

Respect to the 400 interviews foreseen we realized 130 interviews more.

Overall, results show that among the general public there is a low acceptance of wolves and little availability toward the implementation of preventive methods for wolf predation on livestock. Livestock owners are slightly negative towards the idea of a wolf population increase and most agree that government must pay them compensation for damage caused by wolves, regardless the use of preventive methods. Most hunters are neutral toward the idea of hunting wolves, and most want wolves to exist in the region. Seeing the wolf as a competitor for game species is not an issue for surveyed hunters. Most media workers and police officers tend to have a moderately positive opinion toward wolves. However, a minority in both groups agree with wolf hunting and lethal control. These groups must be under the scope of a powerful information campaign about wolves, which will contribute towards the success of any wolf conservation project.

Knowledge is consistently recorded at low levels among all groups, with an average score of 3,68 (this score ranges from 0 to 12, if all questions are answered correctly). In general, questions related to various biological aspects of the species and the size and the trend of the wolf population in Portugal are answered incorrectly or are not answered, with most respondents answering more than 50% of the questions incorrectly. The majority of people show some fear and most of them (52.3%) show a strong fear of the species (they are on the second half of the fear scale, that ranges from 4 [no fear] to 18 [strong fear], with scores higher than 11). People tend to fear an elusive animal they cannot see. Low knowledge about wolves is associated with higher fear of the species ( $r = -0.207$ ;  $p < 0.001$ ).

Timing	Foreseen	Actual date
Start	01/01/2013	01/01/2013
End	30/09/2013	31/08/2013
Deliverables	Deadline	Actual date
Brief Report	31/12/2013	31/12/2013 (Annex 13 PR1, Annex 3 MTR)
<b>Indicators of action implementation</b>	Questionnaires designed; Collaborators contracted; Data collected and analysed; List of topics to be tackled by communication campaign.	

### **5.1.12 Action A12: Ex-ante survey on the knowledge level and attitudes towards wolf presence in Italy**

*Beneficiary responsible for implementation: WWF*

*Expected costs: 71,400€*

*Incurred costs: 47,434€*

The objectives of this action were to obtain a baseline estimate of the level of knowledge on wolf and the most relevant related issues in the Italian project area, through submission of at least 100 questionnaires. The action, realized by WWF, was concluded and the Final Report, describing the themes discussed among the livestock owners, was delivered (Annex 14 PR1), after having been revised by the SAB. Considering that a similar survey had been undertaken recently (Action E3 of LIFE IBRIWOLF project), in order to achieve the objectives and to gather a better understanding of the local situation, the methodology was modified. Instead of direct interviews to different interest groups, we undertook a series of focus group meetings with livestock owners only, which is the group most affected by the presence of wolf. Meetings started in September 2013 and the action was completed in December 2013. Seven different meetings were held between the project partners to discuss the organization of the action, its implications with regards to the project's implementation and analysis of obtained data. A total of 10 focus groups were conducted (divided into 2 rounds of 6 and 4 focus groups respectively). In order to grant the success of the focus group meetings and establish a trustful relationship with the livestock owners, a professional facilitator was hired. The consultant had already gained experience in this kind of issues through his participation to the LIFE EX-TRA project (LIFE07 NAT/IT/502). The first round was attended by the representatives of CIA, COLDI and CONFAGRI and included the presentation of the results obtained through action A7 and E3 of project LIFE IBRIWOLF project, given that many of the attendees were interviewed during such actions. The second round of focus groups was also attended by a representative of the Provincial Administration and an expert in damage prevention measures, who was invited to provide clear answer to many request of information coming from the livestock owners. A total of 104 livestock owners participated in the focus groups (90 in the first round and 52 in the second). After every focus group the project staff produced a summary of the themes that were discussed, and circulated it among the Italian partners (Annex 14 PR1).

Overall, the action facilitated the emergence of a more complete and in-depth vision of the problems associated to wolf depredations, as experienced by livestock owners. It allowed the project staff to identify management priorities and provided valuable contributions to the project's communication action (E3) and the correct implementation of the actions C2 and C4. Moreover, the focus groups enabled livestock owners to communicate directly with Provincial authorities, thus allowing the achievement of results, in terms of building relationships and overcoming prejudice, that are important for the implementation of future project actions.

It is worth noting that the original project text included 400 interviews as the expected results. This is obviously an error resulting from the preparation of consistent actions between Italy and Portugal. In fact the action text clearly states that only lacking information would have been collected and a minimum of 50 interviews per each group of hunters and livestock owners would have been collected. The result of 400 interviews has thus not been achieved, because no interviews were undertaken.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/01/2013	01/02/2013

End	30/09/2013	31/12/2013
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Brief Report	31/12/2013	31/01/2014 (Annex 14 PR1)
<b>Indicators of action implementation</b>	Questionnaires designed; Collaborators contracted; Data collected and analysed; List of topics to be tackled by communication campaign.	

## 5.2 Concrete conservation actions

### 5.2.1 Action C1: Selection of beneficiaries and delivery of livestock guarding dogs in Portugal

*Beneficiary responsible for implementation: GL*

*Expected costs: 99,458€*

*Incurred costs: 90,205€*

Action C1 foresaw the delivery of 15-20 livestock guarding dogs to up 15 holdings in the project area aiming a reduction of 30% of damages where they started to work.

This action was concluded and the objectives achieved. In fact the results went well beyond what was expected, as the final number of Livestock Guarding Dogs (LGDs) delivered in the project area in Portugal was 31 (instead of 15-20 as planned) and damage reduction was more than 60% (see also action D1). The selection of the livestock breeders beneficiaries of LGDs was based on data gathered in the action A3, and after having established the selection criteria (e.g. considering the level of damage, the existence of surplus killing events, the interest to receive a dog, the livestock species and flock/herd size and the husbandry system used). Twenty six livestock breeders were interviewed and sixteen were selected (8 from Almeida, 2 from Sabugal, 4 from Pinhel, 1 from Figueira de Castelo Rodrigo and 1 from Guarda municipalities). Thirty one pups, sixteen males and fifteen females (7-16 weeks old, but most previous initiated bonding in the flock/herd of origin), of 14 different lineages of the Estrela Mountain Dog breed (29 of the short and 2 of the long-hair varieties) were integrated in 16 holdings: 9 sheep and/or goat flocks (80-600 head, average 238), 6 herds of cows (30-100 head, average 77) and 1 of donkeys (8 head) (see map in Annex 34). In 7 holdings two or more pups (of different lineages) were placed, while the other holdings received only one pup. The first pup was delivered on the 7<sup>th</sup> of February 2014 and the last one on the 21<sup>st</sup> of August 2017. An agreement was signed before delivering each dog, establishing the rearing conditions and the livestock breeders' responsibilities. In some cases Liability Insurances were made after being requested by the owners.

Nine dogs died (1 male was killed by another dog, 2 males were hit by cars, 1 female was choked in a chain, 1 female was poisoned) or disappeared (3 females) within 3 to 30 months of age, resulting in a total mortality rate of 29% in the first years of the dogs' life. And one male was taken from his herd due to suspicions of having attacked sheep (although nothing was proven by the insurance investigators), and transferred to a different function (guarding dog). In all, but two cases (in one case due to a repeated lack of responsibility by the owner and the second due to a lack of interest in a new dog), the pups were replaced with new ones. All dogs were delivered with microchip from the national dog registry. Pups delivered were confined with livestock during an initial period, usually until they reached 4-6 months of age, although few exceptions (5) were registered, due to a non-compliance of the farmers.

A monthly monitoring of the pups' behaviour, physical development, sanitary status and rearing conditions was undertaken by the project staff. Advices regarding the maintenance and raising of the pups were given. Rabies (mandatory by law) and second combination vaccines shots (Distemper, Hepatitis, Parvovirus, and Leptospirosis) were given and deworming was regularly done to all the dogs and whenever needed. Veterinary assistance was provided whenever necessary, and dog food was supplied according to the dog's age and needs/condition. Some health problems (skin problems, leanness, traumas by car) were registered and easily solved after veterinary assistance or minor surgery. Females in heat were usually confined to avoid breeding, as soon as signalled, or given a contraceptive injection, except in one pair placed with extensive cattle which make it harder to detect and isolate the female, and provide the injection. As a result



the female mated and gave birth to 4 pups (2 males and 2 females) with 12 months of age. These pups were vaccinated, dewormed and microchipped and integrated into new herds/flocks. In five cases dogs exhibited behavioural problems (excessive play - disturbing or injuring sheep, and wandering) that were dealt with in collaboration with the farmers.



Figure 7. Locations where the livestock guarding dogs were delivered in Portugal

Timing	Foreseen	Actual date
Start	01/01/2014	01/01/2014
End	30/09/2016	30/09/2017
Milestones	Deadline	Actual date
First dog delivered	31/12/2013	07/02/2014
Deliverables	Deadline	Actual date
Dog Database	31/12/2015	31/12/2015 (Annex 4 PR2, Annex 1)
<b>Indicators of action implementation</b>		Strategy for identification of beneficiaries; Beneficiaries identified; Agreements signed; dogs purchased.

### 5.2.2 Action C2: Selection of beneficiaries and delivery of livestock guarding dogs in Italy

*Beneficiary responsible for implementation: IEA*

*Expected costs: 131,600€*

*Incurred costs: 108,676€*

The objectives of the action were the delivery of 20 livestock guarding dogs to local farmers, aiming at a reduction of 30% of damages in holdings where they started to work, and the creation of a cooperative of local farmers to promote the local products.

This action was realised by COLDI under the technical responsibility of IEA from July 2013 until February 2016 and implemented directly by IEA since March 2016. The overall objectives of the action were achieved (20 LGDs) and the results went well beyond those foreseen, as we delivered in total 72 LGDs of which 6 died for different causes and were replaced, and 20 are in holdings outside the project area. A total of 46 properly working LGDs are thus present in the Province of Grosseto at the end of the project. This was possible because we managed the pups born by LGDs donated to farmers by the project. Reduction of attacks in the holdings with livestock guarding dogs of two years old was 71% (see also Action D2). The association DifesAttiva was established and is currently operational

Two preliminary steps were realized for the implementation of this action:

- the selection of LGDs supplier: It was decided to acquire the LGDs from C.I.R.Ca. ([www.canidapecora.it](http://www.canidapecora.it)), an experienced association working with LGDs that was also involved in the LIFE EX-TRA project (LIFE07 NAT/IT/502). An agreement with C.I.R.Ca. was signed on the 4<sup>th</sup> April 2014 and it foresaw the supply of 20 dogs, the implementation of two training courses and periodic visits for checking of the working behaviour and efficiency of the assigned pups. The first training course was held in Manciano on 24/06/2014 and was attended by around 50 farmers, a second training course was held in Roccalbegna on 26/3/2016 and was attended by 30 farmers.
- the selection of livestock owners beneficiaries of LGDs (made in synergy with action C4): this selection was made starting from data gathered through action A4. A preliminary list of beneficiaries of prevention measures (fences or dogs) was elaborated using the following criteria of selection: 1) damages suffered; 2) localization of livestock holdings (with respect to a “risk area” identified from data gathered with the action A4); 3) N° of heads and species raised. In order to ensure the effectiveness and the transparency of the selection, a public announcement for expression of interest was published by GR on 7/10/2013. The 201 instances received were ranked according to the following points by a specific commission composed of the beneficiaries' representatives on 7/1/2015:
  - Damages suffered in 2011-2013: up to 40 points;
  - Localization of livestock holdings: up to 40 points;
  - Number of heads and species raised: up to 20 points

Farmers included in the final list were contacted and a visit was made to their premises, in order to verify that there were the proper conditions to insert the dogs in the flocks. Before delivering the dogs, an agreement was signed with the farmers in which it was stated that they agreed to take care of the dog following the indication received by the project staff. In the framework of the project, a veterinary was contracted to monitor the health of the dogs and to make all the necessary vaccinations in their first year of life. The project has ensured the food for all the dogs until two years of age within the project area. Farmers from outside the Province of Grosseto contacted the project and asked for LGDs directly or through a series of Memoranda of Understanding (See section 5.4.4). The decision on whether to allocate the LGDs was made after

an assessment made either by phone or a direct visit. The 46 LGDs present in the project area were delivered to a total of 28 different holdings (Fig. 8). The first 8 dogs in Province of Grosseto were delivered the 18<sup>th</sup> of July 2014, the last ones on the 15/10/2017. All the dogs delivered were around two months of age. Check activities were undertaken following a protocol that included daily communications and one visual check during the first week, and then monthly visits were made for behaviour and health checks. Behavioural observations of the puppies were realized by the personnel of the University of Bologna (one undergraduate student and one PhD student) free of charge (only travel costs were paid by the Project). This ensured prompt intervention in two cases where problems emerged: in one case we intervened to correct the dog behaviour, and in a second case the livestock owner was not following the indications provided by the project staff, thus the dog was removed and re-allocated. 20 LGDs of at least 20 months were monitored with GPS collars for assessing their position relative to the flock guarded and to other eventual dogs. The preliminary results were part of a PhD thesis by Margherita Zingaro and were published on the journal *Applied Animal Behaviour and Science*<sup>1</sup>, while the second session was performed by Francesca de Cristo for her MSc thesis and included both direct observation and GPS data. Both students were from Sapienza University of Rome. It is to be noted that the use of GPS collars on LGDs is the first of its kind in Italy, and provided indications that the LGDs usually stay close to the flock, as they are expected to do (max distance less than 90 mt). In one case the use of GPS collar helped solving a controversy between neighbouring farmers. The GPS collars acquired continue to be used for management purposes, for example with LGDs that tend to roam too much and need to be corrected. The increasing presence of LGDs caused some worries for their potential interactions with hikers and other users of the land, including cars driving on country roads. In order to prevent possible problems we developed a warning sign (Annex 36 MTR), containing simple indication on how to behave in presence of a livestock guarding dog. Through an agreement with Grosseto AUSL we delivered a total of 1061 such panels, placed in 122 farms, 41 of them were directly involved in the actions C2, while 81 were farms not involved in the LIFE MEDWOLF project, but made explicit request for them. Within action C2 the establishment of a cooperative was planned, and one association of farmers involved in the project (**DifesAttiva**) was created instead on the 15<sup>th</sup> of September 2015, as it resulted administratively easier. In order to ensure full commitment from the livestock owners who take part in the association and would ensure long term sustainability, a series of meetings were held with discussions to reach agreement on roles and responsibilities, thus the association was legally registered on 31/01/2017 and its statute explicitly shows the mandate to promote the correct utilization and management of prevention measures, mainly LGDs (Annex 20). A web site ([www.difesattiva.info](http://www.difesattiva.info)) and a facebook page of the association were created. DifesAttiva provides adequate training to farmers on the correct education of LGDs and support to LGDs owners to manage new litters, including contact with other farmers wanting LGDs. In addition, DifesAttiva has promoted the production and the sale of local products from the farms that correctly manages livestock and has adopted damage prevention measures. DifesAttiva participated to a total of 48 events to promote the use of damage prevention measures (Annex 21). For promotion activities a series of gadgets were produced (Annex 21 MTR) as well as a general presentation brochure, while for the delivery of puppies a second-hand car was acquired by FESTAMB (see section 6.1.1.4). DifesAttiva has independently established an agreement with Almo Nature, a firm producing pet food, which has agreed to secure the provision of food for up to 100 LGDs for the whole 2018. DifesAttiva manages the food and the farmers wishing to receive dog food are requested to pay an associative fee and to sign a protocol for collaboration. The association has been awarded the

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<sup>1</sup> Zingaro et al 2017



local prize SOROPTIMUS for young female entrepreneurs. At the end of the project 21 farms were involved in DifesAttiva. The association continues the assignment of puppies to local farmers and is currently promoting the programme “Volontari Attivi” that includes the support to livestock owners for the guarding activities while the flocks are at grazing pastures. DifesAttiva will continue working as support to farmers using funds available from different sources and a specific business plan was produced (Annexes 18, 20 ).



Figure 8. Locations where the livestock guarding dogs were delivered in Grosseto Province.

Timing	Foreseen	Actual date
Start	01/01/14	01/07/13
End	30/09/2016	30/11/2017
Milestones	Deadline	Actual date
First dog delivered	31/12/2013	18/07/2014
Deliverables	Deadline	Actual date
Dog Database	31/12/2015	31/12/2015 (Annex 5 PR2, Annex 2)
Other Annexes		
DifesAttiva Statute and Business plan		Annex 20
DifesAttiva Events		Annex 21
<b>Indicators of action implementation</b>		Strategy for identification of beneficiaries; Beneficiaries identified; Agreements signed; dogs purchased.

### **5.2.3 Action C3: Installation of fences as prevention measures in Portugal**

*Beneficiary responsible for implementation: ESACB*

*Expected costs: 137,338€*

*Incurred costs: 183,512€*

The action was completed and achieved results that went well beyond the original objectives set in the project, as a total of 34 fences were built in 19 farms (instead of the 15 fences in 15 farms as originally planned) and damage reduction was more than 80% respect to 40% expected. The first permanent fence was built in 2013 (19/06/2013) to protect an ostrich farm that registered high damage caused by frequent wolf attacks. This first construction was considered a priority by the ICNF, the national agency responsible for wolf management and damage compensation, to solve a highly conflictive situation in the study area that had been escalating since 2012.

The selection criteria of all the other livestock breeders were established in a coherent way with action A3 and C4 and consisted in the following: i) previous damage suffered; ii) foreseeable continuity of the farm in order to ensure long term sustainability in the use of fixed fences; iii) motivation to use the fence, including availability to pay for part of its installation, namely the construction work; iv) livestock species, and number of heads giving priority to sheep and cows; v) feasibility of construction in terms of terrain and landscape features; vi) farm size and economic viability. The criteria for selecting the farms were presented in several meetings to the livestock breeder association of Almeida, to ICNF and to the participants of the international workshop (organized in action E6). Following the criteria established, 19 farmers (15 from Almeida, 2 Pinhel, 1 from Sabugal and 1 from Guarda municipalities) were selected. During a confirmation interview the characteristics and location of the fences were established in order to best adapt the fence to each farm specific needs and reduce the predation problems. Given the characteristics of the livestock management and the fact that mainly cows are raised in the extensive system, the best solution was to protect not the entire flock/herd but to build permanent fences to protect calving cows, newborn/young livestock during the day/night, or the entire flock/herd during the night. Material was purchased (for a budget around to 3,500€ per farm), and in the cases that the farmer wanted to increase the perimeter of the fence, additional material was purchased with own funds. Most of the fences were installed between 2014 and 2016. Considering that 1-3 fences were built per farm, in situations of 3 fences, the construction lasted until the beginning of 2017. The construction of fences was under the responsibility of the farmers (with technical support provided by ESACB staff), making them involved in the process and co-responsible for ensuring the proper use/maintenance of the fences and ultimately their efficacy. An agreement was signed between ESACB and the farmers when the material was delivered. Given that the almost totality of the livestock breeders in the project area who had been contacted expressed interest in the permanent metal fences rather than the mobile e-fences, the budget available for setting-up the mobile electric fences was transferred to the acquisition of permanent fences. The low interest in mobile e-fences to prevent damage is due to the fact that they are considered to be less effective in larger pastures (several dozen ha are common in the study area), divided by a large number of parcels, and they require extra work for regular maintenance. Permanent metal fences, on the other hand, are considered an interesting asset, at least for fencing smaller areas to confine the cattle in specific situations (e.g. night confinement, calving/lambing). By decreasing the costs with the construction (since these will be ensured by the farmers through a collaborative process), it was possible to maximize the existing budget. Monitoring the use and functionality of the fences was ensured by the project staff, and in some cases, interventions were necessary for improving the effectiveness. In a particular case, the ostrich fence had to be improved as a predatory event occurred (19 months after the start of

operation of the fixed fence) because of terrain irregularity that allowed a wolf to jump the fence. Other interventions included improvements of the foundations and of the existing material in order to ensure the proper characteristics of the fences and that they would remain predator-proof and adequate to confine the respective livestock in good conditions.

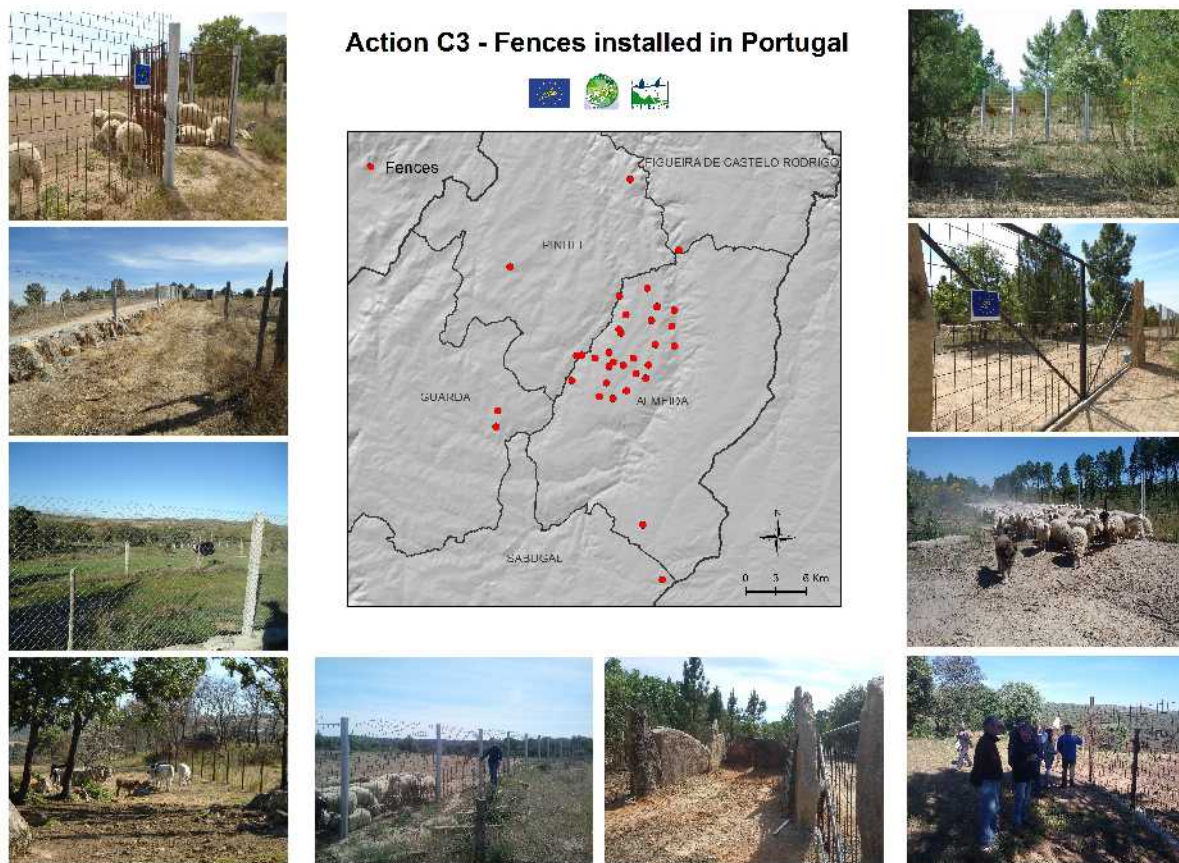


Figure 9. Locations where the fences were delivered in Portugal

Timing	Foreseen	Actual date
Start	01/01/2014	01/04/2013
End	30/09/2016	30/11/2017
Milestones	Deadline	Actual date
First fence installed	30/09/2013	31/12/2013
Deliverables	Deadline	Actual date
-		
<b>Indicators of action implementation</b>		Strategy for identification of beneficiaries; Beneficiaries identified; Agreements signed; Experimental design developed; Fences purchased.



#### **5.2.4 Action C4: Installation of fences as prevention measures in Italy**

*Beneficiary responsible for implementation: IEA*

*Expected costs: 283,616€*

*Incurred costs: 346,240€*

This action, realized by COLDI, CIA, CONFAGRI and GR under the technical responsibility of IEA, started on July 2013 and achieved the installation of a total of 80 fences in 71 holdings in Province of Grosseto (Figure 10). The difference between the objectives set in the project (130 mobile e-fences and 10 fixed fences) is due to the fact that almost all farmers opted for fixed fences, which are at least 2,5 times as expensive as the mobile fences are (average 800€ for a mobile e-fence against at least 2,500€ for an average fixed fence of the same length – 200 mt). The action was implemented in a satisfactory way, and methods used for the selection of beneficiaries, the technical assistance to the farmer and the monitoring of the fences could represent good examples to be followed by the other administration in the future. Examples of replications are given in section 5.7.6. The expected result of a decrease of damages by at least 40% in the holdings in the province territory was met. The ex-post analysis showed that farmers using the fences had reduced the depredation events by 47%, and head losses by 50% (see also action D2).

Starting from data achieved with action A4, the selection of beneficiaries was undertaken as described in Action C2, and a list of potential livestock owners beneficiaries of prevention measure was defined as a result of the expression of interest published by the Province.

In order to maximize the number of interventions we fixed a maximum budget of € 2,500.00 for each fence. Using all budget available for fences and acoustic deterrent, plus some economies from other actions a total of 71 instances were satisfied.

A specific survey to each farmer present in the final list was made to define what kind of prevention measures were the best depending on the characteristics of their husbandry type and method and what kind of prevention measures were possible to implement depending on landscape conditions. Prior to the beginning of the survey, a training course was held in Grosseto (24/02/2014) in order to improve the knowledge of the project staff about the implementation and adequacy of different type of fences.

After the construction of any fence, a second specific visit was made in order to verify that the intervention was correctly made. The first fence was tested the 24/11/2014 and the last on on 27/03/2017. Of the 80 fences installed 86% are metal fixed fences, 2,5% are mixed ones, 7,5% are mobile ones and the remaining 4% are fixed electric fences. The average perimeter of the tested fences is 276 ( $\pm$  130) meters. Specific metal panels were realized informing that fences were built with the contribution of the LIFE financial instrument of the European Union, and they were hung on the fences (Annex 39 MTR).

An agreement was signed with the livestock owners when the material was delivered. Through this agreement, the farmer undertook to comply with the directions of the project staff and to allow the monitoring of the functionality of the fence.

The construction of the fence was under the responsibility of the farmers (with technical support provided by project staff), making them involved in the process and co-responsible for ensuring the proper use/maintenance of the fences and ultimately their efficacy.

Apart from the labor for the installation of the fence in 42% of the fences the farmers provided additional materials (e.g., gates, poles, part of the welded mesh) at their own expense.

All the tested fences were monitored every 6 months through a specific visit, while the electric fences were monitored every 4 months, since the electrical components need to be controlled with deeper attention. During these visits the correct use of the fence was checked in order to

measure the efficiency of fence for damage reduction. The visits represented also a mean for building a strong relationship with local farmers.

To monitor the correct use of the fence and the reaction of predators we installed camera traps near the fence and obtained interesting videos of approaching wolves.

During action implementation we decided to improve 3 fences: 2 fixed metal fences and one electric fence.

In the first two cases we bought additional materials to reinforce the upper part of the fence in order to avoid possible jumping of predators. For the electric fence we added welded mesh in the bottom part of the fence because wild boars damaged the lower electric wires.

Major problem were encountered with mobile electric fences, because sometimes wild ungulates damaged the fence, and it happened that in some cases the lambs got stuck in the mesh of the fence and died suffocated. For this reason we suggested to the farmers to maintain the fence always electrified when the animal were inside, in this way they learn to avoid to approach the fence. Another possible solution could be to install a metal fence along the perimeter of the electric fence.

Two of the 5 mobile fences were not considered satisfactory by the beneficiaries and were given back to the project staff, who agreed to make them available to DifesAttiva for urgent interventions to the associates. One of them was used in January 2018.

The action was implemented in a satisfactory way, and we think that the selection of beneficiaries, the technical assistance to the farmer and the monitoring of the fences could represent good examples to be followed by the Regional administration in the future.

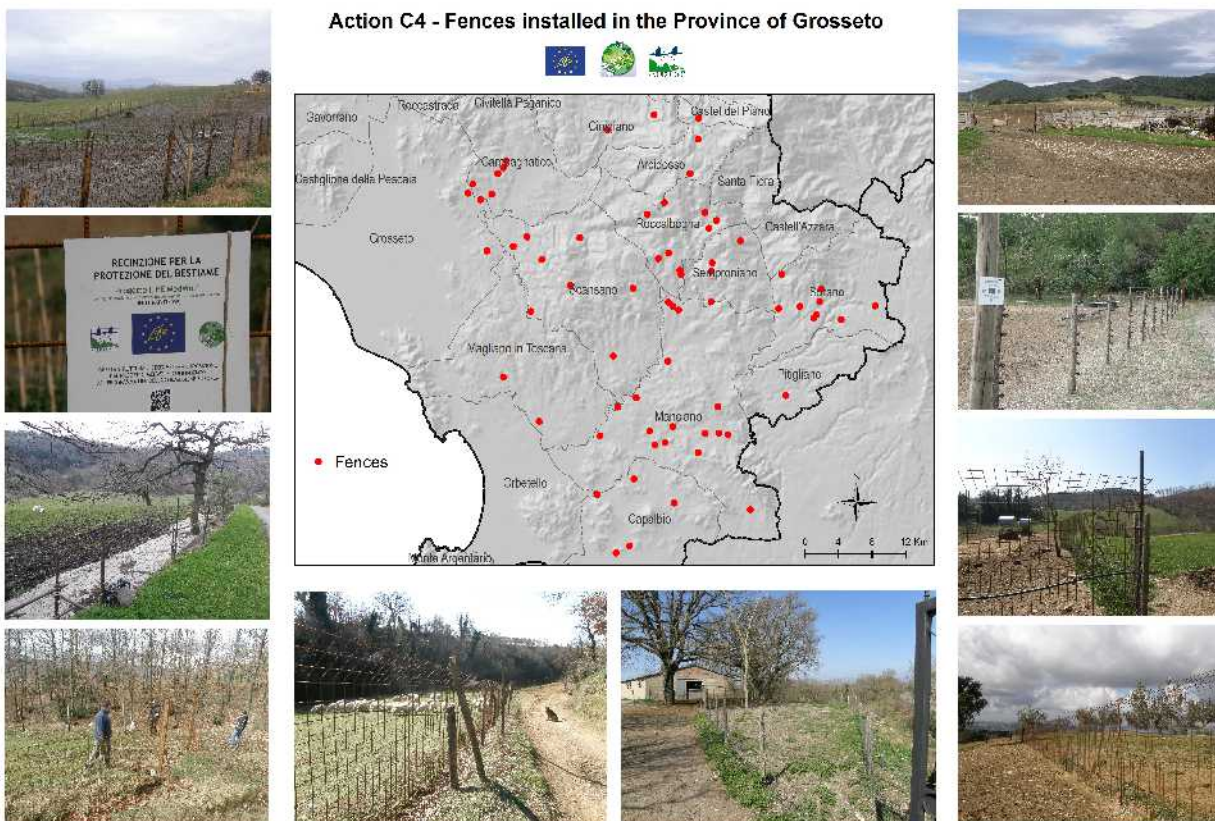


Figure 10. Locations where the fences were delivered in Grosseto.



<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/01/2014	01/07/2013
End	30/09/2016	30/09/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
Experimental design developed	31/08/2013	31/12/2013
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Indicators of action implementation</b>		Strategy for identification of beneficiaries; Beneficiaries identified; Agreements signed; Experimental design developed; Fences purchased.

### 5.2.5 Action C5: Control of poison and anti-poaching activities in Portugal

Beneficiary responsible for implementation: ALDEIA

Expected costs: 98,847€

Incurred costs: 50,412€

This action was aimed at developing a strategy for the control of illegal activities coordinating all the relevant entities, and at least 50 agents equipped with 100 kits for collecting poisoned animals/baits, a minimum of four annual meetings with interest groups, and 5 major actions to control illegal activities conducted, resulting in an overall reduction of poisoning cases of 40%. This action was developed by the associated beneficiary ALDEIA and some of the planned activities were modified according to the local needs that changed in the time lapse between the preparation of the project proposal and its implementation. In fact, the need for poison kits was not relevant any more and the funds were used for the acquisition of other equipment considered crucial by SEPNA-GNR, who have established anti-poaching and anti-poison teams within other projects, namely 8 photographic cameras and 2 freezers that were distributed to the Guarda and Castelo Branco teams. The poison cases registered in 2013 and 2014 was not as high as expected, considering the scenario known before the project, and the number of toxicological analysis was not reached. This was probably due to the previous work done by another LIFE Project (Innovation Against Poison, LIFE09NAT/ES/000533), with which the LIFE MEDWOLF actively collaborated organizing the control actions and exchanging data. As a result there was no need to contract a lawyer. The poison canine team was not be established, but control actions throughout the study area were insured with interventions of a Spanish canine team that collaborated with LIFE Innovation Against Poison (LIFE09/NAT/ES/000533) and LIFE Iberline (LIFE10/NAT/ES/000570) during the period when the SEPNA-GR teams were not operating. Furthermore, poison detection dog teams have been implemented south of the study area under a new LIFE Project (LIFE Imperial, LIFE13NAT/PT/001300), and in the northern municipality under another LIFE Project (LIFE Rupis, LIFE14NAT/PT/000855), with which the LIFE MEDWOLF partners collaborated, maintained contact and exchanged information.

The activities developed within this action rather focused on the coordination and facilitation of

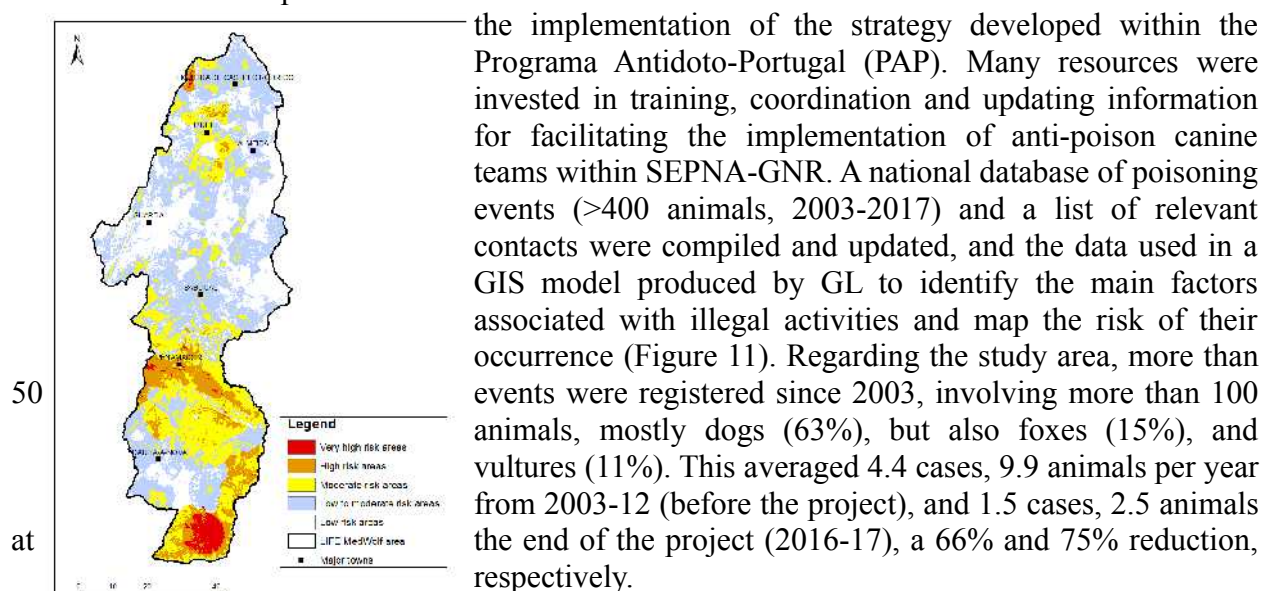


Figure 11 – Risk map for illegal activities.

the implementation of the strategy developed within the Programa Antidoto-Portugal (PAP). Many resources were invested in training, coordination and updating information for facilitating the implementation of anti-poison canine teams within SEPNA-GNR. A national database of poisoning events (>400 animals, 2003-2017) and a list of relevant contacts were compiled and updated, and the data used in a GIS model produced by GL to identify the main factors associated with illegal activities and map the risk of their occurrence (Figure 11). Regarding the study area, more than events were registered since 2003, involving more than 100 animals, mostly dogs (63%), but also foxes (15%), and vultures (11%). This averaged 4.4 cases, 9.9 animals per year from 2003-12 (before the project), and 1.5 cases, 2.5 animals the end of the project (2016-17), a 66% and 75% reduction, respectively.

Regular meetings (22 in total) were held with SEPNA-GNR, and ICNF (central and local Protected Areas) to organize training actions and gather data about poisoning

and poaching events. Meetings were held with two labs responsible for toxicological analysis, and contacts maintained with ICNF to update PAP's toxicological analysis procedures. Furthermore, inputs were provided during the discussion of PAP's strategy and actuation protocol initiated in December 2016 by ICNF, involving all responsible authorities (SEPNA-GNR, DGAV) and NGOs (GL and others involved in LIFE Projects dealing with this issue), in order to optimize and better operationalize it. A strategy focusing on poaching control was also produced, (Annex 22) and reviewed by the IW-WG (action E8), and will continue to be discussed with responsible authorities, namely SEPNA-GNR and ICNF.

One meeting was done with local veterinaries of the study area and surrounding municipalities (around 20), explaining the current protocol in case of poisoning events, and a quick-guide (focusing on toxics, symptoms, procedures) was produced and given to all, and sent to DGAV (national authority for food and veterinary), other relevant entities, as well as LIFE Projects and entities dealing with illegal poisoning. Four workshops were organized for ICNF wardens/techs (18), and SEPNA-GNR agents (76 of Guarda, and 27 of Castelo Branco Districts), focusing also on the use of anti-poison canine teams. Training actions were also done to veterinary (340) and biology (25) students (8 lectures, 1 workshop) focusing on veterinary toxicology and wildlife rehabilitation. Environmental education actions were done in schools (6 events, 220 students) in the study area (3 municipalities), and to the general public (7 events, 537 participants) inside the study area (1 municipality), and adjacent/outside (4 municipalities).

Support to SEPNA-GNR was provided in 4 poisoning events, 2 in the project area (Guarda, 2015: 1 fox; Pinhel, 2017: 1 fox, 1 azure-winged magpie), and 2 in nearby municipalities (Seia, 2014: 1 dog, 1 fox, 2 crows, 1 black redstart; Trancoso, 2014: 1 dog).

Three poison control actions were made in collaboration with SEPNA-GNR, ICNF and local vets, and performed by the Spanish canine team of 5 dogs:

- 22.04-01.05.2014 - 5 municipalities of the study area, and one adjacent, 15 baits/carcasses (birds, dogs, foxes) collected, and 8 positive for toxics (Insecticides: organophosphates and carbamates; Molluscicides: methiocarb); 2 snares found and retrieved by the authorities;
- 19-24.05.2015: 1 municipality of the study area and adjacent ones, 12 baits (not possible to confirm the presence of toxics), and 2 snares collected;
- 25.04-07.05.2016: all municipalities of the study area, and one adjacent, insects (dead after feeding from poisoned baits/carcasses), and 3 carcasses (cow, Egyptian mongooses) were collected (not possible to confirm the presence of toxics).

Samples from 4 carcasses received at CERVAS (2014: black vulture, azure-winged magpie; 2015: dog, black-backed gull) were sent for analysis (organophosphates confirmed in the first case, the bad quality of the others did not allow a complete analysis).

Two poaching control actions were developed. One nocturnal control in Sabugal (30.04.2014), organized in collaboration with SEPNA-GNR and ICNF, based on indications of illegal activities, with no results. Furthermore, the poison canine team helped to locate in Guarda (06.05.2016), one LGD placed by the project that was found alive caught in a wild boar snare that was later retrieved by the authorities. As a result, an additional control action was initiated in this area and several snares were retrieved by SEPNA-GNR.

Timing	Foreseen	Actual date
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Start	01/04/2014	01/10/2013
End	30/06/2016	30/06/2016
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
Detection team set up in Portugal	30/06/2014	
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Other Annexes</b>		
Anti-poaching and Anti-poison strategy		Annex 22
<b>Indicators of action implementation</b>		Trainers contracted; dogs trained; wardens trained; dog kennels built; visits to other projects;

### **5.2.6 Action C6: Control of poison and anti-poaching activities in Italy**

*Beneficiary responsible for implementation: CFS until Dec 2016, CUFAA since Jan 2017*

*Expected costs: 174,282€*

*Incurred costs: 153,822€*

In the frame of this action as was foreseen in the project proposal we established 2 anti-poaching teams and 1 anti-poison team with 2 detection dogs.

This action was expected to start in the last quarter of 2013 but was formally started on 01/12/2014 since a series of factors has revealed the impossibility of implementing the action as it was originally envisioned in the project proposal. Consequently, GR and WWF, in accordance with IEA, have transferred the responsibility to implement the action to the new associated beneficiary Corpo Forestale dello Stato (CFS). This modification has led to an amendment to the grant agreement for which the authorisation was received on 17/09/2014 (ENV E.3/EDR/TF/ib ARES (2014).3050133). The bilateral agreement between IEA and CFS was signed on 28/01/2015 and immediately after the training course for personnel to be involved in the action C6 was held in collaboration with the project LIFE Pluto project (LIFE13NAT/IT/311; see par 5.1.8 for further details). Subsequently two detection teams were established for anti-poaching activities, based at the local command of Orbetello. A total of 20 surveys were realized in 10 different municipalities in the period between 20/06/2015 and 30/09/2016. In December 2016 CFS was replaced by Carabinieri Forestale (CUFAA) who undertook the responsibility to continue the activities started by CFS and a new partnership agreement was signed on 20/10/2017. The staff from the anti-poaching teams were moved to other services (Fire Brigades) and local staff had to be trained again (this training was not charged to the project) before the previous members were moved. Given the reduction of staff, there was no possibility to establish a devoted team thus inspections were made by the staff of the local commands in coordination with AUSL Grosseto on a regular basis. The anti-poison detection team was established in State Reserve Marsiliana. Two dogs were purchased and trained in Andalucía for the first period. A visit was made in March 2016 in order to assess the dog's health status, the adequacy of training and their wellbeing. A dog kennel was built in Follonica at Local Biodiversity Office (UTB) of CFS. The dog kennel has high level standards for dog health and well being. The first dog (called Mora) was delivered in June 2016, together with a specialised training course for dog handlers, that lasted 3 weeks. In September 2016 the second dog (called Lapa) was also delivered and a three weeks training session for handlers was started. The training duration was increased following some inadequacies recorded during LIFE WOLFALPS project, and it was attended by the dog handlers from other LIFE projects (LIFE MIRCO-lupo and LIFE PLUTO). This offered the opportunity to team building for the handlers who collaborate and help each other in case of uncertainties or difficulties after the trainers left to Spain. The vehicle acquired was equipped with appropriate commodities for transport of dogs and handling of poison, including two dog kennels and a series of drawers. The team was fully operational from October 2016 and started its activities including routine training sessions and preventive surveys as well as interventions after urgent calls. The list of 28 actions undertaken in the period of activity is reported in table 1. A set of 15 camera traps were acquired for increasing the efficiency of inspections and set up nearby holdings with frequent and non reported predator attacks.

One of the two dogs of the team was detected a foreleg dysplasia and treated in April 2017. The dog needed extra training after having to rest for a period of 4 weeks. The training was done by Rita Santos, a dog handler expert from the Conservation Canine Team. The surgery and the training were successful and the dog recovered and could go back to work.

DATE	MUNICIPALITY	IMPLEMENTED ACTIVITY
26/01/17	BELAGAI	PREVENTIVE INSPECTION
10/02/17	SCARLINO	INSPECTION AFTER DEAD DOG REPORTED
13/02/17	SCARLINO	PREVENTIVE INSPECTION
20/02/17	VAL PESA (FI)	PREVENTIVE INSPECTION
16-17/03/17	FOLLONICA	PREVENTIVE INSPECTION
20-28/3/17	VARIOUS LOCATIONS	FOUR TRAINING SESSIONS
18/05/17	RADDA IN CHIANTI	URGENT INSPECTION ON CALL
31/5/17	FENIGLIA	PREVENTIVE INSPECTION
6/6/17	MARSIGLIANA	PREVENTIVE INSPECTION
7/06/17	BELAGAI	PREVENTIVE INSPECTION
9/6/17	FENIGLIA	PREVENTIVE INSPECTION
12/06/17	MASSA MARITTIMA	PREVENTIVE INSPECTION
06/07/17	MONTE SAN SAVINO (AR)	PREVENTIVE INSPECTION
10/08/17	GIANNELLA (ORBETELLO)	PREVENTIVE INSPECTION
31/08/17	BELAGAI	PREVENTIVE INSPECTION
10 -12/09/17	BELAGAI AND SURROUNDINGS	FOUR TRAINING SESSIONS
03/10/17	BELAGAI AND SURROUNDINGS	PREVENTIVE INSPECTION
17/10/17	SCARLINO SCALO	URGENT INSPECTION ON CALL
19/10/17	BELAGAI	PREVENTIVE INSPECTION
01/11/17	VETRICELLE	PREVENTIVE INSPECTION
07/11/17	MONTIONI	PREVENTIVE INSPECTION
18/11/17	MONTIONI	PREVENTIVE INSPECTION

Table 1 – Date and location of the anti-poison surveys made by the Dog Detection Team in Italy



Lapa and Mora, the anti-poison dogs

Notwithstanding the delay in the implementation of this action, a first survey with two anti poison dogs coming from the Gran Sasso National Park was realized on the 18/06/2015 in one farm of Roccalbegna (Province of Grosseto) who had denounced a suspected case of poisoning. A striking case of poaching was investigated and procedures are not public yet, but the anti poison team was called for inspections in Monterotondo Marittimo and surroundings after a wolf was hung at the road side. A protocol and activity plan was produced for planning interventions in the province of Grosseto (Annex 42).

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/01/2015	01/02/2015
End	31/10/2017	30/11/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
Detection team set up in Italy	31/12/2014	31/10/2016
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Other Annexes</b>		
Anti-poaching and Anti-poison strategy		Annex 42
<b>Indicators of action implementation</b>		Trainers contracted; dogs trained; wardens trained; dog kennels built; visits to other projects

## 5.3 Evaluation actions

### 5.3.1 Action D1: Assessment of the efficacy of damage prevention structures and livestock guarding dogs in Portugal

*Beneficiary responsible for implementation: GL*

*Expected costs: 26,904€*

*Incurred costs: 43,798€*

This action aimed at assessing the efficacy of the different prevention methods implemented, with damage prevention methods being used at least by 40% of the farmers in the project area, and a decrease by at least 30% of damages to livestock in the project area. An additional analysis on opinion polls and satisfaction of beneficiaries of the damage prevention measures was also expected, with farmers in the project areas being aware of the best livestock management techniques in order to reduce depredation. The action was concluded and the evaluation of the efficacy of the fences was carried out also with an experimental approach (treatment vs control farms) not originally foreseen, and a Final Report presenting all the different results obtained was produced (Annex 3).

Results show that a total of 31 holdings received prevention measures, and they represent all the farms that suffered damages in the project area. No data are available to estimate what % of farmers in the area this represents. Opinion pool was expected to involve 30 beneficiaries of damage prevention measures and 100 other livestock owners, 50 inside and 50 outside the wolf range. We interviewed a total of 103 farmers respect to 150 planned, because we decided to invest time and energy in the experimental approach to evaluate the efficacy of damage prevention methods, because this approach which guaranteed a more robust and accurate result than a simple interview.

An overall analysis, comparing the average yearly number of damages from 2013-2016 (95.5 events), with those of 2017 (55 events), last year of the project, when most prevention measures were fully operational, shows a decrease of 42.4% of events in the project area.

Comparisons were made between treatment (16 farms with 26 fences) and control (farms without fences) and results show that an average of 8 cattle and 1 sheep in control holdings had damages, with 200 animals affected: 139 bovines, 61 sheep. These numbers should be considered minimum, since not all damages may be claimed. During the 1-year monitoring period only one treatment farm registered damage (5 attacks, affecting 20 sheep), that occurred when the flock was left outside the fences, namely during the night, and thus the main purpose for using the fences (night confinement) was not met.

Considering the overall number of months the fences were in use, and the period before they were operational, there was a significant decrease in the average number of attacks per holding/month (-83%) and in the average number of affected animals per holding/month (-88%). No problems linked with the use of the fences were detected, but it implies extra daily work and higher production costs (construction and operational costs), which can be relevant if several fences are used per holding. Also the cyclical movements of the livestock through different pastures along the year may imply the building of several fences. The size of the fences were considered small in some cases, and limit any increase in herd/flock size. Other advantages are protection against other predators (e.g. dogs, foxes), the possibility of improving livestock management/handling, the deterrent effect from a higher human presence, and the peace of mind of knowing the livestock is protected. Most farmers (63%) were satisfied/very satisfied with their fences, supported by the replication of structures, the increase in fenced areas, and investment in



labour/time/capital by some beneficiaries.

LGD behavioural observations (average of 20' during grazing, evaluated according to the 3 behavioural components: attentiveness, trustworthiness, protectiveness), complemented with inquiries to farmers to assess perceived performance, were also done.

Considering mortality and the minimum age for evaluation (18 months), 20 dogs were included in the behavioural and satisfaction analysis, and 13 dogs (10 holdings) in the damage analysis, since one monitoring year had to be considered after the dogs reached adulthood.

In the presence of LGDs there was an overall reduction of >60% in the number of animals affected. Most adult dogs were evaluated as excellent/good in attentiveness (55%), trustworthiness (85%), and protectiveness (65%), comparable to owner ratings (55%, 85%, 80%, respectively), that rated most dogs (70%) as having an excellent/good performance. Some problems were registered, namely: lack of attentiveness (35%) and trustworthiness (10%), all in LGDs raised with no or very limited supervision. This was expected considering the less suitable raising conditions, lower experience of farmers and reduced supervision during early stages of the dog's development. These results are within the range of those obtained in similar projects in different regions for the same husbandry systems. No aggressiveness to other dogs or people was registered, and only one dog was observed killing (with other dogs in the flock) a badger and a roe deer. Most farmers (75%) were satisfied/very satisfied with their dogs; half of the dogs with highest ratings (n=3) were in shepherded flocks and the other half in unsupervised cattle, system where the lowest ratings were also registered (n=3). This positive result is supported by the establishment of this measure in holdings that reported highest damage, namely by adopting new dogs, and its dissemination to neighbour farms, by recommending its use and distributing pups. Best practices are proposed to optimize the implementation of LGDs and reduce the constraints identified.

Awareness data were obtained from 19 beneficiaries (mostly of fences). Most (53%) considered fences and/or LGDs effective in reducing predation, 21% mention shepherding (but consider this not possible in the current context), and a small number (24%) proposed wolf control to reduce losses. Most (63%) considered the LIFE MEDWOLF a good initiative, and most (79%) were aware about the work developed by the project in what concerns the donation of fences/LGDs to other farmers. There was a slightly higher awareness regarding wolf (knowledge), among beneficiaries which is a good indication. For the results of the interviews of the other 84 farmers see action D5.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/07/2016	01/07/2016
End	30/09/2017	30/11/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Report of evaluation	30/09/2017	30/11/2017
<b>Indicators of action implementation</b>		Collaborators contracted; sampling design; data collected; Data analysed.

### **5.3.2 Action D2: Assessment of the efficacy of damage prevention structures and livestock guarding dogs in Italy**

*Beneficiary responsible for implementation: GR / IEA*

*Expected costs: 43,780€*

*Incurred costs: 48,057€*

This actions aimed at assessing the efficacy of the implemented prevention measures, through comparison of damages before and after implementation and reporting the satisfaction level of the involved farmers. The results expected were that damage prevention methods were used at least by 40% of the farmers and a decrease by at least 40% of damages to livestock in the project area. The action was concluded also adopting an experimental approach not originally foreseen and the damage reduction observed was around 50% . Considering all the activities carried out in the project (Action C2, C4, E3) also the objective that at least 40% of the farmers used damage prevention methods was fully achieved. Opinion pools were planned to involve 300 farmers but we limited the interviews to 254 farmers, because we preferred to invest time in the experimental approach to measure the efficacy of fences. The the Final Report including all the different results of this action was produced (Annex 4).

The evaluation of efficacy of damage prevention measures was made during a period of 12 months of data collection and subsequent analysis. The action was originally planned to be undertaken under the responsibility of GR but after the implementation of National Law 6/2014 that transferred many competencies from the Provincial Administrations to the Regional ones (see section 4.1), many staff members of GR became civil servants for Tuscany Region, who adopted the decision not to replace the provincial administration in ongoing LIFE projects. In consideration of the decreased availability of technical staff in GR, the responsibility to develop this action was transferred to IEA.

After having assessed the feasibility and the potential for producing an innovative and best practice approach for the development of the action, a request was made to the EC to delay the duration of data collection from may 2016 to may 2017 (see request for amendment to the grant agreement dated 24/6/2016) and to adopt an experimental approach “treatment vs control” for collecting data, instead of just being limited to interviews. Due to minor delays in installation of some fences, the data collection started in July 2016 and was continued for 12 months. The duration of 1 year of the study period was decided in order to cover the different phases of the annual cycle of the wolf.

Data collected for fences were the following:

- data were collected on two sets of holdings: 51 with project fences installed and correctly functioning and 103 holdings with comparable flock size ( $\pm 50\%$ ) and placed at a distance within a radius of 5 km, which represents the average wolf home range size, and without any damage prevention measure. The holdings with project fence were considered “the treatment group”, while those without any fence were considered “the control group”. Treatment farms were checked twice during the action period to verify that farmers maintained the fences in good operating conditions, while control farms were checked 4 times to verify they did not change their husbandry practices. The two groups of farms were also surveyed after each predation event in order to collect relevant information (e.g. time of the attack, protection and management of the flock at the moment of the attack).
- Damages suffered by the control and treatment holdings were compared in order to identify trends and eventual significant differences that would demonstrate the efficacy of the fences.
- Data on predatory events in each of the farm where a project fence was analysed through a BACI (Before and After Control Impact) that foresees the comparison of events that happened

before with those that happened after the installation of the fence.

- Finally, a satisfaction questionnaire was submitted to all farmers to understand their opinions toward the prevention measures.

Overall we recorded 139 depredation events during the study period comprising 94 reported and 45 unreported ones. 93 (67%) depredation events occurred in control farms (n = 45 control farms, 1-8 depredation events/farm), while 46 (33%) in treatment farms (n = 18 farms, 1-10 depredation events/farm). 107 attacks (77%) occurred during daylight, 32 (23%) during the night. The majority (63%) of the attacks during daylight occurred in control farms (37% in treatment farms). The difference between the two groups was much higher if we analysed the attacks during the night, where we can really evaluate the role of the fence in flock protection. Of the 32 attacks that took place during the night, 81% occurred in control farms and only remaining 19% in treatment farms. Of the 6 events occurred in treatment farms only 1 happened inside a fence but the predator passed under the gate that was not correctly installed; the remaining 5 attacks were registered on groups of sheep that were not protected in any way.

We registered the same trends when we compared the number of animals killed in the 2 groups of farms. Of the 367 animal killed 66% were of control farms and 34% of treatment farms; 272 (74%) animals were killed during daylight, while 95 (26%) during the night. The percentage of animals killed during daylight was 58% in control farms, and 42% in treatment farms, while during the night was 81% and 11% .

These results showed clearly that fences, for flock protection during the night played a significant role in damage reduction in terms of number of attacks and number of animals killed.

We considered the number of damages occurred before and after the installation of the fences for 49 farms. Damage reduction after fence installation was 47% if we consider the number of attacks and 50% if we consider the number of animals killed.

For assessing efficacy of LGDs we also considered number of attacks to farms that received our dogs. We considered only the period after the dog had reached 2 years of age, thus the sample is represented by a total of 9 farms. The number of events decreased by 71% and none of the attacks occurred on flocks directly guarded by the project's LGDs, thus the direct efficacy of the dogs could be considered as 100%, but a secondary deterrent effect could be considered given that the overall amount of attacks decreased significantly.

The other approach used to evaluate the prevention measure efficacy was the farmer's satisfaction. We carried out 163 face to face interview to 62 farmers involved in LIFE MEDWOLF project (farmers who received fences and or LGDs) and 101 farmers who didn't receive prevention measures from the project (the control group).

The questionnaires used for fences and LGD's were composed by 11 close-ended questions about:

- the opinion about prevention measures as a tool to reduce damages to livestock;
- the cost in terms of additional work caused by the use of prevention measures
- the opinion on the possibility to establish the obligation to use prevention measures for farmers who are in area at risk of predation
- the opinion on the project action concerning the assignment of prevention measures
- the opinion on the technical assistance offered by project staff in the implementation of prevention measures

The interviews were carried out between July and August 2017.

158 farmers were specifically interviewed about the fences; while 5 specifically about LGD's (3 of the 163 farmers interviewed answered both questionnaires). For LGDs we only considered farmers who had adult dogs (because LGDs become effective around 2 years of age).

Over the 161 answers obtained (there were 2 missing answers) fences were judged a valid tool to reduce the risk of predation by 81% (n =130) of the farmers, and a similar percentage (74% of farmers) answered in the same way for LGDs.

Among the 108 farmers interviewed who had a fence, 69% answered that there has been a decrease in the damages since they started to use the fence; but 59% responded that the use of the fence involves additional work in livestock management. Of the 8 farmers specifically interviewed about LGDs 100% answered that there was a decrease of damages since the use of the dogs, and that the use of the dogs involves additional work for livestock management.

The majority of the respondents (57%) about the fences (n=158) believed that farmers who are in area at risk of predation should use the fences for livestock protection, 11% only under particular conditions, while 32% didn't agree at all. On the contrary all the farmers interviewed about LGDs, answered that fences should be mandatory.

The opinion toward the delivery of prevention measures (fence +LGDs) was judged positively or very positively by 77% of the respondents, and a similar percentage (70 %) was registered about the opinion toward technical assistance provided by project staff (n = 70, we considered only farmers directly involved in the project).

For the results of the other 91 farmers interviewed see action D6.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/07/2016	10/12/2015
End	30/09/2017	30/11/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Report of evaluation	30/09/2017	30/11/2017
<b>Indicators of action implementation</b>		Collaborators contracted; sampling design; data collected; Data analysed.

### **5.3.3 Action D3: Assessment of wolf presence in expansion area in Portugal**

*Beneficiary responsible for implementation: GL*

*Expected costs: 118,875€*

*Incurred costs: 88,315€*

A report on wolf distribution and a comparative analysis with results obtained in 2013-2014, and respective maps was expected, with wolf presence or number of packs increasing in project area. The action was concluded and the Final Report, describing the presence and distribution of wolves in the Portuguese study area, was produced (Annex 23), as well as an additional report about the use of the new scat detection dog team (SDDT) implemented in 2016. The development of this action has involved two associated beneficiaries, GL, which was charged with field work and data collection, and INIAV, responsible for the genetic analysis of the samples. CIBIO-InBIO Laboratory collaborated (in the scope of the formal agreement established with this entity) to assess connectivity of the LIFE MEDWOLF nucleus with the remaining Portuguese wolf population South of the Douro river.

The same methodologies used in action A2 were implemented: interviews, camera trapping, sign surveys, howling sessions, and the SDDT. Despite the high detection rate of the SDDT implemented in action A2, the accuracy required improvement, and training of the dog continued with a new handler designated by Conservation Canines. The low wolf density the study area can result in dog frustration and decreased accuracy, and reinforcement training is necessary to sustain accurateness.

#### **Results obtained in the year 2016 (with scat detection dog team - SDDT) and overall analysis:**

A total of 555 transects (2-4 km) to look for wolf signs were covered in 66 UTM squares (minimum 2 per UTM): 65 sampled in previous surveys, and one new (Estrela Mountain) added due to information about possible wolf presence. Transects done in 2014 were repeated and new ones (49%) added. Most cells were sampled three times from January-October 2016, transects not covered by the field team (FT) were done by the SDDT. Opportunistic interviews (n=20) were done throughout the area, while information was also gathered during the 377 interviews done in action D5. Camera traps (n=29, 1,039 trap-nights) were set-up and howling stations (n=50) done in 11 UTM, but no wolf records were obtained. No confirmed records of mortality and breeding were obtained. Wolf presence was confirmed in 24% of the kill sites where swabs were collected. Considering the kill sites where species identification was possible, wolf was confirmed in 38.9% of the cases. According to the genetic results (swabs and scats) of 2016, the wolf range comprised 12 UTM squares, increasing by 10 cells the range estimated in 2002, but reducing in 1 the range estimated in 2014, despite expanding its limits to the south and west, now including Guarda municipality. A more detailed distribution map by 4x4 UTM cells was also produced. Results confirm the consolidation of the wolf in half of the LIFE MEDWOLF area (Figure 12). Wolf presence was confirmed in all areas previously considered probable, suggesting a slow recovery of this nucleus, mainly due to a high dependence on livestock. According to genetic results 11 individuals were identified in 2015, and 17 in 2016 (one identified in both years). For population estimates only wolves identified in 2016 were considered. A minimum density of 1.42 wolves/100 sqkm was obtained (12 UTM with wolf presence genetically confirmed), similar to the adjacent area south of the Douro River, and higher than the one estimated in 2001 for the Spanish range south of the Douro river. Three packs were estimated: one confirmed in Almeida (also estimated in 2014), one considered

probable in the border with Spain (F. de Castelo Rodrigo/Almeida, estimated in 2014), and one new pack considered probable in Sabugal/Malcata. Based on scat concentration and damage records it was possible to identify (kernel density distribution estimators) three other areas where the presence of the species was confirmed, expanding the wolf range to the south and west (Figure 12).

A high number of biological samples (n=1,516) was analysed since 2013. Samples were tested for 16 microsatellites, higher amplification success was achieved for swabs. To minimize overestimation samples were regrouped using 6 microsatellite *loci*, enabling the detection of 42 individual genotypes in 2013-2014 and 27 in 2015-2016. A strong male dominated sex-ratio was found, coinciding with other studies, namely outside the usual wolf range. Analysis performed by CIBIO-InBIO confirmed the dispersion of 2 males from a nearby pack (Leomil), one after 2011 and the other after 2014. This confirms the connection between the packs of the study area and those westward that may be relevant source packs to the LIFE MEDWOLF nucleus and deserve special attention. Results are promising, the presence in the Estrela Mountain, Guarda, and the existence of the Sabugal/Malcata pack reveal an expanding range that may foster a positive trend.

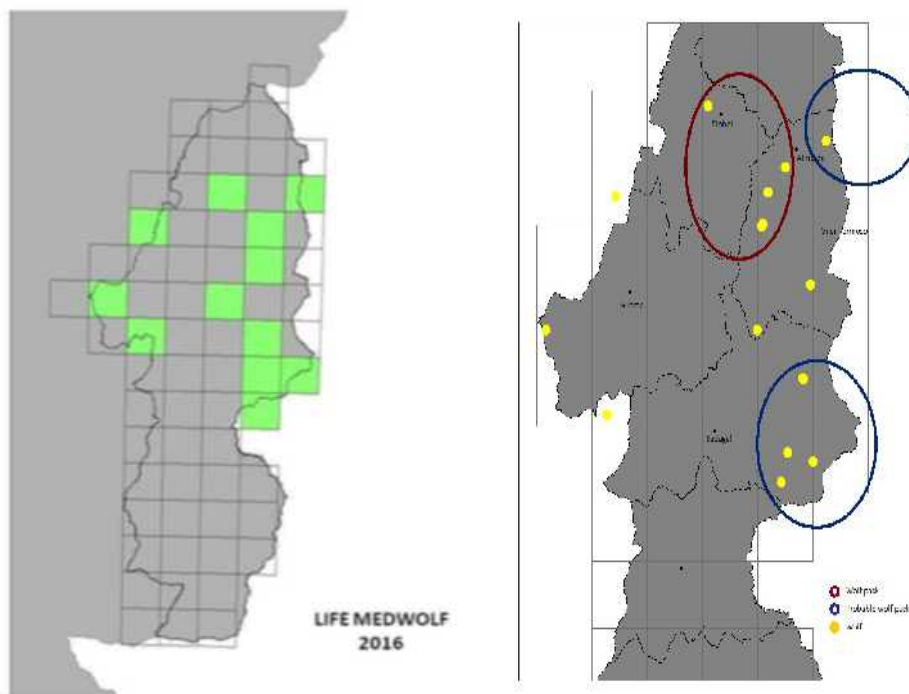


Figure 12 – Wolf range (left) and pack's location (right) in the Portuguese project area in 2016.

The detection and accuracy rates of the new SDDT in areas with high and low wolf densities (HWD and LWD, respectively), was assessed, and the factors influencing its cost-efficiency, when compared with the FT. Tests were conducted from June to October 2016, in Montesinho Natural Park (HWD), and the LIFE MEDWOLF area (LWD), and consisted in searching for wolf scats along 60 transects (2-4 km each, total 136.2 km). The SDDT detected wolf presence more efficiently than human observers, especially in LWD areas. The SDDT found more scats than FT in both HWD and LWD areas. When the aim is to get a big sample the use of SDDT is advisable, since it is better at surveying wider roads, detecting older scats or those deposited in plants/bushes. The SDDT requires more sampling time than a FT in a vehicle, but the number of

scats found is significantly higher, increasing cost effectiveness for samples obtained by this SDDT, especially in LWD areas. The use of the FT is more cost effective if the goal is to detect presence only. This economic analysis concerns the specific teams involved in the study, and may not be extrapolated to others with different experience. The results provide information useful to design wolf surveys.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/03/2016	02/01/2016
End	31/05/2017	31/12/2016
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Other Annexes</b>		
Technical report		Annex 23
<b>Indicators of action implementation</b>		Collaborators contracted; Field sessions reports; Data collected; Data analysed.

### **5.3.4 Action D4: Assessment of wolf presence in expansion area in Italy**

*Beneficiary responsible for implementation: GR*

*Expected costs: 35,466€*

*Incurred costs: 62,344€*

The aim of this action was to assess the effects of project actions implementation on the presence and distribution of wolves in Grosseto province, by comparison with data available from prior the project implementation. The evaluation of the presence of wolf in Province of Grosseto was made in the period February 2017 – September 2017. The area surveyed included all the provincial territory and not only the area where wolf presence was not detected during the previous survey carried out within LIFE IBRIWOLF project. The sampling effort was also more intense than originally planned (2220 Km travelled respect to 200 Km planned, and 298 genetic samples collected respect to 100 foreseen). The technical coordination and scientific overview was provided by IEA and Sapienza Università di Roma. The estimated number of wolf packs present was 21: 16 reproductive, 4 non reproductive and 1 probable. This is a higher estimate of the one produced previously, suggesting an increase of the wolf presence in Grosseto, although estimates were produced using different methodologies. The final technical report was produced and delivered (Annex 24) in Italian to the Regional administration.

Three field technicians were formally contracted by GR after public evidence and selection. The field data collection was designed in order to optimize resources and time available and in full consideration of the local socio-ecological conditions (e.g., wolf ecology, hunting activities).

In order to improve data collection and to involve the local community we organized 3 different training sessions for hunters (3/4/2017), for environmental guides (3/04/2017) and for the Carabinieri Forestali (11/04/2017). In these meeting we presented the monitoring activities and we asked the collaboration of the different interest groups.

Data were collected using classic techniques such as scat collection for genetic analyses, camera traps and wolf howling. The sampling design was developed in order to cover as much as possible of the large territory of the Province of Grosseto. The preliminary selection of areas to survey was made based on the results of action A6, the preliminary map of habitat suitability model, where areas associated to higher probability to detect wolf were identified. A total of 172 3x3km cells were selected on the areas of highest suitability scores (48% of the high suitability area of the Province). A pre-test was performed in March 2017, in order to assess feasibility and detectability of scats in few selected cells.

Each cell was surveyed by the three technicians in the following manner:

- Scat collection: the collection was made in a systematic intensive manner whereby each selected cell was visited with a transect walked on the months of April, June and August. Collection was also made accidentally while performing other survey activities, and whenever possible invasive attempts to collect scats at rendezvous sites were made. A total of 2220 Km were covered to look for wolf scats. A total of 978 scats were registered, and 289 were sent to the lab for genetic analysis, and of those 138 had DNA of adequate quality for genotypes identification. 63 genotyped (32 males and 31 females) wolves and putative wolf x dog crosses were registered in the project area.

The samples were analysed at the CIBIO-InBIO lab in Porto, Portugal, in order to ensure coherence with samples analysed within the LIFE IBRIWOLF project, and after having assessed availability of ISPRA genetic lab. The costs for the genetic analyses was born by the project after having received permission by the project technical desk officer because we originally expected they could be included in the agreement between ISPRA and GR. After implementation of NL



56/2014 the agreement was not in place anymore, thus it was impossible to cover such costs.

- Camera trapping: 35 camera traps were made available by Sapienza University of Rome, through agreement for collaboration of Dr. Paolo Ciucci as scientific advisor of the project. Cameras were placed in sites where wolf presence had been detected, and within the sampling cells. Intensive camera trapping check was performed in May, July and September. A total of 744 photo/video documents were available, and with some of them it was possible to detect reproduction events.

- Wolf howling: the equipment for wolf howling was made available by the hired technicians and Sapienza University of Rome. Wolf howling was performed using a saturation sampling approach in the selected cells, and in simultaneous sessions whenever required. A total of 37 (including 6 spontaneous howlings) positive responses were received, of which 19 with pups.

Genetic samples returned a minimum of 68 individuals genotyped. Data were analysed using two maximum likelihood based modelling approaches for population estimates.

The estimated number of individuals present in the sampled area was 80 (95% CI: 50-109). Extending the estimate to the wolf suitable area as resulted from the model developed with action A6, the number of packs for the whole provincial territory goes up to 22-24 and the number of individuals estimate goes to a maximum of 100 (range: 86-115) wolves.

Comparison with data available from the previous surveys suggest that the number of packs have increased since 2014 (LIFE IBRIWOLF data reported 5 reproductive packs), and 2015 (14 packs were reported in 2015 from a survey conducted by CIRSeMAF under a contract with the Tuscany Region, with an estimate of ca. 75 individuals for the whole provincial territory).

The preliminary results of monitoring activity were presented to the local community the 25<sup>th</sup> of October 2017 and the final results were presented on the 28<sup>th</sup> of March 2018.

We underline the fact that this action represents the first attempt to produce a reliable estimate of the population present in a limited area, where the population is not closed or isolated. In order to achieve such results the data collection sessions had to be particularly intensive and limited in time.

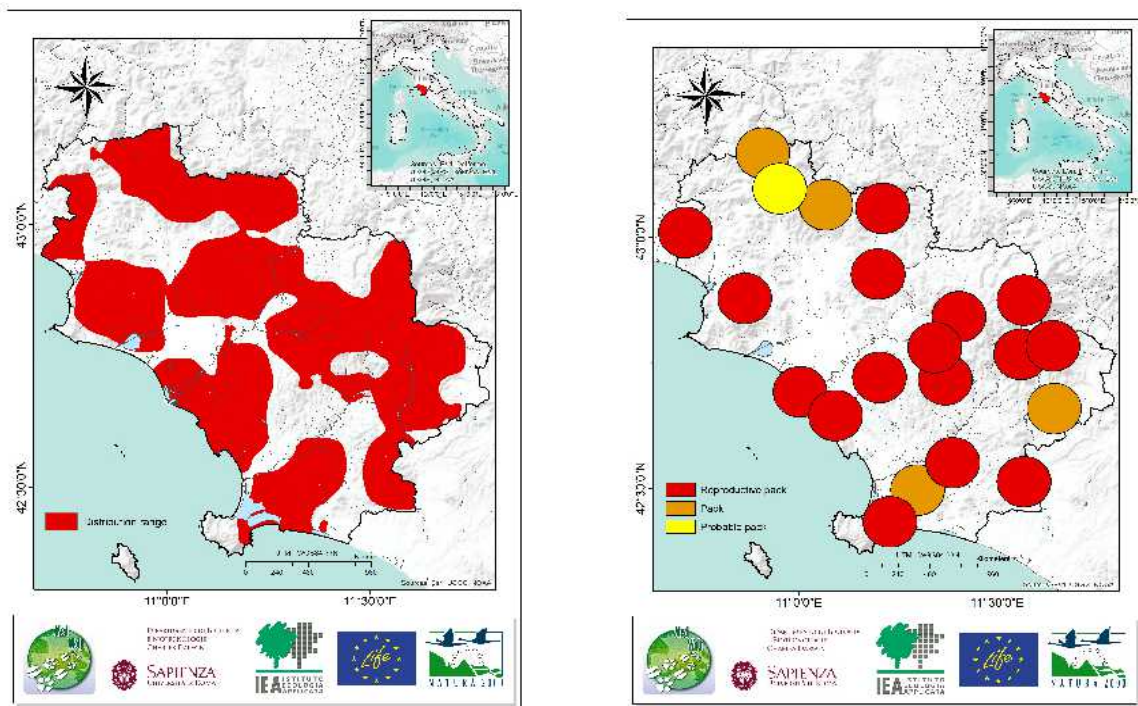


Figure 13 – Wolf distribution range (left) and packs arrangement (right) in Grosseto Province

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/07/2016	01/07/2016
End	30/09/2017	30/11/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Other Annexes</b>		
Technical report		Annex 24
<b>Indicators of action implementation</b>		Collaborators contracted; Field sessions reports; Data collected; Data analysed.

### **5.3.5 Action D5: Ex-post survey on the knowledge level and attitudes towards wolf presence in Portugal**

*Beneficiary responsible for implementation: GL*

*Expected costs: 19,033€*

*Incurred costs: 10,709€*

A survey (at least 400 questionnaires) on knowledge and attitudes towards wolf and its management in the project area, with the respective statistical analysis of the changes and identification of the influencing factors, was expected, as well as a time analysis to assess the effectiveness of the information campaign, with a 10-20% increase in the scores of the general public and farmers. The action was concluded and the Final Report, documenting attitudes toward wolves and its management, knowledge about the species and fear towards it, as well as a factorial analysis, spatial and time analysis, and an additional study comparing opinions of fence beneficiaries to non-beneficiaries, was produced Annex 25). In both surveys 1,076 questionnaires were answered by local residents, and overall, results show that opinions remained stable or improved at the end of the project: the general public is close to a neutral position, hunters moderately in favour of wolf conservation, journalists, environmental police officers, and specially students, the most positive, (all recognize wolves as having an important role in nature), and farmers with the most negative (still not extreme) opinion.

The survey replicated the 2013 enabling a comparison with the data gathered previously. A total of 377 face-to face interviews were done (150 general public, 84 farmers, 58 hunters, 21 journalists, 64 environmental police officers), and additional questionnaires filled-in by students in 2014 were included in the analysis (171 before educational activities, 169 after). Opinions remained stable or had slight changes at the end of the project, but environmental police officers opinions improved significantly. All groups, except farmers, recognize wolves as having an important role in nature. Hunters do not see wolves as competitors for game and most want wolves to exist. Although a peak of negative news covering wolf damage appeared in the local media between the opinion polls, journalists do not believe wolves have a strong impact on livestock, and their support for wolf conservation improved slightly. Although farmers' support for wolf conservation remained low and stable between 2013 and 2016 a strengthening of the conflict may have been avoided, since attitudes in areas where wolf populations are new and recovering may become more negative as people begin to gain experience with wolves, and negative experiences like seeing a wolf in association with a predation event influences attitudes. An additional study was done comparing farmers in wolf areas who benefited from predator-proof fences with non-beneficiaries. The results show their opinions and awareness toward wolves is similar, which could reflect a positive impact of the project, since beneficiaries were expected to have lower scores, considering they had higher damages, and even after the peak of damages registered in 2013-2014. The decrease in the level of damages 2016 may have also contributed, which may have also occurred due to the implementation of the project's prevention measures (action D1). The positive impact of these actions is also supported by the stronger willingness to receive prevention measures at the end of the project.

Other factors played a role in the public opinion, and the impact of negative media articles is suspected to have a negative influence on people's views of wolves, since knowing people or hearing about people who had damage caused by wolves was an important variable affecting support for wolf conservation. Specifically, farmers who have not suffered damages may become more negative toward wolves, as a result from an understanding and empathy for their counterparts who suffered damage on livestock.

Knowledge level is consistently low but improved in particular groups after the information actions by the project, not in what concerns the general public, but mostly in the case of important opinion makers as the environmental police officers, media and hunters, and in the case of students whose knowledge increased significantly after the educational activities. Fear scores are relatively high, mostly within the general public, with most fearing for their families' safety. Attitudes are inversely correlated with fear, i.e., people less fearful are more in favour of wolf conservation. Attitudes have no correlation with knowledge, except for students, where higher knowledge is associated with positive attitudes. Providing factual information on wolf bio-ecology significantly reduced fear among environmental police officers and a similar correlation was found in the general public. It did not influence farmers' acceptance of wolves, since they already had the highest knowledge level before the project and the most negative opinion. More research is needed to understand these relationships, but other factors may have negatively influenced farmer's attitudes, masking the impact of the project actions: a) delays in damage compensation; b) decrease in values paid; c) political rhetoric; d) reduced information about procedures for subsidies in wolf areas; e) belief that wolves are being reintroduced; and f) the lack of trust in authorities. The results provide important insight on people's willingness to accept wolves in wolf dispersal areas and provide managers with relevant information to improve the quality of their decisions.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/01/2016	01/07/2016
End	31/01/2017	31/3/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Other Annexes</b>		
Technical report		Annex 25
<b>Indicators of action implementation</b>		Collaborators contracted; sampling design; data collected; Data analysed.

### **5.3.6 Action D6: Ex-post survey on the knowledge level and attitudes towards wolf presence in Italy**

*Beneficiary responsible for implementation: WWF / FESTAMB*

*Expected costs: 69,510€*

*Incurred costs: 28,225€*

The objective of the action was to measure the success of communication activities (Action E3) and the concrete conservation actions (Action C2, C4 and C6) and to measure changes over time of the attitudes and opinions of general public and interest groups toward wolf presence and wolf management.

Respect to what was foreseen we made 500 questionnaires to the general public instead 400 using telephone surveys instead face to face interviews, This is because as starting point we used the opinion pool made in the frame of LIFE IBRIWOLF project, where a telephone survey was carried out. For the interest groups we only interviewed farmers because this is the most involved and conflictual group in the province

The action started in March 2017 under the responsibility of FESTAMB, instead of WWF, and ended in September 2017, when most communication activities had been developed, and concrete conservation actions ended.

Two separate approaches were conducted to this fulfil the objectives of the action:

- A quantitative study of local resident's opinions, through a fixed questionnaire
- A qualitative study of the opinions of sheep owners and of the representatives of livestock owner and environmental associations, through semi-structured interviews

A detailed technical report was produced (Annex 26), and a short synthesis is reported below.

#### Quantitative study

A questionnaire of 36 questions was administered through computer assisted telephone interviewing to a random sample of 500 rural residents across the Province of GR, in proportion to the number of residents in each municipality. A subsample consisting of respondents that currently own livestock or that had owned livestock in the past (n=74) was extracted from the sample of rural residents of the Province of GR. In addition, 504 questionnaires were administered to a random sample of residents at the national scale, in order to compare key variables with the rural populations of the Province of Grosseto. Finally, we also included data collected within the LIFE IBRIWOLF project in 2014 (LIFE10NAT/IT/265) using the same methodology (sample of the rural population of Grosseto, n=475; sample of current or ex livestock owners, n=75). These were used to evaluate changes in opinion and knowledge of wolves over the past 3 years, among the rural and livestock owner populations.

The results show that the rural population of GR has a prevalently positive attitude towards wolf conservation. The conflict mitigation strategies most supported by the public are damage compensation, damage prevention measures, and general support mechanisms to the livestock breeding sector. Livestock owners were found to hold more negative attitudes towards wolf conservation and to be more favourable to wolf population control. A comparison with data collected in 2014 shows that opinions regarding the value and importance of wolf conservation among the rural population have remained consistent across the local resident and farmer sample, in this last case with a slight improvement. Other promising signs emerging from the comparison with data on local residents collected in 2014 are an increase in awareness regarding the wolf-dog hybrids and reduced perception of the wolf as a risk to public safety. On the other hand, we found a slight increase in support towards wolf population control. This finding is likely

explained by our results suggesting that the wolf's population and the damages it causes are perceived to have increased over time.

In recognition of the importance of building trust in the information and the damage mitigation strategies supported by scientific evidence, many of the LIFE MEDWOLF project's actions focussed on the the livestock owners most affected by wolf presence and most likely to guide public sentiment regarding the issue. The results indicate that the majority of local residents attribute a high level of importance both to the issue of wolf management and to the projects aimed at mitigating the conflicts it generates. Finally, opinions at the national scale were found to be significantly more positive regarding wolf conservation and significantly less favourable to its population control, compared to opinions of local residents in the province of GR. The cultural tensions and power relations that characterize the farmer-resident and local-national divides emerging from this study are important aspects to consider when addressing conflict surrounding wolf presence, and highlight the complexities inherent in developing management strategies that protect stakeholder and public interests alike.

### Qualitative study

Twenty semi-structured interviews were conducted in total, 3 with representatives of the MedWolf project partners (2 livestock owner associations and 1 environmental association) and 17 with sheep owners (who were involved in the project and in DifesAttiva to varying degrees, through active, limited or no participation at all). An overarching theme that emerged is one that describes sheep breeding as a politically, economically and socially isolated sector. The narratives of marginalization and perceived loss of negotiating power that surfaced from the interviews are important descriptors of the context in which wolf presence is experienced, and were found to be strongly interconnected to a large number of themes regarding wolf conflicts. The perceived loss of power is therefore due to the difficulties that the area's free-ranging, family-run sheep breeding sector encounters when competing with more intensive production, but also to the power relations between agricultural and environmental worlds which farmers perceive as unequal. The growing influence of conservationist at the national level has brought many farmers to develop a vision of wolves as economically and culturally destabilizing elements imposed by external, more powerful actors. This is reflected in farmers' widespread belief that the sector lacks power to influence wolf conservation policy. Results suggest that farmers share a common basis of values as they all claimed to prefer for wolves not to be present or for their population to be reduced. On the other hand, they held contrasting opinions regarding the role of damage prevention measures. Some considered it a priority to revive livestock breeding activities given the available tools; others instead considered damage prevention as a palliative measure or, in the more extreme cases, a distraction from the more incisive solution of wolf population management. Regardless of whether damage prevention was viewed as an agent of loss or of restitution of power, all farmers provided ample discussions of the cost and efforts required to implement damage prevention, suggesting that the actions developed by LIFE MEDWOLF and DifesAttiva responded to real concerns. The most appreciated actions were in fact the provision of materials and technical support to implement damage prevention measures and the actions to monitor their efficacy. Results also suggest that most farmers that expressed scepticism towards the project on the basis that it included wolf conservation among its objectives, still regarded many of the project's actions as useful and necessary. The scientific, practical and collaborative approaches of the project were identified by the project partners as elements that enabled groups with different ideas to work together towards common objectives. The project partners and many farmers also claimed that the initiatives of the LIFE MEDWOLF project and DifesAttiva served to promote the exchange of experiences among farmers, open the

sheep breeding sector to new ideas and to contact with the general public, and facilitate dialogue with the more moderate environmental associations. After participating in the projects' initiatives, some farmers claimed their belief in the efficacy of damage prevention had grown considerably, and that they had become interested in experimenting with farm tourism and product promotion activities.

The results showed the general appreciation of the project actions by the general public and by the farmers. Even the farmers who showed the most negative opinions about the wolf appreciated the approach of the project to be open to listen all the opinions.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/01/2017	22/03/2017
End	30/06/2017	30/09/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Other Annexes</b>		
Technical report		Annex 26
<b>Indicators of action implementation</b>		Collaborators contracted; sampling design; data collected; Data analysed.

### **5.3.7 Action D7: Assessment of socio-economics impact of the project and ecosystem functions in the project areas**

*Beneficiary responsible for implementation: IEA*

*Expected costs: 0€*

*Incurred costs: 0€*

In order to measure the socio-economics impact of the project and ecosystem functions in the project areas we developed 3 different typologies of indicators: social, economic and bio-ecological.

These indicators were measured for each year of the projects to analyze temporal variations of the selected variables (Annex 27).

Social indicators were mainly related to number of people involved in the disseminations activities, in terms of number of persons involved in public events about wolf, number of people visiting the web site and social channels of the project, number of articles and TV shots about the project, number of school and students involved in educational activities, and number of participants in training courses, as well as number of people visiting the wolf exhibition realized in the project.

The economic impact of the project was evaluated through a different set of indicators. We considered the potential negative impact of the wolf on local farmers measuring the number of predatory attacks, the number of farms involved and animal killed in predator attacks, and the amount of money paid for compensation. At the same time we measured what has been done to counteract this negative effect especially quantifying the number of farmers involved in the delivery of prevention measures, and the reduction of losses caused by the use of these prevention measures.

The economic impact of the project was also measured through the number of people contracted for project implementation, the revenue for local suppliers of material needed for implementation of project actions, the revenues for the local communities coming from wolf ecotourism programs in Portugal, and in Italy the farmers revenue from the sale of products during fairs in which DifesAttiva took part.

Finally to measure the impact on the ecosystem functions we estimated wolf population trends in the project area and the results of anti-poaching activities. These variables were selected as a tool to measure the direct effects of the project implementation on wolf conservation.

In order to measure the situation related to wild preys, only in Italy, we collected data from hunting statistics (In Portugal these kind of data were not available).

#### **Results for Italy**

The social indicators showed a marked increase during project implementation.

In Italy the number of participants in public events was 2,815 the 28% in 2015 the 30% in 2016 and 42 % in 2017. The numbers of visitors of the website of the project showed a peak during the 2017 when there were 35,277 visitors, which represent the 55% of the people visited the web site during the whole project duration. A similar trend was observed in the number of visitors of the facebook page where total number of likes where 3,642 the 53% in 2017. The presence of the project in the media reached a peak in 2015 (n = 131) more than the double of the ones published in the first two years of the project. In the last two years 93 articles were published in 2016 and 38 in 2017. The peak of 2015 was probably related to the beginning of the concrete conservation actions.

Educational activities were very intensive and involved around 1,700 students with a constant



increase until 2016.

At the provincial level the number of damages decreased from 2015 to 2017 by 33% if we consider the number of attacks by 20% relative to the companies involved and by 28% for the animals killed.

We limited the comparison to 2015-2017 because in 2015 we started the delivery of prevention measures to local farmers, and especially because in those years data about damages were collected in a standardized way and the same regulation about damage compensation was active. Even if it is not possible to attribute the decrease in wolf attacks to project activities for sure we played an important role on this trend.

If we considered only data related to the beneficiaries of prevention measures the number of attacks and the number of animals killed decreased respectively by 47% and 50% after fences installation.

It was not possible to compare the amount of money paid for damage compensation because data were not available for all the project period, and the criteria changed over time.

The amount of money “left on the ground” in the provincial territory was €368,822.00. This includes expenses for local suppliers of material needed for implementation of project actions as well as services (printing, designing, etc) purchased from local dealers. Half of the amount of money was spent in 2015 and was mainly related to the purchase of materials for the construction of fences.

In the future years a growing income for local farmers will be generated by the activity of DifesAttiva. This association represents a real innovation and a new tool to face the conflict between the wolf and local farmers from an economic and social point of view.

In the frame of the project the highest number of people contracted per year ranged from 10-12. From an ecological point of view wolf population increased during project implementation and data collected in 2017 showed that the species have occupied almost all the available habitat. Surely it is not possible to attribute this result exclusively to the project activities but we can consider it as an index of the correct implementation of the whole project and a significant role could be attributed to the set up of anti-poison team and the anti-poaching activities.

In conclusion much remains to be done but the project has certainly represented an important step for the mitigation of the conflict in the territory of the province of Grosseto.

### Results for Portugal

In the Portuguese project area we also registered a positive impact of the project.

The number of participants attending public events about the project and the wolf was more than 90,000 people during project implementation with a peak in 2017 when more than 28,000 persons were involved.

The presence and visibility of the project was measured through the number of articles published on the newspapers. The number of n articles was relatively constant for the first four years of the project (40-50/year) but reached a peak with 81 articles published in 2017.

Around 1000 students were involved in educational activities and once again the maximum number (n=344) was reached in 2017.

An important role in the awareness raising on wolf conservation was played by the itinerant exhibition, and, in this sense, it was very important the agreement signed with the National Natural history Museum of Lisbon that will guarantee the prosecution of the activity in future years.

The number of wolf attacks in the project area between 2013 and 2017 was 382 with 1,145 animals killed. The damages caused by wolf showed a peak in 2014 and then started to decrease.

Respect to the situation of 2014 the reduction of damages in 2017 was 56% if we consider the number of attacks and 57% if we consider the number of animals killed. Once again these reduction can be considered due at least in part due to the delivery of prevention measures to local farmers.

The overall data, considering the total number of months the fences were in use revealed a reduction of 83.3% in the average number of attacks per holding/month and of 88.1% in the average number of affected animals per holding/month.

The revenues for local suppliers related to the project implementation was estimated to be of around € 192,000.00, while the maximum number of people contracted in the frame of the project was 22 in 2016. Another economic benefit generated by the project was related to the revenue for the local communities coming from wolf ecotourism programs that amounted to € 5,700.00. Even if it is still of limited entity we should consider its potential for future years.

In Portugal, as well as in Italy we registered an increase in the number of wolf packs and in the area occupied by the species. Even if it is difficult to measure the direct project contribution to this result we could attribute it to the increase in the use of prevention measures, that lowered the level of conflict, and to the anti-poaching activities carried out. Given that wolf is a large mammal, usually impacts are measurable at longer intervals of time. It is to be noted, though, that the presence of wolf in the “Duna Feniglia” Reserve, where it was never registered before, and where the presence of ungulates was at high densities, has allowed, for the first time in over 30 years, some vegetation regeneration, thus leading to a healthier ecosystem.

In conclusion in the two project areas we registered a positive impact of the project activities from all the point of views and we can consider that this positive impact will continue in the future years.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/09/2015	01/09/2015
End	30/09/2017	30/11/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Other Annexes</b>		
Indicator tables		Annex 27
<b>Indicators of action implementation</b>		Data collected and analysed; Draft reports submitted to project management staff.

## 5.4 Dissemination actions

As spelled out in the project's communication strategy (Annex 35 PR1) the main objective of the project's communication is to inform about the project's activities that are implemented with the view to mitigate the conflicts between predators and human activities. In particular, communication focuses on activities that are developed by the project in an attempt to promote an understanding that tools to achieve a less conflictual coexistence with the predator exist, and that the project is experimenting some of them for assessing their applicability and functionality in the project areas context.

### 5.4.1 Action E1: project website

*Beneficiary responsible for implementation: FESTAMB*

*Expected costs: 39,683€*

*Incurred costs: 38,247€*

This action, realized under the responsibility of FESTAMB, was formally concluded in March 2013 when the LIFE MEDWOLF project logo was produced (Annex 36 IR) and the website ([www.medwolf.eu](http://www.medwolf.eu)) was finalized in three languages (Italian, Portuguese and English). It should be noted that the description of action E1 includes a website in four languages. This is an obvious mistake, given that a previous version of the project proposal included Spanish beneficiary that could not be confirmed before project proposal submission. The project website thus is not available in Spanish, since the cost for such translation is not included in the approved budget. While the Italian version reports mainly activities developed in Italy and the Portuguese versions reports activities developed in Portugal, the English version reports both, so that an overview of the project can be obtained for international visitors. The project document also includes the Layman's report as a deliverable for action E1, but it was elaborated within action E3 (as included in the action description). All the project deliverables are available for download and the News and Video sections have been updated with documents and information relative to the activities undertaken. A map showing the sites where the exhibit is installed is also available. The home page of the web site includes a direct link to the official web page of LIFE project, Natura 2000 and other projects concerning wolf conservation. The website has been mirrored by a Facebook page which is posting messages in order to attract web page visitors. The facebook channel, more adequate for a modern communication and providing higher visibility to the project, collects all the news from project activities both from Italy and Portugal. This ensures that at least there is one place where all the information about what is going on in the project is available. Most posts in facebook give a short hint of the activity and direct the reader to the project website. Starting from September 2016 a more intensive activity on Facebook and the updating of the web site has been started, in order to increase the communication potential of the project website at this stage, when some results can be shown. Below is the graph indicating the nr. of visits since the beginning of the project. A total of 368 posts on facebook were made in the reporting period, reaching 4,035 likes. The Facebook page has now 2,641 followers.

During the project duration, the average number of visits per month was 1,562 with 704 monthly visitors on average. In the third trimester of 2017, when the results of the evaluation actions (D1-D7) were available, the number of visits increased significantly (see Figure 14).

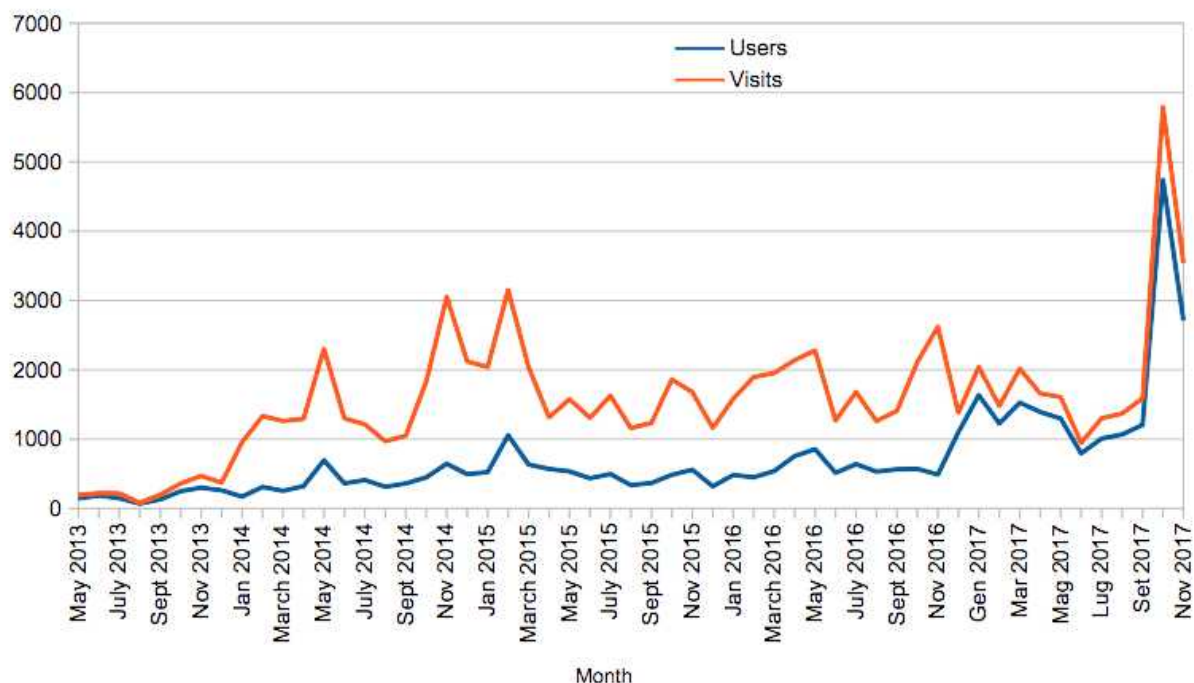


Figure 14 – Website visits per month

Timing	Foreseen	Actual date
Start	01/09/2012	01/09/2012
End	31/03/2013	31/05/2013
Milestones	Deadline	Actual date
Website online	31/05/2013	31/05/2013
Deliverables	Deadline	Actual date
Website	31/05/2013	31/05/2013
Layman's Report (error, as it was included in action E3)	31/10/2017	31/10/2017 (Annex 11)
<b>Indicators of action implementation</b>		Website developer contracted; material collected; texts elaborated and approved; number of visits on website.

### 5.4.2 Action E2: Communication campaign on conflicts mitigation in Portugal

Beneficiary responsible for implementation: GL

Expected costs: 73,682€

Incurred costs: 108,636€

This action was planned to start in the first quarter of 2014 but the responsible beneficiary for its implementation (GL) proposed to anticipate the beginning date by 3 quarters in order to start developing an adequate communication strategy for Portugal. The communication strategy for Portugal was established integrating relevant results obtained from action A11.

The activities undertaken throughout the project duration were the following:

E2.1 – Brochures indicating maps of past, present and potential wolf distribution: a leaflet with information about the bio-ecology of the species, the clarification of old and new myths about this predator, and the LIFE MEDWOLF project was produced (23/05/2014 - 1,000 copies) and distributed to the general public in the project area (Annex 6 PR1). The maps were also included in the booklet on Iberian Wolf produced in 2016 (Annex 2 PR2), which also included information about the effects of the use of poison and information about damage prevention measures. The leaflet about damage prevention measures, planned to be produced in action E2 was restructured into a “Manual for Damage Prevention”, a larger and more comprehensive product thus more useful for farmers and managers, with more information about each damage prevention measure, husbandry practices, the damage compensation system and useful telephones, as well as the existing funds available for damage prevention. This Manual, which contains the main guidelines regarding wolf conflict mitigation concerning all types of livestock (corresponding to the guidelines proposed in action E6), is based on the information transferred from the LIFE-COEX, includes information provided by the LCIE Pilot Action as well as inputs from ICNF and other stakeholders (farmers, managers, livestock breeder associations), thus making it a fairly complete and consensual document, which will be employed by the ICNF. One leaflet about the project was produced (26/09/2013 - 500 copies; 10/04/2015 – 500 copies) and is being distributed to all the entities contacted in the development of the project (municipalities, associations), as well as to all the Portuguese associated beneficiaries of the MEDWOLF project and collaborators (SEPNA-GNR, ICNF, Quercus and UE Pilot Action Team, Annex 38 PR1). One brochure on “Large Carnivores Know no Boundaries” was produced (30/10/2014 - 500 copies), after being translated and updated, and are being distributed to the public of the LCIE exhibits and was provided to the participants of the workshop of action E6 (Annex 8 PR1). The booklet on the Iberian Wolf, with detailed and technical data from A5, was produced (19/05/2016 - 1,000 copies) and distributed to local/national managers and authorities, as well as interest groups and participants in events organised within the project.

E2.2 – E2.2 Project moving Exhibition: adapted from the LCIE exhibit on Large Carnivores (Annex 7 PR1, Annex 1 MTR), the exhibit was produced in five copies with a total of 10-16 panels printed per set. New panels were added focusing on the Iberian sub-species - wolf and lynx - and the Portuguese reality. 2 versions were produced: one version with 16 PVC panels and another one with 10 roll-up panels. It was set up in the following locations:

Place	Dates	Place/Event	Number of visitors	Products distributed
Lisbon	18/5-26/7/2015	National Museum of Natural History and	6,124	LCIE Leaflet

		Science of University of Lisbon (Museu Nacional de História Natural e da Ciência da Universidade de Lisboa)		
Lagos (Algarve)	28/7-30/9/2015	Science Museum Ciência Viva de Lagos (Museu de Ciência do Centro Ciência Viva de Lagos)	2,825	LCIE leaflet; MedWolf leaflet
Idanha-a-Nova	2-5/7/2015	3 <sup>rd</sup> edition of the Eco-Festival Salva a Terra	4,000	MedWolf leaflet; Wolf leaflet
Proença-a-Nova	31/7-30/9/2015	Science Museum Ciência Viva da Floresta (Museu de Ciência Ciência Viva da Floresta)	2,900	LCIE leaflet
Proença-a-Nova	12-13/9/2015	“Andamento” Festival	2,000	Med Wolf leaflet
Lousal	17/10/2015-30/09/2016	Museum “Mina de Ciência” – the Living Science Centre in Lousal (Museu de Ciência do Centr Ciêncis Viva do Lousal)	8,350	LCIE Leaflet
Castelo Branco	20-31/10/2015	Higher Agricultural School of the Polytechnic Institute of Castelo Branco (Escola Superior Agrária de Castelo Branco)	500	LCIE leaflet; MedWolf leaflet
Fundão	16/11/2015-31/01/2016	Different schools in the municipality	904	Medwolf leaflet; LCIE leaflet
Fundão	01-29/02/2016	Municipal Library (Biblioteca Municipal do Fundão)	87	MedWolf leaflet
Idanha-a-Nova	29/04–31/08/2016	Raiano Cultural Centre (Centro Cultural Raiano)	462	LCIE Leaflet
Idanha-a-Nova	01/09/2016 - Present	Municipal Library (Biblioteca Municipal de Idanha-a-Nova)	Free entry (number of visitors was not counted)	MedWolf leaflet; LCIE leaflet
Guarda	05–31/05/2016	Guarda Polytechnic Institute (Instituto Politécnico da Guarda)	830	MedWolf leaflet; Wolf leaflet
Felgueira, Vale de Cambra	23/07–07/08/2016	Living Village Festival (Festival Aldeia Viva)	2,000	MedWolf leaflet; Wolf leaflet
S. Pedro do Sul	3-4/09/2016	EXPO-DOG	700	MedWolf leaflet; Wolf leaflet
Caminha	23-25/09/2016	Agricultural Fair (Feira Agrícola e dos Produtos Tradicionais)	Free entry (number of visitors was not counted)	MedWolf leaflet; Wolf leaflet
Castelo Branco	6/10-10/11/2016	Municipal Library (Biblioteca Municipal de Castelo Branco)	3,000	MedWolf leaflet; Wolf leaflet
Abrantes	17/2-31/5/2017	Tejo Park (Parque Tejo)	219	LCIE Leaflet; MedWolf leaflet
Idanha-a-Nova	23-25/6/2017	Eco Festival “Salva-a-Terra”	2,000	MedWolf leaflet; Wolf leaflet; Wolf booklet
Maфра	11/08-01/09/2017	Iberian Wolf Recovery Centre (Centro de Recuperação do Lobo Ibérico)	339	Med Wolf leaflet

Lisboa	04/09-07/09/2017	EMAPI 14 - International Conference on Ecology and Management of Alien Plant Invasions	200	Medwolf leaflet
Setubal	15-17/9/2017	Festival Observa Natura 2017	Free entry (number of visitors was not counted)	MedWolf leaflet; Wolf leaflet
Vila Praia da Ancora - Caminha	22-24/9/2017	Agricultural Festival (Feira Agrícola e dos Produtos Tradicionais)	Free entry (number of visitors was not counted)	MedWolf leaflet; Wolf leaflet
Pinhel	28/09-28/10/2017	Pinhel Municipality Schools (Agrupamento de Escolas de Pinhel)	400	MedWolf leaflet; Wolf booklet
Macedo de Cavaleiros	10-10-2017-to present	Macedo de Cavaleiros Geopark	166	MedWolf leaflet; Wolf booklet
Pinhel	19/11-27/12/2017	Alverca da Beira Parish	100	MedWolf leaflet; Wolf booklet

Table 2 – Locations where the large PVC panel exhibit was exposed in Portugal

A simple questionnaire (including a set of easy games) was prepared to survey the opinions and knowledge acquired by 30 groups of 128 students (belonging to 11 classes, 6-13 years) that participated in guided tours to one copy of the LCIE exhibit on display at Parque Tejo (Abrantes). The results were very positive, with 70-100% of the students answering correctly the questions about the identification of the four LC (mainly about the Iberian wolf and lynx, exhibiting more difficulties with the wolverine, a species not present in the country and thus less familiar), their habitat and main prey, and 77% stating they got to know more about these animals. The animal they liked best was the lynx (73%), followed by the wolf (67%), the wolverine (43%) and the bear (33%). The guided visit as well as the written activities/games proposed at the end (as part of the questionnaire, aiming to assess the knowledge acquired in a funny way) were very appreciated by most of the students (93%).

Furthermore, the project has collaborated with the National Museum of Natural History and Science of the University of Lisbon (MUHNAC) for setting up a permanent exhibit on Large Carnivores, entitled “*Kings of Wild Europe: Our Last Large Carnivores*”, which opened to the public on 02/03/2017 and registered 19,456 visitors until 30/11/2017.

To assess the visitors’ opinion and knowledge acquired, a survey was prepared in collaboration with the MUHNAC, and filled-in by 36 (including 3 children) visitors at the end of the visit. 72% were first time visitors, and 28% were recurrent visitors, with 27% going purposely to see the exhibit. The website of the Museum (60%) and the media (50%) were the main means of information about the exhibits. Despite the reduced sample size (the questionnaire will continue to be implemented), results are very positive. Overall visitors were very satisfied, enjoying especially the diorama, (75%), followed by the modules about the species and the threats/conservation (58% equally to both), the prey (56%), the habitats (53%) and the myths and curiosities (44%). In terms of the information provided visitors were very satisfied/satisfied (82%) (12% did not answer, and 2 complained about), with 94% answering that the exhibit improved their opinion about the importance of LC conservation, in general, and specifically the Iberian wolf (16%), lynx (8%) or wolverine (5%).

The photo exhibit "Looking at the wolf", produced within the IV Iberian Wolf Conference

(Action E5) was in itinerancy since, at the following locations:

Place	Dates	Place/Event	Number of visitors
Castelo Branco	25.10.2016-16.02.20017	CyberCentre (CyberCentro)	1,500
Gradil, Mafra	22.03-30.04.2017	Iberian Wolf Recovery Centre (Centro de Recuperação do Lobo Ibérico)	966
Lisbon	29.05-17.09.2017	National Museum of Natural History and Science of University of Lisbon (Museu Nacional de História Natural e da Ciência da Universidade de Lisboa)	5,775
Pinhel	28.09-28.10.2017	Pinhel's Castel (Castelo de Pinhel)	600
Vale do Côa, Pinhel	19.11-27.12.2017	Vale do Côa Parish	80

Table 3 – Locations where the photo exhibit was exposed in Portugal

Additionally, an itinerant exhibit made of 7 or 12 panels, produced within the LIFE-COEX, also continued to be used within GL's educational actions. This exhibit was on display in the following locations:

Place	Dates	Place/Event	Number of visitors
Porto	6.10.2013	Autumn Fest – Serralves (Contemporary Art Foundation) (Festival de Outono – Serralves)	25,000
Aldeia de Figueira, Preonça-a-Nova	03.01-0.2.02.2014	Ti' Augusta House (Casa Ti' Augusta)	Free entry (Number of visitors not counted)
Lisboa	14-28.03.2014	Primary School "O Bosque" (O Bosque – Jardim Escola)	Free entry (Number of visitors not counted)
Sabugal	22-24.04.2014	High School Sabugal (EB 2,3 Sabugal)	Free entry (Number of visitors not counted)
Castelo de Paiva	28.07-30.08.2014	Interpretation Centre of Local Culture of Castelo de Paiva (Centro de Interpretação da Cultura Local de Castelo de Paiva)	Free entry (Number of visitors not counted)
Melgaço	03.10-07.11.2014	Peneda-Gerês Lamas de Mouro Gate (Porta de Lamas de Mouro – Parque Nacional da Peneda-Gerês)	Free entry (Number of visitors not counted)
Vila Real	19.01-13.02.2015	<a href="#">Urban Ecology Agency of Vila Real</a> (Agência de Ecologia Urbana de Vila Real)	Free entry (Number of visitors not counted)
Vila Real	27.02-20.03.2015	Camilo Castelo Branco High School (Escola Secundária Camilo Castelo Branco)	Free entry (Number of visitors not counted)
Montalegre	21-22.03.2015	Barroso Eco-museum – The Wolf and the Village - ALDEIA (Ecomuseu do Barroso – O Lobo e a Aldeia)	Free entry (Number of visitors not counted)
Lisboa	10.04-02.08.2015	National Cordoaria – Sebastião Salgado's "Genesis" photograph exhibition at Cordoaria Nacional (Cordoaria Nacional –	Free entry (Number of visitors not counted)



		Exposição fotográfica “Génesis” de Sebastião Salgado)	
Lisboa	13-15.11.2015	IV International Conference FAUNA	Free entry (Number of visitors not counted)
Sintra	15-19.02.2016	Primary School Sintra	Free entry (Number of visitors not counted)
Lisboa	23-25.02.2016	Research Journeys on Biology FCUL (Jornadas de Investigação em Biologia na FCUL)	Free entry (Number of visitors not counted)
Vouzela	07-08.05.2016	FAME - Adventure, Mountain and Ecotourism Fair (FAME – Feira de Aventura, Montanha e Ecoturismo)	Free entry (Number of visitors not counted)
Arouca	23.01-12.03-2017	Arouca Geopark – Weather Tower (Geopark de Arouca – Radar Meteorológico)	357
Lousada	07-30.04-2017	Municipal Library (Biblioteca Municipal de Lousada)	Free entry (Number of visitors not counted)
Sintra	24-25.04.2017	Carlucci American International School of Lisbon (Fundação Escola Americana de Lisboa)	Free entry (Number of visitors not counted)
Venda do Pinheiro, Mafra	05-09.06.2017	Primary Scholl of Venda do Pinheiro (EB1 Venda do Pinheiro)	500
Idanha-a-Nova	23-25.06.2017	Eco Festival “Salva a Terra”	2,000
Lisboa	04.-07.09.2017	EMAPI 14 - International Conference on Ecology and Management of Alien Plant Invasions	200

Table 4 – Locations where the reduced moving exhibit was exposed in Portugal

*E2.3 – Press conferences and press releases:* the project produced in total 14 press releases respect to 10 originally planned and 4 press conferences (Annex 6, Annex 22 MTR and Annex 8 PR2), they are indicated as follows:

- 1) 04.04.2013 - *Salvar o lobo na Guarda e em Castelo Branco, promovendo a coexistência com o Homem.* Press release about the presentation of the LIFE MEDWOLF project.
- 2) 24.04.2013 - *Ataques a rebanhos na Guarda mostram a urgência da continuada utilização de formas de conviver com o lobo.* Press release to clarify incorrect information conveyed in the TV news about wolf damage in the study area.
- 3) 16.07.2014 - *O homem que comprou um Zoológico visitou o Projecto MedWolf, na Guarda.* Press release about the visit of Benjamin Mee (owner of the Dartmoor Zoo, England, and author of the memoir book "I bought a Zoo") and his sons, to the IWRC and the MEDWOLF project, to learn more about the wolf monitoring and the damage prevention actions;
- 4) 21.07.2014 - *Encontro participativo em Lamas de Mouro para redefinir a coexistência com o lobo.* Press release about the national workshop organized with the LCIE Pilot Action;
- 5) 23.09.2014 - *Pela primeira vez, um painel de especialistas sobre o lobo ibérico reúne-se em Portugal. Em Castelo Branco, dia 27.* Press release about the first meeting of the IW-WG;
- 6) 30.09.2014 - *Primeira Reunião de Trabalho de Estudo e Gestão do Lobo Ibérico.* Press release about the first meeting of the IW-WG;
- 7) 24.10.2014 - *Da teoria à prática: Reunião de Trabalho Ibérica sobre Mitigação de Conflitos*

- com o Lobo*. Press release about the organization of the International Workshop (action E6);
- 8) 05.11.2014 - *O primeiro passo para a criação de estratégias partilhadas face ao lobo ibérico*. Press release about the results of the International Workshop “Mitigação de Conflitos com o Lobo” (action E6);
- 9) 21.10.2015 - *Cães de Gado trazem cientistas de três continentes a Portugal*. Press release about the meeting “LGDs - From tradition to modernity: How to assess, improve and innovate” held in Castelo Branco;
- 10) 01.02.2016 - *O Projeto Med-Wolf apresenta os seus primeiros resultados a quem lida com o lobo*. Press release about the presentation of the preliminary results to the main breeders' associations and official institutions and the launch of a complete brochure on the Iberian wolf.
- 11) 27.05.2016 - *Ponto da Situação do Projeto Life Med-Wolf*. Press release about the visit of the Italian delegation from the Med-Wolf project to the Guarda district, and visit to beneficiaries of the MW project.
- 12) 27.10.2016 - *Saber mais, coexistir melhor. Nesta semana, o lobo-ibérico é a estrela em Castelo Branco*. Press release about the IV Iberian Wolf Conference.
- 13) 24.02.2017 - *Save the date: 2 de março. Os “Reis da Europa Selvagem” chegam ao MUHNAC*. Press release about the inauguration of the exhibit “Kings of Wild Europe” at the National Museum of Natural History and Science of the University of Lisbon.
- 14) 03.10.2017 - *Quatro anos e meio a trabalhar pelo lobo-ibérico, na Guarda e em Castelo Branco, promovendo a coexistência com o Homem*. Press release about the final results of the MW project.

#### **4 Press Conferences** were organized:

- 1) Lisbon 21/05/2013 - to present the project to the community and to the media, taking advantage of the presence of representatives of the IEA;
- 2) Lisbon 18/05/2015 - at the opening of the exhibit "Coexisting with Large Carnivores – the Challenge and the Opportunity" at the National Museum of Natural History and Science of University of Lisbon (MUHNAC), with the presence of the Italian coordinator, Valeria Salvatori, the Portuguese coordinator, Francisco Fonseca (GL, FCUL), and a representative of the Museum.
- 3) Guarda 25/05/2016 - to present of the first results of the Med-Wolf Project in Portugal and Italy and the next actions to be developed, with the presence of the Italian coordinator (Valeria Salvatori), the Portuguese coordinator (Francisco Fonseca), the monitor of the European Commission (Ilenia Babetto) and the president of Guarda Polytechnic Institute (Constantino Mendes Rei).
- 4) Lisbon 3/10/2017 - to present the main results achieved within the project, with the presence of the project's coordinator as well as IEA and GL technicians, and a representative of the MUHNAC, with a final visit to the exhibit "Kings of Wild Europe".

**9 interviews/news broadcasted** on national TVs (11 and 24.06.2013; 27.09.2013; 13.1.2014; 26 and 27.01.2015; 26.05.2016; 30.03.2017 and 8.12.2017).

**13 national/local interviews broadcasted** in radios (27.04.2014; 16.07.2014; 29.09.2014; 26 and 28.01.2015; 14.01.2016; 8.02.2016; 25.05.2016; 26.10.2016; 20.02.2017; 5, 6 and 8.03.2017).

E2.4 – Information panels: 30 information panels, respect to 8 originally planned, were produced (19/11/2013) and distributed to the tourism offices in all the municipalities of the Portuguese project area, as well as to ICNF, Quercus, SEPNA-GNR units working in the study area,

Protected Areas included in the study areas and to all the Portuguese associated beneficiaries (Annex 11 PR1). 30 information panels with MW project updates were produced (18.05.2016) and distributed on the same places.

*E2.5 – Media articles on wolf presence:* **247 articles** were published in regional/national newspapers or magazines (Annex 23 MTR; Annex 9 PR2; Annex 7)

*E2.6 – Scientific publication and participation at congresses:* a total of 22 oral presentations were given and 16 posters were exhibited at the following scientific meetings (Annex 28):

Date	Location	Type/title/beneficiary
26-28.05.2013	Congress SciCom PT, Lisbon, PT	1 poster on project communication strategy, GL.
15-16.11.2013	III Symposium on Wild and Exotic Animals, University of Trás-os-Montes e Alto Douro, Vila Real, PT	1 invited talk about wolf ecology and conservation, and the MW project, GL.
03.03.2014	II Researcher Journeys on Biology, at Faculty of Sciences of the University of Lisbon, Lisbon, PT	1 invited talk about wolf ecology and conservation, and the MW project, GL.
22.03.2014	1st Environmental Seminar (As várias faces da Conservação Ambiental), Fornos de Algodres, PT	1 invited talk about wolf ecology and conservation, and the MW project, GL.
27.04.2015	Wolf Day, at Faculty of Sciences of the University of Lisbon, Lisbon, PT	1 invited talk about wolf ecology and conservation, and the MW project, GL.
28-30.5.2015	Congress SciCom PT, Lagos, PT	1 poster about the environmental education actions implemented in the study area (Wolf Kit and talks), GL.
4-7.12.2015	SECEM Congress, Burgos, ES	1 talk focusing on the results of the SDDT and 1 poster comparing the data collected by different wolf survey methods (except the SDDT) within the A2-Ext, GL/INIAV.
26-27.05.2016	Congress SciCom PT, Lisbon, PT	1 poster reporting results from ecotours done in 2015, GL.
03.06.2016	Seminar on Wolf Conservation MONTIS, Viseu, PT	1 invited talk focused on the wolf population south of the Douro river in Portugal, GL.
15-17.09.2016	X Iberian Congress on Animal Genetic Resources (X Congresso Ibérico sobre Recursos Genéticos Animais – SPREGA), Castelo Branco, PT	1 poster focusing on the results from the implementation of permanent fences to prevent wolf damages, ESACB.
27-30.10.2016	IV Iberian Wolf Conference, Castelo Branco, PT	5 posters and 7 talks about project results, GL/ALDEIA/INIAV/ESACB.
20-23.04.2017	International Conference: Wolf Management and Conservation in North America and Europe - an unresolved conflict, Robledo de Sanabria, Zamora, ES	1 invited talk, 2 talks, and 1 poster, all focusing on the wolf in Portugal and the main results from the MedWolf (LGDs, public attitudes, ecotourism), GL.
6-7.05.2017	XVIII National Congress FAPAS: Nature Conservation and Environment Education for	1 poster focusing on the work developed by GL, also within action E2 of the MedWolf, GL.

	Sustainability, Vimioso, PT	
25-31.08.2017	EAAP Congress-68th Annual Meeting of the European Federation of Animal Science, Tallinn, EE	2 posters about the results of the implementation of permanent fences to prevent wolf damages, ESACB.
20-23.09.2017	Workshop: Wolves in cultural landscapes along the coast: livestock damage prevention and other solution options, Hamburg, DE	1 invited talk about the experience gained by GL in the last 20 years on the use LGDs to prevent wolf damages on livestock and the main results of the use of damage prevention measures (LGDs and permanent fences) within the LIFE MedWolf Project, GL.
12-13.10.2017	Congress SciCom PT, Coimbra, PT	1 talk and 1 poster about the meetings with livestock owners during the MW project and about the exhibition "Kings of wild Europe", GL.
9.11.2017	MW International Symposium, Grosseto, IT	3 invited talks: one by the national coordinator, to present the main actions and results achieved by the Portuguese partners; the other to present the main results of implementing LGDs to prevent wolf damages and the main results of the study on farmer's attitudes, since implementation of such measures depends on social factors; and one to present the main results of implementing fences to prevent wolf damages, GL/ALDEIA/INIAV/ESACB.
9-10.11.2017	16th Ecology National Meeting SPECO, Lisbon, PT	1 poster was presented at the, organized by SPECO - Sociedade Portuguesa de Ecologia in Lisbon (9-10th November), focusing the main results obtained on the MW project, GL/ALDEIA/INIAV/ESACB.
04.11.2017	V Symposium on Wild and Exotic Animals, University of Trás-os-Montes e Alto Douro, Vila Real, PT	1 invited talk about the wolf in Portugal and the results of MW project, GL.

Table 5 – Scientific Congresses and Symposia where the project was presented in Portugal.

Additionally, three one-week trainings to 8 students were provided by INIAV about genetic forensics, based on the experience gathered within the LIFE MEDWOLF, in July 2014-2017.

*E2.7 – Tours in the project area:* Four different ecotourism programs were developed involving 4 municipalities of the study area (Almeida, Pinhel, Guarda, and Sabugal), where wolves are present, 6 tours were made (one had to be cancelled due to bad weather conditions) respect to 4 originally foreseen, and they were held involving 66 participants:

- 1) “Wolves in Côa River Country” eco-tour was developed in Sabugal and Pinhel municipalities (05-07.06.2015), with 17 participants (very good reception, reaching the maximum number of participants). It involved farmers that participate in the LIFE MEDWOLF project (which received dogs or fences);
- 2) “One Day with the Shepherd in Wolf Country” eco-tour was developed in Sabugal municipality (31.10–01.11.2015), with the participation of 8 people;
- 3) “Wolves in Côa River Country” eco-tour was repeated in Sabugal and Pinhel municipalities (10-12.06.2016), with 5 participants;
- 4) “One Day with the Shepherd in Wolf Country” eco-tour was repeated in Sabugal on (16.06.16), with 5 participants (3 adults + 2 children);
- 5) “Wolves and Shepherds in Estrela Mountain” eco-tour, to be developed in Guarda and Almeida municipalities (10-11.12.16) was cancelled due to bad weather conditions;
- 6) “One Day with the Shepherd in Wolf Country” eco-tour was repeated in Sabugal municipality

(10.06.2017), with 18 participants (10 adults + 8 children);

7) “Sunset at the Wolf Trap” eco-tour was developed in Pinhel municipality (half day, 05.08.2017), with 13 participants (11 adults + 2 children), including tourists from the Netherlands.

*E2.8 – The wolf kit:* The kit was adapted and (Annex 39 PR1) it was distributed and presented (e-mail, meetings) to all the high-schools in the project area (15). We aimed at reaching 20 schools, but this was not possible given the target area did not count 20 high schools at the onset of the project. One school (Sabugal municipality) started to implement the kit activities with 3 classes and 45 students in 2013/2014. In 2014/2015 two other schools participated (Figueira de Castelo Rodrigo and Sabugal municipalities) and 9 classes were involved, and a total of 126 students attended talks about the wolf. In 2016 1 school in Sintra started using the kit with 48 students. Meetings were held with the teachers to present the Wolf Kit before being developed with the students. Immediately before the activities (talks or Wolf Kit) the students filled in a questionnaire, developed after the one used in action A11 (and pre-tested with 27 students in urban and rural areas), to learn about their knowledge and opinion about the wolf (as proposed in action A11). Note that The analysis of the students’ questionnaires was included in the action D5 report (Annex 25).

To complement these actions and also expand the intervention to neighbouring areas, other activities were developed by GL, involving another 218 students (around 10 classes) from the MW area, and 478 students/participants (around 24 classes) from neighbouring municipalities:

- 27.04.2013 - one talk about the wolf and the possibility of coexistence (focusing on the damage prevention methods - LGD) for 100 high school students in Fundão;
- 27.09.2013 - one talk about the wolf (bio- ecology and conservation) attended by 30 persons (students 7-12 years, teachers and some representatives of local development associations), in the scope of the European Researchers Night 2013, in Almeida;
- 09.06.2014 – one field trip focusing on the wolf (bio-ecology and conservation) and demonstration of study methods (e.g. camera trapping, SDDT), with 60 students from Almeida;
- 22.04.2016 - one talk about the wolf (bio-ecology and conservation) was held for 70 high school students to complement the LCIE exhibit on display in the science museum Mina da Ciência - Ciência Viva do Lousal, Lousal;
- 02.06.2016 - one session at the Senior University of Castelo Branco, with two generations of students: 12 students (1 class) from a local school (first grade) were invited to share information and discuss about the wolf with senior students (around 80); senior students shared real stories regarding wolves, while younger students prepared a presentation about the wolf, and produced one song and a hand-made gift for the older participants. This was followed by a lecture about the wolf (bio-ecology and conservation) followed by a debate;
- 07.07.2016 - one session with 37 students (6-13 years) from Sabugal, in the scope of the holiday activities camps, developed in a semi-natural area nearby the Côa River, focusing on the wolf (bio-ecology) enabled children to have a hands-on experience with wolf study methods (e.g. identifying wolf prints and howls, and the use of SDDT);
- 17.02.2017 - five guided visits to the LCIE exhibit, followed by a set of written activities focusing on LC (as part of a questionnaire to survey opinion and knowledge acquired) were done with 100 first cycle students (7-10 years), in Parque Tejo, Abrantes;
- 07.04.2017 – one guided visits to the LCIE exhibit, followed by a set of written activities (as part of a questionnaire to survey opinion and knowledge acquired) focusing on LC were done with 46 students (6-14 years), including also a brief demonstration of the SDDT,

in Parque Tejo, Abrantes;

- 22-25.06.2017 – a series of workshops/activities (e.g. wolf survey methods, puppet show, wolf track molds) involving 36 children (2-13 years) and 15 adults, were developed during the Eco-Festival Salva a Terra, organized by Quercus, in Salvaterra do Extremo, Idanha-a-Nova;

- 28.09.2017 – one guided visit to the LCIE exhibit for 40 students (high school), during the inauguration of the LCIE exhibit at the school, in Pinhel;

- 03.11.2017 – one talk for 70 students and teachers focusing on the use of LGDs, the MW project and the main results achieved with of the implementation of damage prevention measures (LGDs and Fences), ESACB, Castelo Branco.

*E2.9 – Meetings with interest groups:* A total of 25 meetings were organized respect to 6 foreseen in the project proposal. Four meetings with livestock owners were held in November 2015, 4 meetings with directors of livestock breeders associations in January 2016, and 5 meetings with the president of hunter's association between January and March 2016. In June 2016 a meeting was held with the hunting Federation which gathers most hunting associations (135) in the project's area, and a mailing, with information on the project, the wolf and the results obtained was sent to all. Two meetings with local newspapers were held in March 2016. Four meetings with the SEPNA-GNR agents on poison effects and wolf presence. Two seminars were held in Castelo Branco (02/06/2016) and Viseu (30/06/2016). Seven meetings were held (17-21/11/2014) with 5 municipalities of the study area, as well as with 2 local development and environmental associations, to prepare the ecotourism actions (discuss the viability of wolf ecotourism in the region, collect information and evaluate possible partnerships).

The LIFE MEDWOLF project was presented in 9 talks given in different occasions:

Date	Location	Title	Number of attendees
16.03.2013	Almeida	Colloquium "The Iberian wolf in Beira Interior" (Colóquio "O Lobo Ibérico na Beira Interior")	70
22.06.2013	Santulhão (Vimioso)	The Wolf and the Village – ALDEIA (O Lobo e a Aldeia)	40
17.05.2014	Alcanena	Science Museum Ciência Viva do Alviela – "Night Predators" (Centro Ciência Viva do Alviela – "Predadores da Noite")	30
22.05.2014	Lisboa	Seminar about several ongoing Life Projects in Portugal in the Faculty of Sciences of University of Lisbon	25
18.02.2016	Fundão	Talk "A Hora do Lobo" film	40
24.05.2016	Lisboa	Seminar about several ongoing Life Projects in Portugal in the Faculty of Sciences of University of Lisbon	70
24.06.2017	Salvaterra do Extremo, Idanha-a-Nova	Eco-Festival Salva a Terra	10
15.09.2017	Setúbal	Festival Observa Natura 2017	20
28.09.2017	Pinhel	Pinhel's House of Culture (Casa da Cultura de Pinhel)	30

Table 6 – Popular talks held in Portugal.

A series of guided visits to the LCIE exhibit and photo exhibit, and lectures about the wolf and the main actions developed and results achieved by the MW, was initiated in several parishes of Pinhel municipality, to the general public, children as well as farmers/hunters, as part of a collaboration initiated with this municipality, which will continue after the end of the project:

- 1) 25.10.2017 – GL, two guided visits to the photo exhibit held at the Pinhel's Castle, focusing the Iberian wolf and the main actions developed in the project to achieve coexistence, organized by Pinhel Municipality (MW area), were attended by 30 people;
- 2) 19.11.2017 – GL, one guided visit to inaugurate the photo exhibit "Looking at the Wolf" in a parish inside the MW area, and focused on the Iberian wolf, its ecosystem, main threats and conservation status, as well as the main actions developed in the project to achieve coexistence, in Pinhel, was attended by 30 people;
- 3) 19.11.2017 – GL, one guided visit to inaugurate the LCIE exhibit (roll-ups), in a parish inside the MW area, and focused on the LC, mainly the Iberian wolf, its ecosystem, main threats and conservation status, as well as the main actions developed in the project to achieve coexistence, in Pinhel, was attended by 10 people.

In order to raise awareness to all publics, GL invited a theatre company “A Jangada Teatro” to present a musical puppet theatre based on the story “Peter and the Wolf” at the Eco-Festival Salva-a-Terra, organized by Quercus, in Salvaterra do Extremo, Idanha-a-Nova (MW area), on 25th June 2017. Around 130 attended the theatre that raised a lot of interest from the public of the Festival.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/01/2014	01/04/2013
End	31/10/2017	30/11/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
Exhibits printed	31/08/2013	31/10/2014
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Brochure on wolf distribution	30/04/2014	30/4/2014 (Annex 6 PR1)
Exhibition and brochure	31/05/2014	31/10/2014 (Annex 7-8 PR1)
Notice boards	30/11/2013	30/11/2013 (Annex 11 PR1)
Press clippings	30/09/2016	30/11/2016 (Annex 9 MTR, Annex 7)
Scientific publication	30/09/2016	
<b>Other Annexes</b>		
Posters and ppt presented at scientific meetings		Annex 28
List of schools where activities were undertaken		Annex 33
CDP Newsletter Article on stakeholders meetings		Annex 34
<b>Indicators of action implementation</b>		Communication experts contracted; brochures designed; texts agreed; advertisements published; exhibitions translated and printed; exhibitions set up.

### 5.4.3 Action E3: Communication campaign on conflicts mitigation in Italy

Beneficiary responsible for implementation: FESTAMB

Expected costs: 320,863€

Incurred costs: 284,340€

Action E3 was expected to start in the first quarter of 2014, but the responsible beneficiary for its implementation (FESTAMB) proposed to anticipate the beginning date by 3 quarters, in order to start communication activities aimed at contradicting the misinformation of local newspapers regarding the negative impact of wolves on livestock survival. In January 2013 the communication responsible has been identified. A communication working group was set up to develop the communication strategy in April 2013. It included representatives from the press offices of all project beneficiaries in Italy. The process was led by a Communication Expert hired by IEA, who coordinated the process and drafted the strategy and the Communication plan in collaboration with FESTAMB (Annex 35 PR1). All the activities and products foreseen were developed, and in many occasions additional initiatives were undertaken. One brochure was not produced, and replaced by 2 different ones (see E3.1 below).

The activities undertaken throughout the project duration were the following:

**E3.1 – Brochures:** a brochure with general presentation of the project was printed on 31/07/2014 (6.000 copies, Annex 43 PR1).

The brochure on damage prevention measures was printed in 2.200 copies (Annex 29 MTR)

The brochure on effects of poison was printed in 1500 copies in November 2015 (Annex 10 PR2) and distributed in all the events where the project and the exhibition were present.

One brochure on large carnivores distribution in Europe “Large Carnivores Know no Boundaries”, translated and printed on 30.10.2014 (500 copies, Annex 10 PR1). The brochure was distributed as support tool of the exhibition panels.

The brochure with present, past and potential distribution of wolf was not printed because of the paucity of data available on past presence of wolf and the preliminary nature of the potential distribution map produced in action A6. It was replaced by a brochure containing indications on how to behave in presence of livestock guarding dogs (printed in March 2017, 1000 copies, Annex 29). A brochure presenting the association Difesa Attiva was also produced and printed in 2,500 copies (Annex 30). All these products were used in all the events listed below.

ORGANISATION/EVENT	LOCATION	DATE	PARTICIPANTS	DISTRIBUTED
Farfalle nella Testa	Bordano (UD)	25/10/2014	30	Opuscolo Medwolf n°50
Museo Civico di Storia Naturale	Trieste	31/10-2/11/2014	100	Opuscolo Medwolf n°50
Convegno Internazionale sulla Ibridazione – Progetto LIFE IBRIWOLF	Grosseto	2-3-4/11/2014	400	Opuscolo Medwolf n°100
Centro visite – Aperitivi per la mente	Gradina (GO)	07-09/11/2014	30	Opuscolo Medwolf n°30
WWF Emilia Romagna – Festa del lupo 2014	Castelluccio di Porretana Terme (BO)	07-09/11/2014	100	Opuscolo Medwolf n°200
Museo Storia Naturale della Maremma	Grosseto	01-21/11/2014	50	Opuscolo Medwolf n°50
WWF Livorno – Convegno “Il lupo è intorno a noi: convivere con l'animale più affascinante e	Livorno	22/11/2014	150	Opuscolo Medwolf n°50



ORGANISATION/EVENT	LOCATION	DATE	PARTICIPANTS	DISTRIBUTED
incompreso dei nostri boschi”				
WWF Chieti Oasi WWF "Lago di Serranella"	Casoli (CH)	01/12/2014	30	Opuscolo Medwolf n°50
Scuola Secondaria Primo Grado Santo Stefano Magra	La Spezia	03/12/2014	120	Opuscolo Medwolf n°100
XII Congresso degli inanellatori italiani	Gorizia	05-07/12/2014	50	Opuscolo Medwolf n°50
Museo del Lupo Viggiano - Centro educazione ambientale e sostenibilità	Viggiano (PZ)	29/12/2014	100	Opuscolo Medwolf n°50
Centro visite Cà Carnè – Parco regionale della Vena del Gesso romagnola	Brisighella (RA)	Dec 2014-Feb 2015	500	Opuscolo Medwolf n°100
Therion Research Group – Serata divulgativa “Notte da lupi”	Clauzetto (PN)	24/01/2015	100	Opuscolo Medwolf n°100
EDUZOO	Falconara	10/02/2015	15	Opuscolo medwolf n°30
WWF Martina Franca	Martina Franca (TA)	20/02/2015	60	Opuscolo Medwolf n°50
ITAS Grosseto	Grosseto	21/02/2015	150	Opuscolo Medwolf n°50
WWF Verona	Verona	01/03/2015	100	Opuscolo Medwolf n°100
Assemblea AGAT (Associazione Guide Ambientali della Toscana)	Lago di Santa Luce (PI)	16/03/2015	30	Opuscolo Medwolf n°30
Riserva Naturale Diaccia Botrona – Centro visite	Castiglione della Pescaia (GR)	28/2-29/03/2015	200	Opuscolo Medwolf n°100
Cinema The Space Grosseto	Grosseto	27/03-01/04/2015	1200	Opuscolo Medwolf n°350
Cooperativa Il Nodo Baciocca	Montioni, Suvereto-LI	20/03-13/04/2015	100	Opuscolo Medwolf n°50
75esima Avventura Gerfalco	Montieri (GR)	01/05/2015 – 2/10/2017	500	Opuscolo Medwolf n°100
Incontro pubblico “Problematiche e coesistenza con le attività antropiche”	Pomarance (PI)	08/05/2015	30	Opuscolo Medwolf n°20
World dog show 2015	Milano	10-14/06/2015	50	Opuscolo Medwolf n°50
Legambiente Alpignano	Alpignano (TO)	22/05-22/06/2015	250	Opuscolo Medwolf n°50
Falcolandia Tenuta della Mistica	Roma	03-05/07/2015	300	Opuscolo Medwolf n°50
Luna Lupis – Workshop sul lupo	Assisi	18-19/07/2015	25	Opuscolo Medwolf n°15
Pro Loco Valtramontina – FESTinVAL	Pordenone	07-10/08/2015	150	Opuscolo Medwolf n°50
Circolo Festambiente di Legambiente	Grosseto	7-16/08/2015	10000	Opuscolo Medwolf n°1500
Campo “Sulle tracce del lupo” - Unifauna	Croci di Calenzano (FI)	24-26/08/2015	20	Opuscolo Medwolf n°15
Meeting nazionale di Canilupus Italia	Badia di Moscheta, Firenzuola (FI)	28-30/08/2015	25	Opuscolo Medwolf n°25
Legambiente Lombardia Prim'Alpe	Canzo (CO)	29-30/08/2015	50	Opuscolo Medwolf n°50
Canislupus Italia	Suvereto (LI)	20/09/15	30	Opuscolo Medwolf n°20

ORGANISATION/EVENT	LOCATION	DATE	PARTICIPANTS	DISTRIBUTED
Festambiente della Piana and Regional Assembly of Legambiente	Campi Bisenzio	2-11/10/2015	500	Opuscolo Medwolf n°100
Riserva Acquerino Cantagallo		24-25/10/2015	200	Opuscolo Medwolf n°50
Assemblea dell'Associazione delle Guide Ambientali della Toscana	Oasi Lipu di Massaciuccoli	11/2015	30	Opuscolo Medwolf n°20
Secondary School Santo Stefano Magra	La Spezia	12/2015	120	Opuscolo Medwolf n°100
National Legambiente Congresses	Milan	11-13/12/2015	700	Opuscolo Medwolf n°100
M'ammalia National meeting	Grosseto, Natural History Museum	5-6/12/2015	50	Opuscolo Medwolf n°20
Nature Museum of Pantano (MT)	Wolf Workshop	27/12/2015	40	Opuscolo Medwolf n°20
Natural History Museum	Livorno	16-23/1/2016	100	Opuscolo Medwolf n°50
Incontro Formazione per educatori ambientali di Legambiente	Badia Prataglia (AR)	26-27/2/2016	20	Opuscolo Medwolf n°15
School summer camps	La Marsiliana	29/06/2016 – 12/07/2016 – 2/08/2016	35	Opuscolo Medwolf n°35
Environmental Education Centre	Pretoro (CH)	04-10/2016	200	Opuscolo Medwolf n°50
Legambiente Lomellina	Val Nizza (PV)	04-05/2016	120	Opuscolo Medwolf n°50
Scuola Pistelli Roma	Roma	29/4/2016 – 10/5/2016	50	Opuscolo Medwolf n°50
Il Grande Faggio	via fonte palombo 36, 66010 Pretoro (CH)	1/04/2016 – 1/10/2016	200	Opuscolo Medwolf n°50
Corpo Forestale dello Stato	Riserva Marsiliana	29/06/2016 – 12/07/2016 – 2/08/2016	130	Opuscolo Medwolf n°100
Nature Museum of Voghera	Voghera (PV)	1/07/2016 – 1/9/2016	50	Opuscolo Medwolf n°50
Assemblea Volontari WWF	Assisi	28-30/10/2016	70	Opuscolo Medwolf n°50
Italian wild wolf	Castello Monservisi – Castelluccio di Norcia (PG)	4-6/10/2016	110	Opuscolo Medwolf n°50
Assemblea dell'Associazione delle Guide Ambientali Europee	Lajatico (PI)	21/11/2016	30	Opuscolo Medwolf n°20
Scuola: ISIS Polo	Cecina (LI)	20/01/17	50	Opuscolo Medwolf n°50
Uisp Lega Montagna	Valle Argentina - Molini Di Triora (IM)	19-29/02/2017	250	Opuscolo Medwolf n°50
Assemblea dell'Associazione delle Guide Ambientali Europee	Abetone (PT)	6-7/03/2017	30	Opuscolo Medwolf n°15
WWF Italia	Università La Sapienza, Roma	24/03/2017	150	Opuscolo Medwolf n°50
DifesAttiva promotional activity	Civitella Paganico – Campagnatico (GR)	1-2/04/2017	35	Opuscoli: 40 escursionismo cani da guardiania; 35 difesAttiva 40 contro bracconaggio
Legambiente general Assembly	Enaoli – Rispecchia	3/04/2017	600	Opuscolo Medwolf

ORGANISATION/EVENT	LOCATION	DATE	PARTICIPANTS	DISTRIBUTED
	(GR)			n°250
Oasi Lipu Lago Santa Luce	Santa Luce (PI)	08/04/17	40	Opuscoli: 25 escursionismo cani da guardiania; 20 difesAttiva
DifesAttiva stand at Fiera del Madonnino	Grosseto Fiere – Braccagni (GR)	22-25/04/2017	Circa 50	Opuscoli 80 escursionismo cani da guardiania; 50 difesAttiva; 50 contro bracconaggio
DifesAttiva - IEAAppia Day	Roma	14/05/2017	Circa 50	Opuscoli 50 escursionismo cani da guardiania; 30 difesAttiva
Medwolf camp school	Enaoli – Rispeccia (GR)	27-28/05/2017	20	Opuscolo Medwolf n°20
wwf Arezzo	Arezzo	16/06/17	Circa 50	Opuscolo: 20 difesAttiva
Presentazione Nucleo Cinofilo Antiveleno	Marsiliana, Massa Marittima (GR)	15/06/17	30	Opuscolo Medwolf n°15
Centro Visite Parco Regionale della Maremma	Alberese (GR)	1/07/2017 – 31/08/2017	1200	Opuscolo Medwolf n°200
Centro storico Suvereto	Suvereto (LI)	23-24/9/2017	60	Opuscolo Medwolf n°20
Simposio Medwolf - Polo Universitario Grosseto	Grosseto (GR)	8-9/11/2017	250	Opuscolo Medwolf n°250
Natural History Museum	Grosseto (GR)	8-9/11/2017	200	Opuscolo Medwolf n°200

Table 7 – Public events where the project was presented in Italy.

**E3.2 – Exhibition:** The exhibition regarding the conservation of the wolf and the mitigation of conflicts was created based on a re-elaboration of the one produced by the Large Carnivore Initiative for Europe (LCIE), which has been translated into Italian (31<sup>st</sup> of July 2014, Annex 9 of 2). The communication group selected 9 specific topics and new panels have been printed focusing only on wolf (not on all the four European large carnivores). Panels report on the Italian wolf population, conservation and biology with particular reference to the Italian situation. The panels are of larger size than the original LCIE ones and are in form of self-standing roll ups. The exhibition was thought as an itinerant tool to promote and disseminate the project and the mitigation of conflicts between the presence of wolf and human activities. This was the reason why the group decided to create an information tool of 9 panels only (instead of 26), 80 x 200 cm each one, to make easier the transfer from one place to another and the organization of the exposition of the panels to assure a wider dissemination activity all over Italy. A catalogue showing the panels has been uploaded on the new section “Materiali” of the LIFE MEDWOLF website and users can consult it in order to apply for a request to use the exhibit and the information material (wolf-kit, brochure on damage prevention measures, LCIE brochure and the LIFE MEDWOLF leaflet). We offered the exhibition for free and shipping was also covered by the project budget, so as to encourage wide usage of the exhibit. The panels have been set up in 69 meetings/events (see Table 2) and a map showing where it has been set up and where it is currently visible is available on the web site. One copy of the exhibition is always visible at Circolo Festambiente (Rispeccia, Grosseto).

ID	ORGANISATION/EVENT	LOCATION	DATE
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1	Farfalle nella Testa	Bordano (UD)	25/10/2014
2	Museo Civico di Storia Naturale	Trieste	31/10-2/11/2014
3	Convegno Internazionale sulla Ibridazione – Progetto LIFE IBRIWOLF	Grosseto	2-3-4/11/2014
4	Centro visite – Aperitivi per la mente	Gradina (GO)	07-09/11/2014
5	WWF Emilia Romagna – Festa del lupo 2014	Castelluccio di Porretana Terme (BO)	07-09/11/2014
6	Museo Storia Naturale della Maremma	Grosseto	01-21/11/2014
7	WWF Livorno – Convegno “Il lupo è intorno a noi: convivere con l'animale più affascinante e incompreso dei nostri boschi”	Livorno	22/11/2014
8	WWF Chieti Oasi WWF "Lago di Serranella"	Casoli (CH)	01/12/2014
9	Scuola Secondaria Primo Grado Santo Stefano Magra	La Spezia	03/12/2014
10	XII Congresso degli inanellatori italiani	Gorizia	05-07/12/2014
11	Museo del Lupo Viggiano - Centro educazione ambientale e sostenibilità	Viggiano (PZ)	29/12/2014
12	Centro visite Cà Carnè – Parco regionale della Vena del Gesso romagnola	Brisighella (RA)	Dec 2014-Feb 2015
13	Therion Research Group – Serata divulgativa “Notte da lupi”	Clauzetto (PN)	24/01/2015
14	EDUZOO	Falconara	10/02/2015
15	WWF Martina Franca	Martina Franca (TA)	20/02/2015
16	ITAS Grosseto	Grosseto	21/02/2015
17	WWF Verona	Verona	01/03/2015
18	Assemblea AGAT (Associazione Guide Ambientali della Toscana)	Lago di Santa Luce (PI)	16/03/2015
19	Riserva Naturale Diaccia Botrona – Centro visite	Castiglione della Pescaia (GR)	28/2-29/03/2015
20	Cinema The Space Grosseto	Grosseto	27/03-01/04/2015
21	Cooperativa Il Nodo Baciocca	Montioni, Suvereto-LI	20/03-13/04/2015
22	75esima Avventura Gerfalco	Montieri (GR)	01/05/2015
23	Incontro pubblico “Problematiche e coesistenza con le attività antropiche”	Pomarance (PI)	08/05/2015
24	World dog show 2015	Milano	10-14/06/2015
25	Legambiente Alpignano	Alpignano (TO)	22/05-22/06/2015
26	Falcolandia Tenuta della Mistica	Roma	03-05/07/2015
27	Luna Lupis – Workshop sul lupo	Assisi	18-19/07/2015
28	Pro Loco Valtramontina – FESTinVAL	Pordenone	07-10/08/2015
29	Circolo Festambiente di Legambiente	Grosseto	7-16/08/2015
30	Campo “Sulle tracce del lupo” - Unifauna	Croci di Calenzano (FI)	24-26/08/2015
31	Meeting nazionale di Canilupus Italia	Badia di Moscheta, Firenzuola (FI)	28-30/08/2015
32	Legambiente Lombardia Prim'Alpe	Canzo (CO)	29-30/08/2015
33	Canislupus Italia	Suvereto (LI)	20/09/15
34	Festambiente della Piana and Regional Assembly of Legambiente	Campi Bisenzio	2-11/10/2015

35	Riserva Acquerino Cantagallo		24-25/10/2015
36	Assemblea dell'Associazione delle Guide Ambientali della Toscana	Oasi Lipu di Massaciuccoli	11/2015
37	Secondary School Santo Stefano Magra	La Spezia	12/2015
38	National Legambiente Congresses	Milan	11-13/12/2015
39	M'ammalia National meeting	Grosseto, Natural History Museum	5-6/12/2015
40	Nature Museum of Pantano (MT)	Wolf Workshop	27/12/2015
41	Natural History Museum	Livorno	16-23/1/2016
42		Badia Prataglia (AR)	26-27/2/2016
43	School summer camps	La Marsiliana	29/06/2016 – 12/07/2016 – 2/08/2016
44	Environmental Education Centre	Pretoro (CH)	04-10/2016
45	Legambiente Lomellina	Val Nizza (PV)	04-05/2016
46	Scuola Pistelli Roma	Roma	29/4/2016 – 10/5/2016
48	Il Grande Faggio	via fonte palombo 36, 66010 Pretoro (CH)	1/04/2016 – 1/10/2016
49	Corpo Forestale dello Stato	Riserva Marsiliana	29/06/2016 – 12/07/2016 – 2/08/2016
50	Nature Museum of Voghera	Voghera (PV)	1/07/2016 – 1/9/2016
51	Assemblea Volontari WWF	Assisi	28-30/10/2016
52	Italian wild wolf	Castello Monservisi – Castelluccio di Norcia (PG)	4-6/10/2016
53	Assemblea dell'Associazione delle Guide Ambientali Europee	Lajatico (PI)	21/11/2016
54	Scuola: ISIS Polo	Cecina (LI)	20/01/17
55	Uisp Lega Montagna	Valle Argentina - Molini Di Triora (IM)	19-29/02/2017
56	Assemblea dell'Associazione delle Guide Ambientali Europee	Abetone (PT)	6-7/03/2017
57	WWF Italia	Università La Sapienza, Roma	24/03/2017
58	DifesAttiva promotional activity	Civitella Paganico – Campagnatico (GR)	1-2/04/2017
59	Legambiente general Assembly	Enaoli – Rispescia (GR)	3/04/2017
60	Oasi Lipu Lago Santa Luce	Santa Luce (PI)	08/04/17
61	DifesAttiva stand at Fiera del Madonnino	Grosseto Fiere – Braccagni (GR)	22-25/04/2017
62	DifesAttiva - IEAAppia Day	Roma	14/05/2017
63	Medwolf camp school	Enaoli – Rispescia (GR)	27-28/05/2017
64	wwf Arezzo	Arezzo	16/06/17
65	Presentazione Nucleo Cinofilo Antiveleno	Marsiliana, Massa Marittima (GR)	15/06/17
66	Centro Visite Parco Regionale della Maremma	Alberese (GR)	1/07/2017 – 31/08/2017
67	Centro storico Suvereto	Suvereto (LI)	23-24/9/2017
68	Simposio Medwolf - Polo Universitario Grosseto	Grosseto (GR)	8-9/11/2017

69	Natural History Museum	Grosseto (GR)	8-9/11/2017
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Table 8 – Locations of LIFE MEDWOLF exhibit installation, Italian version

Three totems were developed, with information on wolf presence, its impact on the sheep industry and the farms adopting damage prevention measures that could be visited in the provincial territory. They were installed in the Maremma Natural History Museum (1) and Rispechia Environmental Education Centre (2).

E3.3 – Press conferences and press releases: 15 press releases were made respect to 20 planned (Annex 8) because for the lively debate that was being held in Grosseto we wanted to produce press releases with some hard facts, thus we had to wait for concrete actions finalisation.

As was planned in the project proposal four press conferences were held (May 2014, October 2016, 25/10/2017, 9/11/2017), they are listed below:

1. Grosseto, 21/05/2014 – press conference to launch the project
2. Grosseto, 23/09/2015 – press conference to launch the film “Soluzioniamoci”
3. Grosseto, 25/10/2017 – press conference to present preliminary results of action D4 (wolf presence survey)
4. Grosseto, 09/11/2017 – Press conference in occasion of the final project symposium.

E3.4 – Notice boards: As was foreseen 8 notice boards 50x70 cm were printed and distributed to the Italian associated beneficiaries (Annex 12 PR1).

E3.5 – Media articles: the project was reported in 163 articles and in several occasions direct interviews to project staff member was included (Annexes 9, 31, 32). Whole 2-page articles were dedicated to farmers participating in the project in July 2017, and to the final symposium in November 2017. The project was also publicised in the Local and National “La Repubblica” newspaper issues through short boxes underlining the work done by female farmers for coping with the wolf (Annex 26 MTR and Annex 31). Two articles were published in the magazine “La Nuova Ecologia” and in the monthly Newsletters of the Agricultural Unions which are sent to all their associates (Annex 27 PR2 and Annex 32). One publication promoting the presence of LIFE MEDWOLF project at EXPO2015 in Platinum special issue of Il Sole 24 ore (Annex 28 MTR).

E3.6 – Scientific publication and presentation at scientific meetings: Respect to one scientific publication planned two different ones were produced. A scientific article was published on European Journal of Wildlife Research in February 2016 (Annex 13 PR2). The paper highlights the difficulties to be tackled for conflict management and the lack of effectiveness of management approaches applied without a long-term strategy for conflict mitigation. A second scientific paper was published on the Journal of Animal Behaviour Science in January 2018 presenting the preliminary data on the use of GPS collars for detecting movements of LGDs (Annex 10). The project was presented at 4 scientific meetings, presenting results of some project actions:

- Talk at 9<sup>th</sup> Italian Congress of Theriology (Atit): S. Ricci, A. Marino, C. Braschi, V. Salvatori, C. Galli, F. Fabbri, D. Petrucci, Ciucci P. 2014. Does the insurance system enhance mitigation of predator-livestock conflicts? Experiences from the Province of Grosseto.
- Talk at the international meeting on problematic fauna: A. Marino, C. Braschi, S. Ricci, V. Salvatori, Ciucci P. 2016. Pendulum swing between damage compensation systems -without

adequate monitoring- hinders human coexistence with wolves.

- Talk at Europarc Congress: V. Salvatori, J. Young, A. Marino, S. Redpath, S. Ricci, Ciucci P. 2017. Using Multi Criteria Decision Analysis to address conflicts over wolf conservation: wolves, sheep and stakeholders in the Province of Grosseto.

- Poster at 10<sup>th</sup> Italian Congress of Theriology (Atit): M. Zingaro, L. Vielmi, V. Salvatori, Boitani L. 2016. Using GPS collars to evaluate the association between livestock guarding dogs and flock: preliminary results.

E3.7 – WOLF kit and school education activities: 2 Wolf-Kits were produced in order to meet the needs of local schools:

- Wolf kit junior in paper version (printed on recycled paper, Annex 32 MTR). A booklet of 24 pages addressed to children aged from 7 to 12 was printed in 6000 copies on January 2015 as support tool for school training sessions led by experts from FESTAMB about the LIFE MEDWOLF project activities and aims.
- Wolf kit (from LIFE COEX project, 04 NAT/IT/144) in USB version, distributed to students aged from 13 to 18 as support tool for school training sessions led by experts from FESTAMB about the LIFE MEDWOLF project activities and aims. The USB version of wolf kit was realized on April 2015 (Annex 33 MTR).

The school activities were undertaken with the students of schools Capalbio, Alberese, Sorano, Marsiliana, Seggiano, Roccastrada, Arcidosso, Grosseto, Roma, Orbetello, Campagnatico, Magliano in Toscana, Civitella Paganico (see Annex 33).

Two educational events in the field were undertaken on 18/3/2016 in Montignoso (MS) and on 19-20/3/2016 in Montioni (LI). Furthermore the school children from a school in Rome were involved in the project's activities through a summer camp with a visit in one of the livestock holdings that have adopted the project's measures for protecting livestock. A demonstration was made for cheese making and information was provided on the challenges posed by wolf presence in the area.

Collaboration was made with high school Istituto Agrario Grosseto within the frame of labour-school practical teaching, and students took part to the fence installation works in three farms.

E3.8 – The layman's report: The report directed to the general public was produced in Italian and Portuguese, with English translation (Annex 11).

E3.9 – Meetings with stakeholders: A series of meetings with different stakeholders was organised and the following meetings were held:

Date	Group	Number of participants
17/6/2016	Environmental associations	13 (WWF, Irriducibili liberazione animale, CIA, Italia Nostra, ENPA, LAV)
28/6/2016	Hunters	6 people
4/8/2016, 19/01/2017	Livestock owners	49 people; 43 people

Given that during these meetings there was no occasion of discussing issues among the stakeholders, as they only interacted with project staff, and taking in full consideration the level of conflict and unsatisfaction that was verbally reported by farmers, we decided to modify the approach and apply a more structured methodology for participatory approach. We involved experts from University of Aberdeen and CEH from Edinburgh, who had extensive experience in

managing social conflicts. We applied the method called Multi-Criteria Decision Analysis (MCDA), which allows for discussion and participation of different stakeholders at the same time, who meet and discuss issues under the assistance of a professional facilitator. We held 4 workshops inviting representatives from farmers, hunters, environmentalists and animal welfare groups, and a scientist. Representatives of the agricultural associations participated to the meetings but did not follow the entire procedure of MCDA. The results were extremely encouraging (Annex 40, pg. 28-33) as for the first time the different stakeholders were given the possibility to express their views without being criticised and getting a better understanding of each other's positions. The outcome suggests that there are few management interventions that are certainly supported horizontally by all groups, and they included those implemented by the LIFE MEDWOLF project.

E3.10 – Participation at Festambiente: The Summer festival organised by Legambiente is a particular occasion for making the project to be known to a wider public and increase awareness of adults and children. The project was present at the Festival in the editions of with Summer 2015, 2016 and 2017. In 2015 A stand of 16 sqm was installed next to the children area of the festival (period: 07 – 16/08/2015). Every day an expert biologist gave information to people who visited the LIFE MEDWOLF project stand and organized workshops and activities for children aged from 3 to 6 years.

Several activities were also organized:

- 1) exhibition of a panel with press clipping of the most significant articles related to the project and the local conflict between the wolf presence and the human activities published in local newspapers from the first months of the project up to now;
- 2) workshops addressed to children;
- 3) visitors were invited to leave their thought in a box with the sentence “Leave your message”;
- 4) set up of the MEDWOLF exhibition and of one prototype of electric fence the association DifesAttiva (see action C2), and the activities were performed with the members of the associations, all farmers from the area. In particular for 11 days the farmers turned for ensuring the presence at the stand in collaboration with Luisa Vielmi, who is coordinating the association's activities. Demonstrations of cheese making and lectures about livestock guarding dogs were given.

Gadgets (bags, key-rings, block notes. Annex 31 MTR), 2 models of T-shirts LIFE MEDWOLF (one for children and one for the staff involved in awareness activities) were distributed in the children area during the Summer Festival Festambiente, organised in August 2015 by Circolo Festambiente (Rispetcia, Grosseto) (Annex 30 MTR). Postcards and shapes of wolf, LGD and sheep were printed for being used at the several exhibits and talks given (Annex 47 PR1) and a DifesAttiva T-shirt was also printed. For DifesAttiva we produced a set of brand gadgets that were distributed at the many promotion activities and were left at shopping points of the project farms who sell cheese. For the final symposium (Action E7) a set of gadgets was produced, including organic cotton shopper, notebook, and 2018 diary (Annex 36).

In summers 2016 (7-15/8/2016) and 2017 (4-15/8/2017) the stand was slightly smaller and focused mainly at the promotion of DifesAttiva, the LIFE MEDWOLF project and its links with Natura2000. The stand was installed with photos of the many LGDs given to the farmers, and in 7 evenings for each edition some of the farmers associated to DifesAttiva took active part to the activities. The latter included children labs focused on wolf ecology and its relationships with sheep raising, how to behave in presence of LGDs, labs for production of wolf and sheep puppets using wool from the sheep raised in the project area, exhibition of the children story “Spezzaferro” (Annex 37) with the Kamishibai theatre, visits to DifesAttiva farms and free



tasting of cheese.

*Other activities:* In addition to the activities planned originally there are a number of initiatives that were undertaken in order to improve the visibility of the project and to ensure the project could reach as many sectors of the society as possible. In particular:

- Course “[Journalism@school](#)”. A collaboration with the three local newspapers “Il Tirreno”, “La Nazione” and “Il Giunco” was started for involving students of two local high schools in reporting news in an objective and documented manner. Professional journalists from the three Newspapers gave classes to the students and two technicians taught the students how to film interviews and perform film assemblage. Field interviews to farmers who received damage prevention measures from the project were made and a series of articles published in the local newspapers. The second edition of the course was mainly focused on press office activities to be developed during public events. It involved students from the Secondary school Technical Institute in Grosseto who physically acted as press office of the final international symposium held in Grosseto on 7/11/2017 (see action E7).
- Short Films “MEDWOLF Spot”, “Allevatori e Pastori di Maremma” and “Soluzioniamoci” (Annex 15 MTR). The films were produced early in 2015 and promoted through Google and Youtube channels, as well as published on the website and advertised on our Facebook page, where they recorded a total of 6,595 visitors.
- Local TV9 channel proposed to produce a report on LGDs and filmed activities developed within action C2. The report was broadcasted in August 2015 on the ZONA ATTIVA programme and is visible on the project website, Italian section Video.
- Participation at tourist initiatives in collaboration with local association Terramare or other partners. In twelve occasions the association DifesAttiva was promoted through talks and demonstration of how the guarding dogs work and are inserted in a flock and free tasting of cheese produced by the associated farms (see table below).

Initiative	Location	Date	Nr participants
Terramare – Tour of Farma river	Grosseto	22/05/2016	50
Terramare – Tour of Farma river	Grosseto	19/06/2016	50
Terramare – Tour of Belagaio reserve	Grosseto	27/07/2016	20
Terramare – Magliano in Toscana tracking	Magliano in T.	01/07/2016	18
Terramare – Monte Laterone tracking	Arcidosso	16/10/2016	50
Terramare – Tracking in Montorsaio	Montorsaio	18/12/2016	50
Legambiente – M'Illumino di Meno	Grosseto	24/02/2017	40
Il lupo nelle aziende	Magliano in T.	26/03/2017	35
Terramare – Vivifiume Ombrone	Paganico	01/04/2017	20
Terramare – Vivifiume Ombrone	Monte Antico	02/04/2017	15
Il lupo nelle aziende (natura 2000 day)	Castell'Azzara	21/05/2017	15
Terramare – sagra della lumaca	Campagnatico	27/07/2017	30

Participation to local fairs and festivals. This was done particularly through the association

DifesAttiva, in order to directly involve the farmers adhering to the project. The project was present at the following fairs:

<b>Fair</b>	<b>Date</b>	<b>Location</b>	<b>Theme</b>
Fiera W La Terra	30-31/04/2014	Massa Carrara	LIFE MEDWOLF
International EXPO	08/06/2015	Milano	LIFE MEDWOLF
Fiera Festa delle Oasi	30/05/2016	Oasi Burano	DIFESATTIVA
Sagra del Tortello a Marrucheti	26/08/2016	Campagnatico	DIFESATTIVA
Fiera dell'Agricoltura al Madonnino	22-25/04/2017	Grosseto	LIFE MEDWOLF / DIFESATTIVA

- Partnership with Confederazione Italiana Agricoltori (CIA) National office for the production of the story “Spezzaferro, una favola antica”. The story was set up as a moving theatre Kamishibai style and represented in several public occasions. A booklet was also produced and distributed at Festambiente Summer festival 2017 edition (Annex 37).
- Promotion of the Natura2000 day in 2016 and 2017 with tourist association Terramare, for promoting Natura 2000 Network, Biodiversity and the LIFE programme (see <https://www.youtube.com/watch?v=SIDfNJpBBY8>).

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/01/2014	01/04/2013
End	31/10/2017	30/11/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
Exhibits printed	31/05/2013	31/7/2014
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Brochure on wolf distribution	30/04/2014	Replaced by brochure on project activities 31/7/2014 (Annex 43 PR1)
Notice Boards	30/11/2013	30/11/2013 (Annex 12 PR1)
Press clippings	30/09/2016	30/11/2017 (Annex 8-9)
Scientific publication	30/09/2016	24/02/2016 (Annex 13 MTR and Annex 10)
<b>Other Annexes</b>		
Posters and ppt presented at scientific meetings		Annex 28
Leaflet on how to behave in presence of a Livestock Guarding Dog		Annex 29
Leaflet on DifesAttiva		Annex 30
Inserts on National newspaper La Repubblica		Annex 31
Articles on the agricultural associations magazines		Annex 32
List of schools where activities were undertaken		Annex 33

CDP Newsletter Article on stakeholders meetings	Annex 34
Booklet for kids tale “Spezzaferro”	Annex 37
<b>Indicators of action implementation</b>	Communication experts contracted; brochures designed; texts agreed; advertisements published; exhibitions translated and printed; exhibitions set up.

#### 5.4.4 Action E4: Networking with other LIFE and non LIFE projects

Beneficiary responsible for implementation: IEA

Expected costs: 17,288€

Incurred costs: 22,938€

This action was concluded and successful contacts and exchange of information were taken with other LIFE and non-LIFE projects. The representatives of IEA, GL, ESACB and COLDI have taken part at several initiatives in Italy, Portugal and Europe to present the LIFE MEDWOLF results and to gather the knowledge from other experiences.

In the tables below (Tables 4 and 5) are reported the activities of networking implemented by the referents of IEA and other beneficiaries in Europe, Italy and Portugal. Some of the listed activities were only invited presentations, or attendance to meetings, while in some cases the events have led to concrete collaboration or exchange of information that was then implemented. The latter are indicated with \* (Annex 21):

BENEFICIARY	LOCATION	ACTIVITY	DATE	PROJECT
GL, ALDEIA	Córdoba, Spain	Attendance to the international scientific and technical congress Poison, Wildlife and Society	14-15/11/2012	LIFE Innovation Against Poison Project, LIFE09 NAT/ES/000533
IEA, COLDI, GR	Postojna, Slovenia.	Attendance to the International Conference “Wolf Conservation in Human Dominated Landscapes”, and presentation of the MEDWOLF Project	24-27/09/2013	LIFE Slowolf project, 08 NAT/SI/244
GL	Thessaloniki, Greece	Attendance to the International Conference "Transport, Infrastructure and other categories of bear-human conflicts"	6-8/02/2015	LIFE Arctos Kastoria Project 09/NAT/GR/333
GL, ALDEIA	Madrid, Spain	*Attendance to the workshop about the control of poisoning in the Iberian Peninsula	26-27/02/2015	LIFE Imperial Eagle Project
GL	Schleswig-Holstein, Germany	Workshop "Wolves in cultural landscapes along the coast: livestock damage prevention and other solution options"	21-23/09/2017	NABU association
IEA	Brussels	*Attendance to plenary meeting of EU stakeholders platform in Brussels, presentation of MEDWOLF case study	01/06/2017	EU stakeholders platform plenary meeting
IEA	Friuli Venezia Giulia	*Attendance to Regional workshop of the EU stakeholder platform organised by Europarc in Venzone, presentation of MCDA results (action E3)	12-13/10/2017	Europarc

Table 9 – Dates, locations and purposes of networking activities implemented in Europe

Furthermore contacts were taken by the referent of IEA with the team developing the UE Pilot Action “Exploring traditional husbandry methods to reduce wolf predation on free-ranging cattle in Portugal and Spain” implemented in North of Portugal and Spain within the contract “Support to the European Commission's policy on large carnivores under the Habitats Directive – Phase 2” (nr. 07.0307/2013/654446/SER/B.3) that IEA held with the CE were established and some

activities were developed in collaboration, namely the national and international workshops for stakeholders (livestock breeders, researchers, managers) and the elaboration of the Damage Prevention Manual, in the scope of action E6.

LIFE MEDWOLF was also taken as an example of best practice within the frame of activities undertaken by the EU stakeholder platform for large carnivores and human coexistence. The project was included in the 10 examples of good practices for further insights (see [http://ec.europa.eu/environment/nature/conservation/species/carnivores/case\\_studies\\_sub\\_analysis.htm](http://ec.europa.eu/environment/nature/conservation/species/carnivores/case_studies_sub_analysis.htm)) and it was presented at the plenary meeting of the platform on June 1<sup>st</sup> 2017.

The exchange of experiences among farmers from Italy and Portugal was also made through field visits of Italian farmers to Portugal (October 2016) and Portuguese farmers to Italy (May 2017).

BENEFICIARY	LOCATION	ACTIVITY	DATE	LIFE PROJECT	NON LIFE PROJECT
IEA	Caramanico Terme, Majella National Park	*Attendance to the International Wolf Congress	05 – 08/11/2013	LIFE Wolfnet project, 08/NAT/IT/325	
IEA,GR,CIA, WWF,COLDI, CONFAGRI, FESTAMB	Arcidosso (Grosseto)	Attendance to the Symposium on management of hybrids and feral dogs	22/11/2013	LIFE IBRIWOLF project, 10/NAT/IT/265	
IEA, WWF, COLDI	Roma	*Attendance to the technical workshop “Danni da grandi carnivori, indicazioni per la mitigazione del conflitto”	28/01/2014	LIFE Arctos project, 09 NAT/IT/160	
IEA, GL	Firenze	*Attendance to the meeting and exchange of experiences about the use of methodologies to manage participatory meetings, useful to actions E2 and E6	30/05 – 01/06/2014	LIFE project Strade, 11BIO/IT/072	
IEA, COLDI, WWF, GR, FESTAMB	Roma	*Exchange of experience about the importance of communication for LIFE projects regarding large carnivores	08/07/15	Italian LIFE Projects, see report available on project website	
COLDI	Bordano (UD)	Attendance to meeting and presentation of the MEDWOLF Project	25/10/2014		Edition 2014 of M'ammalia
COLDI	Falconara	Attendance to meeting	11/02/2015		Eduzoo
COLDI	Arenzano (GE)	*Beigua Regional Park Attendance to the national meeting about wolves in protected areas and presentation of the MEDWOLF Project	20/03/2015		Beigua Regional Park
IEA, COLDI	Grosseto	Exchange of experience regarding the utilization of LGDs	13-14/05/2016	LIFE Arctos Kastoria project, LIFE09 NAT/GR/00033. Referent Spyros Psaroudas	

GL	Vilar Formoso	*Workshop on exchange of experience on anti-poison activities	28/01/2016	LIFE Innovation against poison (LIFE 09/NAT/ES/533)	
IEA, COLDI	Rome	*Workshop on exchange of experiences for LGDs management	20/10/2015		WAC, PNFC, CIRCA, PNGSL
IEA	Grosseto	*Study tour of project CanOvis from France	10-12/11/2015		CanOvis project
GL	Vilar Formoso, Almeida	*Workshop on exchange of experience on anti-poaching and anti-poison activities	27/01/2016		CIBIO-InBIO wolf monitoring project in NW Portugal
IEA, COLDI	Lamone Reserve	*Workshop for promotion of damage prevention measures	29/01/2016		Lazio Region
IEA	S. Margherita Staffora	*Exchange of experience on LGD management	01/04/2016		Liguria Region
IEA	Urbino	Presentation of project activities	15/4/2016		Marche Region
GL	Castelo Branco	Exchange of experience (results and information) on poison events	05/05/2016	LIFE Innovation against poison (LIFE 09/NAT/ES/533)	
GL	Mértola	*Data gathering/analysis of one participatory meeting focusing on wildlife conservation and poisoning	23/05-12/06/2016	LIFE IMPERIAL (LIFE13 NAT/PT/001300)	
GL	Lisbon	*Exchange of experience (results and information) on poison events	01/06/2016	LIFE RUPIS (LIFE 14 NAT/PT/000855)	
IEA, ESACB	Lessinia	*Workshop on damage prevention measures	21-22/6/2016	LIFE WOLFALPS	
GL	Barca d'Alva, Figueira de Castelo Rodrigo	Meeting and assistance to the public presentation of the LIFE RUPIS project	23/06/2016	LIFE RUPIS (LIFE 14 NAT/PT/000855)	
IEA, COLDI, CIA, CONF	Grosseto	*Study tour of staff from Eliante	18/5/2017		Pasturs Project
IEA	Valtellina	*Promotion of ecotour and wolf friendly products	3-4/7/2017	LIFE WOLFALPS	
IEA	Ariano Irpino	*Attendance to the workshop on LGDs and presentation of the MEDWOLF Project	17/09/2016		ENCI and CIA
IEA	Grosseto	Study tour of the staff from Barcelona	11-12/10/2017	LIFE PIROS	
IEA	Grosseto	*Workshop on wolf monitoring	8/11/2017		Regional administrations, ISPRA
IEA, ESACB, GL	Siena	*Study tour to eco-friendly farm in Siena	10/11/2017		Farmer from Siena

Table 10 – Dates, locations and purposes of networking activities implemented in Italy and Portugal

In addition in Italy the project strongly fed the process of revision of the Regional Rule for

damage compensation (see section 5). The LIFE MEDWOLF project was presented to the participants in occasion of the Large Carnivore Initiative for Europe (LCIE) coordination meeting (Enaoli, 22-24.03.2013). A strong cooperation with the LIFE IBRIWOLF project (finished at the beginning of 2015) was established from the outset of the LIFE MEDWOLF project, since two beneficiaries of this project (GR and WWF) were the same and the two projects took place in the same area. Finally, contacts were taken with the technical responsible of Selva del Lamone (VT) to promote the utilization of LGDs within the livestock owners in that area and many farmers from the area have made contacts with farmers from Grosseto to get LGDs. In 2016 no wolf damages were reported in the Reserve.

The project staff from Italy and Portugal was invited to share their experiences in successfully using fences against wolf depredation by LIFE WOLFALPS project in Lessinia on 21-22/6/2016. The outcome was a declaration of experts finding that setting up prevention methods in the area was feasible and as a results the project invested increasing resources and finally succeed in setting up 13 fences, breaking through a strong resistance of local livestock owners that seemed to make the conflict impossible to resolve.

In Siena, a project was initiated by ENCI (Ente Nazionale Cinofili Italiani) for allocating LGDs to local farmers. The project staff held two meetings with ENCI in order to provide advice and suggestions on how to proceed. Activities for training and capacity building of the anti-poison team were always held in conjunction with LIFE MIRCo-lupo and LIFE PLUTO projects.

In Portugal, the referents of GL and ALDEIA were involved April 2015 in the elaboration of the Portuguese Wolf Action Plan (coordinated by ICNF), together with other NGOs and entities representing different stakeholders and levels of authority. Information gathered during the LIFE MEDWOLF Project, as well as previous experience and knowledge obtained by GL about wolf ecology, human dimensions, threats and conflict mitigation, was included in the Plan when relevant. In September 2015 contacts were initiated between GL and ALDEIA with ICNF and the remainder entities that constitute the Antídoto Program, to discuss future projects to fight illegal poisoning in Portugal. A joint application was prepared, coordinated by Quercus, and submitted to national funds managed by ICNF. Contacts with CERVAS (Wildlife Recovery Centre managed by Quercus) were maintained to learn about poison events in the southern part of the LIFE MEDWOLF study area, and a collaboration has also been established to cover the expenses of the toxicological analysis of the samples they collected, whenever there was a suspicion of poisoning as the mortality cause. This was an advantage to LIFE MEDWOLF since QUERCUS NGO has a deeper knowledge of that area, and during their LIFE Project have developed a wide net of collaborators and partners. Finally a collaboration started among the referent of GL and QUERCUS NGO in the scope of action E2, to present the LIFE MEDWOLF project and the exhibition at the “Salva a Terra” Eco-Festival, organized by QUERCUS NGO every two years in Idanha-a-Nova municipality in July 2015 and June 2017. This Festival includes concerts, workshops, walks through interpretive paths, conferences, outdoor cinema, always against the backdrop of the conservation and protection of wildlife.

Formal agreements were signed with the following institutions:

AUSL Grosseto – for sharing data on predation events in Grosseto province

CIBIO-INBIO – for sharing data on genetic origins of wolves sampled in the Portuguese project area

WAC – for sharing protocols on LGD management and adhering to DifesAttiva

Unione Comuni Garfagnana – for sharing protocols on LGD management and adhering to DifesAttiva

CREA – for estimating the economic impact of fences and LGDs on the production cycle in Grosseto

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/03/2013	21/2/2013
End	31/10/2017	30/11/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
First experience exchange	30/06/2013	21/02/2013
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Reports of study tours to other European projects	31/03/2015	30/11/2017 (Annex 21)
<b>Indicators of action implementation</b>		Contacts with national and international experts start; study visits.



### 5.4.5 Action E5: Iberian Wolf Congress

*Beneficiary responsible for implementation: GL*

*Expected costs: 13,122€*

*Incurred costs: 17,181€*

This action, under the responsibility of GL, was concluded. The IV Iberian Wolf Congress, held at the facilities of ESACB, was held in Castelo Branco from 29-31<sup>st</sup> October 2016. It was organized by GL in collaboration with Portuguese (3) and Spanish (5) entities, and aimed to disseminate the results and the latest advances in wolf studies, as well as its population situation, forms of conservation and conflict mitigation measures, and was structured along three themes: Biological Dimension, Social Dimension, and Management and Conservation. The scientific committee included 17 researchers and managers from Portugal (10) and Spain (4), as well as from Italy (3). 3 speakers (Petter Wabakken - theme 1: Biological Dimension; John Shivik - theme 2: Management and Conservation; Stephen Redpath - theme 3: Social Dimension) were invited to give a plenary talk, as well as the Italian coordinator of the LIFE MEDWOLF, that presented the project. Around 140 participants attended, presenting 39 talks and 26 posters. The book of abstracts was delivered to all participants and invited speakers, and available for download at the Congress website, that had a Portuguese and a Spanish version. Parallel to the Congress three exhibits were organized: a collective art exhibit "Wolf in Art" in the Cine-Theatre of Castelo Branco; a photo exhibit "Looking at the wolf" at the CyberCenter in Castelo Branco; and the roll-ups version of the LCIE exhibit was on display at the Municipal Library in Castelo Branco since 6th October, and until 8th November. Another photo exhibit focusing on LGDs of the Estrela Mountain Dog breed was also exhibited during the Congress. An EcoMarket to promote local products was also present during the Congress. Furthermore, 29 local students (8-10 years old) visited the Congress, and interacted with the researchers during the coffee break, and prepared a poster about the wolf which was exhibited during the scientific poster session. The mascots produced by GL (Signatus – the wolf; and Estrela – the LGD) were also present and gathered a lot of interest from the participants, adults and children.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/06/2016	20/01/2016
End	31/12/2016	31/10/2016
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Proceedings of Iberian Wolf Congress	31/12/2016	31/10/2016 (Annex 12)
<b>Indicators of action implementation</b>		Organisers contracted; Scientific committee set up; List invitees; Programme developed; participant list.

#### **5.4.6 Action E6: Workshops on best practices for management of wolf at population level**

*Beneficiary responsible for implementation: GL*

*Expected costs: 11,687€*

*Incurred costs: 1,908€*

The action foresaw the organization of three workshops with people involved in wolf management and the production of technical guidelines on best practices for the conservation and management of the Iberian wolf. A total of 5 meetings and 3 workshops were effectively organized and a manual on prevention of damages to livestock was produced.

Three meetings were held in March 2014 between representatives of GL, ESACB, one livestock breeder association (whose associates were registering high levels of damage) and the representatives of three municipalities of the project area (Guarda, Penamacor and Idanha-a-Nova), where future collaborations were also sought/defined (e.g. regularly providing updated information on the project activities and results, use of the available media supports of the municipalities to disseminate news/information about the project and its actions, transmission to the project staff of contacts of prospective livestock breeders to benefit from the prevention measures to be implemented).

A meeting was held (Lisbon, 28/10/2013) between GL, IEA, ICNF and the LCIE Pilot Action team to establish future collaboration between both projects in the organization of national and international workshops to stakeholders (Iberian livestock breeders and managers) and the definition of technical guidelines regarding wolf management and the support of ICNF to the implementation of these guidelines.

A meeting was held on the 02/07/2014 with the LCIE Pilot Action and ICNF, to jointly organize the national workshop. The national workshop was held on the 16/07/2014, in Castro Laboreiro, Melgaço municipality in the North of Portugal (LCIE Pilot Action study area). 40 participants were involved, among which 11 livestock breeders, as well as representatives of local associations, livestock breeder associations, NGOs, wolf researchers and Natural Parks. It was organized by the LCIE Pilot Action and ICNF, in collaboration with GL staff, mainly in the definition of the working model to be used to facilitate a profitable discussion of the problems and the definition of useful guidelines to reduce the cattle-wolf conflict. The workshop was moderated by the GL researcher, Clara Espírito Santo (previously involved in action A11). An opinion survey was also prepared to evaluate the workshop.

The international workshops were held on 28/10/2014 and on 27/01/2016. The first one was held in Castelo Branco (ESACB), involving representatives of ICNF and the responsible for the Protected Areas in the LIFE MEDWOLF study area, one representative of the Castilla La Mancha Province (Spain), and 6 representatives of 4 livestock-agriculture associations (1 national and 3 local, of which 2 from the LIFE MEDWOLF study area). Participants also included members of IEA, GL, ESACB, and staff from the EU Pilot Action (Spain and Portugal). A total of 20 people were present, in a workshop that included talks to present the results of the UE Pilot Action and the A3 action of LIFE MEDWOLF, the EC Stakeholder Platform, the management of wolf conflicts by the authorities in Castilla La Mancha, and the main livestock production concerns related with the wolf presence in the country and in the LIFE MEDWOLF Project and Pilot Action areas, presented by the livestock-agriculture associations. The talks were followed by a round-table (facilitated) where the participants discussed what the main contributions of the LIFE MEDWOLF to the livestock breeders could be and the way this could be done. The main conclusions of the Workshop was prepared and sent to all the participants, after including the inputs from the participants. The second workshop was held in Sabugal with wolf researchers from Spain and representatives of the Junta de Castilla y León. Further

collaboration with ICNF and wardens of protected areas was established through a workshop held in May 2016 for exchanging information and discussing methodology of wolf damage assessment.

The deliverable to be produced within this action is represented by the Manual on prevention of damages to livestock. The manual was produced in collaboration with the IUCN/SSC Large Carnivore Initiative for Europe (LCIE), which was focusing on a manual to prevent damages to livestock only in northern Portugal. The contribution provided by the LIFE MEDWOLF project staff was to include data from the project area and make a more comprehensive document, particularly providing information on sheep and goats (small ruminants). The project staff contributed with the section on livestock guarding dogs (including texts and photos) as well as the diagrams, photos and texts for fences.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/09/2014	20/10/2013
End	31/12/2016	31/12/2016
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
Guidelines on best practices	30/09/2015	30/09/2015 (Annex 6 MTR)
<b>Indicators of action implementation</b>		List of invitees; list of topics; workshop reports.

#### **5.4.7 Action E7: International symposium on wildlife damage prevention**

*Beneficiary responsible for implementation: GR*

*Expected costs: 18,470€*

*Incurred costs: 14,231€*

The international symposium was held in Grosseto on 9/11/2017. The symposium was associated to two technical workshops held on 8/11/2017 (see actions E4 and E8). The symposium was intended to be directed to both scientific and management sectors, as well as to the local parties involved in the issues, particularly in Grosseto Province.

The symposium included a National and an International sessions, and simultaneous translation was ensured. For the National session the invited speakers external to the project were:

Province of Trento; Emilia Romagna Region, Piemonte Region; while for the International session the invited speakers were: The European Commission and AGRIDEA. A total of 250 participants attended the symposium and the book of abstracts was produced and included in the symposium package (Annex 39).

The main local authorities were present, and illustration of examples of good practices from both Italy and abroad were given. The students of Technical Institute High School acted as press office for the symposium, and the students from the Tourist high school in Grosseto provided the buffet.

<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/03/2017	23/03/2017
End	30/09/2017	10/11/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Other Annexes</b>		
Book of Abstracts		Annex 39
<b>Indicators of action implementation</b>		List of invitees; advertisement published; organisers contracted; scientific committee established; Programme.

#### **5.4.8 Action E8: International Working Group on Damage prevention and trans-boundary Working Group on assessment of wolf presence and abundance**

*Beneficiary responsible for implementation: GL*

*Expected costs: 77,035€*

*Incurred costs: 75,475€*

The action foresaw the establishment of a Carnivore Damage Prevention Group (with members of PT and SP and at least 5 other countries), a discussion forum, as well as an Iberian Wolf Working Group (at least 12 members from SP and PT), with minutes of 4 meetings of both groups, and the publication of 8 issues of the Carnivore Damage Prevention News was expected. The Iberian Wolf Working Group (IW-WG) has been created and involves 25 researchers and managers from Portugal (11) and Spain (14). The first meeting was held on the 27.09.2014 in Castelo Branco, and 18 members attended (12 Portuguese and 6 Spanish, Annex 48 of PR1, 30/11/2014). The Goals and Terms of Reference of the WG were sent to all the members, as well as the conclusions/minute of the first meeting, after having received their feedback.

A second meeting was held on the 05.03.2015 in Lisbon, anticipating the meeting with ICNF scheduled for the next day, to start the process leading to the elaboration of a Wolf Action Plan for Portugal. 10 Portuguese members of the IW-WG participated (Annex 40).

The Carnivore Damage Prevention Working Group (CDP-WG) was created, and integrates 38 members from the USA and 10 European countries, apart from Italy and Portugal. The terms were discussed as well as the implementation of the Discussion Forum. Most members feels the forum will not be useful as most probably will duplicate the effort made by the People & Wildlife Discussion Group coordinated by the WildCRU at University of Oxford, on which most members take part. New instruments to gather information and promote research were discussed, namely a database and a book about carnivore damage prevention issues that actively contribute to the enhancement of the existing knowledge on this exciting area of applied conservation biology. A proposal to hold the discussion group and information platform at AGRIDEA was discussed and implemented.

The first meeting of the International CDP-WG was delayed to the end of 2015 due to unavailability of some of the members and invited researchers, and for ensuring people were gathered for discussing a focus topic. The planning of the meeting involved the editors of the CDPNews and IEA. It was held from 19-21.10.2015 in Castelo Branco, and involved 17 researchers/managers from 10 countries (8 from Europe, USA and Australia), as well as some shepherds (during the field trip) and some dog breeders (during the workshop). The goal of this meeting, entitled “LGDs - from tradition to modernity: how to assess, improve and innovate” was to promote the sharing of experiences, contribute to the definition of the current state of knowledge on the use of LGDs and help point out new lines for future research and collaborations, in order to better be able to deal with the new challenges emerging. Possible solutions to these limitations were also proposed, mostly gathered after the meeting. A Book of Abstracts was produced and distributed to all participants, as well as a copy of the book produced by NINA (LGD: cultural heritage icons with a new relevance for mitigating conservation conflicts). A summary of the contributions of the participants was published in CDPNews#13, and a larger article regarding possible solutions to perceived limitations was published in CDPNews#15.

The second meeting was held at Castelo Branco on 26.10.2016, organized by GL in collaboration with IEA, AGRIDEA, and IPRA. The goal was to exchange experiences between farmers/shepherds from different regions/countries on the problems faced regarding livestock

production in the presence of large carnivores (mainly wolves) in different contexts, and the measures taken to reduce them, and work to devise best practices adequate for areas that wolves have been recolonizing and where husbandry is not adapted to their presence - as is the LIFE MEDWOLF area. A total of 38 participants (including 20 farmers/shepherds) attended (17 Portugal, 13 Italy; 4 Switzerland; 2 Spain; 1 France; 1 Canada). The meeting was facilitated and at the end a list of solutions was compiled and complemented with later inputs to address all topics.

The third meeting was held at Grosseto, on 8.11.2017, organized by IEA and GL, in collaboration with AGRIDEA, and the Slovak Wildlife Society. Thirty six managers/researchers, (Italy, Portugal, members of CDP-WG from Switzerland and Slovakia, DifesAttiva and other Italian LIFE Projects) participated. The goal was to share experience and foster debate towards the standardisation of methods leading to a reliable and scientifically-based evaluation of the most commonly used tools in damage prevention. A summary of the main findings and definition of the next steps towards a more standardised approach was initiated. A field trip was organized to project beneficiaries in Grosseto and to the only farm in Europe (Siena), bearing the Wildlife Friendly certification for coexistence with wolves, to learn more about this certification.

The CDPNews is edited by Silvia Ribeiro (GL), with former editors of the newsletter and new ones: John Linnell (NINA, Norway), Jean-Marc Landry (IPRA, France), and Daniel Mettler (AGRIDEA, Switzerland). Overall 60 articles were published by 139 different authors, from 25 countries, mostly Europe (18), North/Central/South America (5), but also Russia and Australia. 23 articles reported on 11 LIFE Projects, 11 articles on the MedWolf, 1 on a LCIE Pilot Action, 2 on the LC Platform for Coexistence and EU Funds for damage prevention, and 1 on a EC Report about bears. Most focused on the grey wolf, but also brown bear, wolverine and Eurasian lynx in Europe, as well as puma, jaguar, dingo, and a guild of other carnivores (e.g. Canadian lynx, bobcat, coyote, black bear).

All issues are available on the project's website, and the websites of GL, KORA, AGRIDEA, LCIE and the European Commission large carnivore Initiative. All were sent to the authors, associated beneficiaries of the project, members of the CDP-WG/IW-WG, and disseminated to fellow researchers and managers, and other collaborators. The first issue was printed and distributed by the EC to the participants of the event launching the EU platform on Large Carnivores held in Brussels in June 2014. All issues have been translated to Italian, and are available at the project's website, and the first issues were printed in the English and Italian versions, and distributed to the participants of the final Symposium (action E7).

The main reasons for delay of the CDPNews are linked with the lack of availability of the authors to prepare and of the editors to review the articles according to the deadlines proposed. A copy editor was contracted in order to speed up the revision process. This action was extended until the end of the project, in order to make sure that all the 8 issues of the newsletter were published.

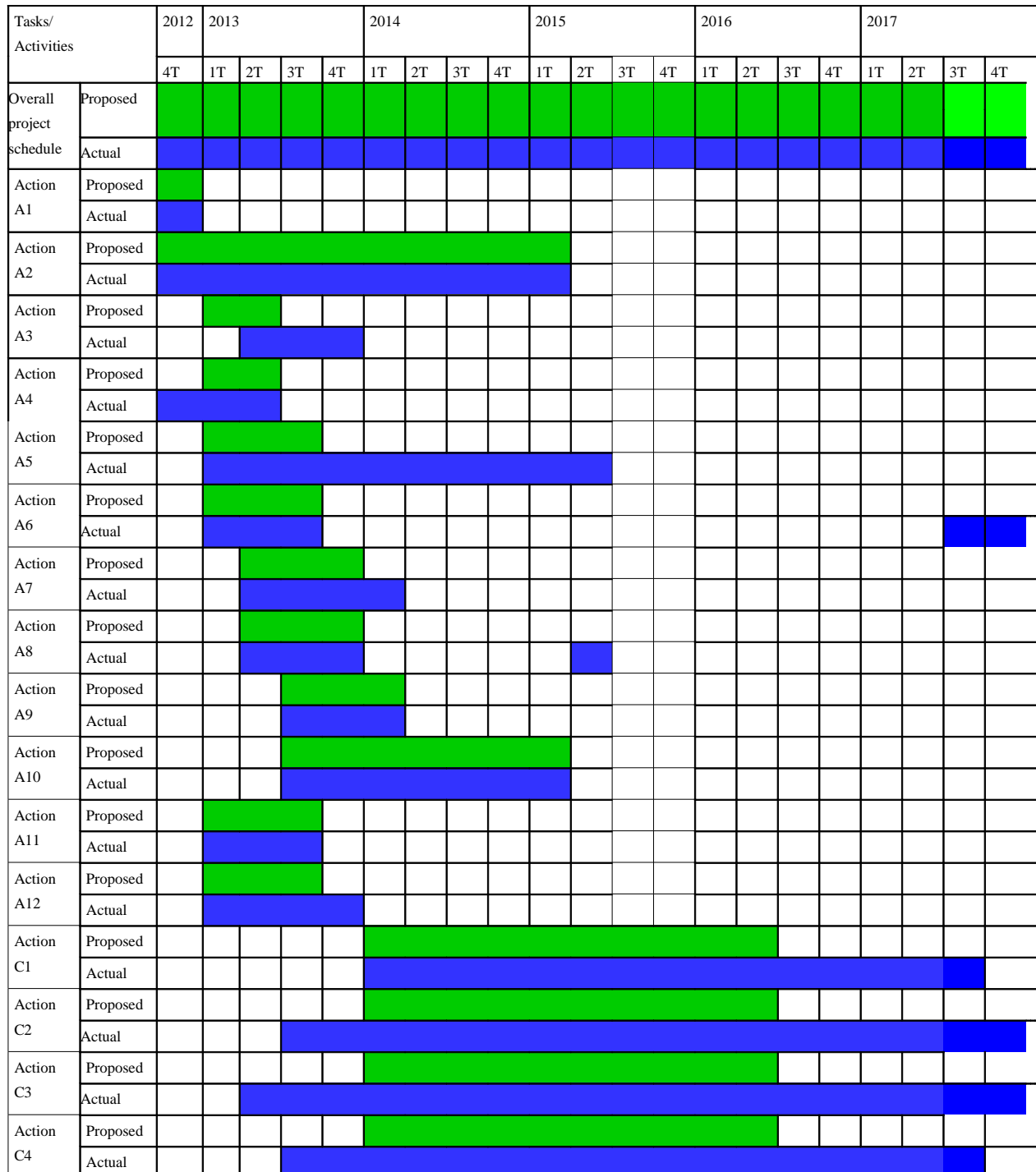
<b>Timing</b>	<b>Foreseen</b>	<b>Actual date</b>
Start	01/01/2015	20/10/2013
End	31/10/2017	30/11/2017
<b>Milestones</b>	<b>Deadline</b>	<b>Actual date</b>
-		
<b>Deliverables</b>	<b>Deadline</b>	<b>Actual date</b>

Issue I of Carnivore Damage Prevention Newsletter	30/09/2013	15/04/2014 (Annex 1 PR1)
Minutes of first meeting Damage Prevention WG	31/03/2014	31/10/2015 (Annex 16 PR2)
Issue II of Carnivore Damage Prevention Newsletter	31/03/2014	20/01/2015 (Annex 4 MTR)
Issue III of Carnivore Damage Prevention Newsletter	31/03/2016	23/04/2016 (Annex 17 PR2)
Minutes of second meeting Damage Prevention WG	31/12/2016	31/12/2016 (Annex 13)
Issue IV of Carnivore Damage Prevention Newsletter	30/11/2016	31/12/2016 (Annex 14)
Minutes of third meeting Damage Prevention WG	31/08/2017	30/11/2017 (Annex 15)
Issue V of Carnivore Damage Prevention Newsletter	31/03/2017	30/06/2017 (Annex 16)
Issue VI of Carnivore Damage Prevention Newsletter	30/09/2017	30/09/2017 (Annex 17)
<b>Other Annexes</b>		
Carnivore Damage Prevention Newsletter Issues nr. 7 and 8		Annex 40
<b>Indicators of action implementation</b>		List of people to be included in each WG; meeting timeplan; meeting reports; Protocols agreed.

## 5.5 Overall project timeplan evaluation

An overall progress of all the actions of the LIFE MEDWOLF Project is exposed in the graphic below:

Key:	Planned Time schedule		Actual Time schedule	
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Tasks/ Activities		2012	2013				2014				2015				2016				2017			
		4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T
Action C5	Proposed																					
	Actual																					
Action C6	Proposed																					
	Actual																					
Action D1	Proposed																					
	Actual																					
Action D2	Proposed																					
	Actual																					
Action D3	Proposed																					
	Actual																					
Action D4	Proposed																					
	Actual																					
Action D 5	Proposed																					
	Actual																					
Action D6	Proposed																					
	Actual																					
Action D7	Proposed																					
	Actual																					
Action E1	Proposed																					
	Actual																					
Action E2	Proposed																					
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Action E3	Proposed																					
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Action E4	Proposed																					
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Action E5	Proposed																					
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Action E6	Proposed																					
	Actual																					
Action E7	Proposed																					
	Actual																					
Action E8	Proposed																					
	Actual																					
Action F1	Proposed																					
	Actual																					
Action F2	Proposed																					
	Actual																					
Action F3	Proposed																					
	Actual																					

## 5.6 Evaluation of Project Implementation

### 5.6.1 Methodology applied

The development of the project actions was always undertaken making reference to the most up-to-date technical approaches and ensuring full consideration of any reference produced by other projects. The best practice character of the project required a continuous review process at all stages: planning, implementation, reporting. For this reason a SAB was established in order to discuss and choose the most appropriate approach, the quality of the reports produced and to ensure coherence and homogeneity between the two countries.

In the first year of the project the preparatory actions served to gain baseline information about the extent of wolf damage in the project area, the abundance and distribution of the wolf population and the opinions, attitudes, and knowledge of the general public and interest groups toward wolf presence and management.

We also carried out different training activities on damage assessment, on wolf monitoring, and on detection of illegal activities toward the species in order to ensure that relevant people had adequate competence while performing activities that often lead to crucial results. Some of the methodologies are discussed in details below.

#### Actions A3 and A4

The analysis of the extent of wolf damages before project implementation was realized through the collection of existing data and through direct interviews with local farmers.

The analysis focused to estimate spatial distribution of damages, to identify the most affected farms, the livestock management system and the prevention methods already used by local farmers.

The integration of data coming from the official statistics and direct interview was fundamental to obtain representative data of the real situation in the project area.

The direct interviews with local farmers represented also a tool to start to develop a dialogue and trust building with this important interest group. Results from the training sessions held in action A10 were immediately used for gathering additional data, given that the available ones for Grosseto were incomplete and highly fragmented. We thus maximised the first results of the project actions. The high quality of the analysis carried out on the extent of wolf damages in the project area is witnessed by the different scientific publications produced (e.g. Marino et al. 2016)

The results obtained in the frame of this preparatory actions allowed us to make some changes in the implementation of concrete conservation actions (especially C3 and C4) in relation to the types of fences preferred by local farmers. Moreover, in Italy the results of Action A4 contributed to the change of the compensation system (see below).

#### Actions A5 and A6

The model related to habitat suitability and the possible expansion areas as well as the risk map of conflict with local farms were produced using the results of the monitoring activities. The most update analytical and statistical procedures were applied and the results obtained were shared with the provincial authority in Italy because they represent a useful tool to address future management interventions. In Portugal the maps produced were integrated in the National Action Plan for the species.

### Actions C1-C2-C3-C4

The selection of beneficiaries in Italy and in Portugal was realized on the basis of different variables in order to ensure the transparency of the process and the effectiveness of the results.

Selection of variables and ranking of eligible beneficiaries were made in the most objective and robust ones in order to drive the most suited selections. In Italy the province of Grosseto published a call for expression of interest and received 201 requests. In Portugal we relied on direct interviews with local farmers and all those that had suffered damages in the project areas were effectively involved.

Once the list of potential beneficiaries was ready a survey to each farm was organized by the project staff in order to choose the best appropriate prevention measure directly with the farmers. This fields survey was fundamental to select the best solution, and also to involve farmers in the project.

In order to guarantee the success of the action we decided to deliver to the farmers only the materials but leaving the installation at their own charge. In this way we avoided the risk that the fences were not properly used or maintained. This responsibility sharing approach has stimulated active collaboration from the farmers and some of them have contributed financially to purchase additional material.

An important aspect of the actions implementation was the technical assistance provided by the project for the fence installation as well as the correct use of the LGDs.

The use of LGDs needs special attention especially for the farmers, like the ones in the project area, not accustomed to work with these animals. For this reason regular and frequent monitoring visits were carried out to overcome possible problems in the LGD integration in to the flock. In order to support and to favour the use of LGDs in the project areas we delivered food for the dogs and veterinary care until they reached 2 years of age.

The use of prevention measures, fences and LGDs, results always in a change in the livestock management, this implies time and money for the farmers, so it's important to foresee some incentives to support this change.

In the province of Grosseto, that is a very touristic areas, to avoid possible problem in the use of LGD's we delivered special warning signs to the farmers in which we specified the correct behaviour to be taken toward dogs. We also held meetings with environmental guides in order to teach appropriate behaviour in presence of LGDs. This was a really appreciated action by the farmers. All these details contributed to a strong trust-building relationship with farmers that allowed the correct implementation of the project actions.

### Actions C5 and C6

Action C5 and C6 were modified from what was originally planned in order to accommodate to the local situations. For C5 it was not necessary to establish a dedicated anti-poison team given that SEPNA-GR, the relevant authority, was involved in other two LIFE projects that also foresaw anti-poison activities and team set up. Support to these teams and other activities was provided, facilitating full implementation of the Programa Antidoto Portugal (PAP).

In Italy the involvement of CFS and Carabinieri was deemed necessary and a modification of partnership was made. This resulted to a successful integration of the LIFE MEDWOLF teams in other teams that were established in other (neighbouring) Italian regions through other LIFE projects, thus ensuring coherence in operations and networking among teams and operators. This was extremely successful and contributed to a nation-wide strategy adopted by Carabinieri Forestali.

### Actions D1 and D2

The monitoring actions related to the effectiveness of the prevention measures implemented were carried out in an innovative and very accurate way.

We followed different approaches in order to evaluate the efficacy of damage prevention measures from different points of view.

The applied approaches were the following:

- ✓ Epidemiological approach

We made a comparison between treatment farm vs control farms, where treatment farms were the ones who received the fence and the control ones were those without prevention measures, during 1 year monitoring period.

- ✓ B.A.C.I. approach

We evaluate the amount of damages in terms of numbers of attacks and number of animals killed before and after the fence installation and the use of livestock guarding dogs.

- ✓ Farmers satisfaction

We made a survey to understand farmers opinion toward the efficacy of the fences and livestock guarding dogs. When we deal with the conflict between wolf and human activities we have always to remember that it's not only a question of numbers but it's important to evaluate the perception of the interest groups directly involved by the livestock depredation.

In this way we applied a study design considering all the potential variables involved and our results and approaches used can be an example to be followed in the future.

Moreover for the first time in Italy the monitoring of LGDs was made with the use of GPS collars. GPS collars were applied to a livestock guarding dog and to a sheep in the flock protected by that dog. This methodology allowed us to measure the mean distance between the dog and the flock giving another parameter to evaluate LGDs efficacy. We produced a scientific publication also on this topic. Another important aspect to underline was the direct involvement of the farmers in the application of such methodology (they had to change collar's batteries every days) and their general appreciation because through their phone they were able to monitor dog behaviour constantly.

### Actions D3 and D4

The monitoring of wolf population abundance and distribution was realized through the application of different techniques: camera trapping, scats collection for genetic analysis, wolf-howling, but also a very innovative tool represented by the scat detection dog team (SDDT). The presence of dog was very useful especially in Portugal where wolves in the project area were present at very low density. The use of dog significantly increased the number of scats found, improving the quantity and quality of data collected. A test session was also made in Italy, in June 2017, and indicative results show that SDDT optimise time for collecting higher number of scats needed for population modelling approaches.

In Italy the sampling design selected allowed us to obtain very accurate results. This represents an innovative approach in the apennine wolf population, that could possible be applied to other areas. We applied mark-recapture methods to genotypes sampled in the study area and in this way we obtained a reliable estimate of number of wolves present (instead of just the Minimum Number Known Alive that is more frequently delivered). This a big difference with what was done in the past, because in previous studies there was only a count of genotypes sampled but not an estimate of population size. The model applied gave also a measure of the apparent survival of the animals which was a very important parameter to be considered to implement a management

strategy. Once again we optimized means and resource available and the approach used could be applied in futures assessments of wolf presence and population size.

#### Action D6

The assessment of knowledge and attitudes variation following the implementation of the communication activities undertaken in action E3 was done with caution and particular care, given that the time for detecting variation in knowledge and/or attitudes is usually longer than 2 years and the communication efforts implemented in the LIFE Nature projects are not intense enough to actually make a real change in attitudes. We thus decided to undertake both a qualitative and quantitative assessment, carrying out both telephone interviews to a sample of the population, but also undertaking direct interviews to a carefully selected sample of people involved directly or indirectly in the project activities. This has led to the detection of insights that would have otherwise ignored. We nevertheless are aware that significant results will only be achieved if continued promotion and communication is ensured.

#### Actions E2 and E3

The communication activities were considerably more intense than expected. We obviously needed to adopt an adaptive management approach, modulating our effort depending on the local events and situations. This has allowed us to grab opportunities and make optimal use of the resources available. A series of activities that were not originally foreseen were undertaken at limited costs for the project, but were considered useful in the local contexts. A more focused efforts with journalists could have probably been effective, but an information tour for journalists is usually expensive and we did not have capacities for organising them. We suggest to consider it for future activities.

#### Action E8

The production of the Carnivore Damage Prevention Newsletter was particularly demanding. We made efforts to keep the levels of articles published both qualitatively high and understandable for practitioners. This has requested intense efforts from the editors, for whom no budget was originally foreseen, thus imposing a limitation to their availability. Nevertheless we achieved to publish the eight issues foreseen ensuring continuity and practical information. The work will be continued within the LIFE EUROLARGE CARNIVORES project within which budget has been foreseen for the editorial work, and we expect this to result in a better organisation of timings for the editors. The translation of the issues in Italian was an extremely appreciated activity as it rendered the texts readily available to local farmers and technicians. Within the new coordination and effort will be made for translating the texts into the different project languages.

### 5.6.2 Results achieved

In the table below the results achieved are exposed and they are compared against the objectives foreseen in the project proposal for each action.

Action	Foreseen in the revised proposal	Achieved	Evaluation
Action A1	Detailed project Action Plan with activities to be implemented yearly	Completed. Two Action Plans were drafted, one for the Italian beneficiaries and one for the Portuguese beneficiaries (Annexes 12, 13 of IR).	The Action Plans were used to evaluate the progress of the activities and to draft the monthly updates
	Bilateral agreements between the coordinating beneficiary and associated beneficiaries	The bilateral agreements were discussed during the kick off meetings and they were signed by the end of December 2012. The bilateral agreement with CFS was signed on 28/01/2015; the bilateral agreement with Arma dei Carabinieri was signed in October 2017.	The bilateral agreements served for regulating the relationships between each beneficiary and the coordinating beneficiary, including payments, deadlines for contribution to project reports and were based mainly on the Common Provisions
	Minutes of first internal coordination meeting	Minutes of the first coordination meeting were drafted and consolidated by all partners (Annex 15, 17 IR)	
Action A2	Detailed map of estimated wolf presence	A map depicting the estimated wolf presence in terms of range and number and spatial arrangement of packs was produced with field data collected in 2013 and 2014, also with the integration of the Scat Detection Dog Team (SDDT) Completed (Annex 16 PR1)	The knowledge of presence and distribution of wolf was used as a baseline for the implementation of the concrete actions (C1, C3 and C5)
	Genetic database for wolf characterization	Completed. N of samples collected: 281 in the year 2013 (198 swabs and 88 scats) and 544 in the year 2014 (390 swabs, 142 scats, and 12 hair samples).	The improved collection protocol used for swab samples in the year 2014 allowed to increase the success of the analysis respects to year 2013.
	Evaluation of detection dog efficacy	In order to evaluate the efficiency of the SDDT, the results obtained with its use were compared to those obtained only using the field team (Annex 1, PR2). There was an 86% increase in the number samples compared to 2013, due to the higher number of scats collected by both teams and 23 more kill sites investigated.	This result was not foreseen in the project proposal and it was added in order to test the efficiency of detection dog and to compare it with the traditional wolf survey methods. The SDDT was also promoted in other projects and received interest.
Action A3	Comprehensive database on wolf damage (GIS map)	Data were filed in a database that allowed analysis of magnitude of damages at parish level for the year 2012 and 2013.	The database was used to identify management priorities for selection of beneficiaries of damage prevention measures delivered through the concrete actions (C1 and C3). It was also used for the elaboration of the guidelines planned in action E6.
	50 interviews	A semi structured questionnaire was used in order to obtain data on previous damage events and management of the holdings in the project area.	Through the 50 interviews all the holdings in the study area that reported wolf damage in previous years were reached
	Report of assessment of extent of damage	The final report on the background situation was compiled and used as baseline (Annex 17, PR1).	
Action A4	Comprehensive database on wolf	Data were scattered among different offices and increased effort had to be	The database was used for the correct implementation of concrete actions (C2

Action	Foreseen in the revised proposal	Achieved	Evaluation
	damage (GIS map)	made in order to collect them (some resistance was shown in few offices).	and C4).
	50 interviews	140 interviews were realised	More interviews than was originally planned were carried out in order to obtain a complete picture of the level of impact of wolf on livestock.
	Presentation of results at national conference and public events	The obtained results were exposed in the occasion of 2 national conferences, several public events and one scientific publication.	The results showed that the current system was no longer sustainable as too few livestock owners were declaring damages, most of them were suffering attacks without declaring.
	Analysis of compensation system	An in depth analysis was done, also evaluating the efficacy and the level of satisfaction of the livestock owners.	This result was immediately visible since the analysis was shared with the referents of Tuscany Region and it has contributed to the modification of regulation for damage compensation.
	Report of assessment of extent of damage	The final report on the background situation was compiled and used as baseline (Annex 18, PR1)	
Action A5	Map of project areas with associated degrees of suitability for wolf presence and possible routes of expansion	A preliminary map using old data was prepared in 2014, while an updated one was prepared using 2014 data (Annex 19, PR1; Annex 2 PR2)	The map was updated in March 2015 and a final map for wolf suitability was delivered in 2016, included in the booklet on wolf (Annex 2, PR2)
	Report with interpretation for being used by local administrations	The report was embedded into a booklet that represented a more general publication on wolf (Annex 2, PR2)	The booklet was distributed to local/national managers and authorities, as well as interest groups and visitors of the LIFE MEDWOLF exhibitions (4 events-2,666 visitors)
Action A6	Map of project areas with associated degrees of suitability for wolf presence and possible routes of expansion	A preliminary map using old data was prepared in 2014 using data from the LIFE IBRIWOLF project, while an updated one was prepared using 2017 data (Annex 20, PR1 and Annex 19, FR)	The suitability map and the human potential risk conflict are useful tool to address local management interventions. These maps are also used to develop the strategy to counteract poaching and illegal use of poison (Annex 19, FR)
	Report with interpretation for being used by local administrations	Drafts were discussed with the staff of Province administration, and a risk map was also produced (Annex 19, FR)	This Report was delivered at the end of the Project and discussed with the Regional Administration.
Action A7	A minimum of 6 people specifically trained on techniques for detection of wolf presence and illegal hunting activities	Completed. Over 30 people trained	The presence of invited dog trainers was very appreciated, as well as the presence of the K9 units of SEPNA/GNR. The training material of the training course was uploaded to the project's website ( <a href="http://www.medwolf.eu/index.php/documenti-46.html">http://www.medwolf.eu/index.php/documenti-46.html</a> ).
	Report of wardens training sessions	A training report was produced (Annex 2, PR1)	
Action A8	A minimum of 6 people specifically trained on techniques for detection of wolf presence and illegal hunting activities	Completed. 14 people trained	The course materials were uploaded on the project website ( <a href="http://www.medwolf.eu/index.php/documenti.html">http://www.medwolf.eu/index.php/documenti.html</a> ).
	Specific training for anti-poison dog detection team (CFS staff)	Completed. 37 people trained	This specific training course was not foreseen in the project proposal but it became indispensable given the fact that the control of poaching activities

Action	Foreseen in the revised proposal	Achieved	Evaluation
			has undergone a re-organisation for being developed under the responsibility of CFS /Carabinieri Forestali.
Action A9	At least 6 Veterinarians trained	Completed. 44 and 12 people trained in two sessions	
	Training materials available on the website	Completed (Annex 4, PR1)	The training materials is available on the web page <a href="http://www.medwolf.eu/index.php/documenti-46.html">http://www.medwolf.eu/index.php/documenti-46.html</a>
Action A10	At least 6 Veterinarians trained	Completed. 16 people were trained in two sessions.	This result was immediately visible since two veterinaries trained in the training course were involved to monitor depredations and putting into practice what they had learned
	Training materials available on the website	The training materials is available on the web page <a href="http://www.medwolf.eu/index.php/documenti.html">http://www.medwolf.eu/index.php/documenti.html</a> (Annex 5, PR1)	
	Data collection on damages suffered by livestock owners. Report on Damage Assessment	In order to overcome difficulties encountered in action A4 for a comprehensive collection of data an analysis of the characteristics associate to damages, permission was requested to the EC for hiring two trained vets to collect detailed data on damage events. 80 events were described in detail (Annex 3, PR2)	The acquired data were used for the correct implementation of the actions C2 and C4 and they was made available to administrators in order to promote awareness among stakeholders and the general public regarding the issue of livestock depredations.
Action A11	400 questionnaires filled in	Completed (N = 359 questionnaires)	The interviews were made to 150 people from the general public, 62 livestock owners, 52 hunters, 20 media workers and 75 police officers. Even if we realized less questionnaires then expected the sample obtained allowed us to understand the local situation and to develop statistical analysis of the data.
	Statistical analyses on knowledge and attitudes towards wolf in project areas	Results show that among the general public there is a low acceptance of wolves and toward the implementation of preventive methods for wolf predation on livestock. Knowledge is consistently low among all groups, with an average score of 3,68. (Annex 3 MTR).	These results were used to implement the information campaign about wolves (action E2)
Action A12	At least 400 questionnaires for assessing the level of knowledge	No questionnaires were realised. The expected result of this action was slightly modified in order to analyse specifically the opinions of farmers regarding the management of wolf damage to farming activities, through the organization of focus group meetings. This change was due to the fact that the assessment of the level of knowledge and attitudes towards wolf presence in Italy was previously achieved through the implementation of the LIFE IBRIWOLF project. A report was produced (Annex 14, PR1).	The results of focus groups allowed a more detailed consideration of the needs of the main target group for developing concrete conservation actions (C2, C4).
Action C1	A total of 15-20 dogs in 15 holdings	31 dogs delivered in 16 holdings.	31 pups delivered but 6 died, 3 disappeared and 1 was transferred to a



Action	Foreseen in the revised proposal	Achieved	Evaluation
			different function (guarding dog). At the end of the project 21 LGDs are present in the project area. Dogs' behaviour was monitored on a monthly basis, veterinary assistance provided for the first year of dog's life as well as food for the first 2 years
	Reduction of 30% of damages in holdings where they work	Reduction >60% of animals killed after the use of LGDs	The evaluation was made for 13 LGDs in 10 holdings, because we have to consider only those dogs that reached adulthood (18 months of age) when they became effective in flock protection.
	Dog Database	The dog database compiles all information about dogs delivered, including registration, health problems, behavioural problems, etc. (Annex 1, FR)	All information about the delivered LGDs were stored in a specific database. This is very important to monitor the LGDs and to correctly programme future matings.
Action C2	A total of 20 dogs delivered	72 dogs delivered	72 dogs were delivered, but 6 died and 20 were delivered in holdings outside project area. At the end of the project 46 LGDs in 28 different holdings are present in the project area.
	Reduction of 30% of damages in holdings where they work	Completed. Damages in holdings with LGDs decreased by 71%	The use of LGDs proved to be effective but not suitable for all livestock owners as they require extraordinary effort and care and attitude of working with a dog. Some areas are intensively used by tourists and the presence of LGDs is perceived as a threat.
	Cooperative of farmers to manage LGD	Completed. The association DifesAttiva was created the 15/09/2015 and legally registered on 31/01/2017. At the end of the projects 21 holdings were associated.	This result was not explicitly stated in the project proposal while it constitutes an important result in order to guarantee the sustainability of the activity because farmers will exchange puppies and promote the use of LGDs.
	Dog Database	The dog database compiles all information about dogs delivered, including registration, health problems, behavioural problems, etc. (Annex 2, FR)	All information about the delivered LGDs were stored in a specific database. This is very important to monitor the LGDs and to correctly programme future matings
Action C3	At least 10 electric fences and 5 traditional fences	34 metal fixed fences in 19 farms were installed.	The number of fences realised was much higher than foreseen in the project proposal. We gave the materials and provided technical assistance to farmers while the installation of the fence was under their responsibility.
	Reduction of 30% of damages in holdings present in the project areas beneficiaries of prevention measures provided in the MEDWOLF project	Decrease in the average number of attacks per holding/month was up to 83% and in the average number of affected animals per holding/month was up to 88%.	This result was integrated respect to what was foreseen in the project proposal in order to evaluate the reduction of damages across one year with data collected in areas with and without fences for an objective comparison.
Action C4	Up to 130 electric fences and 10 traditional fences	80 fences installed in 71 farms: 86% are metal fixed fences, 2,5% are mixed ones, 7,5% are mobile ones and the remaining 4% are fixed electric fences	The total numbers of fences realized (both traditional and electric fences) are less than foreseen in the project proposal, in order to meet the needs of farmers who preferred metal fixed fences that are more expensive than the electric ones.
	Reduction of 40%	Decrease of 47% of the number of	This result was integrated respect to

Action	Foreseen in the revised proposal	Achieved	Evaluation
	of damages in holdings beneficiaries of prevention measures provided in the MEDWOLF project	attacks and 50% if we consider the number of animals killed.	what was foreseen in the project proposal in order to evaluate the reduction of damages across one year with data collected in areas with and without fences for an objective comparison.
Action C5	Action plan about control of illegal activities	Completed (Annex 22, FR). A strategy focusing on poaching control was produced, and reviewed by the IW-WG (action E8), and will continue to be discussed with responsible authorities, namely SEPNA-GNR and ICNF.	The document produced is a first effort towards the establishment of a strategy on poaching control. The elaboration of a definitive strategy will be continued by GL and ALDEIA after the end of the project, and namely in the scope of the Wolf Action Plan, which will start to be implement by ICNF in the near future.
	50 agents equipped with 100 kits for collecting poisoned animals	No kits were acquired	The expected result was modified and 2 freezers and 8 cameras were acquired to equip the agents instead than kits. The reasons of this change were communicated in the PR1, 30/11/2014
	Minimum 50 toxicological analyses	34 realized	Overlap with other LIFE projects focusing on anti-poison activities was avoided, thus activities were limited exclusively to the project area.
	5 major actions to control illegal activities	Completed: 3 poison control actions were made in collaboration with SEPNA-GNR, ICNF and local vets, and performed by the Spanish canine team of 5 dogs 2 poaching control actions were developed. 1 nocturnal control in Sabugal (30/04/2014), and 1 in Guarda (6/5/2016).	Control actions throughout the study area were insured with interventions of a Spanish canine team that collaborated with LIFE Innovation Against Poison (LIFE09/NAT/ES/000533) and LIFE Iberlince (LIFE10/NAT/ES/000570).
	Four meeting /year with interest groups	Completed: 22 meetings where held with SEPNA-GNR, and ICNF (central and local Protected Areas) to organize training actions and gather data about poisoning and poaching events	
	40% overall reduction of poisoning cases	Reduction of 66% of poison events and 75% of animals killed in the project area during the period 2012-2016.	A mean of 4.4 poison events, involving a mean of 9.9 animals per year from 2003-12 (before the project), and 1.5 cases, 2.5 animals at the end of the project (2016-17),
Action C6	2 teams of CFS	The teams were base in the Provincial Office and collaborated with AUSL in checking damage events.	The teams have been set up and anti – poaching surveys were carried out and will continue after the end of the project (see Annex 18, FR)
	2 anti poison dogs trained	The anti-poison dogs (Mora and Lapa) were acquired from Spanish expert and fully operational since October 2016.	The 2 dogs were trained and the anti-poison team was set up and fully operational on the provincial territory.
	Strategy for dealing with illegal use of poison	The strategy was elaborated by Carabinieri Forestali with the support of IEA staff and it served for launching extraordinary control campaigns against poaching in Grosseto province (Annex 42, FR)	Grosseto area was included in the list of those requiring special attention. This will guarantee the continuation of the activity after the end of the project. The strategy was largely based on the results of Action A6, D2 and D4.
Action D1	Report on efficiency of prevention methods implemented	The efficacy of prevention methods implemented was evaluated trough different approaches: -Treatment vs control -BACI approach	A comprehensive approach was adopted in order to obtain reliable data. Very few examples of correct evaluation o f damage prevention system exist.

Action	Foreseen in the revised proposal	Achieved	Evaluation
		-Questionnaires of satisfaction. In this way we were able to evaluate the efficacy of prevention measure from all point of views (statistical, economic and social) (Annex 3, FR)	
	Damage prevention used by 40% farmers in the area	Damage reduction of 42,4% - 71%	The comparison of average number of damages from 2013-2016 (95.5 events), with those of 2017 (55 events) allowed the estimation of the effective decrease of impact.
	Damages decreased by 30% in farms in project area		
	Report on opinion poll on satisfaction by farmers	19 farmers interviewed and the majority of them expressed their support to LIFE MEDWOLF activities and recognized the importance of the prevention measures for damage reduction (Annex 3, FR)	Although the project did not reach all farmers in the area, the experience of those who participated in the project was transferred to others, thus increasing the level of knowledge.
	Livestock owners are aware about best damage prevention measures	The interviews showed that livestock owners not only are aware that each farm needs ad hoc prevention measures, but also that some of them may be used in combination.	
Action D2	Report on efficiency of prevention methods implemented	The efficacy of prevention methods implemented was evaluated through different approaches: -Treatment vs control -BACI approach -Questionnaires of satisfaction. In this way we were able to evaluate the efficacy of prevention measure from all point of views (statistical, economic and social). A report was produced integrating results from the different approaches used (Annex 4, FR)	It was extremely important to show the livestock community that the project was determined to evaluate efficacy of damage prevention measures, also showing that they do not represent the 100% solution. The results were received positively and contributed to the trust building process.
	Damage prevention used by 40% farmers in the area	At least 260 farms used LGD or fences, which was an increase since the beginning of the project, when we hardly found someone with prevention measures.	On the basis of the results of Action D2, C1 and C2 we can say that at least 40% of the farms ( $\geq 50$ sheep) present in the project area uses at least one prevention measure
	Damages decreased by 40% in farms in project area	Reduction of 33% of the attacks, of 20% of the farms involved, and of 31% of the animals killed.	Difference between damage occurred in 2015 respect to 2017 (30/11/2017). We compared years under the same damage compensation regulation
	Report of opinion poll on satisfaction by farmers	163 farmers interviewed, and a large the majority of them expressed their support to LIFE MEDWOLF activities and recognized the importance of the prevention measures for damage reduction (Annex 4, FR)	In Grosseto there is still a group of farmers that do not agree in using damage prevention measures as a matter of principles, thus in the interviews they expressed their lack of support for the LIFE MEDWOLF project
	Livestock owners are aware about best damage prevention measures	Knowledge about fences and LGDs has increased and fences can be purchased through some measures of the RDF	The communication activities implemented and farms involved in Action C2 and C4 allowed us to reach a large majority of the farms present in the project area in order to disseminate the importance of the use of damage prevention measures. Number of farmers with damage prevention measures increased, although official figures are not available, we found difficulties in identify "control" farms

Action	Foreseen in the revised proposal	Achieved	Evaluation
			that were not using any damage prevention measure.
Action D3	Report on wolf distribution in 2017 and comparative analysis with 2013-2014 results	Completed Annex 23 of the FR	Results confirm the consolidation of the wolf in half of the MEDWOLF area. Through genetic analysis we were able to confirm the connection between the packs of the study area and those westward that may be relevant source packs to the MEDWOLF nucleus and deserve special attention.
	Maps presenting results obtained	A detailed distribution map by 4x4 UTM cells was also produced	The wolf distribution map produced is a very useful tool to plan future management interventions
	Number of packs increases	1 new pack considered probable in Sabugal/Malcata was detected in 2016	Wolf expansion was confirmed and according to genetic results 11 individuals were identified in 2015, and 17 in 2016
	Min. 130 transects	555 transects (2-4 km) to look for wolf signs were covered	A major sampling effort was applied in order to better surveyed the project area
	Min. 20 WH stations	50 Howling stations used	Even if we doubled the effort foreseen no replies were obtained.
	Tot. 150 scat samples for DNA	137 cats analyzed in the project area and 134 scats were analysed, these collected in from Montesinho (North Portugal, outside ME area, high wolf density), concerning the tests of the new SDDT. 372 swab samples analysed and 1 hair sample, collected in wolf kill sites in the project area area, from March 2015-December 2016	Genetic analysis was fundamental in order to estimate wolf trend in terms of abundance and distribution. Swab samples provided considerably more information, due to the higher % of success in the genetic analysis, in comparison to scats (due to the lower quality of these samples in the MW area), as confirmed since the first surveys.
	10 camera traps	29 camera traps (1,039 trap-nights) were set-up	The effort of Camera trapping was increased respect what foreseen in order to obtain more data
Action D4	6 sessions of 15 days	9 intensive sessions of 21 days realized for scat collection, plus wolf-howling sessions in July-August, and camera trapping	The sampling design was developed in order to cover as much as possible of the large territory of the Province of Grosseto and in order to obtain reliable results.
	200 km walked through transects	2,220 Km were covered to look for wolf scats	An intensive sampling effort was produced in order to apply capture-recapture model to estimate population abundance
	Min. 100 scat samples for DNA	978 scats were registered and 289 were sent to the lab for genetic analysis.	Through genetic analysis we were able to produce a reliable estimate of population abundance
	Report on distribution in 2016 compared to 2013-2014	Results obtained show an increase in wolf range and number of packs (Annex 24 of the FR).	We produced a reliable and accurate estimate of wolf distribution and abundance at the provincial level and the results achieved could represent a starting point to monitor the evolution of the wolf presence in the following years.
	Wolf packs increased	In the sampled area 21 packs were detected: 16 reproductive packs, 4 packs without sign of reproduction, and 1 pack defined probable. Extending the estimate to the wolf suitable area as resulted from the model developed with action A6, the number of packs for the whole provincial territory goes up to 22-24 and the number of individuals	Even if the comparison with previous results was not possible due to difference in sampling effort and study design the results obtained showed an increase in wolf distribution and abundance. During project LIFE IBRIWOLF 5 reproductive packs were detected while 14 packs (around 75 individuals) were reported in 2015 from

Action	Foreseen in the revised proposal	Achieved	Evaluation
		estimate goes to a maximum of 100 (range: 86-115) wolves.	a survey conducted by CIRSeMAF under a contract with the Tuscany Region.
Action D5	400 questionnaires	A total of 377 face-to face interviews were done (150 general public, 84 farmers, 58 hunters, 21 journalists, 64 environmental police officers), and additional questionnaires filled-in by students in 2014 were included in the analysis (171 before educational activities, 169 after).	The survey was carried out with the same methodology of the one of 2013 enabling us to make a comparison of the results
	Knowledge score increased by 10-20% in farmers and general public	Opinions toward wolf remained stable or had slight changes at the end of the project. Knowledge level is consistently low but improved in particular groups after the information actions by the project	Even if we didn't reach the expected results it's important to underline that opinions remained stable although there was a peak in damage occurrence in 2013-2014 and Although a peak of negative news covering wolf damage appeared in the local media between the opinion polls. It's also important to underline the general support registered toward the project
Action D6	400 questionnaires	A random sample of 500 rural residents across the Province of GR were interviewed. In addition, 504 questionnaires were administered to a random sample of residents at the national scale. Twenty semi-structured interviews were conducted in total, 3 with representatives of the MedWolf project partners and 17 with sheep owners	The survey was carried out with the same methodology used in a previous LIFE Project (LIFE IBRIWOLF) used as a reference point because in Action A12 were analysed focus groups with farmers. Moreover we made a qualitative study not originally foreseen in order to gain a more complete Knowledge of farmer opinions.
	Knowledge score increased by 20% in farmers and general public	A comparison with data collected in 2014 shows that opinions regarding the value and importance of wolf conservation among the rural population have remained consistent across the local resident and farmer sample, in this last case with a slight improvement. It's also important to underline the general support registered toward the project	Even if we didn't reach the expected results the great support received by the project especially toward concrete conservation actions confirmed that we used the right approach to reduce the conflict between human activities and the wolf
Action D7	Report	We used a set of social, economic, and bio-ecological indicators to measure the project impact (Annex 27 of the FR)	The project had an important socio-economic impact in terms mainly of reduction of losses, revenues for local firms and professionals in the project areas.
Action E1	Web site operational	The project website was proposed and agreed with all project partners, all contributed to its maintenance.	The web site was periodically updated, and news about project activities were regularly published
	Average 500 visitors per month	Average 704 sessions/month	The number of sessions increased towards the end of the project, when results were made available.
	Project materials uploaded on the web site	All projects material are available on project website	
Action E2	1.000 brochures about wolf	Completed. 1,000 copies were printed	This material was distributed to the general public in the project area
	200 copies of LCIE brochure	Completed. 500 copies printed	This brochure was translated and updated, and was distributed to the public of the LCIE exhibits and was provided to the participants of the

Action	Foreseen in the revised proposal	Achieved	Evaluation
			workshop of action E6
	1 copy of LCIE exhibition	Completed. 2 copies printed (16+10 panels)	This result was immediately visible since the exhibition was met with a lot of interest and it was exposed in several museums, meetings and public events. As a result extra copies will be printed and a major exhibit was set up in collaboration with the Natural History and Sciences Museum of Lisbon., This exhibit entitled "Kings of Wild Europe: Our Last Large Carnivores", which opened to the public on 02/03/2017 and registered 19,456 visitors until 30/11/2017.
		A booklet on the Iberian Wolf (1,000 copies)	This booklet was not foreseen and included detailed and technical data from A5. It was distributed to local/national managers and authorities, as well as interest groups and participants in events organized by the MEDWOLF
	8 press articles (2/year)	249 articles were published in regional/national newspapers or magazine 9 interviews/news broadcasted on national TVs 13 national/local interviews broadcasted in radios	The activities realized significantly overcome what was foreseen in the project proposal
	Brochure on wolf distribution	Annex 6, PR1	
	Exhibition and brochure	Annex 7, 8, PR1	The exhibition will continue to be available and had high success, particularly after the collaboration with the Lisbon Science Museum.
	Notice boards	Annex 11, PR1	
	Press clippings	Annex 7, FR	
	500 brochures	Completed	
	150 copies of LCIE brochure	Completed. 500 copies printed	
Action E3	1 copy of LCIE exhibition	Completed. 10 copies printed (9 panels each)	This result was immediately visible since the exhibition was met with a lot of interest and it was exposed in several museums, meetings and public events. It will continue to be available for free to those who request it. One copy is permanently exposed at the Natural History Museum Maremma.
	16 press articles (4/year)	163 articles	The debate was at times very lively and the project was mentioned in relation to the use of damage prevention measures.
	Production of gadget	Completed. Realization of T shirt, block notes, bags	This result was not explicitly stated in the project proposal. The gadgets were distributed for free in occasion of education activities and workshops
	Notice Boards	Annex 12, PR1	
	Press clippings	Annex 9, FR	
	Scientific publication	Two publications were produced and more are being prepared with the data originated by the project. (Annex 13, PR2; Annex 10, FR)	Data were collected in appropriate manner, thus it was possible to use them for peer reviewed publication. This will increase the visibility of the project among scientists and managers.
	Layman's report	Completed Annex 6, 11, FR	The layman's report was distributed at

Action	Foreseen in the revised proposal	Achieved	Evaluation
			press conference with final results of the projects data analyses.
Action E4	Successful exchange of information	Exchange of information was ensured by communication, visits, talks in meetings at both national and international levels. (Annex 5 MTR, Annex 21FR)	Some exchange of information with other projects or administrations were important for the project implementation or for ensuring sustainability of the project's results.
	Two study tours to other projects	A study tour to LIFE IMPERIAL was organised in 2016 and to LIFE WOLFALPS in 2017.	The visit to LIFE WOLFALPS produced a statement and implementation of fences in Lessinia area was made after that.
	At least 6 experts from EU and beyond invited	International experts were invited in occasion of the DP-WG meeting and Iberian Wolf Congress.	The DP-WG produced guidance documents for solutions to problems that usually arise with LGD amnagement.
Action E5	Proceedings of Iberian Wolf Congress	Around 140 participants attended, presenting 39 talks and 26 posters. Annex 12 of the FR	The IV Iberian Wolf Congress, held at the facilities of ESACB, was held in Castelo Branco from 29-31st October 2016.
Action E6	Technical guidelines on best practices	This was included in the manual produced in 2015 (Annex 6 MTR)	the information was also used for input in the development of the National Wolf Action Plan.
	Best practice Manual on damage prevention measures	The best practice manual was included in the publication of the work done in collaboration with the "Pilot project on traditional husbandry and wolf presence" developed for the EC.	
Action E7	Book of Abstracts	Completed Annex 39, FR	The symposium was attended by over 250 people
Action E8	Carnivore Damage Prevention WG established	The Working Group was established inviting experts at international level with proven experience on damage prevention issues. 6 members are part of the core group, also with the role of editors for the CDP Newsletter	
	8 issues of the CDP Newsletter	Completed, all of them were also translated into Italian (Annex 1 PR1, Annex 4MTR, Annex 17 PR2, Annex 14, 17, 40 FR)	This required more efforts than originally foreseen, given no resources were available for the editors. Nevertheless, the commitment was full and all 8 issues were produced, and considered of great value.
	Discussion forum set up	Not done because considered obsolete, replaced by social media	
	Iberian Wolf Working group established	Completed. Members from both Spain and Portugal adhere to this WG and exchanges on technical approaches to wolf monitoring have been discussed extensively.	The exchanges have improved also collaboration between different Portuguese groups.
	Minutes of 4 meetings of the WGs	The WGs met more than expected, given the IW-WG also provided inputs to the National Wolf Action Plan in Portugal and the DP-WG also met in Italy in occasion of the closing symposium (action E7) (Annex 16 PR2, Annex 13, 15 FR)	
Action F1	Minutes of coordination meeting	Minutes of 8 meeting available	Coordination meetings were essential for ensuring coherence of activities implemented in the two project areas.
	Report for EC	Completed Report delivered: IR, 30/05/2013, 1 <sup>st</sup> PR, 30/11/2014, MTR, 30/11/2015, 2 <sup>nd</sup> PR 30/11/2016, FR 30/11/2017	
	Financial and	Instructions on how to report project	Administrative procedures needed to be

Action	Foreseen in the revised proposal	Achieved	Evaluation
	administrative procedures	expenses were prepared in 2013. Regular meetings were held with project partners in order to ensure correct reporting and updating according to instructions provided by the EC.	updated several times, and project partners found it difficult to send up to date reports in due time. Extra effort was made to support them.
Action F2	Monthly reports of activity implemented	Completed. 61 reports produced (from November 2012)	
Action F3	After LIFE conservation plan	Completed Annex 18 FR.	The after LIFE conservation plan commits the project beneficiaries to continue some of the project activities, mainly those related to the promotion of damage prevention measures, but also anti-poison and anti-poaching controls.

### 5.6.2.1 Detectability of project results

Some of the project results achieved were immediately visible and detected with our evaluation actions, while other will only be detected in the future, given the intrinsic nature of the issue tackled.

#### 5.6.2.1.1. Wolf presence

Although not probably completely related to the project actions, also in consideration that wolf is expanding generally in all populations throughout Europe, the presence of wolf increased in both project areas during the project implementation. This result was detected with actions D3 and D4, but the long term establishment of the detected packs will need to be monitored in the future.

In Grosseto, the presence of a wolf pack in Duna Feniglia Reserve, where it was never registered before, and where the presence of ungulates was at high densities, has allowed, for the first time in over 30 years, some vegetation regeneration, thus leading to a healthier ecosystem. This result is immediately visible and will be kept under control by the Carabinieri Forestali, who have contracted IEA in 2018 for continuing the wolf monitoring activities inside the reserve.

#### 5.6.2.1.2 Impact of wolf on livestock productions

Wolf presence is always associated with damages to domestic animals if those are not protected against its predatory nature. In areas of recent or relatively recent recolonisation the impact of wolf can be acute and damage prevention measures should be promoted and adopted. This is not always easy because of technical and cultural reasons. In the project areas we experienced difficulties with the implementation of damage prevention measures as they were little compatible with the management system of the stock. But most important is the cultural resistance of older livestock breeders. For them to modify their habits it is extremely difficult and some significant results may be obtained only with a generation change, if the economic conditions will allow new generations to continue this difficult activity. We certainly have detected immediate results in the farms that adopted damage prevention measures, but the spread of word of mouth will probably be the only effective mean of increasing awareness among farmers. In order to have a significant decrease of the impact of wolf at both economic and social levels, continued efforts should be ensured and time for humans to accept change needs to be allowed.



#### *5.6.2.1.3 Decreased level of illegal wolf killing*

The illegal killing of wolf in the project areas is strongly related to social acceptance and the way that livestock owners feel their work is being valued less than the predator's presence. In order to have an effective, long term and significant decrease of illegal acts, which by definition are extremely difficult to detect, local communities need not to be left alone dealing with the many difficulties that arise with wolf presence. This will only be possible through an integrated approach to wolf management, which very few competent authorities have. The establishment of anti poaching and anti poison teams represent a precondition for effective contract to illegal actions, but the cause that trigger desperate and unacceptable acts should be addressed too. Thus, although the short term result of having a control system set up and functioning is tangible and visible, the effects of such operation will be visible in longer terms.

#### *5.6.2.1.4 Increased awareness*

Wolf conservation is largely based on communication, given the place that wolf holds in our culture and ecosystems. Although at local level the effects of the project's communication activities could be detectable, the effects of decreased intensity of support that the livestock owners will experience after the project's end will only be detectable in the long term. In previous experiences (many project beneficiaries were also collaborating in the previous LIFE COEX project) once the project is closed many actors in the community start to regret not having grabbed the opportunity to collaborate, given the high level of technical assistance provided.

Furthermore, the increase in the level of knowledge would only be possible after intensive communication campaigns, that were not the primary objective of the present project.

Finally, the effects of communication and education programmes that were developed in schools will only be visible in the long term, when students will become more independent and will take their own decisions. We nevertheless have detected an increased awareness on the use of damage prevention (in some cases the project has been associated to their use).

### ***5.6.2.2 Results achieved as a consequence of the amendment to the grant agreement***

During the implementation of the LIFE MEDWOLF project, an amendment to the grant agreement was requested to EC in order to include a new beneficiary in the project (CFS) and it was accepted on the 17/9/2014 (ENV E.3/EDR/TF/ib ARES (2014).3050133). Consequently, the CFS, a police force that specialises in contrasting environmental offences and crimes against wildlife, became the beneficiary responsible for the implementation of the action C6. The inclusion of a new beneficiary has allowed the implementation of anti-poaching activities in Italy, which would not be possible if the amendment had not been agreed upon. The beneficiary was subsequently replaced by Carabinieri Forestali (CUFAA) and a new Amendment to the grant agreement was required in order to formalise their participation to the project (Ares(2017)3953151 – 08/08/2017).

A further amendment was needed to extend the project duration from 31/3/2017 to 30/11/2017 (Ares(2016)5507505 – 22/09/2016). This was crucial for accomplishing the objectives set within action C6, given it was delayed due to the aforementioned changes, and for the correct assessment of the damage prevention measures through actions D1 and D2. Without the extension the results as they are could have not been achieved, also in consideration of the fact that the different type of fences to be installed from the planned one took more time than expected, thus a proper evaluation would have not been possible within the project original planning.

### ***5.6.2.3 Effectiveness of the dissemination***

An extraordinary effort was made to realize transparent and balanced information campaigns. Our goal was to improve the knowledge on wolf ecology as well as knowledge and awareness of the problems encountered by the farmers in presence of the predator.

Different interest groups, through different methods, were targeted by the dissemination activities.

The main groups involved were:

- General public (local and national resident in the two countries involved)
- Farmers
- Students
- Other interest groups (hunters, environmentalists)
- Public authorities

The itinerant exhibition was a valid tool to reach the general public across Italy and Portugal. The exhibition was set up in 112 locations, and is estimated to have been visited by over 6,000 people in the two countries. In Portugal the agreement established between the project and the Museum of Natural History in Lisbon was also very important to ensure the prosecution of the activity after the project end.

In Italy the exhibition will continue to be available to be set up in different places.

The mass media and social activities were very intensive and represented another valid tool to disseminate the results obtained in the frame of the project. The number of website's project visitors constantly increased up to 2712 visitors in November 2017, with an average of 1,562 monthly visits, as well as the number of likes in the facebook page. The latter resulted to be the most effective tool for immediate communication about factual happenings, but the web site remained the most essential tool that functioned as a repository of all produced documentation.

At the local level in Italy and Portugal, as was already mentioned, the evolution of opinion attitudes and knowledge was measured through specific surveys (Action D5 and D6). In general the opinion toward wolf remained stable or showed a little improvement. We considered these results always positive because during project implementation there was an increase of the anti-wolf position on local media most probably associated to the expansion of wolf range (see results of actions D3 and D4).

The educational activities were carried out through the implementation of the wolf kit. We involved 29 classes and 945 students in Portugal and 122 classes and 1,697 students in Italy. In Portugal we measured the efficacy of the educational activities through a specific survey and the results showed a significant increase of knowledge after the implementation of the educational program.

A very innovative approach used in Italy was the organization of the journalism course for the school, and the involvement of the students in fence installation.

The farmers were the most critical group and even if their position was not in favour of wolf conservation we were successful to open a dialogue with them and a large majority of this group really appreciated the actions implemented by the project and they recognized the transparency and capacity to listen the different point of view.

The other interest groups (hunters and environmentalists) were targeted through specific events in which we presented the results obtained and they were also involved at least in Italy in the monitoring action.

The management authorities in the two countries were constantly updated about project's results, and the recognition of the importance of what was done, was witnessed by the fact that in Portugal there was a direct involvement of the project staff in the elaboration of the Action plan for wolf conservation, while in Italy there was a regular contact with the Regional administration and the veterinarians of the national health system.

The individual partnership was extremely important in both project areas. In Portugal the presence of ESACB technicians facilitated good relationship with farmers, while in Italy the agricultural associations were both acting as watchdogs against too environmentalist approach of the associated beneficiaries WWF and FESAMBiente, but also as catalysers of information and approaches with livestock owners. High level professionalism of IEA technicians was also extremely well valued by livestock owners, as they directly engaged in meetings, visits and social events. The participatory process experimented in Italy was extremely well perceived by the small group of participants.

## 5.7 Analysis of long-term benefits

### 5.7.1 Long term environmental benefits

The main environmental benefits ensured by the project were related to the improvement of wolf conservation status in Italy and Portugal through mitigation of its impact on human activities.

At the end of the project the abundance and distribution of the wolf population significantly increased in the two project areas.

In Grosseto province for the first time a robust estimation of the wolf population was provided: we estimated 86-115 individuals distributed in 22-24 packs over an area of 2,838 km<sup>2</sup>. This represents an increase in wolf presence and distribution in comparison with data provided through previous projects (LIFE10NAT/IT/256 IBRIWOLF, and Regional Funds). Although the results are not completely comparable, the minimum number of packs detected in 2014 increased by 50% (Annex 19, 24).

In seven municipalities of the districts of Guarda and Castelo Branco the estimates of wolf presence and distribution made in 2013, 2014 and 2016 showed a considerable increase in range and number of packs, when compared to the last national survey conducted in 2003-04, where only two probable packs had been confirmed, and with an increase of 5.5 fold in its range. In what concerns the number of packs, in 2013-14 one confirmed pack and m probable pack were estimated to be present, while in 2016 the estimates improved with 1 confirmed pack and 2 probable packs (Annex 23), and with the confirmed presence of wolves in two other areas in the west of the project area, in one of which two wolves were identified.

Even if it is not possible to ascribe this situation only to the project implementation because different variables were involved, we surely acted to reduce the threats to species survival trough the delivery of damage prevention measures and trough the contrast to illegal activities, as well as increased knowledge and awareness in the project areas. Furthermore, in Grosseto, the presence of a wolf pack in Duna Feniglia Reserve, where it was never registered before, and where the presence of ungulates was at high densities, has allowed, for the first time in over 30 years, some vegetation regeneration, thus leading to a healthier ecosystem.

The threats originally identified that justified the project implementation have been mitigated locally, but further work will be needed to ensure long term sustainability of results achieved.

Particularly:

Threats identified	Status	Issues to tackle
Conflicts with local human activities	Mitigated: increased number of farmers that use damage prevention measures	Impact of wolf (and other predators like wolf-dog hybrids) on domestic animals need to be reduced through promotion of damage prevention measures and modification of livestock management practices.  Functionality of delivered damage prevention measures needs to be ensured.
Social habitat fragmentation	Mitigated: interventions and controls have resulted in less cases of poaching, wolf	In Italy this is not relevant any more as wolves do expand in areas not previously detected. In Portugal social barriers have been mitigated, and genetic analyses show that one wolf of the study area is related to the western wolf nucleus,

	distribution has expanded	<p>confirming the connection and transfer of individuals in the Portuguese wolf population south of the Douro river.</p> <p>In both countries wolf monitoring will be continued by the relevant authorities (i.e. ICNF in Portugal and Regional Governments through funds that will be made available by MATTM).</p> <p>Anti-poaching and anti-poison activities will be continued in order to contract illegal practices. Participatory approach will be promoted within the Regional Administration.</p>
Lack of coherent conservation measures in Iberia	Improved: exchange of experience and technical staff ensures consistent monitoring approaches	Establishment of an Iberian Wolf Working Group including technical staff from both Spain and Portugal to share approaches and results. Communication will need to be continued.
Lack of systematic testing of efficacy of damage prevention measures	Mitigated: local authorities are aware that monitoring is needed. The project has provided reliable data.	A best practice example was provided for measuring effective use of damage prevention measures have been produced (See Annex 4 of the Project Final Report). Promotion of their approach among other projects needs to be ensured.

Most of the issues that remain to be tackled will be addressed in the future through planned activities (see After-LIFE Conservation Plan, Annex 18).

Overall we can say that the LIFE MEDWOLF project contributed to favour the condition for the species expansion, and the reduced availability of livestock ensured by the implementation of prevention measures will force the predator to opt for its natural prey. This could have both a positive selection effect and a regulatory effect, potentially important for the wild ungulates.

### ***5.7.2 Environmental Policy & Governance benefits***

The project impact on environmental policy and governance benefits resulted in Italy in the change of damage compensation system and also in the damage monitoring system.

Project results clearly showed the inadequacy of the insurance system and thus contributed to the shift in 2014 to the direct compensation of damages established by the Tuscany Region.

This was realized through a consultation process in which project beneficiaries were actively involved.

Another aspect influenced by the project was the monitoring of the livestock damages and the importance to have an updated database of damages occurred in the territory. This was realized through a constant contact with the veterinary service of the province of Grosseto and through the training course promoted in Action A10.

In Portugal project results were used in the elaboration of the species Action Plan. The main results used were those related to damage prevention measures (the manual of damage prevention measures) and those related to the monitoring activities.

In the two countries an important role was also played by the action related to the contrast to illegal activities. In Italy the strategy produced by the Carabinieri Forestali is a very important instrument to guarantee the anti-poaching activities in the whole provincial territory while in Portugal the coordination of activities and the elaboration of a strategy to deal with anti-poison and anti-poaching activities within the frame of the Programa Antidoto Portugal will contribute to the effectiveness of such operations.

### ***5.7.3 Long term economic benefits***

Economic benefits generated by the project can be evaluated from different points of view:

- ✓ Reduction of the expenses related to damage compensation
- ✓ Revenue for local suppliers of material needed for implementation of project actions
- ✓ Revenue related to eco-tourism activities in the project areas

In the long term we will support the competent authorities in developing management schemes that will gradually shift from an ex-post approach to a premium-based pro-active one. In practical terms this will mean valuing the work done by farmers who will adopt damage prevention measure, thus investing in local dealers and preventing excessive losses and consequent high expenditures by the Regional administration. In the current situation the results are a decrease in expenditure for damage compensation but additional workload and expenses for implementation of damage prevention measures on the complete responsibility of the single livestock producers. This situation will in the long term increase unsatisfaction among the farming community.

On the other hand those farmers who have adopted damage prevention measures will have the possibility to continue their business with a mitigated impact and the promotion of products through eco-tourism activities (that will be continued in both project areas) will likely increase their income.

### ***5.7.4 Long term social benefits***

A part the working opportunity developed in the frame of the project (e.g the aforementioned people contracted) the main social benefit produced by the project was the mitigation of the social conflict between different groups. In Italy the structure of the partnership, with the involvement of the agricultural associations, environmental associations, and the Province of Grosseto, was a mean to open a dialogue between parties too often firm on their position.

The experimental participatory approach applied in the analysis of wolf presence in the Province of Grosseto within action E3 was highly appreciated by the different groups involved and showed a possibility to be engaged in future work seeking for shared solutions.

Overall in the two countries we worked to improve the conservation status of the wolf without neglecting that is fundamental to sustain the farmers and their role in the local ecosystems and economies.

The conflict for sure is not completely solved, the situation is still critical also because is in permanent evolution but we showed a possible approach to manage and mitigate the conflict. A continuation phase for conflict management will be ensured by the contract held by IEA with the

European Commission “Service contract for the establishment of local /regional platforms on coexistence between people and large carnivores” (contract nr. 07.027739/2017/771819/SER /ENV.D.3).

#### ***5.7.5 Sustainability of project results and future activities***

The sustainability of the results achieved is guaranteed by the commitments taken by the project beneficiaries and the results achieved. On one hand livestock owners have experienced the positive outcome of correctly using damage prevention measures (with a reduction of losses ranging from 42 to 88%) and some of them have adopted prevention measures at their own expenses during the project implementation, on the other hand the project beneficiaries will continue to promote the damage prevention methods through a series of initiatives (Annex 18 – After LIFE plan). The promotion of the prevention measures will be ensured in Italy through the dissemination and communication activities that will be made by the agricultural and environmental associations. The former, for their institutional role, are in permanent contact with the farmers and so they can assist them in the implementation of the prevention measures by providing the necessary technical assistance, while the latter are engaged in promoting measures that increase the peaceful coexistence with wolf in the project area.

The same role will be played by ESACB for fences and GL for LGDs in Portugal.

In Italy an important tool to ensure the future sustainability and the long term benefits of the project will be the activity of DifesAttiva. This association is continuing to promote the use of LGDs not only in the province of Grosseto, and the exchange of experiences between farmers in the management of dogs. It is noticeable that a branch of the association has been established in Liguria Region, sharing values and commitments and joining efforts to support communication and networking among farmers.

At the end of the project different initiatives were started that also contributed to continuation of the activities implemented:

- *MABITA'* project in Grosseto-Siena-Arezzo provinces: project funded with Regional Funds for promoting use of damage prevention measures in the provinces of Grosseto, Siena and Arezzo. Lead is CIA Grosseto, collaborating with Coldiretti Grosseto, Confagricoltura Grosseto, DifesAttiva, IEA.
- *Sentieri del lupo* project in Grosseto-Siena-Arezzo provinces: funded through Regional funds and aimed at promoting eco-tourism activities. Lead is Circolo Festambiente Grosseto, in collaboration with DifesAttiva.
- Involvement of IEA and DifesAttiva in two proposals for RDF measures, mainly integrated projects or Operative Groups.
- A short term project for monitoring wolves present in Reserve of Duna Feniglia and Orbetello. Lead is IEA with funds from Arma dei Carabinieri.
- Establishment of a National Wolf working group on Portugal, where issues related to poaching and poisoning, as well as wolf monitoring will be discussed. GL and FCUL will actively participate.

In order to guarantee the wolf conservation status in the project area is also important the continuation of anti-poaching activity. This will be realized in Italy by the implementation of the strategy developed by the Carabinieri Forestali and in Portugal by the approval of the National Action Plan.

The CDP-WG, established during the action E8 with the aim to discuss damage prevention

techniques and to share knowledge among experts from in and outside Europe, will continue to operate at the end of the project, also through synergies established during the working group activities, such as the collaboration with Swiss association AGRIDEA, which manages the carnivore damages for the Swiss government. The CPD newsletter will continue during the next years within the LIFE EuroLargeCarnivores project (LIFE16GIE/DE/0661).

One of the most important contribution for the long term sustainability of the implementation of damage prevention measures will be the activation of RDF measures related to non productive investments (measure 4). Although this measure has been activated in both Italy and Portugal, its opening is sometimes problematic and not promoted for damage prevention measures. The agricultural associations that took part to the project will promote their use.

Furthermore, and looking at other experiences, such as Piemonte Region and France, RDF could ensure the technical support for management of damage prevention measures through measure 7.

### ***5.7.6 Replicability, demonstration, transferability, cooperation***

Due to the dissemination and networking actions developed during the project we can already register several replication cases for example in the approach used in the implementation of prevention measures (the selection of beneficiaries, what kind of prevention measure is better to install, the technical assistance provided by the project). This is what was done in Italy in Emilia Romagna Region and in Trento Province where the experience of LIFE MEDWOLF project was replicated also thanks to the presence of Dr. Duccio Berzi, who was contracted by the Grosseto Province for technical coordination of activities related to action C4. The Unione dei Comuni della Gargagnana has also replicated the experience, involving technicians that were hired within the LIFE MEDWOLF project.

Within the IUCN/SSC Large Carnivore Initiative for Europe (LCIE) the modelling approach for estimating wolf population used within action D4 was shared with representatives from the French Government.

At International level the experience of stakeholder involvement was shared with the EU stakeholder platform on coexistence between people and large carnivores, where the project was taken as a case study within the activities undertaken by the platform secretariat.

The experience of DifesAttiva was also used as a best practice demonstration case for the EUROPARC webinar held on 27<sup>th</sup> March 2018.

Another replication case was the birth of DifesAttiva Liguria. This association followed the example of the organization constituted in the frame of the project,

The importance of the activity carried out in the frame of the project related to LGD's was also witnessed by the MoU signed with Appennino Tosco Emiliano National Park and the Comunità Montana Alta Garfagnana. In Portugal the MoU signed with InBIO-CIBIO has fostered interesting results concerning the parenthood lineages of wolves belonging to different packs followed by different research groups.

Transferability of the results achieved will be ensured in Italy also by the agricultural associations which will disseminate the experience gathered in damage prevention at the Regional and National level.

The two anti-poaching teams and the canine unit, set up with action C6, acted in partnership with the anti-poaching teams set up in other LIFE projects (LIFE MIRCo-lupo, LIFE Pluto, LIFE Wolfalps). This offered the opportunity to team building for the handlers who collaborate and



help each other in case of uncertainties or difficulties, and this collaboration and exchange of experience will continue after the end of the project.

The results achieved was presented in different scientific congress favouring the cooperation with other projects and initiatives. The different workshops organized in Italy and Portugal were an excellent examples in this direction.

#### ***5.7.7 Best Practice lessons***

During project implementation became more and more evident the importance of the farmer's involvement in the development of the prevention measures. There is not a unique solution valid for all the situations, but each intervention has to be shared with the farmers and has to be adapted to their livestock management system, otherwise it cannot work in an efficient way. In this sense all the process carried out from the selection of the beneficiaries, to the choice of the intervention to be realized, as well as the technical assistance provided by the project staff were excellent examples to guarantee the effectiveness of the action.

The monitoring of the efficacy of the prevention measures to reduce livestock damages has to evaluate non only the quantitative aspects of the problem but also its social dimension in terms of farmers satisfaction of the implemented interventions

The experimental participatory approach applied in the province of Grosseto to favour the dialogue between different groups, and to identify the possible shared management interventions was the only way to mitigate the conflict between human activities and the wolf. If the different stakeholders are not involved in the process each solution is destined to fail. To manage the participatory approach it is fundamental to rely on the expertise of experts of negotiation processes and a facilitator, this has been taken into account for future actions.

The guidelines produced by researchers and experts involved in the CDP-WG (Action E8), developed in collaboration with the LCIE and ICNF constitute a reference point for future management strategies related to wolf presence in Portugal: we have slightly modified the document as it was originally planned in order to include livestock management practices that are implemented outside the project area, so as to produce a more comprehensive and largely useful document.

#### ***5.7.8 Innovation and demonstration value***

The LIFE MEDWOLF project represented an important opportunity to test the efficiency of prevention measures that were scarcely used before the implementation of the project in the two project areas (more specifically LGDs and fixed fences). The success of these prevention measures in reducing damages suffered by farmers will help to spread the use of fences (properly built) and dogs (correctly managed) in areas outside the two project areas. Most importantly the process of selection of material and assistance to farmers has certainly provided for a difference in attitudes: some measures were already available but treated with suspicion by farmers who felt they would have been too costly or too labour demanding to be implemented.

The experience made with the scat detection dog in the Portuguese study area during the action A2 constitutes an innovative methodology since until now no study had compared the effectiveness of this tool and other non-invasive survey methods for detecting wolves in Europe. The excellent performance of detection dog, as revealed by data collected in the year 2014, sets the conditions for allowing this technique to be applied also in future projects, although needing some refinement, especially if they are intended to detect wolf presence in low-density carnivore

populations and in potential expansion areas.

In dealing with the Provincial and Regional administrations, the project experience demonstrated that making reference to sampling strategy criteria for the assignment of preventive measures is a key factor to take into account for any conflict mitigation policy. This, in turns, demonstrated the important of producing reliable measures of conflicts through time (i.e., monitoring), in order to enhance the efficacy and efficiency of any mitigation intervention. Hardly in previous similar experiences, both in the study area and elsewhere in Italy, prevention measures have been donated to livestock owners according to recorded depredations levels at the provincial or regional scale, thereby strongly limiting the long term efficiency of such interventions. We have reasons to believe that the criteria we used in the project (Action 4) will become a reference for damage prevention projects to come by the same and other administrations.

### ***5.7.9 Long term indicators of the project success***

Considering that the targeted species is wide ranging and in the project areas the individuals belong to larger open populations, the direct effect on the number of wolves present can hardly be ascribed solely to the project's implementation.

What can certainly be assessed as project's implementation success is the correct use of damage prevention measures and the number of institutions and/or farms that apply the methods implemented by the project, particularly in the areas that were identified by the project as critical for expansion and /or conflict levels.

The project's activities may more easily result in socio-economic effects, influencing the attitude of a portion of the farming sector and making the urbanised population more aware of the difficulties for economic activities in rural areas where the wolf is present.

Below is a table of provisional indicators identified for assessing long term project's benefits:

<b>INDICATORS</b>	<b>QUANTIFICATION</b>	<b>ASSUMPTIONS</b>
<b>ENVIRONMENTAL INDICATORS</b>		
Wolf presence in areas indicated as suitable	Established nr packs in areas suitable for wolves	The suitable areas are territories where levels of conflicts are affordable
<b>ECONOMIC INDICATORS</b>		
Decrease of damages	Number of damages suffered by farmers beneficiaries of prevention measures	Prevention measures are sufficient for protecting holdings and are correctly used
Increase of utilization of prevention measures	Number of fences correctly implemented	Support for correct implementation of fences is available
Decrease in costs associated to purchase of good livestock guarding dogs	nr. of dogs provided free of charge from project's beneficiaries	Support for training and management of LGDs is made available
Sales of MEDWOLF farms products	Number of products sold	Promotion activities are continued
<b>SOCIAL INDICATORS</b>		
Decrease of negative attitudes and retaliation against wolf	Nr. of wolf carcasses exposed	Carcasses of illegally killed wolves are always visible
Decrease of protest behaviour by farmers:	Nr. of damage events	Damage compensation system

information provided to responsible authorities	communicated	in place and functioning
Increased knowledge on wolf conservation issues and best practices for mitigating conflicts	Nr. of schools involved in education programmes; Nr. of people participating in Eco-tourism activities; Nr. of occasions where the MEDWOLF Exhibit was exposed	Knowledge is used for improving attitudes

## 6. Comments on the financial report

The costs incurred during the project implementation (01/9/2012-30/11/2017) are reported in the standard statements of expenditures available in the toolkit section of the LIFE webpage. An overall project consolidated cost statement was compiled in the coordinating beneficiary file. Overall costs are reported below and some comments are included for interpretation and understanding. The Annexes 43-54 represent the individual cost statements and the consolidated project cost statement. They also include declarations from the competent authorities supporting the eligibility of VAT costs, as it represents a non recoverable cost.

### 6.1 Summary of Costs Incurred

The overall project expenses sum up to 3,278,021.10 €, which represents 98.88% of the total proposed project budget. It should be noted that the project duration was extended for 6 additional months with respect to the original planning, and some activities have achieved more results than expected, thus the project can be considered cost-effective.

project COSTS INCURRED			
Cost category	Budget according to the grant agreement	Costs incurred within the project duration	%
1. Personnel	1,435,918	1,666,467	116
2. Travel	368,461	225,158	61
3. External assistance	801,094	666,636	83
4. Durables: total <u>non-depreciated</u> cost	343,722	348,567	101
- <i>Infrastructure sub-tot.</i>			
- <i>Equipment sub-tot.</i>	343,722	348,567	101
- <i>Prototypes sub-tot.</i>			
5. Consumables	110,564	122,883	111
6. Other costs	96,780	87,767	91
7. Overheads	158,732	160,543	101
<b>TOTAL</b>	<b>3,315,271</b>	<b>3,278,021</b>	<b>98.88</b>

The original project budget has been amended on 17/09/2014, following the permission accorded by the EC for a substantial modification *sensu* art. 15 of the Common Provisions.

#### 6.1.1 Comments on expenditures per partner and per budget categories

The project implementation has been undertaken in order to achieve the planned objectives and some modifications to the budget were needed. They were mainly of minor nature, with the exception of the transfer of budget to the new beneficiary CFS in 2015 (i.e., actions A2, A10, C2, C3, C4, C5 and C6). Some of the planned actions were extended and this has also had some implications at financial level, as will be discussed below. The overall percentages of expenditures per project beneficiary with respect to the total project budget is indicated below:

<b>Beneficiary</b>	<b>% of total expenditure</b>	<b>% of original project budget</b>
Istituto di Ecologia Applicata - IEA	19.55%	14.74%
Province of Grosseto - GR	11.35%	11.50%
Grupo Lobo - GL	15.85%	14.82%
Fac. Ciencias Un. Lisboa - FCUL	1.83%	1.00%
ESACB	7.85%	6.30%
INIAV	5.01%	4.41%
ALDEIA	0.79%	2.56%
WWF	2.85%	10.86%
FESTAMBIENTE	11.87%	10.27%
CIA Grosseto	5.04%	3.04%
COLDIRETTI	10.86%	12.31%
CONFAGRICOLTURA	2.69%	3.28%
CFS /CUFAA	4.46%	4.91%

It appears evident that some beneficiaries have spent less than expected and this is explained below:

- ALDEIA – The expected incidence of poison in the project area was higher than effectively registered (see section 5.2.5). Only 1.2% of expenditures were made for the toxicological analyses, while no need for the lawyer assistance was recorded.
- WWF – The association underwent a significant restructuring and most staff and/or consultants were not confirmed. Thus the active involvement of WWF in the project had to be necessarily decreased and some of the budget for planned activities was transferred to other beneficiaries.
- COLDIRETTI – The association underwent some changes in staff and the activities to be undertaken within action C2 were not continued after February 2016, thus the responsibility for the activities and the budget were transferred to other beneficiaries.
- CFS / CUFAA - Administrative difficulties associated to the shift from Corpo Forestale dello Stato and Carabinieri Forestali made the use of financial resources impossible, thus the budgeted expenses were made by IEA on behalf of CUFAA for the development of anti-poison activities.

In order to balance such changes the coordinating beneficiary and associated beneficiaries found solutions in order to ensure that expected results would be achieved and some of the beneficiaries have spent more than expected, thus bearing the responsibility of ensuring that the project was fully developed. This has led to the slight increase of the budget of the following beneficiaries:

- IEA: has undertaken some of the activities for action C2, C6, D2 and D4 that were foreseen in the budget for Coldiretti, CCFF, WWF and GR.
- GRUPO LOBO: has undertaken some activities within action C3
- FESTAMBIENTE: has taken full responsibility of action D6, and some activities for action C2, that were originally foreseen in the budget for Coldiretti and WWF.
- CONFAGRICOLTURA and CIA: have taken some activities for actions C2 and C4 originally only budgeted for Coldiretti.

A small income was reported by Grupo Lobo, amounting to 40.00€ for a fee to external attendees to the second Scientific meeting - Study and Monitoring Wolf (13-14 November 2013 in Bragança) organised within action A7. Comments on the total amounts reported for each category follow below, with explanation about overall costs per beneficiary.

### **6.1.1.1 Personnel costs**

The personnel cost category amounts to 1,666,467€, which represents 116% of the provisional budget for this category and 51% of the overall project expenditures.

Note that in the compilation of the financial statement we opted for filling up the optional column D4 (Action in the project), but some staff members were assigned for the implementation of different actions. In such cases when the daily rate in the provisional budget for the different actions was the same the staff member was reported in one line with many actions reported in column D4, while if the daily rate in the provisional budget was different for the different actions implemented by the same person different lines were used, in order to account for discrepancies between the provisional and actual daily rate. *[Omissis]*

### **6.1.1.2 Travel costs**

The total amount spent for the Travel and Subsistence category amounts to 225,158€, which represents 61% of the total budget available for this category and 7% of overall project expenditure. The lower than expected expenditure had no negative impact on the technical development of the project actions.

As requested in the letter Ref. Ares(2015)3946820 - 24/09/2015, Monitoring visit of 23-24/06/2015, we explain in detail for each beneficiary concerned on which basis the km-costs for company cars are calculated. *[Omissis]*

### **6.1.1.3 External Assistance costs**

The total amount spent for the Travel and Subsistence category amounts to 666,636€, which represents 83% of the total project budget available for this category and 20% of total project expenditure. The lower than expected level of expenditure is mainly justified by the fact that for action C6 the dogs were purchased trained, and the dog trainer was only needed to rehabilitate the dog after surgery. Also the dog keeper is a member of staff of CFS and Carabinieri, thus there was no need for hiring one, and finally the scientific supervision was not needed as much as expected, given that CFS and Carabinieri Forestale have more experience than Polizia Provinciale, thanks to their participation to LIFE Antidoto and LIFE Pluto projects.

Note that for printing services, given they are of immediate implementation, the period of the service provided is not specified, as they are one-shot (always one day). *[Omissis]*

### **6.1.1.4 Durable goods (Equipment)**

The total amount spent for the Travel and Subsistence category amounts to 348,567€, which represents 101% of the total project budget available for this category and 11% of total project expenditure. *[Omissis]*

### **6.1.1.5 Consumables**

The total amount spent for the Travel and Subsistence category amounts to 63,811.50€, which represents 57.7% of the total project budget available for this category and 3.9% of total project expenditure to date. Level of expenditure is progressing as expected. *[Omissis]*

#### **6.1.1.6 Other costs**

Total expenditure amounts to 87,767€, which represents 91% of total project budget available for this category and 2.7% of total project expenditure to date. *[Omissis]*

## 6.2 Accounting system

Each project beneficiary has adopted a separated accounting system for the project, assigning a code for all expenses related to project implementation. The expenses are made according to technical needs and approved by the financial manager for each entity. In case expenses that are not foreseen in the provisional budget are needed a communication is forwarded to the coordinating beneficiary, with a technical justification. The coordinating beneficiary expresses an opinion on the justification provided and reminds that the ultimate decision on the approval of such expenses will be made by the EC during the evaluation of the final project report. For most unforeseen expenses an authorisation was asked to the EC.

All expenses made for the implementation of the project have also been recorded and reported in the financial reporting file provided by the EC, and in July 2015 the new version of the file was implemented.

Below is a table indicating for each beneficiary the codes associated to the project expenditures and the name of the persons authorising expenses and payments.

<b>Name of coordinating/ associated beneficiary</b>	<b>Cost account (e.g. code name or number, capitolo di spesa etc.)</b>	<b>Name / function of person authorising payment at present</b>
IEA	Gestione nr. 157	Valeria Salvatori, General Secretary
PROVINCIA DI GROSSETO	Progetto LIFE MEDWOLF codice 1003H	Dr. Fabio Fabbri/ Dirigente dell'Area Sviluppo Rurale e Turismo until December 2015, then Mr. Emilio Ubalino, general secretary.
CFS / ARMA DEI CARABINIERI	Cesare Patrone, Capo del Corpo until december 2016, then Ministry of Economy CODICE CONTO: 123002 Attrezzatura Varia e Minuta - 124002	Cesare Patrone, Capo del Corpo until december 2016, then Gen. Stefano Spagnol
CIA GROSSETO	Macch,Ufficio elettrom. ed elettroniche - 305092 Costi Progetto Medwolf	Enrico Rabazzi, President CIA
COLDIRETTI GROSSETO	Gestione nr. 01	Francesco Viaggi, Presidente Coldiretti until December 2015 and then Marco Bruni, president.
CONFAGRICOLTURA GROSSETO	Centro di Costo nr. 10	Antonfrancesco Vivarelli Colonna Presidente Confagricoltura GR until January 2016, then Attilio Tocchi.
CIRCOLO FESTAMBIENTE	Gestione nr 40.01.057	Barbara Presta /Administration responsible
WWF ITALIA ONLUS	LIFE MEDWOLF	Bruno Carlo Ravaglioli - Direttore Amministrativo e Finanziari
GRUPO LOBO	CGD LIFE - 0035 0824 0001154433072	Francisco Petrucci Fonseca, President



Name of coordinating/ associated beneficiary	Cost account (e.g. code name or number, capitolo di spesa etc.)	Name / function of person authorising payment at present
Facultade de Ciencias Universidade de Lisboa	PI-MEDWOLF (0102500172)	Payments can be authorized by one person from the Administration Board: - José Martinho Simões - Director - Jorge Lobato - Executive Director - Paula Montenegro - Coordinator of the financial department
INIAV	5856500000	Maria Helena Cardoso
IPCB/ESACB	P128-Prj MEDWOLF	Carlos Maia / President
ALDEIA	CC101	Fábia Azevedo / Administration responsible

All documents supporting expenses bear the reference to the project (except for payment of salaries for personnel) through inclusion of the project acronym (LIFE11NAT/IT/069). For the Italian partners the CUP (C41H1000000004) when relevant and required by the Italian legislation. Documents are checked by IEA and requests for modification in case such information is not included are made. In cases when the insertion of project code is impossible because of the electronic system for issuing invoices, a stamp has been produced with the project code, and it is inserted by the relevant beneficiary. A unique number ID is identified and highlighted in the accounting document for identification and cross reference with the expenditures reported in the financial reporting file.

Working time was registered using the time sheets (TS) provided by the EC. For the following beneficiaries an internal electronic system for registering presence was available: Provincia di Grosseto, FCUL, ESACB, INIAV. For the other beneficiaries the hours worked were reported by the staff member daily and checked by a responsible person able to certify that the time declared corresponds to reality at the end of the month. Time devoted to single project actions were also recorded since the beginning of the project using separate files. Such information is included in the individual time sheets from July 2015.

The yearly gross salary was always updated at the end of the reference year, inserting a real cost as reported by the human resources departments (or employment consultant). Such cost never included IRAP for the Italian beneficiaries. The total yearly number of working hour was also updated at the end of the reference year, by either summing the hours reported in the time sheets (if available for the 12 months) or inserting the values declared by the staff member and/or the human resources department.

### 6.3 Partnership arrangements

Partnership agreements included 23 articles.

Art. 15 describes the obligation of associated beneficiaries for reporting the statement of expenditures. Each beneficiary is expected to provide financial statement quarterly each year. Additional updates are requested in occasions of monitoring visits and reporting to the EC. A time lapse of 2 working weeks is allowed for delivering updated statement of expenditures (e.g., 20<sup>th</sup> of April each year for expenditures updated to 31<sup>st</sup> of March). Each beneficiary fills in the financial reporting file, which is checked by IEA administrative responsible (M.A. Mameli and then S. Nisticò) and in special occasions, such as the preparation of mid term report, additional support was provided by ad hoc consultants S. Palazzani and S. Nisticò, and a final check was made by project responsible V. Salvatori.

Art. 16 describes the criteria for expenditures to be eligible by the EC, as reported in the Common Provisions.

Art. 17 regulates transfer of EC funds from the coordinating beneficiary and the associated beneficiaries. It provides for the first pre-payment to be transferred to each beneficiary in two instalments: the first amounting 20% of EC co-financing for each beneficiary upon signature of the partnership agreement and receipt of a payment request. The second 20% is only paid on condition that at least 70% of the funds transferred are effectively spent and on condition that the financial statements are correctly filled in (assistance from IEA staff is provided for correcting errors). The second payment is transferred to each beneficiary in the same measures the coordinating beneficiary receives it from the EC: 40% of the EC co-financing on condition that 150% of the first two payments are effectively spent and that the EC has approved the mid-term report and has transferred the second payment to the coordinating beneficiary.

The payment of the balance will only be made upon receipt of the final payment by the EC, after approval of the project final report.

### 6.4 Auditor's report/declaration

A call for tenders has been sent to three experienced external auditors and based on the financial and technical offers received, an agreement was made with Mr. Massimo Lucii, who has performed the overall project's expenditures auditing report according to the instruction provided in the Common Provision and using the reporting template provided by the EC (Annex 38). Mr. Lucii is based in Sarzana (SP) via Sarzanello 226, and listed in the registry of accountants in La Spezia with registry nr 115 since 27/3/1987, he is also listed in the National registry of auditors within the Ministry of Economy with registry nr. 33301 (G.U. N 31 bis of 21/4/1995).

### 6.5 Summary of costs per action

The table below reports the costs incurred to date for the implementation of each action, making direct reference to costs foreseen in form FB of the project budget. Comments for actions that costed more than expected, in any cost category, will follow.

Action number and name	Foreseen costs	Total spent	Difference
<b>Azione A1</b> <i>Kick off meeting and detailed project plan preparation</i>	6.913	8.556	+1.643
<b>Azione A2</b> <i>Ex-ante detailed survey of wolf presence in the Portuguese project areas</i>	118.901	160.833	+41.932

Action number and name	Foreseen costs	Total spent	Difference
<b>Azione A3</b> <i>Ex-ante survey of damages suffered in the Portuguese project areas</i>	46.088	41.885	-4.203
<b>Azione A4</b> <i>Ex-ante survey of damages suffered in the Province of Grosseto</i>	14.640	24.486	+9.846
<b>Azione A5</b> <i>Estimation of potential expansion areas in Portugal</i>	47.251	28.496	-18.755
<b>Azione A6</b> <i>Estimation of potential expansion areas between Apennines and lowlands in Grosseto Province</i>	22.560	23.494	+934
<b>Azione A7</b> <i>Training of wardens for detection of wolf presence and illegal hunting activities in Portugal</i>	15.865	15.025	-840
<b>Azione A8</b> <i>Training of wardens for detection of wolf presence and illegal hunting activities in Italy</i>	20.504	16.383	-4.121
<b>Azione A9</b> <i>Training of relevant personnel for damage assessment and trust building in Portugal</i>	2.408	1.792	-616
<b>Azione A10</b> <i>Training of relevant personnel for damage assessment and trust building in Italy</i>	32.857	43.289	+10.432
<b>Azione A11</b> <i>Ex-ante survey on the knowledge level and attitudes towards wolf presence in Portugal</i>	20.615	11.103	-9.512
<b>Azione A12</b> <i>Ex-ante survey on the knowledge level and attitudes towards wolf presence in Italy</i>	71.400	47.434	-23.966
<b>Azione C1</b> <i>Selection of beneficiaries and delivery of livestock guarding dogs in Portugal</i>	99.458	90.205	-9.253
<b>Azione C2</b> <i>Selection of beneficiaries and delivery of livestock guarding dogs in Italy</i>	131.600	108.676	-22.924
<b>Azione C3</b> <i>Installation of fences as prevention measures in Portugal</i>	137.338	183.512	+46.174
<b>Azione C4</b> <i>Installation of fences as prevention measures in Italy</i>	283.416	346.240	+62.824
<b>Azione C5</b> <i>Control of poison and anti-poaching activities in Portugal</i>	98.847	50.412	-48.435
<b>Azione C6</b> <i>Control of poison and anti-poaching activities in Italy</i>	174.282	153.822	-20.460
<b>Azione D1</b> <i>Assessment of the efficacy of damage prevention structures and livestock guarding dogs in Portugal</i>	26.904	43.798	+16.894
<b>Azione D2</b> <i>Assessment of the efficacy of damage prevention structures and livestock guarding dogs in Italy</i>	43.780	48.057	4.277
<b>Azione D3</b> <i>Assessment of wolf presence in expansion areas in Portugal</i>	118.875	88.315	-30.560
<b>Azione D4</b> <i>Assessment of wolf presence in expansion areas in Italy</i>	35.466	62.344	+26.878
<b>Azione D5</b> <i>Ex-post survey on the knowledge level and attitudes towards wolf presence in Portugal</i>	19.033	10.709	-8.324
<b>Azione D6</b> <i>Ex-post survey on the knowledge level and attitudes towards wolf presence in Italy</i>	69.510	28.225	-41.285
<b>Azione D7</b> <i>Assessment of socio-economics impact of the project and ecosystem functions in the project areas</i>	0	0	0
<b>Azione E1</b> <i>Project website</i>	39.683	38.247	-1.436
<b>Azione E2</b> <i>Communication campaign on conflicts mitigation in Portugal</i>	73.682	108.636	+34.955
<b>Azione E3</b> <i>Communication campaign on conflicts mitigation in Italy</i>	320.863	284.340	-35.523
<b>Azione E4</b> <i>Networking with other LIFE and non LIFE projects</i>	17.288	22.938	+5.650
<b>Azione E5</b> <i>Iberian Wolf Congress</i>	13.122	17.181	+4.059
<b>Azione E6</b> <i>Workshops on best practices for management of wolf at population level</i>	11.687	1.908	-9.779

Action number and name	Foreseen costs	Total spent	Difference
<b>Azione E7</b> <i>International symposium on wildlife damage prevention</i>	18.470	14.231	-4.239
<b>Azione E8</b> <i>International Working Group on Damage prevention and trans-boundary Working Group on assessment of wolf presence and abundance</i>	77.035	75.475	-1.560
<b>Azione F1</b> <i>Project coordination and management</i>	716.321	759.025	+42.704
<b>Azione F2</b> <i>Project Implementation</i>	209.878	157.406	-52.472
<b>Azione F3</b> <i>After Life Plan</i>	0	0	0
<b>TOTAL</b>	3.156.539	3.117.478	-32.148

The table reports foreseen costs as included in form FB of the project budget, and final costs incurred. Comments on exceeding expenses are given below: *[Omissis]*.

## **7. Annexes [Omissis]**

### **7.1 Deliverables**

Annex 1 – Dog Database for Portugal (Action C1)  
 Annex 2 – Dog Database for Italy (Action C2)  
 Annex 3 – Final Technical report (Action D1)  
 Annex 4 – Final Technical Report (Action D2)  
 Annex 6 – Layman's report in English / Portuguese (Action E3)  
 Annex 7 – Press clippings in Portugal (Action E2)  
 Annex 8 – Press Releases in Italy (Action E3)  
 Annex 9 – Press clippings in Italy (Action E3)  
 Annex 10 – Scientific publication (Action E3)  
 Annex 11 – Layman's report in English / Italian (Action E3)  
 Annex 12 – Book of abstracts for Iberian Wolf Congress (Action E5)  
 Annex 13 – Minutes of the 2<sup>nd</sup> meeting of the DP-WG (Action E8)  
 Annex 14 – 4<sup>th</sup> issue of CDP Newsletter (Action E8)  
 Annex 15 – Minutes of the 3<sup>rd</sup> meeting of the DP-WG (Action E8)  
 Annex 16 – 5<sup>th</sup> issue of CDP Newsletter (Action E8)  
 Annex 17 – 6<sup>th</sup> issue of CDP Newsletter (Action E8)  
 Annex 18 – After LIFE conservation Plan (Action F3)  
 Annex 21 – Reports of study tours (Action E4)

### **7.2 Administrative Annexes**

Annex 41 – Table with staff roles and working days (Action F1)  
 Annex 38 – Independent Audit Report  
 Annex 43 – Amendments to the partnership agreements  
 Annex 5 – Explanation for late purchase of second hand car by Festambiente (Action E3)

### **7.3 Dissemination Annexes**

Annex 28 – Posters and ppt presented at scientific meetings (Actions E2, E3)  
 Annex 29 – Leaflet on how to behave in presence of a Livestock Guarding Dog (Action E3)  
 Annex 30 – Leaflet on DifesAttiva (Action E3)  
 Annex 31 – Inserts on National newspaper La Repubblica (Action E2, E3)  
 Annex 32 – Articles on the agricultural associations magazines (Action E3)  
 Annex 33 – List of schools where activities were undertaken (Action E2, E3)  
 Annex 34 – CDP Newsletter Article on stakeholders meetings (Action E2, E3)  
 Annex 36 – Gadgets produced for International symposium (Action E7)  
 Annex 37 – Booklet for kids tale “Spezzaferro” (Action E3)  
 Annex 39 – Book of Abstracts for the International Symposium (Action E7)  
 Annex 40 – Carnivore Damage Prevention Newsletter Issues nr. 7 and 8 (Action E8)

### **7.4 Other Annexes**

Annex 19 – Technical report Action A6  
 Annex 20 – DifesAttiva Statute and Business plan  
 Annex 22 – Anti-poaching and anti-poisoning strategy (Action C5)

- Annex 23 – Technical report Action D3
- Annex 24 – Technical report Action D4
- Annex 25 – Technical report Action D5
- Annex 26 – Technical report Action D6
- Annex 27 – Indicator table for socio-economic and ecosystem impact (Action D7)
- Annex 35 – List of action implementation indicators (Action F2)
- Annex 42 – Protocol for anti-poison activities in Grosseto (Action C6)
- Annex 58 – Replies to letters from the European Commission

## **8. Financial report and annexes**

- Annex 44 – Financial documents coordinating beneficiary IEA, Action F1
- Annex 45 – Financial documents associated beneficiary GR, Action F1
- Annex 46 – Financial documents associated beneficiary GL, Action F1
- Annex 47 – Financial documents associated beneficiary FCUL, Action F1
- Annex 48 – Financial documents associated beneficiary ESACB, Action F1
- Annex 49 – Financial documents associated beneficiary INIAV, Action F1
- Annex 50 – Financial documents associated beneficiary ALDEIA, Action F1
- Annex 51 – Financial documents associated beneficiary WWF, Action F1
- Annex 52 – Financial documents associated beneficiary FESTAMBIENTE, Action F1
- Annex 53 – Financial documents associated beneficiary CIA, Action F1
- Annex 54 – Financial documents associated beneficiary COLDIRETTI, Action F1
- Annex 55 – Financial documents associated beneficiary CONFAGRICOLTURA, Action F1
- Annex 56 – Financial documents associated beneficiary CFS, Action F1
- Annex 57 – Project consolidated financial statement and request of payment, Action F1