DESCRIPTION OF ACTIONS

Project description

LIFE BOREALWOLF conveys information about wolves and their behaviour, promotes local interaction and provides tools for the prevention of adverse impact and losses caused by wolves. The coexistence of people and wolves in specific regions causes concerns, fears and, occasionally, also losses of dogs and domestic animals. Strong opinions and emotions are associated with wolves, and discussions easily become heated, especially in social media. The wolf is a threatened species in Finland, and the wolf population is not at a favourable protection level. Reaching a vital wolf population is a challenge if people feel that they cannot coexist with wolves.

The LIFE BOREALWOLF project has three main objectives:

1. The project reduces any negative impact associated with the presence of wolves, such as fears, concerns and any losses of dogs and domestic animals.
2. The project increases the acceptability of wolves in society.
3. The project develops tools for wolf population management, such as preventing the illegal killing of wolves.

The LIFE BOREALWOLF project aims to improve the coexistence of people and wolves. Human coexistence with large carnivores requires that people are provided with information and support. Well-functioning cooperation between citizens, contact people for large carnivores and appropriate authorities ensures that wolves are monitored, their visits to yards are prevented actively and proper responses are made to repeated visits before wolves cause any danger.

The LIFE BOREALWOLF project started on 1 October 2019, and it will end on 30 September 2025.

LIFE BOREALWOLF project partners

The Natural Resources Institute Finland (Luke) is the project coordinator. Luke ensures that the project proceeds as planned, monitors project activities and takes care of reporting, financial management and communication. Furthermore, Luke develops DNA monitoring and modelling tools for population management and participates in the development of a network of contact people for large carnivores.

The Finnish Wildlife Agency (FWA) focuses specifically on the prevention of losses and cooperation in wolf regions. For example, it develops the network of contact people for large carnivores and territory cooperation groups. The Finnish Wildlife Agency's LIFE

BOREALWOLF planners cooperate with people living in wolf regions in the prevention of losses.

Metsähallitus (MH) is responsible for events held for media representatives and participates in communication activities and the prevention of the illegal killing of wolves. A game warden from MH forms the other member of the two-person patrol working in Eastern Finland.

The Eastern Finland Police Department (Police) plays a central part in the prevention of the illegal killing of wolves. A police officer is the other member of the two-person patrol working in Eastern Finland.

The Uusimaa district of the Finnish Association for Nature Conservation (FANC) will arrange media events and school visits in the Western Uusimaa region in 2021 and 2022.

Each of these parties has their own areas of responsibility, while they work in close cooperation within the scope of each theme. The LIFE BOREALWOLF project employs some 50 people, seven of whom are full-time project employees.

The project funding and budget

The project has received funding from the EU LIFE programme (LIFE BOREALWOLF, LIFE18 NAT/FI/000394). The project is also funded by the Ministry of Agriculture and Forestry, the Ministry of the Environment and the project organisations. The Central Union of Agricultural Producers and Forest Owners (MTK) funds activities that aim to protect domestic animals and prevent any losses.

Financier	Sum
EU LIFE programme	3 019 000 €
Ministry of Agriculture and Forestry	720 000 €
Ministry of the Environment	50 000 €
MTK	30 000 € *
Project organisations	1 696 000 €
Total	**5 515 000 €**

* MTK funds activities that aim to protect domestic animals and prevent any losses.

The project budget is presented according to the main themes of the actions

Themes	Sum	Share of the total budget
Wolf population monitoring development (A1, C1)	1 155 000 €	21 %
Interaction and cooperation in wolf-areas (A1, C4)	505 000 €	9 %
Wildlife patrol in Eastern Finland (C6)	850 000 €	15 %

Mitigation of damages caused by wolves (A1, A3, C3)	1 198 000 €	22 %
Modelling tools for wolf population management (C2, C5)	357 000 €	6 %
Project communication (E1, E2)	764 000 €	14 %
Project monitoring and administration (A2, D1, D2, D3, D4, F1)	326 000 €	6 %
Overheads	360 000 €	7 %
Total	**5 515 000 €**	**100 %**

Action A.1: Action plan

Responsible partner: Luke

Participants: Luke, FWA, FANC, MH, POLICE

Timeframe 2019-2020

Objectives: This action collects data and background information, and describes background and target reasoning actions, timeframes and partner roles for the conservation actions. The concrete actions are sharing common targets of an improved conservation status of the wolf population in Finland through a higher public acceptance of wolves. The most important afterlife impacts of conservation actions are expected to be that 1) the number of reproductions will stay constantly above the minimum of 25, 2) a transparent and trustworthy monitoring method reporting the status of breeding population is in use, 3) a permanent decrease in poaching levels and 4) less wolf-caused livestock damages. These results will be achieved by developing the DNA based wolf pack monitoring methodology and enhancing the voluntary large carnivore observer network, and by identifying and compiling best damage prevention methods suitable to Finnish conditions.

This action will produce a working plan for DNA -based pack monitoring, including guidelines on the sampling protocol. As to gather knowhow on best practices in DNA monitoring for the basis of the working plan, the project will invite international experts to a workshop in Helsinki, in January 2020. The workshop will discuss sampling and analysis protocol and evaluate the most appropriate methods for the Finnish conditions. In addition, the workshop will enhance the planning of future Scandinavian cooperation in monitoring transboundary movements. It will also strengthen the relationships towards Russian and German colleagues.

This action will also produce a strategy for transboundary wolf population monitoring through sample and methodological co-operation on wolf packs closest to the reindeer husbandry area (RHA) and wolves dispersing through RHA together with other organizations involved in Scandinavian wolf monitoring.

Authorities from Finland, Sweden and Norway in charge of the large carnivore governance and management meet on a regular basis to share information and knowhow, and to discuss common issues concerning large carnivores. The experiences of the practices and modelling tools produced in this LIFE project will be shared in this Nordic forum during the regular meetings, in parallel with this project.

The project staff from Luke and FWA will produce a plan on how to update the educational materials on large carnivore observer network, to compile the materials into a web-based training e-course with multimedia materials, and to develop a certificate system. The plan will also include a strategy on how the training and feedback events (using the new education materials) for new network members will be arranged.

The project will review the variety of the damage prevention methods worldwide and the available scientific evidence of the associated effectiveness. The review also maps the methods used and developed in the other European countries and discuss the best practices for damage

prevention of pets and domestic animals, especially cattle and sheep. The data will be collected from scientific literature (articles, meta-analyses), grey literature (e.g. project reports) and relevant webpages focusing on the guidance given to prevent large carnivore damages). The gathered information will be used as background information to lay out a plan for building a damage prevention toolbox guide and show the links from this project to other European large carnivore LIFE-projects.

Dissemination

The plans and assessments produced in this action will be published on the project homepage, and disseminated at meetings with stakeholders, scientist and authorities at a local, regional, national and international level.

Deliverables

2020 Working plan on the development of DNA-based pack monitoring in Finland.

2020 Plan on how to update the educational material on carnivore observation, to compile it into a web-based training course with multimedia materials, and to develop a certificate system

2020 Working plan for compiling damage prevention toolbox and releasing it as an electronic guide.

2020 An evaluation report on the Best practices used in wolf conservation in Europe

2020 Media release on the Best practices used in wolf conservation in Europe

Action A2: Survey on the people's acceptance towards wolf

Responsible partner: Luke

Participants: Luke

Timeframe 2019-2020

Objectives: The main objective is to determine the onset level of the views held by the Finnish (adult) population about the wolves and the conservation. The views will also be determined in the end of LIFE BOREALWOLF to evaluate what influence the project has had on the views.

It is important to explore the situation in the beginning of the project in order to recognize the key perceptions of the various segments of the population. This helps to formulate the key messages and choose the most relevant media channels for key target groups and reach the

segments that are most willing to collaborate with the project participants. The overall goal is to collect information that helps to direct the conservation actions and dissemination action more efficiently.

Activities: A survey will be conducted among a random sample of Finnish internet panelists of the market research company. The sampling procedure and the questionnaire form will be planned, and the results will be reported, by the project group.

Deliverables

2020 Media release on people's acceptance towards wolves

2020 General newspaper article on people's acceptance towards wolves BEFORE LIFE BOREALWOLF

2020 Scientific report on the results from the survey on the people's acceptance towards wolves at the beginning of the project

ACTION A3: Background investigation on damage-mitigation costs

Responsible partner: Luke

Participants: Luke

Timeframe 2020

Objectives: The magnitude of economic losses and the variety of the sources related to the mitigation of wolf-related harm and damages will be examined among livestock producers in the Southern Finland. The damages have most often occurred in sheep farms in the Western and South-Western Finland, but there have also been incidents for farms with other type of animals (i.e. having cattle, horses etc.), and also in the farms locating in the Eastern Finland.

Economic wolf damage mitigation losses experienced and expected by livestock producers are not formally monitored or covered by the current Finnish damage compensation system. Examples of undocumented costs include e.g. personnel costs of the actions that aim at building and maintaining full functionality of the large carnivore electric fences around pastures during summertime. Identification of the variety of the mitigation tasks not covered by compensation system, resources needed to complete the task, and realistic estimates of (net) costs help to define the challenges of the current mitigation and damage compensation arrangement. The examination of the issue together with best practice guidance of mitigating damages will help to find solutions that enhance local people's tolerance and acceptance of

co-existence. With this action, we're collecting background data to target information materials and to mitigate harmful aspects.

Activities:

Interviews: The examination start by collecting *in situ* interview data (10-15 informants) on-site, i.e. on the pastures of the farms that are either building the large carnivore electric fences or maintaining one. The data describes the variety of the mitigating measures taken (variety of the tasks completed) by informant livestock producers and help to define measurements needed to quantify the resources (time, money) used.

Internet survey: The examination continues by conducting an internet survey. The survey data describes the prevalence of the taking each mitigating measures by livestock producers in Southern Finland and enable the estimation of the associated costs. The data will be collected from randomly selected 200 livestock producers in 10 wolf territories in Southern Finland, and that of all the producers' farms in the region that have received large carnivore electric fence material during the last five years from the FWA.

Deliverables

2020 Popularized report on the voice of everyday farmers. The report will be disseminated in project's and partners' websites and social media accounts.

2020 Media release on damage-mitigation costs for livestock producers

2020 Scientific report or Master thesis (in Finnish with English abstract) on the key result from all the themes in the interviews and the survey.

ACTION C1: Applying newly formulated cost-effective genetic family group monitoring

Responsible partner: Luke

Participants: Luke

Timeframe 2020-2025

Objectives: Luke delivers annually an estimate on the wolf population in Finland. Including a larger proportion of existing or newly arising wolf territories into the genetic monitoring scheme will increase the accuracy of both the population estimate and the scenario models used in the population management. Broadly trusted genetic monitoring will also decrease the mistrust or doubts voiced concerning the estimated status of a given territory, i.e. is there a breeding pack or only a pair without offspring. To achieve an extended coverage of territories included in the genetic monitoring field samples will be collected by permanent field workers and by newly educated volunteers. Wolf management coordinators will also participate in the data collection and in motivating the volunteers.

In order to obtain as comprehensive field data as possible from all territories occupied by pairs and family packs in the project area, new territories must be incorporated into the genetic monitoring program. Comprehensive genetic monitoring based on voluntary field work calls for cooperation among volunteers and experts. This, together with an effective public outreach, will increase the understanding of the processes and reliability of the monitoring and population estimation. This action supports the management strategy estimation models by producing accurate demographic and genetic parameters. This action serves to provide knowledge about the role of Finnish wolf family packs for the viability of the Fennoscandian meta-population, which is critically relevant information for transboundary wolf population management. Therefore, this action is targeted to the Ministry of Agriculture and Forestry, the Finnish Wildlife Agency, NGOs, the scientific community of large carnivore contact persons and the general public.

Dissemination

This action improves the public trust of the annual national wolf population estimate, primarily through popularization and open discussions on the DNA-results.

After Life

In the future, Luke will use the monitoring protocol developed in the project on an annual basis, as to get reliable information on the number of reproductions and as to manage the public discussions around methods and the monitoring results. Luke will allocate sufficient resources for transparent and regular communications with volunteers that are contributing to the data collection. Luke's permanent field personnel will also take part in the monitoring program roughly by the same volume as during the project. The new monitoring protocol, including the annual genetic analyses, will be supported by Luke's financing.

The engagement of the volunteers collecting DNA samples in the field will be promoted by a regular exchange of information, and by a possibility of further education. The willingness of the volunteers to conduct the field sampling will be followed up by Luke and FWA so that challenges can be met proactively. The goal is to maintain a 100% coverage of the sampling area in the wolf pack territories after the LIFE project.

Deliverables

2020	2 articles in general papers about the methodology and why to collect DNA and how to participate (to increase involvement of volunteers)
2021	2 articles in general papers (feedback on the volunteer involvement and DNA results)
2022	Technical report (the methods taken in operation for territory level monitoring and the process of result analysis)
2020	2 Webinars (how population monitoring for wolf is done, how DNA analysis works and how to study breeding events based on that)
2020-2023	4 x Press release about onset of the DNA sample collection season
2021 and 2022	2 webinars (general presentation of the use of DNA sampling in large carnivore observation; how to use open access webpage for looking at the national level results)
2022-2024	4 articles in general magazines (monitoring results, volunteer involvement and experiences, use of results, stories of territory history)
2022	Scientific manuscript about DNA methodology for wolf breeding events monitoring

ACTION C2: Developing tools to forecast and target management procedures

Responsible partner: LUKE

Participants: Luke, FWA, MH, Police

Timeframe 2020 –2023

Objectives: The main objective is to develop tools for the actual conservation actions through developing a set of predictive computer tools in two separate work packages.

Tool to control illegal killing by spatially and temporally estimating its extent, predicting priority targets for monitoring and control

Objective: The tool will provide wildlife guards/police, volunteer network contact persons a basis to identify areas with the highest illegal action risk. The authorities can focus patrolling and other actions in high risk areas, thus, increasing the detectability of a poacher and enabling the patrol to get more up to date technical evidence. Public widespread knowledge of the existence of this tool in use in patrolling will possiby also decrease the probability that a potential lawbreaker would commit a wildlife crime.

Luke is currently developing a new wolf population estimation tool based on a target tracking algorithm through internal funding. The tool uses wolf observations collected by volunteer citizens to update the estimate of the size and spatial distribution of the Finnish wolf population in real-time. In this action, the algorithm will be developed further and implemented in such a way that it will enable probabilistic predictions on wolf movement and wolf observations. The prediction is presented as a probability distribution and is comparable to a probabilistic weather forecast. Combined with previous data on illegal killing, the prediction will be able also to estimate the spatiotemporal variation of illegal killings. The output will be visualized using an interactive map for mobile devices.

Comparison of predicted and realized wolf observations can also be used to guide both wolf population monitoring and the investigations of illegal killings in the following ways:

1) When an unexpected wolf sighting is reported (e.g. in an area that typically has low wolf activity), the observation will be flagged as preliminary until an expert has confirmed the observation.
2) When wolf observations are not realized where predicted, the area would be flagged as a potential site of illegal killing that warrants closer inspection by local authorities.
3) The algorithm will learn from and adapt to the above cases, in order to make more accurate predictions in the future.

Management Strategy Evaluation (MSE) tool

Objectives: The MSE tool considers uncertainty about population dynamic parameters and natural variation. Thus, management plans that are less sensitive to uncertainty about population size can be identified, and disputes about population size become less relevant.

This increases stakeholder cooperation and public acceptance of wolf presence, and reduces the societal tension surrounding wolves and the monitoring of the wolf population.

An additional objective of the new tool is to mitigate the harmful aspects of wolves being present. Worry and fear can be defined as one of the performance statistics, used to evaluate and compare management plans. The MSE approach can help to identify management plans that reduce worry and fear. The framework will model the mechanisms leading to dog and livestock damages by connecting them to the wolf population status and to preventive actions. As a result, management plans that reduce dog and livestock damages will be identified.

The third objective of this action is to support a decrease in occurrence of Illegal killings. The MSE tool will model the mechanisms leading to illegal killings. The uncertainty about these mechanisms will be taken explicitly into account in the simulation. As a result, management plans that would reduce the probability of illegal killing can be identified.

This action synthesizes the results of this project into a formal decision support tool that can be used in the future by the wildlife management authorities. In order to assess the performance of population estimation procedures, the ideal solution is to compare the estimates of population abundance to the true abundance. This is typically impossible in practice, because the true abundance can never be known for certain. The next best approach is to evaluate the estimation procedures in a virtual environment using computer simulation. An evaluation framework based on this concept is known as Management Strategy Evaluation (MSE). The MSE framework can be expanded from population assessment to comparison of management plans. A management plan can be seen as an algorithm for decision making: given the estimate of the current population state, what will be done?

The MSE tool will be developed for forecasting effects of wolf population conservation strategies. The tool will integrate information yielded in the project. The ecological component of the tool will be used in the multispecies management (wolf-ungulates) and the societal component will couple wolf population status to human attitudes and wolf-induced damages. Therefore, this action targets wildlife managers, scientists and other stakeholders widely.

The work will be organized as follows:

1. A one-day problem-framing workshop will be organised with stakeholders in order to provide a baseline of parameters to the model. A large variety of possible management action will be discussed and used in the model.
2. System modelling will test how alternative actions affect the wolf population and eventually translate to the performance statistics defined by stakeholders. The core of the system model is to describe the wolf-ungulate-bear population dynamics, which accounts also for the presence of other large carnivores. Additional dynamic components account for the relationship between the multispecies population status and performance statistics defined by stakeholders.
3. Evaluation of management plans. Each management plan is evaluated using a computer simulation. Uncertainty about parameters and natural variability of the population dynamics is accounted for by simulating thousands of potential trajectories. Performance statistics are summarised for each plan. Plans are then compared based on graphical

comparison of the performance statistics to identify the most appropriate compromise between potentially conflicting objectives.

The resulting simulation tool will be a computer program with a user manual. Depending on the speed of necessary computations, the tool can be used either interactively through a web-based user interface or a web-based interface can be used to visualize pre-run simulation results. The program will be maintained by Luke during and after the project.

Dissemination

Public knowledge of the use of the tool to control illegal killings in patrolling will decrease the probability that a potential lawbreaker would commit a wildlife crime. The tool itself is not public. Still, the more we can build trust around the tool by showing how it works and how the patrols use it, the more people trust the decisions made based on the information provided by the tool.

We will create communication material that involves key messages, simple examples and understandable infographics on how the tool works. The dissemination package can be used by police and game wardens when they present the tool to colleagues. Since the tool is novel internationally, we will also disseminate the information to Nordic large carnivore researchers and officials.

Since the MSE tool will support decision-making it is important that it reflects the ideas and visions of different stakeholders. The problem-framing workshop is the first step to disseminate the work. The workshop allows stakeholders to evaluate which problems the tool should tackle. This evaluation happens by asking the stakeholders which statistics and management actions they find important to be included in the model.

During the MSE tool development the team will stay in contact with the stakeholders and ask their opinion whenever a large-scale decision must be made. This way the tool builds up to be collective and shared. News about the progress of both tools will be updated on the project websites and in social media.

After LIFE

The interactive map/web application will be taken in everyday use by the police and Metsähallitus after the project. The MSE tool will be used as a decision support tool for the Finnish wolf management. It will be maintained by Luke and used by relevant decision makers.

Deliverables

2023 C2.2 MSE results: simulation tests of alternative management procedures, application to moose harvest planning piloted

2023 C2.2 Press release on MSE tool

2023 C2.1 Map/web application on assessing poaching probability is operational

2023 Deliverable C2.1 Communication materials (key messages, examples and infographics) ready

ACTION C3: Developing practical tools to manage wolf-related threats

Responsible partner: FWA

Participants: Luke, FWA, MH, Police

Timeframe: 2020–2025

Objectives: Responding to wolf encounters and educating people is crucial for preventing damages and increasing the acceptance of wolves. Wolf Management (WM) coordinators will support local wolf conservation and management by providing neutral information to local residents, sharing knowhow to animal owners and assisting in collecting data for population estimation.

The development of damage prevention is essential to improve the human-wolf coexistence. In this action, the project will also develop and distribute tools on preventing losses and threats to livestock and dogs. The development of new tools to prevent damages to dogs will decrease the risk of dogs being injured in wolf attacks, which in turn will improve the acceptance of wolves among hunters and the public. It will also enable hunters to continue using dogs in hunting and important related management tasks.

This action aims to reduce both the perceived risk and the realized damages caused by wolves. It will alleviate fear and reduce citizens' feel of injustice, inducing more positive attitudes towards wolves. An important feature for the overall success of the project is that WM coordinators will meet residents at their homesteads and in organised local events, which enables the local citizens to share their views on wolf-related issues more easily and to receive information about damage prevention and the project itself.

Building collaboration networks

During 2019–2020 FWA hires three regional WM coordinators that participate in various local events to establish cooperative networks with local actors of wolf management (e.g. territory cooperation groups and game management associations). The coordinators will work primarily in their own regions of responsibility (Western, Northeast and Southeast Finland), but in close collaboration with one another. **During 2021–2024,** WM coordinators continue to participate in various regional events to share wolf-related information and to enhance collaboration with local stakeholders (e.g. associations for hunters and farmers, local municipalities).

Toolbox of damage prevention measures suitable to Finnish conditions

During 2020, Know-how and praxis from both national and international sources will be collected based on studies and collaboration with wolf-related LIFE-projects. Information exchange and education to the staff in Finland will be organised in cooperation with international experts. Based on written reports, project partners' expertise on Finnish conditions, and knowledge exchange with international experts, the suitability of different protective measures in Finland will be assessed. From within EU, we will utilize data from wolf

management plans (e.g. from Estonia, Sweden and France), and collaborate closely with organisations such as the Swedish Wildlife Damage Centre (*Viltskadecenter*). We will also utilise an overview of electric fences and their effectiveness throughout the country, as well as current knowledge of any other tools for preventing livestock damage used so far.

In 2021, the best practises for the protection of domestic animals will be compiled to form a toolbox guide, and its first draft is published as an online version (available to any interested citizen). During 2021–2023, we will test different tools presented in the guide and add information about test experiences into the guide. This process will also provide demonstrative photos and instructions for applying the protective measures to be added in the guide. It will be useful for a variety of farms with different challenges and contexts. In addition, the guide will be useful for any non-commercial animal owners who wish to protect their domestic animals (sheep, cattle, horses, dogs etc.) from wolf attacks.

Different damage prevention equipment, such as motion-activated scaring devices using light, sound and scent, will be tested for use on farms with continuous wolf visits. WM coordinators will install devices to farms, use both offline and online trail cameras (video, images) to observe wolves' behaviour, and check up on the farms to see, how the equipment is working. Based on observed changes in wolf behaviour, scaring devices found most helpful will be added to the toolbox.

Damage prevention plans for livestock farms

In 2020, WM coordinators will assess the damage risks in areas, where wolves are newly established. They will map target areas and the location of electric predator fences currently in use. Networks established with local LCOs will provide useful local-level insight on the potential risk areas. Risks of attacks will be assessed to all types of farms (sheep, cattle or horses, or petting zoos). The risk assessment will take into consideration the number of animals and the location of the farm in relation to wolf territories. WM coordinators will also consider the fact, that young alpha pairs on newly established territories often seem most prone to cause damage to livestock.

In 2020–2024, WM coordinators will visit high-risk farms to plan protective measures with owners, using the toolbox guide. Risk areas will be re-evaluated annually throughout the project. Farm visits aim to offer expert consultation and knowledge for protecting livestock. WM coordinators will also give handouts to farmers with basic information on whom to contact and where to find more information (webpage addresses). In addition, best practices for livestock protection will be demonstrated to livestock owners at farms already using these tools.

Throughout the project, the WM coordinators will maintain a supply of rapid response fences to be deployed to farms at acute risk. Packages are delivered with only a few days' response time to farms needing immediate protection. Applications for fence materials will be accepted with the same criteria as in the current, state-supported system (value of protected livestock larger than expenses of the materials, an agreement from the farmer to uphold the built fence in operation for 5 years). WM coordinators will assure operability by instructing farmers on how to assemble and maintain the fences. A stock of lightweight fencing for rapid deployment will be acquired for temporary protection when building permanent electric fence.

Fieldwork to support data gathering and damage inspection

During 2020–2024, WM coordinators will help local damage inspectors in verifying observations and providing information to residents, when wolves visit homesteads or livestock pastures—and especially when damages have occurred. WM coordinators will collect DNA-samples (and additional samples when needed), and identify any potentially removable reasons for wolf visits at the farms. They will provide important support for the large carnivore observer (LCO) network and wolf monitoring research in areas with few observers or very frequent wolf visits, and the work will be carried out in close collaboration with the local observers as well as with the staff of Luke.

Developing protective gear for dogs

The purpose of the action is to develop and test a new model of protective vest which allows good mobility year-round while also providing adequate protection. The project will plan the features of the protective vest with hunters that hunt with dogs. The vest is ready for market in 2024, after the dog owners have tested it in practise. As it may be difficult to find a suitable operator to develop the traditional vests, the project might have to broaden the frames for the development of protective gear. The project will aim at choosing the most developable protective tool available that will benefit hunting dogs and their owners the most.

Dissemination

Throughout the project, FWA will disseminate information on wolf biology, distribution and behaviour, and the best protective practices through communication and local events organised within and outside LIFE BOREALWOLF. To educate key target groups, FWA will participate annually in approximately 30 invited events organised by stakeholders. A lot of working time will be allocated to face-to-face actions and swift communication with residents to de-escalate any situation, in which false information is spread. From the wolf observation system, FWA and Luke experts will acquire up-to-date information on the distribution of wolves and FWA staff will disseminate this to the residents of wolf-populated areas in events organised by local operators and with short articles offered to newspapers annually. TC groups are also encouraged to invite WM coordinators to participate in their meetings as expert visitors. WM coordinators and game planners will educate livestock and dog owners about attack prevention and damage compensation when they meet these people in their daily activities.

Communication is active and focuses on the practical work: a key aspect of communications is to assure that the locals know about the WM coordinators and what they do. Most important channel for this is through meetings and events, but also stakeholder organisations are utilized to reach locals. In addition, it will be pivotal to relate the experiences of the locals from this cooperation, in order to gain visibility for the project.

After LIFE

FWA will continue to implement the developed practical tools to manage the conflict. Game planners from FWA regional offices will continue to disseminate information to local people and to carry out necessary risk assessments to distribute protective fences and devices, acquired through the annual MAF-funded project for preventive measures. In addition, equipment acquired during the project will be lent to people in wolf territories needing these devices. Game planners will continue to advertise any well-functioning protective gear available for dogs. Overall, the FWA personnel will adopt the operating model of active communication used in this action to increase daily stakeholder communication. Dependent on funding received from MAF, FWA may be able to employ WM coordinator(s) also after the project.

Deliverables

2020 An article in general magazine about the dog vest seminar

2020 Media release about the project developing damage prevention methods for livestock

2021 First version of toolbox guide for damages prevention ready

2021 Media release about the online toolbox guide for damage prevention methods

2021 An article in general magazine about the rapid response supply of electric fence

2021 A report on the best damage prevention practices used in wolf conservation in Europe published

2024 Media release about developing protective gear for dogs

2024 An article in general magazine about the developing protective gear for dogs

ACTION C4: Development of collaborative working methods and public outreach

Responsible partner: FWA

Participants: Luke, FWA, MH

Timeframe: 2020–2025

Objectives: The large carnivore observer (LCO) network is a network of voluntary observers usually from the local hunting clubs. This network currently includes some 2 150 active observers (2019). However, the network is regionally sparse, and some observers are strained in conflict areas, where they have a larger workload than they can commit themselves to. It is therefore important to extend the LCO network to include also non-hunters, as this can locally 1) increase the quantity of observation data and DNA gathered, and 2) reduce the workload of individual observers. In addition, the accessibility of membership and transparency of the observation system will increase trust on the impartiality of the data collected. Additional DNA sampling training will improve the quality of population monitoring. A formal observation examination for volunteers will improve the status of LCOs as data providers and local experts, ensuring an adequate level of knowledge for all members of the network. A web-based course will increase the efficiency and accessibility of training, while training events will provide necessary conversational demonstrations e.g. for identifying tracks and excrement, strengthening the observer expertise. Ultimately, these actions will enhance the human–large carnivore coexistence.

The LCO network will be strengthened by recruiting new volunteer members and accepting membership of both hunters and non-hunters. The current network includes hunters that have been recommended for the position by local game management associations (GMAs). These persons have a valid hunting card and are members of one of the 282 GMAs in Finland. In the future, non-hunting people can be accepted too. The group of non-hunting voluntary observers will be included to the network and supervised by Luke under the same requirements of reliability and suitability for the task as hunters currently are.

Further, a web-based training course will be introduced followed by a formal exam with a certificate. The first modules of course materials will be updated during **2020**, and all basic modules will be published in an electronic format **by 2021**. Materials will also be compiled separately into suitable packages for organizing face-to-face training events. During the first events **in 2020**, feedback will be gathered from participants to fine tune the contents of the training materials. Additional modules will be developed **during 2021–2024** to be included in the online and training event materials. In addition, supplementary video materials (webinars) will be produced from field demonstrations. Observers are free to sign up for these special training modules. An advanced observer can train further to become a voluntary helper in wolf DNA-sampling. Training events are targeted both for the new network members and for those already acting in the network. Similarly, the training materials are made available online for all interested persons to view. Existing network members will be required to take the new course and exam by 2025.

Project partners will also plan and execute together updates for the current feedback materials, and new materials including the video materials from field demonstrations and further develop the interactive properties of the map-based web page that allows observers and citizens to see overviews of the observation data (www.riistahavainnot.fi).

Currently there are some 30 territory-cooperation (TC) groups established in the Finnish wolf territory areas. These groups round up local stakeholder representatives to discuss wolf-related issues in their region and to plan for local management actions. The existing network of local territory cooperation groups and their code of conduct will be developed further during the project. As a clear baseline of operation has been established for the TC groups, they will require significantly less assistance in the future. One of the key aspects of developing territory cooperation is to encourage TC groups to compose and plan for more concrete actions for themselves, that also will serve other local operators and the regional/national administration.

Dissemination

Information about the updated operating model of LCO network will be published on the web sites and in social media. It will also be disseminated through presentations and printed handouts at stakeholder events, school visits, seminars and exhibitions. This will serve the observation network and other authorities, such as public-safety answering points, by fewer "false alarm" contacts (non-urgent calls to LCOs, fewer mis-identified large carnivore observations).

The TC groups are informed about the LIFE BOREALWOLF project in 2020, as to understand the concept of the project, and to prepare for their new role as being "in-between" different local stakeholders. The project will also support group members to actively require information and share it forward.

After LIFE

The LCO network will require financing only for training events in the future. The e-course and exam will be maintained by FWA and the materials will be updated on a regular basis as a collaboration between Luke and FWA.

Support and materials for the TC groups will be provided by FWA. Group activities will be supported by national funding, which allows the groups to independently organise annual seminars in the future. FWA will continue to support the TC groups as a part of its regular work based on the annual budget. The goal is that TC groups are more motivated and able to work independently, so that the main role for FWA would be to set up and support new groups. The aim is to attain more effectiveness and purpose for TC, so that the members are motivated to continue, and the operating model is found even more useful than now. The concept of TC groups can be transferred to other EU-countries and to different environmental subjects. This is supported by producing the guideline materials during the project available online in English, Finnish and Swedish.

Deliverables

2020 Media release on engaging new volunteers to become LCO persons

2021 Article in general magazine about LCO course materials available to anybody – more detailed description

2022 New TC guidelines are published

2022 Article in general magazine about the working principles of the LCO network – more detailed description

2023 Article in general magazine about the updates and experience of LCO e-course – more detailed description

2023 Media release about an overview to TC groups and project work, aiming to add conspicuousness

2024 Article in general magazine about seminars organised for TC groups

2025 Article in general magazine about new modules to the LCO course materials – more detailed description; originally 4 articles bundled together

2025 x 3 webinars on a) how to sample DNA material, b) recognising carnivore tracks in the field, and c) how to use the large carnivore observation storage application

ACTION C5: Deploying a multispecies pilot approach for ungulate harvest management in wolf areas

Responsible partner: FWA

Participants: Luke, FWA

Timeframe: 2021–2025

Objectives

The purpose of this action is to:

1) Educate hunters to understand the concept of multispecies management

2) Test the prototype multispecies management approach in five local pilot areas

3) Further develop, based on pilot project experience, the approach for full-scale implementation of the multispecies management framework (MSE) tool

4) Implement local-level ungulate harvest management (UHM), accounting for large-carnivore presence and other elements of the complex (traffic accidents, forestry damage levels etc), in practice.

This action will provide a multispecies approach that utilises up-to-date simulation data and on-time population data in an interactive platform between managers and hunters. This approach, in which multispecies interactions and social dimensions are combined, provides a useful high-quality tool for managing a wildlife entity where predators and their prey interact in a human-dominated system, and it will be applicable also in other countries with different composition of species. This action will increase people's understanding of how ungulate management policy and hunting quotas are linked to the availability of prey for wolves and the risk of wolf attacking hunting dogs.

This new pilot approach on multispecies management will be implemented at all relevant scales: 1) Moose management areas (MMA), composed of geographic areas relevant for local population management of all ungulates, which in turn consist of several 2) Game Management Associations (GMAs), in which 3) local hunting clubs conduct harvesting.

The project will deliver education on i) The concept of multispecies management, including basics of the ecology of ungulate- large carnivore interactions, ii) The use of ungulate and large carnivore data in multispecies UHM planning, and on iii) The cooperation of hunting clubs in multi-species harvest management.

During 2021, UHM planners and other FWA project staff will prepare and execute educational events in areas, in which wolf predation influences ungulate harvest, or is expected to do so during the project timeline. At these events the multispecies management scheme and a working prototype of MSE tool will be presented to the local persons responsible for UHM. Out of the 60 MMAs, it is estimated that 30 will be impacted by wolves during the project, which

multiplies to ca. 150 GMAs and ca. 2 000 hunting clubs. For an adequate coverage, two educational events per MMA will be conducted (also involving hunting clubs), totalling in 60 events. Hunting clubs will also be presented with tools on how to collaborate towards the common goal of well-managed ungulate populations. The ultimate aim is to educate and build a large enough capacity of responsible persons in MMAs, GMAs and hunting clubs to develop and implement multispecies UHM planning in the future.

From 2022 onwards, annual updating and implementation of the UHM plans will be carried out by these trained local actors, supported by FWA. UHM plans will be adjusted annually in spring, when the estimate of post-hunting season population is available and permits for the following hunting season are applied for.

During 2023–2024, the new MSE modelling tool will be tested five MMAs. The pilost will be carried out in areas with varying ungulate and large carnivore densities to gain information from multiple management scenarios. Experience and feedback will be collected at local events, organised at the end of hunting seasons in both years. The feedback will be used to refine the modelling tool. During 2025, the MSE tool will be finalised simultaneously together with the updated educational material for the future use of the MSE implementation.

The education of persons involved in the UHM process is vital for the actual full use of the tool. It is necessary to provide professional education and dissemination of the modelling information to ensure that the local actors of UHM can account for wolves in the challenging social context. The densities of different ungulate and carnivore species and environmental conditions vary significantly from one region to another. Taking these preconditions into thorough consideration is possible only with a local approach.

Dissemination

MSE will provide a necessary scientific background on how to manage ungulate populations while accounting for large carnivore predation in a multispecies-societal complex. Disseminating this know-how to hunters and decision makers will mitigate the conflict arising from wolf predation on ungulate populations. Communication will also be directed towards local communities at large as the understanding of the benefits of having a viable population of large carnivores and ungulates side by side needs more attention. It will be of long-term benefit to local communities—especially farmers and hunters—that wolves, bears and other large carnivores have access to a prevalent wild food source. This will decrease the interest of wolves in livestock as a potential food source and decrease the likelihood of wolves considering dogs as competitors. Secondly, reasonable ungulate hunting opportunities decrease the perception of wolves as being competitors of hunters and discourage the illegal killing of wolves.

After LIFE

The multispecies harvest tool will continue to be applied annually by local operators of MMAs, GMAs and hunting clubs, incorporated into the current operation model of ungulate

management. After LIFE, the annual updating and implementation of the UHM plans—including MSE model information—will be carried out by these trained local actors. Game planners of FWA will provide supplementary training on a regular basis to employ new operators and to introduce any updates on the modelling output.

Deliverables

2021 Educational material for MMA events (presentation to introduce the concept of multispecies management and the prototype of MSE modelling)

2023 Educational materials on piloting the implementation of MSE modelling.

ACTION C6: Police and wildlife wardens enhanced patrolling and networking

Responsible partner: MH, Police

Participants: MH, Police

Timeframe: 2024

Objectives: During the last decades, the number of the illegal killings of wolves that has been reported to the police has increased. This is a result of the wolf population's expansion in the country into human dominated landscapes. The wolves' return has created a new kind of challenge, since wolves are, by some, perceived to be a threat to human safety. Nearly half of Finnish adults are reported to fear wolves. The presence of wolves has also enhanced the risk of damages to hunting dogs as current ungulate and hare hunting practices, developed during an era of wolf absence, are largely based on the use of dogs. In addition, wolves are viewed as a threat to domestic animals, causing concern and expenses to farmers. Losses may further motivate illegal killing, one of the major threats to the Finnish wolf population.

According to research, the observed wolf population trend is not explained by the estimated number of animals, their reported reproductions or known mortality. The human caused mortality plays a notable role. This conclusion is also confirmed by the known fate of GPS-collared animals. Further, the number of criminal cases reported to police and known cases of illegal killings indicate that poaching regulates the wolf population in Finland.

Metsähallitus and the police department in Eastern Finland will hire a wildlife warden and a policeman to work full time on preventing further illegal killings of wolves in Finland. The combined team of police and wildlife warden will work in both privately and state-owned areas and it will be able to act flexibly and respond fast when information concerning illegal killings is received. The team will conduct the first and the most important investigation actions at the crime scene. The local police department will provide analysed information of previous cases of illegal killings and tips that are informed to the police from local persons, which can be used to effectively target the patrolling to the areas which are so called hot spots. The project will support the team's work by providing a new tool through which the team can monitor the movements of wolves and focus their patrolling according to this information.

The patrol team will also help out locals where wolves have entered house yards or gardens and must be banished. This will support the work of local large carnivore contact persons and develop the process from the point that a wolf enters a yard to the point that it has been banished. Through these duties, local people feel that their fears and expectations are responded to and this can lead to more positive attitudes towards wolves.

The team will also take part in the wolf population monitoring and management actions, e.g. by counting wolf tracks and collecting DNA samples.

Dissemination

In the areas where most illegal killings occur, it is necessary to build confidential relationships between authorities, local people, village communities, hunters, hunting clubs and nature conservation NGOs. This can be achieved by long-term sharing of information concerning wolves between authorities and other actors and by arranging educational activities for hunters and volunteer hunting supervisors and through open discussions within the local communities. By building these confidential networks, the police and wildlife wardens will receive more information and tips from the public concerning illegal killings and other criminal behaviour committed against wolves. Local, trustworthy volunteer hunting supervisors will be activated and trained to make observations of signs of illegal killings and to take part in the population monitoring.
During the project, the procedures and skills for the network building, monitoring the illegal killings, investigation actions, population management and monitoring actions are widely distributed within the police force, and among wildlife wardens and borders guards.

The team will acquire a phone so that citizens can send tips and local information via text messages. The police and Metsähallitus will organize annual seminars for authorities concerning the project and to spread information about illegal killings. This ensures that the knowledge and skills acquired during the project circulate across the country for other authorities to use.

During the project, the team will share information of the project to other wildlife authorities and educate the lessons learned from the project, concerning investigation actions etc. An average of 60 new officers are educated during the project and 5-10 officers annually after the project.

After LIFE

After the project, the duties of the wildlife patrol will be implemented through routine police and wildlife warden duties and through pro-active communication, dissemination and education. During the project, every actor will nominate representatives to work closely together in their local areas in cases of wildlife crime. After the project, joint patrol members will conduct regular educational sessions at the state police college and training sessions in the field for these representatives, so that the project's actions can be expanded and implemented nationwide as a preventative measure against the illegal killings of carnivores.

The local network of local hunters and voluntary hunting supervisors built up by the wildlife patrol during the project will function independently after the project. These actions will be implemented with regular police budget funding.

Deliverables

2021 - 2024	4 yearly organized educational seminar for authorities on wildlife surveillance and cooperation
2024	Article in general magazine on the wildlife patrolling with a special focus on the wolves
2024	Media release on experiences of the new model on cooperation in wildlife patrolling

ACTION D1: Monitoring conservation actions

Responsible partner: Luke

Participants: Luke, FWA, MH, Police, FANC

Timeframe 2020-2025

Objectives: Impact monitoring actions are being used to measure and document the effectiveness of the project actions as compared to the initial situation, objectives and expected results. The outputs and impact of the project will be reported considering the Key project level indicators. Information on project impacts will be submitted at the time of the first report (Mid-term) and Final report.

Genetic monitoring will gradually be developed during this project. By adopting the developed monitoring scheme, the costs of monitoring per territory will decrease which enables a higher number of territories to be included in the genetic monitoring program. A broadly trusted genetic monitoring will also decrease the mistrust or doubts voiced concerning the estimated status of a given territory.

New tools to support the surveillance of possible illegal killings will be assessed annually through a number of measurable parameters. These tools will gradually be developed and taken into use during the project. Yearly reports on the development steps taken towards the tool and yearly reports on the use of the tool from the year the tool is available will be reported.

The management strategy evaluation (MSE) model will be developed so that it can integrate wolf-ungulate population dynamics model with management actions and performance metrics that are tested in this project. The aims is to have the MSE tool available for the wildlife management authorities for evaluating wolf management plans together with statistics of e.g. forestry damages and traffic accidents caused by ungulates. The assessment of the model will be based on the annual reports on the development steps taken towards the tool development, and annual reports on the use of the tool from when the tool is available for management and for pilot use in moose harvest planning.

Information workshops and face-to-face meetings on protective fencing and compensation procedures. Livestock owners will be presented with a questionnaire in 2020 and again in 2025, surveying their knowledge of the prevention methods available against wolf attacks and compensation system in case of occurring attacks. FWA staff will also record the number of planning and evaluation visits to farms, as well as the number of public presentations on livestock protection. Reports on the damage prevention related questionnaires (2020 And 2025) and reports on the livestock damage prevention related activities (+presentations made available on project website) will be reported.

Number of events where information about wolf-induced damages and preventive measures is shared will be recorded. Number of visits to farms will be monitored, in which advice on protecting livestock and to confirm occurred damages is provided.

The usage and success of damage prevention methods for dogs: All known cases of dogs encountering or being attacked by wolves will be reported and compared to the number of

dogs testing the new protective vest. The interest towards the developed vest will also be assessed through the number of vests sold after 2024, and it will be compared to the number of dogs owned by people living in the areas of high risk for a wolf attack.

Annual reports on the known cases of dogs encountering or attacked by wolves (2019-) and reports on the use of the vest since its release and number of vests sold (from 2024 onwards), as well as reports on the meetings/workshops, visits and presentations on dog-related damage prevention (links to the presentations made available on project website) will be made.

Delivered fences*:* The number of fences delivered to farms (both rapid response and traditional type) and the pasture area thus protected will be assessed on a yearly basis. Fence operability, and wolf behaviour and response to applied prevention methods will be surveyed at farm visits and by using trail cameras. Yearly reports related to fences and protected pasture area ((2019), 2020-), including reports on the wolf related damage, wolf visitations and other response on fenced farms will be made. Reports on the meetings/workshops and presentations on damage prevention are to be included (links to presentations made available on project website).

The development of the network of large carnivore observers will be monitored by tallying the new recruits and those passing the e-course exam, number of users visiting the course material website, observing improvements in coverage in the less-habited regions and comparing the number of observation records at the beginning, during and end of the project in relation to wolf population size and the prevailing snow conditions.

The enhancement of territory cooperation will be gauged with a survey directed to cooperation group members. Also, citizens living in wolf territory areas will be presented with a questionnaire at the beginning and end of the project, asking them whether they know of the territory cooperation groups and have been in contact with them in some way. FWA staff will record the number of events and seminars organized by the groups and those regarding territory cooperation.

The number of training and coordination events in moose management areas (MMAs) and five pilot areas will be reported. After the pilot, the number of hunting regions (MMAs and game management areas, GMAs) ready to deploy the multispecies approach with the new MSE tool will be reported.

The number of illegal killings will be assessed on a yearly basis through various parameters, i.e. tips of from the network (local hunters, voluntary hunting supervisors) and police statistics.

Deliverables

2020	Guidelines for yearly reporting of the progress in each action and reporting tool () for each action
2020-2024	Yearly assessments of the progress of the implementation for each action
2020	Guidelines for final reporting on the success of C-actions and impacts for each action
2020	Technical report and open source computer code about the prototype MSE model for strategical planning of multispecies multi-value population management

2022 Technical report on the web application aimed for enhancing wildlife crime prevention (used by police and game wardens)

2023 Technical report and open source computer code for the final MSE model for strategical planning of multispecies multi-value population management

2024 Report on the results of C1, with public overview and conclusions to be published in project web page

2024 Report on the results of C2, with public overview and conclusions to be published in project web page

2024 Report on the results of C3.1, with public overview and conclusions to be published in project web page

2024 Report on the results of C3.2, with public overview and conclusions to be published in project web page

2024 Report on the results of C3.3, with public overview and conclusions to be published in project web page

2024 Report on the results of C4.1, with public overview and conclusions to be published in project web page

2020 Report on the results of C4.2, with public overview and conclusions to be published in project web page

2024 Report on the results of C5, with public overview and conclusions to be published in project web page

2024 Report on the results of C6, with public overview and conclusions to be published in project web page

2025 Scientific manuscript on the population development of wolves based on DNA monitoring of breeding events (paper published after Life)

ACTION D2: Survey on the people's acceptance towards wolf

Responsible partner: LUKE

Participants: Luke, Police, MH, FANC

Timeframe 2024-2024

Objectives: The main objective is to determine and report/communicate the attitudes and views held by the Finnish (adult) population about the wolves and the conservation, and further to evaluate what influence the project has had on the views.

Most of the actions in BOREALWOLF focus on changing the perceptions of various target audiences towards wolves to being more accepting and positive. For example, the adopting of actions into daily routines to protect hunting dog or livestock may build a sense of control over

issues, and a perception that risks can be managed. This in turn may build higher tolerance and acceptance at the personal level and other way around. People, who already accept the presence of wolf, are more likely to also adopt mitigating measures in their practices of protecting hunting dogs and livestock, as well as other relevant issues. It is important to monitor the people's perceptions of wolf-related risks, the reflection of perceived risk to daily life (e.g. participation in outdoor activities), the effect on species, and acceptance toward illegal killing.

Activities: At the end of the project, a survey will be conducted among a random sample of Finnish internet panellists of the market research company. The sampling procedure and the questionnaire form will be planned, and the results will be reported, by the project group.

After LIFE

The experiences gained from this action helps to evaluate the key directions for AFTER LIFE actions (i.e. helping to choose the methods or practices that have highest potential for being replicated or transferred to new contexts).

Deliverables

2024 The media release of the key-findings prepared.

2024 Media release on people's acceptance towards wolves. In addition, a press release will be published on project websites, social media channels and Luke's communication channels.

2024 Scientific report in Finnish (with English Abstract) on the comparative results of the wolf surveys made in 2020 and 2024.

2025 General newspaper article on people's acceptance towards wolves based on the new survey at the end of the project, with a comparison of the first survey results.

2025 Scientific report on the key results on the assessment of possible changes of people's attitudes and acceptance towards wolves during the project

ACTION D3: Media coverage of the wolf and the project

Responsible partner: Luke

Participants: Luke

Timeframe 2019-2024

Objectives: The media content associated with the wolf produce and participate in maintaining interpretative frames regarding the situation, its problems and alternative solutions. The main contents vary to some extent dynamically around the year and may show trends over years. The project's societal impact is reflected in the amount and the relative proportion of the media content. The monitoring needs to be dynamic. Due to the large and potentially increasing number of wolf-related media content due to the project actions / impacts, the assistance of the state-of-the-art media content classifier in providing an overview of the wolf-related media hits is indisputably valuable. By getting a monthly report on wolf-related issues in the media enable BOREALWOLF to tackle misinformation quicker and more effectively.

The idea of making the wolf-related media content analysis is not entirely new. Many university master students have focused on the theme in their theses, qualitatively and with different perspectives, during the last two decades. Statistical algorithms have not been applied prior to the project in classifying media contents in Finland, and examples from the other countries are still rare. Notable exceptions include Melanie Houston's et al. (2010) analysis focusing on the citizen attitudes toward wolves in the United States and Canada, based on the automated content analysis of the print news media in 1999–2008. Another recent example is from France, where Chandelier et al. (2018) made content analysis of newspaper coverage of wolf recolonization in France using the novel structural topic modelling technique. The existing examples support the idea that media contents can be used as source of the interesting monitoring data and show different methodological alternatives that the monitoring can be based on.

Activities: The media coverage of the digital and printed media (about 200 sources from local to national newspapers) will be monitored monthly by the variety and the extent of wolf-related themes with and without connection to the proposed project. The pre-classification of the themes will be made by a specific machine learning algorithm, and the results of the classification will be published in the internet by the content type and the media source.

Deliverables

2020-2024 Monthly reports of media contents on wolf related issues. The release will be distributed by using several channels

2024 Report on the key-findings of the media monitoring on wolf relate issues during the project

2024 Scientific report in English on the media monitoring results on wolf related issues during the project.

ACTION D4: Monitoring the effects of conservation actions on the Finnish wolf population

Responsible partner: Luke

Participants: Luke

Timeframe 2024-2025

Objectives: The grey wolf's global population is estimated at 180 000 animals and is not listed as globally endangered species by the IUCN. In many national red lists, such as that of Finland, the wolf is, however, classified as endangered. The wolf population has been re-populating new areas in some European countries and the U.S. after an absence of more than 100 years. The return of the wolves and their expansion to human-dominated landscapes has resulted in concern and displeasure. The mitigation of this conflict has been approached through management interventions, awareness raising campaigns and stakeholder integration in many countries, including Finland. Still, the demographic and genetic viability of wolves in Fennoscandia are threatened.

The wolf (*Canis lupus*) is included in the annex IV of the Habitats Directive in Finland, excluding the reindeer management area. The area outside the reindeer management area is hosting 95 % of Finland's wolves. In the past 10 years, the range of the breeding wolf population has expanded further into human- dominated landscapes, not without dispute. Despite the vast recourses disposed for all conservation actions taken in the wolf management, a stable wolf population with a favourable conservation status has not been successfully reached. As the wolf is an animal with the highest imaginable controversy, more effort is definitely needed for the mitigation of the strong social conflict as to reach its status more favourable. The conservation actions of this project aim to decrease the human-wolf conflict and to bring about a better co-existence with the wolves, resulting in decrease in illegal killing and attainment of a minimum viable population (of 25 annual reproductions) in a sustainable fashion.

The objective of this action is to monitor the effects of the conservation actions conducted in the project on the development on the Finnish Wolf population. The development of the Finnish wolf population is assessed by Finnish national authorities annually, and the project has access to this assessment.

After LIFE

The tools piloted and demonstrated during LIFE BOREALWOLF will have a long-lasting effect on the national wolf management, considering and forecasting different management actions and societal outcomes, ensuring that the objectives will be reached and maintained.

Deliverables

2025 Scientific article on the effect of project actions on the Finnish wolf population published

Action E1: Dissemination of the project results: plan and execution

Responsible partner: Luke

Participants: Luke, FWA, MH, FANC

Timeframe 2019-2025

Objectives: The dissemination and communication of LIFE BOREALWOLF can be described as regular, open and interactive. The project communicates about its aims, goals, progress, challenges and importance. LIFE BOREALWOLF utilizes both its own communication channels and all partners' channels widely to reach all possible stakeholders and groups of interest.

The LIFE BOREALWOLF beneficiaries are important organizations when it comes to building knowledge and managing large carnivore conflicts in Finland. The project improves wolf-themed communication, spreads evidence-based information to new platforms and advances cooperation between the beneficiaries, stakeholders, NGO's and citizens.

Annual communication plans will specify more focused actions for the upcoming year. Communication and its impact will be evaluated at the end of each year.

The dissemination package covers themes such as wolf biology and behaviour, population estimates, DNA monitoring and decreasing harms and damages caused by wolves. The project spreads information on the professional and voluntary network designed to help citizens to cope with wolves. This network includes e.g. large carnivore contact persons, police and the game administration.

LIFE BOREALWOLF will have its own **visual identity** that represents all beneficiaries together. All communication aims to be as visual and clear as possible. LIFE logo will be presented in all communication materials throughout the project.

Project websites (susilife.fi) will be established. Digital platform which is already used for disseminating large carnivore information (riistahavainnot.fi) will be updated. Besides project's own website the communication group will utilize partners' channels and suurpedot.fi for project dissemination whenever possible.

LIFE BOREALWOLF will bring evidence-based knowledge where we see lack of it today: **social media platforms**. The project will have its own Facebook and Twitter accounts. Tone of voice used in social media will be polite, sturdy and interactive. Content published in social media will focus on project day-to-day life, information on wolves and interacting with followers.

At least three **info boards** will be set up at sites of conservation actions. These will initially include Eastern Finland, Ostrobothnia and Southwest Finland. The boards will have description of the project, its objectives and actions in Finnish, Swedish and English, accompanied by relevant logos.

To increase awareness, a **brochure** in Finnish and Swedish describing the project's background, objectives and actions will be created at the beginning of the project and distributed to stakeholders in areas where most of the actions take place. During the project other brochures

and printed material will be made as well. These include information on e.g. how to protect livestock and pets from wolves and how to act if encountering a wolf.

Most countries rely on **scientific evidence** when deciding management actions of a species. Therefore, it is essential to also scientifically describe the methods and outcomes in the project. These results will then be disseminated to an international scientific audience at conferences and published articles. This will enhance replication and transferability of the actions far into the future.

Project's progress and results will be disseminated in **webinars and videos** whenever needed. Webinars are a more interactive way to communicate and they are meant for a more targeted audience. Videos are shared mainly in social media and project websites.

Project will actively engage with **media** on national and regional levels. Media work is a powerful way to connect with the general public and people living in wolf territories.

At the end of the project a popularized **layman's report** will be published. The report will give clear insight to what the project achieved in a highly visual manner. The report will be released in Finnish, Swedish and English and made available to all readers.

There is a need to present the project and disseminate its results also in **various events**, reaching different stakeholders and enabling interactive communications about LIFE BOREALWOLF.

To ensure the uptake of best practices and efficient cooperation between different projects, the project will cluster with other LIFE projects, other national and international projects and forums with similar objectives in human-wildlife conflict. The project manager will participate in the Nordic LIFE Platform meetings yearly during the project and beneficiaries will visit projects relevant to their expertise for best practice exchange and networking.

An international seminar on human-wildlife conflict will be hosted by the project in Finland in 2023 to which all ongoing associated LIFE projects will be invited. The two-day seminar will consist of networking, experience sharing and discussions of best practices and future cooperation among other LIFE project actors (day 1), and more general presentations and discussions about project results and goals (day 2). Day 2 is open for other stakeholders as well, such as students, media representatives and colleagues from different organizations. Approximately 50 individuals are expected to be invited for the first day of the seminar.

In parallel with the LIFE BOREALWOLF project Finland will promote cooperation and a common policy on the large carnivore management with the Scandinavian countries. Annual Scandinavian meetings on large carnivore management include information sharing and discussions on large carnivore policy and management. All conservation, dissemination and communication actions and their results will be actively presented to our Nordic colleagues during the yearly meetings, and further to other LIFE projects and the international academia and stakeholders throughout the project time. Russian colleagues will be invited to seminars and workshops during the meeting to share knowledge and to enhance future networking and cooperation.

Dissemination

The project results will be disseminated both via popular and scientific channels, nationally and at the EU-level. This ensures that vast knowledge on wolf-related issues reaches both the Finnish countryside and the academic world abroad.

Dissemination in the action E1 means establishing and maintaining the project's communication channels and networking with other projects and countries. Dissemination substance-wise is described in the other action plans, containing various and specific communication materials.

The objectives for the dissemination are:

1) Creating and implementing effective communication plan to guide and aid project work
2) Inspiring citizens to be active part of wolf management and monitoring
3) Alleviating fears and worries of citizens living near wolf territories by disseminating information
    a. Increasing knowledge of voluntary large carnivore contact persons
    b. Boost the cooperation between local territory cooperation groups (TC) and between TCs and local people
    c. Decreasing harms and damages caused by wolves
4) Building good connections between project beneficiaries and stakeholders
5) Increasing knowledge and acceptance of wolves
    a. Enhancing knowledge on population estimate principles
    b. Building better trust in population estimates
    c. Boosting and creating positive attitudes towards wolf conservation
    d. Decreasing fear of wolves
    e. Giving journalists new insights and ideas for wolf-related communication in media
6) Establishing a good model of internal communication

After LIFE

Project communication channels are chosen bearing After-LIFE in mind. The project results and outcomes will be communicated on digital platforms which are in use and updated after LIFE BOREALWOLF ends. These platforms include partners' websites and already widely known websites such as riistahavainnot.fi and suurpedot.fi.

The texts, graphics, videos and other content will be produced so that it is useful to beneficiaries' communication also after LIFE BOREALWOLF.

Cooperation between beneficiaries and stakeholders builds a new way to plan and execute communication together. Revising accomplishments and failures at the end of each year gives the beneficiaries a good view of how to improve wolf themed communication together.

Interacting with stakeholders is crucial for the project's success. During the six years of LIFE BOREALWOLF beneficiaries will strengthen their bonds with the stakeholders and create mutual trust.

Deliverables

2019 Project visual identity ready

2019 Social media accounts (Twitter and Facebook) published

2019 4 regional development seminars for territory cooperation groups

2020 Communication and interaction plan for 2020

2020 Susilife.fi website published

2020 LIFE BOREALWOLF brochure printed

2020 Communication strategy ready

2020 Info boards set up in combination with other info boards in the vicinity of nature information centres and in recreational areas

2020 Riistahavainnot.fi updated

2021 Suurpedot.fi updated

2022 Scientific human-wildlife conflict seminar for researcher, stakeholders and NGO's on the experiences on the wolf conflict mitigation management.

2025 Layman's report published

Action E2: Awareness raising activities

Responsible partner: Luke

Participants: Luke, FWA, MH, Police, FANC

Timeframe 2020-2025

Objectives: People base their opinions of wolf and wolf conservation partly on false information spread by word of mouth and through social media. More reliable information is needed especially in areas in which wolves have not been present for a long time and people are not used to living with them. Without evidence-based information on wolves, illegal poaching may proliferate. This action relies on best practices in conflict prevention and mitigation through educational means.

This action accentuates the sustainability, replicability and transferability of the project by communicating to children, families and teachers that live in or near wolf territories, as well as the media and members of the Finnish Parliament, which are known to be important mediators of attitudes for both local and larger audiences.

LIFE BOREALWOLF beneficiaries are important organizations when it comes to building knowledge and managing large carnivore conflicts in Finland. The project improves wolf-themed communication, spreads evidence-based information to new platforms and advances cooperation between the beneficiaries, stakeholders and citizens.

Actions E1 and E2 have partially overlapping objectives. Objective for awareness raising activities is to increase knowledge and acceptance of wolves. This means: (a) enhancing knowledge and trust on population estimate principles, (b) boosting and creating positive attitudes towards wolf conservation, (c) decreasing fear of wolves and (d) giving journalists new insights and ideas for wolf-related communication in media.

Educational materials on wolf and other large carnivores and visits to schools are an important part of knowledge boosting. This action relates to LIFE BOREALWOLF objective of increasing public acceptance of wolf presence.

The project will produce educational materials, which will be used during school visits and made available on the website. The material will also be disseminated in social media and on the beneficiaries' websites. The project will produce material on wolf population management and how to act when encountering a wolf. Presentations will include demonstrative materials, such as roll-out wolf track (with other species) sheets in full scale. These will help to engage children and to better remember the information.

The project staff will visit 110 schools, including areas in which wolves have recently settled (Western Uusimaa). Visits will be made to small village schools and larger urban schools, reaching ca. 3 000 pupils and teachers.

The project will try to build connections to stakeholders such as the Biology Teachers Association (BMOL), Teacher Student Union Finland (SOOL) and The Finnish 4H Organization, to distribute the school materials into further use.

Different roles and facts about wolf management will be introduced to the media. Journalists will be provided with targeted info material, provided with possible ideas for diversifying articles and stories related to wolf themes, and invited to events, meetings and field trips in wolf territories with a possibility to update the knowledge and have discussions with the researchers and other project staff.

This action relates directly to the LIFE BOREALWOLF objective of reducing societal tension surrounding wolves by influencing cultural attitudes through educational means. With education media will less likely publish polarized opinion pieces.

The media events and information materials consist of five entities. **Media coffees** are visits to wolf territory areas, where wolf-related issues such as wilderness supervision, wolf research and conflict mitigation will be discussed by different wolf experts. **Wildlife journalist days** are two-day events, where journalists are provided with a news flash on wolf issues relating to project actions and where they get to know experts working on wolf-related things. The days are arranged once a year and are a great networking opportunity for media and actors within wolf research or management. During the project we will produce '**media kits**', meaning popularized and summarized information packages regarding wolves and wolf management for journalists. During 2020—2021, the project will arrange **two general public events and one media event** in Western Uusimaa area. The events will provide concrete and up-to-date information about wolves; how to coexist with them, how to prevent damages and how to claim compensation should damages occur.

LIFE BOREALWOLF starts cooperation with the Finnish Parliament by producing an information package of wolves. The project will organize annual **dissemination meetings for the Parliament** with varying current themes.

After LIFE

Actions targeted to stakeholders such as journalists and politicians create connections between media, policy making and science. These connections will be sustained also after LIFE BOREALWOLF.

Deliverables

2020 Info package for the Parliament

2020 1st info package for media produced

2020 10 floor rollouts with real-size wolf tracks on

2020 Brochures on wolf for school children

2020 Educational give-away material on wolf for school children

2020 Educational materials found on the project website

2022 Video production on wolf for educational use

2024 Report on project's media coverage

ACTION F1 Action for project management

Responsible partner: LUKE

Participants: Luke, FWA, MH, Police, FANC

Timeframe 2019-2025

Objectives: Through this project management action, it will be ensured that the project runs according to plan, manages risks and fulfils LIFE regulations. The technical and financial management and communication is coordinated through teams, built up by members of each partner. All teams are led by managers from LUKE. The project will be governed by a steering group, with a close communication to other relevant stakeholders.

One of the objectives of this action is to build up a new model of governance and management of the wolf population as a cooperation network between the partners of this project. This model aims to be established as common praxis after the project has ended. In addition, the international network of scientist and management practitioners built up during the project, will be established as a new platform for communication after the LIFE BOREALWOLF project.

The project will establish a project coordinating team and a steering group (consisting of the project and coordinator, financial assistants, representatives from the partners and co-financiers). further, the project will establish an enlarged steering group consisting of representatives from the regional councils of the regions in which actions will take place; the Reindeer Herders' Association, an additional representative of each beneficiary, Luke's Executive Vice President of Research and a representative form the World Wildlife Fund Finland's, a member of LIFE EUROLARGECARNIVORES.

Defined indicators for reaching the project objectives are evaluated using the LIFE Key Project Level Indicator table (KPI). How the project is reaching the set objectives is monitored against these indicators and included in required reports.

An After-Life conservation plan will be produced during the project which will explain the continuation of the project actions and their development in the years after LIFE, and the ensuring of the long-term management of the wolf population in Finland. It will also provide a motivation for action continuation by ensuring cooperation between project partners and sustained dissemination of project results after Life. The requirement of such prolonged affiliation between partners is included in the partnership agreement signed by all beneficiaries prior to project initiation.

After LIFE

After the project has ended, the new model of cooperation will result in an increased collaboration and transparency between project partners and stakeholders. It will further establish a trust of the whole society in the management bodies and increase a willingness to cooperate within the wolf management. The local territory cooperation groups will work in line with each other with defined working principles. The groups will interact with each other and local communities improving communication and information exchange between them, implementing local actions. Population estimations will be more accurate due to increased data from remote areas by the regional wolf management coordinators. Damages caused by wolves will decrease and the general acceptance of wolves will be enhanced. Local people will trust wildlife management and support them in wolf conservation and management.

Deliverables

2022 Mid-term Report to Monitor and EASME

2025 Final report to monitor and EASME

2025 After LIFE plan to monitor and EASME