Towards better human coexistence with wolves

LIFE BOREALWOLF

Official project name: Towards better human coexistence with wolves (LIFE BOREALWOLF)

LIFE18 NAT/FI/000394

1 October 2019 – 30 September 2025

Project partners

Financiers

- EU LIFE programme: EUR 3,017 million
- Ministry of Agriculture and Forestry: EUR 720,000
- Ministry of the Environment: EUR 50,000
- Central Union of Agricultural Producers and Forest Owners (MTK): EUR 30,000*
- Self-funding by the project organisations: EUR 1,697 million
- Total project budget: EUR 5,513 million

*MTK funded activities that aimed to protect domestic animals and prevent any depredation.

Front cover photo: Katja Ronkainen

Layout: Kaskas Media Oy

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The coexistence between people and wolves is important not only for wolves but also for local people.

Photo: Katja Ronkainen

Towards better human coexistence with wolves

For a long time, wolves mainly lived in Eastern Finland. In recent decades, the species spread westwards and has thrived especially in Southwest Finland, a region with plenty of whitetail deer and roedeer available as prey. When moving around in the same regions as people, wolves cause concern, fear, and occasional losses of dogs and livestock.

The wolf is a political animal. It incites heated debate, and people have different opinions on wolf population management. Public debate often culminates to differing views about wolf protection and hunting. Wolves rarely concern the daily lives of most Finns, but they may have a significant impact on citizens and livelihoods in wolf regions.

The wolf is an endangered species in Finland. Reaching and maintaining a vital wolf population is challenging, if not impossible, if people feel that they cannot coexist with wolves.

What does coexistence mean?

In this context, successful coexistence means that people and wolves can live in the same area, with both experiencing as little harm as possible. Coexistence does not require the complete elimination of problems, but it requires the ability to manage and prevent encounters with wolves. It is important that people feel that they can live with such encounters.

Despite coexistence, no one has to tolerate wolves in their own backyard. For example, coexistence is successful when a citizen concerned about wolf tracks can contact the correct actor or identify and remove any factors that attract wolves from outside their home, such as waste that offers nutrition for wolves. Cooperation between citizens, large carnivore observers and the wildlife management authorities is needed. They enable to monitor wolves of the region, actively prevent wolves visiting people's courtyards and intervene in repeated visits before wolves cause any danger.

LIFE BOREALWOLF

The EU LIFE-funded LIFE BOREALWOLF project, started in 2019, promoted local interaction, provided tools for the prevention of adverse impact caused by wolves and wolf depredation, and conveyed information about wolves and their behaviour. The project ended in 2025.

THE LIFE BOREALWOLF PROJECT HAD THREE MAIN OBJECTIVES:

1. Reducing any negative impact associated with the presence of wolves such as fears, concerns, and losses of dogs and livestock.
2. Increasing the acceptability of wolves in society.
3. Developing tools for wolf population management, such as preventing the illegal killing of wolves.

LIFE BOREALWOLF was a joint project of five parties

Natural Resources Institute Finland (Luke) was the project coordinator. It ensured that the project proceeded as planned, monitored project activities, and took care of reporting, financial management and communication. Furthermore, Luke developed DNA monitoring and modelling tools for population management and participated in the development of the large carnivore observers' network.

The Finnish Wildlife Agency focused on the prevention of wolf depredation and on cooperation in wolf regions. It developed the network of large carnivore observers and territory cooperation groups. In addition, LIFE BOREALWOLF planners from the Finnish Wildlife Agency were engaged in cooperation with people living in wolf regions.

Metsähallitus participated in communication and wilderness supervision. A game warden from Metsähallitus was one of the members of the two-person patrol working in Eastern Finland. Metsähallitus was also responsible for events held for media representatives.

The Eastern Finland Police Department focused on wilderness supervision. One of the two patrol members was a police officer.

The Uusimaa district of the Finnish Association for Nature Conservation held public and media events and school visits in the Western Uusimaa region in 2022 and 2023.

The project parties were engaged in close cooperation across their areas of responsibility. The LIFE BOREALWOLF project employed some 65 people, seven of whom worked full time.

Project themes

Collection and monitoring of wolf DNA samples

Interaction and cooperation in wolf regions

Police and game warden patrol in Eastern Finland

Prevention of damage caused by wolves

Modelling tools for wolf population management

Communication

Wolves in Finland

The wolf population has grown during the LIFE BOREALWOLF project.

According to Luke's most recent population estimate, there were 277–321 wolves in Finland in March 2024 (with a probability of 90%). The population estimate is an annual estimate of the size and distribution of the wolf population. While it is conducted by Luke, the estimate's dataset consists of wolf sightings made by ordinary people and recorded by large carnivore observers' network, as well as of results of wolf DNA samples.

There were 277–321 wolves in Finland in March 2024.

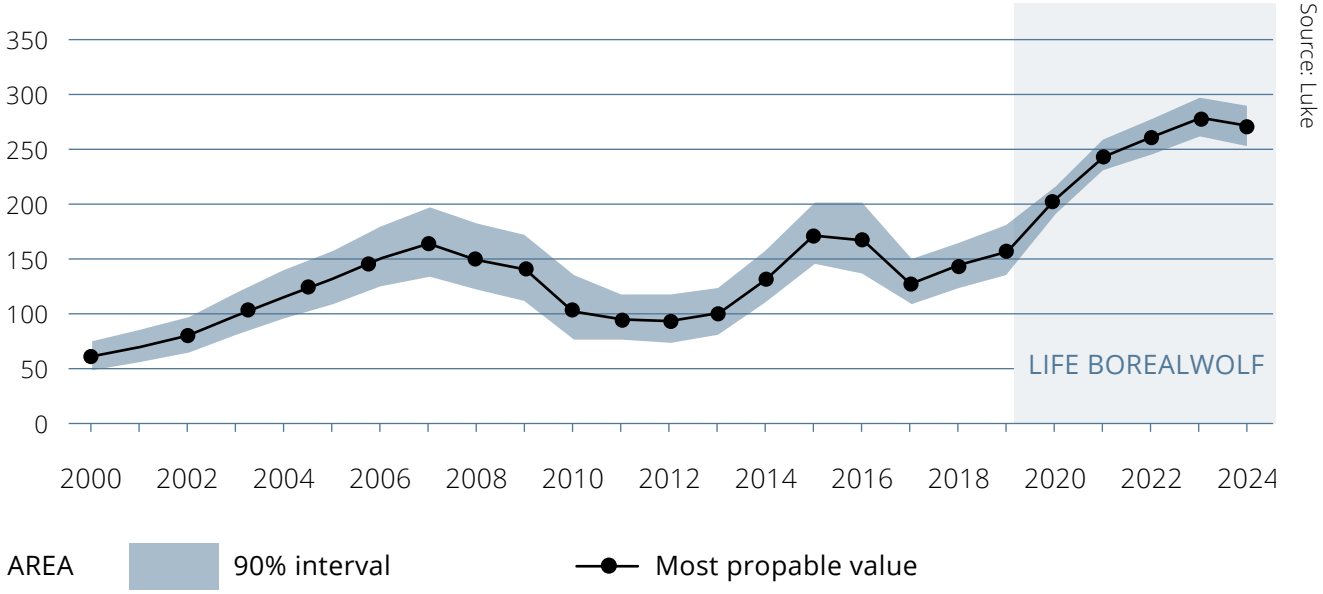


Figure 1: Number of wolves in Finland, 2000–2024. The figure shows the most probable value and the 90% probability interval. The estimate applies to the March wolf population living across Finland, i.e. wolves living in territories along the border are not included in the figure. The definition of population development corresponds to that of the project application, and consequently differs from how the entire wolf population in Finland is defined

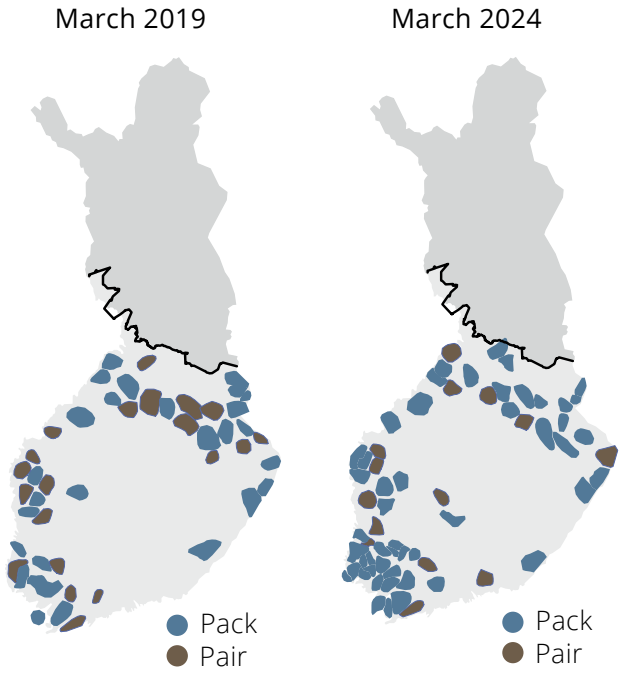


Figure 2: Map of Finland showing territories of 2019 and 2024 side by side. The LIFE BOREALWOLF project operated south of the reindeer husbandry area, the border of which is presented in the map with a line.

Photo: Mari Tikkunen

The wolf is a canid species living in family packs

The wolf is a large canid that lives most of its life in a family pack. The wolf is highly adaptable and thrives in various living environments.

It is a carnivore that hunts large mammals, mainly wild cervid species such as the moose and the white-tailed deer.

Wolves live in packs, each with its own territory. A wolf pair spends their lifetime together, and if they are not disturbed, they stay in a single territory year after year in roughly the same place. While the size of territories varies, the average diameter of a Finnish wolf territory is 25–40 kilometres. Offspring live a year or two in their birth territory.

Young wolves leave their birth pack in the late spring to look for a mate and their own territory. Wolf migration routes may range from dozens to even thousands of kilometres. Inexperienced young wolves wander close to residential areas more often than adults. Over time, they become accustomed to their new territory, and their visits to people's courtyards usually become less frequent.[1]

What does the population management of the wolf entail?

Wolf population management means all the goal-driven actions that are taken to sustain the wolf population and its development in the long term. In Finland, the goal of large carnivore population management is to protect the survival of species as part of nature. National management plans have been prepared for all four large carnivore species. The plans present measures which aspire to fit together the protection of species and the needs of people living in the same areas as large carnivores. Up-to-date and reliable information about the biology and ecology of species lays a solid foundation for population management.

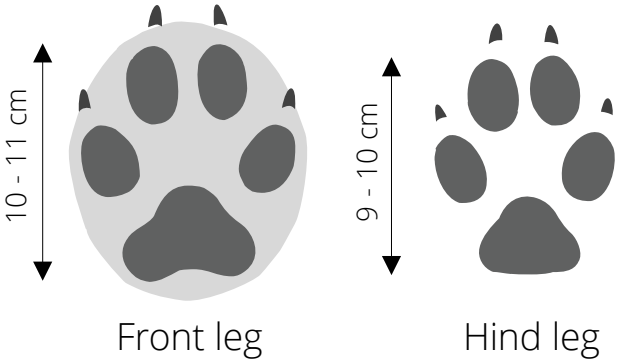
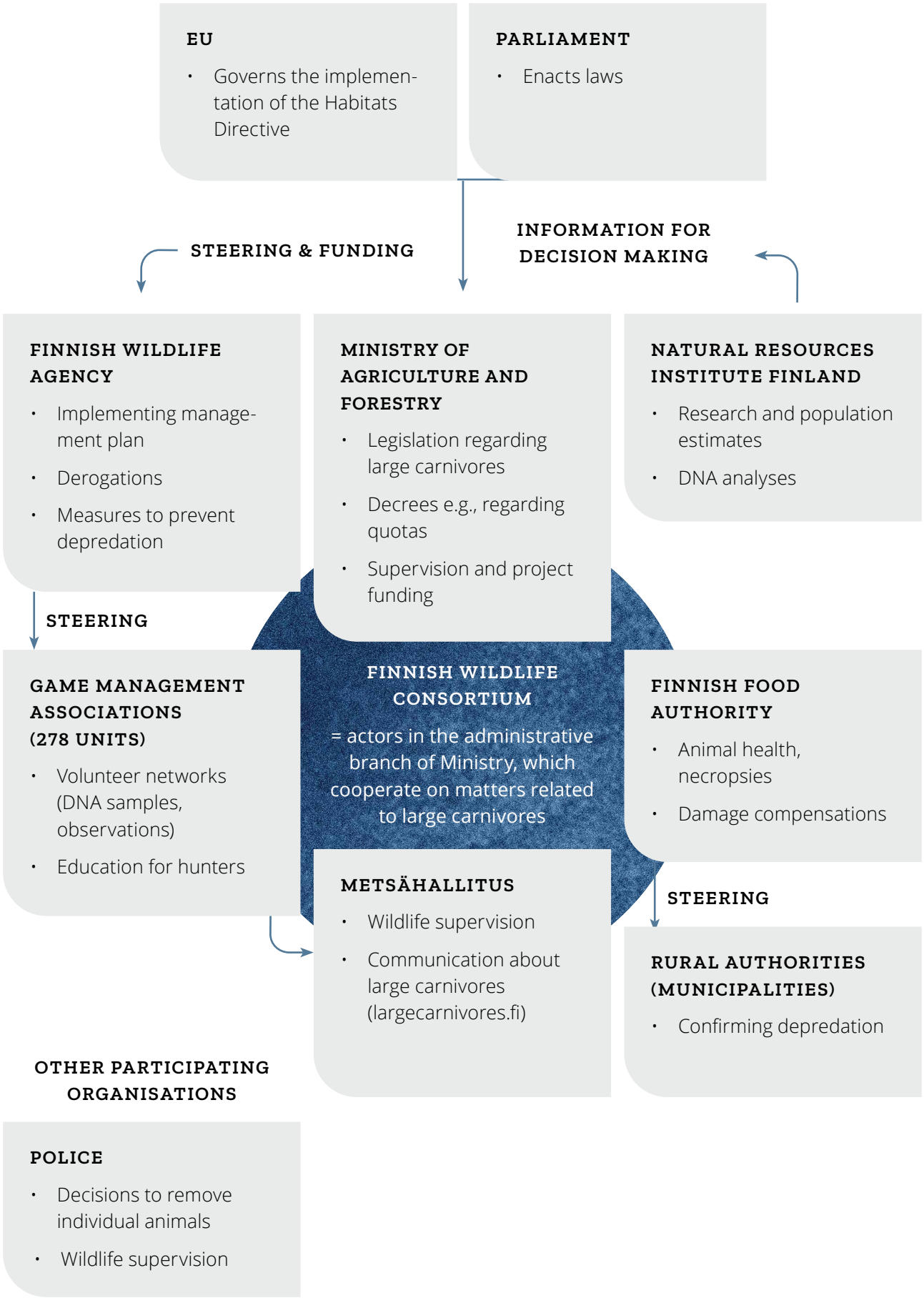


Figure 3: Paw print of a wolf

1 Kojola, I., Hallikainen, V., Mikkola, K., Gurarie, E., Heikkinen, S., Kaartinen, S., Nikula, A., & Nivala, V. (2016). Wolf visitations close to human residences in Finland: The role of age, residence density, and time of day. Biological Conservation, 198, 9–14.

Who decides on wolves in Finland?



Results of the LIFE BOREALWOLF project

Collection and monitoring of wolf DNA samples

DNA reveals information about wolves that cannot be discovered by any other means. Information about the size and spread of the wolf population is useful for the authorities, wildlife management, decision-makers and citizens.

Both researchers and citizens need information about the movement and reproduction of wolves. Where are the boundaries of a pack's territory? Have new pups been born in a territory? Where has this young wolf come from? Has the same wolf been here before, or is it just passing through? All these questions can be answered by using DNA samples.

DNA is usually studied using wolf droppings. Samples can also be taken from wolf urine collected from snow or from bite marks in a victim. Tissue samples are taken from dead wolves.

In Finland, wolf DNA samples have been collected since 2013, albeit not in all wolf territories.

Goal

Expanding wolf DNA sampling to almost all permanent wolf territories.

Measures

- Training was provided for new DNA sample collectors each year.
- Communication on DNA sampling, DNA analyses and their results was increased.
- DNA was analysed using the new and more accurate SNP method.

Information about the size of the wolf population benefits authorities, the wildlife management, decision-makers and ordinary people.

Results

THE NUMBER OF VOLUNTEERS INCREASED

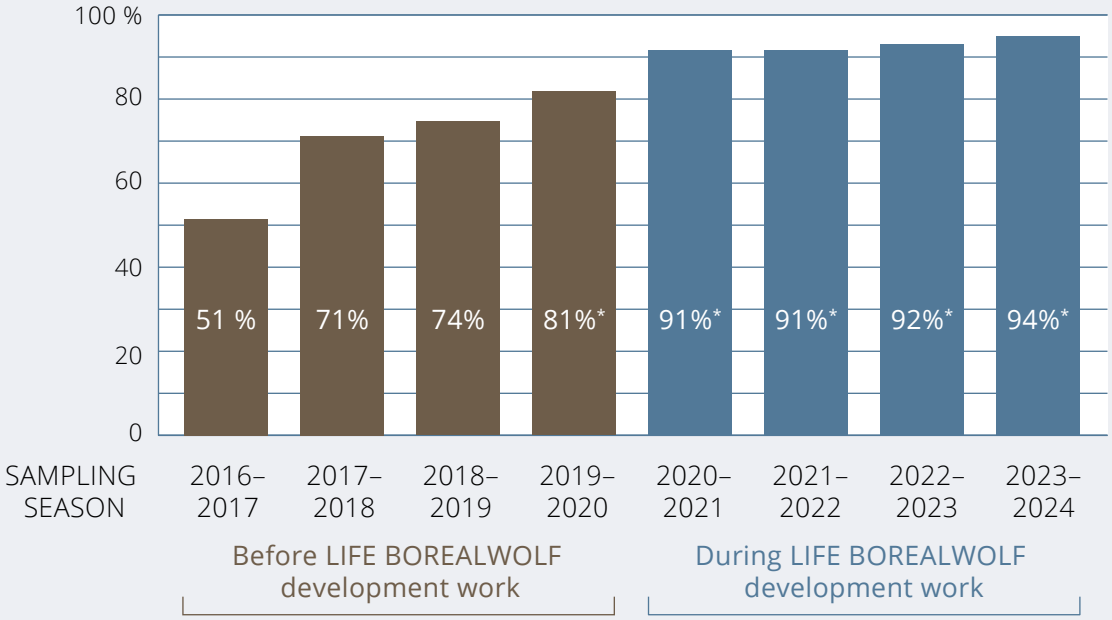
Wolf tracks and droppings were sought by field-workers from Luke and the Finnish Wildlife Agency, as well as a number of volunteers. To expand the collection of DNA samples, more volunteers were trained during the project. Training for volunteer DNA sample collectors was held annually. In 2020–2024, more than 600 people registered for training, and recordings of training events were watched almost 1,000 times. The percentage of samples collected by volunteers of all samples increased from 20% (in the winter of 2018–2019) to 63–70% (in the winters of 2021–2024).

Faeces of wolves. Photo: Jaakko Alalantela

DNA WAS COLLECTED FROM ROUGHLY 90% OF WOLF TERRITORIES

During the project, the wolf population grew, and new wolf territories were formed in Finland. At least one DNA sample was analysed over 86–94% of territories. A total of 5,922 DNA samples was collected during the project.

Figure 4: Proportion (%) of established wolf territories from which at least one DNA sample was collected.



**Contains also tissue samples from dead wolves*

DNA sampling in Ullava. Photo: Mikael Luoma

DNA sample. Photo: Riikka Hurri

COMMUNICATION ON WOLF DNA SAMPLE COLLECTION IMPROVED

Communication on the network of volunteers, DNA analyses and sample results played a central role in expanding the collection of samples.

Using neutral facts as the basis of wolf dialogue motivated many DNA sample collectors. Furthermore, people want to learn more about wolves living in their home area and about their history. DNA results were summarised annually by territory, and the summary was communicated to local and regional papers especially.

During the project, the Riistahavainnot.fi service was updated with data users. The current Luonnonvaratieto.luke.fi service is used to publish information about the start and end of the sample collection period and present a summary of results in a map service. In 2024, more than 98,000 users sought information about large carnivore sightings and DNA samples on the website.

People are interested to learn about the wolf individuals of their own area, and their history.

Wolf faeces on a road. Photo: Antti Härkälä

DNA analysis. Photo: Terhi Iso-Touru

HOW CAN DNA RESULTS BE USED TO IDENTIFY THE BOUNDARIES OF WOLF TERRITORIES? AN EXAMPLE FROM THE REGION OF LAITILA, MYNÄMÄKI AND YLÄNE

Tassu is Luke's data system for sightings of large carnivores, in which large carnivore observers register all the sightings made. Sightings reported to Tassu are the cornerstone of the population estimate. However, there is the challenge that the specific individual cannot be identified with certainty from a sighting. A wolf pack moves in a large area, and its members do not always stay together. This makes it more difficult to identify and differentiate packs based on sightings.

Luckily, DNA results and Tassu sightings complement each other. DNA results reveal which samples come from the same wolf individual, and from where else samples of the same individual have been taken.

The fact that wolf pairs and packs have their own established territory which they defend against other wolves makes it is easier to interpret DNA results. If DNA samples of different wolf individuals are repeatedly found in the same area, it can be concluded that the individuals are part of a single pack. At the same time, indicative outlines of a territory can be drawn.

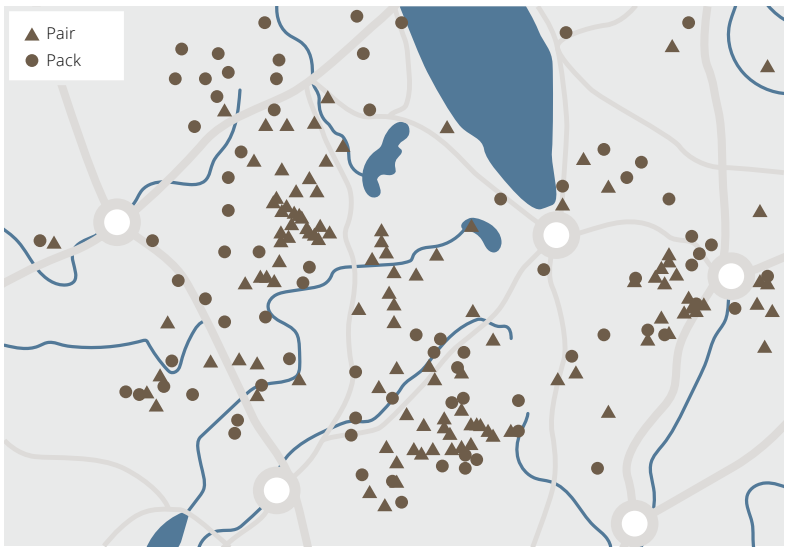


Figure 5: Pack and pair observations of wolves reported in the Tassu system from Aug 1st, 2019, to Feb 28th, 2020. Pair observations are marked with a circle. Pack observations are marked with a triangle.

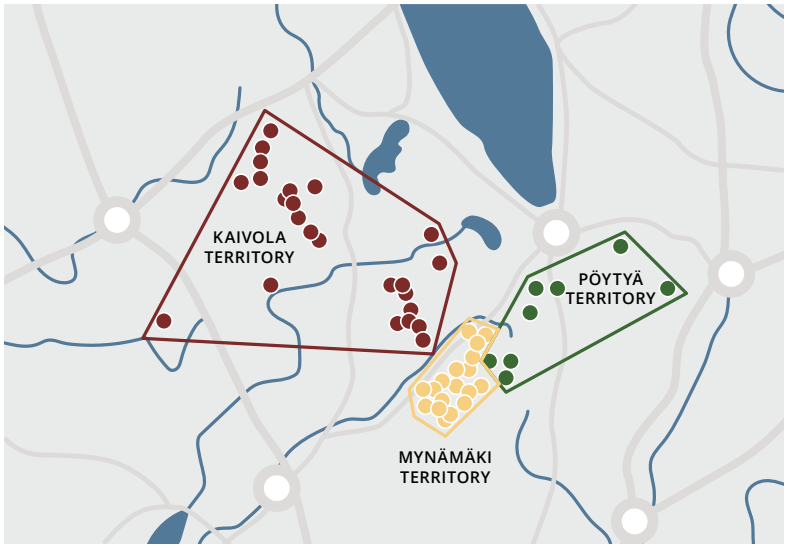


Figure 6: Analysed DNA samples and the territory borders derived from this information.

Damage prevention

Every year, wolves kill and injure domestic and production animals in Finland. From the perspective of coexistence, it is important to develop effective ways to protect animals.

South of the reindeer husbandry area, wolves cause the most significant losses for sheep. Currently, some 400–500 sheep deaths caused by wolves are registered every year. In addition, the Government pays compensation each year for some 50 dogs injured or killed by wolves. Most often, wolves kill hunting dogs that are working far away from people.

Livestock can be protected from carnivores in various ways. For example, a correctly erected and regularly maintained electric fence is an effective way to protect grazing animals[1]. However, not all protection methods can be used on all farms. Solutions must be customised for each farm according to its production line, the location of pastures and the terrain.

Goal

Reducing losses of livestock and dogs by developing tools and sharing know-how on animal protection.

Measures

- Planners from the Finnish Wildlife Agency visited farms and planned animal protection with farmers.
- New deterrents were imported to Finland, and their operability was tested with farmers. Livestock farms were able to apply for fence material from the Finnish Wildlife Agency, funded by the LIFE BOREALWOLF project.
- Protective dog vests were tested together with hunters.

1 Pellikka, 2020: An evaluation report on the best damage mitigation practices used in wolf conservation (LIFE BOREALWOLF project report: : lukepublic.blob.core.windows.net/$web/MNGMT/COMM/gold/susilife/SusiLIFE_livestock-best%20practice-report_final.pdf.

Results

more than 270 visits to farms

168 wildlife and CCTV cameras

184 light and noise deterrents

72 km of electric fences

LIVESTOCK FARMS RECEIVED SUPPORT AND HELP

It is important that livestock farmers' concerns about wolves are taken seriously, and people are not left alone with challenges. There has been a clear need for guidance and support, as indicated by the numerous people who contacted the project planners.

The challenge is often that a fence is requested for protecting animal after depredation has already occurred. The project adopted a proactive approach: when the grazing period started, the planners mapped out, which farms had the highest risk of wolf depredation, and contacted the farmers.

Livestock farmers regarded cooperation with the project as effective and all the equipment, especially cameras and electric fences, as mainly useful. Fifty-three farmers responded to the survey sent to livestock farms, of whom 89% considered that the project measures would also be needed in the future.

On a sheep farm. Photo: Mari Lyly

NEW PROTECTION METHODS DIVERSIFIED THE TOOLKIT

New types of protection methods were also tested in the project. They included GPS trackers to monitor the movement of sheep and take action early, wildlife and CCTV cameras to monitor the edges of pastures, fladry, and various light and noise deterrents.

Most farms had no depredation after the deployment of protection methods. Farmers were very interested in trying different methods to find aid for difficult situations.

Sound and light deterrent. Photo: Mari Tikkunen

Despite the measures taken during the project, sheep depredation caused by wolves increased. This can probably be explained by the increase of the wolf population especially in Western Finland, where there are also many sheep farms. It is impossible to determine how much wolf depredation would have increased without the project. The planners worked over vast regions, and the input of three people was insufficient to help all livestock farms. Especially during the pasture season, their phones rang non-stop, and demand was higher than they were able to supply.

PROTECTIVE VESTS FOR HUNTING DOGS PROVED SUITABLE IN FINNISH CONDITIONS

During the 2024–2025 hunting season, the project tested the functionality of protective vests in Finnish hunting conditions. The trial included 200 hunters and their dogs. The experiences were mainly positive: the vests increased the sense of security and were seen as a good way to reduce the risk of wolf depredation.

Two cut-resistant vest models equipped with steel spikes were used in the test. During the trial, one dog wearing the vest was attacked by a wolf but survived with minor injuries. Most of the dogs got used to the vests, and the equipment was considered to provide protection also against other dangers than wolves. Some challenges were experienced with the fit and flexibility of the vests, and some testers found the vest heavy when soaked.

The trial increased awareness of protective vests. More than half of the participants said they had a more positive attitude towards the vests than before, and the majority wanted to purchase the vest for themselves.

LIVESTOCK PROTECTION MEASURES IN A SINGLE TOOLKIT

The toolkit serves as a practical guide for livestock farmers. It brings together a wide range of methods to protect domestic animals from damage caused by wolves, but also by other large carnivores.

An electrified predator fence is the most reliable way to livestock, but it requires proper installation and regular maintenance, and is not suitable for all sites. Other important protection methods include mobile night fences, fladry, camera traps, livestock guarding dogs, and sound and light deterrents. The guide also discusses other preventive practices, such as monitoring animals with GPS devices or changing grazing habits.

The protection of livestock can be made more effective by combining different protective methods. The guide emphasizes farm-specific consideration when planning for protection measures. Some of the solutions may become necessary in the event of depredation, when additional protection for the animals is needed quickly.

Protective vest. Photo: Juha Tissari

Police and game warden patrol

The patrol worked in Eastern Finland until the end of 2024. Consisting of a police officer and game warden, the patrol supported local people in problems related to large carnivores and made wilderness supervision visible.

While wolves reproduce effectively, the wolf population is still growing slowly. Slow population growth cannot be explained by natural deaths, traffic accidents or legal hunting alone. According to studies, one reason for this slow growth is illegal killing. However, suspects are rarely caught.[1]

A likely reason for the illegal killing of wolves is a general frustration with the authorities' inability to deal with conflicts caused by wolves and other large carnivores. For example, the police is responsible for driving away any large carnivores causing danger or killing them. In contrast, the Finnish Wildlife Agency deals with individuals that repeatedly cause losses by granting banishment permits and/or derogations.

Goal

Preventing, uncovering and combating hunting crime, especially any illegal killing of large carnivores, and providing people with advice and support to reduce or eliminate any problematic situations related to large carnivores.

Measures

- The police and game warden patrol provided citizens, livestock farmers, landowners and hikers with advice and support to resolve and reduce any problematic situations related to large carnivores.
- The patrol carried out general monitoring in sparsely populated areas in diverse ways, as well as more targeted official monitoring in areas where large carnivores had previously been killed illegally, for example.

1 Pohja-Mykrä, M., & Kurki, S. (2013). Suurpetopolitiikka kriisissä: salakaadot ja yhteisön tuki (Large carnivore policy in a crisis: illegal killing and public support).

Game warden. Photo: Jaakko Alalantela

Results

LOCAL RESIDENTS WERE GIVEN HELP TO DEAL WITH LARGE CARNIVORES VISITING THEIR BACKYARDS

The patrol provided citizens with guidance and advice in challenges related to large carnivores and investigated locations in which a bear had damaged an apiary, for example. During the snow period, the patrol investigated reasons for wolves visiting people's courtyards and determined how to resolve such situations. In some cases, attracting sources of food (such as waste or livestock afterbirths) had to be removed from yard areas; in others, the police officer monitored a situation of deterring or removal carried out as official assistance to the police in large carnivore matters. Based on the feedback received, citizens were satisfied with the help provided by the patrol.

During the snowy season, the patrol investigated–among other things–possible reasons for courtyards visits made by wolves.

1 073
Hunting and firearms licences inspected during monitoring activities

228
Fishing monitoring

74
Tassu sightings made

49
Wolf DNA samples collected

25
Crime report (hunting offence)

22
Fine (hunting offences)

23 kpl
Crime report (other offences)

34
Fine (other offences)

Figures describe the actions of the patrol, during the entire five years of operation. Crimes related to wolves were rarely encountered.

INCREASED MONITORING RAISED THE PROBABILITY OF UNCOVERING HUNTING CRIME

In general monitoring, the patrol focused on the legality of hunting, the possession of firearms and the hunting methods used in legal hunting. It also monitored the appropriate transport of firearms in vehicles.

Targeted monitoring was carried out as planned and based on information, in areas where wolves were known to move around, and where hunting crime had previously been discovered. A tip line was established for the patrol, through which they received many calls regarding disturbance and illegal killing of wolves. Monitoring helped increase the probability of getting caught and prevented crime. During the project, at least two new wolf territories were established in the areas in which the patrol carried out extensive monitoring.

Game warden in a pickle. Photo: Kimmo Örn

THE PATROL INTERVENED IN ILLEGAL FEEDING SITES

When carrying out general monitoring, the patrol covered known legal and illegal feeding sites for large carnivores and other wild animals. Illegal feeding in particular was found to attract large carnivores closer to residential areas, resulting in problems. As the project progressed, it was discovered that monitoring reduced the number of illegal feeding sites, especially in North Karelia.

COOPERATION BETWEEN WILDERNESS SUPERVISION AUTHORITIES DEVELOPED

Cooperation between the supervisory authorities – the Police of Finland, Metsähallitus, the Finnish Border Guard and Finnish Customs – improves the efficiency of wilderness supervision. Joint activities between the authorities were developed to uncover and prevent hunting crime related to large carnivores.

Wildlife monitoring in winter conditions. Photo: Jaakko Alalantela

INVESTIGATION OF HUNTING OFFENCES IMPROVED

The project also developed the authorities' capabilities. Police departments' expertise in investigating hunting offences had decreased. If a police investigator has no link to the provisions of the Hunting Act or Decree through education, experience or recreational activities, they may find it difficult to assess whether a certain activity involves a suspected hunting offence. Challenges in police investigations have caused some people to believe the police are inactive in investigating hunting offences.

The project developed national in-service training for the investigation of offences on animal welfare and hunting. During 2023 and 2024, some 80 people from the Police of Finland, the Finnish Border Guard and Finnish Customs, as well as prosecutors, district court judges and supervisory veterinarians, participated in the training. The Eastern Finland Police Department strengthened its investigation operations through recruitments focusing on animal welfare and hunting offences.

The wildlife patrol. Photo: Juha Tissari

Interaction and cooperation in wolf regions

Cooperation and dialogue between citizens, large carnivore observers (LCOs) and the authorities reduces fears, concerns and wolf depredation. Cooperation helps spread information about the wolf population and good practices on how to protect livestock.

There are already networks in Finland that convey information about wolves locally to researchers and the authorities, and vice versa. These networks include the network of LCOs and territory cooperation groups.

LCOs are local trained volunteers, usually hunters, who check sightings of large carnivores made by citizens and register them in the Tassu system. Tassu sightings are the cornerstone of large carnivore population estimates. In addition, sightings effect decisions on issuing taxi rides to school children, for example. There are some 2,400 LCOs operating in Finland.

The cooperation groups of wolf territory areas bring together local representatives of municipalities, game management associations and nature conservation associations, as well as livestock farmers, to discuss wolf-related matters. The groups share an updated overview of the wolf situation, plan local measures and promote a dialogue between game administration, research and citizens.

Goal

Strengthening the network of LCOs by updating related training and developing the activities of the territory cooperation groups.

Measures

- The training material for LCOs was updated and made openly available online.
- New working guidelines were prepared for the territory cooperation groups, and the groups were supported to network with local actors. In addition, annual seminars were held for the territory cooperation groups.

Tassu observations are the cornerstone of large carnivore population estimates.

Results

TRAINING FOR LARGE CARNIVORE OBSERVERS (LCOS) WAS UPDATED AND MADE OPENLY AVAILABLE

During the project, more than 700 people completed the online training.

LCOs require broad expertise. They must have diverse knowledge of large carnivores as species, the know-how on evaluating sightings, and an understanding of coexistence between large carnivores and people. The training provided for LCOs was updated to meet modern standards. The basic course was made openly available on the Riistainfo.fi website.

From now on, new LCOs are required to complete the basic course online or participate in a course organised by the Finnish Wildlife Agency. Those already working as LCOs were also encouraged to study the material to refresh their skills. Based on feedback, the course was considered useful, even though its content and usability could be developed further.

New themes were added to the training material, including communication in the role of a LCO, identifying livestock depredation caused by large carnivores, and DNA sample collection.

The project actively communicated the network of LCOs on social and regular media, and reminded citizens of the importance of reporting sightings.

Link to the LCO online training course

A tape measure used by LCOs, together with wolf tracks. Photo: Mikko Jokinen

TERRITORY COOPERATION GROUPS WERE GIVEN WORKING GUIDELINES AND UP-TO-DATE INFORMATION ABOUT WOLVES

The territory cooperation groups are like their members. In many of the groups, cooperation has become well-established over the years, with different parties knowing each other and being engaged in a varied dialogue. The groups have prepared and implemented a broad range of measures. For example, they have written notifications to local papers, arranged meetings, prepared statements, and shared information about the prevention of losses caused by large carnivores.

The updated work guidelines describe how territory cooperation groups can be established in new wolf territories, act as a framework for the groups, offer examples of measures and promote information exchange.

Annual seminars were held for the groups, with representatives of the project visiting the groups to discuss current wolf themes and hear what the groups had to say. The seminars received positive feedback.

The territory cooperation groups are like their members.

OPINIONS OF LARGE CARNIVORE OBSERVERS WERE IDENTIFIED

It is important to continuously develop the network of contact people for large carnivores. The network is an active part of the rural community and acts as a significant link between different actors. At a local level, large carnivore observers are often seen as specialists who are more credible and easier to approach than distant government representatives.

A thesis was undertaken during the project that asked for information from large carnivore observers about the network's activities, any challenges they had faced, their motivation, and any development needs. A total of 1,127 carnivore observers responded to the survey.

According to the survey, large carnivore observers are motivated by making sightings of large carnivores, collecting information about wildlife and ensuring sustainable hunting. The ageing of volunteers and a lack of appreciation were identified as challenges. Few citizens are familiar with the network which reduces the number of sightings obtained from regular people. In addition, some respondents criticised Luke's population estimates.

Seminar for territory cooperation groups. Photo: Mirja Rantala

Modelling tools for wolf population management

A mathematical model is like a scale model of an animal community's activities. It helps identify the complex interrelationships of species and address them in wolf-related decisions.

Large carnivores (bears, wolves, lynx and wolverines) and ungulates (moose, white-tailed deer, roe deer and wild forest reindeer) are part of Finnish nature. Different species interact with each other: one preys on the other, while some compete for the same food. Diverse population management addresses dependences and interaction between species. For example, planning of moose hunt must take into account the fact that moose are preyed upon by wolves and bears.

It may be relatively simple to see what impact a wolf pack has on moose in its territory. What if bears or white-tailed deer also live in the same area? What will happen to wolves if the moose hunting quota is changed? The more species, areas or other details are added to the equation, the more difficult it is to see the big picture.

A mathematical model is an extension of the brain. Modelling, mathematics and computer programming are tools that help compile information that would otherwise be difficult to comprehend. If a model has been built as a sufficiently detailed representation of the current state, it can be used to predict the future and assess the impact of decisions on animal communities.

Goal

Developing two tools to merge and perceive datasets to support the authorities, administration and decision-makers. The first will illustrate the impact of different population control measures on the population dynamics of cervids and large carnivores; the other will compile wolf-related information to support wilderness supervision.

Measures

- A multispecies game was built during the project. It is a model that illustrates the impact of different population control measures on the population dynamics of cervids and large carnivores. It is openly accessible online (in Finnish). lukepopulation.shinyapps.io/monilajipeli3/

- A tool was developed for the authorities to support wilderness supervision activities and prevent various conflicts caused by wolves.

Moose. Photo: Pentti Sormunen

Results

THE MULTISPECIES GAME ILLUSTRATES THE FOOD WEB FORMED BY DIFFERENT SPECIES

The multispecies game is an interactive tool in which users can select two cervid species and two large carnivores to predate on the former, to test different situations: for example, what would happen if animals were not hunted at all, or if a species disappeared from the area? Users can also set target population sizes for cervids and large carnivores to see whether the targets set for all species can be achieved at the same time.

The multispecies game offers an overview of how multispecies population management works, and what kinds of interrelationships different species can have. It is especially intended for hunting managers and others interested in the theme.

Although the game illustrates the interactions between species in a food web, it is based on simplifications. The game is not directly applicable to practical harvest planning.

The multispecies game gives a general view of how multispecies management works and what kind of interactions there can be between species.

Wild forest reindeer. Photo: Hannu Huttu

THE MULTISPECIES GAME WAS PLANNED IN COOPERATION AND HAS BEEN DEMONSTRATED BROADLY

A diverse group of stakeholders participated in the design of the multispecies game, including representatives of the authorities, administration, nature conservation, hunting, reindeer husbandry and livestock farming. At two joint meetings, the participants considered the challenges to which the tool should respond, and the variables and measures it should measure.

The game was demonstrated and used at meetings held by the Finnish Wildlife Agency in moose management regions. Meetings were also held for regional wildlife councils and other stakeholders, and the game was demonstrated at meetings for planning meetings of moose harvest and at other training events. In 2021–2024, some 2,200 people participated in various events.

The Finnish Wildlife Agency's personnel thought that the multispecies game provided some help in illustrating the interrelationships of large carnivores. All the various factors that affect the diverse group of predator and prey species, as well as animal populations, make the tool difficult to grasp, however.

THE OFFICIAL TOOL ASSISTS IN WOLF-RELATED WILDERNESS SUPERVISION

The official tool is used by some of the employees of the Police of Finland, Metsähallitus, the Finnish Border Guard and Finnish Customs. Although the tool is developed by Luke, it can only be accessed by technical administrators.

The tool collects datasets on a map that the wilderness supervision authorities have previously needed to retrieve from several different systems. Such datasets include wolf sightings in the Tassu system, wolf territories based on the population estimate, the results of DNA analyses and the estimated distance of the sightings from residential buildings.

The more detailed content of the official tool is confidential in accordance with section 24, paragraph 4 of the Act on the Openness of Government Activities, similar to many other systems used by the police and other supervisory authorities.

MODELLING IS DEVELOPING IN THE WILDLIFE SECTOR

The work started in the LIFE BOREALWOLF project to develop modelling in the wildlife sector will continue in other projects. Luke has developed the mathematical model that operates in the background of the multispecies game to be more detailed and more representative of natural phenomena. The aim is that the model can predict the regional densities of different species in Finland several years ahead.

The effectiveness of the model calls for research data on animal ecology. For example, this data can be obtained from field studies in which roe deer, white-tailed deer and lynx are collared. The aim is to identify what impact carnivores have on the reproduction of prey species, the survival of calves and their movement in the region. This data can be used to specify the modelled estimates.

Bear. Photo: Mari Tikkunen

Communication

Information plays an important role in societal dialogue and practical coexistence with wolves. Information about where to get help and support, and how to protect livestock, helps people cope in wolf territories.

Dialogue on wolves is emotional and coloured by various claims about wolves, politics and research. When flooded with information, it may be difficult to perceive what is true and up to date.

People have a thirst for information about wolves. Some 70 per cent of the adult population living south of the reindeer husbandry area say they have read at least one news article about wolves during the last year. This is unsurprising, as an average of 2,600 online news articles are published in Finland each year. This translates to at least 50 wolf-related news articles per week!

Goal

Strengthening people's engagement in the management and monitoring of matters related to wolves, providing people living in wolf regions with information and support, promoting a constructive dialogue with stakeholders, and integrating research data more closely into public dialogue.

Measures

- The progress and results of the project were communicated regularly on the website and in social and conventional media channels, as well as in various other ways.
- The media monitor built in the project used AI to monitor and classify wolf-related news.
- Educational material presented the Finnish large carnivores to children. Specialists from the Finnish Wildlife Agency and the Uusimaa district of the Finnish Association for Nature Conservation visited schools across Finland.
- Wolf events were held for media representatives and Members of Parliament.
- Lessons learned about coexistence with wolves in other countries were heard at an international seminar and were implemented in practice with Finnish stakeholders.
- The Uusimaa district of the Finnish Association for Nature Conservation held two public events about wolves in Western Uusimaa.

Media event in Björkö. Photo: Mari Lyly

Results

THE PROJECT WAS IN THE SPOTLIGHT IN WOLF REGIONS AND COOPERATED WITH STAKEHOLDERS

The project's key stakeholders represented a diverse group of people living in wolf regions and the countryside, livestock farmers, hunters and nature conservationists. Extensive cooperation was carried out around different themes: hiking trips collecting DNA samples, joint patrols of the supervisory authorities, wolf-themed village and community events, workshops, international seminars, and remote meetings.

Specialists participated in various local and regional events, gave interviews to reporters, and answered various questions from citizens.

Social media acted as an important channel not only for communication but also for customer service and interaction. The project received many questions that were answered by specialists from several organisations. Answers to frequently asked questions were published online (www.susilife.fi).

Of the adult population south of the reindeer husbandry area, 25 per cent knew the project by name in 2024. An even larger percentage said they had read news or had otherwise heard more about the project's themes. People living in wolf regions were more familiar with the project and its activities than people in other parts of the country.

More than

3 200

followers in social media accounts

project demonstrated to some

10 000

people at more than

240

events

People living in wolf regions were more familiar with the project and its activities than people in other parts of the country.

LEARNING ABOUT FINLAND'S FOUR LARGE CARNIVORES DURING SCHOOL VISITS

On the tracks of large carnivores" school visit material (in Finnish).]

The educational material on the bear, the lynx, the wolf and the wolverine consisted of a teacher's guide, brochures, videos, slideshows, posters and exercises. The material is openly available online. In addition, teacher's guides and brochures for the identification of tracks were handed out to 283 schools. Based on feedback, teachers were satisfied with the material and spoke especially highly of the videos and the information about how to encounter large carnivores and identify their tracks.

During the school visits by planners from the Finnish Wildlife Agency and specialists from the Uusimaa district of the Finnish Association for Nature Conservation, children learned about the life, nutrition and distinctive features of large carnivores. Children had the opportunity to identify large carnivore tracks using a printed mat on a natural scale.

Educational material handed out to

283

schools

149

classrooms of

2 681

pupils visited

LIFE BOREALWOLF PROVIDED MEDIA REPRESENTATIVES WITH PERSPECTIVES AND SOLUTIONS

Coordinated by Metsähallitus, nine media events were held, both remotely and in person. Media representatives were invited once a year on a field trip to or near a wolf territory.

In 2019–2024, the project was mentioned by name in 944 news stories. This is equivalent to an average of three news stories a week. The project was not always mentioned, even if a news story covered the project's themes or activities. This means that the themes have received broader coverage than is indicated by the number of times the project's name has been seen or heard in media releases.

According to the media representatives who participated in the events, the LIFE BOREALWOLF project provided information, perspectives, new interviewees, meeting places and tangible solutions.

The project also built media monitoring tools to follow wolf-themed news and examine its content. The monitoring tool – the media monitor – helped separate wolf-related news from news in which the word "wolf" was mentioned in other contexts. The media monitor helped identify how wolves were mentioned in the news, and how often. Furthermore, it showed that the themes, publication dates and number of wolf-related news stories followed a similar pattern every year: most news was published during the snow cover in the winter.

944

media articles

30

media releases published

135

media representatives participated in media events

The media monitor helped identify how wolves were mentioned in the news, and how often.

On a school visit. Photo: Tiia Tuomisto

Photo: Joona Kotilainen

What do Finnish people think about wolves?

The number of wolves increased in Finland during the LIFE BOREALWOLF project. New wolf territories have been established in particular to Southwest and Western Finland–regions with a high population density. Although wolves are touching the daily lives of more and more people, opinions on wolves have remained unchanged.

People's attitudes towards wolves were identified through two surveys in 2020 and 2024. In both years, 2,000 Finnish people aged at least 18 years and living in Mainland Finland, south of the reindeer husbandry area, responded to the survey. Half the respondents lived in "wolf municipalities", in which most wolf sightings had been made during the last 12 months.

Some 35 per cent were afraid or very afraid of running into a wolf when outdoors. People were more afraid of bears and ticks than wolves. People living in wolf municipalities were more afraid of running into a wolf than people in other locations.

The more unpredictable wolves were considered to be, the greater the fear. Many believed that wolves might become accustomed to people if they no longer had to be scared of people. Feeding sites were considered to strengthen this phenomenon.

Photo: Katja Ronkainen

The majority of parents of children aged under 15 years regarded wolves as a low or insignificant risk for their children, whereas traffic and strangers caused greater concerns.

People walking their dogs in wolf regions considered wolves as a significant risk for their dog's safety. Regarding recreational activities, the presence of wolves had the most significant impact on how and where people hunted. The impact of wolves on berry picking and mushroom hunting had decreased.

Between the two surveys, production animal and pet owners' concerns had decreased in wolf municipalities.

Support for wolf protection has increased in recent years. Some 47 per cent had a positive approach to wolf protection, and 30 per cent were neutral. Most respondents said that they had neutral attitudes towards wolf protection. They either did not find it necessary or know how to formulate a strong opinion on wolf hunting. In contrast, 37 per cent believed that not enough wolves had been hunted during the last five years.

Some 7–10 per cent of the respondents approved of the illegal killing of wolves, while 20–25 were fully against it, whatever the situation. In wolf municipalities, the percentage of those who accepted illegal killings had decreased, but more respondents were uncertain or unwilling to give an opinion.

More about the report (in Finnish) http://urn.fi/URN:ISBN:978-952-380-989-5 (Pellikka ja Ala-Kurikka, 2024)

Photo: Niko Pekonen

Key results of the LIFE BOREALWOLF project

In regions where people share their living environment with wolves, almost without exception, there are challenges and disputes due to wolf-related decisions. Where can wolves live? How many wolves can there be? The wolf conflict has been described as a "devilish problem", a situation that is difficult to resolve, and where various needs, interests and values are intertwined.[1] The wolf question is like a knot that people try to open by pulling the ends of the rope in different directions.

The wolf population grew during the LIFE BOREALWOLF project. The wolf population has strengthened especially in Southwest Finland, a region with high population density.

In recent years, large carnivores – especially wolves, but also bears and lynx – have been a cause of a heated political debate. The citizens' initiative in 2020 and the Government Programme in 2023 promoted permitting wolf hunting for population management in Finland. According to the project's media monitor, common wolf-related themes in Finnish media services include politics and dialogue on wolf hunting.

Although the increase in the wolf population and the heated political debate could have made people's attitudes more negative, this did not happen during the project. Although wolf-related problems were not resolved, EU LIFE funding helped focus on what was relevant: supporting people living in wolf regions, promoting coexistence using tangible tools, and effective communication. LIFE BOREALWOLF extensively supported the measures listed in the wolf population management plan.[2]

1 Bisi, J. (2010). Suomalaisen susikonfliktin anatomia (The anatomy of the Finnish wolf conflict).
2 Management plan for the wolf population in Finland (2019. Publications of the Ministry of Agriculture and Forestry 2019:24. urn.fi/URN:ISBN:978-952-366-014-4

Practical challenges related to wolves such as **livestock depredation** are local. At its best, support for people living in wolf territories is practical and intensive local work, for which the planners from the Finnish Wildlife Agency and the police and game warden patrol gave a good start in the LIFE BOREALWOLF project. The project presented new protection methods for livestock in Finland, and positive feedback was given on local work with people living in wolf regions through guidance and support.

Although the work carried out with livestock farms was valuable, the input of three planners was insufficient to reduce wolf depredation in Finland as a whole. The work will be continued at the Finnish Wildlife Agency, funded by the Ministry of Agriculture and Forestry. To maintain resource efficiency in this work, administration and the authorities must be engaged in cooperation across organisational boundaries at local, regional and provincial levels.

The police and game warden patrol in Eastern Finland was a completely new model of official cooperation. The patrol supported local communities and cleared the way for a dialogue on the illegal killing of wolves.

The project's most significant successes can be seen where people **have met in person** and worked together to solve problems, whether the question was solving the problem of wolves coming to people's backyards or protecting sheep in a traditional landscape. Furthermore, the events held for media representatives, Members of Parliament and people living in wolf territories were considered valuable opportunities for information exchange. The delightful school visits to help children learn more about fascinating large carnivores were something else entirely!

The LIFE BOREALWOLF project succeeded in diversifying the wolf-related **dialogue in media services**, establishing relationships between local communities, citizens and international organisations, and strengthening the fact-based communication of the research organisation and wildlife administration.

As a result of the project, wolf **DNA sampling** is known better, and its value and importance are recognised even by stakeholders that previously disagreed on wolf hunting and protection.

Protective vests for hunting dogs were found effective in Finnish conditions. While they were already used to some extent before the project, the project trial and its media coverage demonstrated the potential of the vests to Finnish hunters more broadly than before. It remains to be seen whether protective vests establish their position among hunting dog owners.

LIFE **BOREALWOLF**