LIFE18 NAT/FIN/000394

Final Report

Covering the project activities from 01/10/2019[1] to 30/09/2025

30/09/2025

LIFE BOREALWOLF

Project location:	Finland	
Project start date:	01/10/2019	
Project end date:	30/09/2025	**Extension date:** <dd/mm/yyyy >
Total budget:	5 513 M €	
EU contribution:	3 018 M €	
(%) of eligible costs:		
	Data Beneficiary	
Name Beneficiary:	Natural Resources Institute Finland LUKE	
Contact person:	Mrs Madeleine Nyman	
Postal address:	Latokartanonkaari 9, 00790, Helsinki, FINLAND	
Telephone:	+358-29-5322336	
E-mail:	madeleine.nyman@luke.fi	
Project Website:	https://susilife.fi/	

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2. List of keywords and abbreviations

***Keywords**:* Grey wolf | Canis lupus | Finland | population monitoring | human dimension | population management | cross breeding prevention | Collaborative working methods| public outreach| Management Strategy Evaluation tool | Social acceptance | Awareness raising | conflict management | Wildlife surveillance

Abbreviations (beneficiaries): **LUKE** - Natural Resources Institute Finland (CB) | **FWA** - Finnish Wildlife Agency | **MH** - Metsähallitus Parks & Wildlife Finland | **Police** - Eastern Finland Police Department | **FANC -** Uusimaa district of the Finnish Association for Nature Conservation.

Abbreviations (other): **MTR** - Mid-term Report | **LC** - Large carnivores | LCO – Large Carnivore Observer | **CB** - Coordinating Beneficiary | **AB** - Associated Beneficiary | **GA** - Grant Agreement | **GMA** - [local] Game Management Association | **MAF** - Ministry of Agriculture and Forestry | **ME** - Ministry of the Environment | **MTK** - Central Union of Agricultural Producers and Forest Owners | **MMA** - Moose Management Areas| **PM** project manager | **CC** Communications coordinator | **WM** wolf management | **TC** territory cooperation

3. Executive Summary

The LIFE BOREALWOLF project (2019–2025) aimed to enhance the overall long-term status of the grey wolf (Canis lupus) population by maintaining a minimum of 25 wolf family packs. The ultimate long-term goal was to achieve a favourable conservation status for the wolf, through improved coexistence between humans and large carnivores. The goal was targeted through enhancing public acceptance, reducing illegal killing, and improving conflict-mitigation tools. Key objectives included: (1) developing and implementing a cost-effective, DNA-based pack monitoring protocol; (2) forecasting and targeting management actions through novel modelling tools; (3) deploying practical methods to prevent depredation on livestock and dog; (4) strengthening collaborative stakeholder networks and outreach; (5) combatting the illegal killing of wolves and (6) sharing information on the wolf and the conservation and management system in Finland. Deliverables comprised technical and scientific reports (e.g. MSE and DNA-monitoring protocols), policy-support tools (e.g. surveillance hotspot maps, Management Strategy Evaluation interface, Human-Wildlife conflict synthesis report), educational materials (guidebooks, e-training modules, videos), media releases and infographics, and on-site interventions such as protective-vest trials.

At the outset, preparatory actions (A1–A3) were scheduled to conclude by June 2020. While all planned guidelines, survey reports, and cost studies were completed, timelines were shifted by 2–5 months due to underestimation of preparatory workloads and COVID-19 restrictions. A new wolf population monitoring scheme (A1) was developed in collaboration with international experts. The public-attitude survey (A2) met targets with 2 000 respondents; results were published and widely disseminated before conservation actions launched. The damage-mitigation cost study (A3) delivered its master's thesis and stakeholder briefings on schedule.

In the implementation phase, the DNA-based monitoring action (C1) successfully adopted a new SNP-based assay and expanded volunteer sampling from 83 to 174 contributors, achieving and sustaining an over 90 % territory coverage by 2025, despite the wolf population growth. The anti-poaching hotspot tool and MSE model (C2) were piloted and fully operational by late 2023. The anti-poaching hotspot tool reached all wildlife wardens and over 200 law-enforcement officers; the online MSE interface was introduced to 51 moose-management areas and trialled by 200 managers. Practical mitigation (C3) produced an online "toolbox" for farmers, delivered 72 km of protective fences and 168 trail cameras to 43 farms, and carried out over 270 farm visits. The plan for protecting hunting dogs was conducted through a trial of commercially available vests: 200 hunting dogs tested vests through winter 2024–2025, with no vest-wearing dogs injured. Collaborative outreach (C4) revamped the LCO network, publishing a guidebook, rolling out a six-module e-course with 700+ completions, and hosting 21 regional territory-cooperation seminars. The patrolling and networking activities to combat wildlife crime, particularly illegal wolf killings, in Eastern Finland (C6) proved fruitful. Results indicate improved enforcement efforts, increased public reporting of suspected wildlife crimes, and enhanced cooperation among enforcement agencies. The presence of a wildlife patrol contributed to the establishment of new wolf territories and a reduction in illegal activities. Furthermore, proactive community engagement helped mitigate conflicts and foster trust in conservation efforts. The project demonstrated that a dedicated wildlife patrol unit can significantly enhance surveillance, enforcement, and public engagement, providing a cost-effective model for addressing wildlife crime.

The main aim of the project in enhancing the overall long-term status of the Finnish wolf population by maintaining a minimum of 25 breeding females in the project area, was reached by far (41-47 in 2024). In addition, the ultimate long-term goal in achieving a favourable conservation status for the wolf population in Finland outside the Alpine zone, was also reached.

Overall, the project achieved or exceeded core targets: wolf pack monitoring coverage doubled, public acceptance indicators improved modestly despite a growing wolf population, illegal-killing risk assessments became embedded in enforcement practice, and innovative modelling tools provided transparent decision support. The trial of protective vests not only prevented dog losses but spurred over 80% of testers to purchase their own gear. Deviations included minor schedule slips in deliverables due to pandemic-driven remote work, delays in journal publications, and unsuccessful tenders for novel dog-gear and sound-detection applications. Adaptations (such as shifting field demonstrations online, reallocating preparatory tasks between actions, and refocusing resources on proven solutions) ensured continuity and a smooth project management. Engagement challenges included volunteer saturation in DNA sampling, necessitating pauses in sample intake, and the need to continually refresh outreach to offset conflict dynamics in newly recolonized areas.

LIFE BOREALWOLF has generated lasting conservation, social, and institutional benefits. Its outcomes include a scientifically based, stakeholder-supported monitoring system that underpins national wolf population assessments, stronger cooperation between rural communities and authorities, and the uptake of practical tools that directly reduce conflict and economic losses. The project's emphasis on communication and dialogue, transparency, collaboration, and adaptive management has enhanced public trust and policy legitimacy, contributing to improved tolerance in key regions. At a broader scale, the project serves as a model for coexistence in other European carnivore landscapes, with its tools and protocols already adapted for use outside Finland. The integration of scientific research with community engagement has not only stabilized wolf numbers but also fostered a more balanced coexistence, laying the groundwork for resilient large carnivore governance.

By supporting collaboration between organisations, scientists, volunteers, policymakers, and local communities, the project has strengthened the foundation for long-term wolf management and conservation. Although challenges remain, the project's achievements lay a strong groundwork for maintaining a stable and well-functioning management system. Through ongoing research, adaptive management, and community involvement, Finland is well-positioned to ensure the future of the wolf population while balancing ecological and societal needs.

4. Introduction

4.1. Project background, problems, and objectives

Prior to the project, the grey wolf had expanded its range in Europe, but the populations were still low and endangered in most recolonized regions. A small wolf population had remained in Finland throughout its historical disappearance in Europe, but the increase of the population had been slow and fluctuating. The increasing wolf population had resulted in a dispersion further into human-dominated landscapes in Southern and Western Finland, after an absence of over 100 years. Prior to the project, the number of wolf family packs within the Finnish border had remained below the set minimum viable population of 25 breeding females, despite dedicated efforts by the wolf management administration to increase the population. The Finnish wolf population is of international relevance as it forms a link between the Russian and Scandinavian populations.

The recolonisation of wolves into human-dominated landscapes during the last 20 years had not been smooth, with continuously raising conflicts on all levels of the society. This had resulted in a deep-rooted institutional misfit, i.e. a distrust between governmental bodies in charge of the wolf management, stakeholders, scientists, NGOs and the civil society. Aims and methods of governance, implementation, routines of administration and approaches of wildlife research were incompatible with the cultures, wishes and lifestyles of the civil society. The conflict appeared on the territory level as strong demands for wolf hunting, illegal killings, notable fear and worry of wolves, unwillingness to share ungulate game with wolves and mistrust in local officials and the governance and administration at large. The threat posed by LCs on domesticated animals was manifested as depredation on dogs and livestock, producing persistent societal problems and indirectly representing a major threat to the wolf conservation. The media also played a part in the conflict through presenting the situation through polarised filters, further exacerbating these issues. The challenge for the project was to try to untie this knot or at least seek for resolution between parties.

The EU Commission had expressed concern about the conservation status of Finland's wolf population and the necessity for precautionary conservation actions. The major challenge was to identify a proper set of tools to minimise the threats and damage caused by the wolves that would include all of the conflict elements. Another important aspect was to include all central actors into the project activities, either as partners or as collaborators.

The overall goal of the LIFE BOREALWOLF project was to enhance the overall long-term acceptance of the wolf and to maintain the long-term population viability in Finland. This involved maintaining a minimum of 25 wolf family packs (i.e. breeding units, as defined in the national population management plan from 2015) in Finland and maintaining the stability of the breeding population in the long-term. The ultimate long-term goal was to achieve a favourable conservation status for the wolf population, through improved coexistence between humans and large carnivores.

The project aimed at reducing societal tension around human-wolf and human-human conflicting aspects using multiple approaches, such as a) by increasing public acceptance of wolves, 2) mitigating negative aspects of wolf presence (i.e., fear, harm to livestock and dogs),

and 3) creating tools for reducing illegal killing. These activities would influence the public perception of the wolf by increasing the understanding of and decreasing the fear of the wolf, and by increasing its acceptance amongst the citizens (particularly in rural communities) and increasing local know-how on tools for co-existence. The project intended to put effort into mitigating the mistrust towards the administration and its official population estimates, into reducing misinformation about wolves, research and management, and concerns such as wolves' effect on hunting opportunities. The project further aimed at facilitating an improved, collaborative relationship between the civil society, governance, wildlife administration, research and management.

4.2. Expected long-term results as foreseen in the proposal

1. **Improved conservation status of the wolf**. A minimum viable population of 25 reproducing packs will be achieved annually. The monitoring scheme will be in frequent use and understood by citizens. Improved status and network of large carnivore contact persons will be launched. More accurate and trusted wolf population estimation will be achieved by increased data from remote areas. Trust and dialogue between opposing parties and stakeholders will increase.
2. **Improved awareness and positive perception towards wolf and conservation**. People living in wolf territories will have access to the project's results, have a knowledge of wolf biology, conservation and whom to contact with regards to wolf-related issues, and thus fear and worry will decrease. Most livestock and dog owners will know how to protect their animals. Teachers and children will be well educated, as a result of both numerous school visits and widely distributed educational material.
3. **Decreasing illegal killings.** The illegal killings will decrease due to targeted control and several other actions affecting the (background) drivers of illegal killing. Modelled risk will enable faster police intervention when detecting missing or suddenly diminished packs and increase the risk of getting caught. Expert police officers will be familiar with focused monitoring on LC crime and disseminate knowhow at a national level. Public outreach actions will involve locals to act against illegal killing.
4. **Increased collaboration, transparency and trust between project partners and stakeholders**. 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 and implementing local actions. Population estimations will be more accurate as a result of increased data collection from remote areas by volunteer networks. Damages caused by wolves will decrease and general acceptance of wolves will increase. Local people will trust field personnel and support them in wolf conservation and management.
5. **Established novel best-practice and pilot tools**. New fences for livestock and protective materials tested by farmers will prevent predation by wolves. Protective vests are promoted based on project experience to hunters using dogs in wolf territories. Wolf population estimates will be more predictable as social and ecological consequences of management actions can be predicted with the MSE-model and used as a tool in wolf management. The effect of wolves on ungulate prey will be predictable and accounted for, decreasing conflict with hunters.

6. **Accurate, effective and sustainable communication as a part of the project management**. Expert evaluations will estimate impacts of the project's actions, which will be published and widely disseminated both during and after the project has ended.

5. Administrative part

All partners signed a partnership agreement with the Coordinating beneficiary (CB) LUKE. CB conducted the project management and administration as a whole through employing fulltime staff for both the project management and administration (project manager, PM), and for internal and external communication (communication coordinator, CC). The PM (Madeleine Nyman) and the CC (Iina Ala-Kurikka) worked in the project from day one. The PM had the overall responsibility of the project management work and related correspondence with the Associated Beneficiaries (AB) and with EASME / CINEA. Each associated AB had a contact person to whom the mutual correspondence was addressed. The project staff (over 65 persons in total) were employed by the CB or AB. The PM was not responsible for any human relations (HR) issues of the staff but was in continuous contact and provided support concerning HR issues with the staff and the employers.

Each action was led by an action leader (project staff from CB or AB) and coordinated in an action team. Luke was in charge of Actions: A1, A2, A3, C1, C2, D1, D2, D3, D4, E1, E2 and F1, and also responsible for implementing sub-actions D1.1. and D1.2. FWA was in charge of Actions: C3, C4, C5, and also responsible for implementing sub-actions D1.3, D1.4, D1.5, and carried out E2.1. jointly with FANC. MH and the Police were in charge of C6, and also responsible for implementing D1.6 and E2.2, jointly with the project partners. FANC was responsible for implementing Actions E2.1. (jointly with FWA) and E2.3.

The relation between the staff was easy-going and open, building trust along with the proceeding project. The collaboration became smoother and more efficient throughout the project. Similarly, the relations between the CB and the ABs were straightforward with no considerable disagreements despite the delicate and conflict-sensitive themes covered. The project launched a joint internal code of conduct to ensure transparency, avoid misunderstandings or conflicts, and to resolve possible misunderstandings or mismatches. All partners signed the partnership agreements and made an effort of working along with the agreed frames.

All ABs had specialised personnel responsible for technical and financial tasks. In some organisations, only one person was in charge of all tasks. This was not an optimal solution but manageable. The coordinated financial reporting (all beneficiaries combined), was coordinated and prepared by the CB accounting officer, and reported by the PM.

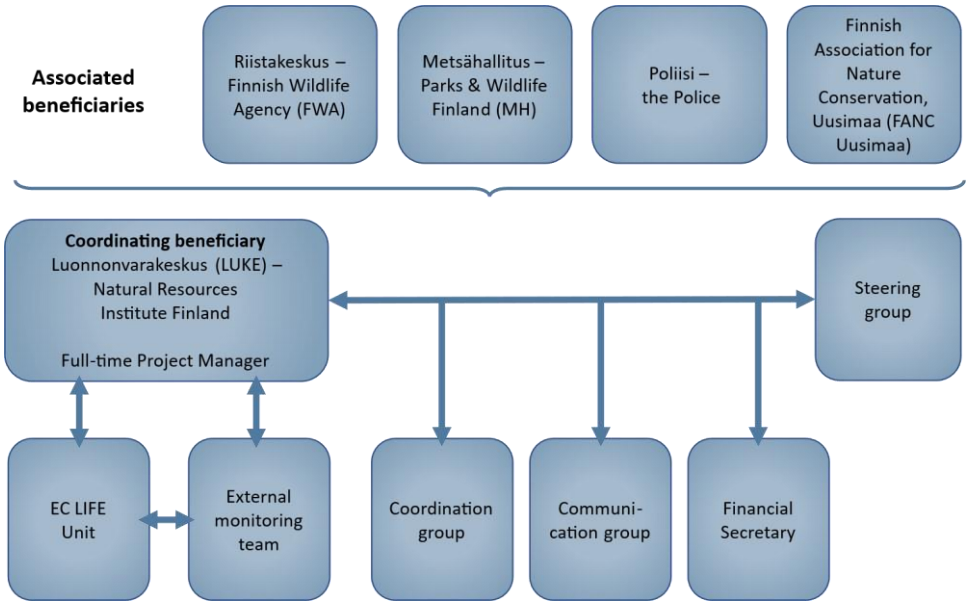

Figure 1. Illustration of the project structure.

The project management built up the project organization and published guidance documents to support the project staff in administrative and reporting activities. It organized 29 coordination group meetings, 12 steering group meetings and 5 enlarged steering group meetings (meetings listed in Table 1). The project established an annual meeting cycle consisting of both internal and external meetings, conveying up-to-date information on activities and outputs.

Table 1 Project meetings during 2019-2025.

Groups	2019	2020	2021	2022	2023	2024	2025
Beneficiary meeting	Oct						
Kick off meeting	Nov						
Coordination group	Nov, Dec	Jan, Feb, Mar, May, Aug, Oct, Nov	Jan, Feb, Apr, Oct	Feb, May, Sep, Nov	Feb, Aug, Sep, Oct,	Apr, June, Sep	Jan, Mar, May, Aug, Sept
Finance reporting group		Jan, Mar, Oct	Feb	Apr	Apr	Jan, Aug, Sep	
Steering group		Apr, Oct	Apr, Sep	Apr	May, Nov	May Nov	Mar, June, Aug
Enlarged Steering group		Oct	Sep	Nov	Nov		Mar
EU-Monitoring meetings	Oct	Feb	June	March	April, Aug, Sep	Nov	Feb, May
LIFE vs. national wolf management plan		Feb, Sep	Feb, May	May			

Communication with EASME / CINEA was excellent throughout. There was a low threshold in communication and correspondence with NEEMO/ELMEN EEIG, who provided factual based support and prompt advice whenever needed. In addition, 10 LIFE monitoring meetings were organized in different parts of the country demonstrating the fieldwork of the project. Annual project reports (Milestones) were delivered 2020-2024 to the monitor to ease the monitoring process, and to report on amendments requested and/or accepted by EASME/CINEA (Annex 61a and 61b in MTR, reports in 2022–2024 sent directly to the monitors). The project has actively communicated with both the monitoring partner and with EASME/CINEA throughout the project and have reacted at a short notice and amended the changes requested (Annex 11, 62 a, b, 63a, b, 64 a, b, and 65a, b in MTR, Communication via the Desk Top service since 2024). The Midterm report and a monitoring online session was organized in 09/2023, in which representatives from DG-ENV were present. This was followed by a project visit from CINEA. The monitors were satisfied with the outputs and outcome of the project so far and sent a

feedback letter (10/2023) with a request for more information to be attached to the final reporting. Answers to the requests are presented in the unabridged version of this report.

No major changes were needed as a result of the amendments to the Grant Agreement.

6. Technical part

6.1. Technical progress, per action

ACTION A1: Action plan

Completed /	Foreseen start: 01/10/2019	Actual start: 01/10/2019
	Foreseen end: 31/12/2019	Actual end: 31/05/2020

Activities undertaken and outputs achieved: As a part of the preparatory actions the following guidelines were produced:

A working plan on the development of DNA-based pack monitoring in Finland was prepared through an open and collaborative process within the project. In addition, experts from neighbouring countries were invited to a workshop (16.–17.1.2020) discussing best way forward for a DNA-based pack monitoring in a Finnish context and for future international collaboration. The working plan provides tools to extend the genetic monitoring as to get a robust estimation of the number of territories and confirm the number of reproductions (Annex 1 in MTR).

A plan on how to update the educational material on carnivore observation was produced, including a road map of compiling the education package into a web-based training course with multimedia materials, and developing a certificate system for new observers (Annex 2 in MTR).

An evaluation report on the best practices used in wolf conservation in Europe was prepared with the focus on the best practices of mitigating livestock damages. The evaluation reviewed the mitigation measures taken in LIFE-projects, and of the scientific experiments made to test the effectiveness of the mitigating measures (Annex 21 in MTR). A media release on the Best Practices used in wolf conservation in Europe was produced as well (Annex 4 in MTR).)

A working plan for compiling a damage prevention toolbox and on how to release it as a web-based guide was produced. The damage prevention toolbox included different methods of how to prevent wolf related damages on farms with livestock and on hunting dogs. Knowledge gathered from previous projects on wolf-related threats and damages from Finland (e.g. *SusiAita*-project) and Sweden were utilised. In addition, experiences from various wolf management plans from Europe were assessed (Annex 3 in MTR).

Comparison with planned output and time schedule: The timeframe planned for the preparatory actions were partly unrealistically short and were therefore postponed with a few months. All changes were accepted by EASME in letter commenting the first monitoring meeting (Annex 63a in MTR). All planned deliverables were produced in due time before the corresponding conservation actions were launched. The deliverable "An evaluation report on the Best practices used in wolf conservation in Europe" was moved to Action C3 due to time limit in this action. These changes were accepted at the first monitoring meeting in 2020 (Annex 21 in MTR).

Modifications, problems, and delays: No modifications, problems or substantial delays that would affect the other actions.

Deliverables reported in the MidTerm (MTR) report

- A1: 2020: Working plan on the development of DNA-based pack monitoring in Finland (Annex 1)
- A1: 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 (Annex 2)
- A1: 2020: Working plan for compiling damage prevention toolbox and releasing it as an electronic guide (Annex 3)
- A1: 2020: Media release on the best practices used in wolf conservation in Europe (Annex 4)

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

Completed /	Foreseen start: 01/10/2019	Actual start: 01/10/2019
	Foreseen end: 30/6/2020	Actual end: 31/08/2020

Activities undertaken and outputs achieved: A survey on the acceptance towards wolves among Finnish citizens was conducted, aiming at evaluating the situation at the beginning of the project. A similar survey was also carried out at the end of the project (see Action D2) as to assess whether the project has succeeded in changing the attitudes among Finnish citizens towards a more positive view on wolves. A target population, sample frame, and a questionnaire form were determined based on discussions in a project workshop (November 11th, 2019). The response rate was 23 % out of 2000 persons. The survey covered issues, such as citizen attitudes, feelings, beliefs and experiences regarding the wolves, support on killing wolves illegally and perceptions of the current and desired roles of the public authorities and other social actors. The results were compared whenever possible to corresponding results from previous surveys made to estimate trends during 2014–2020. The key results are shown in figure 2, the full report is found in Annex 7 (in MTR). The key results were summarized in infographics which reached up to 21 500 citizens in social media. The report received notable publicity in Finnish newspapers and on the radio. The report was also shared on the international website hosted by the European Wilderness Society. Information about the results of the findings were shared in a media release on people's acceptance towards wolves (Annex 5 in MTR), and in a general newspaper article on people's acceptance towards wolves BEFORE LIFE BOREALWOLF (Annex 6 in MTR).

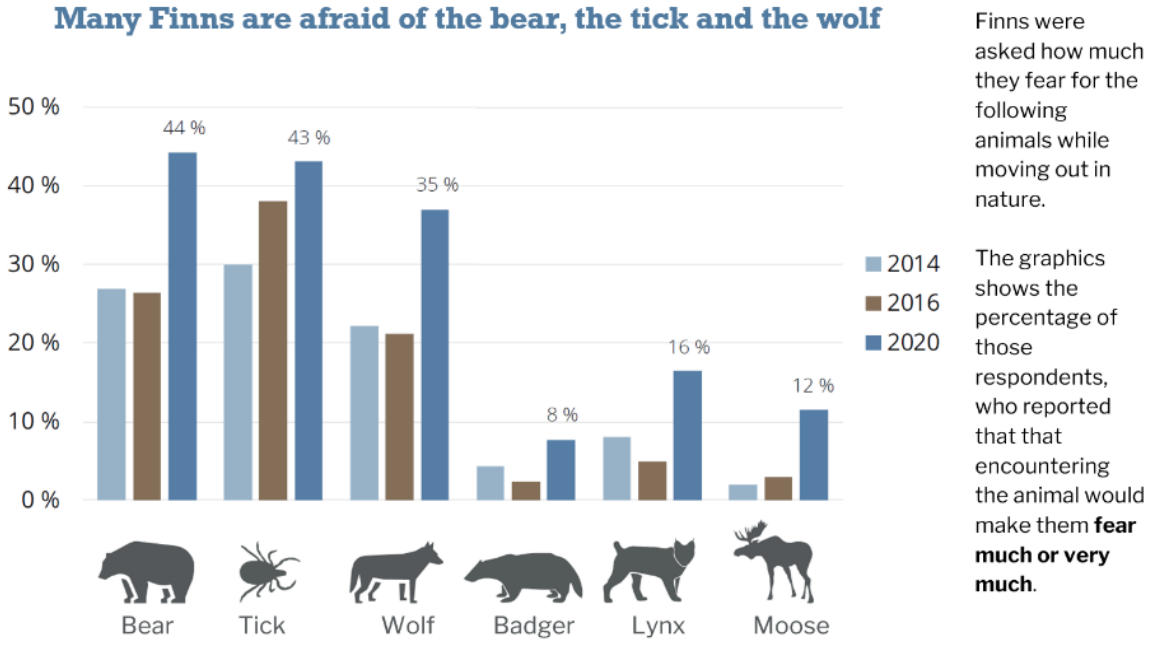

Figure 2. The key results of the report were summarized in infographics. The results show that people are afraid of large carnivores and ticks.

Comparison with planned output and time schedule: The timeframe planned for this action was partly unrealistically short and was therefore postponed with a few months. All planned deliverables were produced in due time before the corresponding conservation actions were launched.

Modifications, problems, and delays: No modifications, problems or substantial delays that would affect the other actions.

Deliverables reported in the MidTerm (MTR) report

- A2: 2020 Media release on people's acceptance towards wolves (Annex 5)
- A2: 2020 General newspaper article on people's acceptance towards wolves BEFORE LIFE BOREALWOLF (Annex 6).
- A2: 2020 Scientific report on the results from the survey on the people's acceptance towards wolves at the beginning of the project (Annex 7)

ACTION A3: Background investigation on damage-mitigation costs

Completed /	Foreseen start: 01/03/2020	Actual start: 01/03/2020
	Foreseen end: 31/12/2020	Actual end: 31/1/2021

Activities undertaken and outputs achieved: ***A report on the damage mitigation costs*** was produced examining the extent 1) to which the presence of LCs and the perceived risk of damage on farms activated measures to prevent damage to farm animals; and 2) to which those who mitigate damage are satisfied with the effectiveness of their prevention and more generally; with 3) the formal supporting arrangements. The package was conducted by a Master's student, who interviewed 10 farmers and sent a questionnaire (receiving 223 responses).

The results suggest that waking up to the damage risk can occur through nearby LC large carnivore (LC) observations or events. Although several LC-species coexisted in the vicinity of the farms, it was the wolf that was rated as the greatest risk factor by farmers (respondents). Sheep and goats were particularly perceived as exposed to LC damage. Experiencing the risk was year-round and multi-year for most farms. A higher perceived risk of LC damage was associated with a higher probability of a need to apply many mitigating measures in parallel. The most common measures included activities that increased awareness of the LC presence (i.e. enhanced monitoring), and those that prevented LCs from discovering and getting used to seeking food nearby. Most farmers were satisfied with the effectiveness of the mitigating measures they already used, and a clear majority (76-84%) of them estimated that LCs did not affect the future plans of the farms, regardless of the level of the perceived risk of LC damage.

The respondents strongly supported the formal guidelines, in which the damage caused by LCs is entirely to be compensated by the state. In contrast, most respondents opposed to the other part of the formal guideline, which requires efforts of their own to prevent damage (such as fence maintenance) to be entitled to compensations. In general, attitudes were divided, and some emphasized the role of own-initiative, self-employed damage preventive measures, referring to the peace of mind their own actions and effective methods brought.

Information on the results and outcome was shared in a media release on damage-mitigation costs for livestock producers (Annex 9 in MTR) and in a popularized report on the voice of everyday farmers. (Annex 8 in MTR). The whole report was published as a scientific report or Master thesis (in Finnish with English abstract) interviews and the survey (Annex 10, in MTR).

Comparison with planned output and time schedule: As hiring external personnel in Luke was not possible, the project changed the expense type from salary into external assistance (student´s work time and travel costs). The total costs of worktime of the action were not changed, and the work time that had been allocated for the student was transferred to the person responsible for this action in Luke. This change was accepted by EASME in 2020 (Appendix 63a in MTR).

Modifications, problems, and delays: No modifications, problems or substantial delays that would affect the other actions.

Deliverables reported in the MidTerm (MTR) report

- A3: 2020 Popularized report on the voice of everyday farmers. (Annex 8)
- A3: 2020 Media release on damage-mitigation costs for livestock producers (Annex 9)
- A3: 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 (Annex 10).

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

Completed /	Foreseen start: 01/10/2019	Actual start: 01/10/2019
	Foreseen end: 31/12/2023	Actual end: 31/12/2023

Activities undertaken and outputs achieved: This action has delivered 1) a new monitoring protocol aiming at a maximal coverage of the wolf packs in Finland and is building up 2) an enhancement of the network of collaboration between governmental institutions and volunteers. The co-operation steps have included close collaboration with important stakeholders (such as the Finnish Hunter´s Association and nature conservation NGOs) and governmental organizations, with the aim of asking for support to find new voluntary field samplers.

The results show that: 1) the coverage of identified wolf territories has reached the goal of the project by covering 91% (90% foreseen after LIFE) of the active wolf territories. The number of covered territories increased from 43 to 74 territories in 2025, showing a clear increase of the wolf population during the project time. 2) The effort put into training and engaging samplers in the field work has proven fruitful as the number of active volunteer samplers has reached a level of saturation (from 83 to 174 persons / 200 foreseen), sending in even more samples than can be analysed. The volunteers coordinating the field sampling has also increased from 8 to 45 persons (50 foreseen), which covers the need at present. The proportion of samples collected by volunteers increased from 50% to 70% annually since the project started (> 50% foreseen). These results shows that there is an interest in this kind of volunteer activity among the citizens, and that the trust and attitude towards the authorities is neutral or positive, 3) The annual cost of the updated DNA family pack monitoring system has proved very cost- efficient (Figure 3). At the end of the project the cost had reduced to a level similar to that prior to the project (roughly 0,5 M€ annually, excluding the efforts of the volunteers) despite the wolf population growth to almost the double. 4) Yearly Nordic exchange of samples and joint monitoring meetings were used as indicators of an increased collaboration with Scandinavian neighbours. After some years of intensified collaboration and exchange with the Nordic countries (harmonising the analytical DNA-methods and sending up to 63 samples annually), the networking and collaboration has been established back to 4 regular monitoring meetings annually and occasional sample exchanges.

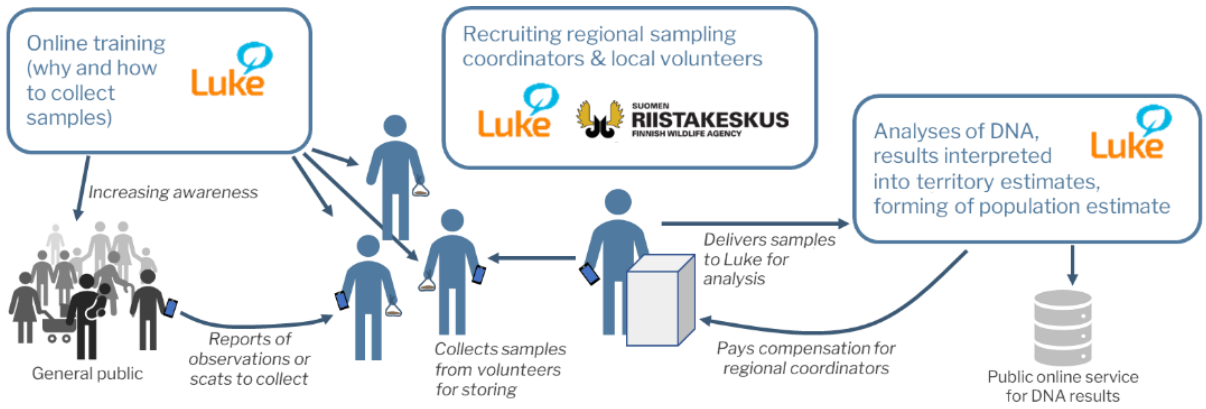

Figure 3. The infographic demonstrates the vital role of volunteers in the DNA sampling system.

The expansion of the wolf population has acquired a constant need for increased sampling efforts in new areas. The new monitoring system has proven to be technically adaptive to the population growth and has managed to cover also newly established family packs. The new monitoring system is described in detail in a technical report (Deli C1: 9/2025 in BUTLER), and in a scientific manuscript about DNA methodology for wolf breeding events monitoring (Deli D1: 09/2025 in BUTLER). The article will be published after the project has finished.

Effective communication about the volunteer network, DNA analysis, and results has played a key role in engaging new samplers for the expanding wolf population. Neutral information and annual feedback sessions have served as a motivating factor for many DNA sample collectors and coordinators, while local interest in individual wolves and their histories has further encouraged participation. DNA results by territory have been published annually through local and regional media and press releases have been used to announce the beginning and end of the sample collection season and to report the number of samples collected (Deli C1:08 and 09/2020 - Articles in general papers about the methodology and why to collect DNA and how to participate (to increase involvement of volunteers, Annex 12 and 13 in MTR; Deli C1 06/2021 and 11/2020 (delayed from 08/2020) - 2 articles in general papers (feedback on the volunteer involvement and DNA results, Annex 14 and 15 in MTR; Deli C1:10/2020 and 10/2021 - Annual Press release about onset of the DNA sample collection season, Annex 18 and 19 in MTR; Deli C1: 10/2021 1 of 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, Annex 20 in MTR; Annual press releases and articles in 2022 and 2023 in BUTLER). In additional, a sampling campaign called #SusienJäljillä (organised by MAF, Luke and FWA) to raise awareness of the importance of the sampling effort was very successful, as received around 900 views on the project's website and 4500 views on Twitter.

To make both the wolf population estimate and DNA sampling more familiar and understandable to the public, two animations have published on the Luke YouTube channel (Annex 16 and 17 in MTR). The first animation describes how the population estimate is done, and the second demonstrates what DNA analysis reveals about wolves.

Figure 4 Swab sampling of livestock killed by wolves was tested as a new DNA collection method. Photo: Mikko Jokinen.

Comparison with planned output and time schedule: Some deliverables were delayed with a few months: 1) a general article on the DNA results from 2020–2021, and 2) a general article

on the wolf population estimation in 2021, due the schedule of the publishing journal (*Metsästäjä/Jägaren*). The change in DNA analysing methodology resulted in postponing the submission of the scientific manuscript (Milestone 12/2022). The assessment of the new method was finalized in 2022, and the manuscript was delayed to 09/2023, and the technical report describing the new scheme in detail was also delayed until 09/2025. The title of the manuscript was changed to "Development of cost-effective, multifunctional SNP panel and analysis workflow for genetic species monitoring". The changes were corresponded with NEEMO in 11/2022 and presented in monitoring meetings in 2023, 2024 and 2025.

Modifications, problems, and delays: The project requested to proceed through a straight tendering process (not an open tendering process as planned) in 2020 with a 2-year agreement for the DNA analysis of wolf samples with the Turku University (Letter of request to EASME on changing the DNA analysis method, Annex 11 in MTR). In addition, a request was put forward to EASME in 2020 on changing the method for the DNA analysis. The Ministry of Agriculture and Forestry in Finland (MAF) financed a SNP (single nucleotide polymorphism) analysis equipment to Luke, thus increasing the efficiency of wolf DNA analysis, and to enable harmonising the results with the other Nordic countries. The total costs of the new technique were covered outside the project. The change of plans was accepted by CINEA in 28.6.2021 (Annex 64a in MTR). The change of analysing method altered the project budget by diminishing the costs of DNA analysis from 275 000 € to 200 000 € in total, leaving 75 000 € to be transferred mainly to project disseminating costs.

Complementary action outside LIFE: As a result of a fruitful collaboration between the Nordic countries a framework for transboundary cooperation on management and conservation of wolves in Fennoscandia was signed by the participating authorities in each country (MAF in Finland, Norwegian Environment Agency, Swedish Environmental Protection Agency) in 2020. Similarly, the SNP monitoring has been coordinated to enable discovering wolves migrating between the countries.

An extensive national project was conducted in 2022-23, aiming at scientifically establishing a favourable conservation reference value for the wolf population. It supported the LIFE project by increasing knowledge on the wolf population in Finland. The project was conducted in an international cooperation with Sweden, Norway and the USA. The international collaborators were invited as external experts to broaden the shoulders of their Finnish colleagues in such a politically sensitive question. The process and results were proactively communicated to the wolf management, central stakeholders and the general public. This project was prioritised by the governing bodies of the partner organisations over the LIFE project due to the political pressures on the wolf management in Finland today. However, the outputs from this project provided 1) direct data and information to the LIFE project, 2) support for the policymaking of the wolf management in Finland, and 3) a better knowledgebase for the decision making in the wolf management. This has in turn affected the opinions and attitudes the general public towards the wolf and its management.

Perspectives for continuing the action after LIFE: Luke will maintain the new monitoring system as a standard tool for collecting reliable, annual data on wolf reproduction. The results will be communicated regularly and transparently to both volunteers and the media, helping to build trust within the monitoring process. Luke's permanent staff will participate in DNA sampling at roughly the same level as during the project, and the genetic analyses will be

maintained with Luke's own funding. The databases developed for data management in Luke will be supported and in use, including necessary technical updates in coming years. The experience gained from the new monitoring system of the wolf population will be used to develop the bear population monitoring. The established networking and collaboration on population monitoring of large carnivores in Fennoscandia will continue as planned. As an example, Finland and Sweden are working closely to identify wolf immigrants on either side of the border by exchanging and analysing DNA samples.

Volunteer engagement will be supported by continued coordination from Luke and FWA and through regular information exchange and training events. Luke and FWA will monitor volunteer motivation and address any emerging challenges. Cooperation with authorities and stakeholders will continue after the project, focusing on maintaining the volunteer network, sharing research outcomes, good practices, and data. The electronic data collection form introduced during the project will be established as a part of the standard procedures and will increase the monitoring cost-effectiveness.

Deliverables reported in the MidTerm report (annexes 12-20):

- C1: 08 and 09/2020 - Articles in general papers about the methodology and why to collect DNA and how to participate (to increase involvement of volunteers) (Annex 12 and 13)
- C1: 06/2021 and 11/2020 (delayed from 08/2020) - 2 articles in general papers (feedback on the volunteer involvement and DNA results) (Annex 14 and 15)
- C1: 10/2021 and 11/2023 -> 05 and 11/2020 - 2 Webinars /educational videos (how population monitoring for wolf is done, how DNA analysis works and how to study breeding events based on that) (Annex 16 and 17)
- C1: 10/2020 and 10/2021 - Annual Press release about onset of the DNA sample collection season (Annex 18 and 19)
- C1: 10/2021 1 of 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) (Annex 20).

Deliverables reported during 2022-24 in BUTLER.

- C1: 2022 Annual Press release about onset of the DNA sample collection season
- C1. 10/2023 Annual Press release about onset of the DNA sample collection season
- C1: 06/2022: Article in general magazine on monitoring results
- C1: 06/2023: Article in general magazine on volunteer involvement and experiences
- C1: 12/2022 – 12/2023 Scientific manuscript about DNA methodology for wolf breeding events monitoring -> Due to changes in the DNA analysis method, the assessment of the new method was not finalized until spring 2023. The manuscript was written by 09/2023 and was submitted by 12/2023
- C1: 06/2024: Articles in general magazine on the use of results
- C1: 12/2024: Article in general magazine on stories of territory history
- C1: 09/2022 ->09/2025 Technical report on the methods taken in operation for monitoring and for result analysis.

ACTION C2 Developing tools to forecast and target management procedures

Completed /	Foreseen start: 01/01/2020	Actual start: 01/01/2020
	Foreseen end: 31/12/2023	Actual end: 31/12/2023

Activities undertaken and outputs achieved: Two new tools were developed for the actual conservation actions: ***a) tool to prevent illegal killings*** by spatially and temporally estimating its extent, predicting priority targets for monitoring and control (presented as an interactive map for officials conducting wildlife surveillance, and ***b) a Management Strategy Evaluation (MSE) tool***.

C2.1. Tool for preventing illegal killings

This action is described on a general level as its content is sensitive, and thus not possible to share to the general public. The aim was to provide all wildlife wardens (11) and 50 policemen specialized in wildlife criminality with (1) a map service for preventing illegal killings and (2) a tool for detecting hot-spot areas of wolf related illegal activity.

The map application pools together the following information as separate map layers:

1. Wolf observations from the national large carnivore observation system
2. Wolf territory information
3. Collared wolf individuals
4. Predictive map layer for wolf observations. Using internal funding, Luke developed a new wolf population estimation tool based on a target tracking algorithm. The tool was published in 2022 (Karppinen et al, 2022). In this action, the model was further adapted to enable probabilistic predictions of wolf observations, visualized as a probabilistic forecasting map layer. The user can compare predicted and realized wolf observations, which can be interpreted in the following way:
   - When an unexpected wolf sighting is reported (e.g. in an area that typically has low wolf activity), a new wolf territory is potentially forming in the area. This distributional change in the wolf population is potentially important for the law enforcement officers.
   - When wolf observations are missing where they are predicted, the area is flagged as a potential site of illegal killings that warrants closer inspection.
   - When wolf observations are obtained at normal pace, the area is flagged as normal, not requiring special attention.

The tool was constructed and further developed during 2020-23. The prototype was piloted by the wildlife patrol in the field, until the end of 2023. The Final tool was taken into operative use in Action C6 during 2022-2024. (Deli C2.1: 12/2023 Surveillance tool on assessing poaching probability is operational, and Deli C2.1: 12/2023 Communication materials (key messages, examples and infographics) on surveillance tool ready to use, in BUTLER). The tool has been presented in international fora and especially to Nordic Enforcement authorities in various meetings.

C2.2. Management Strategy Evaluation (MSE) tool

The Management Strategy Evaluation (MSE) tool was developed for illustrating the effects of wolf population management strategies. The ecological component of the tool was developed for multispecies management (wolf-ungulates in Action C5) and the societal component for

assessing wolf-induced damage coupled with the status of wolf population. Therefore, this action targeted wildlife managers, scientists, and other stakeholders widely.

The MSE tool provides an educational and user-friendly way to learn how species interact with each other and how different management measures affect the system. For example, from the wolf conservation point of view, the user can study how the harvest of ungulates could be used to ensure sufficient food source for the wolf population while keeping the forest damages and vehicle collisions related to ungulates at an acceptable level. As the tool is aimed at everyone interested in multispecies game management in Finland, the language of the tool is Finnish. The open-source information was published in 2023 (Deli D1: Annex 40 in MTR). The tool is available online at https://lukepopulation.shinyapps.io/monilajipeli3/

The management component of the model simulates the effects of management measures on population dynamics of species as well as other impacts, i.e., management target variables The management measures and targets included in the tool are based on the discussions in the problem framing workshop. It should be noted that it was not possible to include all measures and targets deemed relevant by the stakeholders in the MSE tool. This applies especially to illegal killing of wolves as well as fear and other emotions evoked by the presence of wolf, for which reliable data was very challenging to acquire.

Management measures include harvesting of species (Figure 5). The harvest is simulated by assuming that at the time of harvest decision the population density and effect of predation are known. The harvest necessary to achieve the set density target can then be determined. For short time span and small geographical areas, the simulation represents operational level situation, whereas for longer timespans and larger areas the simulation shows strategic level long term consequences of the selected harvest strategies.

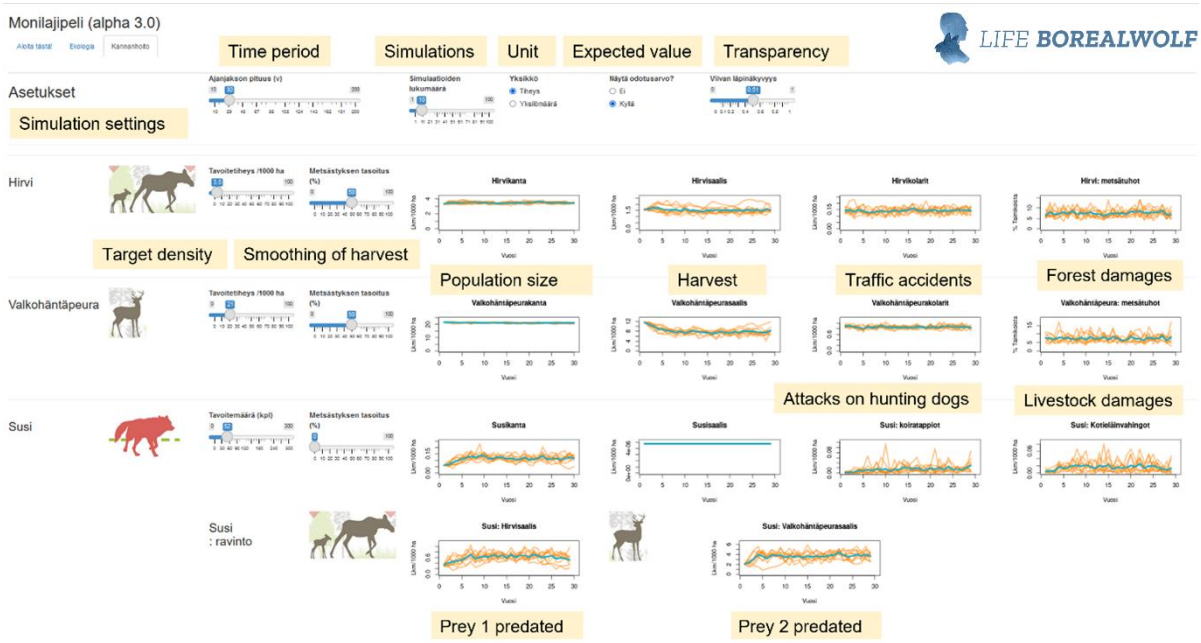

Figure 5. Graphical user interface of the MSE tool showing the effects of a user defined ungulate harvest strategy on wolf population, ungulate populations, vehicle-ungulate collisions, forest damages and on wolf attacks on hunting dogs.

The MSE simulation were tested for alternative management procedures and for application to moose harvest planning and introduced to 51 Moose Management Areas in 2021 (Deli C2.2 12/2023 MSE piloted in MMAs, in BUTLER). After this, the open web demonstration tool was presented to various stakeholder groups in numerous meetings, with a final demonstration at the annual Finnish Wildlife Management and Research Conference in Oulu, Finland in January 2024 (Deli C2.2: 01/2024 MSE presentation, in BUTLER).

Figure 6. The MSE tool being presented to wildlife experts in January 2024 by Samu Mäntyniemi. Photo: Iina Ala-Kurikka.

Comparison with planned output and time schedule: The deliverable: Press release on MSE tool 12/2023, was revised to a presentation of the MSE tool as part of a presentation at the Finnish Wildlife Management and Research Conference in Oulu, together with a news text on the progress of the modelling tools on the SusiLIFE.fi website in 01/2024. This change was accepted by CINEA.

Modifications, problems, and delays: Time spent in the project was less than expected due to other politically pressing duties around the national wolf conflict. However, the outputs of the other duties could be directly utilized in this project. The ICT services budgeted for developing the MSE model in C2.2 was used for extending the use of a could service operating the MSE tool. This payment allows the tool to be kept publicly available on-line for the next five years. It shows as a payment for one year of professional grade subscription of the cloud service, but the subscription level will be downgraded to basic level, in which case the payment covers the service for five years. The payment of the subscription was delayed due to administrative hurdles only after the project had ended in October 2025.

Complementary action outside LIFE: The project has established a contact with the LIFE EUROLARGE CARNIVORES project. During discussion of mutual interests, both models and their applications were brought up for discussion and were assessed to other similar tool already in use in Europe. It was concluded that the tools in use elsewhere are not based on modelling algorithms but rather build on gathering information. The modelling algorithms provide a possibility to make risk assessments and estimates of i.e. hotspot areas of wildlife crime. these assessments provide guidance on where to focus the scarce resources of the

wildlife surveillance. Having the accessibility very high level of information data from many parts of the wildlife management and surveillance in Finland, it is possible to build up a precise and up to date application that is ready to use in the field.

Other modelling efforts on wolves within Luke have enhanced the development of these two models: development of wolf population assessment models and wolf population dynamics model. A Nordic networking group has been initiated by the project concerning future use of scientific models as management tools in a Nordic context

A scientific manuscript on the estimation of the number of wolves in Finland was published during the project (Mäntyniemi, S., Helle, I. & Kojola, I. 2022). This publication will strengthen the scientific base of the MSE tool, which uses the population estimates as model inputs.

Perspectives for continuing the action after-LIFE: After the project, the MSE tool continues to be regularly used by the management administration in Finland. The insight provided by the online tool will be used annually to support the planning of moose culling, a process coordinated by FWA. The tool will be developed further by updating its biological input parameters based on models and results from other research projects. These projects include UMaKa (New modelling tools to support multispecies management of wildlife), a 3-year research project in Luke, funded by the Ministry of Agriculture and Forestry of Finland. UMaKa has developed a detailed spatial multispecies simulation model, which includes the majority of species included also in the MSE tool.

The MSE tool will also be used as a decision support tool for the Finnish wolf conservation. It will be maintained by Luke and used by relevant decision makers.

Ungulate hunting is rather similar in Scandinavia and Finland. With some modifications, the MSE tool and its use are transferable and replicable within Scandinavia. Different species can be added to the MSE when appropriate information is available. Wildlife managers will benefit from adding species such as bear, lynx and mountain hare into the model. Interest has been shown in the Ministry of Forestry and Agriculture in expanding the model to fit a wider array of species once the pilot has been tested in BOREALWOLF.

Deliverables reported during 2023-24 in BUTLER.

- Deli C2.1: 12/2023. Surveillance tool on assessing poaching probability is operational
- Deli C2.1: 12/2023 Communication materials (key messages, examples and infographics) on surveillance tool ready to use
- Deli C2.2: 12/2023. MSE results: simulation tests of alternative management procedures, application to moose harvest planning piloted.
- Deli C2.2: 12/2023 -> 01/2024 Presentation of the MSE tool as part of a presentation at the Finnish Wildlife Management and Research Conference in Oulu

References:

- *Karppinen, S., Rajala, T. Mäntyniemi, S., Kojola, I & Vihola, M.. (2022). Identifying territories using presence-only citizen science data: An application to the Finnish wolf population. Ecological Modelling. 472. 110101. 10.1016/j.ecolmodel.2022.110101.*

- *Mäntyniemi, S., Helle, I. & Kojola, I. Assessment of the residential Finnish wolf population combines DNA captures, citizen observations and mortality data using a Bayesian state-space model. Eur J Wildl Res **68**, 70 (2022). https://doi.org/10.1007/s10344-022-01615-5.*

ACTION C3 Developing practical tools to manage wolf-related threats

Completed / Foreseen start: 01/01/2020 Actual start: 01/01/2020
Foreseen end: 30/06/2025 Actual end: 30/06/2025

Activities undertaken and outputs achieved: This action consisted of tasks directed towards *a) building collaboration networks* on a local and regional scale, *b) sharing information and producing a toolbox of damage prevention measures* suitable to Finnish conditions, *c) fieldwork* to deliver protective materials and promote damage prevention, do damage inspections, and gather data, and *d) developing protective gear or tool for dogs*.

Within action C3, the project staff contacted and shared advice with ca. 200 different farmers (125 foreseen) including over 270 farm visits and delivering nearly 200 batches of equipment (25 foreseen). The material consisted mostly of fences, trail cameras and light and sound deterrents, providing increased protection to around 10 000 livestock (2 500 foreseen). Majority of the farms interested in collaborating with the project were estimated to receive equipment at least once and were positive towards trying out new tools for protecting their livestock. At the end of the project, roughly 500 livestock animals per year were killed by wolves (200 before the project), and some 150 000 € was paid annually in compensation of lost or injured livestock (60 000 € before the project). The number of dogs attacked by wolves during 2024 was 53, out of which 42 were killed (194 703 € compensated; some 150 000 € before the project). In summary, even though the animal owners were keen on collaborating with the project, the intensified protection could not yet be clearly seen as a decrease in damages on a national level.

Toolbox of damage prevention measures (C3.1): In 2021, the information on preventive measures gathered and experiences learned from national and international experts was compiled into a toolbox guide of damage prevention. An updated version was released in 2025 (https://riista.fi/riistatalous/riistavahingot-ja-konfliktit/suurpetovahinkojen-estaminen/), based on further lessons learned in collaboration with farmers, and through international dialogue (e.g. Swedish Wildlife Damage Centre, LIFEstockProtect, LIFE WolfAlps EU and LIFE EuroLargeCarnivores). Videos on preventive measures (https://youtu.be/I5kFhnIOx2w) and building electric fences (https://youtu.be/mjT74Oy58Sg) were released as supportive material, substituting for the on-the-field demonstrations originally planned.

Lending preventive tools to farmers (C3.2): For their advisory work, project staff utilised the information gathered for the toolbox and experience from hands-on usage of protective materials, aiming to recommend preferred measures for different livestock and varying environmental conditions. Plans to map out maintenance solutions for electric fences (outside original project plan) were cancelled due to farmers being too busy to participate. Protective equipment acquired and borrowed to livestock owners included 168 trail cameras, 38 GPS-collars, 184 sound and light deterrents, 7.5 km of electric mesh fence, 18 km of fladry, and 0.7km of floating fence with flags.

Damage prevention plans for livestock farms (C3.1): The project assessed the wolf depredation risk each spring to find focal areas of advertising project support to farmers. This was based on the locations of sheep farms, previous depredation, wolf territories and wolf sightings. Information on whom to contact in case of predator sightings or depredation was shared. WM

coordinators visited some 200 livestock farms for consultation and delivery of equipment. Priority was given to farms where predators had been seen or even were causing depredation. Feedback of preventive measures from 2025 showed that farmers were mostly happy with the collaboration and the equipment provided.



Figure 7. a) WM coordinators met with some 200 livestock owners, mainly at sheep farms. Photo: Mari Lyly; b) Farmers received advice on building electric fences, e.g. regarding ditch crossings. Photo: Mikko Jokinen; c) Maintenance of fences and monitoring of voltage were an important, advocated topic. Photo: Mikko Jokinen.

Fieldwork to support DNA sampling and damage inspection (C3.2): Project staff consulted on damage inspection in individual cases and verified some courtyard or pasture visits made by wolves. In addition, WM coordinators supported the DNA-sampling of wolf scats based on regional needs, signalled by Luke staff (C1) and local LCOs. During sampling seasons of 2020–2025, 200 field trips were made collecting a total of 350 samples.

Developing protective gear or tool for dogs (C3.3): The project sought to reduce wolf depredation on dogs, supported by multiple stakeholder meetings and market dialogues. At the end of 2023, the project launched the preparations of an extensive trial of protective vests for hunting dogs. After consulting Swedish experts, the project acquired vests from two different manufacturers and lend them to 200 hunting dog owners for one season. The three mandatory online surveys carried out during 2024–2025 showed that the overall experience was positive: the test group considered vests a viable solution against wolf-depredation and thought them to reduce risks for accidents and other injuries, too. Only one incident of wolf attack–with minor injuries–was reported on these dogs. Detailed results of the vest testing are presented in a separate report on project web page (www.luke.fi).https://www.luke.fi/en/prevention-of-damage-caused-by-wolves).

In addition, practices to reduce depredation risk were actively communicated to hunters, especially at the onset of each hunting season. These include using a GPS collar to follow the dog at close proximity, and temporal and spatial selection of hunting grounds to minimize the probability of wolf encounter. Capability to retrieving a dog from mid-hunt situation is important and requires training and help of co-hunters. Information was shared through a media release about developing protective gear for dogs (Deli C3.3 05/2024 in BUTLER), and in a magazine article about the developing protective dog gear (Deli C3.3: 08/2024 in BUTLER).

Figure 8 a) Photo (on the left) showing the Genzo Wolf vests with protective steel spikes on the upper flanks of the dog; b) The challenges of protecting hunting dogs and the experiences of test trial were conveyed to both national and international audiences, e.g. at Wolves Across Borders in Lunterens, 2025. Photo: Mari Lyly.

Information on wolves and damage-preventing measures was shared in over 200 events and meetings (partially in connection with other actions of the project), and more than 3 000 persons took contact with the project regarding depredation, risk of meeting a wolf, and aspects of wolf biology. This was a big input in form of daily-basis work, with more than 10 contacts per week on average. The three wolf management (WM) coordinators were the key actors, participating in various regional events, throughout the duration of the project, to share wolf-related information and to established cooperative networks with various local stakeholders.

The outputs of the project action were communicated through project web pages (toolbox guide, videos, blog posts, Annexes 21 & 23–25 in MTR) as well as through various news articles (e.g. Annexes 22 and 26 in MTR) and collaboration with farmers associations. Webinars for sharing knowhow and recent changes in the wolf population and depredation cases were organised collaboratively with environmental authorities and MH staff. In addition, a social media collaboration with the Finnish Sheep Association answered farmers' questions on how to prevent damage to livestock. Work done in this action was also presented in international conferences.

LIFE BOREALWOLF also disseminated general information about wolves (biology, distribution and behaviour), and the best protective practices through media releases, blog, news articles and events organised within and outside the project. Especially in SW Finland the wolf population grew during the project period and caused a need for many local-level information events, where the project has been an active organising party. Via daily meetings and phone calls the project staff disseminated up-to-date information about the range of wolf territories and recent observation to the residents of wolf-populated areas. Project staff instructed livestock and dog owners about preventing depredation, and the project also prepared fact sheet templates that were spread to citizens via territory cooperation groups.

Comparison with planned output and time schedule: The media release in June 2021 covered not the online toolbox but instead, gave an overview of methods offered by the project to livestock farmers. The news article published in 2021 (magazine of sheep herders

association) covered the use of GPS collars, instead of focusing on the light-weight fences, that had not yet gained much of user experience.

The development of a protective gear for hunting dogs deviated from the original plan. A letter of request to widen the competitive tendering of dog protective gear was put forward to EASME in May 2020 (Annex 65b in MTR). Modifying the tender call of 2020 was accepted by EASME (Annex 63b in MTR) but provided no acceptable offers. In 2021, the project planned for an observation sharing platform, but such feature was launched independently by a commercial operator (application of sharing wolf observations on a map interface). During 2022, the project prepared a tender call for an application that collates wolf information to support risk assessment, but the funds were deemed insufficient to execute the plan. During Jan–Sep 2023, the project explored options to develop a sound-recognition algorithm to be used as early-warning of wolf presence. The idea was discussed in the monitoring meeting of Sep 2023, but unfortunately, the intended partner withdrew from the endeavour in Oct 2023. Consequently, the project decided at the end of 2023 to promote the use of vests via an extensive trial, rather than developing new protective gear, per se. The protective vest trial was communicated to CINEA for their approval on April 2024 and received positive feedback on April 9th from the project monitor (via HelpDesk), as this new measure was seen to support the original aim of developing protection against wolf attacks. It was also approved that the original sum of 100 000 € for external services (tender for gear development) could be used for acquisition of ready-made vests. The vest trial was carried out during 2024–2025.

Modifications, problems, and delays: Work under action A1.3 was largely transferred to C3, as A1 closed in 2020 but C3 ran almost throughout the project. This work included the planning of the toolbox guide of preventive measures.

Due to Covid-19, the project organised less face-to-face meetings and very few field demonstrations. These were replaced with online meetings, webinars and production of informative video materials, available also after the project has ended. From 2022 onwards, it was possible to organize public events again, and the annual target of some 15 stakeholder events participated by the project was met.

Due to changes within the permanent staff (especially FWA) there were more participants in this action than initially planned. However, the number of people working in this action remained stable throughout the project.

The external costs originally budgeted for development of protective gear for dogs were changed in to acquiring consumables, i.e. dog vests from to different companies. This budget change was communicated with CINEA at the same time as the planned changes in the sub-action, i.e. dog vest trial, were described.

Complementary action outside LIFE: Non-project personnel from FWA has disseminated information on wolves to residents through personal outreach, local events and magazine articles. In addition, FWA has shared information and collaborated with various local stakeholders. In total this has summed up to some 130 working days annually.

LIFE BOREALWOLF provided the EuroLargeCarnivores project with a status report on the wolf management in Finland and data on wolf depredation on domestic animals.

The project has launched dialogue with Centre for Economic Development, Transport, and the Environment to share information and discuss collaboration on preventing wolf depredation in pasture habitats currently being established with a state funded Helmi-programme.

Perspectives for continuing the action after LIFE: FWA will continue to support farms under acute risk by lending protective materials and giving advice on damage prevention. It will be conducted using a shorter rotation time when lending equipment to the farmers with the most acute need, i.e. during the first couple of weeks. This will help to ensure that resources and equipment are sufficient for all in need of support. With the help of materials produced in the project, FWA will also continue their daily stakeholder communications to disseminate information to local people about wolves and how to mitigate problems related to the species. For this, FWA recruits more people to support the permanent staff, and their tasks will include coordinating the deliveries of protective materials and organising regional information-sharing events. The equipment acquired during the project will be lent to farmers, but also new devices will be tested when available on the market. These acquisitions of deterrents and other devices, same as electric fences, are funded from the annual subsidy applied from the MAF. Assessment of depredation risk will follow the procedure used during LIFE BOREALWOLF.

FWA staff will continue to advertise protective gear available for dogs, recounting experiences from LIFE BOREALWOLF. Vests left over (not purchased by test users) from the trial period will be used as sample units, which can be fitted on hunting dogs at the FWA regional offices to facilitate purchasing a protective vest of suitable model and size.

Deliverables reported in the MidTerm report (MTR):

- Deli C3.1: 02/2022 A report on the best damage prevention practices used in wolf conservation in Europe (moved from A1, Annex 21)
- Deli C3.3: 06/2020 → 04/2020 An article in general magazine about the dog vest seminar (Annex 22)
- Deli 3.2: 09/2020 → 05/2020: Media release about the project developing damage prevention methods for livestock (Annex 23)
- Deli C3.1: 03/2021 First version of toolbox guide for damages prevention ready (Annex 24)
- Deli C3.1: 06/2021 → 05/2021 Media release about the online toolbox guide for damage prevention methods (Annex 25)
- Deli C3.2: 06/2021 → 03/2021: An article in general magazine about the rapid response supply of electric fence (Annex 26)

Deliverables reported during 2022–2024 in BUTLER:

- Deli C3.3: 01/2024 → 05/2024 Media release about developing protective gear for dogs
- Deli C3.3: 09/2024 → 08/2024: An article in general magazine about the developing protective gear for dogs
- 04/2024. Letter to CINEA regarding dog vest trial and change of expense category (Apr 2024) and approval.

ACTION C4 Development of collaborative working methods and public outreach

Completed /	Foreseen start: 01/01/2020	Actual start: 01/01/2020
	Foreseen end: 30/06/2025	Actual end: 30/06/2025

Activities undertaken and outputs achieved: This action enhanced the local collaboration and public outreach in three separate packages: ***a) developing the large carnivore observer (LCO) network***, including some 2 150 active volunteers (2019), and ***b) promoting the function and collaboration of the territory-cooperation (TC) groups***.

C4.1: The online training for LCOs was established in 2022 and provided support to the gradual increase of volunteers from 2 153 to 2 378 persons (2 320 foreseen) during the project. Over 450 LCOs passed the basic online course since it opened in Feb 2022, and the reported 14 435 wolf observations in 2024 show a clear increase from the level prior to the project (8 461 before the project). These results indicate that both new and more experienced observers are very active. The challenge for the project was to ensure the active volunteers would stay engaged also in the future.

Supportive materials for the LCO network: The project strengthened the regionally patchy LCO network by recruiting new volunteers and updating the training programme. A guidebook for LCOs was published in 2021, freely available online. Printed copies were delivered to active LCOs, same as a badge and a tape measure with the new network logo. The guidebook also acted as the basis for a new online course, comprising of six lessons. Four optional online modules were published during 2022–2025. Annual feedback event reached some 10–15% of LCOs, and were considered crucial to motivate the volunteers at times of substantial policy changes. The project also produced four short online videos for supporting LCOs in their fieldwork and encountering citizens (Deli C4.1 5/2024 in BUTLER), and translated carnivore literature from Swedish collaborators.

A feedback survey for LCOs was carried out in 2023, jointly with a Master's thesis. One third of the volunteers responded and produced valuable insight on the needs for developing the operations. The thesis was published in 12/2023 (https://www.theseus.fi/, PDF in Finnish).

Throughout the project, field personnel worked in close collaboration with the local LCOs to support the monitoring the carnivores, but also to gain insight for efficient DNA-sampling. The outputs of the project actions were communicated through various news articles out of which two were listed as project deliverables (Annex 28 and 30 in MTR, Deli C4.1 1/2023 and Deli C4.1 7/2024 in BUTLER). As a result, the role of the LCOs became better known and was repeatedly highlighted in media releases and local events, at a time in which the number of human-carnivore encounters increased in Finland.

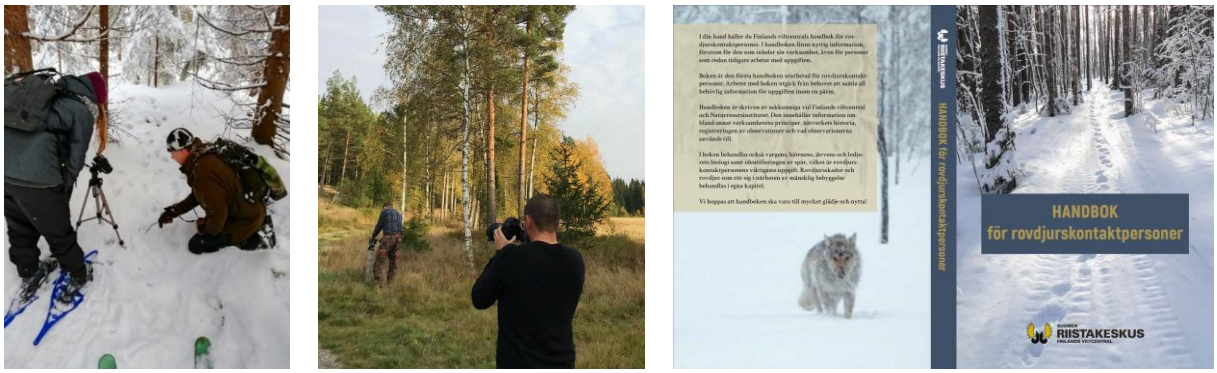

Figure 9 a) On the left: video shoot in Huittinen for the LCO training programme's videos; b) Filming the LCO introduction video in Kemiö in the beginning of October 2021; c) The covers of the LCO handbook (Swedish edition), published by FWA in 2021.

C4.2: The number of wolf territory cooperation (TC) groups increased from 23 to 38 during the project, establishing new groups following with the settlement of new wolf territories. At the end of the project, 94 % of the known wolf territories were covered by a TC group, as compared to 73% prior to the project. Project facilitation was the key input for this process. The percentual target of 85 % coverage of territory groups has been reached and at present a major part of the wolf settlements in the country are covered.

Developing the concept of territory cooperation: The project produced updated guidelines for the territory cooperation groups in 2022, including instructions on forming new cooperation groups and suggestions of possible actions (Annex 29 in MTR). Throughout the project, groups were facilitated to plan, implement and monitor local wolf management actions, map out best practices for coexistence and disseminate information for their peer groups. The project staff also provided on-site support and facilitation by participating in group meetings. The role of the TC groups was developed towards a stewardship approach, in which the participants themselves oversee further enhancing the local human-wolf coexistence. The concept of TC was communicated regionally by groups themselves, and nationally by the project.

Providing material for the groups: New groups received an extensive information "starter package", as well as the latest meeting agenda, which were delivered to all active cooperation groups three times per year (18 meeting material packages during the project). All groups received annual updates of the progress of the LIFE project. Groups provided memorandum of some 220 meetings during the project.

Figure 10. Project organised over 20 regional seminars, providing a platform for stakeholder dialogue. Photo: Mari Lyly.

Regional seminars enhanced networking between stakeholders: The project organised webinars (2021–2024) and over 20 regional seminars (2019, 2022–2024) to support networking between territory cooperation groups. In 2019, these events and their memorandums were listed under action E1, as C4 had not yet been launched (Annex 46 and 47 in MTR). In addition, external guests were invited to the seminars in 2023–2024 to promote networking and collaboration among local and regional stakeholders. All events mapped out various perspectives of developing wolf management, e.g. ideas on how to share information more effectively. events and many information-sharing webinars proved to be a great contact point for territory cooperation, as some 15–30 % of participants were reached per event. Project blogs and other released texts (including e.g. Deli C4.2 11/2023 and Deli 4.2 9/2024 in BUTLER) helped to make cooperation groups more known among territory residents. TC working model was also promoted in multiple international events.

Comparison with planned output and time schedule: Due to the Covid-19 pandemic and national restrictions, many planned events and stakeholder meetings were postponed or cancelled. The launching of the test phase for the LCO online course was postponed by roughly 8 months, as not all chapters were yet fully updated and could not be finished due to project experts being tied to other work. As an advantage, this allowed for testing the course material in an online training event, producing valuable feedback from the trainers. The test version was released in 12/2020 and final version of the online course in 02/2021. Three information-sharing webinars were replaced with four information-sharing videos, that are available online to the public, also after the project has ended.

Some of the TC seminars were organised online due to the Covid-19. This also required additional guidance for some of TC group members, that were not accustomed to using online meeting platforms and their tools. Instead of extensive online survey, feedback and development ideas were gathered annually during webinars and seminars. A short questionnaire to map out need for training was sent out in 2023, but provided only a few answers.

Modifications, problems, and delays: The media release on engaging new volunteers to become LCO persons was postponed from 12/2020 to 02/2022, so that the course could be published first (approved by CINEA in 2021, Annex 64a). Article in general magazine about LCO course materials available to anybody was postponed from 06/2021 to 05/2022, so that the material would be out and available to all at the time of publication. The media release regarding TC groups and project works was provided as a presentation during the journalist event of Laitila, Nov 2023 (Deli C4.2: 11/2023 in BUTLER).

Complementary action outside LIFE: FWA planned and organised training events for the LCO network and helped to organize the DNA sampling network and communicated about their work (20 working days).

Producing a handbook for the LCO network was not included in the original project plan but was found to be a great way to enhance expertise within the LCO network, motivate the volunteers and to produce preliminary material for the online course. Similarly, launching the

development of a new strategy for the LCO network was an action conceptualised outside of the original project plan, launched from the results of the LCO feedback survey in 2023. It was considered a vital tool for anchoring a joint understanding and the best steps forward to ensure the existence of the network also in the future. The strategy, formulated during 2024–2025, was developed in collaboration with FWA and Luke, who coordinate the volunteer network and the volunteers themselves.

Perspectives for continuing the action after LIFE: FWA and Luke will continue to coordinate and train the LCO network as part of their regular work. This also covers financing for the training events and annual feedback events, which will be organised by FWA. The web-course and exam will be maintained and updated by FWA, and feedback event materials are updated by Luke. The LCO guidebook and Swedish information materials and books translated into Finnish will provide additional knowledge base for any new volunteers joining the network. The project work has also prompted a preparation of a national development strategy, which aims to further strengthen the LCO network and to ensure the resilience and continuity of the working model. It will provide an excellent basis to spread information about the operating model and its key advantages—as well as possible challenges—to other countries.

TC groups will continue to be coordinated and supported by FWA. Regional events will be continued in order to motivate the TC groups and to disseminate information more actively between different actors. FWA continues to steer the groups to work independently, so that the main role for FWA will be to set up and support new groups. The concept of TC groups can be transferred to other EU-countries, which is promoted by guideline materials produced during the project available online in English, Finnish and Swedish.

Deliverables reported in the MidTerm Report (MTR):

- Deli C4.1: 12/2020 → 02/2022 Media release on engaging new volunteers to become LCO persons (Annex 27)
- Deli C4.1: 06/2021 → 02/2022 Article in general magazine about LCO course materials available to anybody – more detailed description (Annex 28)
- Deli C4.2: 02/2022 → 03/2022 New TC guidelines published (Annex 29)
- Deli C4.1: 05/2022 Article in general magazine about the working principles of the LCO network (Annex 30)

Deliverables reported during 2023–2025 in BUTLER:

- Deli C4.1: 01/2023 Article in general magazine about the updates and experience of LCO e-course
- Deli 4.2: 11/2023: Media release about an overview to TC groups and project work, aiming to add conspicuousness → changed to a theme in journalist days in 11/2023
- Deli 4.2: 09/2024 → 10/2022 Article in general magazine about seminars organised for TC groups.
- Deli C4.1: 06/2025 → 07/2024 Article in general magazine about new modules to the LCO course materials → originally 4 articles bundled together.
- Deli C4.1: 06/2025 → 05/2024 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. → We produced informational videos as part of the LCO course.

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

Completed /	Foreseen start: 01/01/2021	Actual start: 01/10/2020
	Foreseen end: 31/03/2025	Actual end: 31/03/2025

Activities undertaken and outputs achieved: The tool for assessing the impact of management procedures (MSE) was introduced in 2021 at 40 regional training events, with around 750 participants, alongside 11 additional webinars involving 400 attendees. These events introduced local stakeholders to the principles of multispecies management and the modelling tool's capabilities, emphasizing the importance of understanding complex predator-prey interactions. In 2022, regional offices showcased the updated online simulation interface of the modelling tool to approximately 330 participants in 12 events. Simultaneously, five pilot areas were selected, and relevant ecological parameters were mapped to tailor the tool to local conditions. Educational material for MMA events (presentation to introduce the concept of multispecies management and the prototype of MSE modelling) was finalized in 09/2022 (Deli C5 Annex 31 in MTR), and educational materials on piloting the implementation of MSE modelling were produced by 09/2023 (Deli C5 in BUTLER). The pilot testing continued in 2023–2024, with results and the tool's interface shared with regional game councils and local stakeholders. A survey in 2024 gathered feedback from game managers to refine the tool for broader implementation. The project reached the aim 50 out of the 60 MMAs using the tool after LIFE. The number of MMAs where hunters have been trained to use the MSE reached all 60 MMAs, covering several thousand hunting clubs.

The activities of educating hunters to understand the concept of multispecies management, and of developing the MSE approach (action C2) to full-scale implementation of multispecies management framework was initiated in 2021. In the early stages, online meetings helped lay the groundwork for the action, establishing timelines and crafting a prototype of the multispecies management tool (C2). By the end of 2021, the tool and management approach had been presented at 40 regional training events, with around 750 participants, alongside 11 additional webinars involving 400 attendees. These events introduced local stakeholders to the principles of multispecies management and the modelling tool's (C2) capabilities, emphasizing the importance of understanding complex predator-prey interactions.

The following year, regional offices presented an updated online simulation interface of the modelling tool, to which five pilot areas had been selected and relevant ecological parameters mapped to tailor the tool locally. The pilot testing continued in 2023–2024, with results and the tool's interface shared with regional game councils and local stakeholders. A feedback survey in 2024 gathered insights from game managers to refine the tool for broader implementation.

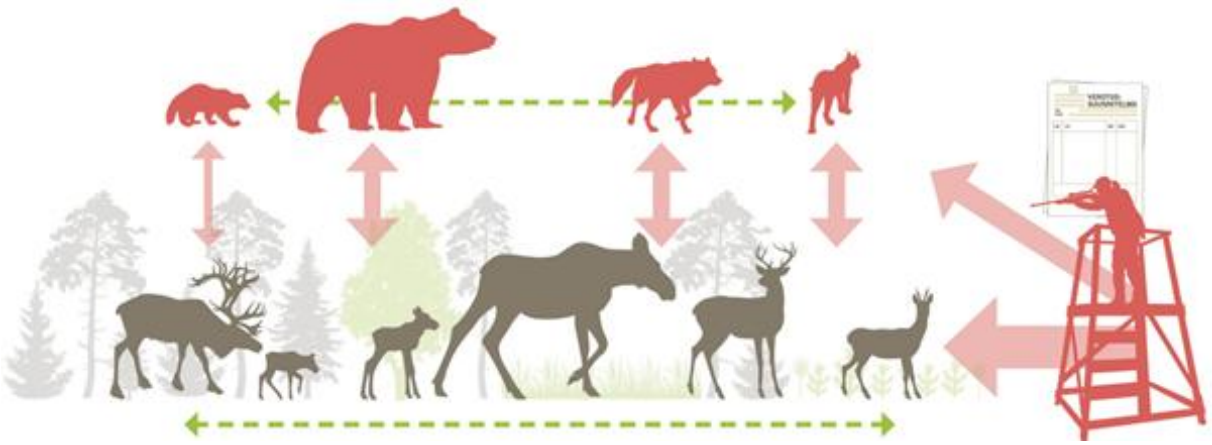

Figure 11. The multispecies management and interactions among different species included in the online simulation platform are presented with this schematic drawing.

The principles of multispecies management and the usage of the MSE tool (C2) have been presented in numerous events to relevant stakeholders, including the moose hunting representatives of game management associations and regional game councils, which make decisions on setting the moose density targets

Comparison with planned output and time schedule: This action was launched two months earlier than presented in the original project plan, as it was necessary to plan the work of 2021 in tandem with action C2 (building of the MSE tool) during the end of 2020. Collaborative online meetings for key participants of C2 and C5 were organised to prepare for the timeframe, worktime budget and contents of the modelling tool. Additional change was made on spatial scale: MMAs consist of several GMAs, in which local hunting clubs conduct harvesting. These smaller-scale areas were not utilised as units of inspection with the multispecies management tool (C2), as the model was too robust to be applied on very fine spatial scale. This affected C5 in terms of targeting mainly regional and national actors.

Modifications, problems, and delays: The training tour was not totally completed during 2021, as had been initially planned. The events of the autumn period were postponed to spring 2022, to gain synergy from events organised annually for discussing and planning of ungulate harvest. All events were organised online instead of regular face-to-face meetings due to the Covid-19 pandemic and were finalized in 09/2022.

Perspectives for continuing the action after LIFE: The MSE tool is set to become a permanent fixture in ungulate management. Its outputs will inform population planning and the triennial setting of regional density targets, with training provided to new and existing wildlife managers. This legacy will not only support sustainable game management but also promote coexistence between humans and wolves by helping local communities to understand the central role of large carnivores within the boreal the ecosystem.

Deliverables reported in the MidTerm (MTR) report.

- Deli C5: 09/2021 → 09/2022 Educational material for MMA events (presentation to introduce the concept of multispecies management and the prototype of MSE modelling) (Annex 31).

Deliverables reported during 2023–2025 in BUTLER.

- Deli C5: 03/2023 → 09/2023 Educational materials on piloting the implementation of MSE modelling (Additional Deli for the monitoring meeting in 2023, Also in BUTLER)

ACTION C6 Police and wildlife wardens enhanced patrolling and networking

Completed /	Foreseen start: 01/11/2019	Actual start: 01/11/2019
	Foreseen end: 30/09/2025	Actual end: 30/09/2025

Activities undertaken and outputs achieved: This action comprised of two main activities: 1) A combined team of police and wildlife warden were hired to develop the wildlife surveillance system in Finland and to ***enhance targeted patrolling and crime investigation*** efforts in an area with a high turnover rate of wolf family packs, and 2) build up a ***social resilience in the local societies*** through active networking, and through being easy to approach and nearby for the local residence.

Figure 12. The wildlife patrol. Photo: Juha Tissari.

Enhanced patrolling and investigation: The patrol conducted both general surveillance (focus on hunting surveillance, traffic control, off-road traffic and fisheries surveillance) and targeted surveillance on large carnivores (patrolling and investigation). The surveillance activities (Table 2) were reported in a new standardised monitoring scheme. The results show impressive numbers of cases of both general offences and offences concerning hunting. As an example, criminal processes were monitored as the number of pre-trail investigations concerning wolves. The numbers increased as expected to roughly 3 annually and decreased to one case annually at the end of the project. The number on investigations is expected remain at one annual case after LIFE: The project showed that a wildlife patrol of only two persons can successfully cover large remote areas and conduct standard policing in parallel with targeted surveillance.

Table 2. The activity of the patrol is reported in a separate monitoring system. The reports summarise the main tasks and surveillance activities of each shift. Here are some monitoring data for the period 1.1.2020 – 31.12.2024 (annual mean).

Vehicles checked during the inspection	1236 (248)
Hunting and weapons permits checked during the inspections	1073 (215)
Drunk drivers encountered	7 (1)
Performed exhalation tests on drivers	825 (165)
Number of criminal reports on hunting offenses	47 (10)
Number of criminal reports on other offences and violations	83 (17)
Alert tasks performed (nearest free patrol)	70 (14)
Collected DNA samples	49 (10)
Tips from the citizens	121 (24)
Collaboration actions with other surveillance authorities (days)	103 (21)
Information sharing	29 (6)
Assisting in inspections of carcasses	71 (14)
Fishing surveillance tasks	228 (46)

The local networking and engagement of the wildlife patrol: In addition to surveillance, the patrol put efforts into enhancing the collaboration with other enforcement authorities, the wildlife management organisations, central stakeholders and local citizens. The collaboration between enforcement authorities was intensified throughout the project, although the collaboration was very well established even prior to the project. Working days spent with other authorities increased to 25 during the project time. The successful outcome of the collaboration shows a possibility of enhancing the cost-efficiency of such a collaborative working model. The engagement of the patrol in management tasks, such as DNA collection, conflict management and assisting citizens in damage prevention and advisory activity, proved to be very fruitful in many ways. The wildlife management got helping hands in remote areas will a deficiency in staff, and the local got acquainted with the patrol. Much more working time than expected was put on local communication, showing the great need for this kind of engagement by the authorities.

Increasing competence: The surveillance field tool (described in Action C2) proved to be very efficient and less time consuming than the previous standard operative procedures used for gathering information. It was rolled out to enforcement authorities it the annual educational seminars (Deli C6: 09/2022-2024 in MTR and BUTLER). During the last year of operation, it was disseminated to 175 persons within the Metsähallitus, Police, border guard and Customs authorities in the third seminar organised by the project. The field tool has been presented to a total of 365 enforcement staff throughout the project, which clearly exceeds the aims of reaching 11 wildlife wardens and 50 police officers in total. At the end of action C6, 8 officials had taken the tool into everyday use. Further efforts are being made to promoting the tool for all enforcement officers in the country. In addition to increasing the competence of the whole enforcement force in Finland in wildlife surveillance, the project also was successful in elevating the competence of investigation of wildlife crime. This form of criminal investigation is very specific and requires expert knowledge on both the large carnivores and the offenders' motivations and behaviour.

Information sharing: The activity started off with a media release on introducing the wildlife patrol (Deli C6: 12/2019, Annex 32 in MTR). The wildlife patrol reported annually about its activities on the project web page (Deli C6: 12/202-12/2024 both in MTR and in BUTLER). The project also shared information about the patrol's activity in an article in a general magazine on the wildlife patrolling with a special focus on the wolves. (Deli C6, 12/2024 – 03/2021 in BUTLER), and a media release on experiences of the new model on cooperation in wildlife patrolling (Deli C6: 12/2024 -> 02/2025 in BUTLER).

The patrol's activity raised both national and international interest. The patrol communicated transparently both to local citizens face to face and posted actively on the social media. Journalists both from Finland and abroad contacted the patrol asking for interviews. As an example, the patrol was accompanied by a Swedish journalist who wrote an article about the wolf conflict in Finland and the Wildlife patrol for the second largest Swedish newspaper, Göteborgsposten, and a separate article for the Police magazine in Sweden.

Comparison with planned output and time schedule: The wildlife warden in the wildlife patrol was on parental leave for 1,5 months and was replaced by a border guard from the North Karelian Border Guard. In this way, the project could further develop the co-operation between the various authorities in mitigating serious hunting crime. The experiences of the six-week collaboration were excellent. The first out of four educational seminars for authorities on wildlife surveillance and cooperation was postponed from 09/2021 to 03/2022 to the Covid-19 pandemic. Two seminars were organised during 2024.

Modifications, problems and delays: None

Complementary action outside LIFE: The project partners were conducting derogations on individual wolves according to the guidelines developed by the enforcement authorities for combatting bold wolves. The derogations were not a part of the project but were used as a means to increase the public acceptance of wolves. The project produced a Report on the current state of the wildlife surveillance system in Finland, in collaboration with the enforcement authorities, aiming at raising a constructive discussion on the need for a stronger support for this field by the decision makers (extracurricular deliverable). It was disseminated to the media in 09/2025 with more than 10 media representatives attending and reaching an extensive media coverage. It will be published in the national Police magazine during 2025. The report was financed by the project through funds that were transferred to C6 external assistance from other cost categories. The transfer was possible due to savings in other cost categories at the final stage of the project.

Perspectives for continuing the action after LIFE: Best practices and skills for crime prevention and investigation (including networking with stakeholders and the local community members, investigating and intelligence, activity and output monitoring, and education and information sharing and activities), are widely distributed within the police force, wildlife wardens and borders guards. The best practices and lessons learnt will be implemented through routine police and wildlife warden duties and through educational efforts. The law enforcement network (PCB) will be able to function independently based on the continuation of established cooperation with local police and wildlife wardens resulting from the project. These actions will be implemented with regular police budget funding.

The network of local hunters and voluntary hunting supervisors built up by the patrol, will continue providing local authorities information concerning wildlife crime and other criminal activities. The PCB network will be using this information and monitoring skills learned during project, to prevent these crimes.

The local network of local hunters and voluntary supervisors will function independently after the project. These actions will be implemented with regular police budget funding.

Deliverables reported in the MidTerm (MTR) report.

- Deli C6: 12/2019 - Media release on introducing the wildlife patrol (Annex 32)
- Deli C6: 12/2021, 12/2022, Yearly reports on the patrol activities and experiences targeted to citizens published on the project web page (Annex 33 and 34),
- Deli C6: 2021→ 2022: First yearly organized educational seminars for authorities on wildlife surveillance and cooperation (Annex 35)

Deliverables reported during 2023-25 in BUTLER.

- Deli C6: 12/2023, 12/2024. Yearly report on the patrol activities and experiences targeted to citizens published on the project web page. The 2023 report was an additional Deli for the monitoring meeting in 2023, Also in BUTLER)
- Deli C6: 12/2023 and 12/2024, 3 x Annual educational seminars for enforcement and management authorities.
- Deli C6: 12/2024 → 03/2021 Article in general magazine on the wildlife patrolling with a special focus on the wolves.
- Deli C6: 12/2024 → 02/2025 Media release on experiences of the new model on cooperation in wildlife patrolling.
- 09/2025. Summary of the report on the current state of the wildlife surveillance system in Finland. Extracurricular report in Finnish with a summary in English and Swedish.

ACTION D1 Action for monitoring conservation actions

Completed /	Foreseen start: 01/10/2019	Actual start: 01/10/2019
	Foreseen end: 30/09/2025	Actual end: 30/09/2025

Activities undertaken and outputs: The indicators chosen to monitor the impact of the conservation actions are presented in the outputs and outcome of the C Actions in this chapter (6.1). The following supporting guidance have been produced: 1) a detailed action working plan, 2) intra-project reporting guidelines (Deli D1: 08/2020 Annex 36 in MTR), 3) a data collecting sheet for each conservation action, and 4) guidelines for the final reporting on the success of the conservation actions and impacts for each action (Deli D1: 12/2020 Annex 39 in MTR).

Five monitoring reports were delivered annually (Deli D1: 12/2020-12/2024 Annex 37 and 38 in MTR, and Deli D1: Yearly assessments of the progress of the implementation for each action in 2023 and 2024 in BUTLER), after collecting monitoring data into the monitoring sheet. A as part of this action, a technical report and open-source computer code about the prototype MSE model for strategical planning of multispecies multi-value population management (Deli D1.2: 12/2020 Annex 40 in MTR) was published on the project homepage. A technical report on the web application aimed for enhancing wildlife crime prevention (Deli D1: 2022→23) was loaded in the BUTLER data base but was not published as the information was seen as sensitive and meant only for internal use by the enforcement authorities.

The reports on the results of the C actions have been produced based on the original working plans and an assessment of the impacts including the After-LIFE activities and a public overview and conclusions (Delis D1.1 - 1.6: Eight separate reports on the results of actions C1-6, with public overview and conclusions to be published in project web page, in BUTLER). The outcomes of the actions have been separately published in June 2025 on the project web page.

The development of the wolf population in Finland during the project has been analysed and reported in a scientific manuscript in September 2025 (Deli D1: Scientific manuscript on the population development of wolves based on DNA monitoring of breeding events in BUTLER). The paper will be published after the project has ended. The results show that the wolf population in spring has increased in the area excluding the Reindeer Husbandry Area during the project from an estimate of ca 156 to 394 wolves in 2025.

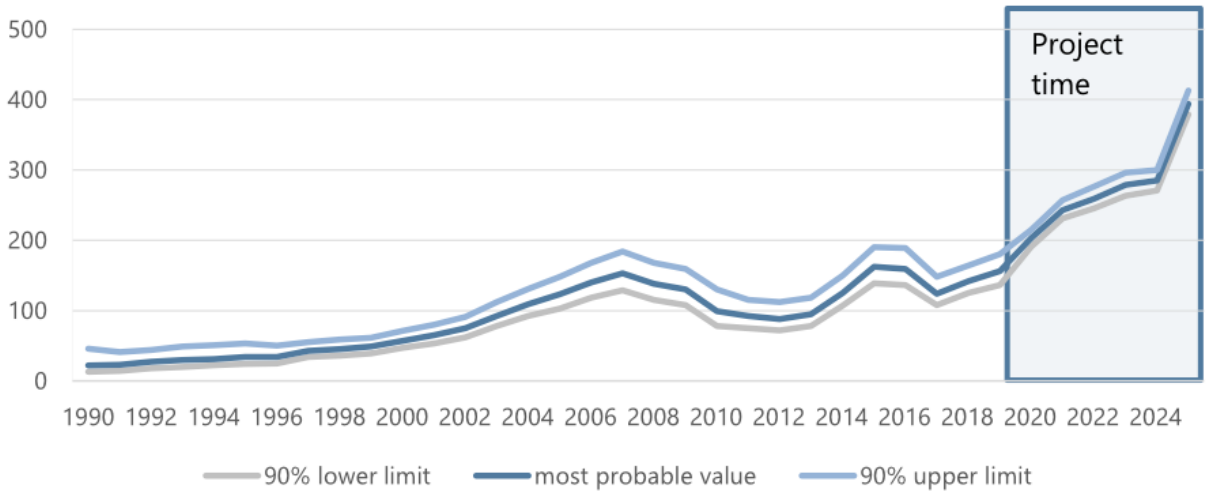

Figure 13. The development of the wolf population development in2000–2025. Most probable value and 90% probability interval for the number of wolves are shown. The estimate applies to the March population living entirely on the Finnish side, i.e. wolves from the border territories are excluded.

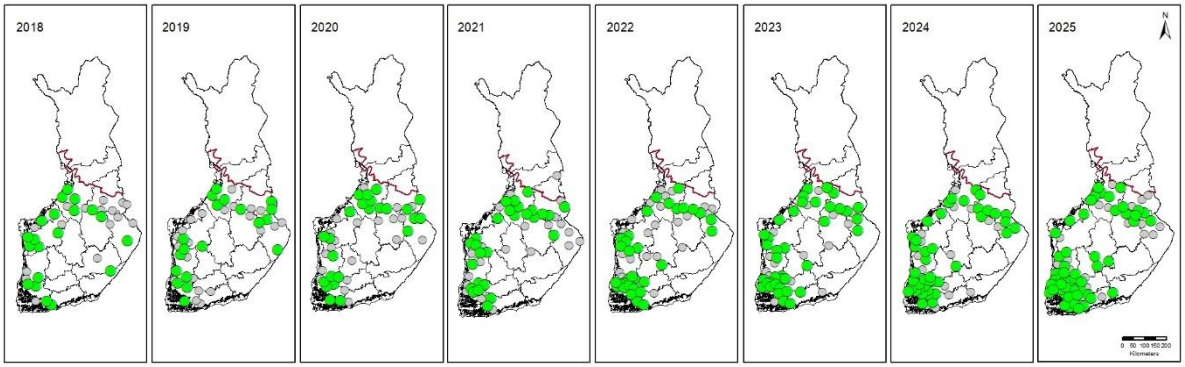

Figure 14. Wolf packs and pairs in 2018-2024, with packs shown in green and pairs in grey circles. Territories on both sides of the eastern border are not shown. The red line shows the border of the Reindeer Husbandry Area in Finland.

Modifications, problems, and delays: As requested by CINEA on the deliverable Deli D1.2: 12/2020: Technical report and open-source computer code about the prototype MSE model for strategical planning of multispecies multi-value population management (Annex 40), the open-source report published on the website of the project was revised. Further, the publication material was re-organized and published together with a Layman´s description of the prototype.

The technical report on the web application aimed for enhancing wildlife crime prevention (used by police and game wardens) was delayed from 2022 to 2023 as the application was developed all through the action time. This was approved by CINEA in the monitoring meeting in 2022.

The project requested to combine some of the deliverables (results from C3.1 and C3.2) in action, as the activities are intertwined with each other. This was accepted by CINEA in 14.12.2024 (Help Desk Ticket). In the 2024 monitoring meeting (11.11.2024), CINEA accepted a request of postponing the publication of the public overview and conclusions of all C actions

(reported in the specific deliverables) to June 2025, as to harmonize them with the publication with the Layman's report.
Complementary action outside LIFE: None

Perspectives for continuing the action after LIFE: The indicators for monitoring conservation actions for the wolf management have been developed based on the assumption that they will become a part of the national wolf management assessment in the future.

Deliverables reported in the MidTerm (MTR) report.

- Deli D1: 08/2020 Guidelines for yearly reporting of the progress in each action and reporting tool for each action (Annex 36)
- Deli D1: 12/2020 and 12/2021 Yearly assessments of the progress of the implementation for each action (Annex 37 and 38)
- Deli D1: 12/2020 Guidelines for final reporting on the success of C-actions and impacts for each action (Annex 39)
- Deli D1.2: 12/2020 Technical report and open-source computer code about the prototype MSE model for strategical planning of multispecies multi-value population management (Annex 40, Also in BUTLER)

Deliverables reported during 2023-25 in BUTLER.

- Deli D1 cont. 12/2022-12/2024: Yearly assessments of the progress of the implementation for each action
- Deli D1.2A: 12/2022 → 12/2023 Technical report on the web application aimed for enhancing wildlife crime prevention (used by police and game wardens)
- Deli D1.2 B: 12/2023 Technical report and open-source computer code for the final MSE model for strategical planning of multispecies multi-value population management (also in MTR Annex 40)
- Deli D1.1: 11/2024 → 03/2025 Report on the results of C1, with public overview and conclusions to be published in project web page
- Deli D1.2: 11/2024 → 03/2025 Report on the results of C2, with public overview and conclusions to be published in project web page
- Deli D1.3.1 and D1.3.2: 11/2024 → 03/2025 Report on the results of C3.1 and 3.2, with public overview and conclusions to be published in project web page
- Deli D1.3.3: 11/2024 → 03/2025 Report on the results of C3.3, with public overview and conclusions to be published in project web page
- Deli D1.4a: 11/2024 → 03/2025 Report on the results of C4.1, with public overview and conclusions to be published in project web page
- Deli D1.4b 11/2024 → 03/2025 Report on the results of C4.2, with public overview and conclusions to be published in project web page
- Deli D1.5: 11/2024 → 03/2025 Report on the results of C5, with public overview and conclusions to be published in project web page
- Deli D1.6: 11/2024 → 03/2025: Report on the results of C6, with public overview and conclusions to be published in project web page
- Deli D1: 09/2025 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

Completed /	Foreseen start: 01/03/2024	Actual start: 01/03/2024
	Foreseen end: 30/09/2024	Actual end: 30/09/2024

Activities undertaken and outputs achieved: The action conducted a similar survey among Finnish citizens to survey made in Action A2. The idea was to estimate and compare (before and after the C-action implementation) citizens' attitudes, beliefs, feelings and experiences on wolves and other issues of previous survey. The survey also explored views held by the Finnish (adult) population about the wolf conservation, and other perceptions that help to evaluate what influence the project has had on the views.

The questionnaire covering the same questions as in 2020, plus some additional questions concerning opinions about the project and the wolf management at large in Finland, aimed at discerning the difference between possible negative attitudes towards the management per se, not the wolf itself. Further, the survey was used as a tool to gather information about the visibility and impact of the project on the social society in general after 5 years of project activities. The survey was conducted with 2,000 citizens via M3Panel and results with comparison to earlier findings (2020) were further analysed and reported as scientific report. The report was published in Finnish with English abstract in the report series of Natural Resource Institute of Finland (Deli D2: 12/2024 in BUTLER). The results were disseminated to the general public through a media release (Deli D2: 12/2024 in BUTLER) and a news item on the project website, social media channels and communication channels of Luke and FWA. The results were also published in a 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 (Deli D2: 03/2025 in BUTLER).

According to the survey, 25 percent of the adult population excluding the Reindeer Husbandry Area recognized the project by name. While only one percent of respondents indicated they were familiar with the project's content, a significant share (up to 48 percent) reported having read news or heard about key project themes, such as livestock protection or the game patrol. The project and its activities were more familiar to residents in wolf-inhabited areas than to those living elsewhere.

The results show that even though the wolf population has increased in Finland, Finnish people's feelings and notions of wolves have remained unchanged (Figure 19). Wolf protection was increasingly supported at the time of data collection (June 2024) compared to opposition compared to situation in 2021, though many citizens would like to see more legal hunting opportunities. This sentiment may partly stem from the growing wolf population, increased damage, and limited legal hunting options. Between 7 and 10 per cent of the survey population accepted illegal wolf hunting, regardless of the motivation of the activity. Local influence in the wolf management was perceived still as too limited, while the EU's impact in it was seen as too extensive.

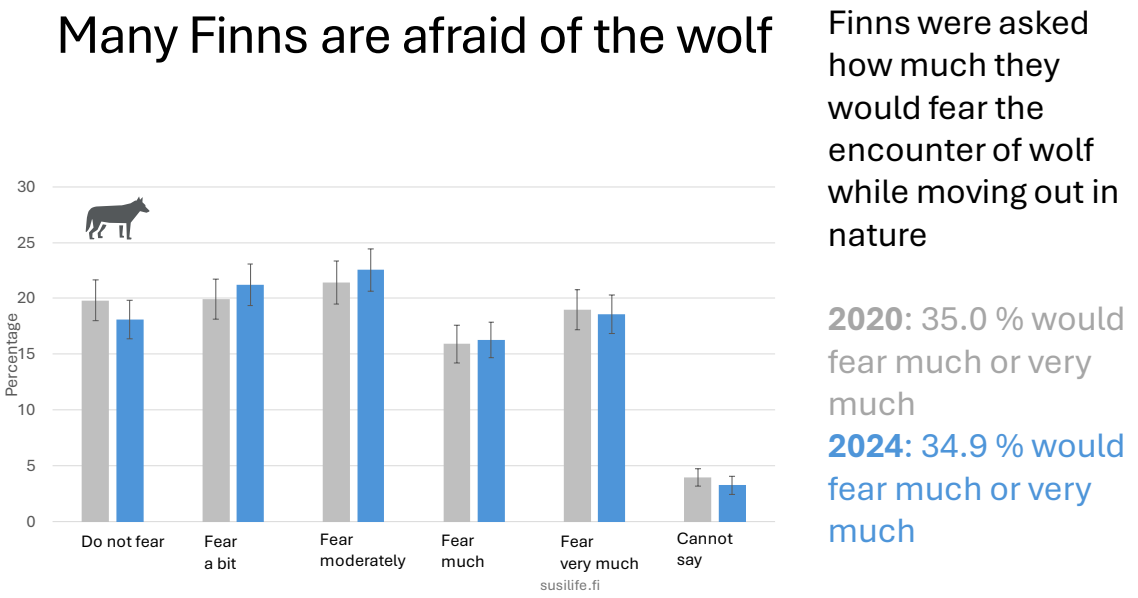

Figure 15. The key results of the report were summarized in infographics. The results show that people are still afraid of the wolf as compared to before the project.

Perspectives for continuing the action 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).

Modifications, problems, and delays: The timing of the publishing the findings were postponed from October 2024 to December 2024, to ensure the better media visibility of the topic. The deliverable "Scientific report on the key results on the assessment of possible changes of people's attitudes and acceptance towards wolves during the project" was included into deliverable "Scientific report in Finnish (with English Abstract) on the comparative results of the wolf surveys made in 2020 and 2024".

Complementary action outside LIFE: None

Deliverables reported during 2024-25 in BUTLER.

- Deli D2: 11/2024 → 12/2024 A media release of the key-findings prepared and released on people's acceptance towards wolves.
- Deli D2: 12/2024 Scientific report in Finnish (with English Abstract) on the comparative results of the wolf surveys made in 2020 and 2024.
- Deli D2: 02/2025 → 12/2024 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.

ACTION D3 Media coverage of the wolf and the project

Completed /	Foreseen start: 01/10/2019	Actual start: 01/10/2019
	Foreseen end: 30/09/2025	Actual end: 30/09/2025

Activities undertaken and outputs achieved: The media content associated with the wolf and this project was monitored during 2020-24 in monthly reports (Deli D3: 02/2020 – 12/2024 in BUTLER). ***Supportive documents*** were produced based on the working plan. Preparatory actions included collecting systematically wolf-related news from variety of the sources, reviewing the research literature on the automated text classifying methodology, and producing algorithms for the media monitoring (including a workshop in 2019) as a statistical model that helps to detect (filter) accurately the specific wolf-related news that concern the project.

The work itself included testing new types of text classifying algorithms, incl. topic modelling approaches, and collecting news on the daily basis from various sources. The summaries of the findings were published monthly on the social media by the content type and the media source (Figure). From 2021, the news monitoring was broadened to also cover the Swedish media in Finland and in 2021–2023 also Sweden.

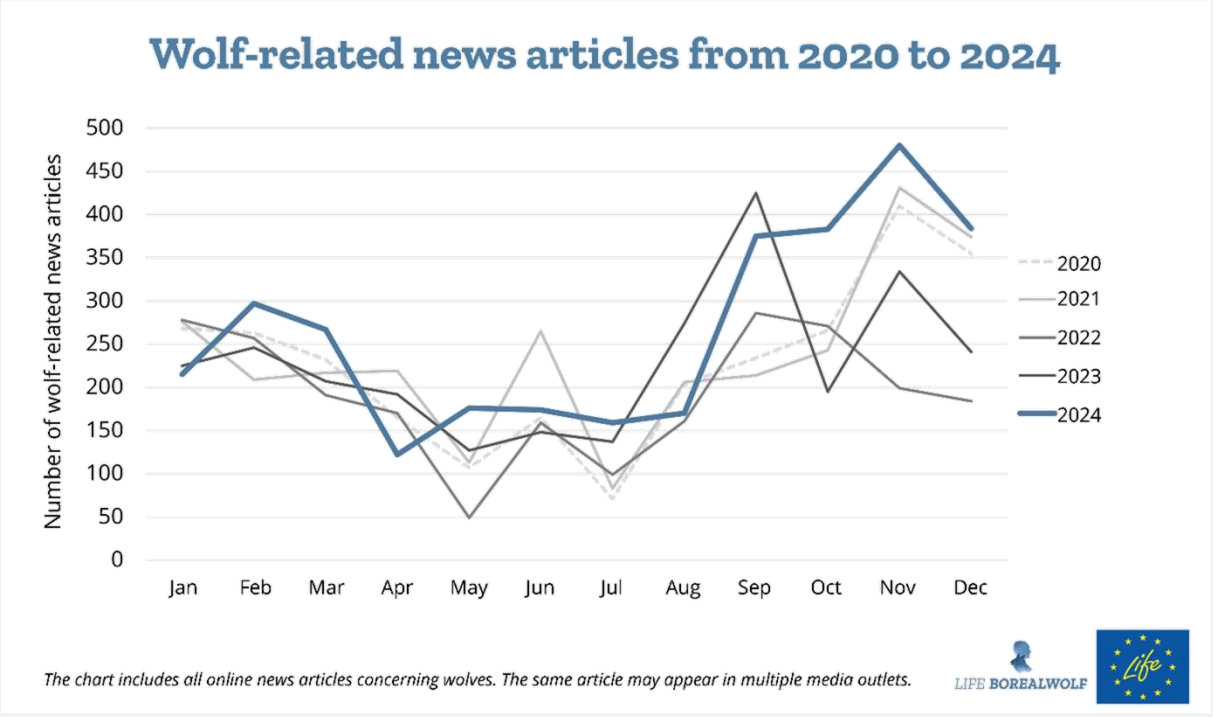

Figure 16. The Media monitoring tool provides information on the relative abundance of wolf related news and main topics that are summarized monthly (and in the end of the year to cover the whole year).

The media monitoring showed that the public wolf discussion is permanently very active in Finland (containing at least 2300 Finnish online news items annually) and showing somewhat predictable seasonal variation (containing highest numbers in autumn and early winter). It also showed with high certainty the key media sources that produce the major proportion of wolf-related news in Finland from year to year. The contents (themes) most frequently (> 20 %) present in online news media has related to wolf policy and the role of lethal management in

it, and notable coverage (>6%) relates specific wolf encounters (mainly in urban areas, sheep, or dog depredations) and role of the wolf in ecosystems.

The results of the media monitoring assessment were prepared in a scientific article manuscript that includes both the substantive and methodological key-findings of the wolf-related media and media monitoring during the project in (manuscript of a scientific article: Deli D3: 5/2025 in BUTLER) and a report in Finnish, with English summary (report: Deli D3: 5/2025 in BUTLER). A press release on the outcome of the scientific report (Deli D3: 10/2024 in BUTLER) will be published in 12/2025 when the scientific report is published.

Comparison with planned output and time schedule: No external assistance for customizing the media monitor was needed in the progress reporting period, because the subscriptions of the Natural Resources Institute (Luke) and Metsähallitus to the service maintained by Liana Technologies served us the feasible data to enable the development work with the wolf-related news. The final deliverables of this action were postponed to 06/2025, to include also a comparison of human annotation and large language model (ChatGPT4o) annotation in labelling the themes of the online news, and to reach higher visibility of the topic.

Modifications, problems and delays: The subscription of Luke to the service maintained by Liana Technologies stopped delivering the archived versions of the full news texts in 2020, and altogether in 2023. After this, the project received its data from Metsähallitus until 2024. Luke had to rearrange the human resources for this action as the main coder of the machine learning algorithms (project staff from Luke) did not return to Luke after a two-year leave of absence. He finished the coding of the theme classifier and help to finalize the publishing of the existing code.

The deliverable "D3: Scientific report in English on the media monitoring results on wolf related issues during the project" was submitted to BUTLER as a manuscript. The Deli D3: "Press release on the outcome of the scientific report on the key-findings of the media monitoring on wolf relate issues during the project" was submitted as a press release to BUTLER. Both deliverables will be published in 12/2025 when the report is published.

Complementary action outside LIFE. The same monitoring procedures and analysis methods were preliminary tested to support another ongoing LIFE-project (Flying Squirrel LIFE, LIFE17NAT/FI/000469).

Deliverables reported in the MidTerm (MTR) report.

- Deli D3: 2020–2022 Monthly reports of media contents on wolf related issues distributed through several channels. The first media coverage report was presented as an example of the output (Annex 41).

Deliverables reported during 2023-25 in BUTLER.

- Deli D3 cont. 2023–2024 Monthly reports of media contents on wolf related issues distributed by using several channels.
- Deli D3: 08/2024→06/2025: Report on the key-findings of the media monitoring on wolf relate issues during the project.

- Deli D3: 10/2024→ 05/2025: Manuscript of a scientific report in Finnish with extended English summary on the media monitoring results on wolf related issues during the project. The scientific report will be published after the project.
- Deli D3: 10/2024->09/2025 Press release on the outcome of the scientific report on the key-findings of the media monitoring on wolf relate issues during the project. Will be published in 12/2025 when the report is published.

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

Completed /	Foreseen start: 01/10/2024	Actual start: 01/10/2024
	Foreseen end: 30/03/2025	Actual end: 30/09/2025

Activities undertaken and outputs achieved: The outputs and impacts of the conservation activities were assessed as a function of the wolf population development. The development of the wolf population (as reported in the manuscript in D1 (Deli D1: 9/2025 Scientific manuscript on the population development of wolves based on DNA monitoring of breeding events) was used to analyse the effects of the following conservation actions: 1) LCO network and territory groups as a measure of management system resilience, 2) contacts with livestock farmers as a measure of damage prevention, and 3) wildlife surveillance as a measure of mitigating illegal killings. The results of the conservation efforts showed that the tasks planned for did successfully reach the aims for each Action. However, the project structure lacked assessment tools for directly combining these findings with the successful growth of the wolf population during the project time. The assessment could only be conducted as a relation study (not a function), with possible indirect assumptions of connections. A manuscript of a scientific report was produced by the project partners together during spring 2025, and the manuscript was finalised in autumn 2025 (Deli D4: 09/2025 in BUTLER).

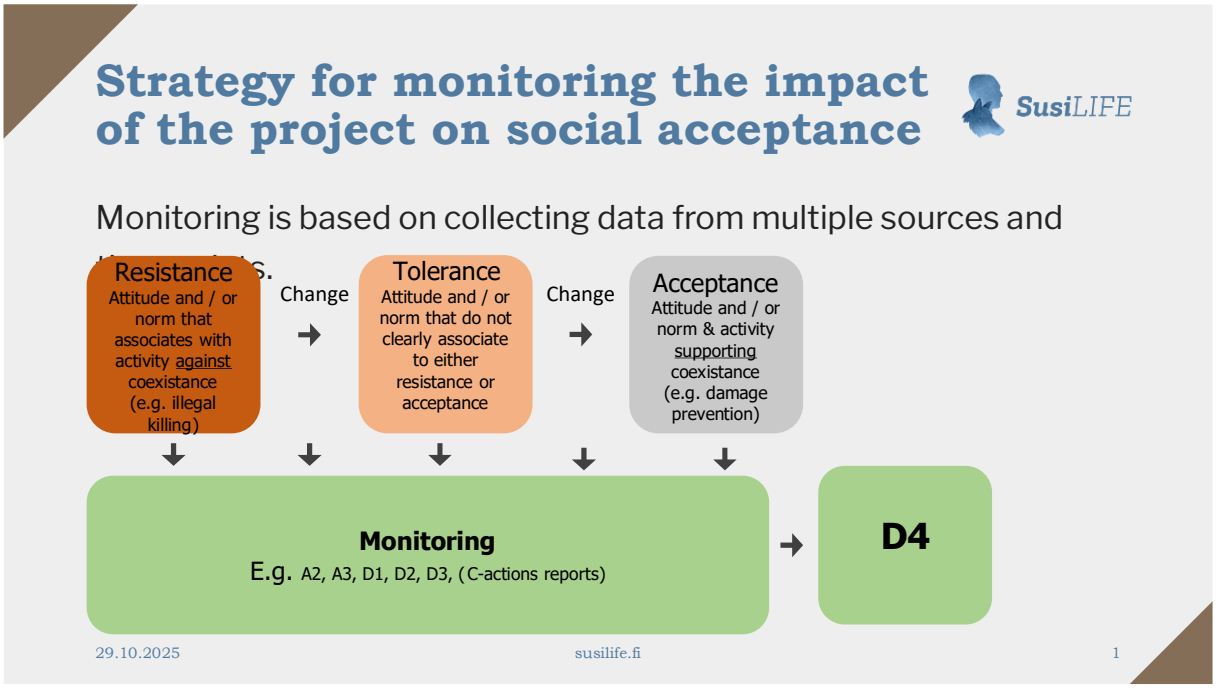

Figure 17. Presentation of the strategy for monitoring the impact of the project on social acceptance on wolves.

The results showed that the national multi-method wolf monitoring system, integrating extensive DNA-based sampling with citizen observation data was successful. Sampling coverage exceeded 90%, and the number of wolf territories from which DNA samples were obtained increased from 43 in 2019 to 74 in 2025. Volunteer participation in genetic monitoring doubled, with over 800 scats collected annually. This enhanced monitoring provided a more reliable basis for estimating population size, confirming annual reproduction events, and improving transparency in management decisions.

A specialized wildlife patrol, operating in Eastern Finland from 2020–2024, demonstrated clear conservation benefits. Patrol-covered areas exhibited stable wolf territories, reduced unexplained disappearances, and no confirmed poaching cases. Patrol activities—combining surveillance, enforcement, and community engagement—also strengthened inter-agency collaboration and public trust. Engagement activities, such as consultations, school visits, and landowner meetings, supported better conflict mitigation and improved communication between authorities and local communities.

The project considerably improved the competence of the Finnish enforcement authority staff. Their procedures and skills for networking, trust building, monitoring illegal killings, investigation actions, population management and monitoring actions were distributed within the police force, wildlife wardens and borders guards, which further provided an increased understanding of wildlife crime and its consequences in the local society among staff and decision makers. The outcome of the significantly elevated competence was shown in the historically largest criminal case of poaching named "Savukukko" (https://www.lehtiluukku.fi/lehti/jagaren/_read/2-2024/370247.html).

The LCO network, consisting of trained volunteers, was trained with updated educational materials, and supported with a field guidebook and annual feedback meetings. These actions helped to maintain volunteers' motivation, even at times when some stakeholders were advocating for strikes and cease of collaboration. The network continued to provide extensive observation data throughout the project, mainly from ordinary citizen but also from volunteers themselves and their active peer networks. These data provided the backbone for the increasingly accurate and less disputed population estimates, that clearly demonstrated the growth of the Finnish wolf population. They also enabled officials to target any needed management actions in a timely manner. The engagement and active collaboration of the LCO network throughout the project despite turbulent LC political discourses indicates a robustness of the network and a trust towards the wolf management system.

Livestock owners were provided with multiple tools for preventing depredation by wolves and other large carnivores. The equipment and consultation services were used by over 200 Finnish farmers, and the information-sharing activities reached even more livestock owners, e.g. via phone calls (several thousand during the project), social media, local newspapers, agricultural authorities and farming publications. The compensations for sheep depredation increased during the project (both the no. of cases and the money paid). However, it is considered likely that the project actions were able to reign in this development, result of increasing wolf population. A more significant increase would have been expected in reference to the increase and expansion of the of population to areas with relatively extensive sheep-farming. The high interest of the farmers in collaborating with the project and in testing new equipment indicates a willingness to coexist with the wolves rather than control them.

The combined actions contributed to a more stable and expanding wolf population, advancing progress toward a favourable conservation status. Socially, the project improved cooperation between authorities and local actors, reinforcing the legitimacy of conservation and management practices. Institutionally, it strengthened inter-agency coordination, standardized field protocols, and informed national policy implementation. While scientific monitoring and enforcement improved measurably, societal acceptance of wolves remains a challenge, emphasizing the continued need for dialogue and participatory governance.

Overall, the project demonstrated that evidence-based monitoring, coupled with proactive enforcement and stakeholder engagement, can deliver tangible ecological and institutional benefits for large carnivore conservation in human-dominated landscapes

Comparison with planned output and time schedule: Completed according to plan

Modifications, problems and delays: The work in this action was prolonged to the end of the project (09/2025), as the manuscript required and extended time to be finalized. This was accepted by CINEA. The project's final report was prepared for and produced in F1 and was sent to the monitor and loaded into BUTLER – database in 09/2025.

Complementary action outside LIFE. None

Deliverables reported during 2023-25 in BUTLER.

- Deli D4: 03/2025 -> 09/2025: Manuscript of scientific article on the effect of project actions on the Finnish wolf population (published after the project has ended).
- Deli D4: 12/2025: Final report (This paper)

ACTION E1 Dissemination of the project results: plan and execution

Completed /	Foreseen start: 01/10/2019	Actual start: 01/10/2019
	Foreseen end: 30/09/2025	Actual end: 30/09/2025

Activities undertaken and outputs achieved: Effective communication and stakeholder interaction have been essential components of every action within the project.

Project communication was strategically planned and evaluated annually. A communication strategy, communication plan, project website and social media accounts were produced (Annex 45, 48-49 and 51 in MTR). The project invested significantly in communication, dissemination and awareness-raising. Its approach was interactive, transparent, and grounded in scientific knowledge. Instead of promoting the project itself, communication focused on key themes such as human–wolf coexistence, stakeholder engagement, and the practical management of wolf-related issues. Special attention was paid to the tone and framing of sensitive topics.

Communication was structured on three levels: 1) informing about the project's progress and results, 2) sharing knowledge on wolves and related societal themes, and 3) engaging stakeholders through meetings, workshops and tailored materials. Residents of wolf areas received targeted support and information. The role of LCOs and TC groups in communication was strengthened through training measures.

The project's key stakeholders represented a diverse group of people living in wolf-inhabited areas and rural regions, including livestock farmers, hunters, and nature conservationists. An extracurricular stakeholder strategy was produced in collaboration with all beneficiaries as to map the most important stakeholders and to have a road map on how to collaborate with them. Extensive collaboration took place across various themes: ranging from joint field excursions to collect DNA samples, coordinated patrols with enforcement authorities, wolf-themed community evenings, collaboration in communication and to workshops and meetings.

Communication was planned and carried out by the communication group, which included the communication coordinator and a representative from each beneficiary. The communication group had regular meetings. The project produced its own visual identity representing all beneficiaries (Annex 44 in MTR). Information was shared in three languages: Finnish, Swedish and English. Three information boards or posters (Annex 52 in MTR) were set up in different places to present the project activities (Ruunaa, Haltia and Kuusamo) and project brochures and roll ups were produced for different events (Annex 50 in MTR).

Communication activities included regular website updates, active social media presence, newsletter and dissemination through beneficiaries' and stakeholder's communication channels. The project also used and developed existing websites concerning large carnivores, that were already widely used among the public (Luonnonvaratieto.luke.fi, formerly known as Riistahavainnot.fi (Annex 53 in MTR) and Suurpedot.fi (Deli E1: 12/2021 -> 12/2023 in BUTLER). Information packages were produced on topics such as wolf biology and behaviour, wolf research and wolf management. In total, 12 videos were released under different project actions (C1 x 2 videos, C4 x 4 videos, E2 x 6 videos), as well as many short social media videos.

The project was active on social media (see Table 3), including Facebook, Instagram and X (formerly known as Twitter), focusing on keeping a dialogue with the audience. Communication in general in the project, was not only used for information sharing, but also as customer service: interacting and answering questions. Content was created based on the needs of the target audience. A list of frequently asked questions was published on the project website in 2025 as to ease the load of questions flowing into the project's communications channels.

The project's social media accounts gained a modest number of followers: over 3200 in total. On the other hand, engagement rates were very good, suggesting that readers were interested in the content the project was creating. The project media visibility is reported in action E2.

Table 3. The activity and reach of project communication channels.

Communication channel	**Activity**	**Reach**	**Observations**
Susilife.fi	> 100 news items	Approx. 1 600 sessions per month	As Luke ceased using Google Analytics in early 2023, the website visitor statistics presented are based on data from 2020 to early 2023.
Facebook	> 145 posts	> 1 170 followers	High engagement rates, on average from 7 to 15 %.
Instagram	> 175 feed posts	> 940 followers	Set up in the beginning of 2021.
X (formerly known as Twitter)	> 1105 posts	> 1 090 followers	
Project newsletter, Hukkaposti	11 newsletters	570 subscribers	

The project was actively sharing information to scientist, decision makers, stakeholders and other end users on all geographical levels (local -> international). The project was presented in over 245 events with more than 10 000 attendees. Finnish events included, for example, regional game management or large carnivore council meetings, local wolf-themed evenings organised by NGOs, training sessions for hunters or volunteers, conferences and meetings organised by the game administration, and activities hosted by national NGOs.

To ensure information dissemination about the best practices developed in the project, an effort was made to network with international governmental representatives, scientists, experts and other projects with similar objectives around human-wildlife conflicts. The project arranged meetings with other Finnish LIFE projects and attended the Nordic-Baltic LIFE Platform meetings. The project was invited to visit other relevant projects and invited them to visit Finland (i.e. LIFE LYNX, LIFE Wild WOLF, LIFE SWIPE, LIFE Tršca, LIFE VARNA PAŠA, Prospective LIFE), in addition to the projects described in Action C3. The project also hosted a number of international experts (i.e. Norway, Sweden, USA, Canada) with different backgrounds, such as wildlife management, research, human-wildlife conflict and communication. The guests were introduced to the Finnish wildlife research and management system both in meetings and in

the field, and shared their knowledge and experiences in online seminars, organised by the project.

An international seminar and workshop 'From Conflicts to Coexistence' was organised in Nuuksio, Espoo in November 2022 (Deli E1: 12/2022). The meeting was well attended (30 participants on site and 65 online on both days) and received positive feedback. In the workshop, concrete ideas and suggestions were put forward on how to further enhance the project activities towards the set goals. Information about the meeting and workshop were disseminated in various channels.

Many international connections were established to a number of European countries (including Sweden, Norway, Estonia, Rumania, Russia, Austria, Germany, Italy, Slovenia, Spain, The United Kingdom, The Czech Republic and Hungary). The project attended a number of international meetings and conferences (see Table 4), and signed a number of MoU's with international networks such as SATEC and AMAP, and with the LIFE WolfAlps project.

Table 4: International congresses, conferences, seminars and workshops attended by the project.

Year	Conference/Congress	Place
2019–2025	Annual Skandulv- meeting for Fennoscandian LC experts	Sweden
2020–2021	Seminar series on combatting wildlife crime, organized by Swedish LC administration	online
2021	International Union of Game Biologists Conference	Hungary
2021	LIFE WolfAlps conference	online
2021	The Collaborative Partnership on Sustainable Wildlife Management (CPW) Wildlife Forum	online
2022 and 2024	Seminar and workshop on transboundary collaboration in combatting wildlife crime, organized by Swedish, Norwegian and Finnish administration	Sweden and Norway
2022	The XIV International Conference of the European Society for Ecological Economics (ESEE 2022)	Italy
2020, 2022, 2023, 2024	Nordic Meeting Large Carnivore Management	Norway, Sweden, Finland
2020, 2024	Annual national Game management days in Sweden	Sweden
2022, 2023 and 2024	Council for Game and Wildlife Conservation (CIC) meeting	Latvia 2022, France 2023, Spain 2024
2022 and 2024	Pathways for Europe conference	The Netherlands 2022 Spain 2024
2022	The Nordic Congress of Wildlife Research (NKV)	Sweden
2022	Barents collaboration group on LC meeting	online
2023	European Union Network for the implementation and Enforcement of Environmental Law (IMPEL) meeting	The Netherlands
2023 and 2025	Wolves Across Borders International Conference	Sweden (2023) The Netherlands (2025)
2024	Multi-country workshop on wolves, TAIEX EIR	The Netherlands

2024	Workshop on wolf damage prevention methods	Spain
2024	Seminar: Transfrontier collaboration in wildlife management, with a special focus on wildlife crime, organized by the Nordic project on transboundary collaboration in combatting wildlife crime	online
2024	LIFE WolfAlps EU final event	Italy
2024	LIFE WolfAlps EU workshop: Dealing with complexity - From LC conservation to biodiversity loss: exploring tools for effective communication	Italy
2025	International Wildlife conference	Norway

The project participated in 5 fairs in Finland throughout the project: The EDUCA fair for outdoor educators (2025), The Northern Savolax Game Fair (2024), The Pirkanmaa game and wilderness fair and the Ulos-Ut-Out fair (2023), and the international Sportsmen's Fair (2022).

As an extracurricular activity, the project collaborated with the Finnish "Well Said" project of the national broadcasting company YLE and the Timeout Foundation in strengthening the Finnish conversational culture. This collaboration resulted to an open citizen dialogue on Finland's largest online discussion forum, Suomi24. In total three hours of open discussion resulted in over 200 messages. Within seven days the thread had reached almost 5 800 readers. The online discussion was a good way to reach out to citizens and answer their wolf-related questions. The project received a 2000 € production support from YLE from the "Well Said" project. The Layman's report was produced by the project partners (Deli E1: 09/2025 in BUTLER), and it was published in August 2025.

Comparison with planned output and time schedule: The communication strategy delayed by a few months, from 11/2019 to 02/2020. The deadlines for updating riistahavainnot.fi and suurpedot.fi were postponed from 12/2021 to 12/2022. Accessibility updates were ready by 12/2021, but visual changes were postponed to 2022, because the responsible organization, Metsähallitus, had ongoing web design projects in 2021 that would have interfered with the project's work. Instead, it was decided to first focus on accessibility since these requirements were more urgent. Because of changes in the DNA monitoring activities (action C1), additional resources were given to the external services of the project dissemination and communication: 10 000 € for arranging the project human-wildlife seminar and information material in 2022, 6 000 € for producing infographics about the project and 10 000 € for translation fees.

Modifications, problems, and delays: According to the comments from EASME after the monitoring meeting in 2021, the project videos lacked sufficient disclaimers. All project's videos were updated to match the disclaimer requirements. Due to the increased costs, one video less was produced than was originally agreed upon.
Complementary action outside LIFE: In parallel with the project, Finland has continuously promoted cooperation and a common policy on the large carnivore management with the Scandinavian countries. It has attended numerous seminars discussing themes such as common goals in the wolf pack monitoring, modelling and LC management.

Perspectives for continuing the action after LIFE: The LIFE BOREALWOLF project utilized a range of communication tools to ensure long-term access to its materials, including websites like Susilife.fi, Luonnonvaratieto.luke.fi and Suurpedot.fi, as well as social media channels that

remain accessible after the project. Materials were designed for continued use, with updates managed by beneficiaries. Media engagement and stakeholder collaboration fostered networks between researchers, policymakers, and practitioners. The relationships, tools, and practices developed during the project will support ongoing communication and cooperation at national and international levels.

Deliverables reported in the MidTerm (MTR) report.

- Deli E1: 12/ 2019 - Project visual identity ready (Annex 44)
- Deli E1: 12/2019 - Social media accounts (Twitter and Facebook) published (Annex 45)
- Deli E1: 12/2019, 12/2020 and 12/2021 - regional development seminars for territory cooperation groups (Annex 46 and 47)
- Deli E1: 02/2020 - Communication and interaction plan for 2020 (Annex 48)
- Deli E1: 01/2020 - Susilife.fi website published (Annex 49)
- Deli E1: 01/2020 - LIFE BOREALWOLF brochure printed (Annex 50)
- Deli E1: 02/2020 - Communication strategy ready (Annex 51)
- Deli E1: 06/2020 - Info boards set up in combination with other info boards in the vicinity of nature information centres and in recreational areas (Annex 52)
- Deli E1: 12/2020 Riistahavainnot.fi updated (Annex 53)

Deliverables reported during 2023-25 in BUTLER.

- Deli E1: 12/2021 -> 12/2023 www.suurpedot.fi updated.
- Deli E1: 12/2022 Scientific human-wildlife conflict seminar for researcher, stakeholders and NGO's 03/2023on the experiences on the wolf conflict mitigation management.
- Deli E1: 09/2025 Layman's report: Towards better human coexistence with wolves (Chapter 6.1, Action E1)

ACTION E2 Awareness raising activities

Completed /	Foreseen start: 01/01/2020	Actual start: 01/01/2020
	Foreseen end: 31/03/2025	Actual end: 31/03/2025

Activities undertaken and outputs achieved: This package focused on distributing reliable information on wolves and wolf-themed topics. It accentuated the sustainability, replicability, and transferability of the project by communicating to children, families, and teachers, 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.

A package of educational material for schools was produced consisting of teacher's guides, slideshows, brochures, floor rollouts with animal tracks, posters and six educational videos on large carnivores (Annexes 56-60 in MTR). The material was published in 2021, after which project received feedback that the materials did not address the threat status of large carnivores or its causes. This information was provided as a separate information card added to the material. The school material was made digitally accessible on the luonnonvaratieto.luke.fi website, which was visited ca 3800 times in 2021-24. The videos received most attention, especially one explaining how to identify large carnivore tracks. This video was viewed over 7 000 times on YouTube.

With the help of a private sector company (SubjectAid Oy), the printed educational material distributed to schools free of charge. In total, 710 printed teacher's guides and 2 000 brochures were delivered to 283 educational institutions. The institutions included preschools, elementary schools, high schools, vocational schools and institutes across Finland. Throughout the project, a significant portion of Finnish schools were reached through school visits and the school material package. According to the feedback collected from educational institutions receiving school materials, it was used in various subjects including environmental studies, languages, religious education, and an optional wilderness course. Teachers appreciated the materials' visual design, neutral tone, and reliable sources, although views varied on their suitability for younger pupils.

School visits were made by the FWA's wolf planners and FANC Uusimaa representatives in 149 school groups across Finland reaching 2 681 students. The school groups consisted primary school grades 1-9, international classes and one special group. 22 teachers responded to the feedback survey following a school visit. They found the content age-appropriate and appreciated the neutral approach to large carnivore themes. Some suggested spending more time on the floor rollout activity and allowing more room for discussion about the children's experiences. The visits were generally rated 4 or 5 on a scale of 1 to 5 (1 = poor, 5 = excellent).

Information packages on wolf biology and ecology, wolf research, human attitudes towards wolves, and societal roles and responsibilities were published and distributed to Members of the Finnish Parliament (MP's) and journalists (Annex 54-55 in MTR). In total 37 MPs and other politicians participated in the events organised by the project, covering wolf-related topics such as damage prevention, wolf population estimates, citizen attitudes and preventing wildlife crimes. The events were attended by MPs from all parliamentary parties, and mostly from those representing the rural voice in politics: the Centre Party of Finland and the True Finns.

The project also wanted to experiment with a more dialogue-based approach to communicating information on wolf issues to the MPs, with the aim of building a shared understanding and promoting collaboration and trust towards the game management system. Interested MEPs were invited to a face-to face discussion on a given subject with an expert (2022). The outcome was poor as only three MPs attended a meeting. On the other hand, these meetings were successful as both sides were open for a dialogue. This experiment was not continued in the project.

The project implemented a strategic media outreach plan including nine media events (see Table 5) and over 30 press releases. Journalists were invited to annual field visits across southern Finland close to a wolf territory, to reach different media representatives. In total, 135 journalists took part in the project's media events. Some events attracted over 30 participants, particularly those held online. The most popular in-person event was held in Laitila in 2023, with 12 journalists attending. The project also organised two public events, often back-to-back with media events. The first one in Lohja (2022), drew 32 participants, and the second (bilingual in Karis/Raseborg) drew 88 participants. Both events sparked lively discussions and were followed by several media features.

Table 5. Project's media events.

Date	Place	Themes
12.3.2020	Seinäjoki	Wolf behaviour and damage prevention
3-4.11.2021	Lieksa, Ruunaa	Wolf scaring devices, game patrol work, DNA sample collection and the wolf in the media
31.3.2022	Online	New methods of protecting livestock and the DNA sample collection in the winter before
30.8.2022	Björkö	Mid-term project: what has been achieved, wolf population and its development in the area, wolf attitudes and news coverage, protection of livestock
9.2.2022	Lohja	Public and media event on wolves in Western Uusimaa
30.3.2023	Online	News from the game patrol, activities of the LCO network, updates on DNA sample collection
23.11.2023	Laitila	Update on wolves in south-western Finland
20.2.2024	Online	Volunteer work on wolf and large carnivore issues
10.12.2024	Siilinjärvi	Survey on wolf attitudes of citizens, protective vests for hunting dogs, the end of work of the game patrol

During 2019-2024 LIFE BOREALWOLF was mentioned in 944 Finnish media articles, averaging three articles per week. Most coverage appeared in local and regional media, and despite the divisive nature of the topic, the tone remained largely factual and balanced. Journalists described the project's communication as effective and appreciated the availability of expert perspectives and up-to-date materials. A report on the project's media coverage was published in 2025 (Deli E2: 12/2024 in BUTLER). The knowledge about the project and its themes was studied in a citizen survey made in Action D2.

Comparison with planned output and time schedule: A journalist field trip planned for in October 2020 was rearranged so that the project staff attended a media event organized by YLE news journalist and the field trip was arranged in 2021. Due to changes in the project

personnel in Luke, the production of the educational materials was postponed from 2020 to 2021. Also, the publishing of both the brochures and give-away material for school children were postponed from 2020 to 2021. The school visits, and the public and media events were postponed due to the Covid-19 pandemic from 2021–2022 to 2022–2023. Thus, the recruitment of a project coordinator for the task was postponed to 2022. The delay of the school visits did not affect the final outcome of the project.

The 2023 event for the MP's was postponed 2024 as it would have overlapped with another similar event focusing on wolf hunting in 2023.

Modifications, problems, and delays: Because of financial reorganizations in C1 action, 10 000 € was moved to E2 for making infographics and pictures for the school materials. The Subject Aid's service in distributing school materials was included.

Complementary action outside LIFE: In 2021, Luke was invited to produce material to a magazine (Maaseudun Tulevaisuus) with a widespread in the rural areas. The project assisted in producing a one-page article on wolf biology population estimates.

Perspectives for continuing the action after LIFE: All text, graphics, videos, and other content were planned and produced to be useful for communication even after the project has ended. All produced information is openly accessible to teachers, the Members of the Parliament, journalists, and citizens also after the project. Metsähallitus will carry on organising annual media events, expanding the scope beyond wolves in the future. Even before the project, stakeholders involved in wolf management were regularly invited to parliamentary hearings. This practice will continue beyond the LIFE project to ensure that the knowledge gained is transferred across governments.

Deliverables reported in the MidTerm (MTR) report.

- Deli E2: 06/2020 - Info package for media and MEPs (Annex 54)
- Deli E2: 06/2020 - 1st info package for media produced (Annex 55)
- Deli E2: 06/2020 - 10 floor rollouts with real-size wolf tracks on (Annex 56)
- Deli E2: 12/2020 -> 08/2021 - Brochures on wolf for school children (Annex 57)
- Deli E2: 08/2020 -> 08/2021 - Educational give-away material on wolf for school children (Annex 58)
- Deli E2: 12/ 2020 -> 08/2021 - Educational materials found on the project website (Annex 59)
- Deli E2: 09/2022 - Video production on wolf for educational use (Annex 60).

Deliverables reported during 2023-25 in BUTLER.

- Deli E2: 12/2024 -> 06/2021, 5 x webinar to children and youth, was published on YouTube in summer 2021.
- Deli E2: 12/2024 -> 06/2025 Report on project's media coverage

ACTION F1 Action for project management

Completed /	Foreseen start: 01/10/2019	Actual start: 01/10/2019
	Foreseen end: 30/09/2025	Actual end: 30/09/2025

Activities undertaken and outputs achieved: The project management aimed at ensuring that the project running according to plan, managing risks and fulfilling the LIFE regulations. The technical and financial management and communication is described in chapter 5.

Figure 19. Staff of LIFE BOREALWOLF at the kick-off meeting in November 2019. Photo: Ilpo Kojola.

The project was managed by detailed action plans for each activity, followed by annual action plans, and monitored annual action specific technical and financial reports. The project aims and activities were streamlined with the implementation of the national wolf management plan and were widely presented and discussed in different fora. Throughout the project time, most stakeholders had a neutral or slightly positive attitude towards the project within their networks. Nonetheless, some stakeholders and agitator presented highly opposing or even aggressive opinions, both directly towards the project staff an in media and social media. Many stakeholders and citizens expressed their support to the project in working in a very challenging environment, which required both patience and wisdom from the project management.

Due to the extensive attention received by the project and the hard pressure under which the staff was working, the management produced some extracurricular activities that were very appreciated by the staff and the steering groups. A stakeholder strategy and an internal and external risk assessment tool was used for evaluating the progress of the project in reflection to changes in the society concerning LC policy and management. The extra effort put into supporting and engaging the staff to their tasks was at times extensive due to the external pressure on the employees. The management answered to the need of the staff to use each other for pier support by for example introducing monthly internal communication coffees (some 50 persons attending on each occasion). The supporting activities were appreciated by the staff, and persons working with wolves outside the project were included in the networking, showcasing that the wildlife authorities also have an extensive role in supporting their staff working with such complex and challenging issues.

Annual internal workshops were organised to enhance a more collaborative wolf governance and management process between the project partners. The workshops discussed the project progress and possible amendments needed to better reach the set goals and prepared for the after-LIFE operations. The workshops provided an important support for the project management in keeping on the track and managed to steer the project focus more to reaching the local level. This was set as a common goal during the second half of the project. Many new ideas and proposals for developing the wolf management were brought up in the workshops, most of which have been put forward to the national wolf management monitoring group or were implemented as a part of the project. A SWOT analysis was used as a project evaluation tool at the Mid Term and at the end of the project (See After-LIFE report).

Comparison with planned output and time schedule: The project was conducted according to plan and delivered the planned outputs accordingly. Any modifications were communicated with the LIFE monitor and adjusted accordingly. All changes have been reported within each action report. In this action, no major changes were made other than the project coordinator taking over the project management from 2021 onwards when the original project manager was transferred to other duties within her organisation. No new project coordinator was employed. The communications coordinator quit her position in May 2025, with several communications personnel from Luke assisting the project on demand until the end. Ca 40 000 € of the transferred funding from Action C1 was used in this action. It was used for the layout and editing of the Human-Wildlife report and the After-LIFE report, and for organising the final seminar and media event. It was also used for organising the human-wildlife workshop and training session for the project personnel (se detailed description below).

Modifications, problems and delays: During the 6-year period, staff reorganisation processes within the partner organisations have resulted in changes in the employment status of several persons from the project. The 2 % rule has been taken into consideration when reorganising the working schemes for the personnel. These changes have not affected the atmosphere nor the working practices of the project.

Complementary action outside LIFE: During the second half of the project the PM made a 6 month visit to Sweden as an exchange program to build up a deeper collaboration network around the LC management, and to get a better understanding of the approaches and activities in these matters. The objective was to enhance the replicability, transferability and cooperation of LC governance, management and science between the Nordic countries (Finland, Sweden and Norway). Themes such as population monitoring, modelling work, management praxis, wildlife crime, dialogue development and multispecies management were on the table in many discussions. The visit enabled the PM to build up a robust network of scientist and officials exchanging knowledge and experiences. During her stay, the PM managed to produce a joint project application to the Nordic Council of Ministers on "Transfrontier collaboration in wildlife management, with a special focus on wildlife crime". The project was funded for and conducted during 2024 (see https://pub.norden.org/nord2025-006 for further information). The cross-border project produced information material on the LC management structures and processes in Finland, Norway and Sweden, with a special focus on combatting wildlife crime. This material was published in three languages (FIN, NOR, SWE) on the www.suurpedot.fi site with funding from this project (roughly 30 000 € from the MH E1 budget, see explanation in chapter 8.1).

Being one of the first large projects putting the Human-Wildlife Conflict (HWC) management on the table in Finland, the project themes were discussed with experts in many different fields of science and management as to dig deeper into the human-wolf and human-human conflict maintaining the strong opposing flanks within the society. It produced an extracurricular report on the human-wildlife conflict in Finland, in Finnish and translated to Swedish and English (Nyman et al 2025), to bring the discussion to the decision makers. In addition, the project organised a workshop for experts and the staff was educated in conflict management and how to take it into practice. The training focused on developing conflict mitigation by mapping the conflict tools needed.

Figure 5. Workshop on the Human-Wildlife conflict in Finland, with a focus on scientific needs.

The project organised a final seminar for the stakeholders, media and staff (both online and face to face). It was attended by **130** persons and the project outcome was widely spread through the media coverage.

Figure 21. The panel discussion at the final seminar, focusing on the achievements and on the preparations for the After-LIFE stage, was also streamed live on YouTube.

Perspectives for continuing the action after LIFE: The After-LIFE conservation plan describes the continuation of the project actions, ensuring the long-term management of the wolf population in Finland. It provides a motivation for maintaining the enhanced collaboration between project partners and 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.

Milestones and Deliverables in BUTLER

- Milestones 2020–2024: Yearly report on the project progress for the monitoring meetings (Annex 61 and 62 in MTR, 2022-24 reports sent directly to monitors)
- Deli 09/2022: Midterm Report, Covering the project activities from 01/10/20191 to 30/06/2022. LIFE BOREAL WOLF.
- Deli 12/2025-> 11/2025. Final report (this report)
- Synthesis report: Wild animals as part of a conflict – experiences and recommendations. Extracurricular report submitted in BULTER
- Deli F1 09/2025: After-LIFE report: Beyond the BOREALWOLF project: Continuing on the path to human-wolf coexistence. Submitted in BUTLER.

References:

- *Madeleine Nyman, Anssi Ahtikoski, Iina Ala-Kurikka, Jukka T. Forsman, Inari Helle, Juha Hiedanpää, Mikko Jokinen, Artti Juutinen, Meri Kallasvuo, Tuija Lankia, Esa Lehtonen, Ari Leskelä, Jani Pellikka, Eija Pouta, Pekka Salmi, Annika Tienhaara, and Riikka Venesjärvi. 2025. Synthesis report: Wild animals as part of a conflict – experiences and recommendations. https://jukuri.luke.fi/items/a4a653e0-2217-4759-a1e7-7b7b76a10b44*

6.2. Main deviations, problems and corrective actions implemented

The project did not face any major deviations or problems, that would have affected the overall outcome. Some minor deviations are described, mostly due to external changes in the society.

1. Action C1. The request to change the tendering process of buying external services for DNA analysis of wolf samples and to change the DNA analysis method was approved by CINEA 28.6.2021 (Annex 64a in MTR) in the comments from the monitoring meeting report in 2021. The detailed description of the request and decisions are reported in chapter 6.1. under Action C1.

2. Action C3. The action of developing protective gear for hunting dogs was delayed and changed from the original plans. The call for high-tech solution tender in 2020 was not successful, and other initiatives planned in 2021–2023 were cancelled. In the end, the project decided to promote the use of vests via an extensive trial instead. Meanwhile, the staff promoted dog safety via information-sharing throughout the project. The deviation in plans were accepted by CINEA 28.6.2021 (Annex 64a in MTR) and by project monitor 9.4.2024 (through HelpDesk). The detailed description of the problems and corrective actions are reported in chapter 6.1. under Action C3.

3. The Covid-19 pandemic affected the project in various ways during 2021–2023. All personnel were strongly recommended to work at home, and all meetings, workshops and seminars were organised through TEAMS or postponed. The effects on the concrete activities within the actions were surprisingly low, other than not being able to meet face to face and thereby resulting in using less money for traveling. Both travel plans and the surplus budget were adjusted to the new situation. Most of the travels were only postponed to 2023. The project management needed to take actions in guiding and engaging the staff to participate in all remote meetings and put an effort into keeping a personal contact with the action leaders supporting them in their work. The positive outcome of the pandemic could be discerned by the vast number of attendees in the webinars and online dissemination meetings. In addition, the interest for the online course (C4) was over expectation, but it is difficult to draw any conclusions on whether it has a connection to the pandemic or not.

6.3. Evaluation of project implementation

1) **Methodology applied;** Action C1: The change of DNA-analysis method (from using microsatellites to SNP) has been very successful. It is more flexible and cost-efficient, and the analysis method is less time consuming. The development of the Finnish Wolf SNP panel was strongly aided by having the possibility to use the Swedish panel as a basis. In addition, the whole process from collecting samples to analysing the results is now conducted seamlessly within Luke and its closest collaborators on an everyday basis. Further advantages are the possibility to broaden the DNA monitoring to other LC and other species, including eDNA studies.

   Action C2.1 and C6: The new web service to enhance wildlife surveillance and control illegal killings has been successfully developed, launched and established as a standard procedure

by the enforcement authorities in Finland. The service gathers spatial information from a large set of data bases and compiles them into one service entity. Further it can spatially and temporally predict priority target areas through a modelling tool (Hotspot model). The enforcement officers and wildlife wardens have experienced it as a smooth and efficient service with all appropriate information in an accessible format.

Action C2.2 and C5: The Management Strategy Evaluation (MSE) tool has been tested and has been successfully introduced into standard operations in all moose management areas outside of the reindeer husbandry area in Finland. It provides the moose planners with information on how hunting decisions affect different species within a moose management area. This has enabled a new multispecies approach on the ungulate and large carnivore management in practice.

Action C3: A set of damage prevention tools have been tested for suitability in Finnish conditions, with the aim of selecting tools that are cost-efficient and thus applicable also after the project. The process of mitigating LC damages has been substantially improved and focused, and has been greatly appreciated among the livestock owners, especially among the sheep owners. In addition, a variety of protective vests have been tested on different breeds of hunting dogs, most of which have been to the dog owner's satisfaction.

Action E1: The project communication focused on transparency and interaction. In practice, this meant sharing not only results but also ongoing progress. Particular attention was paid to how sensitive and conflict-prone topics were framed. The communication strategy was based on actively listening to target audiences and stakeholders, understanding which issues they wanted to discuss, through which channels, and in what kind of language. This approach proved effective in building trust with stakeholders in the field, such as farmers. Journalists familiar with the public debate on wolves also gave positive feedback, highlighting the project's neutral, fact-based communication and reconciliatory messaging.

The above-mentioned actions are newly developed. In the other Actions, the methodologies used are well known and in standard use, and often very straightforward (Best Practice methods). The results have been as successful as expected, and hence the methods can be seen as having been properly selected.

2) **Achieved vs. expected results;** The overreaching goal of supporting an improved conservation status of the Finnish wolf population was reached with an estimated number of 78 wolf territories outside the reindeer husbandry area at the end of the project. In addition, all aims set for the separate actions were achieved accordingly**.** However, the expected results (described in 4.2) could only be assessed indirectly due to the project plan not including measures to directly examine the effects of many of the actions.

In general, the success of the project was highly dependent on the political environment. Wolf management issues are continuously highlighted in the public debate and often used as political instruments to raise other issues and concerns in the society. The project used an internal as well as an external project risk assessment tool to foresee possible weak signals in the society and had a plan for mitigating possible challenges. The plans were put into action several times during the project, and special effort was put into addressing incorrect information spread in the social media.

The positive outcome of the whole project, providing a boost for the management activities in the field in the long run, shows a good example of the trust and collaboration between decision makers, managers, scientists and volunteers working under very hard political pressure. The common goal is to ensure a continuous fruitful collaboration and dialogue amongst all parties involved in the wolf management, despite fluctuations in the political arena. Over the last 20 years of wolf management, political fluctuations have surfaced at times. Despite these heated time periods, management has succeeded in maintaining a dialogue with all stakeholders and has proactively provided opportunities for debate in various fora. The result of this management approach can be seen in an increasing wolf population over time.

While there is no definitive metric to measure the project's specific impacts, it is likely that, amid the turbulent political debate, increased livestock depredations and stakeholder campaigns advocating for wolf hunting, both the status of the wolf population and the concerns of residents in wolf-inhabited areas would be in a worse state without the LIFE BOREALWOLF project.

A consequence of the political tension becomes apparent in members of stakeholders and NGOs not wanting to collaborate visibly to avoid conflict within their own organisation. Thanks to the proactive engagement of the project partners towards the stakeholders through tet-à-tet discussions and at stakeholder meetings on local, regional and national levels, the project succeeded in collaborating with all central stakeholders and NGOs at some level throughout the project. However, if these local communication and dialogue efforts are not maintained in the long-term, the trust built up during the project will weather rapidly after the project has ended.

Table 6. A comparison of the foreseen and the achieved results. Action numbers are expressed in brackets when specified. The evaluation is described as the outcome and lessons learned.

Foreseen result: Improved conservation status of the wolf.		
Expected results:	Achieved results	Outcome and Lessons learned
A minimum viable population of 25 reproducing packs annually.	No. of wolf territories covered by DNA sampling increased from 43 to 74 during the project. 78 wolf territories were observed in March 2025 outside the reindeer husbandry area.	The new monitoring system is a smooth-running and cost-efficient tool for monitoring the Finnish wolf population.
The monitoring scheme in frequent use and understood by citizens.	The monitoring scheme was successfully launched and established as a standard procedure.	The even more accurate population estimation provided a fruitful ground for increasing the trust into the administration and management system.
Improved status and network of LCO, leading to a more accurate and trusted wolf population estimation	The status and network of LCOs was improved through an updated online tuition package, an increase in LCOs (from 2153 to 2378) and the number of annual wolf observations (from 8461 to 14435) along with the growing and spreading wolf population.	The project succeeded in strengthening the resilience of the wolf monitoring and management structures and processes, as it managed to keep a considerable number of volunteers engaged despite heated political and societal tension around the wolf debate on all levels of the society.
Increased trust and dialogue between opposing parties and stakeholders	Increased trust and dialogue between opposing parties and stakeholders was achieved through proactive stakeholder communication, platforms and events (over 245 events reaching 10 000 persons during the project).	The proactive communication and dialogue efforts, especially on the local level, were key to building trust between locals and the management administration, thereby increasing the acceptance of the wolf and its management system.
Two scientific papers and reports published.	Two scientific papers and reports published, in addition to other dissemination material and events.	Lessons learned: Engaging the society and volunteers in the management indirectly benefits the conservation status of the wolf

Foreseen result: Improved awareness and positive perception of the wolf and of conservation.		
Expected results:	Achieved results	Outcome and Lessons learned
People living in wolf territories will have access to the project's results, be aware of wolf biology, conservation and whom to contact with regards to wolf-related issues, and thus fear will decrease.	Information was shared locally through the TC groups, regional LC groups and by the field staff (C3–C6) through local meetings and face-to-face discussions. The project invested significantly in communication, dissemination and awareness-raising, using an interactive, transparent, and fact-based approach. In total, the project reached at least 15 000 persons, exceeding the targets by a good marginal.	The attitude survey (D2) showed a decrease in fear and worries among Finnish citizens in general. Attitudes remained neutral towards the wolf, despite the growing population and political and societal tension around the wolf debate. Positive attitudes towards wolf protection increased slightly during the project time, and the worry and fear of livestock farmers decreased. On the other hand, the worry among hunters increased during the project.
Most livestock and dog owners will know how to protect their animals.	Livestock and dog owners received information through direct contacts with the staff and through proactive information sharing in newsletters, media and social media. The project reached more than 176 livestock farmers, providing them with guidance and support.	The monitoring of damages (D1) showed decreasing numbers of livestock damages relative to the wolf population. The feedback from the livestock owners showed that the majority of collaborating farms considered the offered equipment as useful, and the collaboration with project workers as beneficial.
Teachers and children will be well educated through 110 school visits and associated material .	School material was delivered to 283 schools and the project staff visited 149 school groups across Finland reaching 2 681 students.	Feedback on the school materials and visits was positive, with special thanks given for the neutral tone, interesting topics and inspiring visuals. Lessons learned: Proactive sharing of factual information on wolves and guidance on how to coexist improves the awareness and perception of wolves and conservation.

Foreseen result: Decreased frequency of illegal killings.		
Expected results:	Achieved results	Outcome and Lessons learned
The illegal killings will decrease due to targeted surveillance and several other actions affecting the (background) drivers of illegal killing.	Targeted wildlife surveillance was conducted for 5 years, resulting in numerous cases of suspected illegal killings.	The number of verified illegal killings increased during the project as a result of the enhanced surveillance and investigations efforts. However, the reported cases were only sporadic and cannot be associated with any trends in the frequency of illegal activities.
Modelled risk will enable faster police intervention when detecting missing or suddenly diminished packs, and increase the risk of getting caught, thus decreasing the frequency of illegal killings. Specialised police officers will be familiar with focused surveillance and disseminate knowhow at a national level. Public outreach actions will involve locals to act against wildlife crime.	New tools and best practices were developed, launched and established as a standard procedure in wildlife surveillance and crime investigation. All wildlife wardens and 50 police men were trained in wildlife surveillance, monitoring and criminal investigation. This was disseminated in (16) meetings during the project. The wildlife patrol established a network of locals who were engaged in preventing illegal killings and supporting intelligence and investigations. A phone number was established providing locals with a channel to share information anonymously. The patrol received a total of 121 tips, messages and phone calls during the project.	The surveillance authorities have today an elevated competence in dealing with wildlife crime and have up to date tools in use. The continuous dialogue between locals and officials increased the trust into the wolf management system and the governmental organisations in charge. This was shown as locals engaging in the preventive activities and supporting the surveillance work. The feedback received from the locals showed that local citizens felt that they were heard and got support, which are the two main drivers behind the illegal killings. Lessons learned: The frequency of illegal killings resulting from the project actions is impossible to assess, as the tools used in the project do not provide the information needed.

Foreseen result: Increased and structured collaboration and transparency between project partners and stakeholders.		
Expected results: The TC groups will work in line and interact with each other with defined working principles. They will increase the communication and information exchange with the locals and implement actions locally. 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 general acceptance of wolves will be enhanced. Local people will trust WM coordinators and support them in wolf conservation and management.	Achieved results A stakeholder strategy (E1) was produced to ensure a fruitful networking and collaboration with all central stakeholders. The enhanced communication collaboration between partners allowed for a braver dissemination approach i.e. using an online dialogue session on a discussion forum, a social media campaign with the Sheep Association and a live broadcast on the national broadcasting company's online platform. Guidelines for the TC groups were updated and utilized as a standard framework. Annual seminars gathered TC groups together to enhance peer-support and mutual learning. The number of established TC groups increased along with the increasing wolf population from 23 to 36. In areas with no voluntary activity, project staff covered the DNA sampling efficiently. The monitoring of damages (D1) showed decreasing numbers of livestock damages relative to the wolf population. Regular proactive mitigation of damages together with face-to-face discussions and collaborative actions with locals enhanced a mutual trust according to the feedback given by livestock farmers.	Outcome and Lessons learned The enhanced collaboration and transparency (both between the project partners and with the stakeholders), possibly mitigated worries and fears among the citizens, and increased trust towards the authorities in charge of the management system. The proactive dissemination of project activities and outputs increased the transparency of the wolf management to stakeholders and local citizens The second survey on attitudes (D2) in 2024 showed that the trust of the Finnish citizens in the management system has remained stable despite several campaigns and initiatives against the wolf policy and management during the project The trust towards the police has even increased. Lessons learned: The active support and collaboration between the partners provided a fruitful platform for building inter-agency trust and for fast and adaptive actions in the management system. This enabled stakeholders to reach the project and get support and guidance. It also provided a transparency into the management system.

Foreseen results: Established novel best-practice and pilot tools.		
Expected results:	Achieved results	Outcome and Lessons learned
About 40 new fences for livestock will prevent predation by wolves.	72 km of protective fences was delivered to 43 farms during the project (C3). In addition, 176 farms were contacted and provided with a risk assessment on wolf depredation, including a recommendation on tools from a toolbox of protective gear.	In addition to the protective fencing, other new protective tools were tested and taken into standard use by the FWA in supporting the livestock owners. According to the survey (C3) livestock owners found the proactive support and engagement of the field workers very welcoming and helpful.
Awareness campaign will reach all who use hunting dogs in wolf territories.	Information sharing activities and awareness campaigns on dog protection were conducted, reaching more than 200 000 hunters (E2).	
Wolf population will be more predictable and easier to conserve because social and ecological consequences of management actions can be predicted with the MSE-model and used as a tool in wolf management. The effect of wolves on ungulate prey will be predictable and accounted for, decreasing conflict with hunters.	The MSE tool was developed, tested (C2) and taken into standard operations in all moose MMA's outside of the reindeer husbandry area (C5).	The ungulate planners in FWA found the MSE tool very user friendly and smooth. It showed very helpful in supporting the planners in setting the hunting quotas of ungulates in relation to its effects on the large carnivores. The tool was also successfully used to convey information to the hunters on the inter species relationship between LC and ungulates, and the effects of hunting on bort parts of the ecosystem. Lessons learned: Fencing alone is not an efficient enough tool for protecting livestock. Risk assessments and a protective gear toolbox is needed. Using novel technical modelling tools in wildlife management is cost-efficient and helps visualise complex entities.

Foreseen results: Accurate, effective and sustainable communication as a part of the project management.		
Expected results: Expert evaluations will estimate impacts of the project's actions. The results will be presented at several meetings and conferences. All reports and the After-LIFE plan will be delivered on time.	Achieved results The impacts of the project actions were assessed through scientific evaluations (manuscripts in D1 and D4). Both general and targeted (schools, MPs, media) communication material was disseminated through several channels proactively throughout the project (E1–2). Project activities and outputs were presented in 245 events reaching 10 000 persons, from local to international platforms. In addition, it reached thousands of citizens through traditional and social media over 3200 followers in the project's social media channels) The project's media visibility was strong: it was mentioned in 944 Finnish media articles from 2019–2024, averaging three articles per week. Most coverage appeared in local and regional outlets, and despite the divisive nature of the topic, the tone remained largely factual and balanced. 25% of adults outside the reindeer husbandry area had heard of the project by name, and awareness of its themes was significantly higher. Nearly half (48%) of survey respondents had encountered information about livestock protection, and 44% were aware of large carnivore observer activities. Knowledge of other key actions, such as police patrols in Eastern Finland (21%) and DNA sampling (20%), was also widespread. Residents in wolf territories were more familiar with	Outcome and Lessons learned The project succeeded in providing decision makers, officials, managers, scientists and stakeholders with in-depth information on the wolf management and its complexity of conflict drivers, but also on solutions and mitigation tools. Today, they hopefully have a better understanding of the complexity of the conflict surrounding the wolf and are more open to conflict resolution. The effort put into information sharing and networking in the international for a has provided Finland with a solid ground for future collaboration. The project management succeeded in establishing a positive, communicative and supportive collaboration environment, resulting in a smooth and efficient project progress. The inter-agency collaboration practice formed a platform for building trust and pier support for the staff working with LCs. Lessons learned: The tools and approaches used in the project management were suitable for completing the planned activities within each action. They did not however manage to assess whether the main goals set for the project were achieved. This was due to a halting project structure with some missing assessment activities in action D1. Working together towards a joint effort in managing a

	project themes than those in other municipalities. An inter-agency collaboration practice was established during the project between the partners, and taken into operational use after-LIFE. All deliverables were produced in close collaboration between the partners and delivered on time.	complex and conflicting species is a fruitful opportunity for governmental bodies to override past discrepancies and build trust and a joint engagement.

3) **Visibility of project results vs. time;** All results in the Conservation Actions are connected to the survival, viability and well-being of the wolf population as a whole. Since we are dealing with a population that has been fluctuating depending on the political and social tension in the society, forecasting project results or their visibility over time is very uncertain. The actual results will manifest themselves over an extended period of time. The independent actions by themselves were successful, but the hunting issue overrides all other activity and is highly political. As it was not was not a part of the project, it was not possible to take part in these discussions. The outcome of the hunting policy will affect the long-term impact of the wolf population through the political environment and social tension in the society. The most critical factors to mitigate political tension is to maintain the successful and smooth and cost-efficient collaboration between the parties involved in the wolf management, independent of the political and social oscillations in the society. In addition, keeping the vast number of volunteers on board to maintain trust and the resilience of the management system in the society is key for success in the long run.

4) **Amendments promoting results;** This is not relevant since no significant amendments have been made.

5) **Results of replication;** The replicability is connected to the development of the methodology in all Conservation Actions and in the communication, conflict management and risk assessment tools developed during the project. Some of these aspects have been described in more detail in chapter 6.1. In the international arena, the following themes got most attention and were disseminated both in scientific meetings and shared on international platforms: 1) the communication strategy on mitigating the wolf conflict, 2) the wildlife patrol surveillance model, 3) the local engagement of volunteers as a part of the management system (DNA sampling, LCO network and TC groups), and 4) the MSE tool as a support for multispecies management. All these management tools are established as a part of the Finnish management system today and could easily be replicated to other countries.

6) **Effectiveness of the dissemination activities;** The project was highly focused on dissemination and communication. The sheer volume and professional quality of dissemination activities have ensured effectiveness in raising awareness of the project's themes and tools towards coexistence. Focused and efficient communication and dissemination, achieved through close collaboration between both the project partners and

stakeholders, has resulted in a broad audience following the project and a high proportion of citizens reporting that they have heard about the project and/or its themes.

Public awareness of the project was also evident in the numerous questions and enquiries addressed to FWA's wolf planners, game patrol officers, project managers and communication coordinators, as well as many other project workers. Feedback on the interactivity and responsiveness of project communications was positive, and some myths about wolf research were dispelled.

During the project, the team adopted a new motto: "No number of emails or social media can replace encounters". Even though wolf-related information was disseminated through various channels, the most impactful form of communication was to interact with people, either in groups or face-to-face, and provide solutions to their individual situations. When it came to fears and worries, it was important to acknowledge and address the underlying emotions before offering solutions. The project provided the necessary resources and training for this intensive work, and the positive feedback from farmers who had been in contact with the FWA's planners was a testament to its success.

The project generated significant interest, providing a solid foundation for disseminating the final results to decision-makers, managers, politicians, and the public. The public included target audiences such as residents of areas affected by wolves, hunters, nature conservationists and volunteers.

However, the societal political tension around the national wolf management clearly had an impact on the dissemination efforts. As an example, a few official complaints about the surveillance of wildlife crime were put forward to the Parliamentary Ombudsman. The solution of the Ombudsman eventually stated that there was nothing reprehensible about the measures carried out in the project and no need to intervene with the work of the enforcement officials.

Although it is difficult to assess, the project team has seen some changes in the narratives used about wolves. For example, young wolves who tend to stray near human settlements are more and more commonly described as foolish youngsters trying to find their own territory, in comparison with the narrative of prey stalking and hungry wolves ready to attack children or pets. One master's thesis described a new discourse surrounding wolves ("enduring wolves") and mentioned our project as one driver of this discourse (Halonen, 2021). These new narratives can be one way to increase acceptance of wolves in the society.

7) **Policy impacts:** The Conservation Actions of the project is to a substantial part implementing the national wolf management plan (updated in 2019) and are thereby directly connected to policy developments in the country. The national management plan consists of a very broad array of both concrete and communicative activities, including the monitoring of the wolf population, stakeholder and NGO involvement, media work, and regulations on derogations. The project outcome provides a better basis for the whole entity of management and decision making, which in turn indirectly will support issues that are outside the scope of the project (nature conservation of endangered and/or red listed species, multispecies wildlife management and hunting issues). The complexity of the impacts of independent actions is difficult to discern, but as an example: An increase in

wildlife surveillance can lead to a decrease in illegal killings of wolves, that in turn leads to an increase in the wolf population, which will affect the implementation of the requirement of reaching a favourable conservation status, as stated by the EU Habitats Directive. This achievement will in turn increase the flexibility and range of tools in the national wolf management. Another EU added value of the project is the significant increase in the transnational Fennoscandian collaboration in strategic and management issues concerning wolves during the last few years (Further described in Chapter 6.1 under action E1).

References:

- *Halonen, H. 2021. "Susi kuuluu eittämättä Suomen luontoon – ja luonnossa sen tulisi pysyäkin": Muunlajisen eläimen tilan käsityksiä paikallislehdissä, https://urn.fi/URN:NBN:fi:tuni-202112038893*

6.4. Analysis of benefits

The outcome of the project actions has been assessed in detail in scientific manuscripts (deliverables in Sections 6.1. D1 and D4), where the numerical indicators have been described in more detail.

1) Environmental benefits

a. Quantitative benefits: The results for the DNA monitoring show that the coverage of identified wolf territories has reached the goal of the project by covering 91% (90% foreseen After-LIFE) of the active wolf territories. The number of covered territories increased from 43 to 74 territories (25 reproductive packs annually foreseen After-LIFE), showing a clear increase of the wolf population during the project time. Project actions on damage prevention, mitigating illegal killings and information sharing could indirectly have affected the positive development of the wolf population and its distribution.

b. Qualitative benefits:
An increasing wolf population size and distribution is foreseen over time. During the project, the general attitude towards wolves remained on the same level as prior to the project (Described in more detail Section 6.1 Action D2) despite an increasing and spreading wolf population. The general attitude provides an opportunity for the wolf population to further grow and expand to new territories. In addition, the success of the damage prevention measures, and the local engagement of supporting coexistence further promotes a successful future for the wolf population

The project implemented parts of the national wolf management plan, and the conservation activities will continue as a part of standard operations also after the project has ended: The governmental organisations involved in wildlife management are organised as a consortium, each having their own field of responsibility. In addition, several thousands of volunteers make up a large part of the field work required for the 77 different tasks described for in the management plan. This kind of collaboration systems are commonly used in Finland, based on mutual trust and transparency. It is also cost-efficient and resilient to political turbulence. The increasing wolf population will have consequences for the people and economies sharing the same landscapes. This will have to be considered by the management and administration both in terms of enough resourcing and competence in the future.

The project made significant progress in mitigating several threats related to wolf conservation in Finland, but it did not fully eliminate all threats. A major persistent issue is the institutional misfit between government policies, administrative routines, scientific approaches, and the everyday realities of civil society. Although the project improved internal communication and inter-agency collaboration, the deeper systemic misalignment remains unresolved and continues to complicate the achievement of favourable conservation outcomes.

The threat of no reaching the stakeholders in engagement was mitigated through proactive communication and dialogue helping to maintain volunteer participation and trust. The results were largely successful despite the early withdrawal of the Finnish Hunters' Association (a key national stakeholder). Their continued opposition to strict wolf conservation policies has contributed to societal polarization and complicated the implementation of management plan, especially given the association's influence within hunting communities. In stakeholder work, collaboration often takes place with individual representatives rather than entire organisations. As a result, the benefits gained (increased trust, improved dialogue, or the exchange of information) do not always extend beyond the individual to the wider organisation they represent. This is particularly evident in polarised contexts, where publicly engaging with actors holding differing political views may pose a reputational risk for the stakeholder, especially if their organisation or its members hold opposing positions.

The risk of increasing illegal killings of wolves, driven partly by opposition to wildlife authorities and concerns over predation, remains a critical threat. The project enhanced enforcement efforts, trained authorities, and increased public awareness, which helped mitigate some of the risk. Still, illegal killings persist and are challenging to prevent entirely.

Public discourse around wolf management remains highly polarized. Although the project developed and executed a robust communication strategy to counter misinformation and promote fact-based understanding, deep-seated mistrust, emotional narratives, and social media agitation continue to fuel fear and societal division, especially in rural areas where the presence of wolves is most keenly felt. Communication alone is often insufficient to eliminate polarisation or opposing viewpoints. More effective approaches include dialogue processes, collaborative governance, citizen science, and stakeholder engagement. In the context of wolf-related issues, resolving conflict entirely is an unrealistic goal. Instead, the focus should be on conflict management. In this respect, the project developed valuable tools and insights that can be carried forward both among project partners and more broadly within wildlife governance.

The growing wolf population has also led to an increase in damages to livestock and hunting dogs. While the project provided farmers with risk assessments, prevention tools, and practical support, efforts that were generally well received, some actors have resisted adopting these measures due to mistrust or opposition to current policies. The rising risk of encounters between wolves and dogs remains a significant source of tension in areas where hunting with dogs is culturally important.

Lastly, policy changes affecting the management of other large carnivores, such as bears and lynx, indirectly impacted the project. New legal interpretations banned longstanding hunting practices for these species, causing frustration among hunters and volunteers and increasing

negative sentiments towards the wildlife management in general. Though outside the direct scope of the project, this backlash complicated the broader social and political environment in which the project operated.

In conclusion, while the project successfully mitigated many immediate threats and fostered resilience within local and institutional networks, several challenges and particularly those rooted in societal divisions, institutional misfit, and deeply held stakeholder positions remain unresolved and will have an impact of the wolf population development in the future. The threats will require continued attention beyond the project's duration.
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2) Economic benefits:

The annual cost of monitoring the wolf packs increased initially during the project as a result of the introduction of the new monitoring system. At the end of the action, the annual costs had reduced to a level similar to that prior to the project (0,5 M€ annually), although the wolf population has almost doubled. The cost is expected to stay on a similar level in the coming year despite a growing wolf population

The development of the damage prevention toolbox will provide farmers with new cost-efficient equipment. This will increase their readiness to protect their livelihoods from damage despite an increasing and spreading wolf population. The new cost-efficient damage prevention tools reduce the relative level of the damage but also save costs from the state funding by reducing the costs for damage compensation. This enhances indirectly the possibility for the livelihoods of the rural businesses such as livestock farming. The protective dog west will hopefully provide support for the hunters and decrease the occurrence of injuries and deaths of hunting dogs, which in turn will decrease the demand of compensation.

The whole project has benefitted from the substantial increase in manpower (7 fulltime equivalent jobs) that has markedly improved the ability to implement the wolf management plan, as the shortage of helping hand has been one of the main bottlenecks for the implementation of such an elaborative plan. The increase in manpower has led to increasing the dialogue and awareness raising on the local level as more officials have been working in the field. This has provided a possibility to engage more volunteers into the management system. The proactive and widely distributed marketing in various media, and by using well known people with a high social status and a power to have an impact on the society, has also increased the number of volunteers. The investment in more project staff has considerably increased the work conducted by volunteers. Volunteers conducting a big part of the field work is very cost efficient, but it requires some manpower to keep them engaged and to steer up the whole process. As for staff enrolled after the project, 3 full time equivalents will be empowered on a long-term basis.

3) Social benefits:

The engagement of the volunteer DNA samplers (Action C1) and large carnivore observers (Action C4) have provided a channel to be able to actively take part in the wolf management. This kind of volunteer activity among the citizens is central to building trust towards the authorities and to be able to engage. The project (Action C3) has provided prerequisites for livestock farmers to continue with their livelihoods and eased their peace of mind (according

to the farmers' responses in the enquiry conducted in A2). However, many farmers have ceased their livestock farming during the project time, partly due to the increasing wolf population in their area. The testing of the protective vest on hunting dogs (Action C3) has provided the hunters with support that enables them to continue with their hunting traditions.

The proactive dissemination of the project outputs and awareness raising efforts have been highly welcomed throughout the society and opened for a more constructive dialogue and equally respective approaches especially on the local and regional level. The presence of the officials in the field (especially in Actions C1, C3, C4 and C6) has increased the possibility for the local citizens to have a constructive dialogue raising their fears and concerns (in newly established wolf areas), or to engage in and influence on the wolf matter on a local level (in more established wolf areas). The new tools of dialogue and discussions taken into use in the TC groups (Action C4), have been received as increasing the integrity and equality of the group members, even reaching beyond describing the problematic situation and shifting focus towards solutions.

The higher-than-expected need of the local citizens for collaboration and engagement by the wildlife patrol shows the importance of locally present officials to ease the surrounding local pressure against supporting enforcement authorities in mitigating illegal killings.

4) Replicability, transferability, cooperation:

The national game management system in Finland is constructed through a strong collaboration between authorities and with many volunteer networks. It is aiming at consensus building and transparency through a commonly accepted management plan for specific species, such as the wolf. The common praxis of working together has a long history in Finland and the transparency is a central part of the open democratic system of the society. This management system has produced common practices, such as the large carnivore assistance (volunteer network helping the enforcement authorities with traffic accidents and bold animals), or the regional LC advisory boards. Many of these practices of cooperation could be transferred and adapted also in other countries.

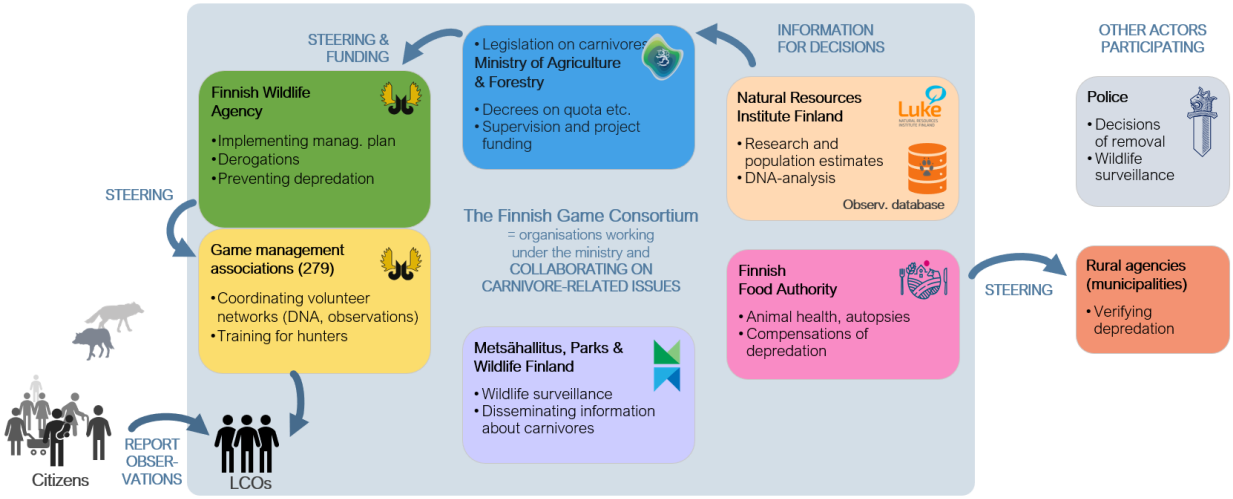

Figure 22. Infographics presenting the key actors of Finnish wolf management and their division of labour. The blue rectangle delineates the organisations included in the Finnish Game Consortium.

Many of the project deliverables have a strong replicability and transferability aspects, supporting future actions in this field. Here are some examples: 1) the updated wolf pack monitoring scheme, 2) the new common code of conduct of the inter-agency collaboration, 3) the enhanced transnational collaboration with our Scandinavian neighbours, 4) the stakeholder networking and collaboration, and the activities combatting wildlife crime. Several of these good practices have been described in detail in the EU Platform on Coexistence between People & Large Carnivores: https://environment.ec.europa.eu/topics/nature-and-biodiversity/habitats-directive/large-carnivores/eu-large-carnivore-platform_en).

Many of the above-mentioned approaches have been widely disseminated and discussed in various international meetings (List of meetings attended by the project in section 6.1 Action E1), and during the 3-month staff exchange by the project manager in Sweden, and the Swedish staff exchange visits to the project. The objective of the exchanges was to enhance the replicability, transferability and cooperation of LC governance, management and science between the Nordic countries (Finland, Sweden and Norway). Themes such as population monitoring, modelling work, management praxis, wildlife crime, dialogue development and multispecies management were brought up to further enhance the cross-border collaboration. As a result of the exchanges, a one-year project on enhancing transnational LC management with a focus in combatting wildlife crime was launched in 2024, in parallel with this project. The outcome of this project is available on https://pub.norden.org/nord2025-006/.

5) Best Practice lessons:

The project did not make any major strategical changes, so no adjustments of the best practices were needed.

Briefly:

- The enhanced efficiency and coverage of the DNA sampling scheme and the SNP method for DNA -analysis (Action C1) has increased the smoothness and cost efficiency on wolf pack monitoring also resulting in less debate on the validity of the wolf population estimates. SNPs are used in Sweden and Norway, which enhances the possibility to collaborate closely (overlapping SNP panel in all countries), especially concerning migratory individuals. SNPs provide much more detailed data on the kinship between individuals, making it possible to build up family trees and thereby following the dispersions of wolf individuals within the country. In addition, the method provides a cost-efficient tool for the monitoring of wolf hybrids, a major concern for the management at large.
- The large variety of tools used in damage prevention work (Action C3) increased the possibility of providing mitigation aid at a faster and at a broader scale.
- The involvement of the citizens in the management system through various volunteer networks increased the transparency of the management practices and the system at large, providing a sound basis for enhancing the trust between the citizens and the management.
- The local presence of officials and other governmental representatives (Actions C3, C4 and C6) and their willingness to keep an open dialogue and support the local people has clearly affected the atmosphere in a positive way on the local level and built trust towards the wildlife management system.
- The wildlife patrol model as a best practice proved to be a very cost-efficient tool for combatting wildlife crime in remote areas and was well received among the enforcement authorities. The activities have received mostly positive feedback, especially concerning the support and aid given to the local citizens.

6) Innovation and demonstration value:

Although the project applied several appropriate and cost-effective, state-of-the-art best practice approaches, it also included elements of demonstration project development and testing methods found to be useful in other contexts. The **popularisation of the Finnish wolf management** (Action E1) has been successfully used to disseminate awareness and knowhow in an understandable form, with the aim of mitigating the conflict.

There is a long Nordic history of **volunteers** engaged in the wildlife management in general. The concept of citizen science is currently gaining ground also in other fields of environmental monitoring and management. The effective use of volunteers as citizen scientists requires an organised structure and scheme by the authorities to be efficient. The project has successfully developed the organisation of the volunteer networks and enhanced the engagement of both new and old volunteers in Actions C1, C3 and C4. Engaging volunteers and keeping them in the loop is a key element in gaining a broad acceptance of the wolf population estimates and the management as a whole in the long run.

The **Management Strategy Evaluation** approach was demonstrated to the game management authorities as a new tool for simulating the short and long -term statuses of both large carnivore and ungulate populations after different combinations of management actions. It was well received and is in standard operative use in all MMAs outside the reindeer husbandry area.

The local **TC-groups** represent a local conflict mitigation platform that was encouraged towards stewardship engagement during the project. Establishing local platforms for each wolf territory enables the locals to voice their thoughts (interest, joy, fears, concerns etc), and fosters a common understanding of the frameworks for the coexistence of humans and wolves sharing the same landscape. It also supports a possibility to put forward joint ideas and actions, i.e. representing a local stewardship model.

The use of a **wildlife patrol** in wildlife surveillance proved to be a very cost-efficient collaborative model for the enforcement authorities in combatting wildlife crime. It also provided a sound base for building trust in the local society both towards the enforcement authorities and the management system. The knowledge and expertise gathered by the patrol will provide all enforcement authorities with an elevated knowledge base and new tools for combatting wildlife crime in the future.

7) Policy implications:

The project successfully contributed to the implementation of the national wolf management plan and established a platform for active communication and dialogue also on the political arena, thereby enhancing the coexistence of wolfs and humans in Finland. Furthermore, the beneficiaries found a common channel for disseminating project activities and results, and for communicating wolf related issues together as a group. The project staff took off the working load of other officials by taking care of the wolf communication and dialogue, but also by assisting in crisis communication. In Actions C1, C3, C4, C6, E1 and E2, the staff communicated directly with locals, stakeholders, politicians and the media on all geographical levels in meetings and through direct contacts.

The overall goal of enabling an increase in the Finnish wolf population was achieved during the project despite numerous political and legal turns around the wolf issue, causing turbulence in the society, and thereby posing a direct threat to the success of the project. As an example, a citizen´s initiative submitted to the Finnish Parliament (2021) called for derogations to be made to the strict protection of wolves under the Habitats Directive, sparking a heated debate at all levels of society. Questions were raised on whether the motivation to take part in the volunteer work of the wolf management (i.e., the collection of DNA samples and LC observer tasks) would diminish if hunting was not allowed. The initiative did not go through, but the volunteers stayed on. This suggests that the management system was still quite resilient to outer turbulence at that time.

Another example was the process of the legal cases on prohibiting the licence hunting of the brown bear and lynx in 2022-24, which further raised societal tension i.e. voices raising in promoting an exclusion the voluntary network from the wolf management system. This would have detrimental effects on the management system, as it is heavily depending on the efforts made by the volunteers. According to the volunteers themselves, the turbulence around the

legal process did not affect their engagement in the management system as they are used to dramatic changes in the conflicted tension and have learnt how to balance between different strong opinions. The pressure on the volunteers was hard throughout the project as support for allowing wolf licence hunting in Finland increased during the project time (according to the results of the survey made in 2024, D2). The final outcome of the legal cases against the bear and lynx hunting establishing a permanent hunting prohibition on these species, did have a negative effect on the local's trust towards the management and administration in some regions, which was shown as a lack of willingness to report LC observations and conduct large game assistance to the enforcement authorities.

The heated debate on wolf management on the European level, and the consequential changes in the Bern convention and further processes by the EU commission were closely followed by the Finnish media and citizens. The outcome of the processes leading to a down listing of the wolf from Annex IV to Annex V was welcome by many citizens. This rendered for a more independent wolf management on a national level providing space for manoeuvring the activities within the national management plan in the future. There are, however, many aspects of the management that require more attention despite the changes on a European level (threats described in this section under qualitative environmental benefits).

The most prominent policy implication during the project time was the change of the conservation status of the Finnish wolf population. In 2025, the Article 17 report on the wolf population changed from unfavourable-inadequate to favourable. This achievement was also set at a long-term goal for the project. The competence, tools and collaborative practices gained in the project will create better conditions for pursuing the coexistence between humans and wolves in the new situation.

7. LIFE Project-level Indicators

No significant deviations from the targets set initially in the KPI have been observed. All targets have been reached, and some have developed clearly beyond the set target (LPI 1.6, 7.4, 12.2).

LPI 1.5 Project area/length: The area of the DNA monitoring covered an area of 12 642 500 ha or 65% of identified wolf territories before LIFE and reached 17 505 000 ha or 90% (foreseen 90%) at the end of the project. The covered area will increase to 19 450 000 ha (stay on a 90% level) in 2030, along with the increasing distribution of the growing wolf population in the country.

LPI 1.6 Humans influenced by the project reached at least 15 000 persons (10 000 foreseen) by the end of the project. The targets have been reached by a good marginal, and the reach out will be continued as a part of the wolf management activities by the beneficiaries in their everyday operations After-LIFE. The number is estimated to continue to raise as a result of project outputs being published after the project has ended to 20 000 persons in 2030 (foreseen 15 000).
The participation was assessed as follows:

- School visits: 5 annual visits before, 149 visits during project (2 700 students reached), and 5 annually After-LIFE.
- Participation in local stakeholder events and meetings: 20 events annually before- and after-LIFE, reaching roughly 500 persons. The project participated in national and regional stakeholder events and meetings reaching more than 6 500 persons. In addition, it took parti in Nordic stakeholders and international meetings (scientific meetings, fora, exhibitions, expert workshops, Nordic LIFE platform etc.), reaching more than 3 000 persons, and organised a Conflict seminar and workshop, and a final project seminar, with more than 300 attendees in total.
- Project website: estimated 19 200 annual sessions, Twitter: 1 090 followers and 1 105 posts, FB: 1 170 followers and 145 posts. Views on project videos on YouTube: 16 946. Media events: 9 (in total 135 journalists participated).

LPI 7.4 Wildlife species: The Finnish wolf population was reported to be *Unfavourable – Inadequate (U1) / Stable* prior to the project, with 22 reproducing females outside the Alpine zone in 2018 (March). The wolf population was reported as *Favourable (FV) / Increase* in 2025 outside the Alpine zone, with 41-47 breeding females. This result is clearly beyond the set target of the project (foreseen 25 females / Favourable (FV) / *Increase*). It also exceeded the target set for 2030 (foreseen 27 females /Favourable (FV)/ *Stable*). The expected population size in 2030 will at least reach 50 reproducing females and will slowly increase as a result of an increasing acceptance of coexistence. The population growth and dispersion into new human dominated landscapes have been supported by the actions taken in the project, such as communication and dialogue efforts, and mitigation measures (dog and livestock damage prevention, combatting wildlife crime). The combination of multiple approaches to mitigate the complex human-wolf conflict has hopefully had a positive effect on the acceptance of the wolf's presence and of its intrinsic role in the natural ecosystems.

LPI 10.1.3 Risk-based compliance/enforcement system completed. One (1) new risk-based compliance / enforcement system has been produced (1 foreseen) to be used by enforcement official internally. This system will be in use in 2030 (1 foreseen). A new model for mapping

hotspot areas of illegal killings also is an additional part of the tool. It has been presented to a total of 365 enforcement staff throughout the project, which clearly exceeds the aims of reaching 11 wildlife wardens and 50 police officers in total. At the end of action C6, 8 officials had taken the tool into everyday use. Further efforts are being made to promoting the tool for all enforcement officers in the country.

LPI 10.2 Involvement of non-governmental organisations (NGOs) and other stakeholders in project activities. The project reached 4 other civil society organisations (4 foreseen), 30 public bodies (30 foreseen) and 25 NGOs (25 foreseen). The results were not surprising as these stakeholders have been involved in the wolf management prior to the project and are part of the established stakeholder involvement processes of the wolf population management system. The same stakeholders will thus be a part of the system beyond 2030. The project has communicated with all stakeholders to improve their attitudes towards the wolf throughout the project. This dialogue will continue After-LIFE.

LPI 11.1. Project website: The unique project website visits was estimated to be 19 200 annually (foreseen 115 200 in total during the project). As Luke ceased using Google Analytics in early 2023, the website visitor statistics presented are based on data from 2020 to early 2023. The site was visited approximately 8 400 times annually, reaching 50 000 visits by the end of 2025. The project website is expected to be visited also After-LIFE as many of the guidance documents will be shared from this site, which will exceed the estimated value of 60 000 visits in total until 2030 (foreseen 120 000).

Other websites connected to the project: The website riistahavainnot.fi was updated to Luonnonvaratieto.luke.fi during the project (in 2023-24). The estimated increase of visits to the site (from 1,3 M before LIFE to 1,6 M in 2025) was not met because Luonnonvaratieto.luke.fi is a new website, and the number of unique visits in 2024 was only 423,732. The website suurpedot.fi had approximately 200 000 annual visits before the LIFE project and was aiming at 400 000 visits annually at the end of the project. There is no exact information on the number of site visits for 2024-25 as Google Analytics was not used at this time period. The estimated number was 300 000 annual visits at the end of 2025.

LPI 11.2. Other tools for reaching/raising awareness of the general public. The number of different **publications** (scientific publications and technical reports) was 16 at the end of the project (foreseen 16). They included evaluation reports, scientific manuscripts and reports, popularized reports, one Master thesis and several technical reports. As two manuscripts are estimated to be published After-LIFE, the number of publications will increase to 17 in 2030.

The number of outputs in **print media** (Printed brochures, info packages and products shared in events and schools) was 11 (foreseen 10). The products include: 1 project brochure, 1 brochure for school children, 1 info package for the Parliament, 1 info package for media, 2 guides for teachers, 4 info sheets on wolf, and 1 floor rollout with real-size wolf tracks on.

The number of **other distinct media products** include 12 education and training videos produced by the project (foreseen originally 8 but increased to 13 as some of the webinar outputs were decided to be produced as videos). The final number was reduced to 12 because of unexpected costs for meeting accessibility demands. The number includes 6 videos for school children and 6 videos for adults.

The number **of events/exhibitions** (annual national wildlife / educational fairs) was 6 in total (foreseen 4). The project participated the EDUCA fair for teachers in 2025, the Northern Savolax Game Fair and the LIFE WolfAlps EU Wolf Day in Trento Italy in 2024, the Pirkanmaa game and wilderness fair and the Ulos-Ut-Out fair in 2023, and the international Sportsmen's Fair in 2022.

The number **of displayed information** (posters, information boards) were 15 (foreseen 7) at the end of the project, including 10 posters at international meetings, 3 info boards, and 2 info posters for schools.

LPI 11.3. Number of individuals surveyed for social acceptance The number of individuals surveyed for social acceptance was 4200 at the end of the project (foreseen 4 000), including randomly selected adult persons from the general public at the beginning and at the end of the project. After LIFE, national surveys are conducted every 5 years on 1 000 persons (foreseen 5000 in 2030).

LPI 12.1. Networking. The project visited in total 149 school groups across Finland and reached 2 681 students (foreseen 3500) around the country at the age of 10–15. The COVID pandemic caused a delay in school visits. Class groups were smaller than initially expected, as some of the visits took place in rural areas. Some 500 students will be reached annually after-LIFE using the information materials produced in the project reaching 5000 students in 2030 (foreseen 6000 students). Number of professionals reached increased through national and international networking efforts reaching 700 persons (foreseen 700). The project included new experts and other professionals both nationally and internationally into the network. These persons will also continue after-LIFE (foreseen 700). The professional networks established during the project will be active also after LIFE. The networking with laymen was very successful despite the Covid-19 situation. The project staff met with locals in information and networking meetings, and with people in communication and dissemination activities to local, regional national and international stakeholders and NGOs, events including scientific meetings, fora, exhibitions, workshops, Nordic LIFE platforms, project seminars, webinars and media events. In total, the project reached approximately 15 000 persons (original aim 15 000). The networking will continue After-LIFE as a part of the everyday work by the officials working with the wolf management (foreseen 30 000 laymen).

LPI 12.2. Professional training and education proceeded well. These numbers include **professional experts** in the field. Project personnel are not included in these numbers. The project has educated more than 400 professionals within the partner organisations, border guards, police, and wildlife wardens, and some 39 MP´s foreseen 180 in total). Training and education continue as a part of the management system after-LIFE to all professionals involved in wolf management and surveillance, reaching more than the foreseen 200 persons by 2030.

The project increased the **competence of laymen** from roughly 2800 to 6500 persons (foreseen 4000) during the project. This includes 977 new DNA samplers, 624 LC observers, 90 new members of the 9 new TC groups, and more than 2000 persons in the 50 moose management groups (20 persons per group). Also, this form of education will continue annually to all volunteers engaging in the management system, reaching 10 000 persons (foreseen 7 200) by 2030.

LPI 13. Jobs: The number of working years in the wolf management increased during the project with 7 full time staff (Foreseen 7), with 2 persons in Luke, 3 in FWA, 1 in MH, and 1 in the Police department. The foreseen additional working force after the project is 3 FTE (3 new posts in FWA as wolf planners), which is one less than was planned for. The police officer and the wildlife warden could not be kept on within the partner organisations after-LIFE due to other priorities within the police force.

LPI 14.1. Running cost/operating costs during the project and expected in case of continuation/replication/transfer after the project period. The wolf is managed as a part of the large carnivore management in Finland in several governmental institutions. It is therefore difficult to discern separate costs for the wolf management. The costs include management and monitoring, surveillance and legal processes, post-mortem examinations, information and awareness raising, conflict management, interaction, cooperation, damage prevention and compensation of losses, stakeholder involvement, volunteer coordination and so on. The estimated annual cost of the wolf management before LIFE was roughly 2 M €. It increased during the project to 17,5 M € or 2,9 M € annually (foreseen 12 M €). This comprised of the standard 2 M € annual costs for governance and management operations from the state budgets and other project grants, 1 M € from the LIFE budget, and 0,4 M € from the compensation of losses caused by wolf outside the reindeer husbandry area.

LPI 14.3. Future funding. The future funding of the wolf management will follow the same standard procedures as before the LIFE project based on state budgets, but with a more cost-efficient management system built up as a part of the project. On the other hand, the marked increase of wolves during the last 6 years, and an expected continuous growth of the population renders estimates of 2-3 M € annually to cover the costs of the wolf management by 2030, reaching a total of 30 M € (foreseen 20 M €).

14.4.1. Entry into a new geographic area: Knowledge exchange with Sweden and Norway has been increased regarding monitoring and information on wolf population development, and on governance and operative management activities. The project has met with Scandinavian colleagues in meetings, networking, conferences and seminars as well as through staff exchange. This level of networking and collaboration will continue also after LIFE.