European Program for Wildfire-Prepared Communities

FIREPRIME

GA number 101140381

Co-funded by the European Union

Deliverable D5.1
FIREPRIME implementation plan in SE Pilot

WP - Task	WP5 Task 5.1	**Version (1)**	Final
Code (file name)	D5.1_FIREPRIME_implementation_Plan_SE	**Dissemination level (2)**	Public
Programmed delivery date	30/04/2025	**Actual delivery date**	14/05/2025

Document coordinator	Johan Sjöström (RISE)
Contact	johan.sjostrom@ri.se Box 857, 501 15 Borås, Sweden Phone: +46 725 655 855
Authors	Johan Sjöström, Frida Vermina Plathner
Reviewed by	Elsa Pastor
Abstract	The Swedish pilot study areas are located in southeastern Sweden (Berga, in Högsby municipality and Kalmar county) and in the urban coastal city of Sundsvall (Västernorrland county) which is surrounded by sparsely populated and forested areas. In this deliverable we describe the tools that have been developed for the areas and materials and tools that will be adapted to the needs and particularities of the pilot in order to be used by the local communities and stakeholders and improve their preparedness towards wildfire.

(1) Draft / Final

(2) Public / Restricted / Internal

Disclaimer

FIREPRIME is co-funded by the European Union. Views and opinions expressed in this document are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the granting authority can be held responsible for them.

Table of Contents

1. Introduction

FIREPRIME (2024 – 2025) is a project funded by the European Union Civil Protection Mechanism (UCPM) programme under the UCPM-2023-KAPP-PREV call. Many of the wildfires that take place in Wildland-Urban interface (WUI) areas involve extremely complex civil protection challenges. On the one hand, the population experiences threats to their lives and property, highlighting a widespread lack of wildfire risk awareness and preparedness of affected communities. On the other hand, emergency services are often immersed in scenarios where emergency management involves both wildfire suppression and protecting people and property.

In parallel, the situation, resource allocation, awareness and incentives for mitigating actions differ drastically throughout the European continent. These gradients are often correlated to the degree of exposure to wildfires the different regions experience.

It is in this context that the FIREPRIME project seeks to lay the foundations of a European program that promotes wildfire risk culture and resilience among communities, with a civil protection perspective. FIREPRIME is developed in three different regions of the EU, in close collaboration with local authorities and communities and seeks to provide tools that are appropriate for the different regions. The case study for northern Europe is Sweden, where the actions are divided between the settlement of Berga (in Högsby municipality, southeastern Sweden), the city of Sundsvall (central-east Sweden) and some actions implemented on a national scale. The other two case studies in the project are the Barcelona region (Mediterranean Europe) and Austrian Tyrol (Central Europe).

Through FIREPRIME, a set of risk awareness and assessment tools, named as FIREPRIME Toolkit, have been designed and adapted to the EU context, discussed and approved with both authorities and communities, through three streams: homeowner fire safety, community engagement and resilient infrastructures. Through the implementation of the FIREPRIME Toolkit, the aim is to:

- To promote wildfire resilience and adaptation of homeowners in WUI areas, community engagement and critical infrastructure resilience.
- To foster a wildfire risk culture among affected communities.
- To improve the necessary coordination and risk governance among local and regional authorities and communities.
- To design an EU adapted strategy promoting wildfire risk awareness among WUI communities.

Thus, this document focuses on the Swedish pilot, outlining the planning of tools and actions to be carried out throughout 2025 in collaboration with local and regional authorities and the involved neighbourhood communities. This collaborative work has made it possible to adapt these tools and actions to the local context, allowing for an assessment of the project's sustainability and the suitability and replicability of the approach in a north European context.

2. Objectives

The current document has the following specific objectives:

- To identify the FIREPRIME tools that best fit with the Swedish case study.
- To define how the available tools have to be adapted to the case studies.
- To provide an implementation guide of the FIREPRIME toolkit in collaboration with local and regional authorities and neighbourhood communities.
- To define the implementation calendar and the roles of all participating entities.
- To prepare the necessary content and supporting materials for the implementation.
- To define the process and methodology for the quantitative and qualitative assessment of the implemented tools and strategies to evaluate their suitability, sustainability, and replicability in other north European contexts.

3. Methodology

3.1. Authorities and target groups

We designed the implementation using a case study in Berga, which is in Högsby municipality, Kalmar county. In this work, we used several local civilians, authorities and forest owners in the region to assess homeowners awareness, specific risk factors for homeowners in Sweden and to develop a wildfire prevention and responsibility tool. Various local, municipal and national authorities in the fields of civil protection, environmental management, and citizen participation were involved in the design of the pilot implementation plan:

- Berga, Högsby municipality officials for landscape planning
- Local residents in Berga
- Private forest-owners in the region around Högsby
- Homeowners association for Kalmar county
- Fire and rescue service in Kalmar county
- Industrial forestry company
- Forest-owners association in Kalmar county
- Insurance company

During the implementation of the tool and work we have the following target Groups:

- Sundsvall municipality
    - Managers of Municipally owned land
    - Forest manager
    - Plan developer
    - Biologist
- Homeowners in the Medelpad region
- The Medelpad fire and rescue service
- Forestry companies
- Forest-owner association in northern Sweden
- The Swedish civil contingencies agencies - MSB
    - Direct access to all fire and rescue services and municipalities through MSB

3.2. Work process

Using these stakeholders we embarked on (1) extracting data on the characteristics of gardens in Berga Municipality (from the WUIVIEW project, funded by DG-ECHO), (2) balanced the characteristics from a survey of all damages to buildings in Sweden (from a previous project funded by FORMAS) to the regional reality, (3) performed a mini-workshop to develop a tool for increasing actions for increased wildfire mitigation in terms of prevention, preparedness and responsibilities for mitigating actions.

The planning process for Swedish pilot includes local citizens, local authorities (Municipalities, rescue services), land owners (private, corporate and owner associations) as well as the national authorities. The work goes through three phases: preparation of the pilot, implementation, and evaluation.

3.2.1. Preparation phase

During **the preparation phase** we used our informants for the design of the pilot implementation, listed above. We explored how information gathered in previous projects could be used to form risk awareness and assessment tools. We prepared a gathering in Oskarshamn, close to Berga, where we met with the stakeholders described above and:

- Verified that the low levels of risk-awareness and concerns [1] was applicable for the region
- Extracted the most difficult obstacles for mitigating work in the local context
- Discussed the typical cases of building ignition [2] with the rescue service to see if the characteristics were in line also with the local experience
- Tested a number of cases (from real building ignitions) to discuss preventive (and to some degree preparedness) and where the stakeholders thought the *responsibility* of the mitigating actions lies.

The preparation thereafter continued by re-writing some of the question from The FIREPRIME Homeowner Wildfire Risk Assessment Questionnaire. Both the formulation, content and scoring were changed in order to be reasonable for the Swedish context.

The cases that were deemed most constructive to raise discussions about the most important factors for homeowner and forest-owner safety, were printed on large papers and laminated. We decided to keep the same structure for each case being (1) a few photos from the incident (or similar), (2) a short text describing the background and consequences and (3) two questions:

- What preventive mitigating work do you consider important to prevent this fire from (a) spread, and (b) ignite buildings?
- Who do you consider responsible to take these mitigating actions?

Six cases were selected, and we developed the Wildfire prevention and responsibility tool consisting of a short introduction to what might be considered a 'responsibility', a group discussion of the six cases, and finally a wrap up and take-home messages from the discussion.

The most important factors for building survival and for safe burn practices that came out of the background material [2], were discussed with the civil contingencies agency. From this discussion we aim to create simple flyers aimed for the public and distributed by the municipalities together with a short text giving more nuanced explanations to the guidelines.

3.2.2. Implementation phase

We ran the FIREPRIME Smart Phone App for all the buildings in the Berga settlement from which we had gathered detailed information on during one of the predecessing project (WUIVIEW) to FIREPRIME. All properties neighbouring the forested areas outside the settlement was assessed.

We also planned a workshop in Sundsvall[1], situated along the Baltic sea coast centrally in the south-north direction. During this workshop we decided to (1) run the FIREPRIME Wildfire Prevention And Responsibility Tool, (2) to go through the FIREPRIME Homeowner Wildfire Risk Assessment Questionnaire and (3) show the FIREPRIME Smart Phone App.

Material for the workshop was prepared, and we found a suitable venue for the discussion. Wildfire prevention and responsibility tool need two rooms as the groups should be small enough to foster good discussions. Sessons were planned to be recorded for future analysis.

3.2.3. Implementation phase

Once the actions are implemented, the **evaluation phase** begins, where an assessment is made to measure impact and detect potential improvements:

- Quantitative evaluation: Measure objective data, such as the number of participants, the number of actions carried out, outreach, and others.
- Qualitative evaluation: Gather feedback and perceptions from participants to assess the usefulness of the actions and identify strengths and weaknesses from a sustainability and replicability perspective.

[1] Note that in the grant agreement the original plan was to plan this workshop in other coastal municipalities just south of Göteborg. However, logistics and difficulties of finding a suitable time made us look for other regions for implementation. We received good response from Sundsvall and decided to change the local implementation site.

4. Communities contextualization

We have a national perspective for the distribution of the flyer on FIREPRIME Safe Burning Practices and the FIREPRIME Homeowner Wildfire Risk Assessment Flyers and the associated expanding text. Additionally, we used two local communities for developing and implementing the tools selected for Sweden. One is a rural community in southeastern Sweden (Berga, in Högsby municipality and Kalmar county) and the other is the urban coastal city of Sundsvall (Västernorrland county) which is surrounded by sparsely populated and forested areas.

These were selected from the fact that both are in regions where the future climate change is expected to increase the fire danger more than other regions in the country and that both showed a positive response in participating in the FIREPRIME activities.

4.1. Berga and Kalmar county

The region is sparsely populated, with towns surrounded by forest. In the forests, there are many houses which are physically isolated, or semi-isolated from each other, whilst some are condensed in small villages (such as Berga). Hence, building capacity against wildfire hazard, with 'neighbours' who may live up to a few kilometres away, is a challenge in this area. The population of the region peaked during the seventies due to the construction of a nuclear powerplant on the coastline. Nowadays the region experiences a slow decline in population.

Figure 1. Typical vegetation around Berga settlement and Kalmar county. Photo: Frida Vermina Plathner.

The forest is often on typically lean soil, favouring fire prone forest floors with lichens, feather mosses and pine litter. It is also one of Sweden's driest areas and irrigation bans during summers are common. It was the scene of the large 1983 Bohult fire which brough destruction to several homes and scorched large areas. Also, a fast spreading fire with the potential of large damages burnt during the summer of 2021 but was effectively suppressed by the rescue services which managed to contain it at 100 hectares. More info in the region and the citizens relation to wildfire can be found in Ref. [1].

Figure 2. The extinguished flank of the 2021 fire in the region. Photo: Frida Vermina Plathner.

4.2. Sundsvall and the Medelpad region

Sundsvall is the capital city of the 'Västrnorrlands county' with about 71 000 citizens. It is surrounded with sparesly populated areas and is one of the main centres for forestry in Sweden (with e.g. the headoffice of the large SCA forest).

Figure 3. Google maps satellite images of Sundsvall and its surroundings. The inset shows the location on a national map with Berga inserted as a reference.

The surrounding area has frequent fires and resources for suppression are scares. Much of the eastern parts of town boarders the forest with typical pine forests and fire prone forest floors.

Figure 4.(Left) Google maps satellite images of the edges of Sundsval. (right) photo of the 'Södra berget' just neighbouring the city with the characteristic fuel. Photo Anders Granström.

5. FIREPRIME Toolkit for Sweden

The following section presents the planned tools and activities further performed in the Swedish pilot. All tools are further detailed in FIREPRIME Deliverable 3.1 except The FIREPRIME Wildfire Prevention And Responsibility Tool.

Table 1. FIREPRIME tools chosen to be tested in Sweden.

HOMEOWNER FIRE SAFETY	
The FIREPRIME Smart Phone App for wildfire risk assessment at homeowner level	This smartphone app, available for both Android and iOS, is designed to help smartphone-owning residents living in the wildland-urban interface across Europe assess the hazard and vulnerability levels of their property. Using a simple, 40-question survey, users receive a quantitative risk assessment indicator along with personalized recommendations for improvement. The system is gamified, encouraging homeowners to revisit the app, log improvements they have made or plan to implement, and track their progress through an updated risk score.
The FIREPRIME Homeowner Wildfire Risk Assessment Questionnaire	The same questionnaire as the Smart Phone app, but delivered in a paper format in order to facilitate its access to people with technological restrictions. The questionnaire is changed in both words and scoring compared to the Mediterranean version.
The FIREPRIME Homeowner Wildfire Risk Assessment Flyer	An easy-to-communicate flyer of the most important things for homeowners in northern Europe to take into account when safeguarding one's house from wildfires. The flyer will be nationally distributed by the Civil Contingencies Agency (MSB) to all municipalities and all rescue services throughout Sweden. It will also be associated to a short (~2 pages) but more detailed text elaborating further on the findings and recommendations.
COMMUNITY ENGAGEMENT	
The FIREPRIME Wildfire Prevention And Responsibility Tool	The tool is a protocol for a short introduction on what is mean by 'responsibility'. There are de-facto legal responsibilities for taking mitigating actions but also 'felt' responsibility that people themselves feel that they have and that play an important role in the incentives for mitigation. Additionally, there are responsibilities people think that *other* people or organisations have with regard to taking mitigative actions. The tool thereafter contains six cases, extracted from real incidents, where damages from fires occur. The cases are

	accompanied by photos, a short text explaining the background and consequences of the incident. These cases are discussed in groups (max 6-7 people in one group to promote free discussions). Finally, the groups gather and shortly describe the proper mitigating actions and the roles different parties play in these. The tool is intended to raise awareness of efficient actions to reduce damages from fires and to give a perspective of the conflicts of interests that appear in how landscapes are managed and operations performed within the landscapes by industries, residents, tourist and authorities.
The FIREPRIME Safe Burning Guideline	The FIREPRIME Safe Burning Guideline is composed of pictorial guidelines for safe burning which is deeply rooted in the north European culture. Five important factors are highlighted, and the guidelines are complemented by a text for the more interested people where the recommendations are discussed and justified in scientific data.
RESILIENT INFRASTRUCTURE	
Wildfire Risk Assessment For Rail Networks	The Risk Assessment For Rail Networks is a protocol to assess and manage the risk along railroads. It is developed for the region and takes into account the actual location and extent of the railways in addition to the specific local fuel at each site to separate the area around the tracks into different zones that needs different types of management.

6. FIREPRIME pilot activities

In this section, the activities to be implemented in the pilot using the FIREPRIME Toolkit are identified and planned according to the following calendar.

Activity	Mar.	Apr.	May	June	July	Aug.	Sep.
The FIREPRIME Smart Phone App for wildfire risk assessment at homeowner level	Finalized 7th of March	Demonstrated 3rd					
The FIREPRIME Homeowner Wildfire Risk Assessment Questionnaire		3rd					
The FIREPRIME Wildfire Prevention And Responsibility Tool		3rd					
The FIREPRIME Homeowner Wildfire Risk Assessment Flyer				TBD			
The FIREPRIME Safe Burning Guideline				TBD			
Wildfire Risk Assessment For Rail Networks							TBD

6.1. The FIREPRIME Smart Phone App for wildfire risk assessment at homeowner level

The FIREPRIME Smart Phone App for wildfire risk assessment at homeowner level	
FIREPRIME tools	The FIREPRIME Smart Phone App for wildfire risk assessment at homeowner level.
General objective	To gather feedback on the Smart Phone App functioning and its results for north European conditions, buildings and garden structure.
Operational objectives	To test the app system in a Swedish context and assess the results. To show the app to land- and homeowners as well as municipal officials.
Stakeholders	**UOC**: To provide the app. **RISE**: To provide data from Berga (WUIVIEW project) and perform the assessment. To provide feedback to the app developer. **UPC**: To receive feedback on the App and scores. **Sundsvall Municipality:** To receive information of the app after going through the questionnaire. **Medelpad fire and rescue service**: To receive information of the app after going through the questionnaire. **Norra skogsägarna (forest owner association):** To receive information of the app after going through the questionnaire.
Activity description	The data from all exposed properties of Berga will be inserted and the result assessed. The Smart Phone App will be shown and discussed during the in-person implementation In sundsvall.
Date	Mostly during February, finalized 7th March 2025. Information meeting April 3rd.
Material/Requirements	Data from 76 properties with 170 buildings. Smart Phone App installed.

	The application was tested by a FIREPRIME researcher using collected data and photos from all properties.
Risks and adaptation/mitigation measures	**Received feedback is complex and require significant changes to the App that would eventually delay other activities**: The App has been internally checked twice with a group of project partners with different profiles, which ensures that the App meets minimum requirements from both technical and social perspectives. In case of complex modifications, the testing phase with neighbours could be delayed several days or reduce the number of testing neighbours.
Sustainability after project lifespan	The result of this activity will be an almost final version of the App and questionnaire, pending testing during implementation of Questionnaire
Evaluation	Results are not adequate for north European conditions. It overestimates the vulnerability due to garden features and underestimates it with respect to the houses. Evaluation of the technical aspects of the app will be forwarded.

6.2. The FIREPRIME Homeowner Wildfire Risk Assessment Questionnaire

The FIREPRIME Homeowner Wildfire Risk Assessment Questionnaire	
FIREPRIME tools	The FIREPRIME Homeowner Wildfire Risk Assessment Questionnaire
General objective	To go through the questionnaire on paper and without the technical limitations of a smartphone, but simultaneously without the fast feedback and gamification provided by the app.
Operational objectives	To share the questionnaire with involved local residents and regional authorities to receive their feedback. To organize a meeting with local and regional stakeholders in order discuss the questions and their interpretation.
Stakeholders	**RISE**: provide paper copies of the questionnaire and go through it using a presentation. To collect feedback on the questions. **UPC**: To receive feedback on the wording and algorithm. **Sundsvall Municipality:** To go through the questions and provide feedback. **Medelpad fire and rescue service**: To go through the questions and provide feedback. **Norra skogsägarna (forest owner association):** To go through the questions and provide feedback.
Target groups	Homeowners
Activity description	An item on the agenda during the April 3rd implementation in Sundsvall.
Date	April 3rd
Time	12:00 – 16:00
Place	Grönborgsgatan 19, Sundsvall
Material/Requirements	A meeting room with a projector. Swedish translations and modifications to the questionnaire in paper format.

Risks and adaptation/mitigation measures	The project received great interest from the local stakeholders, so risk of too few participants is low. Rescheduling is possible if needed.
Sustainability after project lifespan	The questionnaire can be shared with the Sundsvall municipality as well as the Medelpad Fire and Rescue service at the end of the project.
Evaluation	Feedback received orally from the participants and recorded.

6.3. The FIREPRIME Homeowner Wildfire Risk Assessment Flyer

The FIREPRIME Homeowner Wildfire Risk Assessment Flyer	
FIREPRIME tools	The FIREPRIME Homeowner Wildfire Risk Assessment Flyer
General objective	To spread the most efficient preventive actions aimed to protect properties against wildfires.
Operational objectives	To produce the flyer and associated text and help MSB to distribute it.
Stakeholders	**RISE:** Producing the flyer and the associated text elaborating further on its content. **The Swedish Civil Contingencies Agency – MSB:** To distribute the content.
Target groups	Homeowners
Activity description	Preparation of the flyer and text based on scientifically reviewed research.
Date	Aimed to be finished in June
Risks and adaptation/mitigation measures	**Risk:** MSB do not agree with the final output and will not distribute. **Mitigation:** Communication with MSB during the process.
Sustainability after project lifespan	The product can continue for many years after the project on the national authority's webpage.
Evaluation	Verbal feedback from MSB and eventually from users.

6.4. The FIREPRIME Wildfire Prevention And Responsibility Tool

The FIREPRIME Wildfire Prevention And Responsibility Tool	
FIREPRIME tools	The FIREPRIME Wildfire Prevention And Responsibility Tool
General objective	To raise awareness on effective mitigating actions and the problems arising with unclear sharing of responsibilities.
Operational objectives	To run the tool during a session in Sundsvall with residents, officials from the municipality, the fire and rescue service and representations of landowners.
Stakeholders	**RISE**: Moderating the discussions and providing the initial comments on different kinds of responsibilities. **Participants:** Sundsvall Municipality, Medelpad fire and rescue service, Norra skogsägarna (forest owner association).
Target groups	All actors in society living or acting in the wildland urban interface.
Activity description	Group discussions using the tool.

Date	April 3rd
Time	12:00 – 16:00
Place	Grönborgsgatan 19, Sundsvall
Agenda	Running the tools in smaller groups and have refreshment during the sessions.
Material/Requirements	Laminated versions of the cases.
Risks and adaptation/mitigation measures	The project received great interest from the local stakeholders, so risk of too few participants is low. Rescheduling is possible if needed.
Sustainability after project lifespan	The implementation will be recorded and carefully evaluated for the
Evaluation	Verbal feedback from the participants, carefully noted.

6.5. The FIREPRIME Safe Burning Guideline

The FIREPRIME Safe Burning Guideline	
FIREPRIME tools	The FIREPRIME Safe Burning Guideline
General objective	To spread the guidliens for safe burning practices for the Nordic countries.
Operational objectives	To produce the guidelines, the associated text and help MSB to distribute it.
Stakeholders	**RISE:** Producing the guidelines and the associated text elaborating further on its content. **The Swedish Civil Contingencies Agency – MSB:** To distribute the content.
Target groups	Homeowners, hunters and corporations performing burn activities in the landscape.
Activity description	Preparation of the guidelines and text based on scientifically reviewed research.
Date	Aimed to be finished in June
Risks and adaptation/mitigation measures	**Risk:** MSB do not agree with the final output and will not distribute. **Mitigation:** Communication with MSB during the process.
Sustainability after project lifespan	The product can continue for many years after the project on the national authority's webpage.
Evaluation	Verbal feedback from MSB and eventually from users.

6.6. Wildfire Risk Assessment For Rail Networks

Wildfire Risk Assessment For Rail Networks	
FIREPRIME tools	Wildfire Risk Assessment For Rail Networks
General objective	To provide guidelines for management and mitigation of wildfire risks adopted for a real rail network
Operational objectives	Providing UPC with data, reviewing the work and distributing the draft of the Transport authorities and MSB.

Stakeholders	**UPC:** developing the guidelines **RISE:** Providing UPC with data **Transport authority:** Receiving the guidelines and providing feedback. **MSB:** Receiving the guidelines and providing feedback.
Target groups	Railroad operators
Date	TBA in September.
Risks and adaptation/mitigation measures	**Risk:** Guidelines do not align with practices for other operational or legal constraints on the rail network system. **Mitigation:** Reviewing the guidelines after feedback.
Sustainability after project lifespan	If implemented the guidelines will be taken over by the transport authorities. They could also be expanded to other north European countries.
Evaluation	Written feedback from the transport authorities and MSB

7. Impact evaluation and tools assessment

After the implementation of each activity, an evaluation sheet will be collected in different forms. Some are only verbal while others are carefully noted. For The FIREPRIME Wildfire Prevention And Responsibility Tool, the evaluation will be translated into the following format prepared by PCF, to assess the impact of the tool and to evaluate its performance. This identifies strengths and weaknesses, and measures for improvements in further implementations.

SECTION 1. GENERAL INFORMATION OF THE ACTIVITY AND TOOL	
Activity name	
Tools used	
Place	
Date	
Facilitators	
Evaluation methodology	e.g. debriefing with participants, on-site observations, questionnaire…

SECTION 2. ACTIVITY PERFORMANCE	
Participants information	
Number of participants	
Profile	e.g. field of expertise, age…
Activity implementation	
Was the general objective achieved?	Explain
Were the specific objectives achieved?	Explain
Engagement	
How engaged where stakeholders before and during the activity?	
How engaged where the target groups during the activity?	
Challenges maintaining the engagement?	
Effectiveness	
Were the logistics of the activity appropriate (time, date, material…)?	
How successful was the activity approach? Explain.	
Unexpected factors	

Did you encounter any setback?	
If yes, explain adaptation/mitigation measures	
Sustainability/Replicability	
Is this an activity that can be implemented/adapted in the future with the leadership of local stakeholders? Explain.	
Is this an activity that can be easily replicated in other regions? What would be the main requirements to do so?	
Conclusions	
Activity strengths	
Activity weaknesses	
Potential measures to address the weaknesses	

SECTION 3. TOOLS ASSESSMENT	
Tool strengths	
Tools weaknesses	
Potential tool improvements	

**Fill in this table for each tool used during the activity.*