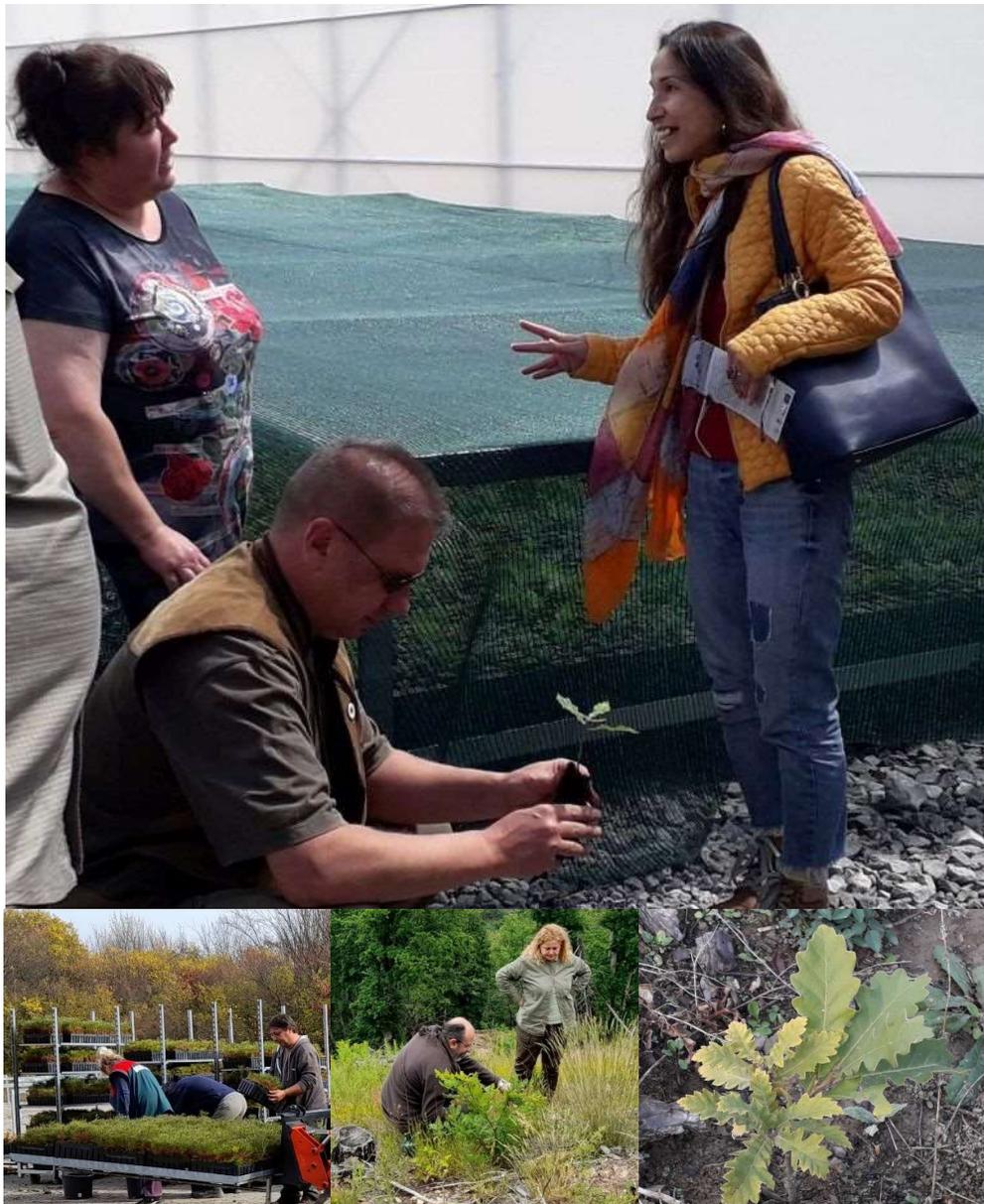


Project „Restoration and improvement of the conservation status of priority forest habitats within Bulgarian Natura 2000 network”

LIFE16 NAT/BG/000817 – LIFEFORHAB

LAYMAN’S REPORT



1. Introduction

Forest ecosystems are among the most valuable natural resources of Bulgaria. Due to the country's geographic location - between the Temperate and the Mediterranean climatic zones – combined with the significant altitude and soil variations Bulgarian forests are valuable natural habitats hosting exceptional diversity of trees, plants, birds and animal species.

Bulgarian forests are part of the European and World's natural heritage. In order to preserve the unique natural forest ecosystems and the biodiversity they keep for future generations, more than half of Bulgarian forests nowadays fall within the boundaries of protected sites of the European ecological network Natura 2000. Nowadays, forests are perceived mainly as a source of timber or place for recreation. However, the role of forests as a source of key ecosystem functions and services (such as prevention of soil erosion, climate regulation, provision of clean air and water, etc.) is of much greater importance. But above all, Bulgarian forests provide home for wildlife which is exactly the meaning of the term "habitat". Forest status and coverage to a great extent determines the biological diversity of our country, the state of our environment and the wellbeing of our society.

Bulgarian forests suffer from natural disasters or human negligence. Over the last decades global climate change has led to intensification of extreme weather events such as severe storms, floods, droughts, etc. Forest fires, pest calamities and human activities also increase the pressure on remaining natural forest ecosystems. The lack of sufficient natural regeneration in some valuable areas and the threats for damage or degradation of forest ecosystems calls for the implementation of initiatives and projects targeted at forest conservation, restoration and adaptation to challenges like climate change. One such initiative is the project "Restoration and improvement of the conservation status of priority forest habitats within Bulgarian Natura 2000 network" – LIFEFORHAB developed by the Southwestern State Forestry Enterprise (SWSFE) – the public entity responsible for the management of state-owned forests in Southwestern Bulgaria.



Forests cover 33% of Bulgaria's territory and most of the forest areas fall within Natura 2000 network

2. Summary of project scope and objectives

LIFEFORHAB project was a joint initiative of Southwestern State Forest Enterprise – Blagoevgrad (SWSFE) and the Forest Seed Control Station – Sofia (FSCS) implemented with the financial support of EC LIFE Nature 2016 Programme. The project aimed at improving the conservation status and

increasing the habitat coverage of 7 priority forest habitats within 6 target Bulgarian Natura 2000 sites. The project had four specific objectives:

1. Support conservation of the genetic fund of priority forest species and habitats from the Natura 2000 network on national level by multiplication and building up of the achieved results from the implementation of previous forest habitat restoration projects;
2. Ensure grounds for future conservation and restoration efforts targeting priority forest habitats within Bulgarian Natura 2000 network of protected sites by developing infrastructure, ensuring necessary equipment and building up expert capacity;
3. Demonstrate best practices for habitat restoration on regional level by restoring and improving the conservation status of 7 priority habitats within 6 Natura 2000 sites (with a total area of 107 ha) and foster the replication of achieved results on national level;
4. Increase the support of stakeholders and target groups for the sustainable management of forest Natura 2000 sites in Bulgaria.



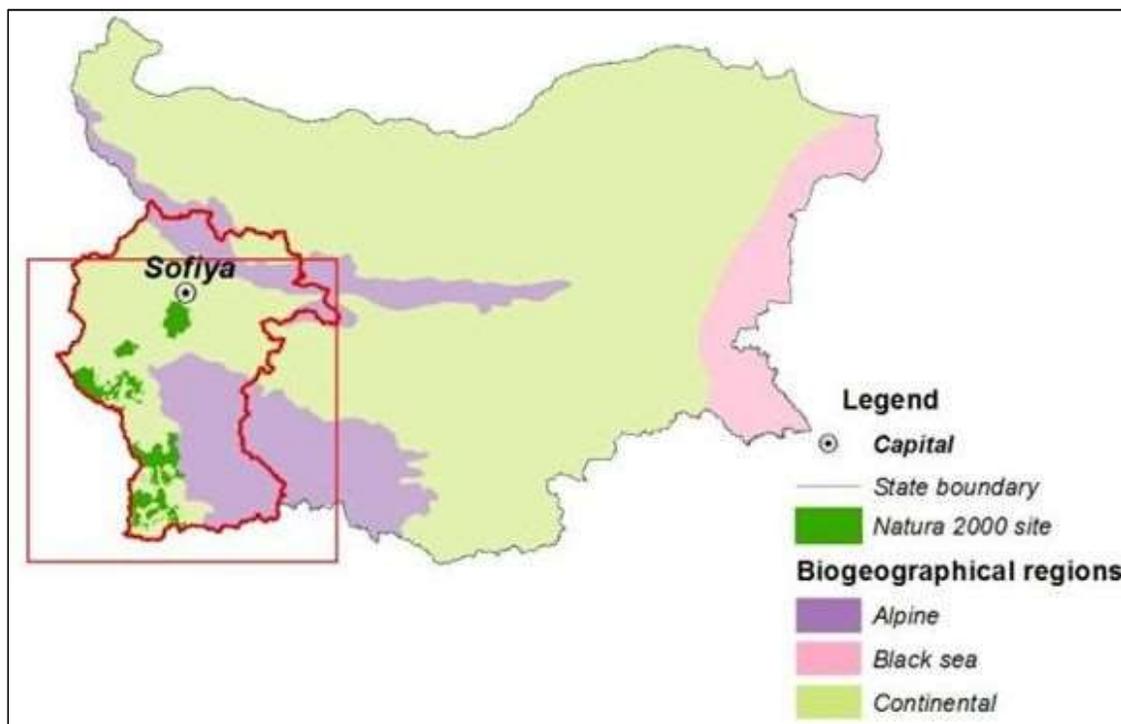
Forests damaged by forest fires in Southwestern Bulgaria – Natura 2000 site Konyavska planina

The main conservation issues addressed by LIFEFORHAB project included:

- Limited natural regeneration potential of priority forest habitats – related to human activities, nature disturbances and climate change.
- Inadequate forestry practices and human pressure – including overgrazing, improper forest management and restoration, change of land use and habitat type, infrastructure development, forest fires, etc.
- Lack of reproductive material - forest regeneration in Bulgaria is mainly focused on few tree species considered economically viable for timber production while reproductive material from most tree and brush species represented in priority forest habitats are not collected, processed or used for reforestation.
- Lack of capacity within the forestry sector for sustainable management and restoration of priority forest habitats within the Natura 2000 network.

The project targeted damaged areas of 7 priority natural habitat types: 91AA*, 91H0*, 91E0*, 9180*, 9530*, 9560* and 4070* all of which were assessed to be in unfavourable conservation status.

Targeted habitat areas were located within 6 protected Natura 2000 sites from the territorial scope of SWSFE in Southwestern Bulgaria.



General map of LIFEFORHAB project target area in Bulgaria

3. Methodology implemented and project results achieved

LIFEFORHAB project was implemented by project beneficiaries within the target region of Southwestern Bulgaria in the period October 2017 – December 2021. Key project actions included:

Analysis of the needs for priority forest habitats restoration within the Bulgarian Natura 2000 network

At project start was formed an expert team to collect spatial information and conduct expert and GIS analysis of all registered forest damages within the Bulgarian Natura 2000 network of protected sites. The results of the analysis showed that by the end of 2017 a total of 9,322.5 ha forest areas falling within Bulgarian SCIs were damaged and needed restoration. The highest concentration of forest damage in Natura 2000 was within the area managed by SWSFE with 5,583.8 ha of forest damaged or completely destroyed by nature disturbances. On national level app. 70% of affected forests were damaged/destroyed by abiotic factors (such as forest fires, snow and wind breaks) and 30% were damaged by biotic factors (such as fungi diseases and pest calamities).

Conducted expert analysis confirmed the huge replication potential of LIFEFORHAB project. Identified damaged forest areas on the territory of SWSFE alone were 52 times larger than the pilot areas for forest habitat restoration targeted under the project, while the damaged forest areas on nation level were estimated 87 times larger with some 20 million seedlings necessary for their restoration.

Identification of sources and collection of the forest reproductive material from SCIs in Bulgaria

The restoration of priority forest habitats is usually done through reforestation with tree seedlings. Key factor for seedling production is to identify sources and collect seeds of the needed species from the relevant forest habitat types, geographic locations and genetic origins. Therefore, one of the main

project actions aimed at identifying such sources of forest reproductive materials (FRM) within the Natura 2000 network of protected Sites of Community Interest (SCIs).

As a result of conducted expert analysis and extensive field visits carried out under the project, the experts of FSCS identified a total of 332 FRM sources within 53 SCIs from the Natura 2000 network in Bulgaria. By project end some 170 kg of forest seeds were collected for stocking forest gene bank located at Lokorsko project nursery near Sofia, including 160 batches of 43 priority tree species. Additional seed quantities (nearly 10,000 kg) were collected by SWSFE and used for project seedling production. Based on conducted expert analysis FRM sources database with GIS data and maps was developed allowing for the effective identification of sources for collection of seeds from priority forest species whenever deemed necessary in future.

Delivery of specialized equipment and development of infrastructure for automated production of containerized seedlings

One of the priorities of LIFEFORHAB project was to introduce the innovative for Bulgaria system for the automated production of tree seedlings for reforestation in containers. The worldwide use of containerized seedling for afforestation over the last 40 years have demonstrated many advantages compared to the use of bare root seedlings (common for Bulgaria) – including higher survival rates of newly planted trees (up to 98%).

To be able to start such production, the necessary forest nursery infrastructure was developed at Lokorsko forest nursery under the project, including: greenhouse, seedling growing areas, water supply system, etc. The next step was the delivery and installation of nursery production equipment including: seed processing machines, high-capacity automated filling and seeding line for containerized seedlings, automated nursery irrigation booms, etc. which became operational and was officially opened in April 2019. All necessary consumables for nursery production were also delivered and used for seedling production under the project – such as container trays, shading cloth, peat substrate, fertilizers and additives.

The final step of the process included the organization of specialized trainings by Swedish lecturers for SWSFE staff covering the production of containerized seedlings and the whole biological growing cycle for the plants at the forest nursery.



Production of containerized seedlings at LIFEFORHAB project nursery at Lokorsko, Sofia

Production of containerized seedlings for reforestation works

The production of containerized seedlings at Lokorsko project nursery has effectively started in spring 2019 with over 2.1 million seedlings of 20 tree species sown in containers and some 1.6 million containerized seedlings used for priority habitat restoration by project end (2021). Based on the lessons learned in the production process SWSFE continued to invest in improving and upgrading nursery production equipment and infrastructure year after year. Respectively, the numbers of produced seedlings started growing annually along with the experience and know-how of nursery personnel and by project end plans were made to start utilizing the full capacity of the automated production line which is some 1.5 million young trees per vegetation season (spring to autumn of each calendar year).

After several failed attempts, in 2020 at project nursery were successfully produced over 1000 seedlings of Greek juniper (*Juniperus excelsa*) – which is one of the most difficult priority species with regard to reproduction and previous LIFE-funded projects have failed to reproduce it successfully in the past.

Immediately after the start of production process SWSFE registered increasing demand for containerised seedlings within the Bulgarian forestry sector as non-government organisations, forestry departments and private entities started ordering thousands of containerized seedlings necessary for the implementation of their conservation and reforestation initiatives.

Reforestation and care for new forests

The implementation of main project conservation action - restoration of priority forest habitats through reforestation – started in 2018 and was successfully completed in the end of 2021 with a total of 109.5 ha restored in the 6 project target SCIs (exceeding the initially planned area of 104.0 ha in project proposal). In addition, support for natural regeneration through soil cultivation and spreading of processed juniper seeds was implemented on a total area of 3.0 ha in SCI Kresna-Ildentsi.

Subsequent cultivation and care were undertaken for all reforested areas including replacement of the seedlings which did not survive after afforestation. For the restoration purposes under the project were used all produced containerized seedlings as well as bare-root seedlings which allowed for comparison of the survival rates and efficiency of both reforestation methods.

By project end, the result of conducted monitoring and inventory of reforested areas confirmed that the use of containerized seedlings is preferable in most cases as planted seedlings have higher overall survival rates and less care and/or follow-up interventions are needed after reforestation completion.



Use of containerized seedlings for restoration of damaged priority habitats through reforestation

Dissemination, capacity building and networking

Project dissemination actions included the development of project website, profile in social networks, project leaflet, t-shirts and caps, producing and installation of notice boards at project restoration sites. Media interviews were given by project staff and media events were organized including reforestation actions with volunteers and a project video was produced which was broadcasted on Bulgarian National TV and private TV networks.

Study visits for forestry students from the University of Forestry, school pupils, NGO representatives and forestry experts were organized at project nursery to demonstrate the specifics and benefits of containerized nursery production.

Capacity building activities included the organization of 3 project workshops and development of guidebooks: 1) Technical guidebook on the collection, processing, sowing and storage of seeds of target tree species under LIFEFORHAB project, and 2) Technical guidebook for priority forest habitat restoration and management. Developed guidebooks proved to be popular among experts, forestry students and practitioners, and are publicly available on project website together with other project deliverables - such as the project video.

4. Assessment of project benefits and impact

Under LIFEFORHAB project damaged priority habitats were restored in a way simulating natural regeneration patterns by the collection of reproductive material from the same regions of genetic origin, reforestation with a complex of various forest species typical for natural habitats in target SCIs, planting both bare-root and container seedlings as well as sowing acorns based on developed Project restoration program.

Newly planted 109.5 ha of forests directly contributed for the increase of the overall coverage of selected natural habitats within the targeted SCIs and improvement of their conservation status. Further growth and development of newly planted forests is expected to enhance habitat connectivity, to increase the ecosystem functions and services provided by restored habitats, and to contribute for the future improvement of conservation status of priority habitats within targeted Natura 2000 sites.

Habitat restoration works were implemented with respect to applicable legislation on national and EU levels after consultations and approval with all relevant institutions. Achieved results from implemented pilot restoration activities clearly demonstrated to all stakeholders that restoration of forest habitats through reforestation (including the innovative use of containerized seedlings) with respect to the requirements of the Natura 2000 network is economically viable and provides sustainable results with expected long term environmental, economic and social benefits.

Within project duration was started the work for subsequent cultivation and care for all restored forest habitats. Based on the stipulations of forestry legislation SWSFE has the responsibility to take care for all newly planted forests for 3-5 years after reforestation/ project end. The identified FRM sources and collected seeds from priority forest species at forest gene bank together with the containerized seedlings produced by project end will provide the necessary grounds for further conservation of targeted priority habitats at respective SCIs.

5. Economic and environmental benefits from project implementation

Conducted independent assessment of the socio-economic impact of the project concluded that LIFEFORHAB project implementation had a tangible positive economic and social impact by restoring a considerable area of damaged forests that will provide an increasing amount of ecosystem services in the decades to come; setting conditions for successful and efficient forest restoration via the

automated production and use of containerized seedlings; providing additional income to forestry workers and personnel engaged with the automated line for containerized seedlings.

As one of the most valued outcomes of the project was identified the change of attitude towards the extensive use of containerized seedlings for conservation activities in forests, which has been widely recognised during project implementation.

The independent assessment of LIFEFORHAB project impact on ecosystem functions and services provided by targeted forest habitats concluded that the effect of project restoration activities is entirely positive. Therefore, this type of habitat/ecosystem restoration actions should be continued/expanded on regional and national levels in Bulgaria.



Project capacity building workshop at Lokorsko nursery with forestry experts

6. Transferability and multiplication of project results

LIFEFORHAB project results related to automated production of containerized seedlings and cost-effective forest habitat restoration have demonstrated high potential for technical and commercial replication both within SWSFE managed territory and on national level. Conducted analysis of damaged forests has shown that project habitat restoration works have 87-fold potential for multiplication based on the total area of damaged forests within Bulgarian Natura 2000 network of SCIs - which would require the production of millions of forest seedlings. Project reforestation actions could be transferred/replicated on national level via further cooperation with other state forest enterprises and various forest owners (i.e. municipalities, private individuals, etc.)

Based on LIFEFORHAB project results, SWSFE, in cooperation with WWF Bulgaria and the Northeastern State Forest Enterprise has developed 2 follow-up projects funded by LIFE Nature 2019 Programme which include priority habitat restoration on larger scale - in different regions and are already under implementation. In 2022 SWFE has developed a concept note for a project under the Bulgarian Operative Programme Environment which is initially approved and includes activities for the development of a second automated line for the production of containerized seedlings on SWSFE territory and large-scale afforestation works.

LIFEFORHAB has also sparked interest among other stakeholders as a close-to-market project since after the start of containerized seedling production in 2019 SWSFE has produced and provided thousands of containerized seedlings for reforestation to private companies, NGOs, municipalities, state forestry units and private individuals.

More information about the project and achieved results could be found at: www.lifeforhab.eu