TEMPLATE

Output factsheet: Pilot actions

Version 1

Project index number and acronym	CE614 - SUSTREE
Lead partner	Federal Research and Training Centre for Forests, natural Hazards and Landscape - BFW
Output number and title	O.T3.1 – Vulnerability assessment, transnational delineation models for forest companies and conservation areas
Responsible partner (PP name and number)	Czech University of Life Science Prague – PP2
Project website	https://www.interreg-central.eu/Content.Node/SUSTREE.html
Delivery date	

Summary description of the pilot action explaining its experimental nature and demonstration character

In Central Europe (CE) forests cover around 30 % of the land area of the respective countries. The SUSTREE project has aimed to improve integrated environmental management capacities in Central Europe (CE) through the promotion of Climate Change (CC) adaptation of forest ecosystems by fostering and enabling transnational adaptive management of forest genetic resources. Utilizing the intrinsic genetic variation of forest tree species has been recommended as one of the adaptive management strategies to overcome the challenges of climate change. Therefore, three pilot actions in which seven target tree species of economic importance in CE have been investigated and implemented within conservation areas and for forest managements. The seven target species include *Fagus sylvatica* (European beech); *Larix decidua* (European larch); *Quercus robur* (Common oak); *Quercus petraea* (Sessile oak); *Pinus sylvestris* (Scots pine); *Picea abies* (Norway spruce) and *Abies alba* (Silver fir).

Pilot actions were conducted with the main aim to cover the specific interests of both forest companies and conservation areas. However, these two distinct groups differ in the services they provide to society, one having an interest more in conservation, protection and recreation measures, whereas the other the interests lies more in tree net productivity, in other terms, tree volume, for its industrial exploitation. Therefore the pilot actions put into place needed to fit the interest of both groups. For this reason the three pilot actions were subdivided according to the groups interests as follows: (1) pilot action on seed management and regeneration practice was focused for forest companies implemented in Austria; (2) the pilot action to evaluate specific vulnerabilities and regeneration improvements of the seven tree species was implemented for the benefit of conservation areas in two national parks of Czech Republic; and finally (3) the third pilot action was implemented for both forest companies and conservation areas where measurements to estimate vulnerabilities of the seven tree species across CE have been planned in order to test if the developed transnational seed transfer model developed by the

SUSTREE is reducing the vulnerability of the systems in climate change.

In the Czech Republic, two national parks were identified by the Czech University of Life sciences (CULS-PP2) for the implementation of pilot action 2 and 3: Krkonoše National Park (KRNAP) and Podýjí National Park. At the initial stage, the decision-making tools in which the Thünen institute (TI-PP5) harmonized the data on national registers and in which the National Agricultural Research and Innovation Center (NAIK ERTI-PP4) provided the WebGIS and Smartphone App was presented to conservation managers. The main focus was on the vulnerability assessment of the key-stone species and predictions based on various climate development scenarios. At the later stages substitution of seed sources from across the whole Europe were recommended based on transfer models produced in the SusSelect application (Smartphone App). On the other hand, the Austrian Federal forests (ÖBf-PP7) which manages around 530 000 hectares of forest within its national boundaries implemented pilot action 1 and 3 for the benefit of forest companies. The climate envelopes within OBf forests were calculated by the Austrian Research Center for Forests (BFW-PP1) for individual tree species. The results obtained were then compared with the ÖBf's stocking targets (volume production) and presented to the forest managers. The calculated climate envelopes measured correspond relatively well with the stocking targets of ÖBf. For pilot action 3 and similarly to CULS (PP2), ÖBf used the transfer models produced in the SusSelect application (Smartphone App) in order to give recommendations for different forest regions on the seed sources across CE adapted to climate change which should be used in order to guarantee productivity in the future.

NUTS region(s) concerned by the pilot action (relevant NUTS level)

NUTS regions concerned in pilot action 2 and 3 within Czech Republic:
Level 2 – CZ05, CZ06
Level 3 - CZ051, CZ052, CZ064

NUTS regions concerned in pilot 1 and 3 action within Austria:
Level 2 – AT11, AT12; AT13; AT21; AT22; AT31; AT32; AT33
Level 3 – AT111, AT113, AT121, AT122, AT124, AT126, AT127, AT130, AT211, AT212, AT213, AT223, AT226, AT313, 314, 315, AT321, AT322, AT323, AT331, AT332, AT333, AT334, AT335

Expected impact and benefits of the pilot action for the concerned territory and target groups

The two pilot actions tests the tools and models developed within the SUSTREE project within two different stakeholder groups, 1) a large forest enterprise which mainly aims at maximizing profits from timber production while ensuring supply of multiple ecosystem services such as biodiversity, 2) National parks which mainly aims at conserving the current state of the forest ecosystem.

The vulnerability assessment and the delineation models developed within the SUSTREE project when applied in the pilot areas of ÖBF forest enterprise, it was concluded that, an adaptive management strategy of increase in the share of native broadleaved tree species such as European Beech while reducing the share of vulnerable secondary forests dominated by Norway spruce not only lowers the overall risk of the forests stands but also increases biodiversity. The ÖBf pilot study also showed that future reforestations would need to be made with other forest see sources. The ÖBf presents part of the pilot study under their new concept "Forest of the Future". On the other hand the vulnerability assessment within the two national parks shows that current stands dominated by secondary Norway spruce will be the most vulnerable under climate change while forests dominated by native Oak species will be least affected.

All three pilot actions described above all show the possibilities of tools developed within SUSTREE. The documentation (attached to the final report) verifies the usability of respective tools for both forestry and conservation managers in their framework. Outputs can be easily obtained and visualized within the Smartphone app or Web-GIS interface. These visual outputs are by no means binding for the current and future management, as there is no current support in legislation, especially in terms of national registers across CE countries, but should serve as the best available guideline for decision making in the field.

Sustainability of the pilot action results and transferability to other territories and stakeholders

These pilot actions are, to our best knowledge, highly sustainable as the models implemented are relevant for long periods of time and cover the whole European range. As the EURO-CORDEX climatic data are gradually upgraded, this can be also flawlessly implemented in our models. Even though the pilot studies were conducted on a relatively small scale, similar conclusions can be drawn across most of Europe. In Germany, Hungary, Poland and Slovakia the SusSelect App is promoted during SUSTREE national training workshops. Therefore there is no doubt that the App will be used in the future by interest groups such as SMEs; NGOs; Universities and even policy makers. Additionally, the results obtained for the vulnerability assessment of the seven tree species are highly transferable beyond CE countries as the models produce cover the whole European range. Therefore, it is expected that many stakeholders working in the field of conservation or wood productivity will use the SusSelect app in the future in order to ensure adequate seed sources adapted to climate change. In France for example, some of the results obtained from the SUSTREE project have been promoted within the H2020 GreenTree project and similar models are being produced with other target species. Likewise, in North Germany the results obtained from the vulnerability tests included in the SusSelect tool is being promoted.

Lessons learned from the implementation of the pilot action and added value of transnational cooperation

Climate change affects all forests - commercial forests and forests in protected areas. Although the interests of foresters differ from those of nature conservationists, they are all concerned on the impact of climate change on their forest ecosystem/biodiversity, tree growth and survival. Thus, despite the national boundaries, there is a common shared natural and cultural heritage as tree species investigated in the SUSTREE project are present among nearly all EU countries. The main reason in which the SUSTREE decided to cover all EU within its models, instead of focalizing only in CE was that the climatic models to calculate species vulnerabilities for all EU were much more reliable than if it only covered CE countries. Moreover, an additional species to test its vulnerability to climate change was investigated as the demand for research on this specific species was very high. The species concerned is the Silver fir (*Abies alba*) which is a large evergreen coniferous tree mainly distributed on high elevated areas, in montane regions, of CE but also present in Southern and Eastern Europe. The species is considered an important ecological and functional balancer of European forests and is a fundamental species for maintaining high biodiversity in forested ecosystems. However, silver fir is particularly sensitive to the effects of climate change, more specifically temperature, which in turn favors diseases and plant pests affecting the trees survival. For example mistletoe and bark beetles have already been responsible for a reduction of silver fir in the Mediterranean, especially in those areas where drought stress is more frequent. Therefore the vulnerability models produced for all EU as well as the supplementary tree species of economic interest would be considered the added value of the output project.

References to relevant deliverables and web-links
If applicable, pictures or images to be provided as annex

D.T1.4.1: Maps of species vulnerabilities and its uncertainties for present and three future climate scenarios
D.T1.4.2: Maps of delineation models for optimal seed transfer for present and three future climate scenarios
D.T1.4.3: Web-GIS and recommendation system to access the transnational delineation model
D.T1.4.4: Documentation handbook
D.T2.2.1: Report on statistics of climate regimes with and among existing provenance delineation
D.T2.3.1: Establishment of a common database
D.T2.3.2: Documentation of the harmonized registers
D.T3.2.1: Database of nature conservation areas linked to the developed Web-GIS
D.T3.2.2: Report on vulnerability of nature conservation systems and how to decrease vulnerability
D.T3.4.1: Documentation of pilot action 1 for forest companies
D.T3.4.2: Documentation of pilot action 2 for conservation areas

Respective national parks:
https://www.krnap.cz/en/
https://www.nppodyji.cz/?lang=2