



Version 21/04/2016

## **COST Action FP1403 (21/11/2014 – 20/11/2018)**

### **Non-native tree species for European forests - experiences, risks and opportunities (NNEXT)**

#### **PROGRESS REPORT AT MONTH 24**

**This report is submitted by the MC Chair on behalf of the Management Committee.**

##### **Executive summary of the Progress Report:**

The COST Action FP1403 NNEXT 'Non-native tree species for European forests – experiences, risks and opportunities' is successfully working towards its MoU Objectives. NNEXT has already finished several MoU Deliverables, is working on the remaining deliverables and is also producing additional output in the form of manuscripts for scientific publications, monographs, reports, books and book chapters. The COST Action currently involves 34 Member Countries, 2 Near Neighbour Countries and 4 International Partner Countries. In total, NNEXT has attracted around 170 active members, researchers at academic and non-academic institutions, practitioners (nursery owners, forest managers, carpenters) and PhD students. Members regularly convene at large joint WG meetings, joint WG/MC meetings and smaller WG meetings, and otherwise exchange information and communicate via all sorts of modern technological means (NNEXT webpage up-/download area, Dropbox, google drive, Skype,...). The COST Action is organised in 4 Working Groups, of which WG4 is split into 3 subgroups to facilitate the in-depth investigation of the diverse and demanding WG4 topics. All WGs are currently very active and work output oriented. NNEXT is very determined to support networking among countries (regional networks focusing on NNT relevant for the region) and exchange of know-how. The Action is regularly issuing STSM calls and 18 applicants have been selected so far. A Training School has been successfully organised for 14 students and involved 6 trainers and local forest managers. Early Career Investigators are strongly supported in all activities. Inclusiveness Target Countries (ITC) are strongly involved and meeting locations are disproportionately often chosen to be in ITC.

A major output so far for example is the book NNEXT Country Reports. The current situation of non-native tree species (NNT) in Europe was described by the country representatives by answering twelve detailed questions. In its second edition the book includes 35 countries, and the 36<sup>th</sup> report has just been finished. The Country Reports are available in printed and electronic form and have been distributed to NNEXT members. Furthermore, a long term monitoring trials database has been established together with EFIATLANTIC, a web interface has been set up and is promoted at our NNEXT webpage. Monographs on the genetics and breeding of the most important NNT have been finished. Pathways of FRM introduction have been collected and analysed. Risks monographs for the main NNT have been written based on country reports information and expert knowledge. NNT ecology and invasiveness traits information has been collected and is being interpreted now. The effect of NNT on ecosystem services has been analysed in a large-scale meta-analysis for regulating and maintenance services and is currently being for additional ecosystem service categories. Different recommendations, e.g. on genetic provenances, genetic markers and adaptive forest management systems are being compiled and will have a strong impact on forest managers. Many more significant results and deliverables will be produced in the second half of the COST Action. Results are being disseminated by NNEXT members talking at workshops and conferences and by writing all sorts of publications mentioned above. A final Conference for researchers and stakeholders will be held in Vienna in September 2018.



COST is supported by  
the EU Framework Programme  
Horizon 2020

**COST Association**  
Avenue Louise 149 | 1050 Brussels, Belgium  
t: +32 (0)2 533 3800 | f: +32 (0)2 533 3890  
office@cost.eu | www.cost.eu

## I. Progress Report

### I.A. COST Action Profile

#### Objective/ Aim

- 1. Collect, process and harmonise existing information on non-native tree species distribution in Europe.** This step includes an analysis of the historic reason in promoting species, maps, and existing data. Based on this initial step we may select certain key tree species for an in depth analysis across Europe.
- 2. Assess introduction and distribution pathways (including geographic origin) of non-native species.** Defining the role of natural regeneration in the integration and persistence of non-native species in native forest ecosystems.
- 3. Collect and analyse silvicultural management practices in Europe.** This will include the assessment of the growth performance, the multifunctional role of given non-native tree species as well as a review of existing management models for non-native tree species. The management of these species for biomass production and for high quality wood materials as well as the profitability and performance of non-native tree sales at the wood markets will be addressed, as well as the possibilities for co-management of mixtures of native and non-native species.
- 4. Assess the ecological risks for native tree species.** In particular we are interested in related changes on biodiversity and nature conservation issues associated with changes in the competitive situation of native tree species. New pests and pathogens which might be introduced and effect European forest ecosystems will also be addressed. For selected non-native tree species, their potential for spreading across Europe will be assessed. This assessment will be based on climate and soil data maps. These data sources will (i) provide information about the opportunities (climate change adaptation/mitigation, biomass production etc.) for promoting non-native tree species (ii) assess the risks (loss in biodiversity and sustainability, loss in ecosystem stability and thus an increase in ecosystem vulnerability) for the established native forest ecosystems.

#### Details

MoU:	039/14	Start of Action:	21/11/2014
CSO approval date:	14/05/2014	End of Action:	20/11/2018

#### COST Member Countries and Cooperating State having accepted the MoU

Parties							
Country	Date	Country	Date	Country	Date	Country	Date
Austria	03/07/2014	Belgium	16/10/2014	Bosnia and Herzegovina	22/07/2014	Bulgaria	06/06/2014
Croatia	04/07/2014	Cyprus	27/10/2014	Czech Republic	11/08/2014	Denmark	19/04/2016
Estonia	03/07/2014	Finland	11/08/2014	France	29/07/2014	Germany	28/05/2014
Greece	28/05/2014	Hungary	12/12/2014	Ireland	07/08/2014	Israel	29/10/2014
Italy	20/02/2015	Latvia	19/04/2016	Lithuania	22/12/2014	Montenegro	19/04/2016
Netherlands	16/06/2014	Norway	07/07/2014	Poland	28/05/2014	Portugal	03/07/2014
Romania	10/06/2014	Serbia	03/06/2014	Slovakia	31/01/2015	Slovenia	19/06/2014
Spain	09/06/2014	Sweden	09/10/2014	Switzerland	20/08/2014	Turkey	10/07/2014
United Kingdom	20/05/2014	FYR Macedonia	09/01/2015				

Intentions to Accept the MoU

0

#### Other participants:

Institution Name	Country
Ukrainian National Forestry University	Ukraine
Ukraine Research Institute for Mountain Forestry	Ukraine
Al-Husseini bin Talal University	Jordan
University of Alberta	Canada

Scion	New Zealand
Oregon State University	United States of America
Northwest A&F University	China

## Contacts

### Chair/ Vice Chair

Position	Name	Contact details	Country	Date of PhD:	Gender
Chair:	Dr. Elisabeth Pötzelsberger	University of Natural Resources and Life Sciences, Vienna, Peter Jordan Str. 82, 1190 Vienna, Austria elisabeth.poetzelsberger@boku.ac.at	AT	18.5.2015	F
Vice Chair:	Dr. Heinrich Spiecker	Chair for Forest Growth, Albert-Ludwigs-University, Tennenbacherstr. 479106 Freiburg, Germany, instww@uni-freiburg.de	DE	1974	M
Former Chair: Until 14.4.2016	Dr. Marcela van Loo	University of Vienna, Department of Botany and Biodiversity Research, Rennweg 14, 1030 Vienna, Austria marcela.van.loo@univie.ac.at	AT	2002	F

### Working Group Leaders

WG#	WG Title	WG Leader	Country	Date of PhD:	Gender	Number of participants
1	MONITORING	Prof. Hubert Hasenauer	AT	1994	M	16
2	PATHWAYS	Dr. Monika Konnert	DE	1992	F	27
3	SILVICULTURE	Prof. Godefridus M.J. (Frits) Mohren	NL	1987	M	34
4	RISKS	Dr. Anna Gazda	PL	2000	F	59

### Other positions if applicable (STSM Coordinator, WG Vice Leader, Task Force Leader...)

Position	Name	Country	Date of PhD:	Gender
STSM Coordinator	Dr. Oskar Godoy	ES	6.11.2009	M
WG1 Vice Leader	Mr. Christophe Orazio	FR		M
WG2 Vice Leader	Prof. Paraskevi Alizoti	GR	2000	F
WG3 Vice Leader	Prof. Valeriu-Norocel Nicolescu	RO	1997	M
WG4.1 Subgroup Leader	Dr. Anna Gazda	PL	2000	F
WG4.2 Subgroup Leader	Dr. Thomas Wohlgemuth	CH	1996	M
WG4.3 Subgroup Leader	Dr Pilar Castro Díez	ES	1996	F

**Action website:** <http://nnext.boku.ac.at>

Important documents that proof the work and progress in our COST Action are available from the internal part of our NNEXT homepage. To access the internal part of the homepage the personal username and password are required. Science officer of the Action, Administrative officer of the Action and Action Rapporteur have received their personal username and password. For downloading the documents for which the links are provided in this scientific report from the internal part of the NNEXT homepage the following different username and password are required: username: **nnext** password: **tree1403**

## I.B. Progress with MoU objectives and deliverables and additional outputs

### MoU objectives

MoU objective	Achieved Yes/ Partially/ No	For each objective insert description and evidence of (partial) achievement <sup>1</sup> including hyperlink to enable assessment (by the Action Rapporteur) of the achievement and access by end users. Justification if full achievement is not foreseen.
<p>Collect, process and harmonise existing information on non-native tree species distribution in Europe. This step includes an analysis of the historic reason in promoting species, maps, and existing data. Based on this initial step we may select certain key tree species for an in depth analysis across Europe.</p>	<p>Partially achieved</p>	<p>Detailed information about the current situation and use of NNT in Europe were collected from all participating countries by asking them 12 detailed questions. First, every country presented the current situation at the first joint WG/MC meeting. <a href="http://nnext.boku.ac.at/internal/nnext-all-presentations">http://nnext.boku.ac.at/internal/nnext-all-presentations</a> The answers to the 12 questions were collected as country reports and published, now already in an updated 2<sup>nd</sup> edition. <a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-2-reports/2015/NNEXT_Country_Reports_E2.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-2-reports/2015/NNEXT_Country_Reports_E2.pdf</a></p> <p>The analysis and scientific dissemination of the country report distribution data is in progress. Results concerning the current distribution of NNT in Europe were presented and discussed during the WG meeting in Warsaw and Lisbon. <a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_Talk_BRUS.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_Talk_BRUS.pdf</a> Reasons for introduction are being collected now for all NNT. A paper draft on “the current situation of non-native tree species in Europe” is in preparation. Therefore, a matrix based on the information of the country reports concerning NNT occurrence (in the forest, in trials), share in forest area/timber volume and invasiveness status in the different countries was build. <a href="http://nnext.boku.ac.at/images/FP1403/01-WG1/01-1-organisation/2016/Species_Country_Reports_Vol2_BRUS.xlsx">http://nnext.boku.ac.at/images/FP1403/01-WG1/01-1-organisation/2016/Species_Country_Reports_Vol2_BRUS.xlsx</a> Detailed analysis and interpretation of the NNT-countries matrix is in progress. Key species of highest importance in Europe have been determined as to analyse those NNT by all WGs in all their activities. <a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-1-organisation/2015/Keyspecies.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-1-organisation/2015/Keyspecies.pdf</a></p>
<p>Assess introduction and distribution pathways (including geographic origin) of non-native species. Defining the role of natural regeneration in the integration and persistence of non-native species in native forest ecosystems.</p>	<p>Partially achieved</p>	<p>A questionnaire on pathways was sent to NNEXT members. Results of the questionnaire were summarised and presented at the Lisbon meeting. <a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_Talk_KONNERT.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_Talk_KONNERT.pdf</a></p> <p>Information on the genetics and breeding of the major tree species introduced to Europe was collected. Monographs for the 10 most important NNT were compiled.</p>

<sup>1</sup> The links to the outputs and deliverables will be used by the Action Rapporteur in assessing the progress.

		<p><a href="http://nnext.boku.ac.at/internal/wg2-manuscripts">http://nnext.boku.ac.at/internal/wg2-manuscripts</a> Studies on the genetics and breeding of for Europe NNT within their natural range were analysed, summarised and presented to the whole auditorium at the Lisbon meeting: <a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_Talk_ALIZOTI.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_Talk_ALIZOTI.pdf</a></p> <p>Review paper: Alizoti, E., Bastien, J.Ch., Karlsson, B., Kroon, J., Konnert, M., van Loo, M., von Wühlisch, G., Westergren, M. (2016): SHORT REVIEWS ON THE GENETICS AND BREEDING OF INTRODUCED TO EUROPE FOREST TREE SPECIES; Eds. M. Konnert and E. Alizoti. Silva Slovenica (accepted for publication).</p>
<p>Collect and analyse silvicultural management practices in Europe. This will include the assessment of the growth performance, the multifunctional role of given non-native tree species as well as a review of existing management models for non-native tree species. The management of these species for biomass production and for high quality wood materials as well as the profitability and performance of non-native tree sales at the wood markets will be addressed, as well as the possibilities for co-management of mixtures of native and non-native species.</p>	<p>Partially achieved</p>	<p>Key questions have been asked for the country reports (2. Economic value, 4. Key risks - Economic Risks, 5. Non-economic advantages/disadvantages, 6. Management systems, 7. General assessment of growth performance, 8. Options explored to establish mixtures of exotic and native species, 9. Key aspects for comparison of performance of exotic and native species). <a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-2-reports/2015/NNEXT_Country_Reports_E2.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-2-reports/2015/NNEXT_Country_Reports_E2.pdf</a></p> <p>Writing of a review paper on ecology of NNT is in progress. <a href="http://nnext.boku.ac.at/images/FP1403/03-WG3/03-4-manuscripts/2016/NNEXT%20WG3%20review%201%20Ecology%201st%20draft%20October%202016.pdf">http://nnext.boku.ac.at/images/FP1403/03-WG3/03-4-manuscripts/2016/NNEXT%20WG3%20review%201%20Ecology%201st%20draft%20October%202016.pdf</a> Also, a review paper on silviculture of NNT is being produced <a href="http://nnext.boku.ac.at/images/FP1403/03-WG3/03-4-manuscripts/2016/NNEXT%20WG3%20review%202%20Silviculture%201st%20draft%20October%202016.pdf">http://nnext.boku.ac.at/images/FP1403/03-WG3/03-4-manuscripts/2016/NNEXT%20WG3%20review%202%20Silviculture%201st%20draft%20October%202016.pdf</a></p>
<p>Assess the ecological risks for native tree species. In particular we are interested in related changes on biodiversity and nature conservation issues associated with changes in the competitive situation of native tree species. New pests and pathogens which might be introduced and effect European forest ecosystems will also be addressed. For selected non-native tree species, their potential for spreading across Europe will be assessed. This assessment will be based on climate and soil data maps. These data sources will (i) provide information about the opportunities (climate change adaptation/mitigation, biomass production etc.) for</p>	<p>Partially achieved</p>	<p>Key questions have been asked for the country reports (4. Key risks – Biotic, Abiotic, 10. Impact of exotic tree species on ecosystems) and the information is being analysed and extended by expert knowledge and literature information. <a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-2-reports/2015/NNEXT_Country_Reports_E2.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-2-reports/2015/NNEXT_Country_Reports_E2.pdf</a></p> <p>Invasiveness as a concept has been elaborated and the country reports on invasive species have been analysed. <a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2015/2015_10_06_Presentation_WOHLGE_MUTH.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2015/2015_10_06_Presentation_WOHLGE_MUTH.pdf</a></p> <p>Invasiveness traits are collected for the 15 most important NNT in Europe. These traits allow an interpretation whether a species is likely to become invasive. A template to collect the species traits was</p>



<p>promoting non-native tree species (ii) assess the risks (loss in biodiversity and sustainability, loss in ecosystem stability and thus an increase in ecosystem vulnerability) for the established native forest ecosystems.</p>		<p>developed. <a href="http://nnext.boku.ac.at/images/FP1403/04-WG4/04-1-organisation/2016/table_invasiveness_v4.xlsx">http://nnext.boku.ac.at/images/FP1403/04-WG4/04-1-organisation/2016/table_invasiveness_v4.xlsx</a>  First versions of the filled tables were sent by all WG members until September 2016. During an STSM of K. Grityte (Lithuania) at the Swiss Federal Research Institute in Sep. 2016 more traits data were gathered and contributions were analysed. Results of this STSM were presented and discussed at the Lisbon-2016 meeting by T. Wohlgemuth.  <a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_WG4_WOHLGEMUTH.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_WG4_WOHLGEMUTH.pdf</a></p> <p>We conduct a large scale assessment of impact on non-native trees on ecosystem services. Existing data (published papers and other type of data) on the impacts of non-native trees (NNT) on ecosystem services are systematically reviewed according to a scientifically acknowledged methodology. The extension aims to be worldwide and the target species are any NNT in any country.</p>
---	--	---

#### MoU deliverables

MoU deliverable	Level of progress <sup>1</sup>	Description and evidence of (partial) delivery achievement including hyperlink to enable assessment of the delivery <sup>1</sup> . Justification if full achievement is not foreseen.
<p>WG1:</p> <ol style="list-style-type: none"> <li>Country reports on the distribution and importance of non-native tree species of each participating country.</li> <li>Harmonized maps and information covering the historic development and general forestry statistics for non-native tree species growing in Europe.</li> <li>A list of long term research plots and available data and reports for the identified most important non-native tree species.</li> <li>Potential distribution maps of selected non-native tree species.</li> </ol>	<ol style="list-style-type: none"> <li>Achieved</li> <li>Partly achieved</li> <li>Achieved</li> <li>Partly achieved</li> </ol>	<p>Ad 1:  Information on NNT distribution, risks and regulations were provided by all participating countries compiled in two editions of the country report.  The first edition of the country reports were published online and printed in April 2016.  <i>Hasenauer, H., Gazda, A., Konnert, M., Mohren G., Pötzelsberger, E., Spiecker, H., van Loo, M. (2016). Non-Native Tree Species for European Forests: Experiences, Risks and Opportunities. COST Action FP1403 NNEXT Country Reports, Joint Volume. University of Natural Resources and Life Sciences, Vienna (BOKU), Vienna, Austria. 370 pages. ISBN 978-3-900932-35-0 [Online publication]</i></p> <p>Since additional countries joined the COST Action NNEXT, we decided to revise the first edition of our country reports by adding additional information, improving the structure, style and layout. The report was published online in October 2016 and as a printed book. All expenses for the second edition were covered by Institute of Silviculture, BOKU, Vienna.</p> <p><i>Hasenauer, H., Gazda, A., Konnert, M., Lapin, K., Mohren G.M.J., Spiecker, H., van Loo, M., Pötzelsberger, E. (Eds.) 2016. Non-Native Tree Species for European Forests: Experiences, Risks and Opportunities. COST Action FP1403 NNEXT Country Reports, Joint Volume. 2nd edition. University of</i></p>

	<p><i>Natural Resources and Life Sciences, Vienna, Austria. 420 pages. ISBN 978-3-900932-42-8 [Online publication]</i>  <a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-2-reports/2015/NNEXT_Country_Reports_E2.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-2-reports/2015/NNEXT_Country_Reports_E2.pdf</a></p> <p>Based on the results of the Country reports and additional literature search WG1 members have developed a first draft entitled "The current situation of non-native tree species in Europe" with the key topics:</p> <ol style="list-style-type: none"> <li>A full list of non-native tree species in Europe growing in European forests.</li> <li>Analysis of species abundance across genera (genus)</li> <li>The distribution of species across Europe to assess the regional importance of foreign tree species in European regions</li> <li>Assess the relevance of reported invasiveness</li> </ol> <p>Ad 2.</p> <p>This activity involves harmonized maps of non-native tree species in Europe. This activity has caused more work than expected. The first key question regarding species distribution was answered by many countries providing some type of land cover proportion and some maps, but no national forest inventory (NFI) data. Therefore a group of WG1 and WG4 members became strongly engaged in obtaining additional distribution information from the European National Forest Inventory Network (ENFIN), botanical databases with phytosociological relevés and crowd-source floras.</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-5-STSM-reports/2015/STSM_Report_P%C3%B6tzelsberger.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-5-STSM-reports/2015/STSM_Report_P%C3%B6tzelsberger.pdf</a></p> <p>In any case, the most valuable information is contained in national forest inventories. A drawback of NFIs in some countries is that they either (i) do not record the data at the level of detail as they are important for our work (many NNT are not distinguished) or (ii) do not make the data available. Thus we have for some countries very good results while for others little information is available.</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/01-WG1/01-1-organisation/2015/NNEXT_NFI_maps_v1.pdf">http://nnext.boku.ac.at/images/FP1403/01-WG1/01-1-organisation/2015/NNEXT_NFI_maps_v1.pdf</a></p> <p>First distribution maps based on the country reports information were made.</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/01-WG1/01-1-organisation/2015/NNT_distribution_WOHLGEMUTH_20151006.pdf">http://nnext.boku.ac.at/images/FP1403/01-WG1/01-1-organisation/2015/NNT_distribution_WOHLGEMUTH_20151006.pdf</a></p> <p>The European National Forest Inventory Network (ENFIN) was contacted to request NFI data harmonised for Europe for all recorded NNT. Negotiations lasted over one year, but are basically finished and first statistics on the requested data have been delivered.</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/01-WG1/01-1-">http://nnext.boku.ac.at/images/FP1403/01-WG1/01-1-</a></p>
--	---

		<p><a href="http://www.cost.eu/organisation/2016/Request%20non-native%20trees%20data_NNEXT_ENFIN_160901.pdf">organisation/2016/Request%20non-native%20trees%20data_NNEXT_ENFIN_160901.pdf</a></p> <p>The next steps depend on the final decision of the ENFIN group. The goal here is that we will produce harmonized maps based on three pillars (I) NFI data (ii) the country reports, and (iii) local expert assessment by our participating partners.</p> <p>Ad 3.</p> <p>We have created a web portal for a long term monitoring trials database for NNT that facilitates the collection and search of meta-information of research plots across Europe for tree species relevant for our activity.</p> <p><a href="http://nnext.boku.ac.at/nnext-db/trials">http://nnext.boku.ac.at/nnext-db/trials</a></p> <p>A detailed database guide explaining the use of the database has been written:</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161005_Trials_database_P%C3%96TZELBERGER.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161005_Trials_database_P%C3%96TZELBERGER.pdf</a></p> <p>Ad 4.</p> <p>Together with WG4 an approach for distribution modelling was developed and input data are being collected to parameterise distribution models.</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_WG4_VICENTE.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_WG4_VICENTE.pdf</a></p>
<p>WG2:</p> <p>1. Historical and present seed and plant material – pathways for important non-native species in Europe (changed at WG meeting in Sofia; OLD: Review on the artificial distribution range of important non-native species in Europe including historical and present seed- and plant material- pathways.)</p> <p>2. Provenance recommendations for non-native species in different European countries and transferring the results to different regions in Europe, compilation of available provenance tests and seed orchards in Europe (meta-database).</p> <p>3. Reports on available and already tested markers for non-native species for identification of subspecies, varieties and provenances and thus allowing tracing back their geographic origin.</p> <p>4. Summarizing knowledge on genetic aspects of natural regeneration of NNT species and its role in species persistence (changed at WG meeting in Sofia; OLD: Summarizing the role and quality of natural regeneration for</p>	<p>1. Achieved</p> <p>2. Partly achieved</p> <p>3. Partly achieved</p> <p>4. No</p>	<p>Ad 1. A questionnaire on pathways was sent to NNEXT members. Results of the questionnaire were summarised and presented at the Lisbon meeting.</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_Talk_KONNERT.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_Talk_KONNERT.pdf</a></p> <p><a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_Talk_ALIZOTI.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_Talk_ALIZOTI.pdf</a></p> <p>Ad 2. A questionnaire on provenance tests and recommendations was recently outlined and sent to all European countries. Deadline for submission is mid-December 2016.</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/02-WG2/02-1-organisation/2016/Genetic%20fieldtesting_v2.xlsx">http://nnext.boku.ac.at/images/FP1403/02-WG2/02-1-organisation/2016/Genetic%20fieldtesting_v2.xlsx</a></p> <p><a href="http://nnext.boku.ac.at/images/FP1403/02-WG2/02-1-organisation/2016/Provenancerecommendations_v2.xlsx">http://nnext.boku.ac.at/images/FP1403/02-WG2/02-1-organisation/2016/Provenancerecommendations_v2.xlsx</a></p> <p>Ad 3. Reports on genetic markers for traceability are in progress. Reports for Picea sitchensis and Quercus rubra are finished and were presented during the WG meeting in Warsaw.</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20160412_Talk_Cvjetkovic.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20160412_Talk_Cvjetkovic.pdf</a></p> <p>Ad 4. Summarizing knowledge on genetic aspects of natural regeneration of NNT is foreseen for the next</p>



persistence in native forest ecosystems.)		grant period.
<p>WG3:</p> <ol style="list-style-type: none"> <li>1. Collection of guidelines of existing regional experiences in management and production of non-native species across European countries. The guidelines should cover all tree species identified in WG 1.</li> <li>2. List of available regional management models (growth and yield models or any other tools available) for non-native tree species management.</li> <li>3. Report on existing long term research plots covering silvicultural experiences and data of key non-native tree species in Europe. How they address the integrated forest management needs (productivity, nature conservation, biodiversity) will be a key element of these reports.</li> <li>4. SWOT analysis of risks and challenges in managing non-native tree species in European regions.</li> </ol>	<ol style="list-style-type: none"> <li>1. Partly achieved</li> <li>2. Partly achieved</li> <li>3. Partly achieved</li> <li>4. Partly achieved</li> </ol>	<p>Ad 1. Guidelines are being derived from the country reports and species reviews.</p> <p>Ad 2. A review on regional forest management models will be included in review papers.</p> <p>Ad 3. The long term monitoring trials database is currently being filled (see deliverable WG1/3). The analysis of the information collected in the database will follow.</p> <p>Ad 4. A pilot study has been carried out in Balkan countries and results have been presented during the last meeting. A publication with the results of this study is currently being written.</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_Talk_KECA.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_Talk_KECA.pdf</a></p>
<p>WG4:</p> <ol style="list-style-type: none"> <li>1. Synthesis review document and or meta-data base on existing potential biotic risks and abiotic risks.</li> <li>2. Synthesis review on the invasive behaviour of natural regeneration of non-native tree species.</li> <li>3. Analysis on the impact of the provision of non-timber goods and services including biodiversity and nature conservation issues in combination with non-native tree species management.</li> <li>4. Assessment of the potential future spreading (see also Deliverable 4 of WG1) and the resulting (expected) biological risks for the provision of the non-timber goods and services of European ecosystems.</li> </ol>	<ol style="list-style-type: none"> <li>1. Achieved</li> <li>2. Partly achieved</li> <li>3. Partly achieved</li> <li>4. Partly achieved</li> </ol>	<p>Ad 1. The risk information collected in the country reports was organised in a database.</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/04-WG4/04-1-organisation/2016/Pests_CR-database_FP1403_CR_Ed2_161017.xlsx">http://nnext.boku.ac.at/images/FP1403/04-WG4/04-1-organisation/2016/Pests_CR-database_FP1403_CR_Ed2_161017.xlsx</a></p> <p>For the most important NNT synthesis reports were produced using this country reports information and expert knowledge. Internal/WG4 – 4.4 Manuscripts</p> <p><a href="http://nnext.boku.ac.at/internal/wg4-manuscripts">http://nnext.boku.ac.at/internal/wg4-manuscripts</a></p> <p>Ad 2. Invasiveness of NNT is being analysed for the most important NNT in Europe. A review is prepared, focusing (I) on national/international reports on invasive NN tree species in Europe, (II) the most serious threats to ecosystem functioning and production opportunities of NNT, (III) on potential invasiveness of NN tree species (in the frame of continuous global and climate change), (IV) on methods of dealing with invasive NNT, (V) on the focal species' invasiveness status in Europe.</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_WG4_WOHLGEM_UTH.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_WG4_WOHLGEM_UTH.pdf</a></p> <p><a href="http://nnext.boku.ac.at/images/FP1403/04-WG4/04-3-literature/general/invasiveness_paper_literature-XML.zip">http://nnext.boku.ac.at/images/FP1403/04-WG4/04-3-literature/general/invasiveness_paper_literature-XML.zip</a></p> <p>Ad 3. A large global meta-analysis on Ecosystem Services influenced by NNT is carried out. So far, the main focus was on regulating and maintenance services.</p> <p><a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-</a></p>

	<p>meetings/2016/FP1403_20161004_WG4_CASTRO_D IEZ.pdf  The topic of provisioning services was recently integrated:  <a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_WG4_GODOY.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_WG4_GODOY.pdf</a></p> <p>Ad 4. Together with WG1 an approach for distribution modelling was developed and different types of input data are being collected to parameterise distribution models (see also deliverable WG1/2). Current climate data for whole Europe for example will be provided by the Institute of Silviculture , BOKU, Vienna.  <a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_WG4_VICENTE.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161004_WG4_VICENTE.pdf</a></p> <p>Meanwhile, J. Hafner has successfully applied for a STSM taking place in the lab of J. Vicente in Portugal. During this STSM, the distribution model will be parameterised and first model runs may be done.</p>
--	--

**Co-authored publications and FP7/ H2020 proposals**

The co-authored publications and FP7/ H2020 proposals/ projects resulting from the Action are listed on the page following the “Additional outputs and achievements” section

**Additional outputs and achievements**

Please describe any other outputs and achievements that have resulted or are in progress, focusing in particular on those that contribute to the COST mission of “COST enables break-through scientific developments leading to new concepts and products and thereby contributes to strengthen Europe’s research and innovation capacities.”

WG1: International laws and treaties and national regulations on non-native trees species growth have been compiled and analysed.

[http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403\\_20161005\\_Talk\\_LAPIN.pdf](http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161005_Talk_LAPIN.pdf)

The information on national regulations collected with one question in the country reports has been used to design a new and detailed questionnaire on regulations, which has been sent out the MC members and selected country experts. The deadline for submission of the questionnaire is end of November 2016.

[http://nnext.boku.ac.at/images/FP1403/01-WG1/01-4-manuscripts/2016/Regulations\\_Questionnaire\\_NNT.docx](http://nnext.boku.ac.at/images/FP1403/01-WG1/01-4-manuscripts/2016/Regulations_Questionnaire_NNT.docx)

WG2:

- For 10 selected species summarized monographs on genetics and breeding were completed.

<http://nnext.boku.ac.at/internal/wg2-manuscripts>

- A questionnaire on the current status of seed and plant material import and transfer of non-native tree species to and within Europe (statistics, legal regulations, etc.) was outlined and answered by 24 countries. Results were compiled and presented within the Lisbon meeting but also at different meetings for nurseries. An important result is that introduction of FRM from the countries of origin or from third countries into countries from the EC is extremely low, whereas the transfer between EC is very intensive but highly different for both countries and species, starting from low to extremely high movements. For nearly all important non-native forest species many sees stands exist in European countries.

- A questionnaire on provenance tests and recommendations was recently outlined and sent to all European countries.

[http://nnext.boku.ac.at/images/FP1403/02-WG2/02-1-organisation/2016/Genetic%20fieldtesting\\_v2.xlsx](http://nnext.boku.ac.at/images/FP1403/02-WG2/02-1-organisation/2016/Genetic%20fieldtesting_v2.xlsx)

[http://nnext.boku.ac.at/images/FP1403/02-WG2/02-1-organisation/2016/Provenancerecommendations\\_v2.xlsx](http://nnext.boku.ac.at/images/FP1403/02-WG2/02-1-organisation/2016/Provenancerecommendations_v2.xlsx)

- Compilation on genetic markers for traceability was finalized for Picea sitchensis and Quercus rubra.



[http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403\\_20160412\\_Talk\\_Cvjetkovic.pdf](http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20160412_Talk_Cvjetkovic.pdf)

WG3: Trainees of the 1<sup>st</sup> NNEXT training school (23<sup>rd</sup>-27<sup>th</sup> of August 2016) are preparing a scientific publication on the topics discussed at the training school – 1. Chances and opportunities of NNT, 2. Risks and uncertainties when introducing and using NNT / Trade-offs and challenges for management of NNT, 3. The most pressing research questions on NNT. Group work has been finished and now the collected results are combined in a manuscript, which is planned to be submitted by February.

WG4: Two manuscripts targeting WG4 topics were submitted for book projects:

- Rigling A, Gessler A, Feichtinger L, Queloz V, Wohlgemuth T (2016) Introduced or native tree species to maintain forest ecosystem services in a hotter and drier future? In: Krumm F, Vítková L (eds) Introduced tree species in European forests: Opportunities and challenges, pp 236-246 (in press)
- Wohlgemuth T, Hafner J, Höltermann A, Moser B, Nehring S, Rigling A (subm.) Impacts of Douglas-fir on forests and openland habitats. In: What Science Can Tell Us: Douglas fir - an option for Europe. Spiecker, H. (submitted)

The impacts of non-native trees on cultural ecosystem services (CES) in the Iberian peninsula are investigated by 5 scientists from Spain and 4 from Portugal. They are focusing on the development of a novel methodology to assess CES and are starting to write a paper.

The potential distribution area of *Eucalyptus globulus*, the most important NNT on the Iberian Peninsula, under current and future climatic conditions is evaluated and the environmental drivers of seedling establishment success are identified. A Master Thesis on this topic has been finished by an NNEXT STSM participant, supervised by three WG4 members, and a manuscript will be submitted to an international scientific journal.

[http://nnext.boku.ac.at/images/FP1403/04-WG4/04-5-publications/2016/Ortiz\\_2016\\_Master%20thesis\\_Modelling%20the%20potential%20distribution%20and%20naturalization%20of%20Eucalyptus%20globulus%20in%20the%20Iberian%20Peninsula.pdf](http://nnext.boku.ac.at/images/FP1403/04-WG4/04-5-publications/2016/Ortiz_2016_Master%20thesis_Modelling%20the%20potential%20distribution%20and%20naturalization%20of%20Eucalyptus%20globulus%20in%20the%20Iberian%20Peninsula.pdf)

An international multidisciplinary book project on one of the most important NNT in Europe – Douglas fir - has been organised by the MC-Vice-Chair and is almost completed. The book is entitled 'Douglas fir: an option for Europe?' and will appear in the European Forest Institute series 'What Science Can Tell Us'. The book addresses stakeholders and the public and informs about the pros and cons of growing Douglas fir – a hot topic in Europe's forestry sector. Among the authors are 10 NNEXT members. Chapters are 1. Introduction, 2. Douglas fir distribution in Europe, 3. Ecology of Douglas fir, 4. Management of Douglas fir, 5. Socio-economic impacts of growing Douglas fir, 6. Outlook and conclusions.

[http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403\\_20160413\\_WSCTU\\_SPIECKER.pdf](http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20160413_WSCTU_SPIECKER.pdf)

**Co-authored publications and FP7/ H2020 proposals**

**Co-authored publications**

Enter in the table below only publications on the topic of the Action, co-authored by at least two Action participants from two different countries participating in the Action and for which the Action networking added value. A maximum of ten publications may be entered. If the Action has more than ten such publications the Core Group should select the ten most significant ones to include in the table below.

NO.	Bibliographic data (including: Title, Authors, Title of the periodical or the series, Issue number or volume, Publisher, Year of publication, Relevant pages)	Main author	Number of authors	Action participants listed among the authors (Name, country and role <sup>2</sup> )	WGs involved in publication	Date of submission (must be after Action start date)	Expected date of publication (if not already published)	Persistent link to publicly available version of the paper (if available) or the abstract	Is/Will open access <sup>3</sup> provided to this publication?	Is/ will COST be cited/ acknowledged in the publication?	Are/ will COST funds (be) implicated in this publication	Relevance to H2020 Societal Challenges <sup>4</sup> ?	Is it peer-reviewed?	Was the added value of the Action Networking necessary for the publication	Impact Factor (if applicable)
1	Alizoti, E., Bastien, J.Ch., Karlsson, B., Kroon, J., Konnert, M., van Loo, M., von Wühlisch, G., Westergren, M. (2016): SHORT REVIEWS ON THE GENETICS AND BREEDING OF INTRODUCED TO EUROPE FOREST TREE SPECIES; Eds. M. Konnert and E. Alizoti. Silva Slovenica (accepted for publication).	M. Konnert and E. Alizoti	8	1. Alizoti, E., GR, MC, WG2 vice leader WG2; 2. Bastien, J.Ch., FR, MC; 3. Karlsson, B., SE, MC; 4. Konnert, M., DE, MC, leader WG2; 5. van Loo, M., AT, MC; 6. von Wühlisch, G., DE, WG	WG2	Oct. 2016	April 2017		yes	yes	no		no	yes	
2	Hasenauer, H., Gazda, A., Konnert, M., Mohren G., Pötzelsberger, E., Spiecker, H., van Loo, M. (2016). Non-Native Tree Species for European Forests: Experiences, Risks and Opportunities. COST Action FP1403 NNEXT Country Reports, Joint Volume. University of Natural Resources and Life Sciences, Vienna (BOKU), Vienna, Austria. 370 pages. ISBN 978-3-900932-35-0	H. Hasenauer	Editors: 7	1. Hasenauer, H., AT, WG1 Leader 2. Gazda, A., 3. Konnert, M., 4. Mohren G., 5. Pötzelsberger, E., 6. Spiecker, H., 7. van Loo, M.	WG1		April 2016		Yes	yes	no		no	yes	
3	Hasenauer, H., Gazda, A., Konnert, M., Lapin, K., Mohren G.M.J., Spiecker, H., van Loo, M., Pötzelsberger, E. (Eds.) 2016. Non-Native Tree Species for European Forests: Experiences, Risks and Opportunities. COST Action FP1403 NNEXT Country Reports, Joint Volume. 2nd edition. University of Natural Resources and Life Sciences, Vienna, Austria. 420 pages.	H. Hasenauer	Editors: 8	1. Hasenauer, H., AT, WG1 Leader 2. Gazda, A., PL, WG4 Leader 3. Konnert, M., DE, WG2 Leader 4. Lapin, K., AT, Grant Holder Administrator 5. Mohren G.M.J., NL, WG3 Leader 6. Spiecker, H., DE, Vice Chair 7. van Loo, M., AT, MC-Substitute and former Chair 8. Pötzelsberger, E., AT, Chair	WG1		October 2016		yes	yes	no		no	yes	

**FP7/ H2020 Proposals and projects**

This table contains FP7/ H2020 proposals/ projects spinning off from Action activities and including in the proposing consortium at least three Action participants from at least three different countries participating in the Action.

NO.	Title	Name and country of main proposer	Number of proposers	Action participants listed among the proposers (Name, country, role <sup>3</sup> in the Action)	Funding agency submitted to	Date submitted	Date results expected	Result	Call identifier	Relevance to H2020 Societal Challenges <sup>4</sup> ?	Was the added value of the Action Networking necessary for the proposal / project?
<b>Projects</b>											
1	List FP7/ H2020 projects resulting from the Action in this section of the table										
<b>Proposals</b>											
	List FP7/ H2020 proposals submitted as a result of the Action in this section of the table										

<sup>2</sup> MC Member/ MC Substitute/ MC Observer/ WG Member/ Training School Trainee/ STSM Recipient/ Other Action Participant

<sup>3</sup> Open Access is defined as free of charge access for anyone via Internet. Please answer "yes" if the open access to the publication is already established and also if the embargo period for open access is not yet over but you intend to establish open access afterwards.

<sup>4</sup> H2020 Societal Challenges are "Health, demographic change and wellbeing"; "Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy"; "Secure, clean and efficient energy"; "Smart, green and integrated transport"; "Climate action, environment, resource efficiency and raw materials"; "Europe in a changing world - inclusive, innovative and reflective societies"; "Secure societies - protecting freedom and security of Europe and its citizens"

## I.C. Networking

### Added value of the Networking

Please describe here the added value of the networking, highlighting in particular anything that would not have happened without the Action networking.

NNEXT has regular calls for Short Term Scientific Missions (STSM). The goals of the STSMs are to support individual mobility, strengthen existing networks, and foster collaboration between researchers, especially ECI in order to contribute to the scientific objectives of the COST Action. So far, 5 calls for STSM were organized and in total 16 people (8 female/ 8 male) have been selected to conduct an STSM in a research institution abroad. <http://nnext.boku.ac.at/activities/nnext-stsm> Abstracts/Reports are published at our webpage: internal/5 STSM <http://nnext.boku.ac.at/internal/nnext-all-stsm> STSMs so far have largely supported WG activities, mainly of WG2 and WG4.

NNEXT has supported nine national and international project proposals. In the Czech Republic 5 proposals have been submitted from NNEXT participants with the support of NNEXT and confirmed collaboration with NNEXT. In Switzerland 2 such proposals have been submitted, and 1 proposal in Serbia. One Horizon 2020 project proposal has been supported.

Invited speakers enrich the discussion and the pool of knowledge at every joint WG meeting. Several former speakers became active WG members and enlarge the network. This includes people who were involved in the formulation of the Regulation (EU) No 1143/2014 on invasive alien species, the 'List of invasive species of Union concern' issued in July 2016 and the Code of Conduct for on Planted Forest and Invasive Alien Trees of the Council of Europe.

#### WG1:

The long term monitoring trials database for NNT has been developed together with EFIATLANTIC, the Atlantic European Regional Office of the European Forest Institute. EFIATLANTIC has experience with managing large databases. EFIATLANTIC built and hosts the database and provides technical support for the database.

#### WG2:

The questionnaire on forest reproductive material (WG2) gives for the first time a comprehensive overview on import and transfer of seed and plant material of important non-native species. It shows that today import from countries of origin is of only low importance for the presence of these species on the European forests. Compilation of knowledge on FRM was possible only within the COST action. Statistics on FRM of non-native species are of high importance for forest seed companies and forest nurseries but also for the nature protection sector. Results from a questionnaire on the current status of seed and plant material import and transfer of non-native tree species to and within Europe (statistics, legal regulations, etc.) were presented at different meetings for nurseries.

#### WG3:

Our successful 1<sup>st</sup> NNEXT Training School entitled 'Non-native tree species in Europe in the viewpoint of climate change: challenges, risks, opportunities – trade-offs' has been organised by the Croatian Forest Research Institute. The training school involved 6 trainers from 4 countries (Croatia, Rumania, Slovenia and Switzerland) and 14 trainees, PhD students and PostDocs from different disciplines from 12 countries (Croatia, Austria, Bosnia, France, Germany, Greece, Ireland, Lithuania, Poland, Portugal, Serbia, Slovenia). All trainers are NNEXT members. During field trips forest managers of different forest companies presented their NNT forests and any issues they have with growing NNT were discussed with trainers and trainees. Currently, organisers and students are working on a scientific publication on 1. Chances and opportunities of NNT, 2. Risks and uncertainties when introducing and using NNT / Trade-offs and challenges for management of NNT, 3. The most pressing research questions on NNT. Students have formed groups at the end of the training school and are writing on chapters for this publication within these groups.

[http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403\\_20161005\\_Training\\_School\\_PERIC.pdf](http://nnext.boku.ac.at/images/FP1403/00-all/00-4-meetings/2016/FP1403_20161005_Training_School_PERIC.pdf)

[http://nnext.boku.ac.at/images/FP1403/00-all/00-2-reports/2016/NNEXT\\_1st\\_TRAINING\\_SCHOOL\\_REPORT.pdf](http://nnext.boku.ac.at/images/FP1403/00-all/00-2-reports/2016/NNEXT_1st_TRAINING_SCHOOL_REPORT.pdf)



WG4:

WG4.3 Ecosystem Services:

- We have organized a group of 32 scientists, from 14 countries worldwide (7 of them from Europe) who are contributing to collect data from their own countries to do a worldwide review on the effects of non-native trees on ecosystem services.
- A smaller group in the Iberian Peninsula (5 scientists from Spain and 4 from Portugal) are working on the impacts of non-native trees on cultural ecosystem services (CES) in the Iberian peninsula.
- A small network was also established between two Spanish and three Portuguese researchers to evaluate the potential distribution area of *Eucalyptus globulus*, the most important NNT on the Iberian Peninsula, under current and future climatic conditions, and to identify the environmental drivers of seedling establishment success. This project has been successfully developed as a Master Thesis by Laura Ortiz supervised by WG4 members Joaquim Sande Silva, Pilar Castro and Joana Vicente. The Master Thesis was defended on the 10<sup>th</sup> of November 2016 in the University of Alcalá obtaining a mark of 9.3 over 10. The next step is to reorganize this manuscript to be submitted to an international scientific journal. In addition, the Cost Action has contributed to this project giving financial support to Joaquim Sande Silva and Laura Ortiz to visit Spain and Portugal respectively, in STSMs.

#### Extent of the networking

Describe the extent of the networking among the participants in the Action. Were all participants integrated into the networking equally? Were those targeted by COST policies on Inclusiveness Target Countries (ITCs), Early Career Investigators (ECIs)/ Young Researchers, and gender balance fully integrated into the Action networking?

The COST Action NNXT includes 34 countries, almost half of them (18) being ITC countries, and 2 NNC (near neighbour countries). Current COST Member Countries targeted by the COST inclusiveness in our action are: Bulgaria, Cyprus, Czech Republic, Estonia, Croatia, Hungary, Lithuania, Latvia, Malta, Poland, Romania, Slovenia, Slovakia, the former Yugoslav Republic of Macedonia, Montenegro, Republic of Serbia, Turkey, Bosnia and Herzegovina and Portugal. ITC countries are strongly represented within STSMs (RO, BA, PL, BG and LT) and the Training School (HR, PT, PL, BA, LT, SI and RS). Further, three large joint WG/MC meetings and training school took place in ITC countries (BG, PL, PT, and HR). Members from ITC countries are also representative in the position of working group leader (WG4: PL) and working group co-leader (WG3: RO, WG4: RO). The two NNC are involved into NNEXT activities as equally as possible, e.g. the two countries have also submitted their country reports, the representatives are involved in WG activities and all questionnaires,... are sent to them as well and we try to save money to be able to invite them to our joint WG meetings.

Meeting locations are selected in a way that there is change in the biogeographic region, and that there is an alternation between Central Europe, the East, the West, the North and South. By organising our meetings in different cities and countries we allow different resident researchers, local experts and students who are not part of our COST Action to participate in the meetings.

The MC-Chair of the Action and the STSM-Coordinator are Early Career Investigators (ECI). Further ECI were explicitly motivated to submit applications for STSM and being an ECI was a prerequisite to apply for the training school.

In total 170 participants were involved in our COST Action. Further 28% (47 participants) are female and 72% (123 participants) are male. Also, 30% (19) of all MC members are female, 70% (44) of all MC members are male. The implementation of the gender policy was taken care of in all activities of the Action. The active involvement of the females in the leading role was strongly supported. Both, the current and the previous Action MC-Chair are female researchers. The four working group leader positions are equally held by male and female MC-members. Furthermore, the gender balance was taken care off for the selection of the participants for training schools and STSMs (8 male/ 8 female). Gender equality was also considered for the invitation of speakers during WG meetings.

Training school: All training school trainees were Early Career Investigators (ECIs). Among the 14 trainees there were 7 female trainees. Out of the 12 different countries where the trainees came from 7 countries are Inclusiveness Target Countries (ITC). The 6 trainers came from 3 ITC and Switzerland. Two of the trainers are female.

All member countries have been invited from the beginning to actively contribute to the COST Action. During the first joint WG/MC meeting in Vienna every participating country presented to the full plenum the current situation of NNT in the country. <http://nnext.boku.ac.at/internal/nnext-all-presentations>

Further down the line the cooperation and joint discussions among the WGs becomes more important and is supported by organising joint WG sessions at the WG meetings (at the last meeting in Lisbon, and even more so at the coming meetings).

NNEXT country reports have been compiled and published already in an updated and extended 2<sup>nd</sup> edition. In the 2<sup>nd</sup> edition 35 countries are included with their country reports. The single country reports are authored by one to six researchers, most of them active NNEXT members, others were local experts who supported their country's MC-members and MC-substitutes with answering the 12 topically diverse questions for the country reports.

MC-Members and MC-Substitutes and local experts/researchers cooperate in responding to country specific questionnaires, such as the questionnaires on regulations of NNT or FRM for NNT.

For other species specific reports or questionnaires are typically written/answered by several NNEXT members from different countries where a certain NNT is of high importance. Local experts are often addressed by NNEXT members to provide them with additional information to be included into the reports or questionnaires.

For the WSCTU book about Douglas fir 10 NNEXT members are authoring book chapters and all NNEXT members have been invited to participate in writing or reviewing the book.

**I.D. Impacts**

The impacts that have resulted, or might result from the Action are described in the following table.

Description of the impact - Enter one impact per line, and specify the type and timing of the impact.	Type of impact <sup>5</sup>	Timing of impact <sup>6</sup>
The country reports on the current situation of NNT within 35 countries represent a novel compilation of country specific knowledge formerly often only available in local languages	Scientific	Achieved
Knowledge on FRM pathways is important for producers and users of FRM and for the establishment of new forest cultures and stands	Economic/Scientific	Foreseen within 2 years
Database on seed stands and seed orchards in European countries for important non-native species established.	Economic	Foreseen within 2 years
Recommendation of provenances for planting in European regions	Economic/Scientific	Foreseen within 10+ years.
Recommendations for genetic markers to trace back the origin of FRM	Economic/Scientific	Foreseen within 2 years
A long term monitoring trials database for NNT can be used to collect and search for trials within whole Europe and to perform analysis on a European scale	Scientific	Foreseen within 2 years
Recommendations for adaptive forest management of NNT to reduce risk	Economic/Scientific	Foreseen within 2 years
Report on risks for NNT and their assessment	Economic/Scientific	Foreseen within 2 years
Interdisciplinary expert views are provided in the WSCTU book about Douglas fir – one of the economically most important NNT in Europe	Economic/Societal	Foreseen within 2 years

**I.E Dissemination and exploitation of Action results**

Describe the Action's dissemination and exploitation approach as well as all activities undertaken to

<sup>5</sup> Scientific/ technological, Economic, Societal  
<sup>6</sup> Achieved/ Foreseen within 2 years/ Foreseen 2-5 years/ Foreseen 5-10 years/ Foreseen 10+ years

ensure dissemination and exploitation of Action results and the effectiveness of these activities.

The target audiences for dissemination of results from the NNEXT Action include a wide range of stakeholders and interested parties. They include:

1. European and national policy makers and regulators.
2. Private forest nurseries, land owners, forest managers and forestry administrations.
3. Researchers (ecologists, silviculturists, tree breeders and geneticists).
4. Experts examining climate change influences.
5. Conservationists

The findings from NNEXT are disseminated through a series of methods in order to target the full range of interested parties.

- The NNEXT website is a primary means of communication with both open access and password protected areas for working documents. The website includes background information on the Action and its members, MoU, COST Vademecum, Action Fact Sheet, documentation/reports of Working Group findings, Country Reports, Country Presentations, WG and invited speaker presentations, minutes from MC and WG meetings, manuscripts, questionnaires, WG activities guides, email-lists, authorship-guidelines, up-to-date reference lists of journal articles and grey literature etc., and upcoming events advertised. Public <http://nnext.boku.ac.at> and internal <http://nnext.boku.ac.at/internal>
- Members of the Action are expected to promote NNEXT at national and international workshops and conferences.
- Results from collaborations within NNEXT are published in peer reviewed journals but also in journals recognised by forest managers and other stakeholders.
- A NNEXT Best Practice Handbook - for the management of NNT in Europe will be produced.
- NNEXT advisory papers – for potential use of NNT under climate change options will be published.
- A final NNEXT Conference will be held. The proceedings book will be published.

Item/ activity	Target audience	Result	Hyperlink
WG2: Presentation of results from the questionnaire on FRM at the annual meeting of the nurseries association from South Germany (EZG)	Forest nursery owners from Southern Germany	High interest	
WG2: Presentation of results from the questionnaire on FRM at the International conference of the Hungarian nursery association – Sopron 09.September 2016	Forest nursery owners from eastern Europe, Land owners, forest managers and policy makers	High interest	
WG2: Presentation of monographs on genetics and breeding to the Members of the German Federal Working Group on Conservation of Forest genetic Resources during their meeting in Munich in March 2016	Researchers and representatives of forestry administrations	High interest; proposal to publish the monographs in different European languages as information for practical foresters, producers of FRM and land owners	
WG4.3: Pilar Castro-Díez contributed to a short course entitled 'Challenges of the management of biological invasions to preserve Biodiversity'. The course, organized by the International University Menéndez Pelayo, was held in Seville (Spain) in 17-18th November 2016.	The course joint different stakeholders committed with the study and management of biological invasions. The course addressed graduates, undergraduates, environmental managers, ecologists, environment journalists, etc.	High interest	<a href="http://www.uimp.es/agenda-link.html?id_actividad=63BX&amp;anyaca=2016-17">http://www.uimp.es/agenda-link.html?id_actividad=63BX&amp;anyaca=2016-17</a>
Douglas fir WSCTU book	Policy makers, public	Book	
Talk and discussion group at	Researchers from	High interest,	<a href="https://www.ffg.at/">https://www.ffg.at/</a>

the COST information day of the Austrian Research Promotion Agency (FFG) involving the NNEXT MC-Chair and the former MC-Chair	academic and non-academic research institutions interested in COST	networking	<a href="http://europa/veranstaltungen/cost_08092016">europa/veranstaltungen/cost_08092016</a>
FFG Success story about NNEXT	Researchers, forestry administrations, companies, the public	2 page flyer in German about NNEXT	<a href="http://nnext.boku.ac.at/images/FP1403/00-all/00-2-reports/2016/FFG_SuccessStory_COST_NNEXT.pdf">http://nnext.boku.ac.at/images/FP1403/00-all/00-2-reports/2016/FFG_SuccessStory_COST_NNEXT.pdf</a>

### I.F. Action success(es)

COST regularly communicates the successes of Actions. At this point in time what aspect(s) (outcomes and/ or impacts, rather than activities) of this Action is/ are the most suitable for communication?

Description of the success story	Dimension of the success <ul style="list-style-type: none"> <li>■ Breakthrough: scientific, technological or socioeconomic</li> <li>■ Policy implementation (specify which policy)</li> <li>■ Capacity building</li> </ul>
A 420 page collection of 35 country reports about the current situation of NNT has been published	Breakthrough: Scientific, socioeconomic
For the first time there is an comprehensive overview on FRM movements of non-native tree species	Policy implementation/ regulations on production and moving in trade of FRM
A book about pros and cons of growing Douglas fir targeting policy makers and the public is being finalised	Breakthrough: Socioeconomic

## II. Management Report

### II.A. Overview of expenditure

Insert below in the yellow cells the summary of figures from the Yearly Financial Reports (YFRs) of completed Grant Periods and an IFR of any incomplete Grant Period – the Totals will automatically sum.

	Grant Period 1	Grant Period 2	Grant Period 3 (	TOTAL
GP start and end dates	(01/01/2015-30/09/2015)	(01/10/2015-30/04/2016)	(01/05/2016-30/04/2017)	
Grant Holder institution	University of Natural Resources and Life Sciences, Vienna (AT)	University of Natural Resources and Life Sciences, Vienna (AT)	University of Natural Resources and Life Sciences, Vienna (AT)	
Meetings	EUR 57.528,96	EUR 103.935,60	EUR 42.486,66	EUR 203.951,22
Training Schools	EUR -	EUR -	EUR 12.790,12	EUR 12.790,12
STSMs	EUR 5.000,00	EUR 11.000,00	EUR 10.400,00	EUR 26.400,00
Dissemination	EUR 2.999,00	EUR 300,00	EUR -	EUR 3.299,00
OERSA <sup>1</sup>	EUR 178,64	EUR -	EUR 298,56	EUR 477,20
Total Scientific Expenditure	EUR 65.706,60	EUR 115.235,60	EUR 65.975,34	EUR 246.917,54
FSAC <sup>2</sup>	EUR 9.856,14	EUR 17.285,34	EUR 18.391,23	EUR 45.532,71
TOTAL	EUR 75.562,74	EUR 132.520,94	EUR 84.366,57	EUR 292.450,25

<sup>1</sup> OERSA = Other Expenses Related to Scientific Expenditure (e.g. bank charges)

<sup>2</sup> FSAC = Amount received by Grant Holder for Financial Scientific and Administrative Coordination



## II.B. Budget and Participation management

II.B.1 Budget spent in relation to individuals/ institutions outside participating COST countries					
<i>STSMs from or to institutions from countries other than Participating COST countries</i>					
The table below describes the added value STSMs to approved institutions in IPC or NNC or Specific Organisations and any STSMs from an approved institution in an NNC to a participating COST country.					
Grantee		Host		Date	Topic and value added to the Action
Institution	Country	Institution	Country		
Ukrainian Research Institute of Forestry and Forest Melioration (URIFFM), Ukraine	Vinnitsya, Ukraine	Forest Research Institute, Sary, Poland	Poland	2016-07-15 to 2016-09-13	GLOBAL CLIMATE CHANGE IMPACT ON ADAPTABILITY AND GROWTH OF PONDEROSA PINE (PINUS PONDEROSA) IN UKRAINE. One of the main objectives was to strengthen existing networks and fostering collaborations between Ukraine, Poland and COST participating countries. Application of dendrochronology analysis on PT makes it possible to investigate the impact of global climate change on wide areas in Europe and in the world. These studies can be an important initial step for development of international projects and participation by COST and non-COST countries.
Ukrainian Forestry University, Ukraine	National University, Lviv, Ukraine	University of Forestry, Sofia, Bulgaria	Bulgaria	2015-11-09 to 2015-11-28	ASSESSMENT OF 'INTRODUCTION' AND 'DISTRIBUTION' PATHWAYS OF 'NON-NATIVE TREE SPECIES' IN UKRAINIAN AND BULGARIAN FOREST ECOSYSTEMS. The purpose of the STSM was to generate relevant information of the assessment of introduction and distribution pathways of 'non-native tree species' in Ukrainian and Bulgarian forest ecosystems with respect to ecological risks and opportunities. Ukraine is situated at the Eastern border of European Union and needs to find a relevant place in the multifunctional sustainable forest management paradigm and to harmonize existing information on non-native tree species distribution with NNT distribution in Europe.
<i>Invited Speakers</i>					
The table below highlights the added value of Invited Speakers from COST countries that have not accepted the MoU and/ or non-participating NNC, IPC or Specific Organisations whose participation at a meeting or Training School was reimbursed by the Action.					
Participant name	Institution	Country	Event date	Topic and added value to the Action	
Not applicable					
<i>Dissemination meetings</i>					
The table below highlights the added value of Dissemination Meetings financed from Action funds.					
Participant name	Role	Country	Date	Location	Topic and added value to the Action
Not applicable					

## II.C. Participants

Management Committee		
Name	Country	Email address
Paraskevi Alizoti	GR	alizotp@for.auth.gr
Vlatko Andonovski	MK	makmontana1@t-home.mk
Siniša Andrašev	RS	andrasev@uns.ac.rs
Kjell Andreassen	NO	Kjell.Andreassen@Skogoglandskap.no

Filippos A. Aravanopoulos	GR	aravanop@for.auth.gr
Jean-Charles Bastien	FR	Jean-Charles.Bastien@orleans.inra.fr
Robert Brus	SI	robert.brus@bf.uni-lj.si
Pilar Castro Diez	ES	mpilar.castro@uah.es
Hugues Claessens	BE	hugues.claessens@ulg.ac.be
Milic Curovic	ME	curovic@t-com.me
Alexandru Lucian Curtu	RO	lucian.curtu@unitbv.ro
Branislav Cvjetkovic	BA	cvjetkovicb@gmail.com
Dorota Dobrowolska	PL	d.dobrowolska@ibles.waw.pl
Liam Donnelly	IE	liam.donnelly@ucdconnect.ie
Josef Frydl	CZ	JosefFrydl@seznam.cz
Anna Gazda	PL	rlgazda@cyf-kr.edu.pl
Arthur Gessler	CH	arthur.gessler@wsl.ch
Oscar Godoy	ES	ogodoy@irnas.csic.es
Hubert Hasenauer	AT	hubert.hasenauer@boku.ac.at
Jean-Marc Henin	BE	jeanmarc.henin@spw.wallonie.be
Cornelia Hernea	RO	corneliahernea@yahoo.com
Aris Jansons	LV	aris.jansons@silava.lv
Bo Karlsson	SE	bo.karlsson@skogforsk.se
Ljiljana Keca	RS	ljiljana.keca@sfb.bg.ac.rs
Tom Kent	IE	tkent@wit.ie
Zsolt Keseru	HU	keseruzs@erti.hu
Monika Konnert	DE	Monika.Konnert@asp.bayern.de
Andrej Kormutak	SK	nrgkorm@savba.sk
Koen Kramer	NL	koen.kramer@wur.nl
Nicola La Porta	IT	nicola.laporta@fmach.it
Dagnija Lazdiņa	LV	dagnija.lazdina@silava.lv
Barbora Lipovská	SK	barbora.lipovska@uniag.sk
Aljona Lukjanova	EE	a.lukjanova@gmail.com
Tiit Maaten	EE	tiit.maaten@emu.ee
Palle Madsen	DK	pam@ign.ku.dk
Dejan Mandjukovski	MK	dejan.mandzukovski@yahoo.com
Vitas Marozas	LT	vitas.marozas@asu.lt
Bill Mason	UK	bill.mason@forestry.gsi.gov.uk
Frits Mohren	NL	frits.mohren@wur.nl
Maria Cristina Monteverdi	IT	mcristina.monteverdi@crea.gov.it
Per Holm Nygaard	NO	PHN@skogoglandskap.no
Christophe Orazio	FR	christophe.orazio@efi.int
Sanja Peric	HR	sanjap@sumins.hr
Krasimira Petkova	BG	kpet@abv.bg
Gloria Pinto	PT	gpinto@ua.pt
Igor Poljak	HR	ipoljak@sumfak.hr
Emil Popov	BG	emilpopov99@hotmail.com



Károly Rédei	HU	redei.karoly@gmail.com
Orna Reisman-Berman	IL	oreisman@bgu.ac.il
Andreas Rigling	CH	andreas.rigling@wsl.ch
Matti Rousi	FI	matti.rousii@metla.fi
Silvio Schüler	AT	silvio.schueler@bfw.gv.at
Gokhan Sen	TR	gsen77@hotmail.com
Ahmet Sivacioğlu	TR	ahmets1973@hotmail.com
Michalis Socratous	CY	msocrat1@cytanet.com.cy
Heinrich Spiecker	DE	instww@uni-freiburg.de
Ilan Stavi	IL	istavi@yahoo.com
Aleksandar Stijovic	ME	stijovicaleksandar@gmail.com
Margarida Tomé	PT	magatome@isa.ulisboa.pt
Josef Urban	CZ	josef.urban@email.cz
Cemal Visnjic	BA	vicemal@yahoo.com
Kristina Wallertz	SE	kristina.wallertz@slu.se
Marjana Westergren	SI	marjana.westergren@gozdis.si

## Annex 1

### Definitions:

<b>COST Action Challenge (main aim)</b>	"The research question addressed by the COST Action targeting scientific, technological, and / or socioeconomic problems"
<b>COST Action Innovation</b>	"The creation and / or development of new or improved concepts, products, processes, services, and / or technologies that are made available to markets, governments and society"
<b>COST Action objectives</b>	"COST Action objectives are the results that an Action needs to achieve in order to respond to meet its challenge. These are SMART (Specific, Measurable, Achievable, Relevant, Timely) and twofold: research coordination objectives and capacity building objectives."
<b>COST Action research coordination objectives</b>	"Achieving these objectives turns COST Actions from initially scattered teams into one transnational team and leverages the existing funded research. These objectives entail the distribution of tasks, sharing of knowledge and know-how, and the creation of synergies among Action participants to achieve specific outputs."
<b>COST Action capacity building objectives</b>	"Achieving these objectives entail building critical mass to drive scientific progress, thereby strengthening the European Research Area. They can be achieved by the delivery of specific outputs and / or through network features or types and levels of participation."
<b>COST Action networking activities</b>	"any activities organised by the COST Action (whether or not directly funded by COST) in order to achieve research coordination and capacity building objectives."
<b>COST Action networking tools</b>	"instruments through which eligible activities can be funded"
<b>COST Action outputs</b>	"direct results from the COST Action activities. These can be codified knowledge, tacit knowledge, technology, and societal applications."
<b>COST Action impact</b>	"the short- to long-term scientific, technological, and / or socioeconomic changes produced by a COST Action, directly or indirectly, intended or unintended."
<b>COST Action deliverable</b>	"a distinct, expected and tangible output of the Action, meaningful in terms of the Action's overall objectives such as a report, a document, a technical diagram, a software etc. Action deliverables are used to measure its progress and success."
<b>COST Action milestones</b>	"Control points in the Action that help to chart progress. They are also needed at intermediary points so that, if problems have arisen, corrective measures can be taken. A milestone may be a critical decision point in the Action where, for example, the MC must decide which of several technologies to adopt for further development (e.g. core group and MC meetings, mid-term reviews)"
<b>Inclusiveness Target Country (ITC):</b>	Current COST Member Countries targeted by the COST inclusiveness Policy ("Inclusiveness Target Countries" (ITC)): EU 13 (Bulgaria, Cyprus, Czech Republic, Estonia, Croatia, Hungary, Lithuania, Latvia, Malta, Poland, Romania, Slovenia, Slovakia), EU candidate countries (the former Yugoslav Republic of Macedonia, Montenegro, Republic of Serbia, Turkey) and potential EU candidate countries (Bosnia and Herzegovina). In addition, to comply with the EC criteria for 'Spreading Excellence and Widening Participation', Portugal and Luxemburg are included.