



Report of a Pest Risk Analysis for

*Dendroctonus valens* (Coleoptera: Scolytinae)



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This summary is based on a pest risk assessment (PRA) prepared by DEFRA and published in 2021. The PRA covers a smaller area than the EPPO region (UK, including Northern Ireland); however, in the PRA, data was often provided as well for the whole European Union. Additional literature searches have been conducted to make it more representative to the whole EPPO region; and the text was enriched during subsequent discussions in the EPPO Panel on Phytosanitary Measures. Probability of entry, establishment, spread, and potential impact, with associated uncertainties, have been extracted from the PRA and, when necessary, adapted by the Panel for the EPPO region. The measures recommended were initially adapted from EPPO Study on the risk of bark and ambrosia beetles associated with imported non-coniferous wood (EPPO, 2020) as well as from measures recommended by EPPO on other bark beetles, in EPPO PRAs as well as in Standard PM 8/2 *Commodity-specific phytosanitary measures for Coniferae* (EPPO, 2018).

- Pest:** *Dendroctonus valens*  
**PRA area:** EPPO region  
**Assessors:** A. Korycinska (DEFRA) and subsequent discussions in the EPPO Panel on Phytosanitary Measures.  
**Date:** The DEFRA PRA was published in 2021-09. The Panel on Phytosanitary Measures discussed the document in 2022-03. EPPO Working Party on Phytosanitary Regulations and Council agreed that *Dendroctonus valens* should be added to the EPPO A2 List of pests recommended for regulation as quarantine pests in 2022.

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Based on this PRA report, *Dendroctonus valens* was added to the EPPO A1 List. Measures for round wood and sawn wood of *Pinus*; bark of *Pinus*; wood chips, processing wood residues, hogwood (except sawdust and shavings); wood packaging material; and *Pinus* plants for planting (except seeds, tissue culture and pollen) are recommended.

STAGE 1: INITIATION	
<b>Reason for doing PRA:</b>	<i>Dendroctonus valens</i> was added to the EPPO Alert List in 2019 and identified in 2021 by the Panel on Phytosanitary Measures and the Working Party as the highest priority for an EPPO PRA in 2022. However, in 2021-10, the Panel considered that the detailed national PRA prepared by DEFRA on this pest was sufficient to extrapolate to the EPPO region and make an EPPO recommendation.
<b>Taxonomic position of pest:</b>	Insect, Coleoptera, Curculionidae, Scolytinae Synonym: <i>Dendroctonus beckeri</i> (recent molecular studies suggest that this may be a distinct species – needs further confirmation) Remark: the PRA does not include records attributed to the endemic Mexican <i>D. rhizophagus</i> , as the latter is considered to be a distinct species.

## STAGE 2: PEST RISK ASSESSMENT

### PROBABILITY OF INTRODUCTION

#### Entry

#### Geographical distribution:

(Source: EPPO Global Database last consulted 2022-01-21, details on distribution are available in Global Database).

#### **AMERICA:**

Belize, Canada, Guatemala, Honduras, Mexico, Nicaragua, USA

#### **ASIA**

China

#### Major host plants:

(see DEFRA PRA and EPPO Global Database for references)

*Pinus* spp., with 42 species listed to date. Several sources state that *D. valens* is likely to feed on any species of *Pinus*.

Occasional records on other conifer genera (*Abies*, *Larix*, *Picea*, *Pseudotsuga*) do exist, but association with these hosts is considered unlikely (rare, and no information could be found on whether non-*Pinus* hosts allow complete development from egg to adult).

#### Which pathway(s) is the pest likely to be introduced on:

The main pathways for entry into the EPPO region are those of various types of wood and wood products, mostly when associated with older and larger trees:

#### **Wood**

Several EPPO countries (e.g. EU countries, the UK) have requirements which already apply to coniferous wood from Canada, China, Mexico and the USA where *Bursaphelenchus xylophilus* (pinewood nematode) is known to occur, including heat treatment, fumigation, or chemical impregnation. Also, in these EPPO countries, coniferous wood from other countries in the range of *D. valens* (e.g. Belize, Guatemala, Honduras and Nicaragua) should originate in an area free from 'non-European Scolytidae spp.', be bark-free and free from grub-holes more than 3 mm across, kiln-dried, fumigated, chemically impregnated or heat treated. All of these measures are not considered fully effective (e.g. kiln-drying without specifying time/temperature conditions).

- **Round wood and sawn wood with bark:** All life stages of *D. valens* are associated with the inner bark (phloem layer); and could be associated with this pathway. Significant quantities of *Pinus* wood which may contain bark are imported from countries where *D. valens*

is present (200 to more than 1000 tonnes were yearly imported from these countries into the EU and the UK, over the period 2017-2019). Turkey was reported in 2012 as the main importer of round wood of conifers from the USA: 98 000 m<sup>3</sup> over 210 000 m<sup>3</sup> imported to EPPO countries (EPPO, 2015; from FAOstat). Additional trade data are provided in Appendix 1. The likelihood of entry on round wood and sawn wood with bark in the UK PRA was assessed as **moderate** with a **moderate uncertainty**. The Panel on Phytosanitary Measures concluded that this rating was **valid for the EPPO region when similar measures than EU/UK are in place**: For countries in EPPO that do not have similar measures in place the likelihood of entry on round wood and sawn wood with bark will be high with low uncertainty.

- **Round wood and sawn wood without bark**: The likelihood of association of the pest with wood without bark was considered to be low (all life stages of *D. valens* are associated with bark, but not with deeper layers of wood). The risk related to this pathway is dependent on the thorough removal of all bark. The likelihood of entry on round wood and sawn wood without bark was assessed as **very low** with a **low uncertainty**.
- **Wood chips, processing wood residues, hogwood (except sawdust and shavings)**: Even though their size could allow *D. valens* to develop; the chips would also dry out faster than larger pieces of wood due to the higher surface area; and the pest may be killed by the heat generated during decomposition. The probability of transfer highly depends on the intended use (e.g. use as biomass fuel or for further processing vs. use as a soil layer). The likelihood of entry with wood chips, processing wood residues and hogwood was rated as **moderate** with **high uncertainty** (lack of data on the pathway, trade volumes, etc.).

### **Bark**

All life stages may be associated with bark, but when drying, isolated bark becomes unsuitable for young larvae feeding. Several countries already require measures to manage this risk (fumigation or heat treatment); however, as shown by an interception in a wooden structure imported for use in pet rodent cages in the UK, these measures are difficult to apply in view of the wide variety of products that may contain bark. Overall, the likelihood of entry on isolated bark in the UK PRA was considered **moderate** but with a **high uncertainty** as there are a lack of trade data and knowledge about how much bark contains the inner phloem layer where *D. valens* is found.

### **Wood packaging material (WPM)**

All wood packaging material should meet ISPM 15 requirements. Interceptions of Scolytinae on WPM from China used to transport heavy stone products have been reported in EPPO countries (e.g. in the EU). However, in most cases it was suspected that measures prescribed in ISPM 15 were not implemented.

The likelihood of entry on WPM was assessed in the UK PRA as moderate with a moderate uncertainty (because of significant issues of non-compliance). The Panel considered that the likelihood would be **very low** when ISPM 15 requirements are fulfilled, with a **moderate uncertainty** (risk of reinfestation).

### **Other pathways:**

**Plants for planting and cut branches**

*D. valens* is mostly associated with the bole and the roots of *Pinus* trees. When populations are high, trees as small as ‘a few inches’<sup>1</sup> in diameter may be attacked, though usually only larger and older trees are attacked. The latter are less likely to be moved in trade than younger trees. Several EPPO countries (e.g. EU countries, the UK) already prohibit the import of host plants for planting (except fruits and seeds) from all countries where *D. valens* is present. Furthermore, in the EurAsian Economic Union (EAEU), *Pinus* and other Coniferae plants for planting can only be imported when originating from an area free from *D. valens* (EEC, 2016). The likelihood of entry with these pathways was considered in the UK PRA very low with a low uncertainty. This rating is valid for cut branches for the whole EPPO region. However, for plants for planting, the Panel considered that some EPPO countries do not prohibit/regulate the import of *Pinus* plants for planting, and that large plants may occasionally be imported. For these reasons, the likelihood of entry with plants for planting was increased to **low** with a **moderate** uncertainty.

Remark: The Panel noted that entry of the pest by **natural spread** i.e. from Inner Mongolia (China) to Eastern Russia, cannot be excluded. However, this pathway could not be rated as data on natural spread is limited and it is not known how far the pest currently is from the Russian border (as well as the distribution of potential hosts).

**Overall, *D. valens* is able to enter EPPO countries, even though the risk is already reduced by the measures implemented in many EPPO countries.**

### ***Establishment***

#### Plants at risk in the PRA area:

*Pinus* are widely distributed and common throughout the EPPO region, in particular some species which are confirmed hosts of *D. valens*. *P. sylvestris* is a native species in the EPPO region, and is extremely common, present throughout Eurasia, for a distance of 10 000 km (Appendix 2). Several other host species are commonly planted in the EPPO region, such as *P. contorta* (e.g. very common over most of the UK), *P. radiata*, *P. ponderosa* and *P. strobus*. Known *Pinus* host species are less common in the southern part of the EPPO region, but they may be used as ornamentals; and other *Pinus* sp. also occur.

#### Climatic similarity of present distribution with PRA area (or parts thereof):

*D. valens* is found in a wide climatic range (including dry areas, such as Arizona (USA)) and it is likely that much of EPPO would prove to be climatically suitable for the establishment of this pest.

#### Characteristics (other than climatic) of the PRA area that would favour establishment:

The presence of other existing Scolytinae species on *Pinus* in the EPPO region increases the risk that such infestations remain first undetected.

#### Which part of the PRA area is the area of potential establishment:

*D. valens* has adapted to a wide range of climates in its native range. Therefore, it is considered that it can establish in the whole EPPO region where hosts are present.

Nevertheless, there are some areas in the EPPO region where known host species are not common and where other *Pinus* species are present (e.g. in the Mediterranean area). In these areas, there is more uncertainty on whether *D. valens* could establish.

### ***Spread***

#### **Two mechanisms could contribute to the spread of *D. valens***

- **Natural spread.** Definitive data on spread capacity are lacking, but some specimens of *D. valens* appear to be capable of flying at least 10-20 km per year.

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<sup>1</sup> 1 inch = 2.54 cm

- **Human assisted spread.** Wood and wood products (see Pathways) as well as plants for planting (large plants) would contribute to local and long-distance spread in the EPPO region. There is evidence that this species has successfully moved in international trade from North America to China. The Panel noted that WPM would play a greater role for dissemination within a country, or within a group of countries with a common market (e.g. within the EU), as the material does not follow the same requirements than for import.

## POTENTIAL ECONOMIC CONSEQUENCES

**How much economic impact does the pest have in its present distribution:** Impacts have been separated into two geographical categories: those seen in the native range in the Americas and impacts in the invasive range in China.

**In North America,** *D. valens* mainly attacks trees which are already significantly stressed and/or dying, though an increase in local populations can lead to more attacks on trees which appear to be healthy. In general, *D. valens* is mostly considered a secondary pest. The magnitude of impact in North America was considered **very low** with **low uncertainty**.

**In the invasive range in China,** 500 000 ha were infested and 4 to 10 million of apparently healthy trees of *P. tabuliformis* killed in 1999-2004 (mostly those over 30 years old. This was following severe droughts in the previous years). The magnitude of impact in China is considered to be **high** with **moderate uncertainty**, as the factors behind the difference of impacts in North America and China are not fully understood.

**Describe damage to potential hosts in PRA area:**

*D. valens* is known to attack species such as *P. sylvestris*, *P. contorta*, *P. radiata* and *P. strobus*, which are commonly grown and of economic and environmental importance in the EPPO region (Euforgen, 2021). The Panel noted that the EPPO region includes countries where pure *P. sylvestris* amenity stands can be found, which could favor a higher impact. However, high impacts have not been reported yet on these species; and it is not known at present whether some other natural or widely grown pine species in the EPPO region would be highly susceptible (e.g. *P. nigra*, one of the most economically important native conifers in southern Europe). *D. valens* could also have an environmental and social impact on ancestral over-mature *Pinus* trees or in urban areas (e.g. *P. pinea* in Mediterranean cities). The species *P. tabuliformis* which was reported to be highly susceptible in China is not known to be grown in the EPPO region (only reported by Farjon & Filer (2013) in China and North Korea), except very locally as an ornamental or as a bonsai (Arboreus, 2021).

Remark: the fungus, *Leptographium procerum*, involved in the higher impacts in China is already present in the EPPO region. Strains from Europe are similar to those found in North America (Chinese isolates appear to be more pathogenic to *P. tabuliformis* than North American isolates).

**How much economic impact would the pest have in the PRA area:** It is uncertain whether *D. valens* would behave as a secondary pest in the EPPO region (as is the case in North America) or would cause similar economic impacts to those observed in China. Trees under greater stress will be more susceptible to attack by the beetle. It is likely that an increasing number of trees will be more stressed in the future as the climate changes.

## CONCLUSIONS OF PEST RISK ASSESSMENT

**Summarize the major factors that influence the acceptability of the risk from this pest:**

**Estimate the probability of entry:** **Moderate** with **moderate uncertainty** for countries where import of wood and wood products of *Pinus* are requested to fulfil similar requirements as in the EU or the UK. **High** with **low uncertainty** when no treatments are

required at import on wood and wood products of *Pinus*.

**Estimate the probability of establishment:**

Given the wide availability of *Pinus* (in particular *P. sylvestris*) and the suitability of the PRA area, the probability of establishment outdoors was considered **very high** with **low uncertainty**.

**Estimate the probability of spread:**

The magnitude of spread is expected to be **very high** with a **low uncertainty**, due to the important role that human assisted spread would play.

**Estimate the potential economic impact:**

The potential economic impact in EPPO is expected to be **moderate** with **high uncertainty**

**Degree of uncertainty**

The main knowledge gaps or uncertainties identified by DEFRA concern:

- An understanding of the factors responsible for the high impacts on living trees in China, and why these are much greater than the impacts in North America
- Whether populations from Central America are a distinct species so far synonymised with *D. valens*
- More data about the trade in woodchips, the composition, and their storage
- The status of conifers other than *Pinus* spp. as hosts. For example, whether they permit complete development from egg to adult, or how often they are attacked when *Pinus* are available

In addition, whether other *Pinus* spp. can be hosts is important to the risk for areas of the EPPO region where the current known hosts are not widespread.

**OVERALL CONCLUSIONS**

*D. valens* meets all the criteria to qualify as a quarantine pest. In particular, this pest is absent from the EPPO region and could cause significant damage to *Pinus* if it was to be introduced in the region.

*D. valens* poses a risk to the EPPO region and risk management options should be considered.

### STAGE 3: PEST RISK MANAGEMENT

#### IDENTIFICATION OF THE PATHWAYS

Evaluation of the need for management measures for the different hosts: because of the wide host range within *Pinus*, measures are recommended for the whole genus.

- ***Pinus***

It is considered that the import requirements for *Pinus* wood and wood products by several EPPO countries would already cover this risk, because of other pests recommended by EPPO for listing as quarantine pests.

The pathways with a very low likelihood of entry (i.e. round wood and sawn wood without bark, and cut branches) are not further considered.

**Pathways studied in the pest risk management**

- Round wood and sawn wood with bark of *Pinus*
- Bark of *Pinus*
- Wood chips, processing wood residues, hogwood (except sawdust and shavings)
- Wood packaging material (WPM)
- Pinus* plants for planting (except seeds, tissue culture and pollen)

#### IDENTIFICATION OF POSSIBLE MEASURES

**Possible measures for wood and wood products**

***Measures related to the crop or to places of production:***

Pest free area

***Measures related to consignments:***

Heat treatment, ionizing, fumigation. Such measures are included in ISPM 39.

In addition to the pest free area or treatment, storage and transport conditions should be established in a way preventing infestation. Where kiln-drying has been performed, these additional conditions are not required.

Bark freedom

**Possible measures for plants for planting**

***Measures related to the crop or to places of production:***

Pest free area

Pest free place/site of production established according to EPPO Standard PM 5/8 *Guidelines on the phytosanitary measure 'Plants grown under physical isolation'*

Plant with a diameter smaller than 2 cm are not considered to present a risk of infestation. This does not apply to bonsai which are deliberately stressed as part of their cultivation, to keep the trees small, they could potentially be more susceptible to attack (DEFRA PRA).

#### EVALUATION OF THE MEASURES IDENTIFIED IN RELATION TO THE RISKS PRESENTED BY THE PATHWAYS

**Degree of uncertainty**

Uncertainties in the management part are:

- Host plant status for *Coniferae* genera other than *Pinus*.
- Risk of (re)infestation of wood and wood products stored outside

#### IDENTIFICATION OF POSSIBLE MEASURES

Pathway	Measures
Round wood and sawn wood of <i>Pinus</i>	<p>Bark free</p> <p><b>OR</b></p> <p>Pest free area (see requirements below)</p> <p><b>or</b></p> <p>Heat treatment according to EPPO Standard PM 10/6</p> <p><b>or</b></p>

	<p>Treated with ionizing radiation according to EPPO Standard PM 10/8  <b>or</b>  Appropriate fumigation, details to be specified on the phytosanitary certificate.</p> <p><b>AND</b></p> <p>Stored in conditions to prevent infestation prior to export and transported closed, to prevent infestation; or stored and transported outside the flight period.  <b>or</b>  Kiln-drying to below 20% moisture content to prevent infestation</p>
Bark of <i>Pinus</i>	<p>Pest free area (see requirements below)  <b>or</b>  Heat treatment (until the temperature reaches at least 56 °C for at least 30 min throughout the consignment).  <b>or</b>  Appropriate fumigation, details to be specified on the phytosanitary certificate.</p> <p><b>AND</b></p> <p>Stored in conditions to prevent infestation prior to export and transported closed, to prevent infestation; or stored and transported outside the flight period.  <b>or</b>  Kiln-drying to below 20% moisture content to prevent infestation</p>
Wood chips, processing wood residues, hogwood (except sawdust and shavings)	<p>Pest free area (see requirements below)  <b>or</b>  Heat treatment (until the temperature reaches at least 56 °C for at least 30 min throughout the consignment).</p> <p><b>or</b>  Appropriate fumigation, details to be specified on the phytosanitary certificate.</p> <p><b>AND</b></p> <p>Stored in conditions to prevent infestation prior to export and transported closed, to prevent infestation; or stored and transported outside the flight period.  <b>or</b>  Kiln-drying to below 20% moisture content to prevent infestation</p>
Wood packaging material (WPM)	ISPM 15
<i>Pinus</i> plants for planting (except seeds, tissue culture and pollen)	<p>Pest free area (see requirements below)  <b>or</b>  Plants should be produced in a pest-free place/site<sup>1</sup> of production for <i>Dendroctonus valens</i> established according to EPPO Standard PM 5/8 <i>Guidelines on the phytosanitary measure 'Plants grown under physical isolation'</i></p> <p><b>AND</b></p>



	<p>Stored in conditions to prevent infestation prior to export and transported closed, to prevent infestation; or stored and transported outside the flight period.</p> <p><b>OR</b></p> <p>Plants less than 2 cm stem diameter (except bonsais)</p> <p><b>OR</b></p> <p>Post-entry quarantine (in the framework of a bilateral agreement)</p>
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*1: The choice between PFPP and PFPS is a decision to be taken by the NPPO based on the operational capacities of the producers and biological elements.*

**Requirements for establishing a PFA:** PFA is not considered applicable in countries from Central and North America where the pest is present.

- A minimum distance of at least 40 km between the PFA and the closest known area where the pest is known to be present.
- To establish and maintain the PFA, detailed surveys and monitoring (using trapping and other methods) should be conducted in the area in the two years prior to establishment of the PFA and continued every year (because one generation is reported to take up to 2 years (Jianxing *et al.*, 2008)). Specific surveys should also be carried out in the zone between the PFA and known infestation to demonstrate pest freedom. The surveys should be targeted for the pest and should be based on appropriate combination of trapping and visual examination of host trees.
- Surveys should include high risk locations, such as places where potentially infested material may have been imported/introduced.
- There should be restrictions on the movement of host material (originating from areas where the pest is known to be present) into the PFA, and into the area surrounding the PFA, especially the area between the PFA and the closest area of known infestation.

## References:

Arboreus (2021) Internet site of a nursery. Available at <https://www.arboreus.fr/produit/pinus-tabuliformis/> (Accessed on 27<sup>th</sup> January 2022)

DEFRA (2021) Department for Environment Food & Rural Affairs (DEFRA). Rapid pest risk analysis (PRA) for *Dendroctonus valens*. September 2021. Available at <https://pra.eppo.int/prae06b449-c74b-4aa8-8ba5-c5ea5ef1f94a>

EEC (2016) The Council of the Eurasian Economic Commission (EEC). Decision N° 157 on the approval of the common phytosanitary quarantine requirements to the regulated articles and regulated objects at the customs border and in the customs territory of the Eurasian Economic Union. November 30, 2016.

EPPO (2015) Pest risk analysis for *Heterobasidion irregulare*. Revised in 2021. EPPO, Paris. Available at <https://gd.eppo.int/taxon/HETEIR/documents>

EPPO (2018) EPPO Standard PM 8/2(3). Coniferae. Commodity-specific phytosanitary measures. *EPPO Bulletin* 48, 463-494. Available at <https://gd.eppo.int/standards/PM8/>

EPPO (2020) EPPO Technical Document No. 1081, EPPO Study on the risk of bark and ambrosia beetles associated with imported non-coniferous wood. EPPO Paris. Available at [https://www.eppo.int/RESOURCES/eppo\\_publications](https://www.eppo.int/RESOURCES/eppo_publications)

EPPO (in preparation) Pest risk analysis for *Chionaspis pinifoliae*. EPPO, Paris. Soon available at <https://gd.eppo.int/taxon/PHECPI/documents>

Euforgen (2021) European Forest Genetic Resources Programme (EUFORGEN). Available at <http://www.euforgen.org/> (Accesses on 2 March 2021)

Farjon A & Filer D (2013) An Atlas of the World's Conifers. An analysis of their distribution, biogeography, diversity and conservation status.

Jianxing Z, Zhongqi Y, Xiaohong R & Xiaoming L (2008) Biological Characteristics and Occurring Law of *Dendroctonus valens* in China. *Scientia Silvae Sinicae* 44(2), 99-105. Available at <http://html.rhhz.net/linyekexue/html/080215.htm>

*Appendix 1 – Trade of conifer wood into the EPPO region from USA, Canada, Mexico, Cuba and Dominican Republic (extract from EPPO, 2015)  
The data were collected in the context of the EPPO PRA for Heterobasidion irregulare (EPPO, 2015), but are considered to give a good overview of the trade at risk  
for Dendroctonus valens, from the American continent.*

**Table 1. CONIFER ROUNDWOOD – Imports by EPPO countries. FAOStat Roundwood of conifers Ind Rwd Wir (C) m<sup>3</sup>**

	USA							Canada							Mexico		
	2004	2006	2008	2009	2010	2011	2012	2004	2006	2008	2009	2010	2011	2012	2006	2010	2012
Albania		1003	528	127	393	562					9						
Algeria			46	284	393												
Austria		58	4000	1000	1000	51		2696	2000	2000		1000					
Belgium	97300	2035	22000	17000	14000	12000	9000			231	378		2000				
Bosnia and Herzegovina			511														
Bulgaria		4273				169											
Croatia					11	3			5			12					
Cyprus	1393	15030	8659	6437	3803	3051	2580										
Czech Republic		16	1000	1000	8000		373	93		2000							
Denmark	67	10532	1119	1388	1000	1094	691		292	605		277		286			
Estonia			309	10000	6600	2000							12900				
Finland	4	1	19	57	291	289	95					8	179	16			
France	4746	1184	24000	12900	27000	10000	28000		60	1000	1047	869	867	23			232
Georgia							555										
Germany	20223	25129	11100	59000	75000	88000	17	208		271	16						
Greece	363	472	12477	6810	2241	393	787										
Hungary	27	38	33	492		98											
Ireland	464	14508	21000	7000	2000	1319	3298	226	5	5973	4500	5700	11248	4440			
Israel	326		5144	16	213	1444	263			1605				182			
Italy	67065	8380	16000	95000	1000	36000	1000	100	812	432			1000				
Jordan	841	9717					188	22									
Lithuania			164														
Malta	83	455	549	451	239	474	556										

	USA							Canada							Mexico		
	2004	2006	2008	2009	2010	2011	2012	2004	2006	2008	2009	2010	2011	2012	2006	2010	2012
Morocco		547	544	475	546	5560	2896			179							
Netherlands	7907	38805	30000	21000	22065	34000	1000				1000		1000				3
Norway		2288	5000	4000	369	419	1000										25
Poland			1	1000		153	1000			2000							
Portugal	1243	30	19262	1468	315	5665	499			170							
Republic of Moldova	27																
Romania			294									62					
Russian Federation			2000		1546	7018	529		50				270				
Slovakia			89	91000			107										
Slovenia	22	752	1293	2352	1766		1					1475					
Spain	63131	71787	10400 0	12600 0	46000	35000	18000		602		79		2000		4		
Sweden		53	1000	2	44		104									128	
Switzerland	14	39126	1000		9	6	10			70	8						5
Tunisia	151		43														
Turkey	76497	731	20000	30000	27991	21000	98000					32988					
Ukraine		2				46											
United Kingdom	13420 2	16564 2	1000	12000 0	593	92000	2000	74	6688	1000	1360 3	1000	314	5000			
<b>Total</b>	<b>47609 6</b>	<b>41366 4</b>	<b>59243 9</b>	<b>80185 6</b>	<b>28612 4</b>	<b>36260 7</b>	<b>21239 2</b>	<b>276 2</b>	<b>1717 8</b>	<b>5456 5</b>	<b>7714 0</b>	<b>13347 8</b>	<b>24813 0</b>	<b>5191 5</b>	<b>4</b>	<b>128</b>	<b>236 0</b>

ANNEX 3. Table 2. CONIFER WOOD IN THE ROUGH – Imports by EU countries. Eurostat Coniferous wood in the rough 440320

	USA						CANADA						MEXICO	
	2006	2008	2010	2011	2012	2013	2006	2008	2010	2011	2012	2013	2012	2013
AUSTRIA	:	:	227	231	:	238	392	446	:	215	:	4 152	:	:
BELGIUM	:	:	:	482	:	0	:	:	:	:	:	:	:	:
CROATIA	:	:	0	0	:	:	3	:	:	4	:	:	:	:
CZECH REP.	3	:	:	:	0	:	:	:	:	:	:	:	:	:
DENMARK	:	636	:	:	:	:	:	225	:	:	:	:	:	:
FINLAND	:	72	:	:	:	:	:	0	:	:	:	:	:	:
FRANCE	805	330	:	:	:	:	:	671	150	158	:	:	1 394	3 184
GERMANY	33	520	:	:	10	514	:	:	:	:	:	:	:	:
IRELAND	12 597	10 692	1 402	512	1 549	2 022	11 032	6 339	:	:	:	115	:	:

ITALY	15 105	16 109	6 950	12 147	1 986	915	726	448	:	549	:	:	:	:
NETHERLANDS	0	:	:	:	249	0	:	:	:	:	:	77	:	:
PORTUGAL	:	:	499	:	1 314	:	:	:	:	:	:	:	:	:
SLOVAKIA	:	14	:	:	:	:	:	:	:	:	:	:	:	:
SLOVENIA	:	195	:	:	1	:	:	:	1 258	:	:	210	:	:
SPAIN	:	23	:	:	:	:	:	:	:	:	:	:	:	:
SWEDEN	13	:	:	:	7	:	:	:	:	:	:	:	:	:
UNITED KINGDOM	794	4 151	274	1 552	1 548	1 349	2 447	8 448	1 000	:	1 638	969	:	:
<b>Total</b>	<b>29350</b>	<b>32742</b>	<b>9352</b>	<b>14924</b>	<b>6664</b>	<b>5038</b>	<b>14600</b>	<b>16577</b>	<b>2408</b>	<b>926</b>	<b>1638</b>	<b>5523</b>	<b>1394</b>	<b>3184</b>

**ANNEX 3. Tables 3. CONIFER WOOD DETAILED CATEGORIES – Exports from the USA to EPPO countries USDA-FAO (2014). (subcategories of 440320). Details of categories are from <https://www.census.gov/foreign-trade/schedules/b/2011/c44.txt>**

**Table 3.1. Conifer pulpwood 4403200005 (m3)**

	2008	2009	2010	2011	2012	2013
Italy	16,012.0	0.0	0.0	0.0	62,679.0	576,277.0
Germany	481.0	0.0	0.0	67,324.0	146,299.0	131,147.0
Morocco	685.0	116.0	134.0	353.0	429.0	216.0
Greece	0.0	59.0	0.0	0.0	0.0	0.0
Spain	1,283.0	0.0	0.0	0.0	0.0	0.0
United Kingdom	213.0	227.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>18674</b>	<b>402</b>	<b>134</b>	<b>67677</b>	<b>209407</b>	<b>707640</b>

**Table 3.2. Logs and timber : Southern yellow pines (4403200020 - SW LOGS, SY PINE, m3) : Pinus taeda, Pinus palustris, Pinus rigida, Pinus echinata, Pinus elliotii, Pinus virginiana)**

	2008	2009	2010	2011	2012	2013
Spain	7,944.0	6,369.0	6,099.0	3,987.0	1,710.0	2,247.0
Turkey	0.0	591.0	788.0	669.0	9,254.0	1,441.0
Norway(*)	53.0	514.0	0.0	34.0	90.0	1,312.0
France(*)	1,631.0	3,156.0	2,439.0	805.0	668.0	854.0
Germany(*)	1,517.0	2,008.0	1,026.0	479.0	327.0	829.0
Jordan	327.0	0.0	346.0	1,976.0	615.0	714.0
United Kingdom	1,510.0	642.0	359.0	452.0	64.0	469.0
Greece	1,201.0	845.0	369.0	68.0	141.0	324.0
Belgium(!)	1,654.0	1,789.0	1,095.0	507.0	272.0	322.0
Algeria	0.0	31.0	72.0	0.0	0.0	267.0
Italy(*)	12,341.0	12,022.0	4,874.0	1,819.0	1,586.0	207.0
Portugal	505.0	945.0	571.0	108.0	12.0	127.0
Tunisia	1.0	0.0	0.0	0.0	0.0	109.0
Albania	38.0	0.0	74.0	0.0	0.0	0.0
Austria	0.0	72.0	0.0	0.0	0.0	0.0
Denmark(*)	37.0	101.0	35.0	32.0	39.0	0.0
Ireland	243.0	35.0	35.0	0.0	35.0	0.0
Estonia	0.0	1,182.0	975.0	34.0	0.0	0.0
Georgia	0.0	0.0	0.0	0.0	79.0	0.0
Israel(*)	683.0	1,627.0	102.0	117.0	0.0	0.0

	2008	2009	2010	2011	2012	2013
Latvia	0.0	0.0	0.0	36.0	0.0	0.0
Malta	33.0	0.0	0.0	0.0	0.0	0.0
Netherlands	188.0	334.0	223.0	0.0	15.0	0.0
Slovenia	3,440.0	193.0	0.0	0.0	0.0	0.0
Sweden	146.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>33492,0</b>	<b>32456,0</b>	<b>19482,0</b>	<b>11123,0</b>	<b>14907,0</b>	<b>9222,0</b>

**Table 3.3. Logs and timber. Ponderosa pine (Pinus ponderosa) - 4403200025 - SW LOGS, PNDROSA**

	2008	2009	2010	2011	2012	2013
Jordan	192.0	393.0	0.0	100.0	2,319.0	302.0
Germany(*)	54.0	41.0	0.0	103.0	0.0	46.0
Netherlands	0.0	50.0	0.0	0.0	0.0	0.0
United Kingdom	0.0	0.0	0.0	45.0	0.0	0.0
<b>Total</b>	<b>246</b>	<b>484</b>	<b>0</b>	<b>248</b>	<b>2319</b>	<b>348</b>

**Table 3.4. Logs and timber. Other pine, excl. Southern yellow pines (3.2 above) and ponderosa pine (3.3 above) 4403200030- Sw Logs,Pine,Oth**

	2008	2009	2010	2011	2012	2013
Turkey	0.0	0.0	1,267.0	474.0	370.0	114.0
Italy(*)	1,062.0	4,787.0	0.0	0.0	373.0	35.0
Albania	290.0	0.0	0.0	0.0	0.0	0.0
Belgium(!)	182.0	1,455.0	0.0	0.0	0.0	0.0
Denmark(*)	0.0	0.0	215.0	0.0	0.0	0.0
Ireland	0.0	136.0	0.0	0.0	0.0	0.0
France(*)	676.0	1,075.0	0.0	0.0	0.0	0.0
Greece	0.0	187.0	0.0	0.0	0.0	0.0
Israel(*)	0.0	0.0	0.0	428.0	0.0	0.0
Jordan	0.0	269.0	608.0	251.0	0.0	0.0
Norway(*)	885.0	0.0	0.0	0.0	0.0	0.0
Poland	0.0	0.0	0.0	0.0	202.0	0.0
Spain	263.0	2,090.0	233.0	0.0	0.0	0.0
United Kingdom	693.0	3,192.0	215.0	0.0	0.0	0.0
<b>Total</b>	<b>4051</b>	<b>13191</b>	<b>2538</b>	<b>1153</b>	<b>945</b>	<b>149</b>

**ANNEX 3. Table 4. FIREWOOD - Eurostat – imports by EU countries- 440110 FUEL WOOD, IN LOGS, BILLETS, TWIGS, FAGGOTS OR SIMILAR FORMS (in 100 kg)**

EU countries without imports were deleted

	USA						CANADA						MEXICO	
	2006	2008	2010	2011	2012	2013	2006	2008	2010	2011	2012	2013	2012	2013
Austria	:	:	:	:	2	:	:	:	1	3	:	:	0	1
Belgium	:	1	:	:	:	:	:	:	:	:	:	:	:	:
Bulgaria	:	:	:	:	:	0	183	:	:	:	:	:	:	:
Cyprus	:	:	:	:	:	0	:	:	:	:	:	:	:	:
Czech rep	:	28	:	:	:	:	:	:	:	:	86	:	:	:
Denmark	:	68	:	:	73	8	:	:	:	:	:	:	:	:
Estonia	:	:	:	:	:	660	:	:	:	:	:	:	:	:
Finland	:	:	:	:	2	0	:	:	:	:	:	:	:	:
France	:	:	:	:	0	2	120	:	:	:	:	1 003	:	:
Germany	:	:	28	50	277	25	:	:	:	:	:	:	:	:
Hungary	:	:	:	17	:	186	:	:	:	:	:	:	:	:
Ireland	6	850	3	1	0	0	:	1	8	:	:	:	:	:
Italy	:	408	:	:	:	:	4 779	:	:	:	:	209	:	:
Netherlands	:	:	:	:	5	:	:	:	:	:	:	:	:	:
Poland	:	:	:	:	:	0	:	:	:	:	6	:	:	:
Portugal	822	440	:	1 519	75	:	:	:	:	:	:	:	:	:
Romania	:	:	:	:	:	0	:	:	:	:	:	:	:	:
Spain	:	130	:	0	:	:	:	:	:	:	:	:	:	:
Sweden	37	7	11	6	0	31	:	:	:	1	:	:	:	:
UK	6 808	8 737	6 334	222	268	716	:	:	:	:	:	:	:	:
<b>Total</b>	<b>7673</b>	<b>10669</b>	<b>6376</b>	<b>1815</b>	<b>702</b>	<b>1628</b>	<b>5082</b>	<b>1</b>	<b>9</b>	<b>4</b>	<b>92</b>	<b>1212</b>	<b>0</b>	<b>1</b>

**ANNEX 3. Table 5. CONIFEROUS POLES, PILES AND POSTS – exports to EPP0 countries - USDA-FAO (2014). 4403200010 SW POLES, UNTRTD (in number)**

	2008	2009	2010	2011	2012	2013
Italy	0.0	0.0	0.0	0.0	0.0	12,350.0
Russia	0.0	0.0	0.0	0.0	0.0	1,737.0
Morocco	0.0	0.0	0.0	0.0	0.0	200.0
Israel	0.0	0.0	0.0	0.0	108.0	50.0
Bulgaria	0.0	0.0	0.0	388.0	0.0	0.0
Czech Republic	0.0	0.0	1,970.0	0.0	0.0	0.0
France	0.0	0.0	0.0	40.0	15.0	0.0

	2008	2009	2010	2011	2012	2013
Germany	2,693.0	0.0	0.0	0.0	0.0	0.0
Croatia	0.0	0.0	1,592.0	0.0	0.0	0.0
Hungary	0.0	1,130.0	0.0	0.0	0.0	0.0
Netherlands	473.0	0.0	0.0	0.0	0.0	0.0
Poland	143.0	0.0	0.0	0.0	0.0	0.0
United Kingdom	24.0	491.0	9.0	128.0	7,506.0	0.0
<b>Total</b>	<b>3333</b>	<b>1621</b>	<b>3571</b>	<b>556</b>	<b>7629</b>	<b>14337</b>

**ANNEX 3. Table 6. POSTS AND BEAMS OF WOOD – imports by EU countries. Eurostat 441860 (100 kg)**

There were no imports from Dominican Republic, Cuba and Mexico

EU countries without imports were deleted

	USA						CANADA					
	2006	2008	2010	2011	2012	2013	2006	2008	2010	2011	2012	2013
BELGIUM	:	:	:	0	91	:	:	:	751	:	404	25
BULGARIA	:	8	:	:	:	:	:	:	:	:	:	:
CYPRUS	:	:	8	:	:	:	:	:	:	:	:	:
CZECH REP	:	:	:	:	283	508	:	:	:	:	:	:
GERMANY	:	:	10	1 556	40	:	:	:	192	405	:	3
DENMARK	:	:	203	656	:	:	:	:	:	:	:	:
SPAIN	:	1 388	:	:	504	:	:	:	:	:	:	:
FINLAND	:	0	:	:	:	:	:	:	:	0	:	:
FRANCE	:	298	:	215	273	0	:	:	156	1	:	:
UNITED KINGDOM	:	200	545	389	49	143	:	626	19	:	:	:
IRELAND	:	373	:	:	0	:	:	:	6	:	:	:
ITALY	:	:	177	:	23	:	:	:	372	:	:	:
LITHUANIA	:	:	:	21	:	:	:	:	:	:	:	:
NETHERLANDS	:	29	515	11	:	:	:	106	:	250	:	:
POLAND	:	90	3	35	:	1	:	:	:	:	:	:
ROMANIA	:	22	16	15	8	:	:	:	:	:	:	2
SWEDEN	:	:	:	:	159	:	:	:	:	:	:	:
SLOVENIA	:	:	:	:	:	:	:	0	:	:	187	:
SLOVAKIA	:	:	:	:	3	3	:	:	:	:	:	:
CROATIA	:	23	10	41	:	:	:	139	1	:	:	:
	0	2431	1487	2939	1433	655	0	871	1497	656	591	30

**ANNEX 3. Table 7. 440410 Eurostat HOOPWOOD; SPLIT POLES; PILES, PICKETS AND STAKES OF WOOD, POINTED BUT NOT SAWN LENGTHWISE; WOODEN STICKS, ROUGHLY TRIMMED BUT NOT TURNED, BENT OR OTHERWISE WORKED, SUITABLE FOR THE MANUFACTURE OF WALKING-STICKS, UMBRELLAS, TOOL HANDLES OR THE LIKE; CHIPWOOD AND THE LIKE, OF CONIFEROUS WOOD (EXCL. HOOPWOOD SAWN LENGTHWISE AND CARVED OR NOTCHED AT THE ENDS; BRUSHMOUNTS, LASTS)**

	UNITED STATES						CANADA					MEXICO	
	2006	2008	2010	2011	2012	2013	2008	2010	2011	2012	2013	2010	2011
AUSTRIA	0	:	:	:	:	:	:	:	:	:	:	:	:
DENMARK	:	:	:	:	:	:	:	172	:	200	200	:	:



	UNITED STATES						CANADA					MEXICO	
	2006	2008	2010	2011	2012	2013	2008	2010	2011	2012	2013	2010	2011
FINLAND	0	:	:	:	:	:	:	:	:	:	:	:	:
FRANCE	:	:	:	:	:	0	:	0	:	:	:	:	:
HUNGARY	79	52	:	13	:	:	:	:	:	:	:	:	:
IRELAND	24	5	:	:	:	:	13 734	46 987	55 726	23 311	14 470	:	:
LATVIA	:	:	0	:	:	:	:	:	:	:	:	:	:
NETHERLANDS	:	:	:	:	0	:	:	:	:	:	:	:	:
POLAND	:	:	0	:	:	:	:	:	:	:	:	:	:
PORTUGAL	45	:	:	:	:	:	:	:	:	:	:	:	:
SWEDEN	:	:	:	1	0	0	:	:	:	:	:	139	:
SLOVAKIA	:	:	:	0	:	0	:	:	:	:	:	:	0

**ANNEX 3. Table 8. RAILWAY OR TRAMWAY SLEEPERS 'CROSS-TIES' OF WOOD, NOT IMPREGNATED 440610Eurostat**

	USA			Canada				
	2006	2008	2012	2008	2010	2011	2012	2013
Belgium	:	12 795	:	:	:	:	:	:
Germany	:	9 510	:	:	:	:	:	:
France	:	:	0	:	:	:	:	:
UK	:	:	:	21 020	14 735	11 190	8 543	12 696
Ireland	:	:	:	143	:	:	:	:
Netherlands	30	:	:	:	:	:	:	:
Poland	:	4 588	:	:	:	:	:	:

**ANNEX 3. Table 9. Ties, Wood, Not Impregnated USDA FAS-440610 - (m3)**

	2008	2009	2010	2011	2012	2013
Belgium(!)	5.0	0.0	0.0	0.0	0.0	0.0
Germany(*)	0.0	0.0	2.0	0.0	0.0	0.0
Israel(!)	34.0	0.0	0.0	1.0	174.0	0.0
Italy(*)	0.0	0.0	79.0	1.0	0.0	0.0
Latvia	0.0	22.0	0.0	0.0	0.0	0.0
Russia	0.0	0.0	0.0	0.0	0.0	174.0
Switzerland(*)	0.0	0.0	18.0	0.0	0.0	0.0
Turkey	0.0	0.0	0.0	1.0	0.0	0.0
United Kingdom	0.0	0.0	39.0	0.0	2.0	0.0



**Appendix 2 – Distribution of *Pinus sylvestris* in the EPPO region**  
(source: EPPO PRA on *Chionaspis pinifoliae* (EPPO, in preparation))

*Pinus sylvestris* (Scots pine) is found throughout Eurasia (Figure 1), for a distance of 10 000 km (Farjon and Filer, 2013). It is economically important, especially in the northern Europe. It is used for wood and for stabilizing sandy soils and is also a pioneer species, able to colonize nutrient-poor soils in disturbed areas (Euforgen, 2021).



**Figure 1.** Distribution of *Pinus sylvestris* (Caudullo *et al.*, 2017). Green areas indicate the native range of the species, green crosses isolated populations, orange areas introduced and naturalized populations and orange triangles introduced and naturalized isolated populations.