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## Pest categorisation of *Coniferiporia sulphurascens* and *Coniferiporia weirii*

EFSA Panel on Plant Health (PLH),

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### Abstract

Following a request from the European Commission, the EFSA Panel on Plant Health performed a pest categorisation of *Coniferiporia sulphurascens* and *Coniferiporia weirii*, two well-defined and distinguishable fungal species of the family Hymenochaetaceae. The pathogens are regulated in Council Directive 2000/29/EC (Annex IAI, under the previous name *Inonotus weirii* for both species) as a harmful organism whose introduction into the EU is banned. The two pathogens are native to North America, where *C. sulphurascens* causes laminated root rot primarily in Douglas fir (*Pseudotsuga menziesii*) and grand fir (*Abies grandis*), while *C. weirii* causes cedar laminated root and butt rot mainly in cedars (*Thuja plicata* and *Cupressus nootkatensis*). *C. weirii* has been reported from Japan and China, and *C. sulphurascens* from China, Russia and Turkey. Neither species has been reported from the EU. *C. sulphurascens* may infect all conifers, while *C. weirii* is reported to mainly cause disease in tree species of *Thuja* spp. and *Cupressus* spp. The two pathogens could enter the EU mainly via wood with bark, isolated bark and plants for planting (including artificially dwarfed plants) of Pinaceae and Cupressaceae. Both fungi could establish in the EU, as hosts are present and climatic conditions are favourable. The two pathogens would be able to spread following establishment by the pathways mentioned for entry and also by dissemination of basidiospores and root contact with infected root/wood. Should the pathogen be introduced in the EU, impacts can be expected on coniferous woodlands, plantations and ornamental trees, thus leading to reduced tree growth and ecosystem service provision. The key uncertainties concern (i) the distribution of the two pathogens in Asia, (ii) the level of susceptibility of conifers native to Europe and (iii) the role of plants for planting as a pathway of entry and spread. For both pathogens, the criteria assessed by the Panel for consideration as a potential quarantine pest are met. As the two pests are not present in the EU, not all the criteria for consideration as regulated non-quarantine pests are met.

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## 1. Introduction

### 1.1. Background and Terms of Reference as provided by the requestor

#### 1.1.1. Background

Council Directive 2000/29/EC<sup>1</sup> on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community establishes the present European Union plant health regime. The Directive lays down the phytosanitary provisions and the control checks to be carried out at the place of origin on plants and plant products destined for the Union or to be moved within the Union. In the Directive's 2000/29/EC annexes, the list of harmful organisms (pests) whose introduction into or spread within the Union is prohibited, is detailed together with specific requirements for import or internal movement.

Following the evaluation of the plant health regime, the new basic plant health law, Regulation (EU) 2016/2031<sup>2</sup> on protective measures against pests of plants, was adopted on 26 October 2016 and will apply from 14 December 2019 onwards, repealing Directive 2000/29/EC. In line with the principles of the above mentioned legislation and the follow-up work of the secondary legislation for the listing of EU regulated pests, EFSA is requested to provide pest categorizations of the harmful organisms included in the annexes of Directive 2000/29/EC, in the cases where recent pest risk assessment/pest categorisation is not available.

#### 1.1.2. Terms of reference

EFSA is requested, pursuant to Article 22(5.b) and Article 29(1) of Regulation (EC) No 178/2002,<sup>3</sup> to provide scientific opinion in the field of plant health.

EFSA is requested to prepare and deliver a pest categorisation (step 1 analysis) for each of the regulated pests included in the appendices of the annex to this mandate. The methodology and template of pest categorisation have already been developed in past mandates for the organisms listed in Annex II Part A Section II of Directive 2000/29/EC. The same methodology and outcome is expected for this work as well.

The list of the harmful organisms included in the annex to this mandate comprises 133 harmful organisms or groups. A pest categorisation is expected for these 133 pests or groups and the delivery of the work would be stepwise at regular intervals through the year as detailed below. First priority covers the harmful organisms included in Appendix 1, comprising pests from Annex II Part A Section I and Annex II Part B of Directive 2000/29/EC. The delivery deadline of all pest categorisations for the pests included in Appendix 1 is June 2018. The second priority is the pests included in Appendix 2, comprising the group of *Cicadellidae* (non-EU) known to be vector of Pierce's disease (caused by *Xylella fastidiosa*), the group of *Tephritidae* (non-EU), the group of potato viruses and virus-like organisms, the group of viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. and the group of *Margarodes* (non-EU species). The delivery deadline of all pest categorisations for the pests included in Appendix 2 is end 2019. The pests included in Appendix 3 cover pests of Annex I part A section I and all pests categorisations should be delivered by end 2020.

For the above mentioned groups, each covering a large number of pests, the pest categorisation will be performed for the group and not the individual harmful organisms listed under "such as" notation in the Annexes of the Directive 2000/29/EC. The criteria to be taken particularly under consideration for these cases, is the analysis of host pest combination, investigation of pathways, the damages occurring and the relevant impact.

Finally, as indicated in the text above, all references to 'non-European' should be avoided and replaced by 'non-EU' and refer to all territories with exception of the Union territories as defined in Article 1 point 3 of Regulation (EU) 2016/2031.

<sup>1</sup> Council Directive 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community. OJ L 169/1, 10.7.2000, p. 1–112.

<sup>2</sup> Regulation (EU) 2016/2031 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants. OJ L 317, 23.11.2016, p. 4–104.

<sup>3</sup> Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. OJ L 31/1, 1.2.2002, p. 1–24.

### 1.1.2.1. Terms of Reference: Appendix 1

List of harmful organisms for which pest categorisation is requested. The list below follows the annexes of Directive 2000/29/EC.

#### **Annex IIAI**

##### **(a) Insects, mites and nematodes, at all stages of their development**

<i>Aleurocantus</i> spp.	<i>Numonia pyrivorella</i> (Matsumura)
<i>Anthonomus bisignifer</i> (Schenkling)	<i>Oligonychus perditus</i> Pritchard and Baker
<i>Anthonomus signatus</i> (Say)	<i>Pissodes</i> spp. (non-EU)
<i>Aschistonyx eppoi</i> Inouye	<i>Scirtothrips aurantii</i> Faure
<i>Carposina niponensis</i> Walsingham	<i>Scirtothrips citri</i> (Moultex)
<i>Enarmonia packardi</i> (Zeller)	<i>Scolytidae</i> spp. (non-EU)
<i>Enarmonia prunivora</i> Walsh	<i>Scrobipalopsis solanivora</i> Povolny
<i>Grapholita inopinata</i> Heinrich	<i>Tachypterellus quadrigibbus</i> Say
<i>Hishomonus phycitis</i>	<i>Toxoptera citricida</i> Kirk.
<i>Leucaspis japonica</i> Ckll.	<i>Unaspis citri</i> Comstock
<i>Listronotus bonariensis</i> (Kuschel)	

##### **(b) Bacteria**

Citrus variegated chlorosis	<i>Xanthomonas campestris</i> pv. <i>oryzae</i> (Ishiyama)
<i>Erwinia stewartii</i> (Smith) Dye	Dye and pv. <i>oryzicola</i> (Fang, et al.) Dye

##### **(c) Fungi**

<i>Alternaria alternata</i> (Fr.) Keissler (non-EU pathogenic isolates)	<i>Elsinoe</i> spp. Bitanc. and Jenk. Mendes
<i>Anisogramma anomala</i> (Peck) E. Müller	<i>Fusarium oxysporum</i> f. sp. <i>albedinis</i> (Kilian and Maire) Gordon
<i>Apiosporina morbosa</i> (Schwein.) v. Arx	<i>Guignardia piricola</i> (Nosa) Yamamoto
<i>Ceratocystis virescens</i> (Davidson) Moreau	<i>Puccinia pittieriana</i> Hennings
<i>Cercoseptoria pini-densiflorae</i> (Hori and Nambu) Deighton	<i>Stegophora ulmea</i> (Schweinitz: Fries) Sydow & Sydow
<i>Cercospora angolensis</i> Carv. and Mendes	<i>Venturia nashicola</i> Tanaka and Yamamoto

##### **(d) Virus and virus-like organisms**

Beet curly top virus (non-EU isolates)	Little cherry pathogen (non- EU isolates)
Black raspberry latent virus	Naturally spreading psorosis
Blight and blight-like	Palm lethal yellowing mycoplasma
Cadang-Cadang viroid	Satsuma dwarf virus
Citrus tristeza virus (non-EU isolates)	Tatter leaf virus
Leprosis	Witches' broom (MLO)

#### **Annex IIB**

##### **(a) Insect mites and nematodes, at all stages of their development**

<i>Anthonomus grandis</i> (Boh.)	<i>Ips cembrae</i> Heer
<i>Cephalcia lariciphila</i> (Klug)	<i>Ips duplicatus</i> Sahlberg
<i>Dendroctonus micans</i> Kugelán	<i>Ips sexdentatus</i> Börner
<i>Gilpinia hercyniae</i> (Hartig)	<i>Ips typographus</i> Heer
<i>Gonipterus scutellatus</i> Gyll.	<i>Sternochetus mangiferae</i> Fabricius
<i>Ips amitinus</i> Eichhof	

**(b) Bacteria**

*Curtobacterium flaccumfaciens* pv. *flaccumfaciens*  
(Hedges) Collins and Jones

**(c) Fungi**

*Glomerella gossypii* Edgerton

*Hypoxyton mammatum* (Wahl.) J. Miller

*Gremmeniella abietina* (Lag.) Morelet

**1.1.2.2. Terms of Reference: Appendix 2**

List of harmful organisms for which pest categorisation is requested per group. The list below follows the categorisation included in the annexes of Directive 2000/29/EC.

**Annex IAI****(a) Insects, mites and nematodes, at all stages of their development**

Group of Cicadellidae (non-EU) known to be vector of Pierce's disease (caused by *Xylella fastidiosa*), such as:

- |  |   |
|--|---|
| 1) <i>Carneocephala fulgida</i> Nottingham | 3) <i>Graphocephala atropunctata</i> (Signoret) |
| 2) <i>Draeculacephala minerva</i> Ball     |   |

Group of Tephritidae (non-EU) such as:

- |  |   |
|--|---|
| 1) <i>Anastrepha fraterculus</i> (Wiedemann) | 12) <i>Pardalaspis cyanescens</i> Bezzi     |
| 2) <i>Anastrepha ludens</i> (Loew)           | 13) <i>Pardalaspis quinaria</i> Bezzi       |
| 3) <i>Anastrepha obliqua</i> Macquart        | 14) <i>Pterandrus rosa</i> (Karsch)         |
| 4) <i>Anastrepha suspensa</i> (Loew)         | 15) <i>Rhacochlaena japonica</i> Ito        |
| 5) <i>Dacus ciliatus</i> Loew                | 16) <i>Rhagoletis completa</i> Cresson      |
| 6) <i>Dacus curcurbitae</i> Coquillet        | 17) <i>Rhagoletis fausta</i> (Osten-Sacken) |
| 7) <i>Dacus dorsalis</i> Hendel              | 18) <i>Rhagoletis indifferens</i> Curran    |
| 8) <i>Dacus tryoni</i> (Froggatt)            | 19) <i>Rhagoletis mendax</i> Curran         |
| 9) <i>Dacus tsuneonis</i> Miyake             | 20) <i>Rhagoletis pomonella</i> Walsh       |
| 10) <i>Dacus zonatus</i> Saund.              | 21) <i>Rhagoletis suavis</i> (Loew)         |
| 11) <i>Epochra canadensis</i> (Loew)         |   |

**(c) Viruses and virus-like organisms**

Group of potato viruses and virus-like organisms such as:

- |                                  |  |
|----------------------------------|--|
| 1) Andean potato latent virus    | 4) Potato black ringspot virus   |
| 2) Andean potato mottle virus    | 5) Potato virus T  |
| 3) Arracacha virus B, oca strain | 6) non-EU isolates of potato viruses A, M, S, V, X and Y (including Yo, Yn and Yc) and Potato leafroll virus |

Group of viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L., such as:

- |                                      |  |
|--------------------------------------|--|
| 1) Blueberry leaf mottle virus       | 8) Peach yellows mycoplasma  |
| 2) Cherry rasp leaf virus (American) | 9) Plum line pattern virus (American)  |
| 3) Peach mosaic virus (American)     | 10) Raspberry leaf curl virus (American)   |
| 4) Peach phony rickettsia            | 11) Strawberry witches' broom mycoplasma   |
| 5) Peach rosette mosaic virus        | 12) Non-EU viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L. |
| 6) Peach rosette mycoplasma          |  |
| 7) Peach X-disease mycoplasma        |  |

## **Annex IIAI**

### **(a) Insects, mites and nematodes, at all stages of their development**

Group of *Margarodes* (non-EU species) such as:

- |  |  |
|--|--|
| 1) <i>Margarodes vitis</i> (Phillipi)        | 3) <i>Margarodes prieskaensis</i> Jakubski |
| 2) <i>Margarodes vredendalensis</i> de Klerk |  |

### **1.1.2.3. Terms of Reference: Appendix 3**

List of harmful organisms for which pest categorisation is requested. The list below follows the annexes of Directive 2000/29/EC.

## **Annex IAI**

### **(a) Insects, mites and nematodes, at all stages of their development**

<i>Acleris</i> spp. (non-EU)	<i>Longidorus diadecturus</i> Eveleigh and Allen
<i>Amauromyza maculosa</i> (Malloch)	<i>Monochamus</i> spp. (non-EU)
<i>Anomala orientalis</i> Waterhouse	<i>Myndus crudus</i> Van Duzee
<i>Arrhenodes minutus</i> Drury	<i>Nacobbus aberrans</i> (Thorne) Thorne and Allen
<i>Choristoneura</i> spp. (non-EU)	<i>Naupactus leucoloma</i> Boheman
<i>Conotrachelus nenuphar</i> (Herbst)	<i>Premnotrypes</i> spp. (non-EU)
<i>Dendrolimus sibiricus</i> Tschetverikov	<i>Pseudopityophthorus minutissimus</i> (Zimmermann)
<i>Diabrotica barberi</i> Smith and Lawrence	<i>Pseudopityophthorus pruinus</i> (Eichhoff)
<i>Diabrotica undecimpunctata howardi</i> Barber	<i>Scaphoideus luteolus</i> (Van Duzee)
<i>Diabrotica undecimpunctata undecimpunctata</i> Mannerheim	<i>Spodoptera eridania</i> (Cramer)
<i>Diabrotica virgifera zea</i> Krysan & Smith	<i>Spodoptera frugiperda</i> (Smith)
<i>Diaphorina citri</i> Kuway	<i>Spodoptera litura</i> (Fabricus)
<i>Heliothis zea</i> (Boddie)	<i>Thrips palmi</i> Karny
<i>Hirschmanniella</i> spp., other than <i>Hirschmanniella gracilis</i> (de Man) Luc and Goodey	<i>Xiphinema americanum</i> Cobb sensu lato (non-EU populations)
<i>Liriomyza sativae</i> Blanchard	<i>Xiphinema californicum</i> Lamberti and Blevé-Zacheo

### **(b) Fungi**

<i>Ceratocystis fagacearum</i> (Bretz) Hunt	<i>Mycosphaerella larici-leptolepis</i> Ito et al.
<i>Chrysomyxa arctostaphyli</i> Dietel	<i>Mycosphaerella populorum</i> G. E. Thompson
<i>Cronartium</i> spp. (non-EU)	<i>Phoma andina</i> Turkensteen
<i>Endocronartium</i> spp. (non-EU)	<i>Phyllosticta solitaria</i> Ell. and Ev.
<i>Guignardia laricina</i> (Saw.) Yamamoto and Ito	<i>Septoria lycopersici</i> Speg. var. <i>malagutii</i>
<i>Gymnosporangium</i> spp. (non-EU)	Ciccarone and Boerema
<i>Inonotus weirii</i> (Murril) Kotlaba and Pouzar	<i>Thecaphora solani</i> Barrus
<i>Melampsora farlowii</i> (Arthur) Davis	<i>Trechispora brinkmannii</i> (Bresad.) Rogers

### **(c) Viruses and virus-like organisms**

Tobacco ringspot virus	Pepper mild tigré virus
Tomato ringspot virus	Squash leaf curl virus
Bean golden mosaic virus	Euphorbia mosaic virus
Cowpea mild mottle virus	Florida tomato virus
Lettuce infectious yellows virus	

#### (d) Parasitic plants

*Arceuthobium* spp. (non-EU)

#### **Annex I A I I**

##### (a) Insects, mites and nematodes, at all stages of their development

*Meloidogyne fallax* Karssen

*Rhizoecus hibisci* Kawai and Takagi

*Popillia japonica* Newman

##### (b) Bacteria

*Clavibacter michiganensis* (Smith) Davis et al. ssp. *sepedonicus* (Spieckermann and Kotthoff) Davis et al.

*Ralstonia solanacearum* (Smith) Yabuuchi et al.

##### (c) Fungi

*Melampsora medusae* Thümen

*Synchytrium endobioticum* (Schilbersky) Percival

#### **Annex I B**

##### (a) Insects, mites and nematodes, at all stages of their development

*Leptinotarsa decemlineata* Say

*Liriomyza bryoniae* (Kaltenbach)

##### (b) Viruses and virus-like organisms

Beet necrotic yellow vein virus

## 1.2. Interpretation of the Terms of Reference

*Inonotus weirii* is one of a number of pests listed in the Appendices to the Terms of Reference (ToR) to be subject to pest categorisation to determine whether it fulfils the criteria of a quarantine pest or those of a regulated non-quarantine pest for the area of the European Union (EU).

Following a phylogenetic analysis (Zhou et al., 2016) (see Section 3.1), the two observed forms of *I. weirii* were assigned to two different species, *Coniferiporia sulphurascens* and *Coniferiporia weirii*. This pest categorisation will thus deal with *C. sulphurascens* and *C. weirii*.

## 2. Data and methodologies

### 2.1. Data

#### 2.1.1. Literature search

A literature search on *C. sulphurascens* and *C. weirii* was conducted at the beginning of the categorisation in the ISI Web of Science bibliographic database, using the scientific name of the two pests as search term, as well as their previous names and synonyms (see Section 3.1). Relevant papers were reviewed and further references and information were obtained from experts, as well as from citations within the references and grey literature.

#### 2.1.2. Database search

Pest information, on host(s) and distribution, was retrieved from the European and Mediterranean Plant Protection Organization (EPPO) Global Database (EPPO, 2018) and relevant publications.

Data about the import of commodity types that could potentially provide a pathway for the pest to enter the EU and about the area of hosts grown in the EU were obtained from EUROSTAT (Statistical Office of the European Communities).

The Europhyt database was consulted for pest-specific notifications on interceptions and outbreaks. Europhyt is a web-based network run by the Directorate General for Health and Food Safety (DG SANTÉ) of the European Commission, and is a subproject of PHYSAN (Phyto-Sanitary Controls) specifically concerned with plant health information. The Europhyt database manages notifications of



interceptions of plants or plant products that do not comply with EU legislation, as well as notifications of plant pests detected in the territory of the Member States (MS) and the phytosanitary measures taken to eradicate or avoid their spread.

## 2.2. Methodologies

The Panel performed the pest categorisation for *C. sulphurascens* and *C. weirii* following guiding principles and steps presented in the EFSA guidance on the harmonised framework for pest risk assessment (EFSA PLH Panel, 2010) and as defined in the International Standard for Phytosanitary Measures No 11 (FAO, 2013) and No 21 (FAO, 2004).

In accordance with the guidance on a harmonised framework for pest risk assessment in the EU (EFSA PLH Panel, 2010), this work was started following an evaluation of the EU plant health regime. Therefore, to facilitate the decision-making process, in the conclusions of the pest categorisation, the Panel addresses explicitly each criterion for a Union quarantine pest and for a Union regulated non-quarantine pest in accordance with Regulation (EU) 2016/2031 on protective measures against pests of plants, and includes additional information required in accordance with the specific terms of reference received by the European Commission. In addition, for each conclusion, the Panel provides a short description of its associated uncertainty.

Table 1 presents the Regulation (EU) 2016/2031 pest categorisation criteria on which the Panel bases its conclusions. All relevant criteria have to be met for the pest to potentially qualify either as a quarantine pest or as a regulated non-quarantine pest (RNQP). If one of the criteria is not met, the pest will not qualify. A pest that does not qualify as a quarantine pest may still qualify as a RNQP that needs to be addressed in the opinion. For the pests regulated in the protected zones only, the scope of the categorisation is the territory of the protected zone; thus, the criteria refer to the protected zone instead of the EU territory.

It should be noted that the Panel’s conclusions are formulated respecting its remit and particularly with regard to the principle of separation between risk assessment and risk management (EFSA founding regulation (EU) No 178/2002); therefore, instead of determining whether the pest is likely to have an unacceptable impact, the Panel will present a summary of the observed pest impacts. Economic impacts are expressed in terms of yield and quality losses and not in monetary terms, whereas addressing social impacts is outside the remit of the Panel, in agreement with the EFSA guidance on a harmonised framework for pest risk assessment (EFSA PLH Panel, 2010).

**Table 1:** Pest categorisation criteria under evaluation, as defined in Regulation (EU) 2016/2031 on protective measures against pests of plants (the number of the relevant sections of the pest categorisation is shown in brackets in the first column)

Criterion of pest categorisation	Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35)	Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest
<b>Identity of the pest (Section 3.1)</b>	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?
<b>Absence/ presence of the pest in the EU territory (Section 3.2)</b>	Is the pest present in the EU territory? If present, is the pest widely distributed within the EU? Describe the pest distribution briefly!	Is the pest present in the EU territory? If not, it cannot be a protected zone quarantine organism	Is the pest present in the EU territory? If not, it cannot be a regulated non-quarantine pest. (A regulated non-quarantine pest must be present in the risk assessment area)

Criterion of pest categorisation	Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35)	Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest
<b>Regulatory status (Section 3.3)</b>	If the pest is present in the EU but not widely distributed in the risk assessment area, it should be under official control or expected to be under official control in the near future	The protected zone system aligns with the pest free area system under the International Plant Protection Convention (IPPC). The pest satisfies the IPPC definition of a quarantine pest that is not present in the risk assessment area (i.e. protected zone)	Is the pest regulated as a quarantine pest? If currently regulated as a quarantine pest, are there grounds to consider its status could be revoked?
<b>Pest potential for entry, establishment and spread in the EU territory (Section 3.4)</b>	Is the pest able to enter into, become established in, and spread within, the EU territory? If yes, briefly list the pathways!	Is the pest able to enter into, become established in, and spread within, the protected zone areas? Is entry by natural spread from EU areas where the pest is present possible?	Is spread mainly via specific plants for planting, rather than via natural spread or via movement of plant products or other objects? Clearly state if plants for planting is the main pathway!
<b>Potential for consequences in the EU territory (Section 3.5)</b>	Would the pests' introduction have an economic or environmental impact on the EU territory?	Would the pests' introduction have an economic or environmental impact on the protected zone areas?	Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting?
<b>Available measures (Section 3.6)</b>	Are there measures available to prevent the entry into, establishment within or spread of the pest within the EU such that the risk becomes mitigated?	Are there measures available to prevent the entry into, establishment within or spread of the pest within the protected zone areas such that the risk becomes mitigated? Is it possible to eradicate the pest in a restricted area within 24 months (or a period longer than 24 months where the biology of the organism so justifies) after the presence of the pest was confirmed in the protected zone?	Are there measures available to prevent pest presence on plants for planting such that the risk becomes mitigated?
<b>Conclusion of pest categorisation (Section 4)</b>	A statement as to whether (1) all criteria assessed by EFSA above for consideration as a potential quarantine pest were met and (2) if not, which one(s) were not met	A statement as to whether (1) all criteria assessed by EFSA above for consideration as potential protected zone quarantine pest were met, and (2) if not, which one(s) were not met	A statement as to whether (1) all criteria assessed by EFSA above for consideration as a potential regulated non-quarantine pest were met, and (2) if not, which one(s) were not met

The Panel will not indicate in its conclusions of the pest categorisation whether to continue the risk assessment process, but following the agreed two-step approach, will continue only if requested by the risk managers. However, during the categorisation process, experts may identify key elements and knowledge gaps that could contribute significant uncertainty to a future assessment of risk. It would be useful to identify and highlight such gaps so that potential future requests can specifically target the major elements of uncertainty, perhaps suggesting specific scenarios to examine.

### 3. Pest categorisation

#### 3.1. Identity and biology of the pest

##### 3.1.1. Identity and taxonomy

*Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?*

**Yes**

*Coniferiporia sulphurascens* (Pilát) L.W. Zhou & Y.C. Dai and *Coniferiporia weirii* (Murrill) L.W. Zhou & Y.C. Dai are fungi of the family Hymenochaetaceae.

The two species had previously been described as two different forms (a Douglas-fir form and a cedar form; Larsen and Lombard, 1989) of the species *Inonotus weirii* which is listed in Annex IAI in Council Directive 2000/29/EC. However, the suggestion that these two forms are distinct species was already made in the 1990s using enzyme-linked immunosorbent assay (ELISA) (Banik et al., 1993).

Both species have previously been accommodated under the genera *Inonotus*, *Phellinus* and *Phellinidium*. Following a recent phylogenetic analysis of the latter genus, the two species were moved to the genus *Coniferiporia* (Zhou et al., 2016).

Species synonyms listed for *C. sulphurascens* are: *Inonotus sulphurascens*, *Phellinidium sulphurascens*, *Phellinus sulphurascens* (Index Fungorum, <http://www.indexfungorum.org/names/names.asp>).

Species synonyms listed for *C. weirii* are: *Fomitiporia weirii*, *Fuscoporia weirii*, *Inonotus weirii*, *Phellinidium weirii*, *Phellinus weirii* and *Poria weirii* (Index Fungorum, <http://www.indexfungorum.org/names/names.asp>).

##### 3.1.2. Biology of the pest

The host range of the two fungi differs and while the biology of *C. sulphurascens* is rather well known, there is limited information regarding *C. weirii* (Hagle, 2009).

*C. sulphurascens* is known in North America to cause laminated root rot primarily in Douglas fir (*Pseudotsuga menziesii*) and grand fir (*Abies grandis*) (Hagle, 2009). Basidiocarps of *C. sulphurascens* are generally produced on the moist underside of fallen logs (Hagle, 2009). The fruit bodies are mostly annual, crust-like and mature in late summer or autumn (Hagle, 2009). Single-celled basidiospores are wind- or water-dispersed and require moisture to germinate (Hagle, 2009). Fruit body formation is uncommon in many areas and years, especially in dry conditions (Thies and Sturrock, 1995).

Spread of the fungus by root contacts is by far the dominant means of spread for *P. sulphurascens* (Lewis, 2013). New infection centres, e.g. from spores or through vegetative dispersal, appear to occur rarely (Bae et al., 1994). Instead the population structure appears to be mainly clonal with large and old genets slowly spreading in expanding disease centres (Hansen and Goheen, 2000). The genetic variation within established clones is very small and vegetative incompatibility among clones prevents new clones from establishing (Bae et al., 1994). Established clones generally stay in the site for a very long time spreading through root to root contact in living trees or via the contact of roots with infected wood (Hagle, 2009). *C. sulphurascens* can persist as a saprotroph in decaying roots and stumps up to 50 years (Hansen, 1979). By doing so the fungus can infect the regeneration following harvest (Hagle, 2009). Spread is assumed to be very limited in natural soil (EPPO, 1997).

The mycelium grows along the root surfaces and infects through both injured and healthy root bark (Lim et al., 2005). After infection of the root, the mycelium expands, kills the cambium and phloem and starts to decay the xylem (Lim et al., 2005). The mycelium may grow further up to colonise the root collar and may girdle the tree (Hagle, 2009). The optimal temperature for mycelial growth is 25°C, but growth occurs between 5°C and 30°C (Sinclair and Lyon, 2005).

The trees are killed when the roots are destroyed, due to girdling or as a result of wind-throw or secondary attack by, e.g. bark beetles (Hansen and Goheen, 2000; Hagle, 2009). This can be a very slow process and trees may be considerably infected before crown symptoms become apparent (Hagle, 2009).

*C. sulphurascens* can infect trees of any age, but the disease is most severe in stands 25–125 years old (Sinclair and Lyon, 2005). Most infested sites are moist, both cool and warm (Hagle, 2009).

There are no reports of the fungus producing conidia (EPPO, 1997).

*C. weirii* is known in North America to cause cedar laminated root and butt rot mainly in cedars (*Thuja plicata* and *Cupressus nootkatensis*) but there is limited information on the epidemiology of this pathogen (Hagle, 2009). Basidiocarps of *C. weirii* are often produced at the base of infected trees between buttress roots but can occasionally be found up to six feet high (Hagle, 2009). The fruit bodies are thin, resupinate and perennial (2–3 years; Hagle, 2009) and only found on *T. plicata* (EPPO, 1997). Sporulation occurs in spring and summer (Larsen et al., 1994).

Wounds that expose the wood by removing the bark may provide entry points for spores of *C. weirii* and may also increase the decay in already infected trees due to increased aeration (Hagle, 2009).

### 3.1.3. Intraspecific diversity

The fungus was first described as *Fomitiporia weirii* in 1914 on *T. plicata* (Murrill, 1914) and later found on several other hosts. Since around the 1940s two forms of the same fungal species have been recognised, the 'western red cedar form' and the 'Douglas fir form' (Larsen et al., 1994 and references therein). Differences in the cultural characteristics, length of setal hyphae, basidiospore germinating characteristics, host specificity, ELISA (serological) tests as well as compatibility tests and phylogenetic analysis between the two forms have confirmed that they are two separate species, i.e. *C. sulphurascens* and *C. weirii* (Angwin and Hansen, 1989; Larsen and Lombard, 1989; Banik et al., 1993; Larsen et al., 1994; Zhou et al., 2016).

Serological tests and monocaryon matings suggest that North American *P. sulphurascens* isolates are more closely related to Russian isolates of *P. sulphurascens* than to cedar form isolates of *C. weirii* (Banik et al., 1993; Larsen et al., 1994). However, isozyme patterns and pairing tests indicate that the Asian and North American populations of *C. sulphurascens* are not freely compatible (Hansen et al., 1998).

Phylogenetic studies of the genus have also indicated that an isolate identified as *C. weirii* from Turkmenistan isolated from *Juniperus* spp. is another closely related species (Zhou et al., 2016).

### 3.1.4. Detection and identification of the pest

Are detection and identification methods available for the pests?

Yes

Morphological descriptions of the species and supporting literature are given at [www.mycobank.org](http://www.mycobank.org). Further information on methods to differentiate the two species can be found in Larsen et al. (1994) and references therein.

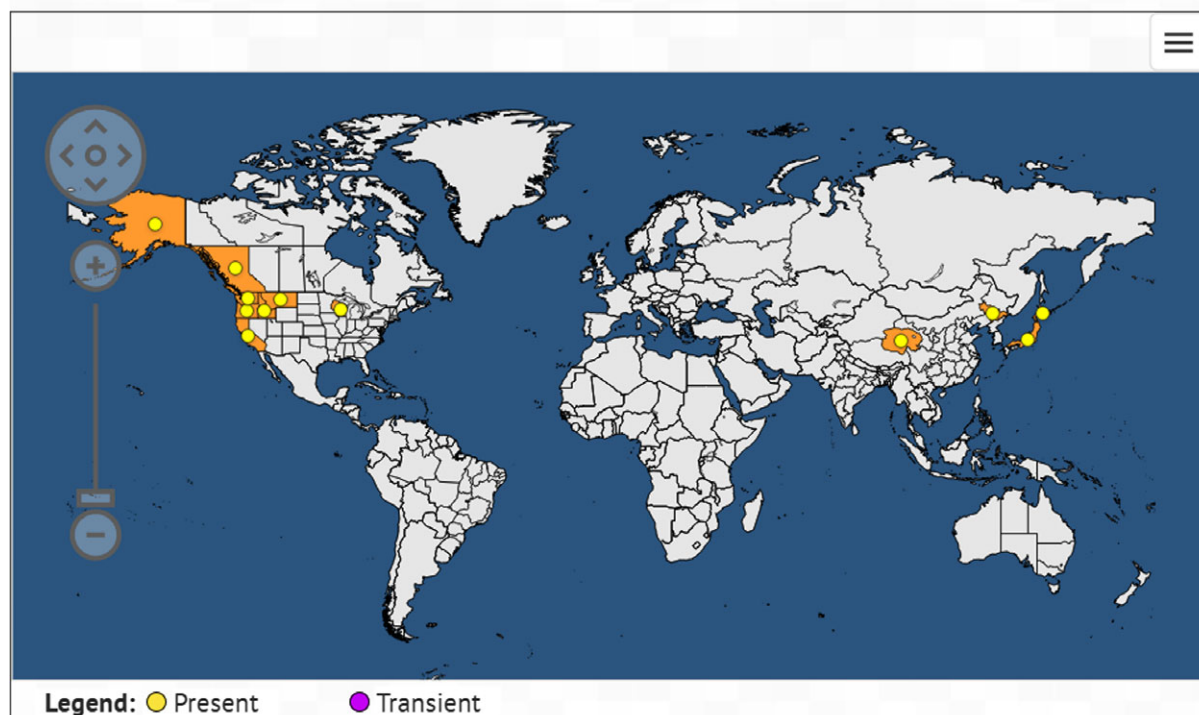
There is a multiplex polymerase chain reaction (PCR) assay based on the internal transcribed spacer (ITS) region available to detect directly from wood and identify the *C. sulphurascens/weirii* complex making it possible to distinguish the complex from other decay fungi commonly found in conifers (Gonthier et al., 2015). In addition, a PCR assay is available to distinguish the two species from each other (Lim et al., 2005).

## 3.2. Pest distribution

*C. weirii* is reported to be present in North America and Asia (Figure 1; EPPO, 2018). It is, however, likely that these observations consist of observations of both *C. weirii* and *C. sulphurascens*. No distribution data are given specifically for *C. sulphurascens* in the EPPO global database (EPPO, 2018).

## Distribution

Last updated: 2017-09-12



**Figure 1:** Global distribution map for *Coniferiporia weirii* (some observations may refer to *Coniferiporia sulphurascens*. Extracted from EPPO (2018), accessed January 2018). There are no reports of transient populations

### 3.2.1. Pest distribution outside the EU

*C. weirii* (most likely including observations of *C. sulphurascens*, see for example Banik et al., 1993; Larsen et al., 1994) is reported as present in Canada in southern British Columbia and in the USA (Alaska, California, Idaho, Montana, Oregon, Washington, Wisconsin) (EPPO, 2018).

The fungus is also present in China and Japan (EPPO, 2018). The reference given for Japan in EPPO GD refers to *C. weirii* (Aoshima, 1950). Both species appear to be present in China (Dai, 2004; Zhou et al., 2016).

*C. sulphurascens* has also been reported from Siberia (Banik et al., 1993) and the Primorsk Territory, Russia (Larsen et al., 1994), as well as from Turkey (Doğan and Karadelev, 2009).

### 3.2.2. Pest distribution in the EU

*Are the pests present in the EU territory? If present, is the pest widely distributed within the EU?*

**No**, the two pests are not reported to be present in the EU.

There are no reports of *C. sulphurascens* and of *C. weirii* from the EU (EPPO, 2018). Slovenia has reported one pathogen (*C. weirii*) as absent in July 2017 (EPPO, 2018). Also the UK, as of January 2018, reports that pathogen (as *Phellinus weirii*) as absent in the UK Plant Health Risk Register (<https://secure.fera.defra.gov.uk/phiw/riskRegister/viewPestRisks.cfm?cslref=12383>). There are no reports of absence available to the Panel that have been confirmed by survey.

## 3.3. Regulatory status

### 3.3.1. Council Directive 2000/29/EC

*C. sulphurascens/weirii* is listed in Council Directive 2000/29/EC as *Inonotus weirii*. Details are presented in Tables 3 and 4.

**Table 2:** *Coniferiporia sulphurascens/weirii* in Council Directive 2000/29/EC

<b>Annex I, Part A</b>	<b>Harmful organisms whose introduction into, and spread within, all Member States shall be banned</b>
<b>Section I</b>	<b>Harmful organisms not known to occur in any part of the Community and relevant for the entire Community</b>
(c)	Fungi
	Species
7.	<i>Inonotus weirii</i> (Murril) Kotlaba and Pouzar

### 3.3.2. Legislation addressing the hosts of *C. weirii* and *C. sulphurascens*

**Table 3:** Regulated hosts and commodities that may involve *Coniferiporia sulphurascens* and *Coniferiporia weirii* in Annexes III, IV and V of Council Directive 2000/29/EC

<b>Annex III, Part A</b>	<b>Plants, plant products and other objects the introduction of which shall be prohibited in all Member States</b>	
	Description	Country of origin
1.	Plants of <i>Abies</i> Mill., <i>Cedrus</i> Trew, <i>Chamaecyparis</i> Spach, <i>Juniperus</i> L., <i>Larix</i> Mill., <i>Picea</i> A. Dietr., <i>Pinus</i> L., <i>Pseudotsuga</i> Carr. and <i>Tsuga</i> Carr., other than fruit and seeds	Non-European countries
<b>Annex V</b>	<b>Plants, plant products and other objects which must be subject to a plant health inspection (at the place of production if originating in the Community, before being moved within the Community—in the country of origin or the consignor country, if originating outside the Community) before being permitted to enter the Community</b>	
<b>Part A</b>	Plants, plant products and other objects originating in the Community	
<b>Section II</b>	Plants, plant products and other objects which are potential carriers of harmful organisms of relevance for certain protected zones, and which must be accompanied by a plant passport valid for the appropriate zone when introduced into or moved within that zone	
1.1.	Plants of <i>Abies</i> Mill., <i>Larix</i> Mill., <i>Picea</i> A. Dietr., <i>Pinus</i> L. and <i>Pseudotsuga</i> Carr.	

## 3.4. Entry, establishment and spread in the EU

### 3.4.1. Host range

*C. sulphurascens* primarily causes damage in *P. menziesii* (Douglas fir), *Tsuga mertensiana* (mountain hemlock), *A. grandis* (grand fir), *Abies concolor* (white fir). These hosts are particularly susceptible, but the pathogen may infect all conifers (Hansen and Goheen, 2000; Hagle, 2009). *Abies amabilis* (Pacific white fir) is also considered highly susceptible (Thies and Sturrock, 1995).

Other hosts in North America reported as intermediately susceptible are: *Abies lasiocarpa*, *Abies magnifica*, *Abies procera*, *Larix occidentalis*, *Picea engelmannii*, *Picea sitchensis*, *Sequoiadendron giganteum*, *Taxus brevifolia* and *Tsuga heterophylla* (Thies and Sturrock, 1995).

Low susceptibility or tolerance has been reported for *Pinus contorta*, *Pinus lambertiana*, *Pinus monticola* and *Pinus ponderosa* (Thies and Sturrock, 1995; Hagle, 2009). *Thuja* spp. and *Cupressus* spp. are resistant and hardwoods are considered immune (Thies and Sturrock, 1995).

*C. sulphurascens* has also been isolated from *Larix sibirica* in Siberia (Banik et al., 1993) and from *Juniperus* spp. in Turkey (Doğan and Karadelev, 2009).

In Japan, other species are reported as hosts; *Abies mariesii*, *A. sachalinensis*, *Chamaecyparis* spp., *Picea jezoensis* and *Tsuga diversifolia* (EPPO, 1997).

*C. weirii* is reported to only cause disease in tree species of *Thuja* spp. and *Cupressus* spp. (Hagle, 2009), where *T. plicata* (western red cedar) and *Cupressus nootkatensis* (Alaskan yellow cedar) are reported as major hosts in North America (Hagle, 2009). Other species, such as *Abies* spp. are however also listed as hosts in Banik et al. (1993) and in China the pathogen has been reported from *Juniperus* spp. (Dai, 2004).

In Council Directive 2000/29/EC, the pest is not regulated on a particular host or commodity (Annex IAI).

### 3.4.2. Entry

Are the pests able to enter into the EU territory?

**Yes**, the two pests could enter the EU via movement of wood with bark, isolated bark and plants for planting of Cupressaceae and Pinaceae.

The main host commodities providing a pathway for entry of the two pathogens (EPPO, 1997, 2018) are:

- non-squared wood of Cupressaceae and Pinaceae
- isolated bark
- host plants for planting (including artificially dwarfed plants).

*C. sulphurascens* can persist as a saprotroph in the stem of cut trees for a very long time (Hansen, 1979), but the moisture requirements of the fungus are not known.

*C. weirii* has been isolated from bark tissue in cedar up to 5 m from ground level (Larsen et al., 1994).

Inoculation of young Douglas-fir (*P. menziesii*) seedlings with slabs of *C. sulphurascens* mycelia has been obtained in Petri dishes (Sturrock et al., 2007). In addition, the roots of potted and outplanted seedlings of nine coniferous species known to be susceptible to *C. weirii* (Douglas fir, grand fir, lodgepole pine, noble fir, Sitka spruce, western hemlock, western red cedar, western white pine and yellow cedar) were inoculated successfully (Sturrock and Reynolds, 1998). This suggests that also host plants for planting can be a potential pathway of entry. The Panel could not find information about whether seed can be a pathway of entry.

As of January 2018, there were no records of interception of *C. weirii* (code INONWE) in the Europhyt database. *C. sulphurascens* is not listed in the Europhyt database.

### 3.4.3. Establishment

Are the pests able to become established in the EU territory?

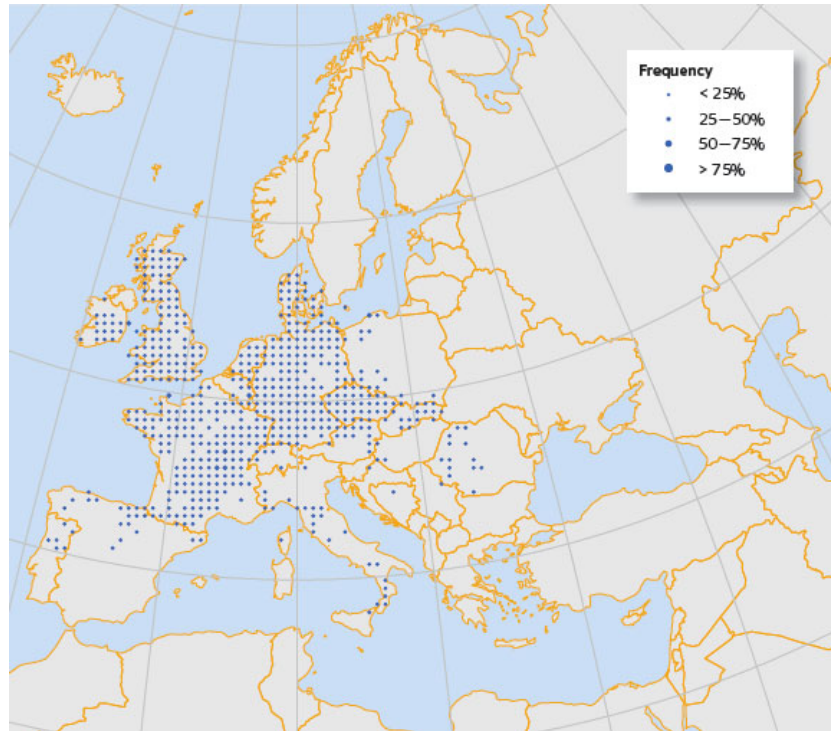
**Yes**, the two pests could establish in the EU, as hosts are present and favourable climatic conditions are common.

#### 3.4.3.1. EU distribution of main host plants

*Pseudotsuga menziesii*, which is reported as highly susceptible to *C. sulphurascens*, was introduced to Europe at the beginning of the early 1800s and is an economically important species in central European forests (Da Ronch et al., 2016) (Figure 2).

*Abies* species are reported as hosts of both *C. sulphurascens* and *C. weirii* in North America. Some of these tree species are highly susceptible to infection by *C. sulphurascens* (EPPO, 1997; Hagle, 2009). Several *Abies* species are native to Europe (Figure 3), but the susceptibility of these species is not known.

In North America, the main hosts of *C. weirii* are cedars (*T. plicata* and *Cupressus nootkatensis*). These species are mainly present in Europe as ornamental trees. Moreover, *T. plicata* has been used in forest plantations in NW Europe, e.g. in the British Isles (Farjon, 2013), where it is reported as a neophyte regenerating from seed and increasing in distribution (Anon, 2018). The Mediterranean cypress (*Cupressus sempervirens*), widely used as an ornamental tree, is mainly found in some of the Mediterranean countries (Caudullo and de Rigo, 2016), but the susceptibility of this species to *C. weirii* is not known.



**Figure 2:** Plot distribution and simplified chorology map for *Pseudotsuga menziesii*. Frequency of *P. menziesii* occurrences within the field observations as reported by National Forest Inventories (Da Ronch et al., 2016)



**Figure 3:** Plot distribution and simplified chorology map for *Abies* spp. Chorology of the native spatial range for the Circum-Mediterranean firs (Caudullo and Tinner, 2016)



### 3.4.3.2. Climatic conditions affecting establishment

The distribution of *C. sulphurascens* and *C. weirii* in North America and Japan (Figure 1; section 3.2) covers areas with temperate and cold Köppen-Geiger climate types, which are found in large parts of the EU (Peel et al., 2007) and to a large extent overlap with the distribution of *Pseudotsuga menziesii* and *Abies* spp.

### 3.4.4. Spread

*Is the pest able to spread within the EU territory following establishment? How?*

**Yes**, by movement of wood and isolated bark, wind- and water-dissemination of basidiospores, and root contact with infected root/wood.

*RNQPs: Is spread mainly via specific plants for planting, rather than via natural spread or via movement of plant products or other objects?*

**No**, plants for planting are a potential pathway of spread, but not the main one.

The fungus may spread through the dissemination of wind- and water-dispersed basidiospores (Hagle, 2009). However, spores are generally not considered important for the dispersal of the disease (Bae et al., 1994; EPPO, 1997). Instead, the fungus mostly spreads through root to root contact in living trees or via the contact of roots with infected wood within the stand (Sinclair and Lyon, 2005; Hagle, 2009; Lewis, 2013). An annual spread rate of 20–40 cm has been observed corresponding to the growth rate of the mycelia along the roots (Sinclair and Lyon, 2005).

Longer distance spread may be due to transport of infected wood, isolated bark and plants for planting, given that the fungus could be associated with these commodities as described in Section 3.4.2.

## 3.5. Impacts

*Would the pests' introduction have an economic or environmental impact on the EU territory?*

**Yes**, the introduction of the two pests could have an impact in coniferous woodland, plantations and ornamental trees.

*RNQPs: Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting?<sup>4</sup>*

**Yes**, the introduction of the two pests could have an impact on the intended use of plants for planting.

Both fungi cause a white rot type of decay in which both cellulose and lignin are degraded (Hagle, 2009). Laminated root rot has been described as 'the most serious forest disease in western North America' (Thies, 1984). Given the wide range of coniferous hosts, the introduction of the pest into the EU could lead to substantial economic losses (EPPO, 1997).

Infections of *C. sulphurascens* may be found both dispersed and aggregated in stands, but high mortality generally occurs in infection centres (Hagle, 2009) (Figure 4). The highest level of damage in North America is found in coastal Douglas-fir forests of Oregon, Washington and British Columbia (Hagle, 2009). In Oregon, surveys indicate that about 9% of the Douglas-fir forest consists of infection centres of *C. sulphurascens* with an estimated mortality of 50% (Hansen and Goheen, 2000). In Vancouver Island, the disease is found in 80% of second-growth Douglas-fir stands (Bloomberg and Reynolds 1985). In Idaho and Montana, 739,000 acres have been estimated to be infested and 156,000 acres of these have at least a 25% mortality rate of the basal area over 15 years. In these two states, large canopy gaps in the most productive forest stands are found on 15,400 acres (Hagle, 2009).

In a study where different tree species were planted in infested sites, mortality rates after 17–20 years were nearly 30% for grand fir, 26% for Douglas fir, 12% for Western hemlock, 11% for ponderosa pine and 5% for western red cedar and other pine species (Nelson and Sturrock, 1993; Hagle, 2009).

<sup>4</sup> See section 2.1 on what falls outside EFSA's remit.

The fungus causes reduction in tree growth due to reduced nutrient and water uptake, and because of the allocation of resources to defence rather than to growth (Lewis, 2013). Thies (1983) estimated growth rates in trees killed by *C. sulphurascens* as 32% less than those of healthy counterparts in their last 10 years of growth. Goheen and Hansen (1993) estimated a combined growth reduction and mortality loss of 40–70% in infested areas (reviewed by Lewis, 2013).



**Figure 4:** Mortality centre due to *Coniferiporia sulphurascens/weirii* in the USA (photo by Robert L. James, USDA Forest Service, Bugwood.org, available online at: <https://www.invasive.org/browse/detail.cfm?imgnum=2250031>)

*C. weirii* causes decay of the heartwood mainly in butt logs and roots, often leaving them hollow (Hagle, 2009). The decay develops and increases with tree age and is especially found in mature trees at least a 100 years old (Hagle, 2009). Extensive decay does not always lead to external symptoms and the fungus rarely kills the trees (Hagle, 2009). *C. weirii* is mainly known to cause disease in *Thuja* spp. and *Cupressus* spp. (Hagle, 2009).

There seems to be no record of *C. sulphurascens* and *C. weirii* associated with plants for planting, but root to root transmission may occur in large trees if these are grown in nurseries. Once established in a site *C. sulphurascens* may persist for a very long time as the fungus is both a saprophyte and a pathogen (Hagle, 2009). Moreover, in an EPPO list of recommended phytosanitary measures for coniferous species, for 'plants for planting (except seeds) of conifers originating in countries where *Phellinus weirii* occurs', 'pest-free area for *Phellinus weirii*' is recommended (EPPO, 2014).

### 3.6. Availability and limits of mitigation measures

*Are there measures available to prevent the entry into, establishment within or spread of the pest within the EU such that the risk becomes mitigated?*

**Yes**, please see Section 3.6.2.

*RNQPs: Are there measures available to prevent pest presence on plants for planting such that the risk becomes mitigated?*

**Yes**, production of plants for planting in pest free areas can prevent pest presence on plants for planting.

### 3.6.1. Phytosanitary measures

Phytosanitary requirements are in place for coniferous wood originating from Canada, China, Japan and the USA (Annex IVAI, points 1.1 and 1.3), as well as for isolated bark of coniferous wood from non-European countries (Annex IVAI, point 7.3).

Phytosanitary measures are currently applied to plants of various conifer genera, but not all the host genera are covered (see Section 3.3.2). As mentioned in Section 3.5, in an EPPO list of recommended phytosanitary measures for coniferous species, for 'plants for planting (except seeds) of conifers originating in countries where *Phellinus weirii* occurs', 'pest-free area for *Phellinus weirii*' is recommended (EPPO, 2014).

#### 3.6.1.1. Biological or technical factors limiting the feasibility and effectiveness of measures to prevent the entry, establishment and spread of the pest

- Once established in a site *C. sulphurascens* may persist for a very long time as the fungus is both a saprophyte and a pathogen (Hagle, 2009).

#### 3.6.1.2. Biological or technical factors limiting the ability to prevent the presence of the pest on plants for planting

- There is little knowledge on the presence of the pest on plants for planting (but see Sturrock and Reynolds, 1998; Sturrock et al., 2007), and of biological or technical factors limiting the ability to prevent the presence of the pest on this pathway.

### 3.6.2. Pest control methods

Control methods against *P. sulphurascens* have been previously reviewed (Lewis, 2013) and include the following:

- Planting of resistant tree species in diseased sites can reduce impacts (Hagle, 2009).
- Removal of stumps may reduce the mortality in infected centres (Thies and Sturrock, 1995; Hagle, 2009; Cleary et al., 2013).
- Treatment of stumps with fumigants has been reported to reduce inoculum, but long term effect may be limited (Thies and Sturrock, 1995; Hagle, 2009) and use of such fumigants may not be permitted (e.g. Commission Regulation (EU) No 73/2013).

### 3.7. Uncertainty

There is limited information regarding the biology of *C. weirii*.

There is uncertainty on the current geographic distribution in Asia of both *C. sulphurascens* and *C. weirii*.

A knowledge gap is the level of susceptibility of conifers native to Europe.

There is little knowledge on the presence of the pest on plants for planting, and of biological or technical factors limiting the ability to prevent the presence of the pest on this pathway.

## 4. Conclusions

Both *C. sulphurascens* and *C. weirii* meet the criteria assessed by EFSA for consideration as potential quarantine pests (Table 4).

**Table 4:** The Panel’s conclusions on the pest categorisation criteria defined in Regulation (EU) 2016/2031 on protective measures against pests of plants (the number of the relevant sections of the pest categorisation is shown in brackets in the first column)

Criterion of pest categorisation	Panel’s conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel’s conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
<b>Identity of the pest (Section 3.1)</b>	The identity of the two species ( <i>C. sulphurascens</i> and <i>C. weirii</i> ) is clear	The identity of the two species ( <i>C. sulphurascens</i> and <i>C. weirii</i> ) is clear	None
<b>Absence/presence of the pest in the EU territory (Section 3.2)</b>	The two pests are not reported to be present in the EU	The two pests are not reported to be present in the EU	None
<b>Regulatory status (Section 3.3)</b>	The two pests are regulated by Council Directive 2000/29/EC (Annex IAI) (as <i>Inonotus weirii</i> ) as a harmful organism whose introduction into, and spread within, all Member States shall be banned	The two pests are regulated by Council Directive 2000/29/EC (Annex IAI) (as <i>Inonotus weirii</i> ) as a harmful organism whose introduction into, and spread within, all Member States shall be banned	None
<b>Pest potential for entry, establishment and spread in the EU territory (Section 3.4)</b>	<p>Entry: the two pests could enter the EU via wood with bark, isolated bark and plants for planting of Cupressaceae and Pinaceae</p> <p>Establishment: hosts and favourable climatic conditions are widespread in the risk assessment area</p> <p>Spread: the two pests would be able to spread following establishment by movement of wood with bark, isolated bark and plants for planting of Cupressaceae and Pinaceae, as well as natural spread</p>	Plants for planting are not the main pathway of entry and spread, given that the pathogen can disperse also by movement of wood with bark and isolated bark	<p>There is uncertainty on the current geographic distribution in Asia of both <i>C. weirii</i> and <i>C. sulphurascens</i></p> <p>There is little knowledge on the presence of the pest on plants for planting</p>
<b>Potential for consequences in the EU territory (Section 3.5)</b>	The introduction of the two pests would have economic and environmental impacts in coniferous woodlands, plantations and ornamental trees	The introduction of the two pests could have an impact on the intended use of plants for planting	A knowledge gap is the level of susceptibility of conifers native to Europe
<b>Available measures (Section 3.6)</b>	Planting of resistant tree species in diseased sites and removal of stumps in infected centres may reduce the impacts	Production of plants for planting in pest free areas can prevent pest presence on plants for planting	There is uncertainty about the biological or technical factors limiting the ability to prevent the presence of the two pests on the plants for planting pathway
<b>Conclusion on pest categorisation (Section 4)</b>	For both pathogens, the criteria assessed by the Panel for consideration as a potential quarantine pest are met	For both pathogens, the criterion on the pest presence in the EU is not met	

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Aspects of assessment to focus on/scenarios to address in future if appropriate	The main knowledge gaps concern: (i) the distribution of the two pest species in Asia, (ii) the level of susceptibility of conifers native to Europe, and (iii) the role of plants for planting as a pathway of entry and spread		

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## Abbreviations

DG SANTÉ	Directorate General for Health and Food Safety
ELISA	enzyme-linked immunosorbent assay
EPPO	European and Mediterranean Plant Protection Organization
FAO	Food and Agriculture Organization
IPPC	International Plant Protection Convention
ITS	internal transcribed spacer
MS	Member State
PCR	polymerase chain reaction
PLH	Plant Health
RNQP	regulated non-quarantine pest
TFEU	Treaty on the Functioning of the European Union
ToR	Terms of Reference
USDA	United States Department of Agriculture