



Proposal for a future policy approach: *Neocerambyx raddei* (Coleoptera: Cerambycidae)



Neocerambyx raddei adult female. Photo credit: Wang Xioa-Yi (Chinese Academy of Forestry)



Cross-section of *N. raddei* larval galleries in the xylem. Photo credit: Wang Xioa-Yi (Chinese Academy of Forestry)

Background

Neocerambyx raddei (oak longhorn beetle) (formerly known as *Massicus raddei*) is a beetle of the subfamily Cerambycinae. It is only present in East Asia, and is a major pest of *Quercus* (oaks) in Northeast China with severe outbreaks occurring since 1993.

Neocerambyx raddei has also been recorded on *Castanea* (chestnut) and *Castanopsis* (chinquapin). This pest was identified during horizon scanning of literature for the UK Plant Health Risk Register, and it was added to the EPPO (European and Mediterranean Plant Protection Organisation) Alert List in 2015. The EPPO PRA (Pest Risk Analysis) (September 2018) concludes that this pest could establish where *Quercus* and *Castanea* are grown within the EPPO region. Wood and host plants for planting are considered pathways for introduction.

Regulation of this pest is proposed for the UK. A summary of the main findings of the EPPO PRA and their significance to the UK are given below, as are recommendations for measures to minimise the risk posed by this pest to the UK.

A link to the EPPO PRA can be found at the following webpage:

Crop/sector considered most at risk in the UK

In its native range, *N. raddei* attacks Asian *Quercus* and *Castanea* species which may be planted as ornamental, amenity or agroforestry trees in the UK. This pest may also pose a risk to native *Quercus* species and naturalised *Castanea sativa* growing in the wider environment and the forest sector in the UK.

Recommendation

Neocerambyx raddei is not known to occur in the UK, and therefore it is proposed to regulate the pest as a **Plant pest not known to occur in any part of the United Kingdom**. By including *N. raddei* on this list, it will be regulated on all hosts and pathways. See below for specific requirements.

Summary and conclusions of the EPPO PRA

Risk of entry

The overall likelihood of entry was considered **moderate** (with moderate uncertainty) for host plants for planting, wood packaging material (if ISPM 15 is not applied) and firewood (as round wood). Regarding wood commodities, the likelihood of entry was considered to be lower than it might have been because of the ban on logging in outbreaks areas in Northeast China. Without this ban the risk relating to round wood would be high.

Significance to the UK: *Castanea* and *Quercus* are both high risk hosts under EU Regulations 2018/2019, Annex I. This means that plants for planting, other than seed, in vitro material, or naturally or artificially dwarfed plants, are prohibited from all non-EU countries until a risk assessment has been carried out. No risk assessment has yet been carried out, and thus *Castanea* and *Quercus* plants for planting, other than bonsais, are prohibited. If a risk assessment were carried out and the prohibition lifted, plants of *Castanea* and *Quercus* with leaves are prohibited from entering the UK (EU Regulations 2019/2072, Annex VI, part 2). However this pest could move with dormant trees so this prohibition does not fully mitigate the risk. Additionally there are currently no requirements for *Castanopsis*. There are currently no requirements for wood of *Quercus* from Asian countries where *N. raddei* is known to occur, the current requirements for wood of *Castanea* are not sufficient for this pest, and there are currently no requirements for wood of *Castanopsis*.

Risk of establishment and spread

The likelihood of *N. raddei* establishing in the EPPO region was considered **high** (with high uncertainty) as climatic conditions were not considered limiting. It was assumed that *N. raddei* would be able to develop on some European species of *Quercus* and *Castanea*. The likelihood of spread was rated as **moderate** (with moderate uncertainty) because

natural spread will be slow, but there may be long distance spread with commodities that would lead to multiple outbreaks and increase the spread.

Significance to the UK: The UK has a Köppen-Geiger climate classification of Cfb (warm temperate/fully humid/warm summer). This classification exists within the current distribution of *N. raddei* (East China and southern Japan) (EPPO PRA Annex 5, Fig. 5). The EPPO PRA maps of degree-day accumulation for Europe/the Mediterranean area and Asia shows similarities between the UK and areas where *N. raddei* occurs (northern Japan and parts of the Russian Far East) (Annex 5, Fig. 2). So far, *N. raddei* has not been reported on *Quercus* or *Castanea* species that are present in the natural environment in the UK, but known hosts of *Quercus* and *Castanea* are available as ornamentals and fruit trees. Following the conclusions of the EPPO PRA, it is assumed that *N. raddei* would pose a risk to native *Quercus* spp. and naturalised *Castanea sativa* growing in the wider environment and the forest sector in the UK.

Economic, environmental and social impact

Since 1993 severe outbreaks have occurred in China. In Northeast China, this pest has infested c. 2640 km² and in some Chinese publications *N. raddei* has been reported to cause tree mortality. In one study, approximately 45% of trees in oak forests had been affected, resulting in ecological and economic losses. In plots with serious infestations, over 80% of oak trees in a stand were found infested.

The potential impact in the EPPO region was rated as **moderate** (with high uncertainty). Impacts would probably be lower than those observed in areas of epidemic outbreaks in Northeast China. The impact would depend on the susceptibility of *Castanea sativa* or major *Quercus* spp. in the EPPO region.

Significance to the UK: Assuming native *Quercus* spp. and *Castanea sativa* are hosts, the presence of this pest in the UK would introduce an additional threat to *Quercus* and *Castanea* which are already under pressure from outbreaks such as *Thaumetopoea processionea* (oak processionary moth), acute oak decline, *Dryocosmus kuriphilus* (chestnut gall wasp) and *Cryphonectria parasitica* (sweet chestnut blight). If native *Quercus* spp. and *Castanea sativa* are not hosts, this pest still poses a risk to ornamental species grown in the UK.

Risk management recommendations

Because of the severe outbreaks in Northeast China, the importance of *Quercus* and *Castanea* in the EPPO region, and the potential impact to the EPPO region, the EPPO expert working group (EWG) considered that phytosanitary measures should be recommended.

The EWG recommended that phytosanitary measures should apply to host genera (*Castanea*, *Quercus* and *Castanopsis*) plants for planting; wood (including firewood); wood chips, hogwood and processed wood residues; wood packaging material; and furniture and other objects made of wood of host plants (see EPPO PRA stage 3 for details).

Castanea and *Quercus* are both listed as High Risk Plants in EU Regulation 2018/2019 and as such are provisionally prohibited pending risk assessment. The measures proposed below would provide long-term mitigations against *N. raddei*.

UK risk management recommendations

***Neocerambyx raddei* Blessig, 1872** is not known to occur in the UK, and therefore regulating it as a **Plant pest not known to occur in any part of the United Kingdom** under **Insects, mites and nematodes, at all stages of their development** is proposed. By including *N. raddei* on this list, it will be regulated on all hosts and pathways.

Specific requirements for *N. raddei*

Relevant material, originating in third countries, which may only be brought into the United Kingdom if specified requirements are met

(1) Item	(2) Description of relevant material	(3) Requirements
	<p>Wood of <i>Castanea</i>, <i>Castanopsis</i> and <i>Quercus</i>, other than in the form of:</p> <ul style="list-style-type: none"> —chips, particles, sawdust, shavings, or —wood packaging material, except associated controlled dunnage, <p>but including wood which has not kept its natural round surface, originating in China, Democratic People’s Republic of Korea, Japan, Republic of Korea, Russia, Taiwan and Vietnam.</p>	<p>The wood must be accompanied by:</p> <ul style="list-style-type: none"> (a) an official statement that it originates in an area* which, in accordance with the measures specified in ISPM No. 4, is known to be free from <i>Neocerambyx raddei</i> Blessig or (b) an official statement that it has undergone an appropriate heat treatment to achieve a minimum temperature of 56 °C for a minimum duration of 30 continuous minutes throughout the entire profile of the wood, or (c) an official statement that it has undergone appropriate ionizing irradiation to achieve a minimum absorbed dose of 1 kGy throughout the wood. <p>Where the phytosanitary certificate includes the official statement referred to in paragraph (b), there must also be</p>

evidence of that heat treatment by a mark “HT” put on the wood or on any wrapping in accordance with current usage and on the phytosanitary certificate.

* The name of the area(s) must be included in the phytosanitary certificate under the heading “Additional declaration”

(1) <i>Item</i>	(2) <i>Description of relevant material</i>	(3) <i>Requirements</i>
	Wood in the form of chips, particles, wood waste or scrap obtained in whole or part from <i>Castanea</i> , <i>Quercus</i> and <i>Castanopsis</i> originating in China, Democratic People’s Republic of Korea, Japan, Republic of Korea, Russia, Taiwan and Vietnam	<p>The wood must be accompanied by:</p> <p>(a) an official statement that it originates in an area* which, in accordance with the measures specified in ISPM No. 4, is known to be free from <i>Neocerambyx raddei</i> Blessig, or</p> <p>(b) an official statement that it has been processed into pieces of not more than 2.5 cm thickness and width, or</p> <p>(c) an official statement that it has undergone an appropriate heat treatment to achieve a minimum temperature of 56 °C for a minimum duration of 30 continuous minutes throughout the entire profile of the chips, particles, wood waste or scrap.</p> <p>Where the phytosanitary certificate includes the official statement referred to in paragraph (c), there must also be evidence of that heat treatment by a mark “HT” on the phytosanitary certificate.</p> <p>* The name of the area(s) must be included in the phytosanitary certificate</p>

under the heading “Additional
declaration”

Justification for requirements on wood

Currently there are no requirements for wood of *Quercus* from Asian countries where *N. raddei* is known to occur. The current requirements for wood of *Castanea* would not be sufficient to prevent the introduction of *N. raddei* and there are currently no requirements for wood of *Castaniopsis*. The requirements proposed are the same as other similar pests. This pest is relatively large, therefore, in this case chipping 2.5 cm thickness and width is considered to be an appropriate treatment.

Heat treatments is recommended for both wood and chips, there is an EPPO standard to support this for round wood and sawn wood (PM 10/6(1) Heat treatment of wood to control insects and wood-borne nematodes (EPPO, 2009a)) and the EPPO Panel on Phytosanitary Measures considered for similar pests that heat treatment of the wood chips and waste at 56°C for 30 min throughout the material could be recommended, therefore it is included as an option here.

Ionising irradiation is an option for treatment of round wood and sawn wood as there is an EPPO standard to support this (PM 10/8(1) Disinfestation of wood with ionizing radiation (EPPO, 2009b)). There is no protocol for the treatments of wood chips etc. with ionizing radiation, therefore, it has not been included as an option.

The PRA included Fumigation with sulfuryl fluoride as a treatments option. This has not been recommended as this is not an option which has been included for other similar pests and is only effective for debarked wood below 20cm in cross-section. This option should be considered as part of a wider review of requirements for Cerambycidae.

(1) <i>Item</i>	(2) <i>Description of relevant material</i>	(3) <i>Requirements</i>
	Plants, other than scions, cuttings, plants in tissue culture, pollen or seeds of <i>Castanea</i> , <i>Castanopsis</i> and <i>Quercus</i> , intended for planting, originating in China, Democratic People’s Republic of Korea, Japan, Republic of Korea, Russia, Taiwan and Vietnam	The plants must be accompanied by: (a) an official statement that the plants have a main stem base of less than 1 cm just above the root collar; or (b) (i) an official statement that they have been grown throughout their life in an area* established by the national plant protection organisation in accordance with ISPM No. 4 as an area that is free from <i>Neocerambyx raddei</i> Blessig, and

(ii) where appropriate, packed in such a manner as to prevent infestation during transport.

or

(c) an official statement that they have been grown during a period of at least four years prior to export, or in the case of plants which are younger than four years, have been grown throughout their life:

(i) in a place of production established as free from *Neocerambyx raddei* Blessig in accordance with ISPM No. 10,

(aa) which is registered and supervised by the national plant protection organisation in the country of origin and has been subjected annually to two official inspections for any signs of *Neocerambyx raddei* Blessig carried out at appropriate times, and

(bb) where they have been grown in a site with complete physical protection against the introduction of *Neocerambyx raddei* Blessig and

(ii) immediately prior to export, the plants, and in particular their stems, have been subjected to a meticulous inspection for the presence of *Neocerambyx raddei* Blessig, which has included destructive sampling, where appropriate, and

(iii) packed in such a manner as to prevent infestation during transport.

* The name of the area(s) must be included in the phytosanitary certificate under the heading "Additional declaration"

Under EU regulation 2018/2019 the prohibition of high risk plants both *Castanea* and *Quercus* are currently prohibited. However these prohibitions are not permanent could be lifted if a risk assessment was carried out. Therefore requirements for these host are being included in this proposal to ensure protection against this pest is not lost. Plant of *Castanea* and *Quercus* with leaves are prohibited from entering the UK (Schedule 3, part A, 2). However this pest could move with dormant trees so this prohibition does not fully mitigate the risk. Therefore specific requirements for plants for planting of *Castanea* and *Quercus* in relation to this pest need to be introduced. Additionally there are currently no requirements for *Castaniopsis* and these would be introduced by this point (although *Castaniopsis* appears to be rarely grown in the UK).

For *Saperda candida*, which is a similar pest an option is included for appropriate treatment of the plants intended for export and the surrounding area (as an alternative to complete physical protection). This has not been included for this pest, as it is seen as a less secure option. Chemical treatment is not supported by the PRA as, sprays would only target adults, and therefore, would not be effective in eliminating the pest, and would only lower pest populations. Trunk injection has been used in China but has been found to not be fully effective. However, if the UK Plant Health Risk Group thinks this option should be included, to maintain consistency with similar pests, it is recommended that the requirements proposed in bb (ii) concerning destructive sampling are strengthened.

Requirements for Phytosanitary certificates

Notifiable material originating in third countries, other than the European Union

Wood, except wood packaging material, where it—

- (a) has been obtained in whole or in part from one of the following order, genera or species—

Castanea, *Castanopsis* or *Quercus* L., including wood which has not kept its natural round surface, other than sawdust or shavings, originating in China, Japan, Taiwan, Vietnam, the republic of Korea, the democratic republic of Korea and Russia.

Justification for change

This proposal would introduce requirements for a phytosanitary certificate, in the case of:

- *Quercus* wood from new countries, China, Taiwan, Vietnam, the republic of Korea, the democratic republic of Korea and Russia.
- *Castanea*. Current requirements exempt wood without bark, but for this pest requirements would apply to all wood other than sawdust and shavings.
- *Castanopsis*. There are no existing requirements for wood