Department for Environment Food & Rural Affairs

Rapid Pest Risk Analysis (PRA) for:

Agrilus convexicollis

June 2015

Stage 1: Initiation

1. What is the name of the pest?

Agrilus convexicollis Redtenbacher (Coleoptera, Buprestidae); a jewel beetle. It has two synonyms: *A. mancini* Obenberger and *A. tesari* Obenberger (http://coleopsoc.org/buprestidae/WorldCat/Genera/Agrilus.htm; accessed 11/06/2015).

2. What initiated this rapid PRA?

This species feeds on dead or dying ash trees and was picked up during horizon scanning having recently expanded its range in Russia into areas where the emerald ash borer, *Agrilus planipennis*, is present (Orlova-Bienkowskaja & Volkovitsh, 2015). It was agreed that a rapid PRA was warranted when discussing its proposed addition to the Plant Health Risk Register at the Plant Health Risk Group meeting in May 2015. A key objective is to explore the potential consequences of another non-native ash pest invasion on such a vulnerable native tree.

3. What is the PRA area?

The United Kingdom of Great Britain and Northern Ireland.

Stage 2: Risk Assessment

4. What is the pest's status in the EC Plant Health Directive (Council Directive 2000/29/EC[1]) and in the lists of EPPO[2]?

It is not listed in the EC Plant Health Directive and is not recommended for regulation as a quarantine pest by EPPO, nor is it on the EPPO Alert List.

5. What is the pest's current geographical distribution?

The distribution of this species is summarised in Table 1 of Orlova-Bienkowskaja & Volkovitsh (2015). In addition, Pedersen *et al*. (2001) noted that it is also present in Denmark and Jendek (2014) includes the Netherlands in country lists of *Agrilus* species.

Table : Distribution of *Agrilus convexicollis*

North America:	No records
Central America:	No records
South America:	No records
Europe:	It is native to Europe and distributed from Greece, Italy, Corsica and Spain in the south, to northern Germany and southern Sweden in the north, to Belgium, the Netherlands, northern France and Denmark in the north west and to the Russian Caucasus in the east (Orlova-Bienkowskaja & Volkovitsh, 2015; Pedersen *et al*., 2001; Jendek, 2014).
Africa:	No records
Asia:	Armenia, Azerbaijan, Georgia, Turkey (Orlova-Bienkowskaja & Volkovitsh, 2015)
Oceania:	No records

[1] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2000L0029:20100113:EN:PDF

[2] https://www.eppo.int/QUARANTINE/quarantine.htm

6. Is the pest established or transient, or suspected to be established/transient in the UK/PRA Area?

There are no records of this species in the UK and it has not been intercepted.

7. What are the pest's natural and experimental host plants; of these, which are of economic and/or environmental importance in the UK/PRA area?

A. convexicollis feeds on native and ornamental ash (*Fraxinus excelsior*, *F. ornus, F. pennsylvanica, Fraxinus angustifolia subsp. oxycarpa* and *F. oxyphylla*), privet (*Ligustrum vulgare)*, lilac (*Syringa vulgaris*) and olive (*Olea europea)* (Orlova-Bienkowskaja & Volkovitsh, 2015; Jendek & Polakova, 2014). It has also been reported on a wide range of other broadleaved trees (*Euonymus*, *Betula*, *Corylus*, *Populus*, *Salix*, *Quercus*, *Acer*, *Tilia*, *Ulmus*, and *Cornus*). However, Jendek & Polakova (2014) consider these records are likely to be misidentifications, the record on *Olea* to be doubtful and even the well-documented larval record on *Euonymus europaeus* (spindle) to be "surprising".

F. excelsior is a very widespread native tree. Both *F. ornus* and *Fraxinus angustifolia subsp. oxycarpa* (listed by the RHS as *Fraxinus angustifolia* "Redwood") are commonly grown as ornamentals. *F. pennsylvanica* has only 2 UK suppliers listed and *F. oxyphylla* has no suppliers according to The Royal Horticultural Society (https://www.rhs.org.uk/; accessed 11/06/2015); *F. americanus* is also listed for sale. Privet and lilac grow throughout the UK primarily in gardens but privet is also native and lilac has naturalised.

8. What pathways provide opportunities for the pest to enter and transfer to a suitable host and what is the likelihood of entering the UK/PRA area?

Four pathways have been assessed in relation to the entry of *A. convexicollis*: (i) plants for planting, (ii) cut branches, (iii) wood chips and (iv) hitchhiking. Other wood pathways and natural spread have not been assessed in detail for the following reasons.

A. convexicollis is found in stems that are usually less than 3 cm in diameter whereas *A. planipennis* is found in wood that is over 5 cm in thickness (Orlova-Bienkowskaja & Volkovitsh, 2015). As such, it is very unlikely that *A. convexicollis* will be associated with the wood pathways (round wood, wood with bark, bark, bark-free wood, firewood and wood packaging material) assessed in the *A. planipennis* PRA (EPPO, 2014) because they are more likely to come from trunks and branches of larger diameters. In addition, there should be no opportunity for *A. convexicollis* to enter on wood of this kind from the area in Russia where its population is increasing because, under Article IVA1 paragraph 2.3 of EU Council Directive 2000/29/EC, any *Fraxinus* wood of this nature imported from Russia must have an official statement that: (i) the plants originate in an area recognised

as being free from *A. planipennis,* or (ii) the bark and at least 2.5 cm of the outer sapwood have been removed or (iii) the wood has been irradiated to achieve a minimum absorbed dose of 1 kGy throughout the wood. *A. convexicollis* has a very low likelihood of surviving in particles, sawdust, shavings, wood waste and scrap and this pathway is not considered further.

Natural spread is also considered very unlikely and not discussed further because the Channel is too wide for the adults to cross assuming this species cannot fly further than the maximum of 10 km reported for *A. planipennis* (see section 11).

Plants for Planting

The entry of *A. convexicollis* on plants for planting from Europe and western Asia is assessed as very unlikely. Currently, the import of ash plants is effectively prohibited by the amendment to the Plant Health Order in 2012[3]. This restricts imports to ash plants originating in pest-free areas for *Hymenoscyphus fraxineus* and no country has declared a pest-free area. However, since these temporary measures are likely to be lifted in the near future, this assessment is based on the assumption that ash plants can be imported from EU member states if notified to an inspector[4]. Although this could increase the risk of pest entry, especially if large trees are imported, there will be little incentive to import and plant ash in the UK even when the embargo is lifted due to the presence of *H. fraxineus* and future concerns relating to an invasion by the emerald ash borer (*Agrilus planipennis*).

Entry with privet and lilac is also very unlikely primarily because, even though the exit holes are very small (2 mm in diameter), pre- and post- export any dead or dying plants or branches in controlled nursery environments are expected to be noticed and destroyed. There is also a very small likelihood of adults being present since adults feed on host leaves. This rating has been given a medium confidence score for three reasons. Firstly, it is possible that any dying wood is not detected, especially in winter when lilac plants have no leaves. Secondly, although *A. convexicollis* is saproxylic, i.e. living on dead and dying wood and “it is unknown whether this species is able to damage healthy trees” (Orlova-Bienkowskaja & Volkovitsh, 2015), this species is poorly studied and it is possible that it can lay eggs and develop in living tissue. Other *Agrilus* species, e.g. *A. planipennis*, attack living trees, particularly if stressed (as summarised by Straw *et al*., 2013). Several saproxylic beetles, e.g. *Ips* species, attack living trees only at high population densities. Thirdly, *A. convexicollis* does not appear to be common in Europe. Only small numbers of beetles tend to be found in woodland surveys, e.g. in Italy (Cocciufa *et al*., 2014) and the Czech Republic (Vodka & Cizek, 2013). However, a marked increase in its distribution and population density has occurred in Russia as a result of the spread of *A. planipennis* linked to the “widespread weakening and mortality of ash trees” (Orlova-Bienkowskaja & Volkovitsh, 2015). It is unlikely that these beetles will enter the EU because, under Article

[3] http://www.legislation.gov.uk/uksi/2012/2707/pdfs/uksi_20122707_en.pdf/$FILE/uksi_20122707_en.pdf

[4] http://legislation.data.gov.uk/cy/uksi/2013/23/made/data.htm?wrap=true

IVA1 paragraph 11.4 of EU Council Directive 2000/29/EC, *Fraxinus* plants for planting from Russia can only be imported to the EU if they come from an *A. planipennis* pest free area. However, in a similar way to the area in Russia where *A. planipennis* and *A. convexicollis* coincide, it is possible that the distribution and population density of *A. convexicollis* might also be increasing in the large areas of Europe where *Fraxinus* has been attacked by *H. fraxineus* (Pautasso *et al*., 2013) and thus enhance the likelihood of association with the pathway.

Plants for Planting	Very unlikely	☐	Unlikely	☑	Moderately likely	☐	Likely	☐	Very likely ☐
Confidence	High Confidence	☐	Medium Confidence	☑	Low Confidence	☐			

Cut branches

Since cut branches of ash are defined as plants, they are also prohibited from entry by the same legislation as for plants for planting (see above). Even if the prohibition is lifted, it is very unlikely that ash branches will be imported. Privet and lilac, particularly bouquets of flowering lilac, may be imported. However, any stems with dead or dying wood are likely to be discarded before import and, even if they contain eggs or larvae, are likely to be too thin to allow complete development. There is a very small likelihood of adults being present since adults feed on host leaves. Although it is a distinctive beetle (iridescent brown), it is only 3.5-5.5 mm in length and may not be spotted. However, it is very unlikely that this species will be present in the relatively controlled environments of the nurseries where cut branches of lilac originate. There should be no opportunity for *A. convexicollis* to enter the EU on cut branches from the area in Russia where its population is increasing because, under Article IVA1 paragraph 11.4 of EU Council Directive 2000/29/EC, any *Fraxinus* cut branches imported from Russia with or without leaves must have an official statement that the plants originate in an area recognised as being free from *A. planipennis*.

Cut branches	Very unlikely	☑	Unlikely	☐	Moderately likely	☐	Likely	☐	Very likely ☐
Confidence	High Confidence	☑	Medium Confidence	☐	Low Confidence	☐			

Wood chips

Fraxinus wood with diameters smaller than 3 cm could form all or part of wood chips that are imported into the UK. However, there should be no opportunity for *A. convexicollis* to enter with this material from the area in Russia where its population is increasing because, under Article IVA1 paragraphs 2.4 and 2.5 of EU Council Directive 2000/29/EC, any *Fraxinus* wood of this nature imported from Russia must have an official statement that the plants originate in an area recognised as being free from *A. planipennis*. Even if the low population densities of this species elsewhere in Europe is increasing due to *H. fraxineus*,

A. convexicollis has a low likelihood of surviving the processes used to manufacture wood chips. This pathway is therefore given a rating of unlikely with high confidence.

Wood chips	Very unlikely	☐	Unlikely	☑	Moderately likely	☐	Likely	☐	Very likely	☐	
Confidence	High Confidence	☑	Medium Confidence	☐	Low Confidence	☐					

Hitchhiking

Although adults could hitchhike with other commodities, this is unlikely because population densities in Europe are generally low and adults will tend to be associated with their host plants. This pathway is given an unlikely rating rather than a very unlikely rating and medium confidence because: (i) population densities may now be increasing in Europe and *A. convexicollis* could exploit the large amount of dead and dying ash caused by *H. fraxineus* and (ii) hitchhiking may be responsible for the movement of *A. planipennis* and *A. convexicollis* in Russia (see section 11). On arrival in the UK, transfer would be relatively straightforward since its hosts are ubiquitous.

Hitchhiking	Very unlikely	☐	Unlikely	☑	Moderately likely	☐	Likely	☐	Very likely	☐	
Confidence	High Confidence	☐	Medium Confidence	☑	Low Confidence	☐					

9. How likely is the pest to establish outdoors or under protection in the UK/PRA area?

Outdoor establishment in the UK is considered to be very likely with high confidence because this species is found in northern France, Belgium and the Netherlands where the climate is similar to southern England and hosts are ubiquitous. It is very unlikely to establish in protected cultivation because the hosts are not normally grown there (though large numbers of ash trees are currently being grown in protected cultivation for *H. fraxineus* tolerance trials in 2016)[5]. Removal of dead/dying wood and plants is likely to prevent its survival in commercial nurseries.

Outdoors	Very unlikely	☐	Unlikely	☐	Moderately likely	☐	Likely	☐	Very likely	☑	
Confidence	High Confidence	☑	Medium Confidence	☐	Low Confidence	☐					

[5] https://twitter.com/Forest_Research/status/608658621283639298

Under Protection	Very unlikely	✓	Unlikely		Moderately likely		Likely		Very likely	
Confidence	High Confidence	✓	Medium Confidence		Low Confidence					

10. If the pest needs a vector, is it present in the UK/PRA area?

A. convexicollis is a free living organism and no vector is required.

11. How quickly could the pest spread in the UK/PRA area?

No information has been published on the natural spread capabilities of *A. convexicollis.* However, it is unlikely to be greater than the maximum 10 km reported for *A. planipennis* (as summarised by Straw *et al*. (2013)). Only a very small proportion of adults are likely to fly even this far (Siegert *et al*., 2015).

Orlova-Bienkowskaja & Volkovitsh (2015) mapped the distribution of *A. convexicollis* in 2007 and compared this with the locations of the six new findings in the Moscow area where *A. planipennis* is now present. They concluded that the limits to its distribution had expanded northwards by approximately 665 km since 2003 assisted by the presence of *A. planipennis*. They considered that it is very unlikely that the species was previously present in the area but at too low a density to be detected because this area has been intensively surveyed for xylophagous beetles and *A. convexicollis* is relatively easy to spot and identify. However, there are other *Agrilus* species superficially the same in general appearance so spotting and identifying these beetles in the field would be difficult (Joe Ostoja-Starzewski, Personal Communication, 17/06/2015). Orlova-Bienkowskaja & Volkovitsh (2015) do not provide an explanation for such rapid spread apart from the "widespread weakening and mortality of ash trees caused by the emerald ash borer invasion". However, to come in contact with ash trees that are dead and dying from *A. planipennis* infestation*, A. convexicollis* will initially have had to spread a long way northwards from the then known northern limit to its distribution. Only by 2013, when *A. planipennis* had spread 460 km southwards from Moscow (Orlova-Bienkowskaja, 2014) would this distance have become relatively short and until 2009, when the rate of spread increased to over 30 km per year, only a maximum spread of 12 km per year had been estimated (Straw *et al*., 2013).

As such, it is very likely that, as with the spread of *A. planipennis* from Moscow, the apparent rapid northwards movement of *A. convexicollis* in Russia could only have been caused by natural spread. Straw *et al*. (2013) concluded that hitchhiking with vehicles along the busy motorways leading from Moscow was most likely to be responsible for the spread of *A. planipennis*.This may also have been the main means for *A. convexicollis* movement following an initial colonisation in the Moscow area where dead and dying ash led to an increase in its population.

Natural Spread	Very slowly	☐	Slowly	☑	Moderate pace	☐	Quickly	☐	Very quickly	☐
Confidence	High Confidence	☑	Medium Confidence	☐	Low Confidence	☐				

With human assistance	Very slowly	☐	Slowly	☐	Moderate pace	☐	Quickly	☑	Very quickly	☐
Confidence	High Confidence	☐	Medium Confidence	☑	Low Confidence	☐				

12. What is the pest's economic, environmental and social impact within its existing distribution?

The impacts within its current distribution are considered to be very small. This is because, although the adults may feed on leaves, its population is very low (apart from in the Moscow area where *A. planipennis* is present) and its larvae are found in plants that are already dead or dying due to the action of a primary pest or other stressors. Larvae are thus assumed to be saproxylic, developing mainly in the cambial region of recently dead shoots and branches of ash trees (Brechtel and Kostenbader, 2002 quoted by Orlova-Bienkowskaja & Volkovitsh, 2015). Since its galleries have only been found in ash wood that is less than 3 cm in diameter, it is unlikely to cause economic damage to ash wood products.

The main reason for giving this species a low confidence score is because, although there are no records of it attacking healthy trees or plant parts (Orlova-Bienkowskaja & Volkovitsh, 2015), it is poorly studied and it is possible that, like *A. planipennis*, it might be able to attack plants already stressed by drought and other factors. *Agrilus* species are known to feed on fresh wood that is stressed by, e.g. drought, shading or physical damage (Telfer, 2015). Several saproxylic beetles, e.g. *Ips* species, attack living trees only at high population densities. Even if *A. convexicollis* only attacks dead or dying plant tissue this species might still act as a secondary pest hastening tree mortality or reducing the effectiveness of host resistance.

Impacts	Very small	☑	Small	☐	Medium	☐	Large	☐	Very large	☐
Confidence	High Confidence	☐	Medium Confidence	☐	Low Confidence	☑				

13. What is the pest's potential to cause economic, environmental and social impacts in the UK/PRA area?

Its potential economic impacts in the UK are given a small impact rating rather than the very small rating given in Section 12 even though: (a) it is primarily a secondary coloniser of dead or dying plants hastening the mortality of dying plants that already have little

economic value and (b) dead or dying plants or parts of plants, including privet (*Ligustrum vulgare*) and lilac (*Syringa vulgaris*) as well as *Fraxinus*, in commercial horticulture and private gardens, are likely to be removed due to the primary cause and thus be unavailable for colonisation by *A. convexicollis.* This is because attempts to develop varieties of ash that are tolerant to *H. fraxineus* would be hampered if *A. convexicollis* attacks specimens that are stressed but not killed by this fungus.

Its potential environmental and social impacts have also been given a small impact rating and a low confidence score. Any agent that increases the likelihood of tree death or the speed at which tree mortality occurs will increase the vulnerability of ash growing in gardens and the wider environment since it is already suffering extensive mortality due to *H. fraxineus* and is under threat from other pests currently absent from the UK such as *A. planipennis*. As Straw *et al*. (2013) have said "Consequently, once the distributions of *C. fraxinea* [i.e. *H. fraxineus*] and *A. planipennis* overlap, as they inevitably will, the combined action of the two organisms is likely to leave very few ash trees remaining intact".

To clarify the potential threat, the key issue is to determine the extent to which *A. convexicollis* can attack living plants and parts of plants. Three other factors would also be worth investigating: (i) whether *A. convexicollis* populations are increasing in Europe where it occurs together with *H. fraxineus,* (ii) to what extent native saproxylic beetles will mask any potential impacts caused by *A. convexicollis* and (iii) the potential role that might be played by bio-control agents.

(i) Are *A. convexicollis* populations increasing in Europe where it occurs together with *H. fraxineus?*

This would give useful insights into the extent to which *A. convexicollis* can exploit the presence of dead, dying and stressed ash caused by Chalara ash dieback. *Hymenoscyphus fraxineus* has not yet been recorded from the area in Russia where *A. planipennis* is present and *A. convexicollis* is expanding its range (Pautasso *et al*., 2013).

(ii) To what extent will native saproxylic beetles mask any potential impacts caused by *A. convexicollis?*

It would be interesting to know to what extent native saproxylic beetles are already benefiting from the large amount of dead and dying ash caused by *H. fraxineus* in the UK and therefore whether their impacts would dominate any damage caused by an invasion of *A. convexicollis*. Studies on the potential ecological impact of *H. fraxineus* tend to focus on the species dependent on ash for their survival rather than species that will benefit in the short term from the increase in dead and dying trees (Mitchell *et al*., 2014a,b; Littlewood *et al*., 2015). Alexander (2002) lists several beetles associated with living and decaying ash in the UK and Ireland, several of which are discussed below.

Tetrops starkii is a cerambycid species that feeds in decaying or recently dead ash twigs with the adults feeding on the leaves. It is known only from *Quercus* in the UK and from *Fraxinus* in Europe. Orlova-Bienkowskaja (2015) considers that the distribution and population density of this species on *F. pennsylvanica* is increasing in the area of Russia

where *A. planipennis* is established in a similar way to *A. convexicollis*. It is a UK Red Data Book species and therefore rare in the UK.

Four scolytid beetles (Family: Curculionidae) in the genus *Hylesinus* attack ash and two of these, *H. oleiperda* (the lesser ash bark beetle also known as *H. toranio*) and *H. orni,* have similar niches to *A. convexicollis* since both can produce larval galleries in recently dead slender branches. *H. oleiperda* can also be found in twigs and has a southern distribution. *H. orni* is nationally scarce and may not be a distinct species. *H. crenatus* is only found in the thick bark of dying ash trunks, while *H. varius* (the common ash bark beetle also known as *Lyperisinus varius*) not only attacks standing and fallen dead trunks and boughs but also makes short hibernation galleries in crotches of living trees that are associated with ash rose canker. Orlova-Bienkowskaja (2015) has shown that *H. varius* populations on *F. pennsylvanica* are increasing in the area of Russia where *A. planipennis* is established in a similar way as *A. convexicollis*. The percentage of trees damaged by *H. varius* varies from 5-60%. Some trees that have been attacked by *H. varius* but not by *A. planipennis* have been seriously damaged or even killed.

Of the 12 buprestid species in the western Palearctic Region with *Fraxinus* recorded as a host, only *Agrilus cyanescens* is present in the UK. It has arrived recently (Hodge, 2010). Virtually no information on the developmental biology of the larvae of A. cyanescens has been published, but this species has been described as polyphagus with *Fraxinus* as a recorded host (Verdugo, 2005 in Hodge, 2010). It is has recently spread in Denmark and Sweden but here it feeds on honeysuckle (Fägerström et al., 2009).

While such species should benefit in the short term from the current glut of dead and dying ash, if the survival of ash in the UK becomes seriously threatened, they will also be in danger unless they can move to other hosts.

iii) <u>What role might be played by bio-control agents?</u>

Apart from the recent northwards spread in Russia (Orlova-Bienkowskaja & Volkovitsh, 2015), it is also possible that *A. convexicollis* has not spread outside its native range where its populations are regulated by parasitoids and other factors so it has not been able to demonstrate its full pest potential. Within its native range (Eastern Asia), *A. planipennis* is only a minor secondary pest (Straw *et al*., 2015) and it is possible that outside its native range, e.g. in the UK, *A. convexicollis* could also be much more damaging. However, it is noteworthy that 50% of the *A. planipennis* larvae collected by Orlova-Bienkowskaja & Volkovitsh (2015) were parasitized by a European braconid parasitoid, *Spathius polonicus* (Orlova-Bienkowskaja & Belokobylskij, 2014), a species absent from the UK. Eight *A. convexicollis* larvae were parasitized by an unidentified braconid parasitoid in the Moscow area (Orlova-Bienkowskaja, 2015).

Economic Impacts	Very small	☐	Small	☑	Medium	☐	Large	☐	Very large ☐
Confidence	High Confidence	☐	Medium Confidence	☐	Low Confidence	☑			

Environ - mental Impacts	Very small	☐	Small	☑	Medium	☐	Large	☐	Very large	☐
Confidence	High Confidence	☐	Medium Confidence	☐	Low Confidence	☑				
Social Impacts	Very small	☐	Small	☑	Medium	☐	Large	☐	Very large	☐
Confidence	High Confidence	☐	Medium Confidence	☐	Low Confidence	☑				

14. What is the pest's potential as a vector of plant pathogens?

A. convexicollis is not known to vector any plant pathogens.

15. What is the area endangered by the pest?

Eastern parts of the UK, where Chalara ash dieback is particularly common and widespread, are most at risk. Plantings of ash aiming to identify *H. fraxineus* resistance would be of particular concern.

Stage 3: Pest Risk Management

16. What are the risk management options for the UK/PRA area?

As outlined in Section 8, the ash plant import pathways are already prohibited and all other pathways except wood chips and hitchhiking have been assessed as very unlikely. Even when the prohibition is lifted, there is an obligation to notify any imports and it is unlikely that there will an incentive to restart trade. If it did enter, the hosts are so widespread that eradication and containment would be very difficult to achieve. It would therefore be appropriate to confine any action, e.g. surveillance for adults from June to August, together with pruning and tree destruction to destroy larval infestations, to protecting ash that is showing resistance to *H. fraxineus* especially at trial sites[6]. Destruction of any infested plants or plant parts could be undertaken by burning or chipping, assuming chips are

[6] http://www.forestry.gov.uk/fr/BEEH-9QZLZJ
http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=18764

covered with a tarpaulin for at least 12 months. Risk management options developed for *A. planipennis* and *A. anxius* are also relevant for this species.

17. Summary and conclusions of the rapid PRA

A. convexicollis is native to large parts of continental Europe where it feeds on dead and dying ash, privet and lilac. All the potential pathways of entry are very unlikely except for wood chips and hitchhiking which are rated unlikely. It is very likely to establish and may cause small impacts. There is only low confidence in the impact ratings because there is a possibility that living stressed trees may also be attacked. Ash trees showing resistance to Chalara ash dieback may be particularly vulnerable.

Risk of entry

The wood chips and hitchhiking pathways are rated as unlikely. All other pathways were assessed as very unlikely. The entry of ash plants for planting and branches to the UK is currently prohibited but, even when the embargo is lifted, the presence of Chalara ash dieback is likely to act as a disincentive to trade and all imports must be notified. Dead and dying plants or parts of plants of privet and lilac are likely to be discarded. Although adults feed on leaves, this species is very unlikely to be present in commercial nurseries. The principal wood pathways (round wood, wood with bark, bark, bark-free wood, firewood and wood packaging material) were considered to be very unlikely because these are generally formed from wood of larger diameters than the 3 cm attacked by *A. convexicollis.* Such smaller sized wood could form all or part of wood chips but the generally low population densities of this species in Europe coupled with the low likelihood of surviving the processes used to manufacture this type of wood led to the unlikely rating. There should be no opportunity for *A. convexicollis* to enter the EU on these pathways from the area in Russia where its population is increasing due to the presence of *A. planipennis* because, under Article IVA1 of the EU Plant Health Directive, any *Fraxinus* plants or wood imported from Russia must have an official statement that the plants originate in an area recognised as being free from *A. planipennis*.

Risk of establishment

Outdoor establishment in the UK is assessed as very likely with high confidence because this species is widespread in Europe and its hosts are ubiquitous. It is very unlikely to establish in protected cultivation because the hosts are not grown there and removal of sick plants is likely to prevent its survival in commercial nurseries.

Economic, environmental and social impact

Impacts in the UK have been rated as small and not very small even though there is no evidence that *A. convexicollis* larvae, that form galleries in dead and dying branches, attack living plants or plant parts. This is primarily because its biology is poorly known and related species attack stressed trees. As such, ash trees showing tolerance to Chalara ash

dieback could be threatened. Adults also eat leaves but this is assumed to be of minor importance.

Endangered area

Eastern areas of the UK where Chalara ash dieback is common and widespread are most at risk. Plantings of ash aiming to identify Chalara tolerance would be of particular concern since this species may attack stressed trees.

Risk management options

The ash plant pathways are already prohibited by the amendment to the Plant Health Order and all other pathways except wood chips hitchhiking have been assessed as very unlikely (see section 8). If it did enter, the hosts are so widespread that eradication and containment would be very difficult to achieve. It would therefore be appropriate to confine any action, e.g. surveillance, pruning and removal of hosts, to protecting ash that is showing tolerance to *H. fraxineus*.

Key uncertainties and topics that would benefit from further investigation

As noted in Section 13, the key issue is to determine the extent to which *A. convexicollis* can attack living plants and parts of plants thereby hampering the extent to which ash can develop tolerance to *H. fraxineus*.

Three other factors (explored in more detail in Section 13) will be helpful in understanding the extent of the threat. Firstly, knowing the extent to which *A. convexicollis* populations are increasing in Europe in areas where it occurs together with *H. fraxineus* would help predict what might happen in the UK. Secondly it would be helpful to conduct a survey on the extent to which native saproxylic beetles are already benefiting from the large amount of dead and dying ash caused by *H. fraxineus* in the UK and therefore whether their impacts would dominate any damage caused by an invasion of *A. convexicollis*. Two other species native to the UK, *Tetrops starkii* and *H. varius* (the common ash bark beetle), appear to be benefiting from the invasion of *A. planipennis* in the Moscow area. Thirdly, it would worth determining the role that could potentially be played by bio-control agents.

18. Is there a need for a detailed PRA or for a more detailed analysis of particular sections of the PRA? If yes, select the PRA area (UK or EU) and the PRA scheme (UK or EPPO) to be used.

(For completion by the Plant Health Risk Group) ✓ (put a tick in the box)

No	✓

Yes		PRA area: UK or EU		PRA scheme: UK or EPPO	

19. Images of the pest

Photos: Christoph Benisch - www.kerbtier.de

Adults can be 3.5 to 5.5 mm in length.

20. Given the information assembled within the time scale required, is statutory action considered appropriate / justified?

[*For completion by the Plant Health Risk Group*] *(put a tick in the box)*

Yes Statutory action		No Statutory action	✓

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