Current UK Insect Threats

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Recent introductions

- pine-tree lappet moth
  2001/2003
- Horse-chestnut leaf miner
  2002
- oak processionary moth
  2006
- Asian longhorn beetle
  2012
- Oriental chestnut gall wasp
  2015
• *Thaumetopoea processionea* is native to central and southern Europe; it was introduced into west London on imported oak trees in 2006

• the larvae (caterpillars) feed on oak and can cause severe defoliation, but they also possess highly irritating hairs that are a hazard to human and animal health

• OPM has a history of mass outbreaks in other European countries, especially in the Netherlands, Belgium & Germany
OPM distribution in 2015
Oak defoliated by OPM
Asian longhorn beetle (ALB)

- *Anoplophora glabripennis* is a primary pest capable of attacking healthy as well as stressed trees

- It attacks a wide range of deciduous broadleaved trees, but especially maples, birch, poplar, willow and elm

- Native to China, where it is highly damaging to poplar plantations, causing annual economic losses of ~$1.5bn

- Introduced in wood packaging material to the USA, Canada and Europe
Results from tree ring analyses - the numbers of adult Anoplophora glabripennis emerging each year at Paddock Wood, in Kent

- by 2012, the population had spread outwards by only 235 m
Several factors combined to allow ALB to establish at Paddock Wood:

- the presence of *sycamore*, a highly favourable host plant, at the site of introduction
  (although a lack of sycamore elsewhere may also have restricted population increase and spread)

- adult beetles were introduced on multiple occasions over several years

- a run of several years with warmer than average summer temperatures and low rainfall during 2003-2007
ALB outbreaks in Europe

Number of infested trees:
- <10
- 10–50
- 50–100
- 100–200
- 1000+

Accumulated number of outbreaks

Year


Number of outbreaks
Oriental chestnut gall wasp

- *Dryocosmus kuriphilus* is native to China, but was introduced into Japan in the 1950’s, the eastern USA in 1974 and Italy in 2002

- It forms galls on the buds, leaf petioles and twigs of trees in the genus *Castanea*, including European sweet chestnut *Castanea sativa*

- Severe infestations reduce nut production and decrease tree vigour
Native & established pests

• large pine weevil (Hylobius abietis)

• great spruce bark beetle (Dendroctonus micans)

• green spruce aphid (Elatobium abietinum)

• leaf weevils & other foliage-feeding weevils
• lives on spruce throughout the year

• populations increase in the spring and peak numbers occur in May and June

• feeding by the aphid leads to chlorosis and premature needle fall

• damaging populations tend to re-occur every 3-6 years

• Sitka spruce is particularly susceptible to damage
Damage caused by *Elatobium*
Elatobium damage to Sitka spruce
Impact on Sitka spruce

- it is very rare for defoliation by Elatobium to cause the death of spruce trees
- the main effect of defoliation is to reduce tree growth for 1-2 years
- severe defoliation may reduce volume increment by >20% in the current year
- on average, Elatobium reduces the growth of Sitka spruce by 6% per year
Foliage-feeding weevils on conifers

Polydrusus cervinus

Strophosomus melanogrammum

Phyllobius argentatus, P. maculicornis

Barypithes aranaeformis, B. pellucidus
Weevils in the canopy of Sitka spruce

<table>
<thead>
<tr>
<th>Species</th>
<th>Total individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Phyllobius argentatus / mac</em></td>
<td>3752</td>
</tr>
<tr>
<td><em>Polydrusus cervinus</em></td>
<td>640</td>
</tr>
<tr>
<td><em>Otiorhynchus singularis</em></td>
<td>41</td>
</tr>
<tr>
<td><em>Strophosomus melanogramma</em></td>
<td>26</td>
</tr>
<tr>
<td><em>Barypeithes aranaeformis</em></td>
<td>1471</td>
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<tr>
<td><em>Barypeithes pellucidus</em></td>
<td>214</td>
</tr>
<tr>
<td><em>Acalles ptinoides</em></td>
<td>40</td>
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<tr>
<td><em>Deporaus betulae</em></td>
<td>4</td>
</tr>
<tr>
<td><em>Phyllobius glaucus</em></td>
<td>3</td>
</tr>
<tr>
<td>Other species</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>6195</strong></td>
</tr>
</tbody>
</table>
Leaf weevils on broad-leaved trees

Phyllobius viridicollis

Phyllobius pyri
Insect threats from overseas:

- **Emerald ash borer**
  *Agrilus planipennis*

- **Bronze birch borer**
  *Agrilus anxius*

- **European bark beetles**
  *Ips typographus, Ips duplicatus, Ips amitinus*

- **Spruce budworms**
  *Choristoneura & Acleris spp.*

- **White pine weevil**
  *Pissodes strobi*

- **Siberian silk moth**
  *Dendrolimus sibirica*