

OPM: HOW FAR AND FAST HAS IT COME IN 16 YEARS?

News reports of oak processionary moth may have reduced in recent years, but that doesn't mean the spread of the pest has slowed – quite the opposite.



Male adult oak processionary moth.

In the current pest and disease order of things, OPM (oak processionary moth – *Thaumetopoea processionea*) appears to have gone off the radar, perhaps not too much of a shock given what else is now on the screen. Chalara ash dieback is spreading in plague proportions while *Phytophthora pluvialis* has joined *Phytophthora ramorum* as a threat to commercial forestry in the UK. And, just to create the perfect storm, two of the world's worst insect pests of conifers are on our shores: *Ips typographus*, which attacks a range of spruces, and pine processionary moth (*Thaumetopoea pityocampa*), which can deal the same depth and degree of damage to pines, have breached our border controls.

However, if you are a member of the public with an infested oak tree outside your house, and the air is filled with urticating (stinging) hairs, causing irritating and possibly dangerous skin, eye and respiratory problems, OPM will be at the top of your list of concerns.

The first OPM infestations were found in the London boroughs of Ealing and Richmond in 2006, after trees infested with the insect's egg stage were imported from the EU and planted on amenity sites. So just how far and fast has OPM come in the last 16 years?

With everything else going on, I would not have given this a second thought, until I found an 'old' OPM folder on my laptop containing a number of files dating back to 2014. These included several PDFs produced by the Forestry Commission and showing OPM distribution in detail nine years ago.

The OPM distribution map for 2014 illustrates how the insect pest got off to a relatively slow start, because after eight long years it was still mostly confined to a small group of West London boroughs.

The map also showed a significant separate outbreak in the Wickham area of south-east London on the border between Bromley and Croydon. This had been found in 2012 as an established outbreak on the Bethlem Hospital site and was judged to have been there for several years prior to discovery. Such was the size and intensity of infestation that the insect pest had run out of oak trees and was attacking other species. This phenomenon has been observed elsewhere in Europe, although I believe this was the first time it has been observed in England. Exactly how and when OPM had arrived at the Bethlem Hospital site remains a mystery to this day.

To get an up-to-date assessment of how far and fast OPM has come, I spoke with Patrick Venables at Maydencroft, one of the bigger arb companies in the south of England, based at Hitchin in Hertfordshire. Patrick has been involved with OPM management from almost the very start and was a key member of the team which initially dealt with and contained the massive OPM outbreak discovered at Bethlem Hospital.

Now as HSEQ (Health, Safety, Environment and Quality) and assets manager at Maydencroft, Patrick plays a key role in the company's risk-assessment-based approach to OPM management using nest destruction and removal across its wide client base.

Patrick told *essentialARB* how OPM has since spread right out into the Home Counties and beyond, as far north as Bedfordshire and into the Horsham and Crawley areas of Sussex, south of the capital. After early indications of a strong westward movement out of London, he said the pest's

eastward penetration into the Home Counties is perhaps more marked, with OPM recently identified in Braintree in Essex, only a stone's throw from the east coast. That apart, OPM continues to make strides westwards, with nests being found as far west as Reading in Berkshire and Aldershot in Hampshire.

That OPM is beginning to hit Reading and surrounding Berkshire towns and villages is significant, given the huge effort sunk into controlling an outlying outbreak discovered in Pangbourne on the River Thames to the west of Reading in 2010. The origin of this outbreak was oak trees imported from Europe and planted on a new, gated development in the town. Considerable control inputs were invested over the following years. Infestation was considerably reduced, but apparently not completely eradicated, because a handful of OPM moths were trapped each year over the following years.

However, the infestation does not appear on the OPM distribution map for 2014, which means the FC apparently considered it to have been all but eradicated by 2014. Irrespective of whether there is still a residual OPM population from the 2010 outlier, Pangbourne and the surrounding area will almost certainly be engulfed by OPM within the next couple of years as the main London outbreak moves further west.

Also instructive to the dynamics of OPM during the 16 years since 2006 is the current status of the so-called 'buffer zone'. Previously called the 'control zone', this surrounds the 'established area', which was previously called the 'core zone' and is where control of OPM is not obligatory. Inside the buffer zone, control remains the aim to prevent or minimise outward spread of OPM into the pest-free area. The outer limits of the current buffer zone are Bedford and Milton Keynes in Bedfordshire, Portsmouth and Brighton on the south coast of England, Southend-on-Sea (Essex) on the east coast and Swindon (Wiltshire)/Southampton (Hampshire) in, respectively, north, south, east and west directions out of London.

Between 2006 and 2014, the distance travelled by OPM from the original outbreak



Nest destruction and nest removal where necessary is a key part of the Maydencroft programme for the ecologically safe and sustainable management of OPM. (Picture courtesy of Maydencroft)

sites in Ealing and Richmond averaged out at 3 km/year. For the period 2014 to 2022, the infestation moved approximately 55 km southwards and westwards, but 80 km northwards and eastwards, which is at least twice the average rate compared with the preceding eight-year period. The longer north/east directional distances achieved by OPM are almost certainly a reflection of the effect of prevailing winds on the flight capability and capacity of OPM moths, according to Patrick.

The considerably greater pest advance achieved between 2014 and 2022 is likely due to the changing nature of the landscape encountered by the pest, including the frequency of oak tree plantings. During the first eight years, OPM was essentially confined to metropolitan London with fewer oak trees overall than in the rural areas of the outer London boroughs and Home Counties. These rural areas will clearly have more oak trees to infest and be better spaced as stepping stones for OPM dispersal and spread, and will also be more difficult to monitor for new infestations.

As I recall, the FC threw in the towel in 2011 when its established policy of pest eradication was downgraded to one of pest containment. In the early years after the insect pest's discovery, OPM management and control was overseen by an FC-led committee, the exact name of which has slipped my mind. But no-one could forget the composition.

In 2010 I visited one of the very few commercial companies with the expertise, experience, kit and clout to carry out hands-on OPM management and control and was staggered to discover that at that time neither they nor representatives of

the few other companies engaged in this work were represented on the committee. As I recall, the committee was stuffed with academics, quasi-academics and bureaucrats with a sprinkling of desk jockeys. Looking at the position of OPM today, perhaps there is a lesson to be learned there.

THE MAYDENCROFT MANAGEMENT STYLE FOR OPM

I asked Patrick Venables about the Maydencroft ethos and management style for oak processionary moth.

He told *essentialARB* how Maydencroft is taking a different approach to the traditional mode of mainstream control, which relies on the spray application of insecticide.

He said: "We are embracing the company's ethos of living with rather than trying to eradicate OPM. The philosophy and practice behind traditional mainstream control measures haven't stopped the spread of OPM.

"Through training and education, nest removal where necessary and using a risk-based strategy, we're looking at the long term rather than attempting an impossible quick fix."

Patrick said that if insecticide application in the early days had worked, then consequent collateral damage to the wider environment could have been justified. Rather than just looking at this single insect pest species, we need to see the bigger picture.

He said: "As a company we are already training people in pine processionary moth, brown-tailed moth and oak processionary moth awareness and control. I update the staff almost on a

monthly basis as and when we see new developments."

Of special interest is OPM management using pheromones for moth mating disruption, one of the latest methods to be deployed in the Netherlands. Patrick said: "We'll continue to see OPM spreading across the country, but we can learn to live with the insect pest and mitigate where needed.

"Natural predation by our native species will increase in time, if we let them. The population of native titmouse birds (e.g. blue tit and great tit) is just one example. These native birds feed billions of caterpillars to their young every year, but they need time to learn.

"When blue tits in the Southampton area began pecking milk bottle tops to get at the cream in the 1920s, it took around 30 years before the whole country was seeing the same behaviour."

BLUE TIT BREEDING BLASTED BY INSECTICIDE

Is there any evidence that native titmouse birds like blue tit and great tit are under pressure from escalating levels of insecticide spraying against OPM? The annual insecticide spray programme to control OPM has now been in operation for more than 15 years. In 2019, 24,250 trees were sprayed across 1,052 sites. This trebled the number of sites treated and amounted to 37 per cent more trees sprayed compared to 2017. Since then, the spread of OPM has accelerated, with the number of sites sprayed each year rising accordingly.

I am not aware of any area-wide research over the longer term to determine how insecticide treatment of oak trees, ►

OPM



MAIN: Increasingly intensive insecticide spraying against oak processionary moth has now been in operation for more than 15 years. (Picture courtesy of Patrick Venables at Maydencroft).



CIRCLE: A late instar OPM larvae equipped with thousands of urticating hairs and a caterpillar with a nasty 'sting in the tail'. (Picture courtesy of Bartlett Tree Experts).

▶ increasing year-on-year, is impacting non-target Lepidopteran larvae and the wild bird species which prey on them.

However, there was evidence of impact on insects and birds from an aerial spraying trial using BTK (*Bacillus thuringiensis* var. *kurstaki*) insecticide to control OPM at Pangbourne in Berkshire during spring 2013.

The FC carried out the aerial application of BTK by helicopter in two SSSI (Sites of Special Scientific Interest) woodlands (Herridge's and Broom copses). Natural England reluctantly went along with the programme on the understanding that environmental assessments would be carried out both before and after spraying in the treated woodland and in nearby unsprayed woodland (Horn's Copse) used for a control (baseline) comparison.

Eleven times fewer green oak tortrix larvae were found in Herridge's and Broom copses after insecticide application (two sprays, 14 days apart) compared with the unsprayed, control woodland. Eight blue tits' nests were identified in Herridge's Copse before spraying, but only one family of blue tits was recorded post-spraying. Respective figures for the untreated Horn's Copse were three nests before and seven family groups after.

The real tragedy concerning the insecticide application trials at Pangbourne is that we will never know if it exerted any control on OPM. We know that green oak tortrix moth was hit hard. However, nobody thought to scout Herridge's and Broom copses prior to spraying to establish whether or not OPM was present in the woodland. My personal view is that the whole thing was an exercise in kite-flying. However, given the resulting uproar in Berkshire, around Pangbourne, Reading and beyond, I doubt whether any more of these kites will be flown.

The great tit population did not appear to suffer in the same way, which may be due to a more varied diet. Great tits are known to prey heavily on spiders to feed their



LEFT: As HSEQ (Health, Safety, Environment and Quality) and assets manager at Maydencroft, Patrick Venables plays a key role in the company's risk-assessment-based approach to OPM management using nest destruction and removal across its wide client base.



RIGHT: OPM continues to move out into the Home Counties and beyond, but there is clearly a long way more to go for this alien invasive insect pest. (Picture courtesy David Humphries, City of London Corporation).



BELOW: Aerial spraying by helicopter of woodland at Pangbourne, West Berkshire, in May, 2013.

nestlings, and perhaps these comparatively larger birds are able to cope with older, more developed larvae.

Newly emerged oak leaves progressively produce tannin and by the end of May oak leaves contain a high concentration of this potentially toxic phenolic compound. Tannins are known to deter insect feeding and also affect the development of nestling birds which are fed insect larvae containing high levels of tannin because such older larvae and later instar larvae feed on more mature oak leaves.

Great tits are known to rip out the gut prior to feeding larvae to their young. As such, great tit nestlings may be able to feed

safely on older developed larvae which pick up correspondingly higher levels of tannin through feeding on more mature oak leaves. The same behaviour is not documented for blue tits.

After at least 17 years of increasingly intensive and widespread spray application of insecticides in London and its environs, it is reasonable to assume that non-target larvae of native Lepidoptera like green oak tortrix moth and winter moth have been impacted. If so, this has almost certainly impacted on the titmouse species of native birds which relies on these caterpillars as a food source for their nestlings.

Dr Terry Mabbett



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