The rapid response model for Asian hornet in Ireland:

A strategic approach

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*An **Invasive species** is a non-native species whose introduction and/or spread by human action, outside their natural distribution, threatens biological diversity, food security, and human health and wellbeing. 'Invasive' means tending to expand into and modify ecosystems to which it has been introduced.*

The role of the **Invasive Species Unit** of the **National Biodiversity Data Centre** is to provide national coordination and management of information on Ireland's non-native invasive species. It also supports the National Parks and Wildlife Service in reporting on the EU Invasive Alien Regulations (1143/2014). Central to this work is maintaining Ireland's **National Invasive Species Database** to collate detailed information on the status and trends on invasive species in Ireland. This includes operating an **Early Warning Alert System** in partnership with key agencies and partners. The aim of this network is to support decision-making to mitigate the spread and impact of invasive species in Ireland.

The **Asian Hornet Management Group** (AHMG) is a task force established by the Government following an incursion of the Asian hornet into Ireland in 2025. It is chaired by the National Parks and Wildlife Service (NPWS), and includes the National Biodiversity Data Centre, the Department of Agriculture, Food and the Marine, and the National Museum of Ireland.

To **identify** Asian hornet, download useful guides at:
invasives.ie/asianhornet/identification

To **report** a suspected Asian hornet sighting, visit:
invasives.ie/asianhornetreporter

To learn more about invasive species in Ireland, see *invasives.ie*

Summary

"The rapid response model for Asian hornet in Ireland" *outlines a risk-based national framework for the early detection and eradication of this invasive species. The approach is adaptive and scalable, allowing the response to scale with the number and extent of incursions. These measures are underpinned by evidence-led decision-making and coordinated action. The primary objective is to maintain a zero-population status for as long as is technically feasible, while recognising that repeated introductions are likely, due to the species' spread in Europe and Great Britain, and expanding international trade pathways.*

The Asian hornet (*Vespa velutina*) poses a significant threat to Ireland's biodiversity due to its predation on a wide range of insect species, including key native pollinators, which reduces pollination services and disrupts ecosystem functioning. Asian hornet has significant economic implications. In other European countries, costs of eradication efforts have been substantial and are increasing. The species also affects the beekeeping sector by preying on honeybees, and spreading disease, which weakens colonies and reduces honey production. The Asian hornet damages fruit crops directly, posing a risk to horticulture. It also has human health impacts, as due to its tendency to nest close to buildings, evidence from countries where the species is established indicates an increase in stinging incidents.

Ireland's response to Asian hornet is also driven by legal obligations. It is listed as a Species of Union Concern, which requires Member States to ensure early detection, implement rapid eradication, and manage the species where established. The action plan also aligns with the EU Nature Restoration Law, which targets pollinator recovery by 2030, and the Global Biodiversity Framework, which seeks to reduce invasive species introductions and impacts.

Preventing further incursions of Asian hornet to Ireland is not considered possible. Fertilised queens can hibernate in a variety of natural and artificial imports, such as wood and shipping containers. As the species spreads across Europe and trade routes expand, the likelihood of repeated introductions is expected to increase. The principles and strategy therefore prioritises minimising the time between arrival and detection. Public awareness of how to identify and report Asian hornet will be critical to enable rapid response.

The rapid response model ensures coordinated action. The National Biodiversity Data Centre screens and verifies reports, after which the National Parks and Wildlife Service leads field investigations and response actions. The Asian Hornet Management Group provides governance and oversight. This document recommends an adaptive approach, recognising that the level of risk from Asian hornet will change over time. Ongoing evaluation allows the response to be scaled up or down as required, and highlights resource requirements at each risk level. Eradication is achievable at early stages of invasion, but success depends on rapid detection, a coordinated response, and sustained engagement from both authorities and the public.

Recommended measures include the adoption of a risk categorisation system, ranging from zero (no confirmed incursions) to five (widespread establishment of the species). This framework supports a proportionate, evidence-based response, ensuring that actions and resources are scaled appropriately. Early stages focus on detection and eradication, while higher levels incorporate broader management and long-term control.

Early detection is critical to successful eradication. This requires increased public awareness, structured reporting systems, and targeted communication to local communities where nests are confirmed. Detection is supported through evidence-based monitoring rather than widespread trapping, which is not effective for eradication. Beekeepers are recognised as key stakeholders due to their expertise in detecting Asian hornet activity.

Categorisation Structure to define the level of risk

Risk categorisation is required to inform appropriate action. Effective decisions rely on the best available data, such as confirmed hornet. It's crucial that interventions are made promptly. The level of response, as set out later in this document, will be guided by the structure as shown in Table 1.

Table 1: Summary of Ireland's risk categorisation structure to guide appropriate action

Risk Level	Definition
0	No confirmed reports of Asian hornet.
1	Confirmed report(s) of Asian hornet individuals. No evidence of active nests.
2	Confirmation of one or more nests. Eradication is still deemed achievable with available resources. Overwintering in Ireland is not proven.
3	An intermediate risk level specifically designed to scale up the response. Overwintering is suspected or proven. Eradication is still deemed achievable.
4	Asian hornet is found more widely in a region or in multiple areas across Ireland. Eradication is still achievable, but with less confidence of success.
5	Asian hornet is widely established across Ireland.

Contents

1. The need for an effective response

This section provides background on the ecology and biology of the Asian hornet, the understanding of which is critical to effective control measures. It explores the variety of negative effects – including the economic, biodiversity, ecosystem health and human health impacts. It also explains regulatory and policy drivers for rapid response.

1.1 Ecology and biology

The Asian hornet is a species of wasp that builds communal nests. These nests are often located in spaces inaccessible to predators, such as tall trees and buildings (Turchi *et al.*, 2023). The Asian hornet is versatile, resilient to environmental changes, and highly adaptable, with its distribution predicted to increase in response to climate change (Barbet-Massin *et al.*, 2013).

Adult hornets are unable to digest protein. They predominantly sustain themselves on carbohydrate sources from nectar, the secretions of their larvae, or ripe fruits (De La Hera *et al.*, 2024). However, in common with other large wasp species, the Asian hornet must forage for protein for its developing brood (Stainton *et al.*, 2023). The Asian hornet is considered a major predator of the honeybee (*Apis mellifera*). While Hymenoptera (bees, wasps, ants and sawflies) are its most significant prey species, it has a generalist diet, and has even been reported to scavenge waste food, roadkill, and fish (Perrard *et al.*, 2009; Rome *et al.*, 2021).

In spring (March-April), after emerging from hibernation, the foundress queen builds a small 'embryo nest'. This is typically similar in size to a tennis ball. It is often built in sheltered, low-height spots such as brambles, hedgerows, garden sheds or the eaves of buildings. Here, the queen hornet begins to produce her female workers.

After about four to six weeks, hornet workers emerge (up to 20 individuals) and further develop the nest to create a larger 'primary nest', where more workers (from dozens to hundreds) will be produced. The 'primary nest' lasts roughly another four to eight weeks, and is about the size of a grapefruit and may also be built at a new location.

Normally around June, workers begin to build a larger, pear-shaped 'secondary nest', up to 60 cm wide and 80 cm tall. The secondary nest is often built high in treetops. An entire season can produce thousands of hornet workers.

Late in the season, each nest produces a final brood of up to 350 queens (also known as gynes) and males, which will leave the nest, attempt to mate, and find somewhere suitable to hibernate over winter (Monceau *et al.*, 2014). Only a small percentage of gynes will mate successfully and survive winter.

These 'foundress' queens emerge in spring to start new nests (Cini *et al.*, 2018). From November, Asian hornet nests, including the old queen, female workers, and male drones, die off.

Impacts on biodiversity and ecosystems

The Asian hornet is a predator of wasps, native pollinators such as bumblebees and hoverflies, spiders, and honeybees, which are used primarily to feed its larvae. Analysis of the Asian hornet diet in an invaded area of France revealed that a single colony preyed upon at least 159 different species (43 families of insects, three families of spiders, and even four families of vertebrates - as carrion), with a single nest consuming about 11 kg of insect biomass in one season (Rome *et al.*, 2021).

A large-scale study of the diet of the Asian hornet, analysing the larval gut contents of over 1,500 samples from Jersey, France, Spain, and the UK, identified that it is a highly flexible predator. The most frequently occurring orders preyed upon were bees, wasps, flies, true bugs, beetles, butterflies, moths, and spiders. While the honeybee was the most abundant species, 43 of the 50 most preyed upon invertebrates were also flower visitors, including four common bumblebee species, indicating potentially substantial risks to wild pollinators (Pederson *et al.*, 2025).

The variety of prey is also influenced by the nest surroundings, with the French study revealing that urban colonies prey more on honeybees, while forest colonies prey more on social wasps (Rome *et al.*, 2021), inferring that risks to non-honeybee pollinators may vary depending on nest location.

Many prey species are important pollinators of crops as well as wild flora, and disruptions to their populations may have serious impacts on biodiversity and pollination services (Fedele *et al.*, 2019). While the Asian hornet is itself a pollinator, it is known to be inferior to the native species it preys on, resulting in a net reduction in pollination efficacy (Rojas-Nossa *et al.*, 2023). Supporting the evidence for ecosystem disruption, a study in Spain demonstrated the negative impact of the Asian hornet on pollination services for apple mint (*Mentha suaveolens*) in invaded areas (Rojas-Nossa *et al.*, 2020).

Key public safety message

The current recommended public safety message is that members of the public should not disturb insects or nests. Suspected Asian hornet nests should be reported to the National Biodiversity Data Centre. If someone is stung by any stinging insect and feels unwell, they should seek medical advice or follow precautions they would normally take to manage their risk of anaphylactic shock.

Impact on human health

There are conflicting reports on the potential health risks from the Asian hornet (De Haro *et al.*, 2010; Vidal, 2022). The scope of this plan will not conclude the risk to human health in Ireland. Instead, members of the public should be informed about the risks in a measured, balanced, and considered manner.

Asian hornet typically do not pose a threat to humans unless provoked or their nest is disturbed. However, its tendency to build nests near, and within, populated areas increases this risk (De Haro *et al.*, 2010; Villemant *et al.*, 2011). It has been reported that deaths resulting from Asian hornet stings most commonly occur due to multiple stings, leading to multi-organ failure, induced by toxins in the venom (Vidal, 2022). However, as with any bee or wasp sting, the reaction will vary in intensity, from mild, localised, throbbing swellings (most frequently) to severe systemic anaphylactic (allergic) or toxic reactions (more rarely) (Feás, *et al.*, 2022).

A report on deaths from insect stings in Spain (Feás, 2021), utilising data over 20 years, identified that the risk that *Vespa velutina* poses to human health is unmatched by other native species and that Asian hornet control 'deserves special attention and management by the authorities'. In 2018, in an invaded region in the northwest of Spain, the number of reported cases of anaphylaxis due to Asian hornet increased exponentially, and currently represents approximately three-quarters of new cases involving hymenopteran anaphylaxis (Vidal *et al.*, 2021). An adaptive response by health professionals in Portugal has been necessitated by allergic reactions to Asian hornet venom becoming 'an emerging problem' (Esteves Caldeira *et al.*, 2023).

Economic impacts

In France, it is estimated that, between 2006 and 2015, nest destruction costs were €23 million, and that the yearly costs are increasing as the species spreads, and could reach €11.9 million in France, €9 million in Italy, and €8.6 million in the United Kingdom, if the species fills its current climatically suitable distribution (Barbet-Massin, Salles, and Courchamp, 2020).

As honeybees are prey for the Asian hornet, there are also potentially large consequences for the honey production sector. In France, the estimated economic impact of the loss of honeybee colonies could amount to €30.8 million per year (Requier *et al.*, 2023).

Losses caused by Asian hornet feeding on, and damaging, commercially produced fruit have been identified as an emerging issue in invaded areas, with a call for an economic evaluation (Nave *et al.*, 2024). In Galicia, Spain, 83% of fruit sector technicians reported Asian hornet-related fruit damage, primarily affecting grapes, but also pears and apples. In Portugal, 25% of technicians reported similar issues in eight fruits, notably grapes, but also apples, pears, figs, plums, peaches, blueberries, and blackberries (Nave *et al.*, 2024).

Bord Bia estimates the Irish-grown fruit retail market to be valued at €841 million, with €47 million of this attributed to strawberries (Teagasc, 2020, 2021). Should a significant Asian hornet invasion occur in Ireland, the level of fruit loss is unknown, but given emerging reports elsewhere, it is a potential impact worth noting.

Impact on honey production

Asian hornets capture foraging honeybees on the way back to their hive, causing a decline in food reaching the hive. The colony is weakened, and hornets may then enter the beehive to prey on the developing brood and pillage honey (Laurino *et al.*, 2019). This behaviour, and the overlap in habitat, provide ample opportunity for transmission of disease. Initial research suggests that the Asian hornet may act as a significant reservoir for honeybee viruses, increasing the risk of disease spread between hives and apiaries (Rodríguez-Flores *et al.*, 2022, 2024).

Honeybees are vulnerable to various transmissible diseases, particularly a range of viruses. Studies have shown that Asian hornets carry over 20 viruses that may infect honeybees. These include deformed wing virus (DWV), black queen cell virus (BQCV), AKI complex (acute bee paralysis virus, Kashmir bee virus, and Israeli acute paralysis virus) and Lake Sinai virus (Dalmon *et al.*, 2019; Rodríguez-Flores *et al.*, 2022; 2024).

1.2 Regulatory and policy drivers for an Asian hornet response protocol

The rationale for developing an Asian hornet management strategy is driven not only by the invasive threat and the potential ecological, socioeconomic, and human health impacts; there are also regulatory requirements and policy drivers.

Asian hornet is listed as a Species of Union Concern in the Invasive Alien Species Regulation ***(Regulation (EU) 1143/2014)*** and is subject to the restrictions and measures set out therein. Member States are required to:

- Take action on pathways of unintentional introduction (i.e. prevention).
- Take measures for early detection.
- Implement rapid eradication at an early stage of invasion.
- Manage the species if already widely spread in their territory.

The Nature Restoration Law (Regulation EU 2024/1991) includes requirements to tackle threats to pollinators and reverse the decline in pollinators by 2030.

As for policy, Global Biodiversity Framework (GBF) Target 6 is critically relevant to Asian hornet control. The target aims to reduce the introduction of invasive species by 50%, to minimise their impact.

1.3 Feasibility of preventing further introductions

As stated above, the Invasive Alien Species ***Regulation (Regulation (EU) 1143/2014)*** requires member states to take action on pathways of unintentional introduction. For Asian hornet, mated queens are known to overwinter under tree bark, in crevices (natural and manmade), and in soil and leaf litter (Marris, 2011; Budge *et al.*, 2017). This increases the probability that Asian hornet will move long distances associated with trade, and may hibernate in goods or containers destined for Ireland. As the species spreads across Europe, and with more frequent and direct trading of goods between France and Ireland, there is an increased risk that this species will arrive in Ireland multiple times.

Any efforts to prevent the arrival of Asian hornet to Ireland are not likely to succeed. Repeated introductions are highly likely. Therefore, a key priority is early detection, reducing the time between first entry and reporting of a new incursion.

2. Principles underpinning detection and rapid response strategy

The following principles underpin an adaptable, coordinated, proportionate, and evidence-based approach to managing the risk that Asian hornet poses to Ireland. These are intended to guide decision-making across surveillance, response, and communication activities, ensuring that efforts remain effective, targeted, and aligned with the long-term goal of eradication.

Principle 1:
Public awareness and engagement will support effective early detection.

Principle 2:
Coordinate, screen and verify sightings to ensure an effective response.

Principle 3:
Develop, maintain and support rapid response readiness.

Principle 4:
Target any monitoring and response trapping based only on the evidence or risk.

Principle 5:
Support strategic communications with the public, stakeholders and public bodies.

2.1 Principle 1:

Public awareness and engagement will support early detection

> ***Maintaining and improving public awareness of Asian hornet and how to report sightings will enable rapid response***

Public awareness is a critical component of effective early detection. Ensuring that members of the public can accurately identify the Asian hornet, and understand how to report sightings to the National Biodiversity Data Centre, is one of the most effective actions available to limit its spread.

The public therefore plays a central role in supporting early detection of this invasive species. Public effort is best targeted at looking out for this species. Key focus points include gardens, bars, cafes, outdoor spaces where food is served, places of work and as part of other citizen science projects.

Clear and consistent messaging should reinforce the risks posed by the Asian hornet to Ireland, alongside guidance on identification and reporting procedures.

Sustained awareness-raising is essential to reduce the likelihood of unnoticed incursions and to enable a rapid and coordinated response. As the threat from the Asian hornet is ongoing, this message should continue to be highlighted and amplified by stakeholders and through appropriate events and engagement opportunities in the coming years.

2.2 Principle 2:

Coordinate, screen and verify sightings to ensure an effective response

> ***Ensuring that all suspected sightings are centrally coordinated, screened, and verified using established protocols will support accurate and timely decision-making.***

The National Biodiversity Data Centre will continue to screen reports of Asian hornet to contribute to rapid detection. The National Biodiversity Data Centre has developed a reporting system (which can be used both on a desktop or smartphone): *https://invasives.ie/asianhornetreporter*.

The National Biodiversity Data Centre will continue to maintain records of all reported sightings in Ireland, along with the final decisions made, and the follow-up actions taken.

An efficient and timely response to Asian hornet reports is a critical part of success. Additionally, with increased public awareness, there will likely be many more reports of similar-appearing winged insects, and screening of these reports will need to be factored into resourcing and staffing. It is also crucial to carefully examine whether further investigation is warranted. Therefore, a framework is required to screen reports and ensure consistent decision-making.

Table 2: Screening framework for Asian hornet reports in Ireland

Action	Verification process
Report submitted	The preferred pathway of Asian hornet reports is that all sightings and reports should be submitted directly to the National Biodiversity Data Centre via the Asian hornet Reporter (*https://invasives.ie/asianhornetreporter*), or referred to there by the recipient individual or organisation. However, alternative receipt routes are likely. For example: **1.** A direct report by phone or email to various organisations **2.** Discussion of a possible Asian hornet incursion on social media **3.** Reports may also be submitted to the Asian hornet Watch App, iNaturalist or iRecord.
Initial screening	Suspected Asian hornet reports to the National Biodiversity Data Centre routinely trigger the internal email alert, leading to screening and, when required, further investigation.
	Screening and further investigation of reports, where required, are critical steps to prevent misidentification and reporting errors unnecessarily triggering contingency implementation. When required, the person(s) who made the report will be interviewed to obtain additional information to verify or rule out the report (e.g. level of expertise in identification and quality of evidence submitted, such as photographs).
Confirmation report is verified	Based on the judgement of the National Biodiversity Data Centre and any consulted experts in the Asian Hornet Management Group, verified reports will initiate the rapid response plan set out in this document.
Responding to verified reports: Initiation	Once a verified report of Asian hornet has been identified, the Asian Hornet Management Group will be alerted by the National Biodiversity Data Centre. Subsequently, the investigation and confirmation of Asian hornet will be actioned by NPWS, with support from the Asian Hornet Management Group.

2.3 Principle 3:

Develop, maintain and support rapid response readiness

> ***Developing and maintaining rapid response capability to enable an effective response following confirmed incursions.***

Building on lessons learned from the successful response in 2025, and from experience in other jurisdictions, Ireland will strengthen its capacity to respond quickly and effectively to Asian hornet detections. This will involve developing and maintaining the skills, systems, and resources required to support a coordinated rapid response.

Maintaining this capability will require a sustained focus on preparedness. This includes ensuring that trained personnel are available, pest control contractors are identified and trained to legal requirements, that operational procedures are defined and regularly reviewed, and that necessary equipment and resources are accessible when required.

The response framework will remain adaptable, allowing it to evolve based on new evidence, operational experience, and emerging risks. Continuous learning, including post-incident review and engagement with international best practice, will ensure that Ireland's rapid response capability remains effective over time.

2.4 Principle 4:

Target any monitoring and response trapping based only on the evidence or risk.

> ***Only deploy targeted monitoring and trapping where there is confirmed incursion or an evidence-based risk in a defined area. In an eradication context, widespread trapping is not an effective method.***

NPWS, supported by partners in the Asian Hornet Management Group, will undertake monitoring or trapping on a risk-based approach. Trapping for Asian hornet in the wider environment or across the landscape is not a strategic response, and would be a drain on both human and financial resources, while not achieving eradication success.

Targeted incursion-response monitoring and trapping will follow the successful methods developed and used during the 2025 NPWS-led efforts to remove all Asian hornet nests from the Irish environment. Subsequent removal of nests is intended to prevent Asian hornet overwintering in Ireland, thereby maintaining the Asian hornet population at zero.

Further information is provided in Section 4.

2.5 Principle 5:

Support strategic communications with the public, stakeholders and public bodies

> ***Delivering clear, timely, and coordinated communications in response to incursions, maximising public cooperation, minimising misinformation, and supporting operational objectives.***

A coordinated communications approach will be implemented following any confirmed detection of Asian hornet, ensuring that information is shared rapidly and consistently across public bodies, stakeholders, and the wider public.

Information will be disseminated through established national channels, but most notably both the ***https://invasives.ie/*** website and the NPWS website, in line with statutory requirements. These two websites will provide reliable information and support efforts to inform the public about the risks.

Engagement with the media will be considered on a case-by-case basis. While media releases can support wider awareness, they may also lead to increased misidentification reports and associated resource pressures. Decisions on media engagement will be made by the Chair of the Asian Hornet Management Group, with communications coordinated through the National Parks and Wildlife Service press office.

The National Biodiversity Data Centre will lead on issuing Invasive Species Alerts. These alerts notify relevant agencies, stakeholders, and the public of an incursion, encourage the reporting of sightings, and highlight the need for appropriate biosecurity measures. Where further sightings are confirmed after initial removal, alerts may be updated or reissued as required.

In parallel, targeted local area alerts will be deployed where incursions are identified in specific locations. These alerts will focus on increasing vigilance in affected areas and may include direct communication methods such as leaflet drops, engagement with local authority staff, and targeted social media messaging. Information gathered through these local alerts will support surveillance and response efforts, including the identification of nests and the extent of spread.

Relevant public bodies, including local authorities and Biodiversity Officers, will be directly notified to support coordinated action.

At an international level, detections and response actions will be communicated through the European Alien Species Information Network Notification System (Notsys), ensuring compliance with EU obligations and information-sharing with other Member States. Updates will also be provided through the British-Irish Council Non-native Invasive Species Work Sector to support cross-jurisdictional coordination.

This structured and scalable communications approach ensures that all relevant audiences are informed appropriately, supporting early detection, effective response, and coordinated action across all levels.

3. Managing Ireland's response to Asian hornet

The following outlines the agreed governance framework for Asian hornet rapid response in Ireland, including key roles, responsibilities, and reporting mechanisms. This structure is designed to facilitate collaboration, optimise resource allocation, and ensure timely decision-making, particularly during the critical early stages of an incursion.

3.1 Governance: The Asian Hornet Management Group

Strategic oversight will be provided by the NPWS. As required, the Government of Ireland will maintain the Asian Hornet Management Group, which will be chaired by the NPWS, to support the goal of eradication.

The Asian Hornet Management Group will use data to decide the Risk Level and appropriate response based on the level (0–5 as laid out in this document).

The Asian Hornet Management Group may request additional support and resources to help manage an incursion.

3.2 Operational Teams

Operational teams will be led and commissioned by the NPWS.

As part of the response, the Government of Ireland will never commission uninsured or untrained personnel or volunteers. This is to protect the individuals involved and members of the wider public.

3.3 Coordinated action for an incursion or spread in the border counties

The Asian hornet poses a significant risk of establishment across the island of Ireland, including in the border counties. Managing this invasive species effectively requires collaboration between relevant agencies on both sides of the border and proactive efforts.

The Asian Hornet Management Group and the Strategic Incident Team (Northern Ireland's governance structure) will retain oversight of progress for their respective areas.

In the event of Asian hornet sightings or confirmed presence within a border region (defined here as 30km on either side of the border), a joint meeting between the NPWS and NIEA is recommended. This meeting will facilitate a shared response strategy, ensuring aligned efforts, effective resource deployment and agree where to collaborate on joint actions to ensure success.

3.4 Asian hornet Stakeholder Group

Ireland's response to Asian hornet will require effective and long-term stakeholder engagement. For example, engagement with the beekeeping community in Ireland will be an important element of the Government of Ireland's response to Asian hornet. Additionally, engagement with agricultural stakeholder groups will be required for Ireland to maintain this species at zero population.

The establishment of the Asian hornet Stakeholder Group aims to facilitate direct engagement between the National Parks and Wildlife Service, in its role as the Competent Authority for Invasive Alien Species in Ireland, and stakeholders from across Government, state agencies, industry, academia, and relevant interest groups.

The Asian hornet Stakeholder Group will be consultative in nature, providing insights and input, on matters such as public engagement, policy, and operations, in relation to Ireland's response to Asian hornet.

A key objective of forming this group is to help NPWS maintain the population of Asian hornet at zero, and consequently help to protect our natural environment, pollinators, agricultural interests and honeybee sector in Ireland. Aims include:

1. ensuring relevant stakeholders are informed about the status of Asian hornet in Ireland and the Government-led efforts to maintain eradication of this Invasive Alien Species of Union concern
2. providing a consultative forum for stakeholders, with a view to protecting Ireland's environment
3. encouraging open communication and engagement on matters relating to Asian hornet
4. building collaborative relationships across the stakeholder group.

4. Guidance to inform ireland's asian hornet eradication strategy

With support from the Asian Hornet Management Group, NPWS will task a field team to carry out an initial site investigation following confirmation of a verified Asian hornet incursion. The key objective is to confirm presence, to understand the scale of the incursion, assess the potential risk of spread, and to investigate what actions are required to carry out eradication safely, depending on the circumstances.

4.1 NPWS led investigations and actions following verified reports

During the initial stage of invasion, one field team member should usually suffice to manage the incursion confirmation. NPWS will decide who will carry out a site visit. This could be an NPWS staff member, another member of the Asian Hornet Management Group, or another appropriately qualified individual with appropriate work insurance in place.

The following actions are presented to guide a field team:

1. If adult insects are found, these will be used to confirm the identification of Asian hornet, initially by the field team and confirmed by appropriate experts where necessary.
2. If a suspect partial nest, larvae and/or dead insects are found, these will be photographed and shared with NPWS, the National Museum of Ireland, and the National Biodiversity Data Centre to support identification. Any samples collected will be delivered to the National Museum of Ireland as required.
3. If no insects or nests are present at the time of the site visit, the inspector will conduct a survey of the immediate vicinity of the sighting (radius 250m). The field team will deploy traps in appropriate areas along two transects (one north/south and one east/west).
4. Where a credible report is made but no adults are found, the field team will seek guidance from the Asian Hornet Management Group to decide on the duration of monitoring efforts and next steps.
5. The field team should identify relevant on-site hazards or challenges that may require a risk assessment in line with normal working practices. Where required, this should be communicated to any subsequent teams or contractors that may be assigned to the site.

4.2 The eradication strategy throughout the year: When to act

Spring[1] – Early detection and prioritising sites for control later in the season

- Any queens found during December, January, and February are most likely to have been disturbed during hibernation.
- Foundress queens are normally expected to emerge from hibernation from mid-March onwards.
- The queen begins to build a small, vulnerable embryo nest where she will begin laying eggs to produce the future workforce. In many cases, this nest is built in garden sheds or buildings that are rarely used.
- The colony will progress to building the primary nest. In this primary nest, the queen produces approximately a hundred workers. These workers then help her to build a secondary nest if the primary nest location is not suitable.

Summer – Active tracking and subsequent control of secondary nests

- The secondary nests are generally built in treetops or vegetation, so they are often hidden and are inaccessible.
- The colony grows rapidly and produces workers. From July onwards, hornet predation on honeybee colonies is reported to intensify, but there was no evidence of this during the three incursions into Ireland during 2025.

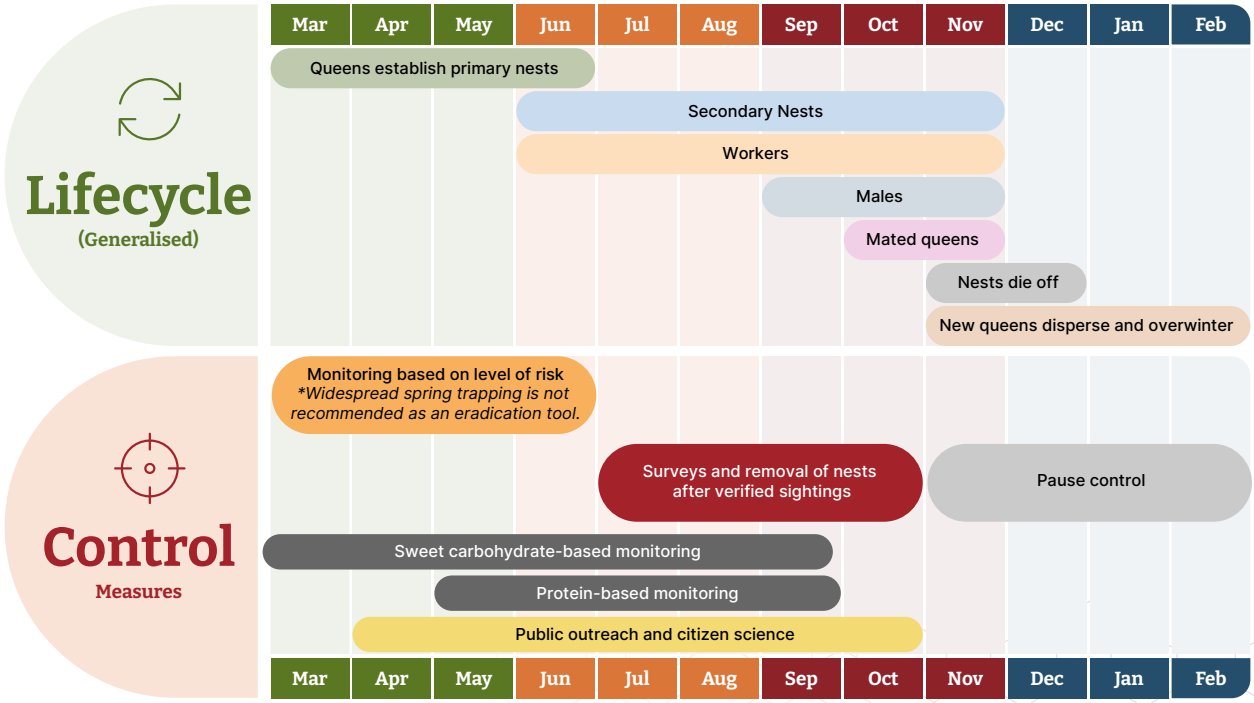
Autumn – Final opportunity for eradication before new queens hibernate

- Nest activities shift to reproduction of queens, and new queens leave to mate and then hibernate. Eradication measures should continue now, in order to prevent nests producing new queens, which will start new colonies the following spring.
- Mid to end of October will be the last opportunity to control nests before mating and foundress queen dispersal. Finding and controlling every nest before this point minimises the number of new queens that survive to hibernate.
- Worker hornets, males and the parent queen die off over winter, but new foundress queens disperse, likely from mid-October.

Winter – Best opportunity to review and plan appropriate actions for the following year

- Nest die off is expected to begin in Ireland from mid-October onwards, depending on local conditions.
- Controlling nests during winter becomes ineffective for achieving eradication success (once foundress queens disperse). However, retrieving nests after this point in the lifecycle will likely have benefits for research and supporting decision-making.

Figure 1: Infographic showing recommended timing of control measures, informed by the generalised life cycle of Asian hornet



[1]For climatological and meteorological purposes, on the basis of air temperature, Irish seasons are as follows:

Spring: March, April and May; summer: June, July and August; autumn: September, October and November; winter: December, January and February

4.3 Targeted spring trapping activities to support the goal of eradication

Spring trapping is not the priority method to achieve the goal of eradication. Finding nests and their subsequent control is the primary eradication strategy for this species in Ireland.

The rationale for this is that spring trapping of individuals has not been shown to be an effective eradication strategy for this species. This is based on findings from both Great Britain and New Zealand. Furthermore, while the density of this species is very low in the Irish landscape, it is not possible to establish an effective spring trapping network. The goal is eradication, which is best achieved by working strategically and targeting effort to risk.

4.3.1 Operational planning guidelines for spring monitoring

Spring monitoring with traps can play a role when it is targeted to a specific risk area and maintained to ensure best possible effectiveness is maximised. Therefore, where there is specific data suggesting a risk of or proven overwintering in Ireland, a formal spring detection programme can be initiated, at the appropriate scale and with the decision on how best to operationalise with NPWS.

It is expected that of the queens that survive winter, most (but not all) are likely to establish nests relatively close to their 'mother' nest locations. This is expected to typically fall within 0–5 km during the initial stages of the invasion by natural spread, when enough suitable nest locations are available and the population of Asian hornet has not reached capacity (Fouracre, 2018).

Bait station set-up will follow the tried and tested methods to attract hornets. Monitoring stations will be placed appropriately, based on ground considerations. Initially, bait stations will be set at a maximum of 500 metres from a central point in the risk area. This distance is chosen so that a station is within 250 metres of potential embryo or primary nests. During the early stages of her development, spring queens or early workers are expected to forage close to their nests, and therefore at least one station per nest is achieved.

Should additional records emerge, the area can be expanded or adapted, if required.

Each station will be checked as required by an NPWS field team member or where appropriate, a citizen scientist. They will also spray attractants into the air to help increase the attractiveness of the trap to Asian hornet.

4.3.2 Targeting of embryo and primary nests

For identified areas of risk, targeted searches for embryo and primary nests by experts or informed citizens could prove useful in an eradication strategy, as has been demonstrated in New Zealand.

If an embryo nest is found, control can be relatively straightforward. The nest, ideally with the new queen inside, should be carefully and safely removed, placed in a sealable container, and frozen for later analysis. Appropriately licensed freeze-spray products may also be considered.

However, action on any embryo or primary nests should only be undertaken by individuals confident in their ability to act safely and, where applicable, in compliance with relevant workplace health and safety standards. If there are any safety concerns, assistance should be sought to ensure that embryo or primary nests are controlled safely before they expand further.

4.4 Overview of summer and autumn tools and techniques for tracking nests

Nest detection and removal is the top priority to ensure Ireland maintains zero population of Asian hornet. The objective is to target and efficiently remove nests and it will be the responsibility of NPWS to select the most appropriate methods to locate the nest. The objective of this section is to prioritise the tools (Table 3) that will most likely be deployed in the context of an immediate rapid response.

4.4.1 Priority method 1: Live-baiting and tracking to locate secondary nests

This is a simple and proven method. The technique was developed in Jersey and has been very successful in enabling teams to track individual hornets to their nests.

The Asian hornet typically forages within a range of 1 to 2 km from secondary nests. However, Asian hornets are capable of travelling distances of up to 5 km if necessary, especially when food resources near the nest are scarce (Poidatz *et al.*, 2018).

This method has the advantage that it avoids the risk of an offence relating to the release of Asian hornets without a licence. It is possible to mark them without first capturing them, thus avoiding 'release'.

The tracking is a five-step process:

1. Set up a bait station.
2. Watch the direction of flight and record on a map or an app.
3. Time the return flights of hornets, to work out distance to the nest (1 min return time = estimated distance of 100 m).
4. Based on recorded information, set up more bait stations in order to close in on the nest.
5. Carefully look for the nests.

Carbohydrate and/or meat-baited traps are used to attract workers and then the worker can be followed as she flies back to her nest. Live-baiting for workers over multiple days is likely to be necessary, with new traps placed at the point at which the observer loses sight of the hornet.

Managing competition between bait stations will be an important consideration. Closing bait stations will likely increase the effectiveness of the remaining stations.

It is noted that this method refers only to the use of Asian hornet workers. Captured queens should be lethally dispatched.

It is also noted that having too many bait stations in an area can result in difficulties in tracking nests or reduced detection. Competition will need to be carefully managed by the NPWS/government-led team. It will be very important to request that members of the public cooperate, so that their efforts do not compete with and reduce the effectiveness of the targeted eradication strategy.

Table 3: Summary of the priority tools and techniques for Asian hornet eradication

Method	Advantage	Disadvantage
Targeting of embryo and primary nests No licence required	Removes a nest before it develops into a more-difficult-to-control secondary nest. Videos on social media can help the public learn how to search for nests in - areas, such as their own garden sheds or on eaves of their houses.	It is not easy to find embryo and primary nests. Natural failure of embryo and primary nests is high, which means this cannot be the main strategy for eradication success. This should only be deployed in a specified local area of known risk, and should not be deployed at the geographic scale of Ireland.
Live baiting and tracking to locate secondary nests No licence required	Low cost of equipment, simple to operate, can roughly locate the nest	Direction records can easily contain errors (e.g. if hornets handle food, flight trajectories are not consistent). Competition with flowering plants will make this method more difficult/ not viable later in the season.
Radio-tagging trapped Asian hornets Licence required under SI 317/2024	Time savings: radio-tagging can reduce the time required to find a nest to approximately 1 hour, whereas traditional manual triangulation methods can sometimes take days. Longer-range tracking Effective in complex terrain	A licence is required to release tagged Asian hornets. It is a more specialised technique and therefore requires greater skill and experience levels.
Tinsel tagging Licence required under SI 317/2024	Low-tech method that is reliable and straightforward for trained staff. Method involves temporarily holding a worker insect in order to attach a long, bright, or reflective strip of tinsel to its back, allowing researchers to track its flight path back to the nest over longer distances.	Requires a licence and therefore must be carried out by NPWS staff or under their direct supervision as part of this contingency plan.

4.4.2 Priority method 2: Radio-tagging trapped Asian hornets

As part of preparations, dedicated tracking kits have been procured for Ireland. This resource will be added to as required and per the decision of NPWS, with advice from the AHMG. The operational window to locate secondary nests is expected to be from mid to late **July – mid-October**.

A key benefit for Ireland may be that radio-tagging Asian hornet would require less staff to identify the location of a nest, following which they could request a call-out from an appropriately trained pest control company.

This method requires authorisation to release trapped and tagged Asian hornets.

4.4.3 Priority method 3: Tinsel tagging

This method requires a licence to release trapped Asian hornet and therefore may not be suitable for every response. The tinsel tagging method involves safely holding a worker hornet in an appropriate catcher or specially made piece of equipment. Using specific glue, a lightweight reflective piece of tinsel is glued to the hornet. When released, the hornet can be watched returning to the nest. With the tinsel attached, an observer can see the hornet for a much greater distance compared to line of sight method above. This is also helpful in more complex environments, where line of sight is limited to a few metres.

4.4.4 Other methods

The above three priority methods should be successful in supporting efforts to locate nests in most situations. However, if field teams are experiencing difficulties or challenging operational environments, it is noted that the Asian Hornet Management Group will support and advise field team with other methods.

4.5 Recommended strategy to engage landowners during an incursion

The option of using legal means to enter a private property is available to the NPWS if an Asian hornet nest is suspected to be found on the property. Enforcement action would compel the landowner to take action or provide access for control efforts.

Powers of entry to any premises, place or vehicle at which there are reasonable grounds to believe that an invasive alien species is, may be or has been present are available to Irish authorities under Regulation (EU) No 182/2011 of the European Parliament, as enacted by ***European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374 of 2024)***.

However, during the early stages of an incursion, following legal routes for entry onto private property may not be required as the public are supportive of controlling the Asian hornet. Any decision to rely on legal powers to enforce control or land entry should be considered by the NPWS only once potentially more efficient options have been worked through and discounted as not achieving the intended goal.

4.6 Guide to decision-making and communications upon finding a nest

Once a nest is located, an NPWS Ranger will be responsible for planning its control, and informing their management team and the Asian Hornet Management Group.

NPWS Rangers will be enabled to call the appointed or nearest pest control company to carry out control of the nest as per their standard operating procedures and training.

Provision of specialist lances, PPE, and other safety equipment is essential for this task to be done without putting practitioners at risk.

If required, the NPWS Rangers, with the approval of their associated management team, will identify and contract required support. For example, a cherry picker or climbing supports hired from a nearby supplier.

Following pesticide treatment, nests will be left in place ideally overnight, but for a minimum of three hours. This will allow the specific pesticide used to take effect and will ensure more hornets return to the nest.

The nest will be removed from the site by triple-bagging and will be transported to the National Museum of Ireland for analysis and preparation of samples for any commissioned genetic analysis or research.

The safe transport of a nest that is triple-bagged will likely require a vehicle with separate, and totally unconnected, driver and storage compartments. Team members should not travel with pesticide-sprayed nests in their cars.

Once a nest is removed, the NPWS Ranger will liaise with their management team and the Asian Hornet Management Group to decide on the next stages.

5. Analysis and adaptive management

5.1 Management of recovered nests

In a similar manner to the 2025 response to Asian hornet, all nest dissection analysis, storage of retained samples, and preparation for any commissioned genetic analysis will be led by the National Museum of Ireland.

5.2 Genetic analysis

Not all nests will be sent for genetic analysis. For each incursion, the NPWS and the Asian Hornet Management Group will decide when to commission genetic analysis.

5.3 Risk-based decision-making on nests

It will not be possible to achieve zero-risk of further incursions by the Asian hornet into Ireland. Further incursions and nests are expected.

Every secondary nest found poses a varying degree of risk, depending on whether the newly hatched 'foundress' queens are still within the nest when it is controlled, or if they have already left and could potentially produce next year's population. Timing of nest control is therefore important, with identifying risk level increasing later in the season. The Asian Hornet Management Group will adopt risk-based decision-making for nests (Table 4).

It is noted that observational data, such as the status of the queen, reproductive success, evidence of worker breeding, or other data collected either in the lab or in the field, may be used to modify the risk rating for individual nests.

5.4 Evaluation and Review

It will be important for field teams and the Asian Hornet Management Group to document the outcome of all nest-tracking and control efforts. This will ensure an effective, adaptive management approach to Asian hornet incursions, and future project teams can learn lessons that may increase their chances of success.

The Asian Hornet Management Group will maintain oversight of the data and field information to ensure that an effective response is maintained.

At least annually, the Asian Hornet Management Group will review the goal of achieving eradication success. This review will be based on the available data and in dialogue with the Shared Island Biosecurity and Invasive Species Steering Committee.

The Asian Hornet Management Group will assess and communicate the appropriate risk level and associated management response based on the data.

5.5 Maintain a watching brief on emerging technologies that could support detection

With Asian hornet spreading across Europe, new populations in North America, and an incursion into New Zealand, it is clear that the risk posed to Ireland will not go away. The Asian Hornet Management Group will maintain a watching brief on the development of new technologies that may be deployed to increase the ability to detect incursions of this species. Specific examples include AI detection methods.

Table 4: risk-based decision-making for nests.

Risk rating	Criteria	Probable action
Low risk	Nest was controlled before September 6th	Risk returns to background level and no enhanced actions are required.
Medium risk	Nest controlled between September 6th and 29th	Targeted engagement at a local level to support local communities in accurately identifying Asian hornet and report to the National Biodiversity Data Centre.
High risk	Nest controlled on or after September 30th	Support enhanced monitoring efforts but with a decision taken by the NPWS in consultation with the Asian Hornet Management Group.

5.6 Maintain the appropriate risk level by scaling up/down the response depending on the data

Asian hornet can be expected to arrive in Ireland multiple times over the coming decades. The goal of eradication of Asian hornet will be pursued unless the data indicates that eradication success is no longer possible due to the scale of the invasion.

After an incursion by the Asian hornet in Ireland, the Risk Level (as set out below in Table 5) prompts a corresponding high-level course of action. Intensifying the appropriate risk level will inform the overarching strategy and management response.

It will be the responsibility of the NPWS, in dialogue with members of the Asian Hornet Management Group, to decide on the appropriate risk level.

During an escalating incursion event, where multiple reports of Asian hornet are received, either in a specific area or multiple regions, the NPWS and the Asian Hornet Management Group will maintain a watching brief on all activities to ensure they are fit for purpose and that resources are directed according to priority and need.

Table 5: Risk Level Categorisation Structure to guide the appropriate response to Asian hornet in Ireland.

Risk Level	Definition	Summary response strategy
Level 0	No confirmed reports of Asian hornet.	• Raise awareness of this species and how to report it to the National Biodiversity Data Centre. • Planning and pre-invasion actions are a priority.
Level 1	Confirmed report(s) of Asian hornet individuals. No evidence of active nests.	• Risk Level 1 is initiated upon confirmation of a verified report. • Issue alerts through the Invasive Species Alert System, particularly focusing on the local area. • Additional monitoring should be carried out within an agreed perimeter of report, but Risk Level returns to 0.
Level 2	Confirmation of one or more nests. Eradication is still deemed achievable with available resources. There is no confirmed evidence of overwintering in Ireland.	• Complexity is increasing at this risk level. Urgent action is required. • Effective decision-making and adaptive management are critical, led by NPWS with support from the Asian Hornet Management Group. • Focused specialist expertise may be required to support active control. This includes measures such as track and trace of homing Asian hornets.
Level 3	An intermediate risk level specifically designed to scale up the response. Overwintering is suspected or proven. Eradication is still deemed achievable.	• Active preparations for a larger-scale programme are urgently required to achieve eradication success. • A more extensive detection and control plan is required in preparation for more widespread invasion across Ireland. • Initial control strategies, employed at Levels 1 and 2, risk resources becoming too stretched. Resources must be scaled up for successful response.
Level 4	Asian hornet is found more widely in a region or in multiple areas across Ireland. Eradication is still achievable but with less confidence of success.	• The more extensive detection and control plan developed at Level 3 is ready to implement. • Eradication is still possible with this significant increase in resources.
Level 5	Asian hornet is widely established across Ireland.	• The formal, government-led eradication plan is replaced by a new management longer term strategy.

5.7 Options to scale up the eradication effort (Risk Level 3 leading to Risk Level 4)

There are various options to scale up the response to an Asian hornet invasion in Ireland. The following is a non-exhaustive list:

i. A funded project proposal is developed for a multi-year effort to eradicate the Asian hornet utilising teams that can readily move across Ireland.

ii. The NPWS agrees a public-private partnership approach, coupled with project management and research experts, to continue eradication work.

iii. Research directed at improving available tools is targeted and supported.

5.8 Managing the transition from eradication to longer term control (Risk Level 4 to Level 5)

Eradication success is not guaranteed in any jurisdiction. Additionally, the risk of the Asian hornet being introduced to Ireland is likely increasing as the species continues to spread across Europe. It has been estimated that only an average of 30-40% of detected nests have been destroyed each year in France (Robinet *et al*. 2017). As a result, Ireland may face a situation where government-led efforts to eradicate this species are no longer viable.

There is currently no precedent for formally ending Early Eradication efforts for an Invasive Alien Species of Union Concern in Ireland. In the event that eradication efforts are discontinued, future priorities would likely focus on:

i. supporting the pest control industry to improve preparedness for responding to Asian hornet reports from the public

ii. clearly communicating to the public that the eradication phase has ended, while also advising affected landowners to contact local pest control companies

iii. conducting research to develop effective control methods

iv. assessing the impact of Asian hornet on Ireland's native species and ecosystems

v. addressing additional unforeseen issues as they emerge.

5.8.1 Longer-term complexities and assessment of risk to Ireland

Any transition to Risk Level 5 will require some complex considerations that cannot be predicted at this stage. As Asian hornet spreads across Europe (and Ireland, under this scenario), the risk to communities and individuals will become clearer. Considerations include:

i. Some priority assets may need to be protected through control of nearby nests (e.g. schools, hospitals, or other buildings/areas where the potentially vulnerable are at risk).

ii. Grants may need to be considered for Asian hornet control in certain circumstances.

iii. Experience from Jersey suggests that emergency services may require training to respond to Asian hornet attacks if nests are disturbed.

iv. Hedge-cutting practices in autumn may need to change, or update risk assessments due to the possibility of disturbing nests.

A transparent process is recommended to support decision making. One such tool is the Detailed Risk Assessment for the Asian hornet (Harrison *et al*., 2023), which offers valuable insights for policy and management.

Maintaining an understanding of the species spread in Europe and Great Britain is essential to Ireland's response. New data could inform management here or alter the perceived risk to Ireland. This Risk Assessment for Asian hornet (Harrison *et al*., 2023) will be reviewed during 2026 and updated as required based on the most current scientific evidence and data on the risk Asian hornet poses to Ireland.

The Detailed Risk Assessment process will support decision-making required by NPWS and the Government of Ireland should the invasion here necessitate moving from the rapid response and eradication phase to longer term control.

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