Scottish Forestry
Coilltearachd na h-Alba

PFA Action Plan

Plan for the West of Scotland conifer bark beetle pest free area (PFA)

Version 3.3
February 2024

Scottish Forestry is the Scottish Government agency responsible for forestry policy, support and regulation

Is e Coilltearachd na h-Alba a' bhuidheann-ghnìomha aig Riaghaltas na h-Alba a tha an urra ri poileasaidh, taic agus riaghladh do choilltearachd

Scottish Government
Riaghaltas na h-Alba
gov.scot

Scottish Forestry
Coilltearachd na h-Alba

PFA Action Plan

Summary

The West of Scotland conifer bark beetle Pest Free Area (PFA) exists to allow trade of conifer logs to Northern Ireland and the Republic of Ireland.
Northern Ireland and the Republic of Ireland are currently free from and have Pest Free Zone (PZ) status for the bark beetles *Dendroctonus micans, Ips cembrae* and *Ips sexdentatus.* These three non-native bark beetles are all established in Great Britain (GB).

The PFA defines an area in which the absence of findings of three bark beetles found elsewhere in GB, *D. micans, I. cembrae* and *I. sexdentatus*, can be demonstrated. It is also possible to confirm the absence of the GB priority pests *Ips duplicatus*, *Ips typographus* and *Ips amitinus* in this area.

Further details on maintaining the PFA can be found in the published PFA dossier.
https://forestry.gov.scot/publications/sustainable-forestry/tree-health/great-spruce-bark-beetle/1386-maintenance-of-a-pest-free-area

Consignments of roundwood coming from the PFA must meet landing requirements for the island of Ireland:

Republic of Ireland - gov.ie - Trading in Plants and Plant Products with GB (www.gov.ie)

Northern Ireland - Wood and bark imports from countries outside the EU requiring notification | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)

EU regulation 2019/2072

Inspections of sites in the PFA allowing for export certification to be issued for roundwood have been in the region of 50 to 70 sites per annum, allowing for the annual export of roughly 100,000 - 250,000 m^3 of conifer roundwood, mostly to the Republic of Ireland. In 2023 the trade was roughly half the previous normal level. This may have been partly down to more timber coming to market on the island of Ireland. This trade is estimated to be worth somewhere in the region of £30 million, allowing for cost of commodity, transport, harvesting etc.

Current survey approach

Surveys are multi-layered to reflect the complexity of finding the different bark beetles and to provide assurance. The surveys consist of six approaches and a barrier.

- Coupe inspections for licensing (phytosanitary certification) of conifer roundwood timber for movement to NI or ROI
- Pheromone traps at timber ports, temporary timber ports and timber processing sites
- Pheromone traps in the forest
- Aerial surveillance
- Field surveys targeting suspicious trees from observations and citizen science reporting
- Additional *I. cembrae* pheromone lures
- Release of *Rhizophagus grandis* along the boundary of the PFA, where incursion of *D. micans* is most likely, and at any sites where *D. micans* is found outside the PFA

Further details on the survey programme are included in Annex A.

Scottish Forestry
Coilltearachd na h-Alba

Actions

1. Following the interception in pheromone traps of *Ips cembrae* in 2023 and prevalence of *phytophthora ramorum* in the region, continue with the non-issuance of phytosanitary certificates for larch from inside the PFA.

2. Impose a 35 km radius buffer around any finding of an outbreak of *D. micans.* If a finding outside the PFA is closer than 35 km then the buffer will be that area inside the PFA that is within 35 km of the finding. This is the minimum radius for the buffer zone. In reality a buffer zone would normally be greater than 35 km due to the requirement to follow easily identifiable features on the ground.
    a. Where an area of sea wider than 15 km falls within the 35 km buffer zone, the Scottish coastline would form the outer boundary of the buffer zone.
    b. Release of *R. grandis* within the buffer area as a precautionary measure to help control any *D. micans* populations present and reduce the risk of further spread (when populations outgrow available material).
    c. Continue to survey as per the survey plan in the PFA and the buffer area.

3. No further phytosanitary certificates will be issued for the movement of spruce roundwood to the island of Ireland originating from any area inside the PFA that falls within a 35 km buffer zone imposed around a finding of *D. micans*.
    a. For the buffer zone being imposed based on findings up to 31 December 2023, coupes with a current authorisation letter issued by Forestry Commission should note that:
        i. No phytosanitary certificates will be issued for roundwood originating within the buffer zone from 1 March 2024.
        ii. Any shipments of roundwood originating from the buffer zone must arrive in Ireland and have cleared the port / pier before 1 April 2024.

4. Once a buffer area has been established for 12 months there will be a presumption to expand the buffer by a further 10 km. The final decision to make this change will be agreed between Scottish Forestry and the relevant authorities on the island of Ireland.

5. Impose restrictions on any port in the buffer e.g. port of Sandbank, for the movement of timber. Based on https://www.eppo.int/RESOURCES/eppo_standards/pm8_commodity_measures allowing movement outwith flight season.
    a. No spruce timber to be stored or moved through the port (of Sandbank) to the island of Ireland between 1 April and 30 September.
    b. Outside this period, any spruce timber moved through the port (of Sandbank) to the island of Ireland to be moved through the “buffer zone” as quickly as possible with minimum stops and to be in the zone for no longer than 14 days.
    c. To be reviewed annually or depending on the extent of any new buffer zone.

6. On any subsequent finding of *D. micans* a new buffer zone of a minimum radius of 35 km to be imposed in which no phytosanitary certificates for spruce are issued.
    a. If inside the PFA an immediate stop on the movement of the timber would be imposed on the forest site where infested trees had been identified.
    b. Expected to take three weeks from finding to imposition of 35 km buffer zone.
    c. Existing issued phytosanitary certificates in the buffer area to be reviewed.
    d. Actual dimensions of buffer zone (minimum 35 km radius) to depend on location of finding and potential link “corridor” to other findings.

7. Allow four years with the buffer zone in place to establish pest presence. At this point review regulatory change to PFA boundary.

8. Continue to monitor for *I. cembrae* and conduct surveys for breeding populations on any interception.

9. Continue monitoring for *I. sexdentatus*, *I. duplicatus*, *I. typographus* and *I. amitinus*.

10. Annex B shows the map extents for the buffer zone following recognisable geographic features around the nearest *D. micans* findings to the PFA boundary as at February 2024.

Rationale for proposed 35 km "buffer zone"

The proposed buffer zone radius is based on past and current research analyses of *D. micans* spread as recommended by Forest Research (FR) and the EPPO guidelines for calculating buffer zones.

11. The EPPO guidelines for calculating buffer zones include:
    a. The size of the buffer zone should ideally be at least the maximum dispersal capacity of the pest within an appropriate period.
    b. Information on the dispersal behaviour of the pest can be used to calculate the assumed maximum natural spread over the relevant period of time.
    c. Typical surveillance to include:
        i. Inspections by trained personnel
        ii. Traps that are periodically inspected
        iii. Sampling and testing of host plants
        iv. Treatments against the vector

12. Previous research on *D. micans* dispersal:
    a. *D. micans* is known to move mainly by crawling on and in-between host trees.
    b. Flying is observed occasionally; however, adult beetles require a temperature threshold of 21–23°C to take flight (Vouland *et al.*, 1984).
    c. No conclusive data on flight distances is available, but it is thought that the species is capable of flying about 10 km, depending on weather conditions (Forsse, 1989) (EFSA, 2017).
    d. Gilbert *et al*. (2003) suggested that short-distance stand-to-stand dispersal is probably accomplished mainly by flight of individual fertilised females.
    e. Surveys in England and Wales, following the initial detection of *D. micans* in the UK in 1982, found isolated spruce stands of up to 7km from known infestations to be colonised by the beetle (Fielding, 2012).
    f. Long-distance dispersal is assumed to be mostly caused by trade-led movement of infested timber (Gilbert et al., 2003).

13. An analysis of the available data on *D. micans* findings made in Scotland from 2019 – 2023 does not show any reason to discount the more comprehensive findings of previous studies as above.
    a. The large majority of findings were made under 10 km from a previous finding.
    b. The maximum distance of natural spread observed without an intermediate finding was 33.1 km (between findings made four years apart). This spread may have been non-natural, but with no hard evidence either way following a precautionary approach it is being taken as natural.
    c. Although analysis of this type is useful for obtaining an overview of the picture of *D. micans* dispersal in Scotland over time, some caution does need to be applied to interpretation of distances between specific findings as the data in Scotland outside the PFA are based on aerial surveillance and ad hoc, voluntary reporting rather than systematic ground surveys.
    d. Due to the above limitations of the available data, it cannot be assumed that the distance between each specific finding made in one year and another finding made in the subsequent year is necesarilly indicative of rate of spread per annum, as there will be

some instances of multi-year spread where intermediate populations were not found, or where low-level populations may have been present before being found.

e. A 35 km buffer zone is therefore proposed as a precautionary measure, taking account of the potential for multi-year spread and incorporating the maximum observed distance of natural spread without an intermediate finding in the intervening years.

14. Unusual movement of *D. micans* between 2020 and 2021:
A movement of 70 km to a site north of Dundee is assessed to be the result of transport of infested timber to a timber mill (non-natural spread).

13. Low level or early stage *D. micans* infestations can be difficult to detect from aerial surveillance of tree canopy symptoms. Ground surveys are a more effective method. Within the PFA, ground surveys by trained inspectors looking for bark beetles are completed for all coupes requesting a phytosanitary certificate. Outside the PFA full ground surveys are not completed for *D. micans* so the data is considered to be incomplete. Ground surveys outside the PFA are conducted to inform release of *R. grandis* and targeted to areas of known spruce production and damage. Foresters outside of the PFA do not receive the same level of training for *D.micans* beetle damage and reporting. Reporting is optional.

14. A 35 km buffer zone around any *D. micans* finding would:
    a. Take account of multi-year spread, despite the ground surveys carried out within the PFA making earlier detection more likely.
    b. Cover the worst case scenario maximum distance of natural spread without an intermediate finding from 2019-2023, as identified by FR analysis of Scottish data.
    c. Reflect the body of literature on *D. micans* dispersal suggesting that approx. 10 km in a year is a sensible estimate, with most natural dispersal being under 10 km.
    d. Take into account that wind direction is predominantly from the SW (away from the PFA).

Risk of incursion related to each beetle

15. *D. micans* is known to be present in woodlands circa 6 km from the PFA – the closest known sites to the PFA are north and northwest of Glasgow and on the Ayrshire coast. Aerial dispersal over to Arran is considered unlikely due to the distance over the sea. Sites in the central belt of Scotland have no significant natural barriers to distribution towards the PFA.

16. Industry agreed to a voluntary 15 km buffer zone around the closest finding to the PFA (as per FR advice dated August 2023), from within which no spruce timber was exported to the island of Ireland, whilst the negotiations between plant health authorities were ongoing.

17. *D. micans* has been spreading in Scotland since it spread from England into southwestern Scotland sometime before 2005. Ongoing monitoring and detections have tracked progress and allowed for release of the predator beetle *R. grandis* to help control populations and successfully prevent significant losses in spruce crops. Initial introduction of *D. micans* into the UK is believed to have taken place in the 1970s.

18. *Ips cembrae* is known to be widely distributed in Scotland outside the PFA, with populations known to have established in a number of areas from the 1950s. Occasional pheromone trap interceptions in the PFA (followed up with intensive ground surveys), and both pheromone trapping and wider environment findings across Scotland, show that populations appear not to have moved into the PFA.

19. Extensive aerial and field surveys of larch since 2012 to detect *Phytophthora ramorum* have only detected two sites where *I. cembrae* infestation was, at least in part, causing larch stress or

dieback. This is after nearly 5,000 site inspections of recently dead or stressed larch across Scotland. Neither site was in the PFA.

a. Pheromone trapping has been a successful tool for monitoring *I. cembrae,* with small numbers of adult beetles being captured in areas where no established populations have been previousely identified. It would appear *I. cembrae* is present in many areas outside of the PFA but rarely causing damage to larch trees that results in significant stress or tree death.

20. *I. sexdentatus* has never been found breeding in Scotland or northern England, with historic populations only known from southeast England.
    a. *I. sexdentatus* is unlikely to pose any material threat to the west of Scotland conifer bark beetle PFA.

21. *I. typographus:* No breeding populations have been found in the wider environment in Scotland. There has been an interception of *I. typographus* near Grangemouth on the east coast of Scotland. This is more than 50 km from the nearest point of the PFA. Intensive surveys moving out from the trap locations in this area have been completed and found no evidence of any breeding population. Increased pheromone lure trapping and ground monitoring in the vicinity of the 2023 interception will be implemented in 2024 and beyond, in addition to the wider routine surveillance programme and forest trapping network.

Modification of PFA boundary

22. Initial actions would be to impose a "buffer zone" where no phytosanitary certificates would be issued around any detections to allow further survey work to continue, as outlined above. This action can be imposed relatively quickly and does not require a change to legislation. It would have the same impact as changing the PFA boundary in removing the ability to move conifer roundwood to the island of Ireland.

23. *Particular* consideration will need to be given to a range of factors including the following:
    - Requirements and recommendations of the receiving authorities in NI and RoI
    - Business objectives of those selling timber from the PFA
    - Proximity of known bark beetle populations
    - Geographic barriers to beetle spread (islands / peninsulas)
    - Area of timber crop due to be harvested in the coming years
    - Timber transport networks

Termination of the PFA

24. PFA status is required to move conifer roundwood to countries with PFA / PZ status for the listed bark beetles. If the PFA status were to be terminated, then any conifer roundwood being moved to NI or RoI would need to be bark free or kiln dried. Once the PFA had been closed, this requirement would be uniform for conifer roundwood originating from across Scotland, England, and Wales.

General points

25. To be clear the PFA has lasted longer than had been expected when it was initially set up. Businesses involved with the trade from the PFA need to be aware that sometime in the next five years the PFA trade in conifer roundwood may no longer be an option.

26. It is not anticipated that significant dieback or loss in yield of spruce in Scotland will result from the continued spread of *D. micans* if it is treated with *R. grandis*. Surveys of spruce for *D. micans*

and treatment with *R. grandis*, where appropriate, will with industry support continue if the PFA is amended or terminated. This will be a decision for industry.

References

EFSA Panel on Plant Health (2017). Pest categorisation of *Dendroctonus micans. EFSA Journal,* 15(7).

Fielding, N. (2012). Minimising the impact of the great spruce bark beetle. *Practice Note-Forestry Commission*, (17).

Forsse, E. (1989). Flight duration of eleven species of bark beetles (Scolytidae) and observations of aerial height distribution. *Migration of Bark Beetles with Special Reference to the Spruce Bark Beetle lps typographus. Dissertation, Sverige Lantbruksuniversitet, Uppsala*.

Gilbert, M., Fielding, N., Evans, H. F., & Grégoire, J. C. (2003). Spatial pattern of invading *Dendroctonus micans* (Coleoptera: Scolytidae) populations in the United Kingdom. *Canadian Journal of Forest Research*, 33(4), 712-725.

Lichtenberg and Lynch (2016). Exotic Pests and Trade: When Is Pest-Free Status Certification Worthwhile? *Agriculture and Resource Economics Review*, 35(1), 52-62.

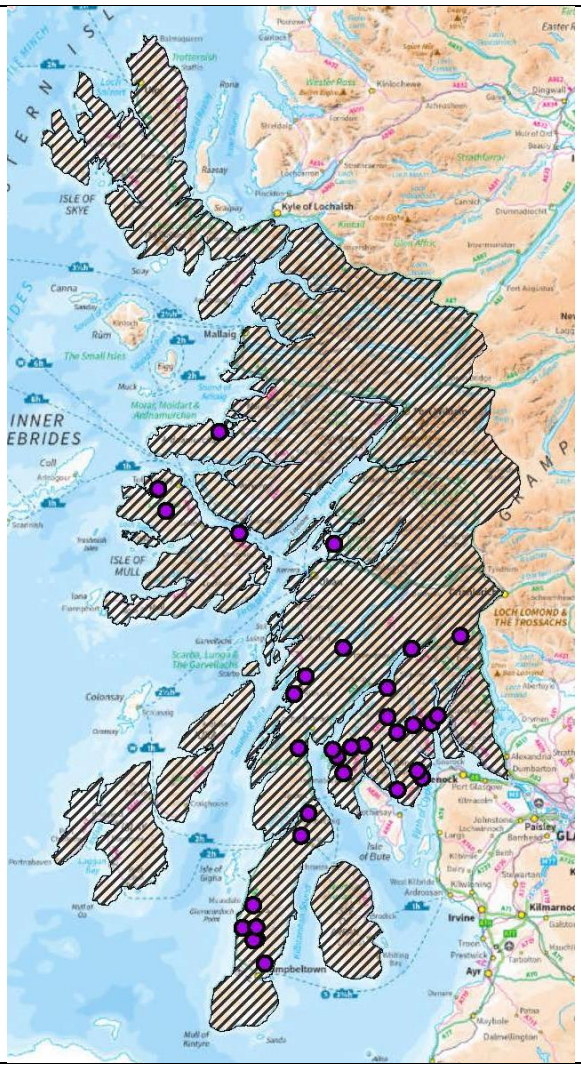
Vouland, G., Giraud, M., & Schvester, D. (1984). The teneral period and the flight-taking in *Dendroctonus micans* Kug.(Coleoptera: Scolytidae). In *Proceedings of the EEC Seminar, Biological Control of Bark Beetles, Dendroctonus micans* (pp. 3-4).

World Trade Organisation ISPM 4 – Requirements for the establishment of pest free areas (ISPM_04_1995_En_2017-05-23_PostCPM12_InkAm.pdf (ippc.int))

Scottish Forestry
Coilltearachd na h-Alba

Annex A

Scottish Forestry
Summary of surveillance operations in the West of Scotland conifer bark beetle PFA
Dated November 2023

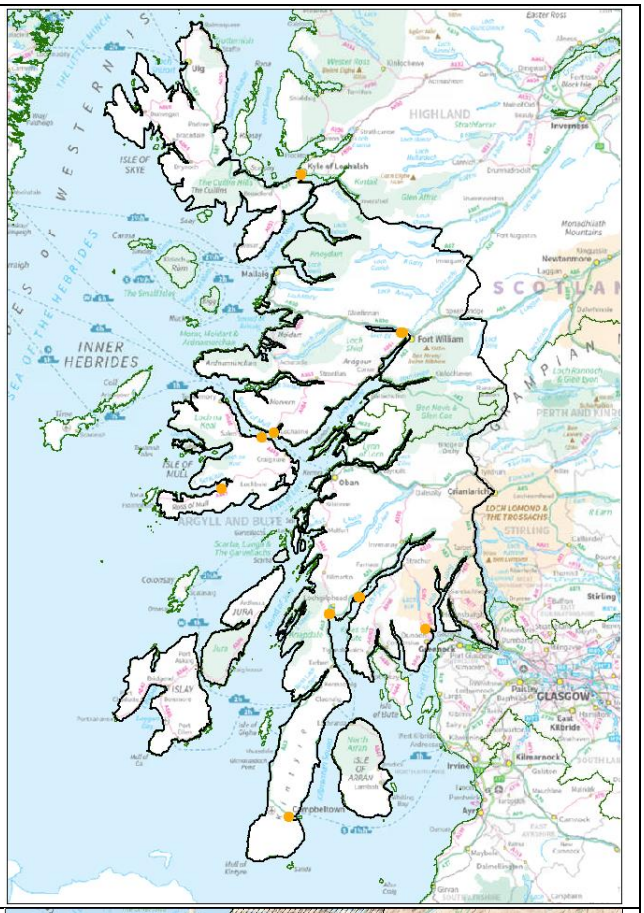
Surveillance operation relevant to detection efforts for *Ips cembrae, D. micans, Ips typographus, Ips Sexdentatus*	Map showing distribution
1. Coupe inspections for licensing of conifer roundwood timber to NI or ROI 2023 – 33 site inspections Requests are made by registered Professional Operators directly to the Forestry Commission, inspections carried out by trained FC staff or contractors prior to felling, to check for any potential signs of bark beetle activity. Some sites are inspected and licensed for export that do not eventually get exported for various commercial reasons. Where larch is included in the proposed felling area, proximity to *Phytophthora ramorum* SPHNs is considered and taken into account during inspection. Larch material with bark on from SPHN sites cannot be licensed for export to NI or RoI (or any other EU member state).	

2. Pheromone traps at timber ports, temporary timber ports and timber processing sites.

Theysohn type slot traps are used with *Ips typographus* aggregation lure at 9 locations. The number / locations used can change where new or temporary piers or premises are established.

The *Ips typographus* aggregation lure is used as it considered the best general option able to catch the necessary target range of *Ips* species.

Checked fortnightly from late spring to early autumn, with lures replaced and any beetles caught sent to Forest Research entomologists for ID.

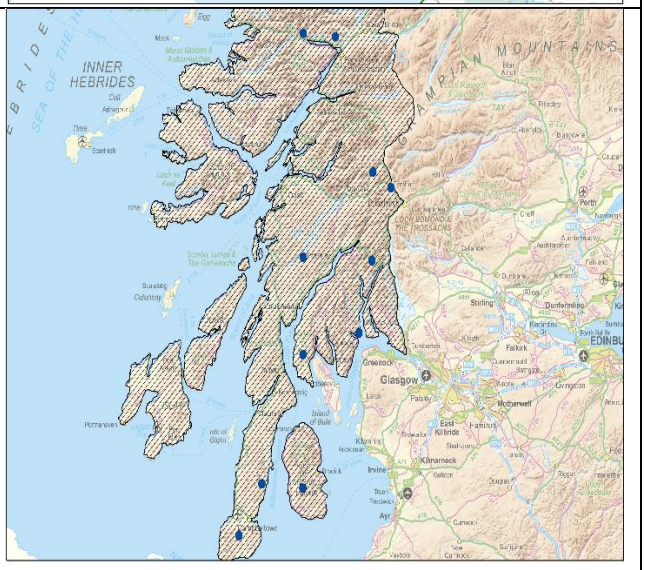


3. Pheromone traps in the forest

Ips typographus aggregation pheromone lures are deployed in the forest. Again this lure is considered the best general option to attract the target range of beetles in this setting.

The traps are inspected regularly through the flying season with any beetle findings sent to FR for analysis. This provides results throughout the season.

The traps are decommissioned in early autumn.



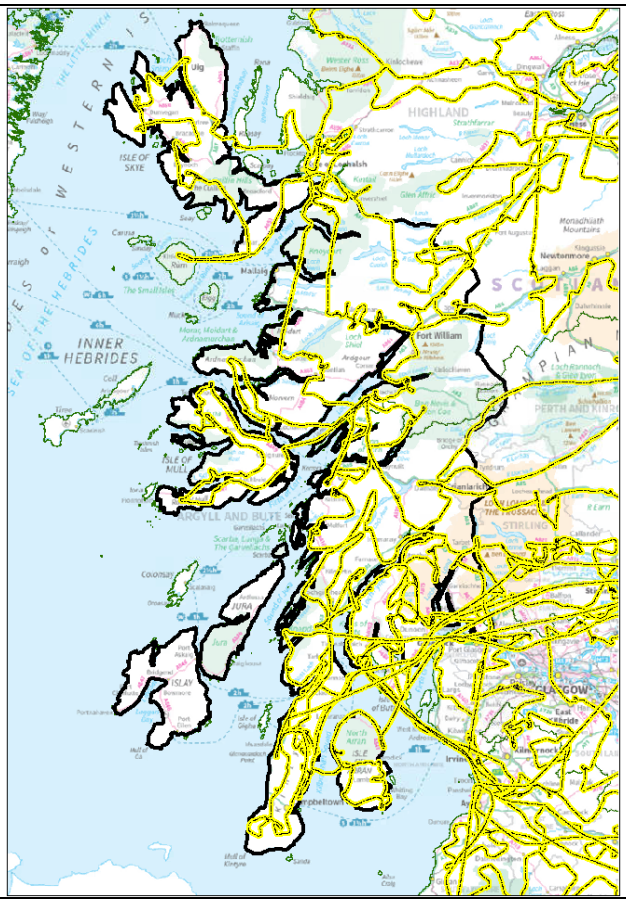
Scottish Forestry
Coilltearachd na h-Alba

4. Aerial surveillance

Surveying all woodlands in Scotland, achieving coverage of 95% of the production conifer area in the PFA.

All sites identified from aerial surveillance as suspicious for presence of a range of potential pests or disease are followed up with a field survey.

Aerial surveys take place from late May to early September.



Scottish Forestry
Coilltearachd na h-Alba

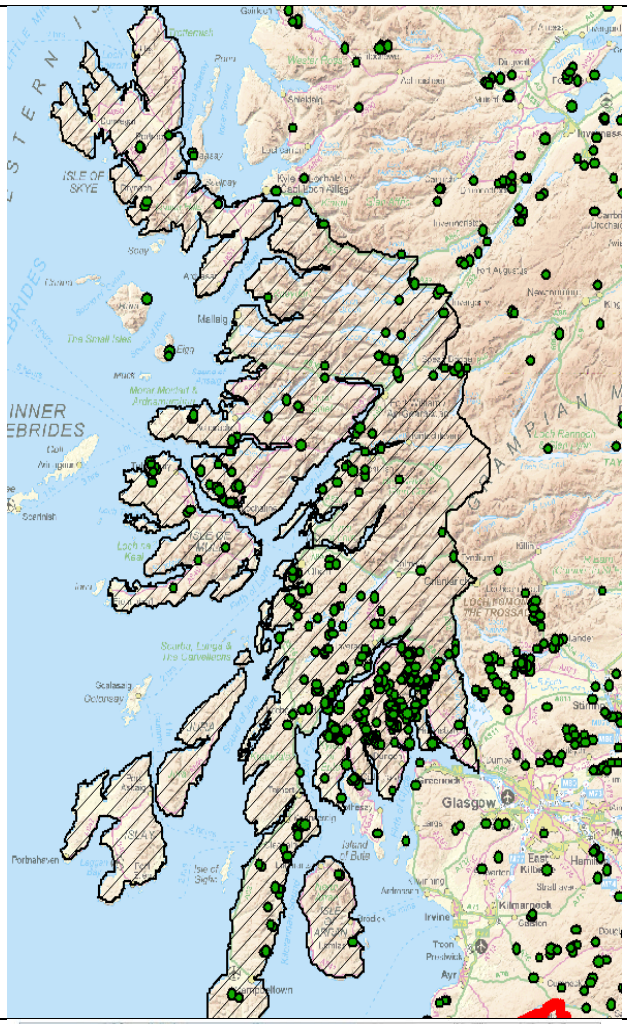
5. Field surveys targeting suspicious trees from observations and citizen science reporting

Principally identified during the aerial surveillance programme but also includes sites reported directly to SF/FC or to FR via TreeAlert.

Local foresters receive training in bark beetle identification and reporting. They are encouraged to report all findings rather than try to self-identify. Observatree volunteers also receive specific pest training.

309 sites visited in the PFA area in 2023. Map shows the spread of sites. Survey teams are all trained in identification of bark beetles and are trained in *Dendroctonus micans* identification annually at locations in south Scotland.

Surveys take place from June to early December.

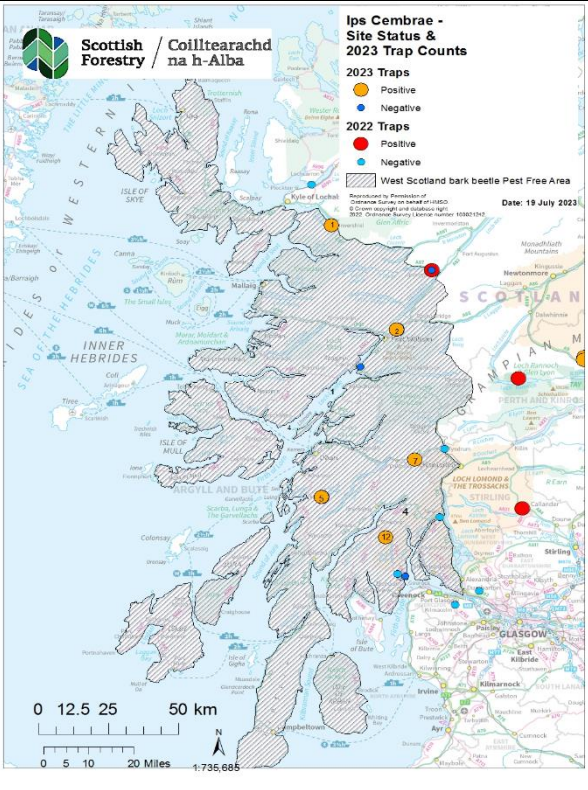


6. Additional *Ips cembrae* pheromone lures

Cross-vane type traps set up in larch coupes with the *Ips cembrae* specific aggregation lure. Lures refreshed fortnightly from late spring to early autumn and any beetles sent to FR entomologists for ID.

This lure is a different formulation to the *Ips typographus* lure and sites are selected on a risk basis, usually by proximity to high-risk transport pathways or proximity to areas of known stressed or dead larch material.

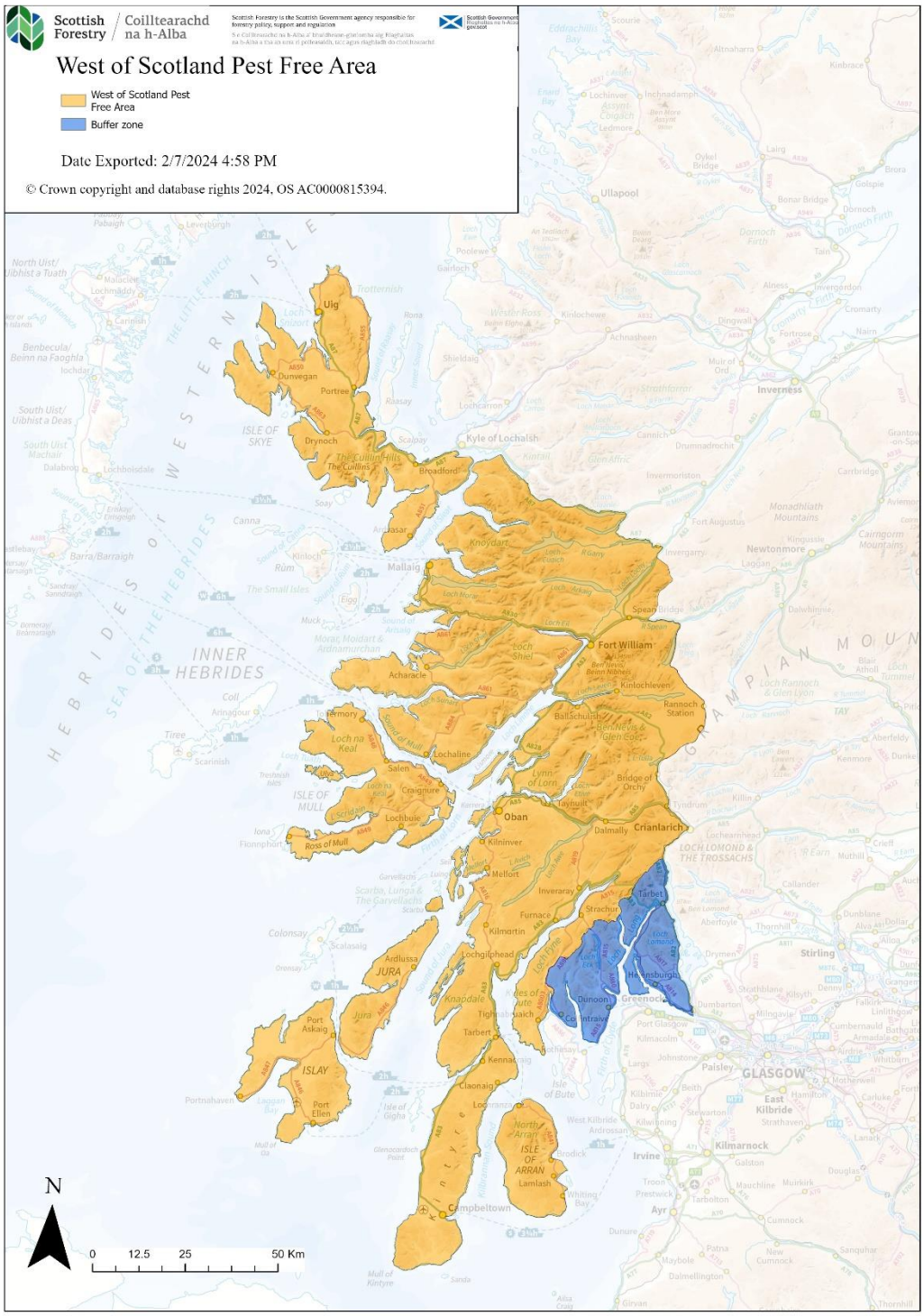
Map shows locations of *Ips cembrae* lures deployed in 2022 and 2023.



Annex B
Dated February 2024

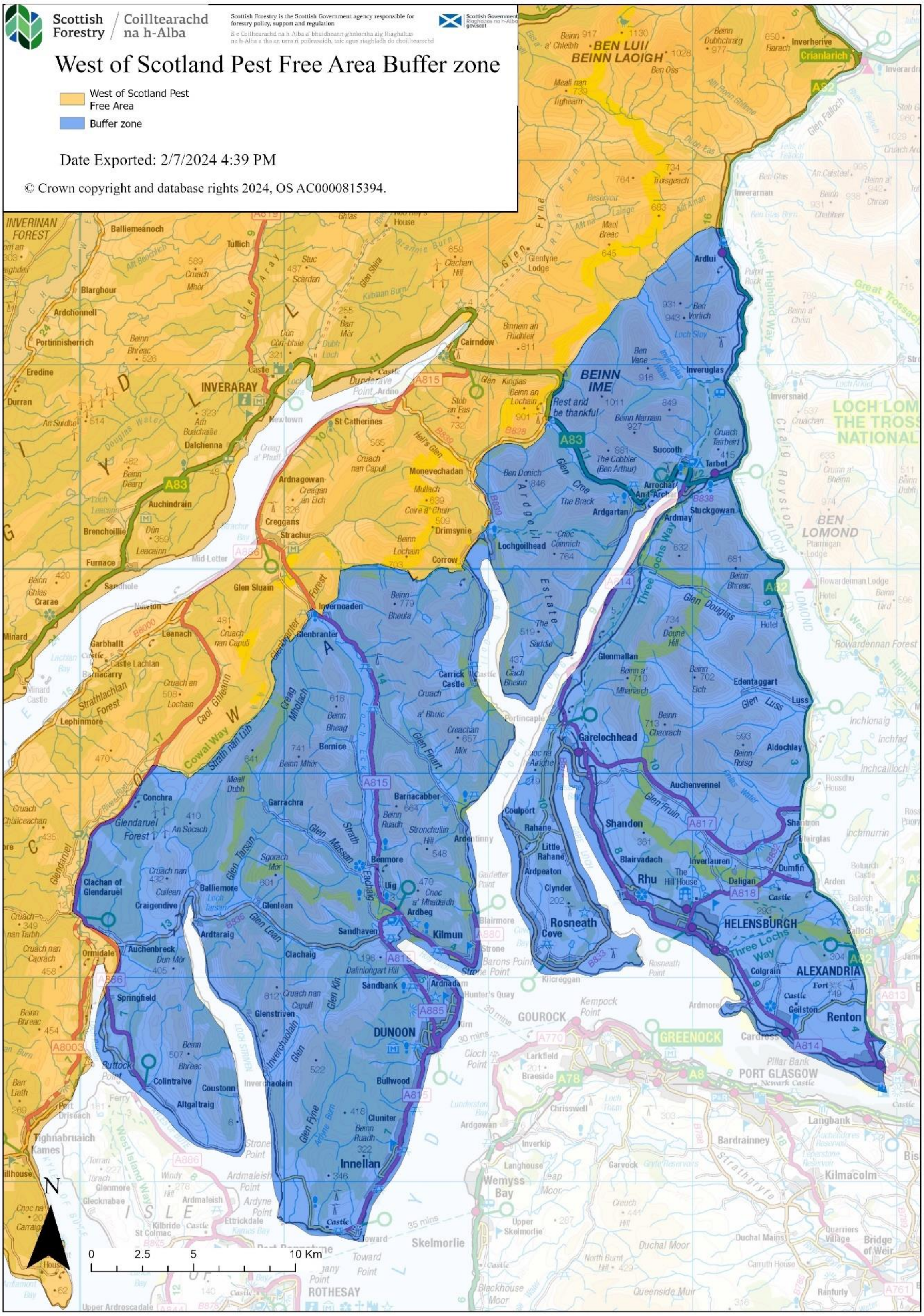
Maps and boundary description for the buffer zone area within the PFA where restrictions apply due to confirmed findings of *D. micans* within 35 km, as at 7 February 2024.

Map 1 – Wider view: The West of Scotland pest free area for conifer bark beetles (coloured orange) and the buffer zone area within which restrictions apply due to confirmed findings of *D. micans* within 35 km (coloured blue), as at 7 February 2024



Scottish Forestry
Coilltearachd na h-Alba

Map 2 – Closer view: The West of Scotland pest free area for conifer bark beetles (coloured orange) and the buffer zone area within which restrictions apply due to confirmed findings of *D. micans* within 35 km (coloured blue), as at 7 February 2024



Scottish Forestry
Coilltearachd na h-Alba

Buffer zone boundary description: Written description of the boundary line for the buffer zone area within the PFA where restrictions apply due to confirmed findings of *D. micans* within 35 km, as at 7 February 2024

The eastern boundary for the restricted area runs from Dumbarton along the A82 to Ardlui. From Ardlui, the boundary continues to run along the A82 for a further 1.3 km to the bridge across the Strath Dubh Uisge river. From here it runs up the Strath Dubh Uisge to the dam at grid ref NN 2862 1518. From the dam it runs in a south westerly direction for 400 m along the track and across open ground to the stream outlet at grid ref NN 2836 1488. It follows this stream to its mouth at the Loch Sloy reservoir. From the mouth of the stream the boundary runs along the northern shore of Loch Sloy and then up the Allt a' Chnoic river for 700 m to the point at grid ref NN 2655 1325 where a track crosses the river. The boundary then follows this track in a south westerly direction until it meets the A83. It then runs along the eastern verge of the A83 to the junction of the A83 and the B828 by the Rest and be thankful viewpoint. From the Rest and be thankful, the boundary follows the southeastern verge of the haul route along Gleann Mór until it meets the B839 near Pole farm. It then runs along the eastern verge of the B839 to Lochgoilhead. From Lochgoilhead it runs westward along the Cowal Way. Where the Cowal Way forks north at the foot of Beinn Lagan (NS 1272 9996), the boundary leaves the Cowal Way and follows the track forking south from this point around Beinn Lagan until the path reaches the A815 at Invernoadan by the Lauder monument. It then runs along the northeastern verge of the A815 to Glenbranter where it rejoins the Cowal Way and follows the Cowal Way south west until Garvie. From Garvie it runs along the eastern verge of the A886 to Springfield, then follows the mainland coastline to Dumbarton. In all cases where the boundary runs along stretches of road, laybys are considered part of the road and are not included in the restricted area.