

# National Action Plan for Pests of Trees And Timber 2024–2034



Plant Health Committee

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## Executive summary

The *National Action Plan for Pests of Trees and Timber 2024–2034* (the Plan) provides a national context for biosecurity risk management in Australia and enhances Australia’s capacity to prevent the introduction of exotic timber and tree pests and assist to prepare for a response, should they be detected in Australia.

Actions set out in the plan have been divided into four areas: prevention; detection; response; and cross-cutting issues. The actions will be used to inform investment and guide state/territory, regional and local efforts or efforts by individual governments, plant industries and stakeholder groups. The actions will also evolve as knowledge is gained through local and overseas’ experience and research.

The plan focuses on 9 National Priority Plant Pests (NPPP<sup>1</sup>) affecting trees and timber and 2 emerging pests – which are not NPPP – that pose a significant risk to enter Australia. These pests are the focus of government national preparedness capability investment and action. Further detail is provided under the pests in scope section of this plan.

The success of this plan is dependent on a high level of cooperation and collaboration between all levels of government, industry, non-government organisations, community groups, forest pest experts and research organisations. The plan will be supported by an Implementation Schedule used to record the progress of actions; set out roles, responsibilities, and funding; and to communicate with stakeholders on progress as well as their roles in the implementation of the plan.

The Plant Health Committee (PHC), as the relevant national committee for plant biosecurity, will formally oversee the implementation of the plan on behalf of governments. Progress of actions will depend on their priority, whether they are business-as-usual, or if resources can be identified and committed to address them. Relevant research and development corporations, industry bodies, and the Plant Biosecurity Research Initiative will be encouraged to promote opportunities for research and development to address gaps in our knowledge of timber and tree pests.

The plan was developed following extensive consultation with more than 85 government, industry and community stakeholders representing 45 organisations. It will be reviewed on a regular basis with a formal review after five years, or as determined by PHC. The forum will include representatives from governments, industry and relevant stakeholders.

The plan aligns with broader strategies, such as the National Biosecurity Strategy, and is complemented by a range of national activities for NPPP that are in progress or are under development including:

- *National Invasive Ant Biosecurity Plan 2018–2028*
- *National Xylella Action Plan 2019–2029*
- *National Khapra Beetle Action Plan 2021–2031*
- *National Hitchhiker (Contaminating) Plant Pest Action Plan 2022–2032*
- *National Priority List of Exotic Environmental Pests, Weeds and Diseases: Action Plan* (under development)
- *National Action Plan for Fruit Flies* (under development)
- *National Action Plan for Pests of Broadacre Crops* (under development)
- *National Action Plan for Pests of Horticultural Crops* (under development)
- *National Action Plan for Spotted Wing Drosophila* (under development).

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<sup>1</sup> This document refers to the 2019 National Priority Plant Pest list.



## Introduction

Australia has robust biosecurity measures in place to prevent the entry, establishment and spread of pests and diseases that could threaten our economy, environment, or human health. However, there are many exotic pests that threaten Australia's trees and timber and on average one to two new tree or timber pests establishes in Australia every year (Carnegie and Nahrung 2019), highlighting the need for a well-resourced biosecurity system that can adapt to changing risks.

Australia has the seventh largest forest estate in the world with 134 million hectares of native forest and 1.82 million hectares of plantation forests (ABARES 2024). These trees and forests are shared by a diverse range of stakeholders with shared responsibility for biosecurity.

Trees and timber provide Australia with a range of economic, social, and environmental benefits. Commercial forests support a thriving wood, paper, and timber industry, which generated a local value of production of \$2.3 billion and a further \$3.0 billion of exports in 2021–22 (ABARES 2023). Additionally, forests produce non-wood products, including essential oils, honey, and native bush foods, worth \$198 million per year (MPIG & NFISC 2013). Trees and forests also help to preserve biodiversity, support tourism, recreation, carbon sequestration, improve air quality, provide amenity spaces, and provide watershed protection outcomes.

Due to the importance of trees and timber to a wide range of stakeholders, protection of trees from pests and diseases (referred to collectively as pests) is of significant concern. The Australian Forest industry and the Australian Government have long recognised the potential threat that exotic pest species could pose to Australia's trees, forests, and timber and work to reduce these threats.

In 2019 PHC endorsed the National Priority Plant Pests (NPPP). There are nine groups of NPPP (Table 1) that are tree and/or timber impacting pests, which are discussed in this plan. Two emerging pests have also been noted, having been identified through consultation with stakeholders. Several of these timber and tree impacting pests are also included on the Exotic Environmental Pest List (EEPL)<sup>2</sup> and are forest industry High Priority Pests (HPPs)<sup>3</sup> as noted in Table 1. While the plan focuses on these pests, the procedures and protocols could be applied to other pests carried across Australian borders that may pose a significant risk to commercially planted trees, urban amenity trees or the environment.

This *National Action Plan for Pests of Trees and Timber* has been developed following extensive consultation with government, industry and community stakeholders. The plan will guide the implementation of nationally agreed actions for a strategic and risk-based approach to prevent the entry of timber and tree impacting pests, while avoiding duplication and complementing existing activities. The plan will enhance our ability to respond to a detection of these or similar pests all while considering the unique challenges associated with these pests (Box 1). The actions detailed in this plan are linked to broader biosecurity strategies and their implementation will support the delivery of those strategies.

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<sup>2</sup> ABARES (2021) provides the complete EEPL, available from: <https://www.agriculture.gov.au/biosecurity-trade/policy/environmental/priority-list>.

<sup>3</sup> Refer to the Plantation Forest Biosecurity Plan (PHA 2022) for more information.

**Box 1: Biosecurity Challenges of Timber and Tree Pests**

This plan is focused on pests that affect trees and timber. This includes pests that affect trees planted in the urban environment, trees growing in the natural environment and commercially planted trees. The plan will not discuss pests that only affect farmed horticultural trees as these pests will be covered under other National Action Plans that have been or are being developed.

Protecting Australia from timber and tree pests presents several unique challenges including:

- The cryptic nature of many timber and tree pests making them difficult to detect at low levels.
- The extensive use of native tree species in urban areas and commercial forests creating a pathway for pests to spread from managed to natural environments (Paap et al., 2017).
- Difficulty inspecting trees for signs of pests due to the large size of trees and the extensive, and often remote areas of forested land.

This plan identifies a series of actions to assist in overcoming these challenges.



# 1. National Action Plan for Pests of Trees and Timber

## 1.1 Scope of the plan

The plan aims to develop and strengthen preparedness, which is about building national capacity and capability to prevent and prepare for responses to plant biosecurity threats. It does so by describing the priority areas for a national approach across prevention, detection, and response, and setting out specific actions and priorities to improve the management of risks associated with exotic timber and tree pests. As Australia is free of these pests, the plan does not include actions relating to containment and asset-based protection or ongoing management.

## 1.2 Structure of the plan

The plan first describes the national context for biosecurity risk management in Australia and is then structured into four areas to address preparedness: prevention, detection, response, and cross cutting issues. Actions from the cross-cutting priority impact on the delivery of the other three priority areas and are equally important to reduce risks and threats of timber and tree pests. The final sections describe how the plan will be implemented, and how progress will be monitored, evaluated, and reviewed.

Users of the plan should look to identify and implement, or contribute to, actions they have responsibility for. Priorities for implementation will need to be assessed against current work programs and budgets, and research project funding. Many of the actions identified in this plan are interconnected with each other and in some cases complex to implement across the 10 years of the plan. Actions are focused on providing prevention benefits if coordinated at the national level. However, the need to transition to management should a species becomes established is ever present. Therefore, some actions do have a component relevant to long-term management (post-incursion).

## 1.3 Pests in scope of the plan

Species covered by the plan are listed in Table 1. These species are all NPPP (2019) except for Ceratocystis wilt and polyphagous shot hole borer with fusarium wilt, which have been included as emerging exotic timber and tree pests of concern to Australia. Emerging pests have been identified as being of increasing concern overseas and having different characteristics to NPPP included in the plan.

All pests included in the plan are exotic to Australia, under eradication, or have limited distribution. Several are listed by plant industries as High Priority Pests or are listed on the EEPL. Additional information about pests in scope of the plan is provided in [Appendix 1](#).

The plan does not discuss all priority pests which affect trees and timber. Other relevant NPPP of interest may be covered under another National Action Plans. For example, spongy moths (*Lymantria* spp.) may affect forests, but this pest will be covered under the National Hitchhiker (Contaminating) Plant Pest Action Plan due to the pest's hitchhiking capabilities.

Table 1: Pests in scope of this National Action Plan

Common name	Scientific name	NPPP <sup>4</sup>	EEP <sup>5</sup>	HPP <sup>6</sup>
Airborne Phytophthora	<i>Phytophthora kernoviae</i>	✓	✓**	
	<i>Phytophthora ramorum</i>	✓	✓*	✓ <sup>§</sup>
Ceratocystis wilt <sup>7</sup>	<i>Ceratocystis</i> spp. (including <i>Ceratocystis manginecans</i> )		✓*	✓ <sup>§§</sup>
Dutch elm disease	<i>Ophiostoma novo-ulmi</i>	✓	✓**	
Exotic drywood termites	<i>Cryptotermes brevis</i>	✓		
	<i>Cryptotermes dudleyi</i>	✓		
	<i>Incisitermes minor</i>	✓	✓**	
Exotic longhorn beetles	<i>Anoplophora</i> spp.	✓		✓ <sup>§§</sup>
Exotic strains of myrtle rust	<i>Austropuccinia psidii</i>	✓	✓*	✓ <sup>§</sup>
Exotic subterranean termite	<i>Coptotermes formosanus</i>	✓	✓*	✓
	<i>Coptotermes gestroi</i>	✓		✓
Pine pitch canker	<i>Fusarium circinatum</i>	✓		✓
Pine wilt nematodes and exotic sawyer beetle vectors	<i>Bursaphelenchus cocophilus</i>	✓		
	<i>Bursaphelenchus xylophilus</i>	✓		✓
	<i>Monochamus</i> spp.	✓		✓
Polyphagous shot hole borer with Fusarium wilt <sup>8</sup>	<i>Euwallacea fornicatus</i>		✓**	
	<i>Fusarium euwallaceae</i>		✓**	

<sup>4</sup> Refer to the National Priority Plant Pests (2019) for further information: <https://www.awe.gov.au/biosecurity-trade/pests-diseases-weeds/plant/national-priority-plant-pests-2019>.

<sup>5</sup> Refer to the Exotic Environmental Pest List for further information: <https://www.awe.gov.au/biosecurity-trade/policy/environmental/priority-list#terrestrial-invertebrates>. Note: pests with a (\*) are Higher priority Exotic Environmental Pests (EEPs) those with a (\*\*) are Medium priority EEPs.

<sup>6</sup> Refer to the Plantation Biosecurity Plan (2022) and Table 3 for more information. Note: pests with a (§) have been identified as HPPs by multiple plant industries. Pests with a (§§) are not HPPs of the forestry industry but have been identified as HPPs by other plant industries. For full details refer to Table 3.

<sup>7</sup> Identified as an emerging pest during the consultation phase of the creation of this document.

<sup>8</sup> Identified as an emerging pest during the consultation phase of the creation of this document. Note *E. fornicatus* is under eradication in WA.

## 2. National context

Australia’s biosecurity system operates under Commonwealth, state and territory legislation administered and managed by the respective government agricultural and environmental agencies. These agencies also contribute to early detection, national response arrangements and committees, in collaboration and consultation with industry and other stakeholders.

### 2.1 Legislation

Legislation relevant to the management of timber and tree pests, current as of January 2024, is listed in Table 2. Legislative provisions are used to prevent the entry, establishment and spread of timber and tree plant pests in Australia.

Table 2: Biosecurity legislation relevant to the management of risks associated with timber and tree pests

GOVERNMENT	ADMINISTERING AUTHORITY	PRIMARY LEGISLATION
Commonwealth	Department of Agriculture, Fisheries and Forestry	<i>Biosecurity Act 2015</i>
Australian Capital Territory	Environment Planning and Sustainable Development Directorate	<i>Pest Plants and Animals Act 2005</i>
New South Wales	Department of Primary Industries <sup>9</sup>	<i>Biosecurity Act 2015</i>
Northern Territory	Department of Industry, Tourism and Trade <sup>10</sup>	<i>Plant Health Act 2008</i>
Queensland	Department of Agriculture and Fisheries	<i>Biosecurity Act 2014</i>
South Australia	Department of Primary Industries and Regions	<i>Plant Health Act 2009</i>
Tasmania	Department of Natural Resources and Environment Tasmania	<i>Biosecurity Act 2019</i>
Victoria	Department of Energy, Environment and Climate Action	<i>Plant Biosecurity Act 2010</i>
Western Australia	Department of Primary Industries and Regional Development	<i>Biosecurity and Agricultural Management Act 2007</i>

#### *Biosecurity Act 2015 (Cth)*

The *Biosecurity Act 2015* (Cth) establish requirements and regulatory powers that affect how biosecurity risks associated with goods, travellers and conveyances entering Australia are managed. These powers allow for the biosecurity risks posed by invasive pests, including timber and tree pests, to be more effectively managed, and complement arrangements with states, territories, and industry to support the management of detections. The definition of ‘biosecurity risk’ considers the risk posed to the environment, as well as human, animal, plant health and the economy.

While the focus of the Biosecurity Act is on the Australian border, many of the supporting activities around the border are focused on reducing the biosecurity risk or responding to areas where unwanted pests and

<sup>9</sup> In July 2024, NSW changed its departmental name to Department of Primary Industries and Regional Development.

<sup>10</sup> In August 2024, NT changed its departmental name to Department of Agriculture and Fisheries.

diseases have entered Australia. The actions in this plan fall under the management of biosecurity risks under the Biosecurity Act.

## Commonwealth land managers

In addition to roles specified under the Biosecurity Act, the Australian Government is also responsible for land management in some ports, and national parks through Parks Australia, the Department of Defence estate, as well as Australia's external territories.

## 2.2 National arrangements

Well-established relationships and national arrangements are in place between the Australian, state and territory governments and, where relevant, industry and other stakeholders to coordinate and implement national action on biosecurity issues.

### National committees

Australia has established national committees to provide a formal mechanism for developing and coordinating key plant biosecurity policies and procedures to ensure national consistency, and to identify activities to enhance national biosecurity preparedness and response capability.

The National Biosecurity Committee (NBC) is responsible for driving a national strategic approach to emerging and ongoing biosecurity policy issues across governments. This committee is supported by several sectoral committees which provide policy, technical and scientific advice on matters affecting their sectors for all pest and disease risks to terrestrial and aquatic (inland water and marine) animals and plants, and the environment.

PHC is the peak government plant biosecurity policy and decision-making forum and reports to the NBC. The PHC is supported by:

- Subcommittee on Market Access, Risk and Trade (SMART)
- Subcommittee on Plant Health Diagnostics (SPHD)
- Subcommittee on National Plant Health Surveillance (SNPHS)
- Plant Biosecurity Preparedness Working Group (PBPWG)
- Australian Fruit Fly Technical Advisory Subcommittee (AFFTAC).

The Environment and Invasives Committee (EIC) provides national policy leadership and advice to the NBC on the identification, prevention and management of invasive plant, vertebrate and invertebrate species that adversely impact the environment, economy, and community. The EIC provides national coordination of environmental biosecurity response and preparedness capability development.

### Biosecurity planning and preparedness

As a shared responsibility biosecurity preparedness involves collaboration and coordination amongst government and industry parties. Plant Health Australia (PHA) is the national coordinator of the government-industry partnership for plant biosecurity in Australia. The role of PHA is to bring expertise, knowledge, and stakeholders together to generate solutions that improve biosecurity outcomes to ensure a future-orientated and solutions-focused system. PHA is the custodian for the Emergency Plant Pest Response Deed (EPPRD) and actively works with plant industries to strengthen their biosecurity capability.

PHA's plant industry members (38 as of September 2024) undertake biosecurity planning to identify the industry High Priority Pests (those assessed to pose the greatest risk) and risk mitigation measures. Through this process, 10 plant industries have identified timber and tree NPPP pests as a High Priority Pest (Table 3).

As the industry with the most identified tree and timber NPPP (Table 3), the plantation forest industry has increased its research and biosecurity levies. Through its industry representative body (Australian Forest Products Association) and its research and development corporation (Forest Wood Products Australia) the sector uses its levies to co-invest with other stakeholders in a wide range of preparedness activities. These include research projects, the mobile tree pest identification tool MyPestGuide Trees, biosecurity planning, a National Forest Biosecurity Manager role and the post-border surveillance and capability training program, Forest Watch Australia (Box 2). AFPA has also established a Forest Health and Biosecurity (FHAB) subcommittee to provide industry with technical advice about biosecurity and pest issues impacting the sector.

**Box 2: Forest Watch Australia**

The [Forest Watch Australia](#) program was established by a formal agreement between DAFF, state and territory governments, the plantation sector, the Invasive Species Council, NRM Regions Australia and Plant Health Australia. The program has a representative governance and operational structure and is coordinated through PHA. Key activities supported by the program include:

- Pest trapping and host tree surveillance in urban and peri-urban areas around high-risk areas.
- Annual Expert Training provided to build the capacity of surveillance and diagnostic staff.
- Online and in-person workshops with tree stakeholders in urban areas (e.g., council staff, arborists, public) to encourage greater participation in general surveillance for tree pests.
- An annual TREEmendous Blitz. As part of the blitz community members report insects or symptoms they observe on trees during a defined period.

National environmental pest biosecurity planning and preparedness is coordinated through DAFF. Environmental pests are included in departmental exercise programs that investigate and develop the role of the Commonwealth in a nationally significant biosecurity emergency response with the aim to improve national preparedness and capability. Exotic Environmental Pest (EEP) incursions that do not affect commercial agriculture or plantation forests, may be managed through sector-related emergency response committees and the National Environmental Biosecurity Response Agreement (NEBRA). Work in this plan will bolster plant and environmental pest response and preparedness.

Table 3: Peak plant industry bodies that have identified a Timber or Tree NPPP as a High Priority Pest<sup>11</sup>

PEAK INDUSTRY BODY	TIMBER/TREE PEST
Australian Forest Products Association	<i>Phytophthora ramorum</i> (Airborne Phytophthora) <i>Austropuccinia psidii</i> (Myrtle rust) <i>Coptotermes formosanus</i> (Exotic subterranean termite) <i>Coptotermes gestroi</i> (Exotic subterranean termite) <i>Fusarium circinatum</i> (Pine pitch canker) <i>Bursaphelenchus xylophilus</i> (Pine wilt nematodes and exotic sawyer beetle vectors) <i>Monochamus</i> spp. (Pine wilt nematodes and exotic sawyer beetle vectors)
Australian Tea Tree Industry Association	<i>Phytophthora ramorum</i> (Airborne Phytophthora) <i>Austropuccinia psidii</i> (Myrtle rust)
Australian Blueberry Growers' Association	<i>Phytophthora ramorum</i> (Airborne Phytophthora)
Chestnuts Australia	<i>Phytophthora ramorum</i> (Airborne Phytophthora)
Hazelnut Growers of Australia	<i>Phytophthora ramorum</i> (Airborne Phytophthora)
Australian Truffle Growers Association	<i>Phytophthora ramorum</i> (Airborne Phytophthora)
Greenlife Industry Australia	<i>Phytophthora ramorum</i> (Airborne Phytophthora) <i>Austropuccinia psidii</i> (Myrtle rust)
Australian Macadamia Society	<i>Phytophthora ramorum</i> (Airborne Phytophthora)
Australian Mango Industry Association	<i>Ceratocystis</i> spp. (including <i>Ceratocystis manginecans</i> ) (Ceratocystis wilt)
Australian Lychee Growers Association	<i>Anoplophora</i> spp. (Exotic longhorn beetles)

## Emergency response arrangements

PHA is the custodian for the [EPPRD](#), the formal legal framework enabling cost-sharing of responses to exotic Emergency Plant Pests. All governments and peak industry body signatories to the EPPRD have agreed that eradication of Emergency Plant Pests should be pursued when it is technically feasible and cost beneficial to do so, and that the costs of eradication are shared across affected parties.

Timber and tree pests that have been categorised as Emergency Plant Pests under the EPPRD are shown in Table 4. In the event of a detection involving an uncategorised Emergency Plant Pest, cost sharing between affected industry parties and government parties will commence at the Category 3 (50% government:50% industry) ratio until the pest is formally categorised.

<sup>11</sup> List current as of April 2024.

Table 4: Timber and tree pests that have been categorised as Emergency Plant Pests under the EPPRD<sup>12</sup>

SCIENTIFIC NAME	COMMON NAME	FORMAL CATEGORY
<i>Austropuccinia psidii</i> <sup>13</sup>	Myrtle rust	Category 1
<i>Bursaphelenchus xylophilus</i>	Pine wilt nematode	Uncategorised
<i>Euwallacea fornicatus</i> with <i>Fusarium euwallaceae</i> <sup>14</sup>	Polyphagous shot hole borer and Fusarium wilt	Category 1
<i>Monochamus alternatus</i>	Pine sawyer beetle	Uncategorised
<i>Ophiostoma novo-ulmi</i> <sup>15</sup>	Dutch elm disease	Category 1
<i>Phytophthora ramorum</i>	Sudden oak death	Category 1

Under the EPPRD response framework, the Consultative Committee on Emergency Plant Pests (CCEPP) is convened in response to a plant biosecurity incident. The CCEPP reports to the National Management Group on plant pest issues in accordance with the EPPRD.

Some timber and tree pests that have environmental impacts, and are not covered under the EPPRD, may be considered under the NEBRA. The relevant sectorial committee to provide advice to the National Biosecurity Management Group is the National Biosecurity Management Consultative Committee. These national arrangements apply when responding to a detection of exotic pests and diseases that are not covered by the EPPRD and impact on the environment and social amenity.

Established pests and diseases, or localised eradication programs, are the responsibility of the state or territory government where they are located. These governments may choose to place biosecurity responsibilities on land managers. The Australian Government may assist with the management of established pests and diseases or localised eradication programs where these are affecting or have the potential to affect matters of national interest.

<sup>12</sup> The EPPRD classifies Emergency Plant Pests into four categories. See Schedule 3 of the EPPRD, 'Categories of Emergency Plant Pests' and [Pest categorisation — Plant Health Australia](#) for further information.

<sup>13</sup> Note, as some variants of this pathogen occur in Australia only exotic variants would potentially be responded to under the EPPRD.

<sup>14</sup> Listed in Schedule 13 of the EPPRD as '*Euwallacea fornicatus* with its symbiotic *Fusarium* species'.

<sup>15</sup> Listed in Schedule 13 of the EPPRD as '*Ceratocystis ulmi*'.

### 3. Action areas

This section describes a national approach covering the priority biosecurity areas of prevention, detection, and response. It sets out specific actions and priorities to improve the management of risks associated with timber and tree plant pests. The biosecurity focus for timber and tree plant pests is on preventing entry into Australia, or early detection linked to a rapid and effective response aiming for eradication.

Specific actions and priorities to improve the management of biosecurity risks associated with timber and tree pests are set out in the plan. Three cross-cutting actions are also identified which are relevant to multiple biosecurity areas.

#### Area 1: Prevention

Prevention is aimed at minimising the likelihood of the entry of new timber and tree pests into Australia. Pest risk assessments, pathway analysis, horizon scanning, improved sharing of information between stakeholders as well as evaluating the effectiveness of phytosanitary treatments and other Actions have been identified to assist in the prevention of priority timber and tree pests entering Australia.

The prevention focused actions identified in this plan aim to achieve a better understanding of the risk pathways and ways to manage them to prevent the entry of priority timber and tree pests that are not yet present in Australia or are present and under eradication. These prevention actions are summarised in Table 5.

Table 5: Summary table of Area 1: Prevention

Area 1:	Prevention	Priority	Timeframe*
Action 1.1	Establish a shared understanding of emerging biosecurity risks and management options for an Australian context	High	Short
Action 1.2	Develop new phytosanitary treatments and import conditions to protect against priority timber and tree pests	High	Long
Action 1.3	Strengthen domestic and international partnerships to encourage collaboration and increase responsiveness to priority timber and tree pests	Medium	Medium

\* Indicative timeframes: Short up to 3 years; Medium 4 to 8 years; Long up to 10 years.

#### Action 1.1: Establish a shared understanding of emerging biosecurity risks and management options for an Australian context

***A shared understanding of emerging risks and management options will improve understanding of biosecurity threats and help us to work better together.***

The Commonwealth implements and maintains a range of pest risk assessments, import conditions, and phytosanitary measures at the Australian border to minimise the risk of entry, establishment and spread of plant pests. These measures are adapted over time as new information about pest interceptions and changing risk profiles become known. Similarly, industry, through the development of biosecurity plans or research projects also conduct risk assessments for some pests. However, there are different levels of awareness across timber and tree stakeholders of processes and activities being undertaken to prevent and detect risks at our border.

Improved biosecurity outcomes could be achieved through targeted communications and engagement activities that address the specific needs of the wide range of timber and tree stakeholders, including the community. There may also be value in sharing pest risk assessments, pathway analysis and border



interception data with priority stakeholders to guide and better coordinate our efforts against priority timber and tree pests.

The ability to establish a shared understanding of emerging biosecurity risks and management options will ensure timber and tree stakeholders can effectively respond to current and future challenges. It will also help to better connect stakeholders, work more efficiently, and make better decisions.

## Action 1.2: Develop new phytosanitary treatments and import conditions to protect against priority timber and tree pests

***New phytosanitary treatments and import conditions will play a key role in minimising the likelihood of new timber and tree pests entering and impacting Australia.***

Most priority timber and tree pests could potentially enter through imported commodities, wood packaging or dunnage. To mitigate this risk there is a range of phytosanitary treatments and import standards in place that detail how imported goods must be treated to minimise the risk of pest introductions to Australia.

It is important that the effectiveness of current phytosanitary treatments and compliance with international standards for imported goods and dunnage (e.g., [ISPM 15](#)) continue to be regularly reviewed and updated to ensure they are applied effectively and adequately reduce the risk of pest entry.

Australia is a signatory to the [Montreal Protocol](#) and is committed to its obligations and commitments to phase out ozone-depleting agents such as methyl bromide. While the use of methyl bromide for quarantine and pre-shipment use is currently excluded from the Montreal Protocol, there is also a need to find equally effective alternative phytosanitary treatments.

## Action 1.3: Strengthen domestic and international partnerships to encourage collaboration and increase responsiveness to priority timber and tree pests

***Strengthening and expanding partnerships with domestic and international stakeholders will build diagnostic and surveillance capacity at national and international levels.***

Several programs and initiatives currently operate domestically and internationally to connect individuals and organisations and help to build Australia's forest biosecurity capacity. Domestically, the Forest Watch Australia program has been established to undertake surveillance for forest pests and provide training to forest stakeholders. Internationally, the Asia-Pacific Forest Invasive Species Network ([APFISN](#)), the International Forestry Quarantine Research Group ([IFORG](#)), and the Australian Centre for International Agricultural Research ([ACIAR](#)) all actively undertake forest biosecurity capacity initiatives, which directly or indirectly benefit Australia, through mitigation of tree health problems or risks in countries trading with Australia.

Building collaborative relationships within and between domestic and international stakeholders is essential to supporting better biosecurity outcomes. Opportunities exist to work more closely with industry, Traditional Owners, local governments, NRM organisations and the community. Linkages with overseas National Plant Protection Organisations (NPPOs) could also be explored to create opportunities to study the surveillance and diagnosis of pests in countries where they are present.

The ability to foster these partnerships will help to coordinate our efforts and build surveillance and diagnostic capacity for priority timber and tree pests at national and international levels. It will also assist with intelligence gathering, knowledge sharing and skill development to help mitigate and respond to biosecurity threats.

## Area 2: Detection

Detection is focused on ensuring that tools and strategies are in place to rapidly find priority timber and tree pests should they enter Australia. This includes ensuring that Australia has suitable surveillance and diagnostic tools and capacity to readily detect new pests thus providing the best chance of successful eradication or containment. Detection in urban areas will be particularly important for timber and tree pests as these areas are expected to act as the source of timber and tree pest outbreaks in Australia (Paap et al., 2017). Detection actions are summarised in Table 6.

Table 6: Summary table of Area 2: Detection

Area 2:	Detection	Priority	Timeframe*
Action 2.1	Develop the skills and knowledge required to address current and future challenges	High	Short
Action 2.2	Create opportunities to enhance community and citizen science contributions	High	Short
Action 2.3	Encourage the uptake of existing and emerging technologies to improve the detection, identification and prioritisation of timber and tree pests	High	Medium
Action 2.4	Develop and update decision-making tools that support surveillance and diagnostic activities	High	Long
Action 2.5	Maintain and develop best practice surveillance programs for timber and tree pests	Medium	Medium

\* Indicative timeframes: Short up to 3 years; Medium 4 to 8 years; Long up to 10 years.

### Action 2.1: Develop the skills and knowledge required to address current and future challenges

***Targeted capacity and capability building activities will help ensure skilled people are available to support biosecurity activities.***

The ability to manage risks to trees and timber relies on skilled and responsive people across a wide range of stakeholders including government, industry, environmental stakeholders and the wider community. While there are many skilled individuals that provide an important foundation for biosecurity (surveillance, diagnostics and preparedness) activities, there is an ongoing need to build and retain expertise in key areas to improve our capacity and capability and to support the use of emerging technologies.

Identifying the current and emerging gaps in human capacity and available training across timber and tree stakeholders in Australia will be an important step in supporting improved biosecurity outcomes. This will contribute to the identification and design of appropriate measures to address these gaps such as recruitment, training requirements, or professional development opportunities.

Professional development opportunities funded by DAFF through the Plant Surveillance Network Australasia-Pacific (PSNAP) and National Plant Biosecurity Diagnostic Network (NPBDN) are already available for PSNAP and NPBDN members. Continuing and increasing these opportunities to industry and other stakeholders would help facilitate knowledge and information sharing, improve skills, enable greater collaboration, and support workforce retention.

There may also be value to include biosecurity modules into existing professional accreditation schemes and training modules to build a background level of biosecurity awareness within key stakeholder groups. Similarly, awareness material could be developed to explain the value of existing programs with biosecurity outcomes (such as [BioSecure HACCP](#), which is a production nursery biosecurity program run by Greenlife Industry Australia), to promote the value proposition for businesses to adopt these schemes/programs.

## Action 2.2: Create opportunities to enhance community and citizen science contributions

***Using citizen science and working more closely with members of the public enables wider participation and provides an opportunity to improve our system.***

There is growing recognition that citizen science has the potential to provide a valuable source of expertise, data and information. While data collected by citizen scientists is increasingly being published in various databases (e.g., [MyPestGuide®](#), [iNaturalist](#), [Atlas of Living Australia](#)), the true potential of citizen science is yet to be fully realised in Australia.

Creating opportunities to enhance community and citizen science contributions will help support the early detection of a range of timber and tree pests and provide a valuable source of information and expertise. The ability to draw on a more extensive source of knowledge and information also provides a unique opportunity to help improve our understanding of the insect and pathogen species diversity present in Australia.

It is likely that citizen science initiatives focused on Traditional Owners, arborists, garden clubs, school aged children, councils, Landcare groups and other members of the public will provide the best opportunities. Advances in tools and the development of standards and systems could also help enhance and support citizen science contributions for priority timber and tree pests.

## Action 2.3: Encourage the uptake of existing and emerging technologies to improve the detection, identification and prioritisation of timber and tree pests

***The speed and trajectory of advancements in technology has the potential to play a key role in addressing future biosecurity challenges for timber and tree pests.***

New technologies and innovative platforms have a key role in supporting early detection, surveillance, and timely response. They are increasingly being used to enable wider participation in biosecurity activities and offer a potential solution to significant resourcing challenges being faced by surveillance and diagnostics.

To support pest reporting the forest industry developed [MyPestGuide® Trees](#), a mobile application that acts as a field guide and pest reporting tool for forest stakeholders. Pest reports sent through the application are received by jurisdictions for diagnosis and further action as required. The application is an example of technology developed to encourage the early reporting of forest pests. Integration of this tool with artificial intelligence (AI) and machine learning has the potential to reduce the diagnostic burden created by mobile-based pest reporting and could speed up preliminary field identifications.

For timber and tree pests, there is an opportunity to investigate the development and adoption of AI and new remote sensing technologies. These technologies could allow rapid and large-scale monitoring of tree health to allow better targeted ground surveillance. Similarly, remote sensing tools can assist with accurate tree species mapping to support delimiting surveillance, tree removal and other response activities. At a smaller scale, AI image processing may also support rapid sorting of surveillance trap captures. To train these systems it will also be important to develop and catalogue the diversity of timber and tree affecting species present in Australia and to acquire specimens of the target organisms.

## Action 2.4: Develop and update decision-making tools that support surveillance and diagnostic activities

***The development of new and improved decision-making tools supports the detection and identification of timber and tree pests.***

The continued development of new and improved decision-making tools will improve the detection and identification of timber and tree pests. These tools include National Surveillance Protocols (NSPs) and National Diagnostic Protocols (NDPs), as well as surveillance guidelines, manuals and other similar documents.

While some priority timber and tree pests already have a draft or endorsed NSP or NDP, the continued development, review, and update of these trusted protocols will help deliver reliable diagnoses and promote national consistency in surveillance activities. Efforts should focus on the development, review, and verification of new protocols for both priority and emerging timber and tree pests, as well as the review of existing drafts to ensure they are accurate and up to date.

The development of NDPs and NSPs will need to be undertaken in collaboration with the Subcommittee on Plant Health Diagnostics ([SPHD](#)), the Subcommittee on National Plant Health Surveillance ([SNPHS](#)) and associated working groups.

## Action 2.5: Maintain and develop best practice surveillance programs for timber and tree pests

***Best practice national surveillance programs play an important role in supporting the early detection of exotic timber and tree pests.***

Early detection of exotic pests is necessary to provide the best chance of successful eradication. A well-resourced surveillance program that utilises best-practice surveillance methods will assist in the early detection of priority timber and tree pests.

In Australia, DAFF funds national surveillance programs operating at or near the border including the National Border Surveillance Program (delivered by DAFF) and the National Plant Health Surveillance Program (delivered by jurisdictions). These programs are delivered by jurisdictions and cover a range of NPPPs. To compliment these programs, but specifically focused on tree health, DAFF, state governments, the Invasive Species Council, NRM Regions Australia, Forest and Wood Products Australia (FWPA) and PHA established a national surveillance program, Forest Watch Australia. It operates in the urban peri-urban areas surrounding potential points of entry for exotic pests, such as ports and airports and is funded through an industry levy with in-kind contributions from participating jurisdictions.

Exploring synergies between these existing surveillance programs or investigating expansion opportunities (e.g., to detect additional pests or focus on additional locations) may help better coordinate our efforts, improve information sharing and provide the greatest return on investment. There is also a need for these programs to regularly monitor outputs, share learnings and provide information on emerging issues to ensure they remain reliable and credible to stakeholders. An inter-program annual forum may provide an opportunity for this.

## Area 3: Response

Responding to a detection of a timber or tree pest or disease can be a complicated and lengthy process depending on the biology of the pest, spread of the species and how long it has been present in Australia before detection. To ensure a rapid response to exotic timber and tree pest detections, several actions are presented to ensure pests are responded to rapidly and effectively. Response actions are summarised in **Error! Reference source not found.**

Table 7: Summary table of Area 3: Response

Area 3:	Response	Priority	Timeframe
Action 3.1	Develop a common understanding of expertise and resources required to rapidly respond to pest incursions	High	Short
Action 3.2	Undertake simulation exercises to test and improve preparedness and response activities	High	Medium
Action 3.3	Develop and maintain preparedness materials and resources to help stakeholders respond to priority timber and tree pests	High	Medium
Action 3.4	Develop and maintain trained personnel to support emergency responses	Medium	Short
Action 3.5	Develop and adopt log traceability systems to allow tracing of logs during a response	Medium	Medium
Action 3.6	Develop national partnership arrangements for responding to priority timber and tree pests not managed under existing emergency response arrangements	Medium	Long

\* Indicative timeframes: Short up to 3 years; Medium 4 to 8 years; Long up to 10 years.

### Action 3.1: Develop a common understanding of expertise and resources required to rapidly respond to pest incursions

***An information repository containing details about subject matter experts and critical response materials will help to ensure a rapid response to pest detections.***

Due to the specialised nature of timber and tree pests it is particularly important that there is a common understanding of where expertise and critical resources are held to allow rapid and effective responses to pest detections.

Critical response materials (such as diagnostic kits and consumables, surveillance traps, lures, chemical controls, personal protective equipment, or casual labour hire companies etc.) that may be needed in the first weeks of a response should be identified. It may also be necessary to identify national and international experts that can be contacted to provide advice about priority timber and tree pests in the event of a pest detection.

Consideration could be given to developing a stockpile of critical materials and/or the development of databases to capture this and other critical information that can be drawn on to rapidly respond to timber or tree pests. Much of this information would also support the development of contingency plans and business continuity plans noted in [Action 3.3](#).

## Action 3.2: Undertake simulation exercises to test and improve preparedness and response activities

***Undertaking and promoting simulation exercises will enhance our preparedness and response capability to biosecurity incidents.***

Simulation exercises are an important and integral part of emergency preparedness for the plant biosecurity system. They play a key role in testing our collective readiness to significant biosecurity threats and identifying opportunities to improve the effectiveness of future responses.

It is recommended that regular simulation exercises with stakeholders are undertaken and promoted to test different aspects of a response and increase awareness of biosecurity threats. For timber and tree pests it will be particularly important to understand how a response may operate in different environments, such as urban, commercial, and native settings.

Learnings and recommendations from simulations and/or past responses should also be adopted and incorporated into contingency and business continuity plans ([Action 3.3](#)) or other preparedness and response activities.

## Action 3.3: Develop and maintain effective plans and information packages to help stakeholders respond to priority timber and tree pests

***Identifying control options (biological, chemical, host resistance and mechanical) and developing plans prior to pest incursions helps to ensure rapid responses to pest detections and helps minimise disruptions to impacted businesses and communities.***

To prepare for future pest responses, it would be beneficial to identify potential eradication, containment and management options for priority timber and tree pests. Broadly, this could include the identification of mechanical, genetic, biological, and chemical control options and the development of scenario-based plans to provide clarity around how pests can be responded to and what potential impacts to business there may be. This will help to ensure that responses occur rapidly, and disruptions caused by pest incursions are minimised.

Control options are used overseas to manage priority timber and tree pests. A desktop analysis should be undertaken to identify suitable mechanical, genetic, chemical, and biological control options for the management and eradication of exotic pests. Data packages may need to be developed that can be used to support regulatory permits for chemical and biological controls. This will ensure that Australia is well prepared to respond to future incursions of timber and tree pests.

To help with decision making, consideration should also be given to developing cost benefit analyses, contingency plans and business continuity plans that clearly capture key information required to respond to pest incursions, make informed decisions and minimise disruptions to businesses affected by a response. Cost benefit analyses will be especially helpful for determining response strategies and would help to inform business continuity and contingency planning.

## Action 3.4: Develop and maintain trained personnel to support emergency responses

***There is a constant need to develop and maintain trained personnel to support emergency responses into the future.***

The ability to respond quickly and effectively to a biosecurity incursion requires people with the necessary skills, knowledge, and experience. This will help ensure people clearly understand their roles and

responsibilities during a response and means that they can be easily deployed when and where they are needed.

Practical training programs for stakeholders are essential to support emergency responses to priority timber and tree pests. A variety of formats and platforms should continue to be used to accommodate different learning styles and accessibility needs. The design and development of training programs should also ensure known gaps in capability are addressed and lessons from simulation exercises or real-life responses are captured and incorporated.

Opportunities to develop and maintain a network of trained Liaison Officers should also be considered to improve response readiness of forest stakeholders. Liaison Officers serve an important role during emergency responses by acting as a communication conduit between government officers involved in a response and affected industries or communities. Opportunities may also exist to work with the National Biosecurity Response Team ([NBRT](#)) to ensure that members have relevant expertise to support timber and tree pest responses.

### Action 3.5: Develop and adopt log traceability systems to allow tracing of logs during a response

***Log traceability systems can be used to support biosecurity tracing in the event of timber or tree pest detections.***

A nationally adopted log traceability system will ensure that pests detected on timber, or sawlogs can be quickly traced back to their source. This is essential for limiting the size of an incursion and supports the tracing of other potentially impacted goods from the same consignment or origin.

A focus should be given to reviewing existing systems currently in place and determining if these can be adapted to support biosecurity tracing activities or if a new traceability system will need to be designed. Once determined, the system should be nationally adopted to support traceability in the event of a pest detection.

### Action 3.6: Develop national partnership arrangements for responding to priority timber and tree pests not managed under existing emergency response arrangements

***Understanding the way priority timber and tree pests will be managed under emergency response arrangements is critical to a strong biosecurity system.***

It is likely that most priority timber and tree pests would be managed under either the EPPRD or NEBRA. However, there may be instances where some pests predominantly affecting timber fall outside the bounds of these emergency response arrangements.

The development of national partnerships arrangements to manage these pests will provide a consistent approach for responding to a detection. It will also provide an important framework for the management and funding of responses which will enhance our preparedness and support improved biosecurity outcomes.

It is recommended that any arrangements developed are fit for purpose and set out the necessary provisions for leadership, coordination, management, and communication. This is particularly important to ensure that stakeholders have a clear understanding of roles and responsibilities and that operational actions are rapid and effective.

## Area 4: Cross-cutting issues

Three cross cutting actions have been identified in this plan. These are actions that cross two or more areas. Cross cutting actions include those relating to communication, governance and research that is needed to support the implementation of the prevention, detection, and response areas of the plan. These actions are summarised in Table 8.

Table 8: Summary table of Area 4: Cross-cutting issues

Area 4:	Cross-cutting issues	Priority	Timeframe
Action 4.1	Develop communication and engagement strategies to increase stakeholder awareness of biosecurity risks and encourage reporting	High	Short
Action 4.2	Establish governance arrangements to coordinate and monitor activities over time	High	Short
Action 4.3	Identify research, development and extension priorities for investment	High	Short

\* Indicative timeframes: Short up to 3 years; Medium 4 to 8 years; Long up to 10 years.

### Action 4.1: Develop communication and engagement strategies to increase stakeholder awareness of biosecurity risks and encourage reporting

**Communication and engagement strategies are important to increase awareness of biosecurity risks posed by timber and tree pests and to encourage reporting.**

Communication and engagement mechanisms are essential to ensure all timber and tree pest stakeholders are aware of their role in protecting Australia from priority pests.

As forest stakeholders vary in terms of their knowledge of biosecurity and their role in the biosecurity continuum, it is important that communication and engagement methods are tailored to the needs of specific stakeholders. Many priority pests will likely enter via urban areas (Paap et al., 2017), meaning, messaging to local councils, arborists, and the public will be particularly important for timber and tree pests. Media uptake and behavioural change should be monitored so that adjustments to messaging can be made overtime to maximise its effectiveness.

The development and delivery of communication and engagement mechanisms will improve the effectiveness of stakeholder engagement, build awareness, and empower stakeholder participation helping ensure all stakeholders play a role in timber and tree biosecurity and the implementation of the plan.

### Action 4.2: Establish governance arrangements to coordinate and monitor activities over time

**Sound governance arrangements are required to guide implementation of the plan and coordinate national effort to ensure we are prepared for post-border timber and tree pest detections.**

Delivery of this plan requires sound governance arrangements and a high level of commitment and collaboration between timber and tree stakeholders to leverage existing activities being undertaken by government, industry and the community.

Any governance arrangement should include representatives from a variety of timber and tree stakeholders to take into consideration their unique needs and skill sets. Ideally, members should hold a mixture of technical, forest and timber industry, environment, policy, and communications expertise.



Determining priorities and deciding on ownership of each Action through consultation across timber and tree stakeholders will promote collaboration, ownership and shared responsibility which will support the implementation of the plan.

### Action 4.3: Identify research, development and extension priorities for investment

***Research and development, delivered in collaboration with national and international experts, will help build knowledge, tools and skills to prevent the entry of timber and tree pests into Australia and will support more effective response activities.***

An assessment to identify existing projects and potential gaps in our understanding of timber and tree pest diagnostics, surveillance, phytosanitary treatments, and management options should be undertaken (as noted under various actions in the [Prevention](#), [Detection](#) and [Response](#) areas of this Plan). Once identified, knowledge gaps will need to be prioritised for research investment.

Once research gaps are identified there will be a need for governments, research organisations, universities, and relevant research and development corporations (including the [Forest and Wood Products Australia](#), the [Plant Biosecurity Research Initiative](#) and others), and community groups to collaborate on initiatives. There will also be a need to collaborate with national and international researchers identified through [Action 1.3](#) to address the identified research, development, and extension gap relevant to timber and tree pests.

The delivery of research, development, and extension activities in collaboration with national and international experts will support the delivery of many of the activities outlined in this plan resulting in improved timber and tree pest biosecurity outcomes for Australia.

## 4. Implementation

The success of this plan will depend on a high level of cooperation between all levels of government, industry, non-government organisations, community groups, forest pest experts and research organisations.

Success will depend on all participants in this area of the biosecurity system assessing their roles and responsibilities around priority timber and tree pests and allocating adequate resources to achieve the necessary outcomes to protect Australia's environment, primary industries, and urban forests. A forum is planned to be held regularly during the term of the plan. Key stakeholders including representatives from industry groups, government and non-government organisations would be invited to these meetings and expected to help support activities or projects under the plan.

The plan is supported by an Implementation Schedule, which will be used to record the progress of actions; set out key performance indicators, roles, responsibilities, and funding mechanisms; and to communicate with stakeholders on progress. It is anticipated investment in preparedness related activities will be guided by the Plan, drawing on new or existing funding mechanisms such as FWPA, Plant Biosecurity Research Initiative (PBRI) or other research and development corporations.

PHC will oversee implementation of the plan on behalf of governments as the relevant national committee for plant biosecurity. Updates on progress against the actions will be provided through the DAFF website and to PHC after annual forums on implementation with key stakeholders.

## 5. Monitoring, evaluation, and review

PHC is the owner of National Action Plans and monitors the implementation of projects and activities. Once projects are completed the intention is they will be incorporated as business-as-usual activities.

A forum will be held with members of relevant PHC subcommittees or working groups, in collaboration with industry representative organisations and other key stakeholders to discuss the progress of the Plan's actions and activities. After the forum an implementation report will be provided to PHC who will be responsible for providing an update to the National Biosecurity Committee. Relevant industry bodies will be responsible for communicating outcomes to their members.

DAFF is also responsible for administration of the plan and will provide regular updates on its website summarising completed projects. A formal review of the plan will occur within five years of its release using a monitoring and evaluation framework. The actions set out in the plan will evolve as knowledge is gained through research and international experience. Further refinements will be made to the Plan's Implementation Schedule after the first five-year review before an evaluation commences towards the end of the plan.

## 6. References

ABARES (2021) The National Priority List of Exotic Environmental Pests, Weeds and Diseases: Information Paper (Version 2.0), ABARES report to client prepared for the Chief Environmental Biosecurity Officer, Department of Agriculture, Water and the Environment, Canberra, ACT. CC BY 4.0. Available from: <https://www.agriculture.gov.au/biosecurity-trade/policy/environmental/priority-list>

ABARES (2023) Australian forest and wood products statistics, September and December quarters 2022, ABARES series report, Canberra, June, DOI: <https://doi.org/10.25814/7ske-0873>. CC BY 4.0.

ABARES (2024), Australia's State of the Forests Report, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

Carnegie, A.J. and Nahrung, H.F., (2019) Post-border forest biosecurity in Australia: response to recent exotic detections, current surveillance and ongoing needs. *Forests*, 10, 336.

MPIG & NFISC (2013) State of the Forests Report 2013 - 5 Yearly Report. Montreal Process Implementation Group for Australia and National Forest Inventory Steering Committee for Australian Bureau of Agricultural and Resource Economics and Sciences

Paap, T., Burgess, T.I. and Wingfield, M.J., (2017) Urban trees: bridge-heads for forest pest invasions and sentinels for early detection. *Biological invasions*, 19, 3515-3526.

Plant Health Australia Ltd (2022) Plantation Forests Biosecurity Plan (Version 3.1 – 2022) Plant Health Australia, Canberra, ACT.

## 7. Acronyms and abbreviations

Acronym	Definition
AFFTAC	Australian Fruit Fly Technical Advisory Subcommittee
CCEPP	Consultative Committee on Emergency Plant Pests
DAFF	Department of Agriculture, Fisheries and Forestry
EEP	Exotic Environmental Pests
EEPL	Exotic Environmental Pest List
EPPRD	Emergency Plant Pest Response Deed
FWPA	Forest and Wood Products Australia
HPP	High Priority Pest
NDP	National Diagnostic Protocol
NEBRA	National Environmental Biosecurity Response Agreement
NPBDN	National Plant Biosecurity Diagnostic Network
NPPP	National Priority Plant Pest
NSP	National Surveillance Protocol
PBPWG	Plant Biosecurity Preparedness Working Group
PBRI	Plant Biosecurity Research Initiative
PHA	Plant Health Australia
PHC	Plant Health Committee
PSNAP	Plant Surveillance Network Australasia-Pacific
SMART	Subcommittee on Market Access, Risk and Trade
SNPHS	Subcommittee on National Plant Health Surveillance
SPHD	Subcommittee on Plant Health Diagnostics

## 8. Definitions and glossary

Term	Definition	Source
Approved Arrangement	An approved arrangement is a voluntary legislative arrangement for a person or company (or other body corporate) to carry out specified activities to manage the biosecurity risks associated with specified goods, premises or other things. This can include managing the risks associated with imported goods.	<i>Biosecurity Act 2015</i> (Cth) s. 10
Biosecurity Act	Refers to the <i>Biosecurity Act 2015</i> <a href="http://legislation.gov.au">legislation.gov.au</a>	<i>Biosecurity Act 2015</i>
Border	First points of entry: specified ports and landing places in Australian territory that are first points of entry for aircraft, vessels and goods that are subject to biosecurity control; and including any areas within the first points of entry designated as a biosecurity entry point, as well as Approved Arrangements and the Post Entry Quarantine Facility. (See also post-border.)	
Commodity	A type of organism, product, or other article being moved for trade or other purpose.	International Standards for Phytosanitary Measures (ISPM) No. 5,
Containment	Application of phytosanitary measures in and around an infested area to prevent spread of a pest.	ISPM No. 5,
Control (of a pest)	Suppression containment, or eradication of a pest population.	ISPM No. 5,
Conveyance	Conveyance means any of the following: (a) an aircraft; (b) a vessel; (c) a vehicle; (d) a train (including railway rolling stock); (e) any other means of transport prescribed by the regulations under the <i>Biosecurity Act 2015</i> (Cth)	<i>Biosecurity Act 2015</i> (Cth) s. 16
Delimitation	Determining the extent of the exotic pest's spread through surveillance. See delimiting survey.	
Delimiting survey	Survey conducted to establish the boundaries of an area considered to be infested by or free from a pest.	ISPM No. 5,
Detection	Finding the species through inspection and/or surveillance.	
Environment	'Environment' includes: a. ecosystems and their constituent parts b. natural and physical resources.	<i>Biosecurity Act 2015</i> (Cth) s. 9
Eradication	Application of phytosanitary measures to eliminate a pest from an area. Eradication is indicated by the pest or disease no longer being detectable.	ISPM No. 5,
Establishment (of a pest)	Perpetuation, for the foreseeable future, of a pest within an area after entry.	ISPM No. 5,
Exotic	A species that is not native to a particular country, ecosystem or ecoarea.	ISPM No. 5,
Interception (of a pest)	The detection of a pest during inspection or testing of an imported consignment.	ISPM No. 5,
Invasive pest	Defined in the <i>Biosecurity Act 2015</i> as a pest that: (a) is an alien species (within the meaning of the Biodiversity Convention); but (b) is not capable of: (i) infesting humans, animals or plants; or (ii) acting as a vector for a disease; or (iii) causing disease in any other way.	<i>Biosecurity Act 2015</i> (Cth) s. 9

Term	Definition	Source
Native	A species, subspecies, or lower taxon, occurring within its natural range (past or present) and dispersal potential (i.e., within the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).	Invasive Species Compendium (ISC) – Definitions used in the ISC
Pathway	Any means that allows the entry or spread of a potential hazard.	ISPM No. 5,
Pest Risk Analysis	The process of evaluating biological or other scientific and economic evidence to determine whether an organism is a pest, whether it should be regulated, and the strength of any phytosanitary measures to be taken against it.	ISPM No. 5,
Post border detection	A post border detection occurs when an exotic pest or disease moves beyond the original imported good or conveyance with which it was imported to the surrounding environment. (A post border detection is also referred to as a suspect incident in the Department of Agriculture, Fisheries and Forestry's Instructional Material, post border detection is used here to ensure consistency with terminology used in the national emergency response agreements).	Draft Near-border biosecurity incident response framework
Prevention	In relation to pests and diseases, includes regulatory and physical measures to ensure that incidents are prevented, or their impacts mitigated, and includes pre-border, border, and post-border activities.	National Environmental Biosecurity Response Agreement (NEBRA) 2.0 2021, cl. 2.2
Response	The management actions undertaken when an invasive species/Emergency Plant Pest is detected. The response may be formalised through a national agreement or response plan.	National Khapra Beetle Action Plan 2021-2031, National Xylella Action Plan 2019-2029
Surveillance	An official process which collects and records data on pest occurrence or absence by survey, monitoring, or other procedures. Surveillance includes active and passive approaches. See also 'delimitation' and 'delimiting survey'.	ISPM No. 5,
Treatment	Official procedure for the killing, inactivation, or removal of pests, or for rendering pests infertile or for devitalisation.	ISPM No. 5,

## 9. Appendices

### Appendix 1: Information about priority tree and timber pests

a) Additional information on tree and timber NPPPs are provided below.

**Airborne Phytophthora (*Phytophthora kernoviae* and *P. ramorum*) (NPPP 14, EEP)** Airborne Phytophthora are currently absent from Australia but if species like sudden oak death (*P. ramorum*, Figure 1) or *P. kernoviae* were to enter and establish in Australia, a range of tree species would be impacted. Important hosts of these species include oaks, rhododendron, beech, eucalypts as well as fruiting trees such as avocado, chestnuts, hazelnut, macadamia, and blueberries. Both pathogens cause necrosis and plant dieback or death. This pathogen group is Australia's 14<sup>th</sup> most significant NPPP and a higher risk EEP.



Figure 1: Sudden oak death symptoms.

Source: Joseph O'Brien, USDA Forest Service, Bugwood.org

**Dutch elm disease (*Ophiostoma novo-ulmi*) (NPPP 41, EEP)** Dutch elm disease is a fungal disease that has caused the death of huge numbers of elm in North America, Europe and parts of Asia. The fungal pathogen is spread between trees by elm bark beetles (such as the established European elm bark beetle (*Scolytus multi-striatus*)) and causes wilting, die back of branches and tree death (Figure 2). This pathogen is Australia's 41<sup>st</sup> most significant NPPP and an EEP.



Figure 2: Elm tree killed by Dutch elm disease.

Source: Jana Albers, forestryimages.org



**Exotic drywood termites (*Cryptotermes brevis*, *C. dudleyi* and *Incisitermes minor*) (NPPP 25, EEP)** Exotic drywood termites feed on seasoned timber and can cause extensive damage to timber structures. Currently, the West Indian drywood termite (*C. brevis*) is present in some areas of Australia, while *C. dudleyi* (Figure 3) and *Incisitermes minor* are exotic and not known to occur in Australia. This invertebrate group is Australia’s 25<sup>th</sup> most significant NPPP. *Incisitermes minor* is an EEP.



Figure 3: Drywood termite (*C. dudleyi*) soldier.

Source: Pest and Diseases Image Library, Bugwood.org

**Exotic longhorn beetles (*Anoplophora* spp.) (NPPP 34)** Exotic longhorn beetles (*Anoplophora chinensis*, *A. glabripennis* and *A. malasiaca*) affect a range of trees including apple, pear, citrus, walnut, stone fruit, maple, willow, casuarina, pine, acacia and others. Adult insects (Figure 4) feed on leaves and bark while larvae are wood borers. Heavy infestations can cause tree death. This invertebrate group is Australia’s 34<sup>th</sup> most significant NPPP.



Figure 4: Adult citrus longhorn beetle (*Anoplophora chinensis*).

Source: Art Wagner, USDA APHIS PPQ, Bugwood.org

**Exotic strains of myrtle rust (*Austropuccinia psidii*) (NPPP 11, EEP)** Strains of myrtle rust were first found in Australia in 2010. Since then, the pathogen has spread through eastern Australia and recently into parts of northern WA. This disease affects plants in the *Myrtaceae* family including eucalypts and melaleuca. Infections cause the formation of yellow spore masses (Figure 5), leaf distortion, defoliation and in some cases plant death. It is known that there are more damaging strains that occur overseas that have not yet established in Australia. Because of the risk of new strains and their potential impact on Australia’s flora, the exotic strains of this pathogen is Australia’s 11<sup>th</sup> most significant NPPP and a higher risk EPPL.



Figure 5: Myrtle rust symptoms.

Source: Steven Conaway, Greenwich Land Trust, Bugwood.org

**Exotic subterranean termite (*Coptotermes formosanus* and *C. gestroi*) (NPPP 29, EEP)**

Subterranean termites such as *Coptotermes formosanus* (Figure 6) and *C. gestroi*, are some of the most destructive termites in the world. Subterranean termites can attack living trees as well as seasoned timber used in furniture and construction, making them significant pests for Australia’s forests and timber industries. This invertebrate group is Australia’s 29<sup>th</sup> most significant NPPP. *Coptotermes formosanus* is a higher risk EEP.



Figure 6: Formosan subterranean termite worker (top) and soldier (bottom).

Source Gerald J. Lenhard, Louisiana State University, Bugwood.org

**Pine pitch canker (*Fusarium circinatum*) (NPPP 38)** Pine pitch canker is a fungal disease of pines and Douglas fir. The disease causes the formation of ‘bleeding’ cankers that exude resin (Figure 7). Over time these cankers can girdle stems and cause die back and tree death. This pathogen is Australia’s 38<sup>th</sup> most significant NPPP.



Figure 7: Pine pitch canker symptoms.

Source: Robyn Doyle, Forestry Tasmania (left). Donald Owen, California Department of Forestry and Fire Protection, Bugwood.org (Right)

**Pine wilt nematodes (*Bursaphelenchus xylophilus*) and exotic sawyer beetle (*Monochamus* spp.) vectors (NPPP 33)** Pine wilt nematodes (*Bursaphelenchus xylophilus*) are vectored by several species of sawyer beetle (*Monochamus* spp.). The beetles spread the nematode while feeding. The nematodes cause wilting and plant death of *Pinus* spp. (Figure 8). Making them significant pests of commercial plantations and urban plantings. A [National Diagnostic Protocol](#) has also been recently developed for *B. xylophilus*.

The related Red rind nematode (*Bursaphelenchus cocophilus*) is also listed as NPPP 33 due to its potential impact on palms causing reduced growth and plant death. It is vectored by the exotic South American palm weevil (*Rhynchophorus palmarum*<sup>16</sup>). This nematode-beetle complex is Australia’s 33<sup>rd</sup> most significant NPPP.



Figure 8: Pine wilt nematode damage to conifer forest.

Source: USDA Forest service, bugwood.org

<sup>16</sup> Note the South American palm weevil is not listed as an NPPP or HPP of any plant industry.

- b) During consultation on this Plan, two pests, which are not NPPPs were identified and have been included in this plan as emerging pests of concern:

**Ceratocystis wilt (*Ceratocystis* spp. including *C. manginecans*) (emerging pest, EEP)**

Ceratocystis wilt was identified during consultation as an emerging pest threatening Australia’s trees. Several species of Ceratocystis wilt impact trees overseas including *C. manginecans* which impacts Acacia in southeast Asia and *C. fagacearum* which causes oak wilt in North America and is also reported to impact eucalypts. Although not currently a NPPP, Ceratocystis wilt is listed as a higher risk EEP and is a potential threat to Australia’s urban, native and commercial tree species.

**Polyphagous shot hole borer (*Euwallacea fornicatus*) and Fusarium wilt (*Fusarium euwallaceae*) (Emerging pest, EEP)**

Polyphagous shot-hole borer (Figure 9) acts as a vector of *Fusarium euwallaceae*, which causes rapid tree dieback and death. Polyphagous shot-hole borer is native to southern Asia but has since spread widely and is currently undergoing eradication in Western Australia. Although not currently a NPPP, Polyphagous shot hole borer and fusarium wilt are listed as EEPs and pose a threat to Australia’s urban tree species.



Figure 9: Polyphagous shot-hole borer (*Euwallacea fornicatus*).

Source: Javier E. Mercado, Bark Beetle Genera of the U.S., USDA APHIS PPQ, Bugwood.org