# Plant commodity/country risk analysis process

Plant import risk analyses assess the biosecurity risk associated with the importation of plants and plant products and identify appropriate ways to manage risk to an acceptable level.

Note: As a World Trade Organisation member, Australia bases this process on standards set by the International Plant Protection Convention.

1. **Pest Categorisation:** A filtering process that aims to identify quarantine pests on a plant import pathway. All pests with a potential to be imported on the commodity are filtered to identify quarantine pests.
2. **Assessment of Overall Likelihood:** An assessment of the likelihood that a quarantine pest will enter, establish and spread in Australia.
3. **Assessment of Overall Consequence Rating:** An assessment of the consequence (economic and environmental impact) should a quarantine pest enter, establish and spread in Australia.
4. **Estimation of Unrestricted Risk:** The likelihood and consequence ratings are combined to determine the biosecurity risk posed by a quarantine pest for Australia. An unrestricted risk estimate is established for each quarantine pest.
5. **Pest Risk Management:** Pest risk management measures are required if the unrestricted risk estimate for a quarantine pest does not achieve the appropriate level of protection (ALOP) for Australia. The ALOP for Australia is very low, but not zero.
   1. A pest, with an unrestricted risk estimate that does not achieve ALOP, may have inspection, treatments, systems approaches, area freedom, or other measures applied to reduce the risk to meet ALOP.

# Step 1: Pest categorisation

A filtering process that aims to identify the quarantine pests on a plant import pathway.

The process is as follows:

1. All pests with potential to be imported on the commodity are identified.
2. It is determined whether the pest meets the following criteria:
   1. the pest is present in the exporting country
   2. the pest is absent in Australia or ‘under official control’
   3. the pest has potential to be on the pathway
   4. the pest has potential for establishment and spread
   5. the pest has potential for economic consequences.
3. If a pest meets all these criteria, then it is categorised as a quarantine pest on the plant import pathway.
4. If a pest does not meet one of these criteria, then it is not considered a quarantine pest on the plant import pathway.

# Step 2: Assessment of overall likelihood

An assessment of the likelihood that a quarantine pest will enter, establish and spread in Australia.

The process is as follows:

1. Likelihood of entry
   1. We assess how likely the pest might enter Australia on the imported commodity by looking at the pest’s biology and the commercial production practices of the commodity in the exporting country.
2. Likelihood of establishment
   1. We assess how likely the pest could establish in Australia by looking at the pest’s biology and the suitability of the Australian environment that could encourage the pest to establish and survive.
3. Likelihood of spread
   1. We assess how likely the pest could spread throughout Australia by looking at factors that affect the pest’s mobility.
4. Overall likelihood
   1. Each likelihood is combined to determine the overall likelihood that the pest could enter, establish and spread in Australia.

**How to combine likelihoods**

The overall likelihood of a pest being able to enter, establish and spread in Australia is determined by assessing and combining each likelihood. These three steps are outlined in the tables below using Pest-X as an example. These assessment tables use a set of rules for combining qualitative likelihoods that are based on indicative probability ranges. For example, these rules mean that combining two ‘moderate’ likelihoods results in a ‘low’ likelihood outcome.

**Assessment table key**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Combined result** | High | Moderate | Low | Very low | Extremely low | Negligible |
| **Definition** | Very likely to occur | Likely to occur | Unlikely to occur | Very unlikely to occur | Extremely unlikely to occur | Almost certainly won’t occur |

**Entry**

* The likelihood of entry is made up of two parts: importation and distribution.
* For Pest-X, the likelihood of being imported on the commodity is Moderate and the likelihood it will be distributed is also Moderate.
* Therefore, using the table below, the likelihood of Pest-X entering Australia is Low.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Importation likelihood** | | | | | |
| **High** | **Moderate** | **Low** | **Very low** | **Extremely low** | **Negligible** |
| **Distribution likelihood** | **High** | High | Moderate | Low | Very low | Extremely low | Negligible |
| **Moderate** | Moderate | Low | Low | Very low | Extremely low | Negligible |
| **Low** | Low | Low | Very low | Very low | Extremely low | Negligible |
| **Very low** | Very low | Very low | Very low | Extremely low | Extremely low | Negligible |
| **Extremely low** | Extremely low | Extremely low | Extremely low | Extremely low | Negligible | Negligible |
| **Negligible** | Negligible | Negligible | Negligible | Negligible | Negligible | Negligible |

**Entry and establishment**

* Pest-X has a Low likelihood of entering Australia.
* The likelihood of Pest-X establishing in Australia is High.
* Therefore, using the table below, the likelihood of Pest-X entering and establishing in Australia is Low.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Entry likelihood** | | | | | |
| **High** | **Moderate** | **Low** | **Very low** | **Extremely low** | **Negligible** |
| **Establishment likelihood** | **High** | High | Moderate | Low | Very low | Extremely low | negligible |
| **Moderate** | Moderate | Low | Low | Very low | Extremely low | Negligible |
| **Low** | Low | Low | Very low | Very low | Extremely low | Negligible |
| **Very low** | Very low | Very low | Very low | Extremely low | Extremely low | Negligible |
| **Extremely low** | Extremely low | Extremely low | Extremely low | Extremely low | Negligible | Negligible |
| **Negligible** | Negligible | Negligible | Negligible | Negligible | Negligible | Negligible |

**Entry, establishment and spread**

* Pest-X has a Low likelihood of entering and establishing in Australia.
* The likelihood of Pest-X spreading in Australia is Moderate.
* Therefore, using the table below, the overall likelihood of Pest-X entering, establishing and spreading in Australia is Low.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Entry and establishment likelihood** | | | | | |
| **High** | **Moderate** | **Low** | **Very low** | **Extremely low** | **Negligible** |
| **Spread likelihood** | **High** | High | Moderate | Low | Very low | Extremely low | Negligible |
| **Moderate** | Moderate | Low | Low | Very low | Extremely low | Negligible |
| **Low** | Low | Low | Very low | Very low | Extremely low | Negligible |
| **Very low** | Very low | Very low | Very low | Extremely low | Extremely low | Negligible |
| **Extremely low** | Extremely low | Extremely low | Extremely low | Extremely low | Negligible | Negligible |
| **Negligible** | Negligible | Negligible | Negligible | Negligible | Negligible | Negligible |

**Overall likelihood**

By combining each likelihood estimate, the overall likelihood of Pest-X entering, establishing and spreading in Australia is LOW.

# Step 3: Assessment of overall consequence rating

# An assessment of the consequence (economic and environmental impact) should a quarantine pest enter, establish and spread in Australia.

* By combining the impact scores of each consequence, an overall consequence rating for the pest is determined. The consequences are:
  + Plant life or health
  + Direct environmental impacts
  + Eradication and control costs
  + Non-commercial values and indirect environmental impacts
  + Domestic trade
  + International trade.
* The economic and environmental consequence (impact) should a quarantine pest enter, establish and spread in Australia is assessed for each geographic level: national, regional, district and local.
* A rating is given to a geographic level at which the quarantine pest is likely to have an impact: major significance, significant, minor significance and indiscernible.

**Overall consequence rating**

The overall consequence rating for a quarantine pest is determined by combining the impacts the pest is likely to have if it was to enter, establish and spread in Australia. This process is outlined below using Pest-X as an example.

**Assign impact scores**

Once the impact of all likely consequences associated with a quarantine pest has been estimated at the geographic level, an impact score is assigned. The impact score ranges on a scale from A to G.

Let’s take a look at how an impact score is assigned for the consequence ‘Plant life or health’. If Pest-X enters, establishes and spreads in Australia, it is likely to impact plant life or health at the regional level. Also, the impact is likely to be significant for the region. Using the table, we find that the impact score for the plant life or health consequence is E.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | **Geographic scale** | | | |
| **Local** | **District** | **Regional** | **National** |
| **Impact** | **Indiscernible** | A | A | A | A |
| **Minor significance** | B | C | D | E |
| **Significant** | C | D | E | F |
| **Major significance** | D | E | F | G |

Note: This step is repeated for the other five consequences. Now it’s time to combine them!

**Combine impact scores**

The overall consequence rating is determined by assessing the impact scores against a series of rules. Starting at Rule 1, we go through each criterion to determine which rule our impact scores satisfy.

Rule 1

If:

* any ‘G’ scores, or
* more than one ‘F’ score, or
* one ‘F’ score and all remaining have ‘E’ scores.

Then the overall consequence rating is: ‘extreme’.

Rule 2

If:

* one ‘F’ score, or
* all ‘E’ scores.

Then the overall consequence rating is: ‘high’.

Rule 3

If:

* one or more ‘E’ scores, or
* all ‘D’ scores.

Then the overall consequence rating is: ‘moderate’.

Rule 4

If:

* one or more ‘D’ scores, or
* all ‘C’ scores.

Then the overall consequence rating is: ‘low’.

Rule 5

If:

* one or more ‘C’ scores, or
* all ‘B’ scores.

Then the overall consequence rating is: ‘very low’.

Rule 6

If:

* one or more but not all have ‘B’ scores, and
* all remaining have ‘A’ scores.

Then the overall consequence rating is: ‘negligible’.

With one ‘E’ impact score, Pest-X has been assessed as having an overall consequence rating of Moderate.

# Step 4: Estimation of unrestricted risk

The unrestricted risk estimate (biosecurity risk) of a quarantine pest is determined by combining the overall likelihood and overall consequence ratings. This process is outlined below using Pest-X as an example.

In steps 2 and 3, we found that for Pest-X:

* the overall likelihood of entry, establishment and spread is ‘low’, and
* the overall consequence rating is ‘moderate’.

Using the matrix below, we combine the overall likelihood and overall consequence ratings. The consequence rating is plotted along the top, and likelihood is shown along the side.

Although the ratings for each axis are similar the matrix is not symmetrical, reflecting the different range of ratings for overall likelihood and consequence. As a result, different risk estimates are obtained by combining a ‘low’ likelihood with a ‘high’ consequence and a ‘high’ likelihood with ‘low’ consequence.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Overall consequence** | | | | | |
| **Negligible** | **Very low** | **Low** | **Moderate** | **High** | **Extreme** |
| **Overall likelihood** | **High** | Negligible | Very low | Low | Moderate | High | Extreme |
| **Moderate** | Negligible | Very low | Low | Moderate | High | Extreme |
| **Low** | Negligible | Negligible | Very low | Low | Moderate | High |
| **Very Low** | Negligible | Negligible | Negligible | Very low | Low | Moderate |
| **Extremely low** | Negligible | Negligible | Negligible | Negligible | Very low | Low |
| **Negligible** | Negligible | Negligible | Negligible | Negligible | Negligible | Very low |

By combining the overall likelihood and overall consequence ratings, Pest-X has an unrestricted risk estimate of low.

Note: Australia’s Appropriate Level of Protection (ALOP) is defined as providing a high level of protection for human, animal and plant life that reduces risk to a very low level, but not to zero. As the unrestricted risk estimate for Pest-X does not achieve ALOP (it is ‘low’ not ‘very low’), the risk is unacceptable. Accordingly, risk management measures are required to reduce the risk of Pest-X to an acceptable level (very low).

# Step 5: Pest risk management

# Pest risk management measures are required if the unrestricted risk estimate of a quarantine pest does not achieve the appropriate level of protection (ALOP) for Australia. The ALOP for Australia is very low, but not zero. Let’s now take a look at the measures needed for Pest-X.

There are a number of risk management options that can be used to manage the biosecurity risk of a quarantine pest. The biosecurity risk of most pests can be managed by one or more of the management options presented.

**Unrestricted risk**

* Pest-X has an unrestricted risk estimate of Low, which does not achieve Australia’s ALOP.
* Risk management measures are required to reduce the risk to achieve ALOP.
* The commodity cannot be imported unless the biosecurity risk posed by Pest-X is reduced to achieve ALOP.

**Measures**

Measures that can be applied to reduce the risk posed by Pest-X include:

* **Inspection***:* To ensure consignments are free of pests, they are visually inspected in the exporting country, and on arrival in Australia. If required, another option (e.g., treatment) may be used, in addition to inspection, to manage the risk of the pest.
* **Treatment***:* A treatment option, such as irradiation, fumigation, or heat or cold treatment, may be available to manage the risk of Pest-X.
* **Systems approach**: A systems approach comprises a series of pest management activities applied at different points along the supply chain. This can include pest control during production and cold storage and pest-proof packaging after harvest.
* **Area freedom**: If there is evidence to prove that the pest is absent from a certain area in the exporting country, sourcing goods from this area (area freedom) may be an option to address the risk of Pest-X.
* **Other measures**: Other risk management measures (e.g., testing) may be available to reduce the risk of Pest-X.

**Restricted risk**

When risk management measures are applied, the risk posed by Pest-X is reduced to very low. This means Australia’s ALOP is achieved and importation of the commodity may be permitted.