Early Detection and Rapid Response Programme for [island group, country name] for [taxon name]

[Year]

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[Country logos here]

Contents

[1 Acknowledgements 1](#_Toc109204923)

[2 Acronyms 2](#_Toc109204924)

[3 Technical terms 2](#_Toc109204925)

[4 Introduction and background 5](#_Toc109204926)

[4.1 Justification for an Early Detection and Rapid Response Programme 5](#_Toc109204927)

[4.2 Objective of the Early Detection and Rapid Response Programme 6](#_Toc109204928)

[4.3 Regional standards: Guidelines for invasive species management in the Pacific 6](#_Toc109204929)

[5 The place of EDRR within biosecurity 7](#_Toc109204930)

[5.1 Risk assessment: PRIORITISE 10](#_Toc109204931)

[5.2 Response preparedness: PREPARE 10](#_Toc109204932)

[5.3 Surveillance: DETECT 11](#_Toc109204933)

[5.4 Response: RESPOND 12](#_Toc109204934)

[6 Response in detail 13](#_Toc109204935)

[6.1 Detection and identification 13](#_Toc109204936)

[6.2 Delimiting 14](#_Toc109204937)

[6.3 Continued surveillance 15](#_Toc109204938)

[6.4 Containment 15](#_Toc109204939)

[6.5 Treatment programme for the Response area 16](#_Toc109204940)

[6.6 Post-response 17](#_Toc109204941)

[6.7 Response risks 17](#_Toc109204942)

[7 Stakeholder roles and responsibilities 17](#_Toc109204943)

[8 Bibliography 19](#_Toc109204944)

[8.1 Legislation 19](#_Toc109204945)

[8.2 Example EDRR plans 19](#_Toc109204946)

[8.3 Guidelines and tools 19](#_Toc109204947)

[8.4 Desktop baseline surveys 20](#_Toc109204948)

[9 Document history (template only) 20](#_Toc109204949)

[10 AnnexES 21](#_Toc109204950)

[10.1 Annex 1: Protocols for ants 21](#_Toc109204951)

[10.2 Annex 9: Protocols for rodents 21](#_Toc109204952)

[10.3 Annex 10: Protocols for feral cats 21](#_Toc109204953)

[10.4 Annex 2: Protocols for weeds 21](#_Toc109204954)

[10.5 Annex 3: Protocols for birds 21](#_Toc109204955)

[10.6 Annex 4: Protocols for mongoose 21](#_Toc109204956)

[10.7 Annex 5: Protocols for Giant African Snail 21](#_Toc109204957)

[10.8 Annex 6: Protocols for snakes and other reptiles 21](#_Toc109204958)

[10.9 Annex 7: Protocols for cane toads and other amphibians 21](#_Toc109204959)

[10.10 Annex 8: Protocols for wasps 21](#_Toc109204960)

[About this template

This template is designed to guide you through developing an Early Detection and Rapid Response Programme. Use whatever sections are appropriate for your purposes and remove or add whatever is needed. For example, the introductory information on the SPREP/SPC Guidelines and the invasive curve are provided for context and may be surplus to requirements for some countries. All text in green within square brackets (like the text you are reading) are guidelines and prompts and should be removed before finalising your EDRR programme. The template has been tailored to small developing Pacific island countries and territories, and is relatively simplified compared to larger, more developed countries. However, the principles remain the same. PRISMSS partners can help with completing the template for your country. Contact PRISMSS for assistance]

# Acknowledgements

We acknowledge the support of all the stakeholders involved in the review and endorsement of this document.

[include names of stakeholders and organisations here]

This plan was based on the Early Detection and Rapid Response template developed by the SPREP PRISMSS Protect our Islands programme, with the assistance of the PRISMSS partners.

[SPREP PRISMSS POI PFP are required for acknowledgement of this template. Other logos can be added here as considered appropriate by country]





# Acronyms

See Technical terms definitions in the table below for descriptions.

| **Acronym** | **Definition** |
| --- | --- |
|  | [Add in terms as appropriate for your purposes. Remove unused terms from the list below] |
| EDRR | Early Detection and Rapid Response.  |
| EDRRP | Early Detection and Rapid Response Programme.  |
| EIA | Environmental Impact Assessment. |
| ERP | Emergency Response Plan.  |
| ESIA | Environmental and Social Impact Assessment.  |
| NISC | National Invasive Species Coordinator |
| NISSAP | National Invasive Species Strategy and Action Plan. |
| POI | Protect our Islands.  |
| PRA | Pest Risk Analysis |
| PRISMSS | Pacific Regional Invasive Species Support Service.  |
| SPC | (Secretariat for) the Pacific Community. |
| SPREP | Secretariat for the Pacific Regional Environment Programme. |

# Technical terms

| **Concept** | **Definition** |
| --- | --- |
|  | [Add in terms as appropriate for your purposes. Remove unused terms from the list below] |
| Adaptive management | Adaptive management is a process of decision making in the face of uncertainty (where you are not sure of everything you need to know). The aim is to reduce this uncertainty over time via monitoring of progress. In this way, decision making both achieves objectives and improves future management. Adaptive management is used not only to change a system (such as EDRR), but also to learn about the system.  |
| Biological classification | Biological classification is the way scientists group living organisms (plants, animals, fungi and so on.). Organisms are classified based on how similar they are or how they are related to each other. The most specific (smallest) category of classification is species. Understanding biological classification is useful as it can help us identify different species, and those that are similar, and so can be managed in a similar same way. |
| Biosecurity | Biosecurity is a combination of two words: biological and security. The original definition of biosecurity was a set of preventive measures designed to reduce the risk of spreading of infectious diseases in crops and livestock, and included pests, invasive species and so on. The goal of biosecurity is to prevent the arrival of unwanted living things (plants, animals, diseases) that could harm people, agriculture, and the environment. If unwanted living things do arrive in a country or on an island, biosecurity measures or activities are used to control them, prevent them spreading and eradicate them.The document refers to the Biosecurity team. This is a team of people assumed to be responsible for, and actively engaged in domestic or international biosecurity. For an EDRR programme to be effective, a Biosecurity team is critical.  |
| Containment | Keeping an invasive or pest species within a defined area. |
| Control | Reducing the population of an invasive species (numbers and distribution). |
| Eradication | The removal of every individual of an invasive species from a specific place. Eradication is only successful if every individual is removed. |
| EDRRP area | In this document, the EDRRP area is the location that has been identified as requiring EDRR actions for surveillance and rapid response to an incursion of an invasive species or pest. This is the area identified as the most likely incursion point for the target species prior to arrival and/or which has high biodiversity values that need to be protected. The size of this area is used to estimate the volumes of treatment product, equipment, and other resources, such as staff time, to be prepared should an incursion occur. |
| Delimiting | Targeted surveys designed to define the extent (distribution) of an invasive species incursion. The methods for delimiting, monitoring and surveillance are often very similar, but they have different purposes. Delimiting is used to find the whole area of an incursion after it has been detected. |
| Emergency responseIncursion responseEarly detection and rapid response (EDRR) | The differences between the terms emergency response, incursion response and EDRR might not be obvious.* Emergency response is a general term that describes an event that requires some immediate action to decrease the impact of the event. Ideally, that event has been planned for, but it is not exactly predictable, such as where a cyclone might make landfall.
* Incursion response is an emergency response where the event is the arrival of a harmful pest or invasive species.
* Early detection and rapid response plans also target invasive species or pests. EDRR requires similar actions as for emergency or incursion response, but also includes prioritisation, surveillance (for early detection) and being actively prepared. Active preparedness is crucially important to acknowledge in the Pacific islands because remote locations and lack of locally available treatment products slow the ability to respond rapidly.
 |
| Emergency Response Plan | When targeting pests and diseases, usually referred to as an incursion response plan. An incursion response plan is an emergency response plan to deal with a newly detected invasive species, plant or animal disease or pest. |
| Environmental Impact Assessment | Evaluates the impact of development and other activities on the environment and puts in place actions to mitigate these environmental impacts. |
| Environmental and Social Impact Assessment | In addition to an EIA, an Environmental and Social Impact Assessment evaluates potential impacts to people and puts in place mitigation actions. |
| Eradication | The complete removal of an unwanted (invasive or pest) plant or animal from a specific place. |
| Incursion | The initial arrival and establishment of a population of a potential invasive/pest species. A single arrival event of an invasive species in a new environment. Typically, an incursion is identified at the time of arrival (or more likely, first detection), and an incursion response plan initiated. Ideally all the requirements for incursion response should be in place *before* the incursion is detected (for example via and EDRR plan). |
| Invasive species | Sometimes called Invasive Alien Species (IAS). An invasive species is any organism that has the potential to harm the environment or other human interests when it is introduced in a new environment. An invasive species can also be a pest. For simplicity, this document uses the term invasive species. |
| Monitoring | Regular surveys designed to assess changes in numbers and distribution of a target invasive species over time. |
| Movement control | Placing restrictions on the movement of people, animals, plants, and goods to restrict the spread of an invasive species. See also containment. |
| Pacific Regional Invasive Species Support Service | The Pacific Regional Invasive Species Support Service (PRISMSS) is a collaboration of leading organisations supporting invasive species management for biodiversity protection in the Pacific. PRISMSS currently provides technical support across five regional programmes for the Pacific region: Natural Enemies–Natural Solutions (NENS), Predator Free Pacific (PFP), Protect our Islands (POI), Resilient Ecosystems, Resilient Communities (RERC), War on Weeds (WOW). |
| Pathway | The means by which an invasive species can be transported. |
| Pest | A pest is an animal or plant that harms the environment directly or human interests in an environment (such as agriculture, people’s health, and so on), whether it is native or introduced.Any animal that is harmful, unwanted, or annoying. |
| Protect our Islands | SPREP’s PRISMSS POI theme has a focus on domestic and international biosecurity for invasive species. |
| Response area | This is the area where the EDRR target pest/invasive species is found in the event of an incursion. This could be within the EDRRP area or might be somewhere different. |
| Risk assessment | Evaluation of the risk that a new introduced species will become invasive with damaging consequences, this evaluation is conducted prior to its introduction, or to assess the level of effort to be put into active prevention, such as targeted surveillance. |
| Surveillance | Actions that enable detection of new incursions of an invasive species. There are two types of surveillance, *active* and *passive*.*Active* surveillance is a formal process of surveying to determine the presence or absence of invasive species or pests, with methods tailored to ensure high likelihood of detection of specific species. Undertaken regularly by biosecurity staff in high-risk areas (such as ports, landing places) as a first line of defence.*Passive* surveillance relies on high awareness of invasive species among members of the community. Supported by awareness raising programmes for high priority species and invasive species generally. |
| Taxon (plural taxa) | A taxon is a scientific term used to describe a group of plants or animals at any level in the biological classification hierarchy. For example, this may be a group of different species such as mammals (which is how the term is used in this document). The technical definition is “any unit used in the science of biological classification, or taxonomy”. A species can be referred to as a taxon, but usually the term taxon is used for groups above the species, such as black rats and Polynesian rats, which are different species but are together called “rats” as a taxon. |
| Treatment | Application of pesticide/herbicide or other means of control of a pest/invasive species at a single point in time. |
| Treatment programme | A series of treatments over time with the goal of controlling or eradicating a pest/invasive species. Monitoring is also part of a treatment programme to assess success or failure of each round of treatment and the overall programme.  |

# Introduction and background

## Justification for an Early Detection and Rapid Response Programme

A small minority of pests/invasive animals and plants have the capacity to devastate economies, health, agriculture, culture, and lifestyle in the Pacific. Prevention of their arrival is ideal. With good biosecurity measures the risk of invasion can be minimised but not eliminated. An Early Detection and Rapid Response (EDRR) Programme (EDRRP) is an ‘insurance policy’ against the worst biosecurity threats: we hope it should never be needed but we must be prepared in case it is.

Functional EDRR systems are composed of early detection and rapid response but also of broad, cross-sectorial awareness and buy-in, rapid reporting, and rapid assessment

[If there is legislation that mandates the creation of an EDRR or equivalent programme for biosecurity write down the name of the legislation here and refer to it throughout the document.]

### The importance of early detection

The earlier a pest or invasive species is found, the more likely it is to be successfully eradicated (completely removed). The invasion curve below (Figure 1) is a good way to see why this is. The curve shows that as the invasive species spreads over time, covering an increasingly large area, eradication becomes less likely (usually impossible). At the same time control costs increase dramatically.



*Figure 1: the goal of surveillance is to move the* ***detection and response point*** *(light blue arrow) to an earlier time point (darker blue arrow). Figure sourced from: The invasion curve: a tool for understanding invasive species management in South Florida. 2018. WEC347, UF/IFAS. Prepared by Rebecca G. Harvey and Frank J. Mazzotti, University of Florida UF/IFAS Extension. Adapted from Invasive Plants and Animals Policy Framework. 2010. State of Victoria, Department of Primary Industries.*

### The importance of rapid response

Surveillance programmes promote early detection of invasive species, allowing incursion response to be rapid. The earlier the species is detected, and a response initiated, the higher the likelihood of eradication. Eradication is always the end goal of EDRR, because it is the most cost-effective option in the long term. If possible, when an invasive species is detected in a new place for the first time, action should be taken as quickly as possible to eradicate it.

## Objective of the Early Detection and Rapid Response Programme

This programme has been devised to fulfil the requirement for an emergency response plan as specified in [provide the specific legislation details – if there is no legislation, delete this sentence].

The objective of this programme is to provide a workable and agreed framework for early detection of and Rapid Response to the top priority biosecurity threats to [name of target location to be protected].

Specifically, the programme aims to respond to any incursion of [name of target species].

These species have been prioritised because [write a few sentences about the impacts of the target species. Information on many target species can be found in the Battler resource base and Annexes]. Further justification for choosing these targets is outlined in the Annexes.

While it might be tempting to write a programme that covers all possible threats, the number of staff, maintenance of capacity, and funding required would make this unachievable. Once a programme for key threats is implemented, others can be added (for example other priority species from the NISSAP).

In this draft form, the EDRR plan provides a framework for circulation and discussion with government and other stakeholders to facilitate a shared understanding and commitment to a programme that will keep the target protected area safer from undesirable invasive species. Once agreed, it will be approved by Ministerial stakeholders (Minister/Permanent Secretary [delete or change as needed]) and implemented by the [name of country] government, with the assistance of regional agencies.

## Regional standards: Guidelines for invasive species management in the Pacific

The EDRR protocols outlined in this document follow the SPREP/SPC guidelines for invasive species management.

The **Catch it early: invasive species early detection and rapid response** Battler guide provides an overview of EDRR for the Pacific. This document provides detailed protocols that expand on the information in the Battler Guide.

The EDRR plan outlines the standard operating procedures necessary for individual species. This template fulfils the need noted in the Battler Guide: **“Establishing one or more Emergency Response Plans in case a response needs to be enacted.”**

**Guidelines for invasive species management in the Pacific – Section C**

Sections below in green are covered by this document.

**C. Management Action**

**C1. Biosecurity** — Preventing the spread of invasive species across international or internal borders.

Prevention works by identifying pathways and establishing four barriers:

1) **Pre-export control** aims to prevent the export of known pests from places where they are established, to other islands.

2) **Pre-border control** regulates importation to an island or country.

3) **At-border control** aims to prevent the arrival of species on-island.

4) **Post-border** rapid response (immediate eradication) aims to eliminate newly arrived pests before they can spread far beyond the point of arrival. An effective biosecurity system must include all four elements. Rapid response is cheaper the sooner an arrival is detected, while numbers are small. Rapid response requires a surveillance programme, tested response plans in place, and resources ready for action.

**Aim**

Effective systems are in place throughout the Pacific to regulate intentional introductions and to detect and manage unauthorised or accidental introductions across borders.

**OBJECTIVE C1.1: Pre-export control. Develop and implement improved inspection, treatment, packing and transportation procedures and methods, for transport leaving countries and islands harbouring priority invasive species.** Specific objectives:

C1.1.a Promote the development and implementation of stronger international standards governing control of potentially invasive species at export, with particular attention to the main trading partners of Pacific countries.

C1.1.b Review export inspection procedures directed at specific priority invasive species and identify gaps.

C1.1.c Develop and implement adequate export controls directed at preventing the export of specific priority invasive species.

**OBJECTIVE C1.2: Pre-border control. Implement a rigorous process of risk analysis in relation to the deliberate introduction of species and the movement of potential carrier goods between countries, and between islands within a country.** Specific objectives:

C1.2.a Establish and implement national and internal (inter-island) risk and impact assessment for proposed deliberate movements of species and for the movement of goods that may accidentally carry invasive species.

C1.2.b Facilitate a common, regional approach to decision-making on proposed introductions, including on the categorisation of species as (1) low-risk, (2) minimally restricted “permitted” species, (3) moderate- risk “restricted” species and (4) high-risk “prohibited” species, and the automatic prohibition of any organism or good not included on the permitted or restricted lists.

**OBJECTIVE C1.3: At-border control. Establish and maintain effective quarantine, transport and border control systems at national borders and between islands within countries.** Specific objectives:

C1.3.a Review existing border controls, transport controls and quarantine systems to identify gaps in country or pathway coverage (movement of ships, planes, people, other organisms, goods and so on) and technical or resource constraints.

C1.3.b Develop and implement adequate border controls and terrestrial and marine quarantine control systems throughout the Pacific.

**OBJECTIVE C1.4: Post-border rapid response. Establish and maintain effective systems to detect incursions of invasive species reliably and quickly and mount rapid responses to them.** Specific objectives:

C1.4.a Review existing port and border surveillance and rapid response arrangements and identify national, island or taxonomic gaps.

C1.4.b Develop and implement adequate surveillance systems at island entry points throughout the Pacific, using a series of standard techniques.

C1.4.c Develop a regional information centre for monitoring the spread of invasive and potentially invasive species and make available status and distribution updates from islands.

C1.4.d Develop and implement model contingency plans for managing different kinds of newly arrived pest species and carry out field trials.

# The place of EDRR within biosecurity

The **Guidelines for invasive species management in the Pacific**, the **Catch it early: invasive species early detection and rapid response** Battler guide and **Protect our Islands with biosecurity** Battler guide outline the context of EDRR within a biosecurity programme. Prevention is always preferable, and that is where the greatest effort should be.

Although there are several possible approaches to early detection and rapid response,[[1]](#footnote-2) including doing nothing, this document is based on the fullest response: eradication is the goal of EDRR. [This document provides a guide on the generic actions to conduct the response as well as procedures for specific priority taxa.]

Early Detection and Rapid Response includes several interconnected biosecurity activities that are used to keep new invasive species from establishing in an area. In some form, actions must be on-going for an EDRR programme to be effective.

These actions are:

1. risk assessment to prioritise target species;
2. response preparedness to make sure everything is available for the target species;
3. ongoing surveillance for target species (including public awareness, and a reporting system);
4. rapid response resulting in the eradication of the target species (including simulation exercises).

Ideally, the above actions will also be supported by risk management actions (such as biosecurity checks and controls on high-risk commodities) prior to arrival in the area covered by the EDRR programme.

The following checklist describes the key actions needed for EDRR. The actions are discussed in more detail in the following sections. Use the checklist as a quick guide.



## Risk assessment: PRIORITISE

Risk assessment is an on-going component of international and domestic biosecurity work.

The first step in an EDRR programme is to identify which species should be the target of a response preparedness strategy. The number of species targeted will be limited by funding, training capacity, availability of tools and so on. Having everything prepared for the arrival of a new invasive species can be costly, so while it might be tempting to try to target all potential arrivals, it makes more sense to prioritise those that are most likely to arrive and have the biggest impact, that is, high-risk species.

The second part of risk assessment is identifying the pathways that risk species are arriving from. High-risk species are those that are already present in trading partners and pose a serious risk elsewhere. The harm these species could cause if they become established is an important consideration when prioritising targets for response preparedness. Knowing where the species might come from helps identify the location for potential EDRR (that is, targeted surveillance).

Once priorities have been set, EDRR plans, and programmes should be developed for each species.

## Response preparedness: PREPARE

Once the potential target species are decided, the key to Rapid Response is having everything necessary to be ready to go before an incursion happens. Being prepared involves:

1. defining an EDRRP area – the focus for EDRR planning and action. Identify risk entry points (arrival and unloading facilities) to determine areas for ongoing surveillance, and potential establishment sites should an incursion occur. This is an ‘EDRRP area’ (see Figure 2 below). We cannot accurately predict where an invasive species will be detected, but we can increase the chance of its detection by understanding where it is likely to arrive from and undertaking regular surveillance there. Defining a hypothetical EDRRP area based on knowledge of entry points and risk assessment helps to estimate what would be required to undertake a Rapid Response, and defines the area for active surveillance (see species-specific protocols in the Annexes);
2. deciding on appropriate treatment products, training and tools for the target species (see species-specific protocols in the Annexes);
3. ensuring appropriate permits are in place (environmental license/import permit). An environmental impact assessment (EIA) may be needed for the permit; [include a sentence that refers to the Environment legislation in your country that governs pesticide/herbicide use] and ensuring safe and secure storage for the treatment products and equipment on arrival (housing of biosecurity treatments; [include a sentence that refers to Environment or other legislation that governs pesticide/herbicide storage]
4. contacting suppliers for quotes for, and ordering, the treatment product(s) and application tools;
5. estimating purchase costs for treatment (including freight);
6. training the biosecurity team in how to recognise the species; how to do surveillance; treatment protocols including use of treatment products; monitoring. Should staff change roles or move out of the team, training MUST be kept up to date. This is particularly important for key leader of the emergency response; [Add a few sentences describing the specific roles that are responsible for EDRRP. See Section 7 for some suggestions]
7. ensuring that the above capacity is maintained within the Biosecurity team. Run simulations regularly;
8. having the content and supplies for production of community awareness materials ready. Passive surveillance by stakeholders is important as the species may not initially be detected at the EDRRP area. This can happen if there are breaches in biosecurity – for example, people bringing in high-risk goods that have not been treated, and not declaring them.



*Figure 2: Aerial view of the area targeted for EDRR surveillance. This is the highest risk entry point [replace the example above with an image of the area that will be targeted for EDRR surveillance]. This area is referred to in this document as the ‘EDRRP area’. Image sourced from Google Maps (*[*http://maps.google.com*](http://maps.google.com)*).*

This EDRRP area is the focus area for surveillance (for many potential targets), and the area that has been used to estimate the resources needed for response preparedness.

[Include a few sentences describing the nature of the area. Why has it been chosen? What is the size of the area, what activities happen there and do people live there?

For example, in the port area above, the area outlined in red is the most likely area for incursion of target species as the port is the arrival point for the majority of goods.

This area covers approximately 6 ha, and mostly contains port and industrial activities, with some people living on the very edge of this area]

## Surveillance: DETECT

Surveillance of high-risk sites is the best form of defence against incursions of invasive species. High-risk areas for entry of invasive species include wharves and jetties, seaports, airports, devanning sites, sea container storage sites and transitional facilities. Nearby areas that could be provide suitable habitat (nesting sites, shelter) or resources (food), should also be part of the surveillance actions.

Surveillance can require many resources, particularly time. These costs are only a tiny fraction of the economic and social costs of invasive species in the long term.

### Active surveillance

Active surveillance involves surveys undertaken by trained biosecurity staff. Surveillance techniques will vary depending on the target. The Annexes describe the active surveillance protocols for the target species. [information on surveillance for many target species can be found in the Battler resource base]

It is critical that staff undertaking surveys to be familiar with species that are already present, so that new arrivals can be detected quickly. Active surveillance should be undertaken on a regular basis, with the schedule dependent on the frequency of transport to the target area.

### Passive surveillance (awareness raising)

Passive surveillance involves building public awareness of emerging biosecurity risks and encouraging notification to biosecurity staff. Such surveillance needs an awareness campaign to inform the public about the threat. If budget and time are an issue, awareness can focus on key stakeholders only, such as port and airport workers, importers, people using boats to travel between islands.

Of course, no process is perfect. Sometimes the first detection will not be at the initial point of entry. This is why passive surveillance through public awareness is important, along with an effective reporting system.

Passive surveillance (awareness raising) requires regular positive reinforcement to continue to be effective. The Annexes describe the passive surveillance protocols for the target species. [information on awareness-raising and passive surveillance for many target species can be found in the Battler resource base]

Citizen science initiatives are useful tools to engage stakeholders, and can result in early detection, as well as reinforcing community vigilance in an enjoyable way. [suggestions for citizen science tools for target species are highlighted in the Annexes]

## Response: RESPOND

Once an incursion of a target invasive species is detected through surveillance the following general actions are undertaken in as *short a timeframe as possible*. The actions for the specific targets are described in detail in the Annexes. [information on response actions for many target species can be found in the Battler resource base]

Rapid Response actions once a potential target has been detected are:

1. confirmed identification of target species;
2. delimiting of the real Response area (that is, the limits of the incursion, and the area subject to treatments to eradicate the pest) in comparison to the EDRRP area;
3. continued surveillance;
4. containment and movement control;
5. treatment of the biosecurity emergency area using pesticides (or other means depending on the protocols for the target pest/invasive species;
6. post-response evaluation.

# Response in detail

The faster the response is initiated, the greater the likelihood of successful eradication.

The generic Rapid Response is described in the sections below. These generic actions are tailored depending on the selected target. Specific actions for the target species [name of the target species] are outlined in the Annexes. [information on response for many target species can be found in the Battler resource base. Include sections of legislation or policy as appliable as this is used to justify actions under a Rapid Response]

Section 7 outlines the roles and responsibilities of people involved in an EDRR programme.

## Detection and identification

Once a potential detection has been reported to the appropriate authority, a designated trained person (as defined in Section 5.3 # 8 above) will lead the response process. This is the Response Leader.

The Response Leader will alert the [Director of Environment/Agriculture, depending on the country legislation, this will be the person who has overall authority under legislation] to the potential incursion and obtain approval to initiate the response.

The Response Leader will confirm identification of the target. If needed the Response Leader may contact SPC (crop pests) or SPREP (invasive species) to assist with identification. [this should not be necessary as specific taxa are subject to EDRR and training in identifying the taxa should have occurred, such as Section 5.3 # 7] SPREP or SPC will facilitate liaison with appropriate experts to confirm identification as soon as possible.

On confirmation of identification the Response Leader will notify the [Director of Environment/Agriculture, depending on the country legislation, this will be the person who has overall authority under legislation] who will approve continuation of the response and advise the Minister/Permanent Secretary that:

* a biosecurity emergency should be declared, and a response should be initiated [as per the appropriate legislation]; and
* depending on the limits of the incursion, additional funding or resources may be required for a successful response.

At this point eradication of the target is the response goal. [if eradication is considered not achievable, the Rapid Response strategy must be adapted. Typically, the new strategy will be one of on-going control of the species]

### Mobilisation of staff

The Director [of Environment/Agriculture, depending on the country legislation, this will be the person who has overall authority under legislation. Change this description as needed] will authorise relief staff for biosecurity so that the Response Leader and other Biosecurity team members can focus on the response as their highest priority.

The Director [of Environment/Agriculture, depending on the country legislation, this will be the person who has overall authority under legislation. Change this description as needed] approves staff attachments to assist Biosecurity staff [or other group depending on the country. Change this description as needed] to undertake delimiting and approves additional funding for delimiting materials (if needed).

The Director [change this description as needed] approves additional staff [additional staff could be those involved in working with the communities to share information] to tailor awareness materials [awareness materials for the target species should already be developed in the local language based on information in the Battler resource base] and prepare to assist Biosecurity staff with advising affected stakeholders.

The response is the *only priority work* for all staff mobilised at this point.

[If biosecurity legislation requires it, include a sentence outlining this, for example “As per section xx of the Biosecurity Act a Notification of emergency declaration is required and must be published as per section xxx of the Act and posted on signs in the Response area.]

## Delimiting

[If biosecurity legislation determines if delimiting should be done, include a sentence outlining this, for example “As per section xx of the Biosecurity Act, the response area must be delimited]

The Response Leader will lead the delimiting of the incursion. The Response Leader and Biosecurity staff will train attached staff on surveillance/delimiting methods and on field identification of the target. [Biosecurity staff will have been trained on surveillance/delimiting methods for the targets as part of response preparedness]

From the first detection point standard surveillance methods for the species will be used to find the limits of the incursion. The limits are defined as the area where the target species is detected, PLUS an appropriate buffer zone. These limits define the Response area.

[include information here to describe how additional staff will be provided If delimiting requires more staff than initially allocated, that is, the Response area is much larger than initially thought]

Once the Response area is known it will be apparent that either the area is:

1. within the EDRRP area (for which EIA has been undertaken and Environment Licenses have been obtained), and of a size that treatment products have been provided for; or
2. outside the EDRRP area or larger than the previously estimated size.

If the Response area is within the EDRRP area, treatment should be undertaken according to the protocols for the target species. [see Annexes or Battler resource base]

[At this point, depending on the nature of the incursion, the Response Leader may need to escalate the response as a National Disaster (depending on the species and legislation provision. This process and the legislation that regulates it should be described here. For example: The Director, as appropriate, will consult with the National Disaster Committee (as per section xx of the Biosecurity Act. The National Disaster Committee is responsible for working with the appropriate ministry/organization in case of disaster.)]

### Extension of Response area

If the Response area is outside of or larger than the EDRRP area (that is, in the case of b) above, it is required that:

1. potential for environmental impacts above those already estimated must be assessed;
2. modification to the Environment License must be obtained. [as part of response preparedness any Environment license or permits required for the herbicide/pesticide will have already been obtained. The conditions on the license will likely be limited to use of the product in the EDRRP area. If the license is issued by a different organisation, the Response Leader or other person may need to ensure this process happens quickly, and that should be noted here. For example, the text might read: The Director of Agriculture will request of the Director of Environment that this request is prioritised above all other Environment License work]; and
3. the cost of additional treatment must be assessed. The Response Leader (or nominee) estimates the cost of additional treatment and the number of staff required to apply this treatment in the shortest possible timeframe. This information is presented to the Director ALD for higher-level approvals.

It should be noted that there may be more than one Response area if the pest/invasive species has been moved around prior to detection. [depending on the requirements of your country, this might require changes to funding arrangements, and this process should be outlined here. For example, the text might read: The Director requests urgent access to the required funding (and temporary/casual staff if necessary) from the Minister/Permanent Secretary, according to section xx of the Biosecurity Act].

At this point, should insufficient funding be available to continue with the response, movement controls and surveillance should continue. However, if the target is not eradicated, it is likely to spread throughout the country and preparations should be made to contain the invasive species and reduce potential impact. Because of the consequences of not eradicating the target species, the decision to not proceed from this point must be made at the highest levels. [the decision not to eradicate or to continue with the Rapid Response will depend on the authority within your country. If EDRR is covered by specific legislation, this could be the Minister/Permanent Secretary or the Cabinet, or equivalent]

Although it might take time to mobilise funds/staff, and obtain any necessary additional resources, the rest of the response process (movement controls and surveillance) must continue until the decision has been made to stop eradication efforts.

## Continued surveillance

During the Rapid Response phase, active and passive surveillance must be promoted and continued.

Surveillance may need to increase in intensity to determine if the target species has spread.

With the approval of the Director, [change designation of responsible person as needed] the Response Leader may assign an additional team member to lead the surveillance effort, so the Response Leader can focus on the response.

## Containment

Movement controls are used to contain an incursion and prevent the invasive species spreading from an infested area.

There are two parts to the containment of the species.

1. Restriction of natural spread: preventing target invasive species independently (by flight or on foot) spreading to new areas. This is done by removing potential habitat and buffer clearance (depending on the target species).
2. Reducing the risk of jump dispersal: ensuring target invasive species are unable to ‘hitchhike’ out of the infested area and establish elsewhere. This requires the control of movements of goods and commodities that can act as pathways.

Both parts of containment involve surveillance. High value areas (for biodiversity or agriculture or human well-being [homes, schools and hospitals]) close to the Response area should be identified and secured.

Depending on the target species, specific commodities will be barred from movement out of the actual biosecurity emergency area. Spot checks of vehicles will need to be undertaken to ensure compliance.

With the approval of the Director [change to name of authority as needed], the Response Leader may assign an additional team member to lead the containment and movement control effort, so the Response Leader can focus on the response.

### Assistance from law enforcement

Compliance with movement controls may be more effective if assistance from law enforcement personnel is obtained. In this case the Director [change to name of authority as needed] will request that the Minister/Permanent Secretary [change to name of authority as needed] request that the Commissioner of Police [change to name of authority as needed] mandate the assistance of their personnel [(as per section xx of the Biosecurity Act). change to name of policy/legislation as needed. If your country does not have this type of legislation/policy, this whole section should be deleted]

Any person who does not comply with movement control restrictions is subject to a fine. [include a sentence describing the fine and where in the legislation this is mandated, for example: A compliance breach is subject to a $5,000 fine, 2 years imprisonment or both, according to the section xx of the Biosecurity Act]

### Stakeholder awareness and engagement

Once the Response area is defined, affected stakeholders within the area must be fully informed regarding the reasons for the response, consequences of not treating the area, and potential hazards of treatment. People will naturally be concerned about the use of chemicals/pesticides, especially around homes, schools, hospitals, markets and food stores.

In some cases, there may be initial (or persistent) resistance to treatment. It will be important to ensure stakeholders know the consequences of allowing the target to persist and spread. The concerns of stakeholders are important and must be treated with respect and appropriate information.

[One difficult situation is when, despite understanding the consequences, stakeholders still refuse treatment to be undertaken on their property. In this case legislation can assist with ensuring compliance. Add a few sentences here describing the appropriate legislation or policy. For example: Biosecurity Emergency Regulations (section xx of the Biosecurity Act) can be invoked by the Minister, on the advice of Director and with the advice of Cabinet, to provide for treatment of goods and land in the Response area. Refusal may be subject to fines (section xx of the Act).]

## Treatment programme for the Response area

The treatment programme commences once the Response area has been defined, movement controls have been established, ongoing surveillance has been implemented, and stakeholders have been engaged.

At this time the Response area is also referred to as the treatment area.

Detailed treatment procedures for each target species are outlined in the Annexes, and the general principles are summarised here. The Response Leader leads all treatment-related activities.

### Immediate pre-treatment activities (see Annexes for details)

* Ensure treatment products and resources *for the entire eradication[[2]](#footnote-3)* have been obtained, or that they will be available in the appropriate timeframe.
* Notify stakeholders via community meetings, signs and information leaflets.
* Restrict access to the treatment area if necessary. This may not be possible if the treatment area is in a residential area or school.
* Complete staff mobilisation and training of attached staff in treatment procedures, with an emphasis on safe handling.
* Pre-treatment monitoring to assess environmental status. This is done to ensure there are no non-target effects of treatment. [this may be required as part of obtaining environment permits or licenses]

### Treatment activities (see Annexes for details)

* Final pre-treatment delimiting.
* Undertake treatment.

### Immediate post-treatment activities (see Annexes for details)

* Post-treatment monitoring to assess any negative environmental effects.
* Review of treatment activity.
* Immediate post-treatment delimiting.

### Post-treatment review

After treatment activities and monitoring are undertaken, a review of the status is undertaken, and includes debriefs within the team and discussions with stakeholders. Any issues (problems or concerns) must be addressed before proceeding with further treatments, that is, adaptive management.

The above four activities (section 6.5.1-6.5.4) are undertaken multiple times depending on the target species (see Annexes).

Many factors affect successful eradication. At some point it may become apparent that the response will not result in eradication or that the cost of repeated treatments is too high. See Response risks below.

## Post-response

Once the treatment activities have ceased (that is, the eradication has been achieved or the strategy has changed to management), the Response should be reviewed. Review and refine response processes and this document as required. This should include stakeholder feedback.

Continue with surveillance to ensure that the target species does not re-infest the area. In some cases (such as ants), the species can be difficult to detect while at low numbers, so eradication may not have been achieved.

Ensure response preparedness actions are sustained.

## Response risks

Eradication of invasive species is often not simple. Many factors can negatively affect the outcome of an eradication programme. Some key risks, their likelihood, and influences on success are outlined below. [this list is not extensive and should be added to as required]

|  |  |  |
| --- | --- | --- |
| **Risk** | **Uncontrolled likelihood[[3]](#footnote-4)** | **Influences** |
| Spread outside of containment area. | High | Movement control compliance. |
| Environmental damage caused by treatment. | Low-High | Appropriate treatment products used. Products used in accordance with manufacturer guidelines. |
| Injury to team members or the public caused by treatment. | Low-High | Tools and products used according to manufacturer’s instructions/MDS. Health and Safety Guidelines consistently followed. |
| Inability to eradicate using chosen/available resources. | Medium | Environmental conditions make eradication difficult. Correct use of treatment products. Selection of correct treatment products. Selected treatment products are appropriate for the environment. Persistence with treatments. Commitment of funding and support. |
| Repeat incursion of the target species. | Medium | Surveillance is maintained. Risk mitigation in source countries or islands (import restrictions). |

# Stakeholder roles and responsibilities

Cells shaded blue indicate potential approvers of the EDRR programme [these should be changed to reflect the legislation and policy and social context in the country]. Cells shaded green indicate key stakeholders for additional circulation and feedback on the draft EDRR programme. [these will be the people who take active part in the EDRR programme, including surveillance, preparedness and Rapid Response. Change these roles as needed for your country]

| **Role** | **Responsibility** |
| --- | --- |
| Office of the Cabinet | Approval of any decision not to eradicate, or to suspend emergency response. |
| Minister/Permanent Secretary  | Approves emergency response actions and funding at the request of the Director [Environment or other designation]. Approval of any decision not to eradicate, or to suspend emergency response. |
| Director [Environment or other designation] | Supports the Response Leader and facilitates approvals for additional staff and funding requests as required. |
| Response Leader | Overall responsibility for day-to-day biosecurity. Leads the emergency response (including movement controls and surveillance).  |
| Biosecurity team | Undertakes response processes with the guidance of the Response Leader. May be delegated to lead specific actions, such as surveillance or movement controls.  |
| National Invasive Species Coordinator | Role depends on mandate. |
| Additional staff | At the direction of the Director, and with appropriate training, will assist with emergency response processes (surveillance/movement controls/treatment) under the guidance of the Response Leader. |
| Extension/outreach/communications staff | Prepare awareness materials for surveillance and response. |
| Commissioner of Police | Directs staff to support movement controls at the request of Minister/Permanent Secretary. |
| Police officers | Support movement controls with the approval of Minister of Police, or in situations where members of the public are not compliant with Biosecurity mandates. |
| Ministry of Health | To be advised if the invasive species poses any health risks (such as Red imported fire ant toxins can cause severe allergic reactions, anaphylaxis and/or infected stings). |
| Ministry of Customs staff | Provide support to Biosecurity team for passive surveillance (port/airport). |
| National Disaster Committee | Enable access to emergency funds upon request from the Director. |
| General public | Comply with movement controls. |
| Village councils  | Comply with directions of Response Leader regarding movement controls and treatment. Direct villagers to comply with these directions. |
| Local residents  | Comply with directions of Response Leader as mandated by the village council(s).  |
| Regional agencies (SPREP/SPC) | Provide access to experts. If appropriate, provide technical advice or contact technical experts regarding technical advice. |
| Technical experts | Provide technical advice on treatment products and approach to management. Provide training if necessary and if funding allows. |

# Bibliography

## Legislation

[Add in country legislation here]

## Example EDRR plans

A plan for prevention of establishment of new ant species in Hawai’i, with special attention to the red imported fire ant. 2001. Hawai’i Ant Group (an interagency group consisting of representatives from Hawaii Department of Agriculture, Bishop Museum, University of Hawai’i, U.S. Geologic Survey, U.S. Department of Agriculture, and U.S. Fish and Wildlife Service). On request

Biosecurity Plan for Ouvea Atoll, Loyalty Islands, New Caledonia. Prepared by Karyn Froude and Souad Boudjelas. <https://integre.spc.int/images/telechargements/Ouvea_Biosecurity_Plan_FINAL.pdf>

A surveillance and rapid response plan for priority invasive species in Kiribati (SRRP). 2016 (draft). Prepared by Ray Pierce, Eco-Oceania for SPREP and Government of Kiribati (MELAD). <https://piat.org.nz/uploads/PIAT_content/pdfs/SRR_Kiribati_28Jun2016.pdf>

Cook Islands invasive species early detection and rapid response plan. 2018. National Environment Service. Compiled by D Butler

Emergency Response Plan for invasive ant incursions for Federated States of Micronesia. Undated. Casper Vanderwoude, Hawai‘i Ant Lab, University of Hawaii and John Wichep, US Forest Service Forest Stewardship Program. On request

General Emergency Response Plan for Invasive Ant Incursions. 2008. SPC. <https://piat.org.nz/uploads/PIAT_content/pdfs/spc_ant_erp_2008.pdf>

Invasive species early detection and rapid response plan for British Columbia. 2014. Inter-Ministry Invasive Species Working Group. <https://piat.org.nz/uploads/PIAT_content/pdfs/final_imiswg_bc_is_edrr_plan_nov_2014.pdf>

Kiribati Biosecurity and Emergency Response Programme (K-BERP). 2019 (draft). Monica Gruber, Pacific Biosecurity and Government of Kiribati (MELAD). <https://piat.org.nz/uploads/PIAT_content/docs/Kiribati%20Biosecurity%20Emergency%20Response%20Plan%20draft%20v0.3.docx>

Samoa invasive species emergency response plan (SISERP). 2019-2024. Ministry of Natural Resources and Environment and Ministry of Agriculture and Fisheries. Developed by James Atherton and Francois Martel. On request

## Guidelines and tools

CABI. 2019. Horizon Scanning Tool. Crop Protection Compendium. Wallingford, UK: CAB International. <https://www.cabi.org/cpc>

Catch it early: invasive species early detection and rapid response. SPREP invasive species battler guide. 2016. SPREP. Apia, Samoa. <https://www.sprep.org/attachments/Publications/BEM/early-detection-rapid-response.pdf>

Environmental and Social Impact Assessment (ESIA) for potential incursion of little fire ant and/or red imported fire ant in Tarawa, Kiribati. 2018. Prepared by Meghan Cooling and Monica Gruber, Pacific Biosecurity for New Zealand Ministry of Foreign Affairs and Trade and Government of Kiribati (MELAD). <https://piat.org.nz/uploads/PIAT_content/docs/ESIA_Tarawa_Synergy%20Pro.docx>

Government of Tuvalu Protect Our Islands Tuvalu iNaturalist project <https://inaturalist.nz/projects/protect-our-islands-tuvalu>

Guidelines for Invasive Species Management in the Pacific. 2009. SPREP. <https://www.sprep.org/att/publication/000699_RISSFinalLR.pdf>

IPPC website. 2019. Available at: <https://www.ippc.int/en/>

PIAT. Pacific Invasive Ant Toolkit. 2016-. Prepared by Monica Gruber, Meghan Cooling and Allan Burne, Pacific Biosecurity for New Zealand MFAT. Available at: <https://piat.org.nz>

Pacific Invasives Initiative. 2011. Resource Kit for Rodent and Cat Eradication. <http://www.pacificinvasivesinitiative.org/rk/>

Pacific Invasives Initiative. 2013. Resource Kit for Invasive Plant Management. <http://ipm.pacificinvasivesinitiative.org>

Protect our islands with biosecurity. SPREP invasive species battler guide. 2020. SPREP. Apia, Samoa. <https://www.sprep.org/sites/default/files/documents/publications/pisb-series-biosecurity_0.pdf>

Remove rodents from small tropical islands with success. SPREP invasive species battler guide. 2016. SPREP. Apia, Samoa. <https://www.sprep.org/attachments/Publications/BEM/remove-rodents-small-tropical-islands.pdf>

The invasion curve: a tool for understanding invasive species management in South Florida. 2018. WEC347, UF/IFAS. Prepared by Rebecca G. Harvey and Frank J. Mazzotti, University of Florida UF/IFAS Extension. <https://piat.org.nz/uploads/PIAT_content/pdfs/Harvey%20and%20Mazzotti_2016_Invasion%20curve.pdf>. Adapted from Invasive Plants and Animals Policy Framework, State of Victoria, Department of Primary Industries, 2010. <http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/protecting-victoria/invasive-plants-and-animals/invasive-plants-and-animals-policy-framework>

## Desktop baseline surveys

This information can be derived from the GISD/GRIIS databases for other countries.

[Niue: Compilation and Review of Invasive Alien Species Information for Niue. Shyama Pagad, Invasive Species Specialist Group (ISSG) Pacific Regional Office. September 2013

Republic of the Marshall Islands: Report for the Secretariat of the Pacific Regional Environment Programme (SPREP). Compile and Review Invasive Alien Species Information for the Republic of the Marshall Islands. Shyama Pagad, Biodiversity Data Management Ltd. Programme Officer, IUCN SSC Invasive Species Specialist Group. March 2015

Kingdom of Tonga: Comprehensive Desk-top Review of Biodiversity, Conservation and Invasive Species Information for the Kingdom of Tonga. Compiled for the Secretariat of the Pacific Region Environment Programme (SPREP). Shyama N Pagad, Programme Officer IUCN SSC Invasive Species Specialist Group/University of Auckland, March 22, 2013

Tuvalu: Baseline Desktop Invasive Species and Biodiversity Study. Shyama Pagad, 11-30-2019]

# Document history (template only)

|  |  |  |  |
| --- | --- | --- | --- |
| author | version | description | date |
| Monica Gruber | 0.0 | First draft  | July 2020 |
| Monica Gruber | 0.1 | Incorporating David Moverley and Bradley Meyer review | September 2020 |
| Monica Gruber | 0.2 | Incorporating Richard Griffith review | October 2020 |
| Monica Gruber | 0.3 | Completion of Annex 1: protocols for ants; noting citizen science/iNaturalist | November 2020 |
| Monica Gruber | 0.5 | Addition of protocols derived from information on weeds and cats from NZ DoC and elsewhere. Splitting protocols from main document as too unwieldy. Incorporation of SPREP Style Guide | May 2022 |

# AnnexES

[Add protocols for target species here as needed from the web page. The status % refers to how complete these protocols are for this version of the EDRR template.]

## Annex 1: Protocols for ants

Refer to Protect our Islands EDRR protocols for ants.

Status: 100%

## Annex 9: Protocols for rodents

Refer to Protect our Islands EDRR protocols for rodents.

Status: 100%

## Annex 10: Protocols for feral cats

Refer to Protect our Islands EDRR protocols for feral cats.

Status: 20%

## Annex 2: Protocols for weeds

Refer to Protect our Islands EDRR protocols for weeds.

Status: 5%

## Annex 3: Protocols for birds

Refer to Protect our Islands EDRR protocols for birds.

Status: 0%

## Annex 4: Protocols for mongoose

Refer to Protect our Islands EDRR protocols for mongoose.

Status: 0%

## Annex 5: Protocols for Giant African Snail

Refer to Protect our Islands EDRR protocols for Giant African Snail.

Status: 0%

## Annex 6: Protocols for snakes and other reptiles

Refer to Protect our Islands EDRR protocols for snakes and other reptiles.

Status: 0%

## Annex 7: Protocols for cane toads and other amphibians

Refer to Protect our Islands EDRR protocols for cane toads and other amphibians.

Status: 0%

## Annex 8: Protocols for wasps

Refer to Protect our Islands EDRR protocols for wasps.

Status: 0%

1. Catch it early: invasive species early detection and rapid response Battler guide page 8 [↑](#footnote-ref-2)
2. Eradication of some invasive species require repeated treatment. This is particularly true for insects such as red imported fire ant and little fire ant, plants and reptiles. Having sufficient resources for the entire eradication is important, as often, once treatment starts it needs to be completed. [↑](#footnote-ref-3)
3. The likelihood of the risk eventuating is influenced by how well risks are controlled. Other aspects, such as the biology of the target species, the situation of the biosecurity emergency area, and the knowledge of eradication tools for the target species will also influence the likelihood of eradication success/risk profile. [↑](#footnote-ref-4)