*Clean boats, clean ports*: a framework to protect Pacific island countries and territories from invasive species

Abstract

The most effective way to manage invasive species is to prevent their arrival in a country. However, prevention is not always successful, and invasive species can arrive, reproduce, and spread within a country. Sometimes, within countries, regular inter-island spread prevention efforts can be hampered by small workforces in distant islands and difficulties in keeping training up to date. But not all countries face the same challenges or have the same needs. The Pacific needs a flexible framework to prevent the spread of invasive that recognises these differences. One of the fundamental principles of preventing invasive species spread is to manage risk at its source. For islands that only have domestic travel connections, the sources are the international arrival points. Managing risk at these points is the basis for *clean boats, clean ports*, which provides a framework that integrates domestic spread prevention with international invasive species prevention (biosecurity/quarantine).

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# Dear Invasive Species Battler

We are a diverse bunch of people in the Pacific region, which spans about one third of the earth’s surface and encompasses about half of the global sea surface. We have ~2,000 different languages and ~30,000 islands. The Pacific is so diverse that its ecosystems make up one of the world’s biodiversity hotspots, with many species found only in the Pacific and nowhere else. In fact, there are 2,189 single-country endemic species recorded to date. Of these species, 5.8 per cent are already extinct or exist only in captivity. A further 45 per cent are at risk of extinction. We face some of the highest extinction rates in the world.

The largest cause of extinction of single-country endemic species in the Pacific is the impact of invasive species. Invasives also severely impact our economies, ability to trade, sustainable development, health, ecosystem services, and the resilience of our ecosystems to respond to natural disasters.

Fortunately, we can do something about it.

Even in our diverse region, we share many things in common. We are island people, we are self-reliant, and we rely heavily on our environment to support our livelihoods. We also share many common invasive species issues as we are ultimately connected. Sharing what we learn regionally makes us and our families benefit economically, culturally, and in our daily lives.

The “Invasive Species Battler” series has been developed to share what we have learned about common invasive species issues in the region. They are not intended to cover each issue in depth but to provide information and case-studies that can assist you to decide about what to do next or where to go for further information.

The SPREP Invasive Species Team aims to provide technical, institutional, and financial support to regional invasive species programmes in coordination with other regional bodies. We coordinate the Pacific Regional Invasive Species Management Support Service (PRISMSS), the Pacific Invasive Learning Network (PILN), a network for practitioners battling invasive species in Pacific countries and territories, and the Pacific Invasives Partnership (PIP), the umbrella regional coordinating body for agencies working on invasive species in more than one Pacific country.

For knowledge resources, please visit the [Pacific Battler Resource Base](https://brb.sprep.org/) on the SPREP website:

Thank you for your efforts,

SPREP Invasive Species Team

# About this guide

The *clean boats, clean ports* framework is a Pacific Regional Invasive Species Management Support Service (PRISMSS) Protect our Islands (POI) initiative to enable countries to better secure international entry ports that are gateways to priority domestic destinations.

This Battler Series publication supports the prevention of the spread of invasive species among islands within countries. The document outlines a flexible framework that recognises the diverse situations in Pacific island countries and territories, and capitalises on existing strengths, while highlighting achievable and aspirational targets.

This publication is part of a collection of Battler guides on preventing the spread of invasive species in the Pacific region. For an introduction read the Battler publication [Protect our islands with biosecurity](https://www.sprep.org/sites/default/files/documents/publications/pisb-series-biosecurity_0.pdf), and [Catch it early: invasive species early detection and rapid response.](https://www.sprep.org/publications/catch-it-early-invasive-species-early-detection-and-rapid-response)

This guide is targeted specifically to support decision-makers in prioritising improvements to prevent invasive species arriving, establishing, and spreading, to guide the implementation of targeted enhancements. The guide aligns with many aspects of the regional [Guidelines](https://www.sprep.org/att/publication/000699_RISSFinalLR.pdf), but particularly *C1. Biosecurity – Preventing the spread of invasive species across international or internal borders*.

David Moverley suggested the *clean boats, clean ports* concept. Monica Gruber developed the framework and prepared this guide based on the experiences and knowledge shared by many around the region, especially in-country Agriculture and Environment directors, managers, and officers, and PRISMSS partners. Ray Pierce, Greg Sherley, Visoni Timote, and Loia Tausi contributed significant ideas to the *clean boats, clean ports* framework. We also thank Huggard Tongatule (Niue), Atelaite Lupe Matolo and Viliam Hakaumotu (Tonga), Kennedy Kaneko and Daffodil Silver Wase (RMI), Sam Panapa (Tuvalu), Domenic Sadler and Bradley Myer (SPREP), for their contributions to the development of the framework and this Battler Guide.

# Why do we need to prevent the spread of invasive species?

We aim to stop the spread of invasive species to protect resources (social, economic, environmental) from the potential harm caused by the arrival of new living things.

A small minority of pests/invasive species (animals, plants, and diseases) can devastate economies, health, agriculture, culture, and lifestyle in the Pacific. Prevention of their arrival is ideal. But even with the best prevention measures, the risk of arrival can be minimised but not completely removed.

Sometimes an unwanted species arrives in a country without us knowing about it for a long time. By then it may have spread to other areas and cause even more problems. “Biosecurity” and “Quarantine” efforts reduce the risk of any unwanted species spreading around the country.

Pacific island nations face an enormous challenge due to the increasing impacts of climate change. Ensuring each country is as resilient as possible to these challenges is a major priority for the region. While we are still learning about the impacts of climate change, we do know some of the effects that may occur on invasive species already present, including:

* disturbance to natural and human infrastructure provides opportunities for invasive species to spread;
* increased intensity and frequency of extreme weather events may affect a country’s ability to respond to invasive species threats; and
* native species are typically not well equipped to adapt to a changing climate. Invasive species may benefit from change.

Reducing the threat that invasive species pose can therefore be of practical benefit to climate resilience. Because effective international and domestic prevention (of arrival, reproduction and spread) is the most cost-effective way to manage invasive species, these actions contribute directly to maximise climate resilience.

# What is the c*lean boats, clean ports* framework?

Pacific island countries and territories collaborate for effective international prevention (Biosecurity/Quarantine). Biosecurity/Quarantine teams are mainly part of the Agriculture Ministry or Department based at international entry points. Effective inter-island prevention of invasive species spread can be difficult because of small workforces in distant islands and difficulties in keeping training up to date.

But, as we noted in the introduction, the Pacific islands region is a diverse place. Differences among countries and territories due to population size, number of islands, economic and development status all affect ability to prevent the spread of invasive species. Some examples of different situations – which are not mutually exclusive - include:

* Countries with few agricultural or other exports but are highly reliant on imports. The risks posed by imported goods and materials (particularly construction materials) to subsistence agriculture and the environment need to be managed.
* Countries with many and diverse islands and archipelagos, multiple entry points and therefore many points of risk. Often, although main islands have robust international biosecurity, outer islands have little capacity as populations are very small and infrastructure is limited. In all cases, communities have a major role, but often do not have the resources, time, or experience to manage biosecurity actions. Some countries have Agriculture Extension Officers on outer islands, who have many other responsibilities. Keeping everyone effectively trained is a challenge.
* Larger countries with agricultural economies. Market access for exports and trade are major drivers for biosecurity. These countries often have relatively robust systems, a stable workforce, and as a result can implement advanced tools such as shipping container hygiene systems and fumigation.
* Development status and access to development funding to maintain capability. Biosecurity and Quarantine resources to prevent the spread of invasive species are often a lower priority than other needs such as health or education. In some rare cases there is little government support for biosecurity, including some very large, developed countries. For these countries the *clean boats, clean ports* framework provides a mechanism for advocacy and a staged approach to build biosecurity from the ground up.

Not all countries face the same challenges or have the same needs. Therefore, a one-size-fits-all approach for to prevent the spread of invasive species is unrealistic. So, we suggest a regional approach that can incorporate this diversity. The c*lean boats, clean ports* framework promotes flexible options that countries can adopt, depending on their unique circumstances. The programme has other benefits that are discussed later in this guide.

One of the fundamental principles of preventing the arrival, reproduction and spread of invasive species is to manage risk at its source. The source of invasive species to outer islands is often the main port of entry or island that is home to the country’s capital. In this guide, we refer to this as the main island.

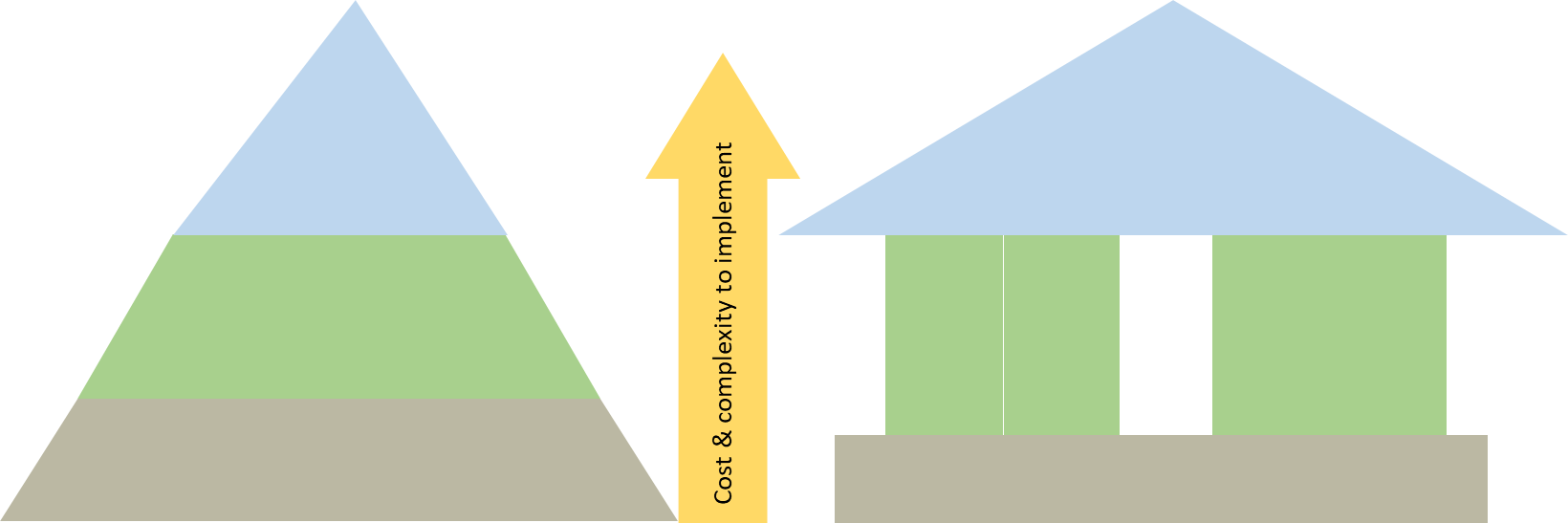
This is the basis for *clean boats, clean ports*: to manage invasive species risks at the main port(s) of entry. The *clean boats, clean ports* approach has the goal of securing the *pathways* that species can use to spread, and reducing the numbers of, or removing completely, the key threat invasive species at the main island. This does not mean that invasive species risks at the outer islands (or special protected islands) should be ignored, as this is also included in the framework.

The initiative provides a checklist that focuses on steps to reduce the risk of invasive species:

* At ports (and airports) and the areas around these sites in the main international arrival point, up to and including the whole island, and
* On boats, including smaller boats that operate locally, and larger ferries and cargo vessels that service distant islands.

To make the framework achievable *clean boats, clean ports* can be seen as a staged system for the range of actions that can be taken around a port and on local and inter-island boat traffic. While the main responsibility for *clean boats, clean ports* would be the existing Biosecurity or Quarantine teams, these teams can also involve other participants in biosecurity, such as environment officers.

The checklist has three stages or categories, with each building on the next. The stages can be viewed as a house or building with the foundations, walls (or pillars) and roof, with all required to add up to a complete and strong system. The actions can also be represented as a pyramid, with the foundation core actions supporting the more advanced actions.



|  |  |
| --- | --- |
| Foundation | Core, fundamental actions requiring typically few resources other than occasional labour, and already part of the activities undertaken by many teams as part of international biosecurity work. An example is casual visual surveillance of ports and boats during regular inspections of arriving ships (and planes), and informal talks with members of the community, businesses, port officials and so on. For countries and territories just starting out in biosecurity, these actions provide simple targets. |
| Walls | More complex actions that require additional cost, resources or more labour. These actions can be implemented by larger, more developed countries and territories and are a target for development assistance to smaller countries. An example is placement of monitoring traps for animals (such as Coconut Rhinoceros Beetle, mongoose, rats) and checking them regularly (and replacing lures/baits and so on). |
| Roof | For many countries, the most complex actions will probably only be possible when major project funds are available, and the benefits are greater than the costs. These actions are typically implemented in the larger countries in the Pacific, who are often exporters. But this can also include actions that are undertaken through development assistance for smaller, less developed countries. Examples include the implementation of sea container hygiene systems (or their principles) and fumigation facilities. |

The actions are arranged roughly according to cost and complexity to implement and maintain, with foundation costs being the least complex, least expensive, and likely to be implemented by many countries. Although it would be helpful to be able to cost all these items, the cost of the actions will differ between countries.

Countries identify actions from the checklists to suit their needs. All the checklist actions are already being done to a greater or lesser extent by many countries in the Pacific.

## Protect our Islands “buddies”

To enhance biosecurity capability, *clean boats, clean ports* implementation supports “buddies” to work alongside the teams responsible for invasive species prevention and control. The buddy’s role is to help implement new actions from the checklist or increase frequency of current actions. A buddy could be a member of an NGO already in-country, or someone from outside, or a retired local expert, or a specialist from a regional agency. PRISMSS is aiming to develop a mechanism for Protect our Islands buddies as a regional service.

The skills of the Protect our Islands buddy, and the amount of time they need to spend in-country will depend on the needs of the country. The need might be as simple as an extra staff member to reduce overwork for a few months, or a specialist in control of a specific pest several times a year over a few years. In all cases the buddy would provide advocacy support to government agencies, communities, and other interest groups to increase understanding around the need for well-supported biosecurity/quarantine teams.

# How do we implement c*lean boats, clean ports* in our country?

The good news is that in many cases, *clean boats, clean ports* actions are already part of what your biosecurity/quarantine teams are doing.

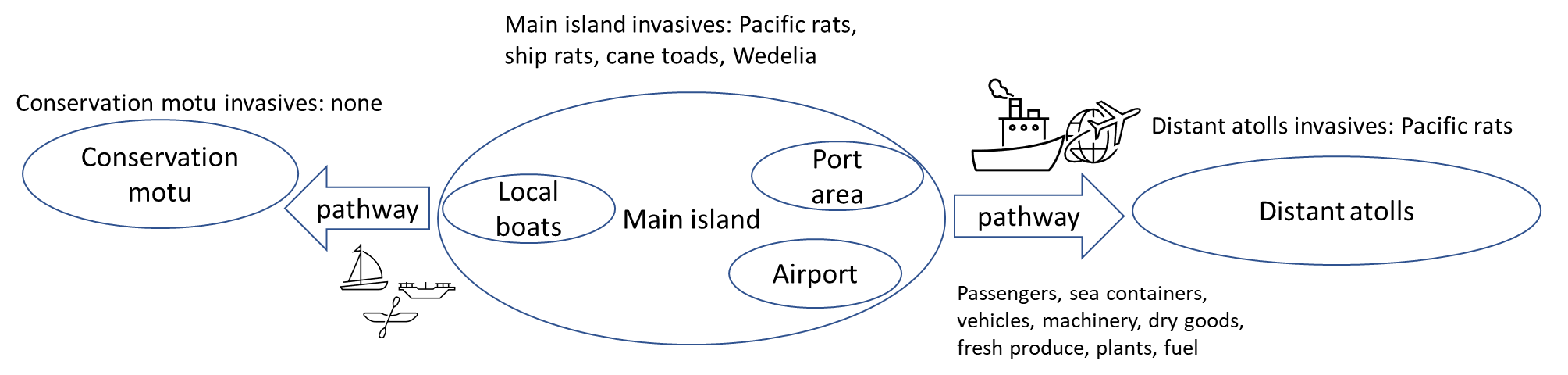
Primary *clean boats, clean ports* actions take place on the islands where there are international arrivals.

The first step is to identify all the *pathways* (both transport mechanisms and the types of goods) that invasive species could use to travel to other islands.

It is also most helpful to know what invasive species are in both the main island and the destination islands, to that the best type of actions can be selected. This can be found in a desktop survey, through local knowledge or invasive species databases, like GRIIS and GBIF. Information on which invasive species and pests are known to be present in various countries can be found in the Pacific Pest List database and other sources on the Battler Resource Base (and should be recorded on a biosecurity register). Contact PRISMSS if assistance is needed.

Finally, any specific sites that are important to protect are indicated. This might be refuges for protected species, for example, or important harvesting sites.

Drawing a picture can be helpful to figure out these pathways, and from this the goals for inter-island biosecurity can be set. This is easiest done on a map. The diagram below shows an example for a hypothetical country.



In the example above, some of the key issues to be managed would be preventing new invasives (particularly rats, cane toads and Wedelia) from reaching the conservation motu and to prevent ship rats from reaching distant motu.

The next step is to compile a list of all the biosecurity actions currently being done Use the *clean boats, clean ports* list of actions as a guide and add to them as needed. This can be a very quick exercise as the list can be added to later. To make this assessment easier, we have developed an online [survey](https://vuw.qualtrics.com/jfe/form/SV_bkkrolOMCGRyaLI).

If the assessment is to be used as a basis for seeking development funding, it should be completed by the country’s Technical Advisory Group for invasive species or other organisation, or at a minimum by the government agency or agencies mandated to undertake biosecurity/quarantine and invasive species management.

Once this assessment is complete, decide on priority actions that can be implemented easily, or actions that will need external support. PRISMSS partners can help you complete the survey and to identify appropriate targets. Think about ways a Protect our Islands buddy could help to implement some of these changes.

Box: iNaturalist helps reporting and identification of new invasive species in Tuvalu and Fiji

The earlier a newly arriving invasive species is detected, the more likely it is to be eradicated. Everyone who lives or works at an international port of entry has an important role to play in early detection. The simplest awareness message is “if something looks new, report it”. Some countries have systems such as help desks and freephone numbers to report new arrivals, but many developing countries do not. Importantly, even if the detection is reported, the new arrival also needs to be accurately identified. Small developing countries might not have experts with the skills needed to accurately identify a new species.

The [iNaturalist app](https://www.inaturalist.org/) can help with both issues. Sam Panapa, a former Director of Agriculture from Tuvalu now working on the GEF 6 Regional Invasives Project, was alerted to a bird found in the Government building in Funafuti by Quarantine staff.

Sam posted a picture of the bird on iNaturalist, and it was quickly identified by other members as the Jungle myna (*Acridotheres fuscus*). Tuvalu has close trading links with Fiji, where Jungle myna are widespread, and this was the mostly source of the bird found in Tuvalu.

Sam has been using iNaturalist to help identify several other species he was not familiar with.

Jake Taoi of Nature Fiji reports that iNaturalist is also being used in a similar way in Fiji.

The iNaturalist app is easily downloaded and used on any smartphone camera. Shape

Description automatically generated with medium confidence

# The *clean boats, clean ports* stages and actions

The *clean boats, clean ports* framework is a collection of actions arranged according to stages, with each stage building on the others and reflecting increasing complexity and cost to implement. Not all actions need to be implemented – it depends on the needs of the country. The full checklist of actions is available on the [*clean boats, clean ports* website](http://www.pacificbiosecurity.org/the-clean-boats-clean-ports-framework.html), and in the [assessment survey](https://vuw.qualtrics.com/jfe/form/SV_bkkrolOMCGRyaLI). Some examples are given here.

* A fit-for-purpose legislation/regulation framework for biosecurity is in place.
* Biosecurity teams have enough staff to do their regular assigned work. This also applies if biosecurity actions are being undertaken by communities.
* Biosecurity teams have all the resources they need to do their regular assigned work.
* Port workers, government agencies (Customs, Health etc.) and businesses operating at the port are aware of biosecurity risks (species to look out for) and who to contact if any are found.
* Boat operators are aware of species to look out for on board and who to contact if any are found.
* The biosecurity team’s work is supported by businesses, boat operators, other government agencies and communities.
* An advocacy programme is in place to increase awareness of the benefits of invasive species prevention by all the above sectors.
* Casual surveillance is undertaken when incoming vessels are being cleared. For example, biosecurity officers walk around the ports (and boats and ships if possible) looking for risk issues (rubbish piles, new weeds, standing water, presence of pests that might need control), and people responsible are advised or a clean-up is organised.
* Boats are free of containers that may hold standing water (particularly where cane toads are present at the main island, but also to prevent mosquito spread).
* Boats are kept free of rubbish. Rubbish is kept on board until return to the main island. No offloading of rubbish at the destination island.
* Food is not stored on boats, other than food brought on board for the journey. Or if kept on board, food is stored in sealed containers or refrigerators (to prevent ants, rats and other animals being attracted to food).
* Berthing, offloading, and loading of vessels only happens during daylight hours.
* Coconut Rhinoceros Beetle visual surveillance is undertaken (damage to palm trees).
* Rope guards are fitted to prevent animals like rats, mongoose walking off (or onto) boats.
* Checklists are provided to tourist operators to outline requirements for visiting protected islands and sites.
* The iNaturalist app is used as an early warning system for reporting detections of invasive species.
* The [Pacific Marine Biosecurity Toolkit](https://brb.sprep.org/marine-biosecurity-toolkit) is used to assess hulls for biofouling.
* Waste bins on boats and in ports are treated with residual insecticide.
* Machinery being sent to islands is inspected and clean of soil (removal of weed seeds, insects, eggs, soil)
* Aggregates, timber, building materials, machinery and so on have been appropriately fumigated before arrival at the main island. Certificate of clearance is an alternative but must be rigorously implemented.
* If the above condition is not possible, aggregates, soils, plant waste and so on should not be moved to other islands or within islands. If this is not possible raise awareness among people of the weeds and insects that could appear.
* International biosecurity requirements and obligations are consistently upheld.
* Biosecurity provisions for preventing domestic movement of invasive species are in place and followed. This could include Legislation, Rules, Protocols, Regulations, or other mandates.
* Biosecurity regulations have provision for registers of risk invasive species, and registers are up to date.
* Biosecurity regulations require shipping operators (including yachts) to use “all necessary steps” to make sure no plants or animals can leave the vessel. See the “All necessary steps” recommendations on the [*clean boats, clean ports* website](http://www.pacificbiosecurity.org/the-clean-boats-clean-ports-framework.html).
* “All necessary steps” are also implemented for interisland vessels (such as fishing boats, tourist boats).
* Plants are not taken on board boats unless they meet biosecurity regulations (e.g., any soil must be clean and free of insects or eggs of snails, the plants must not be weeds).
* A general Emergency Response Plan is in place for invasive species.
* Tourist operators and visitors must have a license to visit protects islands and sites. Checklists are provided to tourist operators to outline requirements.
* Detection tools are used for priority species (such as tracking tunnels for rodents and mongoose).
* Some or all the *Recommendations to prevent the movement of invasive species between islands in Pacific countries* [link] are used.
* Some or all the actions in the [*Battle invasive species that threaten marine managed areas guide*](https://www.sprep.org/attachments/Publications/BEM/battle-invasives-marine-managed-areas.pdf) are followed.
* Biocontrol programmes are in place for priority weeds (to reduce numbers on the main islands and therefore the threat to other islands).
* Biosecurity plans are active for priority islands (such as those where rat eradications have occurred). These actions must be embedded prior to eradication taking place.
* Chemical or physical control of invasive species on board boats (for rats, insects, and other species).
* Regular port ‘clean-ups’ are organised to remove rubbish, weeds and reduce/remove other places invasive species can hide.
* Small weeds at the port are removed by mechanical means (such as hand operated hoes).
* Simplified fire ant surveillance is undertaken (using lures and checking for possible species of concern).
* Small weeds at the port are removed by chemical means.
* Weed trees at the port are removed by mechanical means (such as a chainsaw).
* Waste bins are installed on boats and at ports. These have lids, are emptied regularly, and contents are disposed of in a way that minimises risk, such as incineration. Several waste bins may be needed at ports, and on boats.
* Ongoing control is undertaken of high -risk species on the main island that are not found on destination motu/islands (such as weeds, rats, fire ants).
* An Early Detection, Rapid Response/Emergency Response programme is in place (including planning, readiness, on-going regular surveillance, and regular simulations) for priority species.
* Some or all the *Recommendations to prevent the movement of invasive species between islands in Pacific countries* [link] are used.
* If marine invasive species are present at the main island, ballast water of inter-island boats is exchanged in the open sea.
* Shipping container hygiene is required for containers shipped to outer islands. The methods remove hard to detect invasive species such as snail eggs, dirt that could host ants and other insects and weed seeds. Recommended as a high priority for ports at main islands where Giant African Snail and fire ants are found.
* Coconut Rhinoceros Beetle pheromone surveillance traps are set and checked regularly with pheromones refreshed.
* Drone surveillance or other remote monitoring of key areas in the main island and vegetation analysis is used to assess weed extent, damage to plants, loss of, or recovery of canopy.
* Fruit fly trap surveillance is undertaken (traps serviced every two weeks) and flies caught are identified.
* Targeted surveillance of other risk species happens regularly without support, or occasionally with support.
* Targeted surveillance is undertaken for entire species groups that require expert identification, such as ant surveillance that requires identification of all species found.
* Boat hulls at main islands are kept clean using boat bags or other tools that kill invasive species (if marine invasives are present).
* Detector dogs are used for target invasive species at ports and airports.
* Regular, scheduled surveillance is undertaken for all priority species.
* The country is an endorsed member of the regional [Sea Container Hygiene System](https://piat.org.nz/index.php?page=sea-container-hygiene-system).

Box: A Customs Broker in Tonga finds a Giant African Snail (GAS) at Tongatapu’s main seaport

Siutoni Tupou, Head of MAFF-Quarantine Division for the Kingdom of Tonga, describes how her team dealt with the recent incursion of Giant African Snail.

“On Friday morning 26 August 2022, a Customs Broker found one snail on the doorstep of the Customs Office. On the same day, our Quarantine Inspectors scattered some Blitzem snail bait around the Customs compound and the next day, Blitzem was applied to the main port of Queen Salote wharf and imported container yards. The Quarantine Inspectors monitored and scouted for more snails three times over the following six weeks. To date, no further snails have been found, but daily radio announcements call for the public to report any more sightings.”

Siutoni’s team’s experience highlights how effective awareness is to help prevent the establishment of new species, and how other government workers can support the work of the biosecurity/quarantine teams.

The speedy action by Tonga’s Quarantine team eliminated the risk of the snails travelling from the port to other island groups.

Giant African Snail is a priority species for prevention in the region. The snail can devastate all types of crops and carries a rat lungworm parasite that can cause a brain inflammation in people. It damages native plants, altering the natural habitats needed by native species. It also probably outcompetes native snails, which are a group that is threatened by invasive species in many Pacific countries.

# Principles underlying *clean boats, clean* ports

* Actions need to be achievable by the wide range of countries and territories in the Pacific region, to meet their needs. We need a system that caters for diverse situations.
* Control measures to keep populations low at main entry point are important to reduce “propagule pressure” – the risk of spread is increased by larger source populations, and more opportunities to hitchhike.
* Inter-island/intra-island biosecurity should target the highest risk source (the international entry port or main island) and the risk species already present at that source. This capitalises on the relatively larger populations (larger workforce and number of eyes) and infrastructure on these main island entry points.
* Treats biosecurity as more of a continuum than distinction between inter- and intra-island actions. The main entry point is the first “gate” an invader must open, and often it is these points that are the source for threats to islands domestically.
* Aligns with the “one health” concept. The framework focusses on all threats (regardless of whether it is a potential crop pest, health concern, or threat to biodiversity).
* Encourages the continuing collaboration between Environment and Agriculture teams and aims to ‘synergise’ their actions.
* Aligns with the “pre-export/pre-border” notional segments of biosecurity – undertaking actions at the source of the risk prior to (but in this case, domestic) export. The main island is in effect acting as a good neighbour to outer islands.
* Does not replace any existing actions, plans or projects, only formalises the framework around the actions.

# Benefits of *clean boats, clean ports* for the region

## Benefits for countries

* Makes the most of infrastructure, legislation, and capacity already in place. In the rare cases where there is no biosecurity, it provides staged targets for capacity-building.
* Recognises that all countries have different needs, challenges, and capabilities.
* Reinforces that what countries are already doing is good. Gets away from “do it our way, do it better” expectations.
* Does not require new legislation. Existing legislative frameworks focus on international biosecurity, and domestic biosecurity legislation is limited to containment. *Clean boats, clean ports* overcomes this constraint by focusing on containment.
* Due to the mandate for domestic biosecurity (containment) usually falling to the Agriculture teams, the focus on outer islands is often on crop pests. Biodiversity concerns might be overlooked. *Clean boats, clean ports* focus is primarily on pathways, not impacts.
* Simple actions are achievable with minimal training. In some cases, no training will be needed, as they ae already being done, or all that is required is a little extra effort.
* Does not create additional burden on recipient villages/extension officers on outer islands.
* Simple actions can detect change, make biosecurity officers more visible, so increases awareness among port staff, communities and so on through familiarity. Eventually leading to behaviour change among communities.
* Biosecurity buddies can help embed actions.
* Highlights the good work already being done, providing positive reinforcement.

Box: Red imported fire ants: we are doing something right!

Red imported fire ants are a cross-cutting threat to the Pacific and have caused billions of dollars of economic harm, species extinctions, and human deaths elsewhere. Yet despite the threat being present and increasing for over 20 years, no incursion (arrival) has been documented on any Pacific island.

What is the reason for this success? Good biosecurity, particularly shipping container hygiene at ports across the region, are likely contributors, as are training programmes in ant identification and surveillance at high-risk sites.

But the region must be constantly aware. Red imported fire ant is spreading in Queensland in Australia, and at ports in China, a major trading partner for many countries in the Pacific.

## Benefits for the region

* Opportunities for “south-south” knowledge exchanges through biosecurity buddies and enhancing capability region-wide.
* A shared vision for inter-island biosecurity.
* Does not replace any existing approaches, resources and so on – they can all be used.
* Greater awareness of biosecurity overall, which contributes to regional security.
* Countries self-define their domestic biosecurity needs for their situations, so able to take ownership.
* Fosters cross-agency collaboration by not being constrained by a single “sector”.
* Greater emphasis on detecting change can also detect warning signs for other impacts, such as those of climate change.
* Better resilience to climate change threats by reducing the risk of spread of invasive species.
* Measurable change in capacity region wide.
* The assessment framework provides a mechanism to record actions that are working well for some countries and that may be useful to others.

## Benefits for funders, regional agencies, and project implementors

* Provides a framework for implementation of progressive improvements to domestic biosecurity over time.
* Establishes a way of assessing capability country-by-country, identifying baselines, and setting targets.
* Makes the most of development funding by “filling in gaps” (occasional major surveys, refresh of equipment) and bolstering on-going actions.
* Acknowledges the sporadic nature of development project funding. Initiatives in small island countries cannot be maintained once project funding ceases.
* Removes the expectation that one-off projects complete capability and highlight where repeat projects are needed. Reduces the pressure to “oversell” what a single project can deliver.
* Enables a tailored, rather than a one-size fits-all approach to enhancing capability.

# Key concepts and acronyms

Key Concepts

| **Concept** | | **Description** | |
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| Biocontrol or biological control | | Controlling an invasive species by introducing a natural enemy, such as an insect or fungus, that specifically attacks the target species and does not attack other native or economically important species. | |
| Biodiversity | | The variety of living organisms on the earth, including the variability within and between species and within and between ecosystems. | |
| Biosecurity | | Preventing the spread of invasive species across international or internal borders. | |
| Containment | | Keeping an invasive or pest species within a defined area. | |
| Control | | Reducing the population of an invasive species (numbers and distribution). | |
| Early Detection and Rapid Response (EDRR) | | Early detection and rapid response plans target invasive species or pests. EDRR includes prioritisation, surveillance (for early detection) and being actively prepared should the target species arrive. |
| 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. |
| Introduced species | | Plants, animals, and other organisms taken beyond their natural range by people, deliberately or unintentionally. | |
| Invasive species | | Introduced species that become destructive to the environment or human interests; can also include some native species that proliferate and become destructive following environmental changes caused by human activities. | |
| Monitoring | | Programmes to detect change, such as change in the distribution of invasive species, the success of management projects, and so on. |
| Movement control | | Placing restrictions on the movement of people, animals, plants, and goods to restrict the spread of an invasive species. See also containment. |
| Native species | | Plants, animals, and other organisms that occur naturally on an island or in a specified area, having either evolved there or arrived without human intervention. | |
| Neonative species | | Neonative species are those that have expanded geographically beyond their native range and that now have established populations whose presence is due to human-induced changes of the biophysical environment, but not because of direct movement by human agency, intentional or unintentional, or due to the creation of dispersal corridors such as canals, roads, pipelines, or tunnels. |
| Non-native species | | Non-native species are those species that have been introduced by people. Non-native species include both harmful (that is, invasive) and beneficial species. |
| Pacific Regional Invasive Species Support Service | | 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 harms human interests in an environment (agriculture, people’s health, and so on) - whether it is native or introduced.  Any animal that is harmful, unwanted, or annoying. |
| Region | | When not otherwise qualified, means the Pacific Ocean, with specific reference to the island states and territories members of SPC and SPREP. | |
| Surveillance | | Monitoring to detect the arrival of new invasive species. | |
| Threatened species | General term for species ranked by [IUCN](https://www.iucnredlist.org/) as Critically Endangered (CR), Endangered (EN), or Vulnerable (VU). | |

Acronyms

| **Acronym** | | **Definition** | |
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| EDRR | | Early Detection and Rapid Response | |
| ERP | | Emergency Response Plan |
| IAS | | Invasive Alien Species | |
| IS | | Invasive Species | |
| POI | Protect our Islands | |
| PRISMSS | | Pacific Regional Invasive Species Support Service | |
| SPC | | (Secretariat of the) Pacific Community | |
| SPREP | | Secretariat of the Pacific Regional Environmental Programme | |

# For more information

The Battler Resource Base contains information and materials for battling invasive species in the Pacific. Information on invasive species management in the Pacific can be found on the SPREP [Battler Resource Base](https://brb.sprep.org/) and by request directly to [PRISMSS](mailto:prismss@sprep.org).

PRISMSS Protect our Islands programme supports the collection, development, and implementation of resources to help with preventing arrival and spread of invasive species in the Pacific islands’ region.

An up-to-date checklist of actions within the *clean boats, clean ports* framework is available from the [*clean boats, clean ports* webpage](http://www.pacificbiosecurity.org/the-clean-boats-clean-ports-framework.html) and in the [assessment survey](https://vuw.qualtrics.com/jfe/form/SV_bkkrolOMCGRyaLI).