

THE GUIDING FRAMEWORK FOR INVASIVE SPECIES MANAGEMENT IN THE PACIFIC

SECOND EDITION

A framework for managing invasive species and biosecurity in the Pacific islands



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SPREP's vision: *The Pacific environment, sustaining our livelihoods and natural heritage in harmony with our cultures.*

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KEY TERMS, CONCEPTS AND ACRONYMS

Most terms, concepts, and acronyms used in this document are defined at first mention in the text. The following occur frequently and are defined here for ease of reference. Terminology for invasive species has not been standardised internationally so some of the terms below are defined in the specific context of the Pacific islands. More invasive species terminology definitions can be found [here](#).

KEY TERMS AND CONCEPTS

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. It does not attack other native or economically important species.
biosecurity	Sometimes used to include all aspects of invasive species management. In this document, it is used in the more restricted sense of preventing the spread of invasive species across international or internal borders, including between islands in the same jurisdiction.
containment	Keeping an invasive species within a defined area.
control	Reducing the population of an invasive species to a predetermined level.
ecosystem services	Benefits provided to society by the natural environment which are optimised if ecosystems (such as coral reefs) are healthy and not degraded such as by invasive species like Crown of Thorns which attack coral reefs.
effective management	Achieving operational success (such as reducing the pest's abundance to predetermined levels) and desired outcomes of invasive species management (such as reduced pest impact and recovery of impacted values).
eradication	Complete elimination of an invasive species from an island or other defined area.
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, including changes in the distribution and abundance of invasive species, or the success of management projects, such as the recovery of native species impacted by invasive species.
native species	Plants, animals, and other organisms that occur naturally on an island or in a specified area, having either evolved or arrived there without human intervention.
pathway	the process, mechanism, or route by which a species is moved from its native area into a new area where it has not previously occurred.
region	When not otherwise qualified, means the Pacific Ocean, with specific reference to the island states and territories that are members of SPC and SPREP.
restoration	Management actions at sites, often including mitigating the impacts of invasive species, with the intention of returning that site to a defined state where the natural assets are protected for the future.
surveillance	In this document, defined as monitoring to detect the arrival of new incursions of invasive species.

ACRONYMS

EDRR	Early Detection and Rapid Response
NBSAP	National Biodiversity Strategy and Action Plan
NISSAP	National Invasive Species Strategy and Action Plan
PIER	Pacific Island Ecosystems at Risk
PRISMSS	Pacific Regional Invasive Species Management Support Service
PILN	Pacific Invasives Learning Network
PIP	Pacific Invasives Partnership
SPC	Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme

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INTRODUCTION

What is this *Guiding Framework*?

The purpose of the *Guiding Framework* is to support anyone or any institution planning and implementing invasive species projects or programmes on islands in the Pacific. To this end, this document lists the essential components of a comprehensive and effective invasive species management programme. It has been compiled in consultation with experts and Pacific Island countries and territories, to support them in developing their invasive species work and to guide regional and international agencies. The *Guiding Framework* has been endorsed by all countries and territories in the Pacific islands region and the metropolitan countries with jurisdictional responsibilities in the Pacific via the Secretariat of the Pacific Regional Environment Programme (SPREP) and Pacific Community (SPC) Meetings.

Specifically, this *Guiding Framework* is intended to:

- provide a comprehensive framework for designing, planning and monitoring invasive species management and biosecurity for the Pacific islands,
- identify all tasks and the process for setting priorities,
- direct where to focus implementation,
- increase efficiency by avoiding duplication and facilitating cooperation,
- guide the development and implementation of National Invasive Species Strategies and Action Plans (NISSAPs) and planning by agencies with relevant roles and responsibilities in the region, and
- inform regional and local fundraising.

The *Guiding Framework* addresses invasive plants, animals, disease agents, and other organisms in marine, freshwater, and terrestrial environments. The impacts of these invasive species include those on the environment, biodiversity, ecosystem services, human health, economies, and society. The *Guiding Framework* aligns directly with relevant international conventions and standards and is intended to assist planners and practitioners meet accepted standard operating procedures.

To facilitate reference and planning, the objectives are grouped into nine main Thematic Areas in three sections. All nine Thematic Areas must be considered to achieve an effective invasive species programme, whether national or regional.

The *Guiding Framework* is intended to be comprehensive and therefore contains many objectives, but it is not necessarily recommended that any country or agency should carry out all of them.

Not all the objectives will be applicable to every agency or programme. Some are appropriate for implementation at a national or local level, whereas others require international cooperation

or are more suitable for implementation by regional or international agencies. Each agency can select the objectives that are considered important for its own programme. The process of selecting relevant objectives can be supported by expert advice from the Pacific Regional Invasive Species Management Support Service (PRISMSS) partner agencies.

This *Guiding Framework* may be used as an aid in planning and designing any invasive species programme, at a local, national, or regional level to ensure that key aspects relevant to any given situation or programme are not over-looked.

The objectives have not been prioritised because priorities and immediate needs will differ in different countries and territories. The *Guiding Framework* is intended to facilitate prioritisation by each country, territory, or agency, rather than to set priorities for them. The process of setting priorities can be supported by expert advice from the PRISMSS partners.

Who is this *Guiding Framework* for?

The *Guiding Framework* serves anyone planning an invasive species programme on islands in the Pacific. This framework provides guidance for island jurisdictions plus international and regional agencies (such as SPREP and SPC). Other users could be staff of national and local government departments (such as those designing NISSAPs, for quarantine, biosecurity, forestry, agriculture, fisheries, water management, and conservation), non-government organisations (NGOs), protected area and conservation managers, plus anyone responsible for invasive species management and research.

IF YOU WORK FOR AN INTERNATIONAL OR REGIONAL AGENCY OR NGO,
use this *Guiding Framework* to help you to:

- identify your niche for invasive species work in the Pacific,
- identify priority needs that require action by your agency, and
- identify other agencies with whom you could or should coordinate your work.

IF YOU WORK FOR A NATIONAL OR LOCAL INSTITUTION,
use this *Guiding Framework* to help you to:

- identify and prioritise areas needing action within your jurisdiction,
- design your invasive species strategy and plan your work programme, and
- determine how to coordinate your work with other countries and regional organisations and benefit from their experience and assistance.

THE INVASIVE SPECIES PROBLEM

‘Invasive species’ (often called pests such as weeds) can be any species taken beyond their natural range, usually by people, deliberately or unintentionally. When they establish themselves in the new locality, invasive species become destructive to native biodiversity and the natural environment and/or human interests.

Pacific islands are particularly vulnerable to invasive species because of their isolation and relatively recent human occupation. Vulnerable sites and ecosystems for the Pacific islands include their near-shore marine communities. Pacific island species and communities have not evolved to cope with the impacts of invasive predators, herbivores, insects, weeds, and diseases. They are therefore particularly vulnerable to the establishment of invasive species populations and to the subsequent damage. Invasive species are considered “the most significant driver of population declines and species extinctions in island ecosystems worldwide”^{1,2}. They may cause extensive economic loss and compromise human health^{3,4,5}. All these impacts are exacerbated for small island states because they often have limited human, material, and financial resources available to prevent and respond to such threats. The scenario above is further exacerbated by the accelerating impacts of climate change on the Pacific Ocean and its islands. These factors combine to raise the risks of incursions by invasive species and, when invasions occur, amplify their impacts.

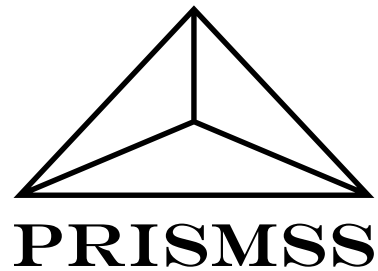
By tackling invasive species and biosecurity, countries can make progress towards meeting the 2030 Sustainable Development Goals and the global targets under the Convention on Biological Diversity, as well as other national and intergovernmental targets under a range of frameworks and multilateral agreements.

The movement of plants, animals, and other organisms beyond their natural range is increasing sharply. Species are effectively transported by increased trade and travel. Many species that are introduced to new places by people do not cause problems in their new locations, and many have considerable benefits for economies, including in agriculture, horticulture, and forestry. However, invasive species are those that become established and proliferate in ways that threaten biodiversity, natural resources, food security, economic development, human health, and ecosystem services such as water resources, nutrient cycles, erosion, and fire regimes.

Types of invasive species include vertebrate animals (such as rats, goats, cats, mongooses, myna birds, fish, and so on), invertebrate pests (such as snails, slugs, nematode worms, mosquitos, beetles, and other invertebrates), weedy plants (such as trees, vines, shrubs, grasses, and seaweeds), and pathogens (such as fungi, bacteria, and viruses that cause plant, animal, or human diseases). They affect agriculture, aquaculture, fisheries, forestry, and tourism, reduce land values, damage buildings, obstruct waterways, disrupt trade and transportation, and cause or transmit diseases of humans, animals, and crops. Environmental changes caused by human activities can sometimes result in a native species becoming invasive. Sometimes these ‘native invasive species’ must be managed.

BOX 1 Pacific Regional Invasive Species Management Support Service (PRISMSS)

The PRISMSS is a coordinating mechanism designed to scale up operational management of invasive species in the Pacific to restore island resilience. PRISMSS was launched in November 2019 with support from the Global Environment Facility and the Government of New Zealand. PRISMSS is supported by seven partner agencies who contribute their expertise to provide support and coordinate their activities within the Pacific region with a focus on protection of indigenous biodiversity and ecosystem function. The intent is to provide a comprehensive suite of support services in a cohesive, effective, efficient, and accessible manner to Pacific island countries and territories. The goal is to reduce the ecological and socio-economic impact of invasive species on ecosystems through the management or eradication of prioritised species and the protection of valued sites.



PRISMSS currently provides technical support across the following five regional programmes for the Pacific region:



Protect Our Islands
POI



Predator Free Pacific
PFP



War On Weeds
WOW



Natural Enemies
Natural Solutions
NENS



Resilient Ecosystems
Resilient Communities
RERC

PRISMSS assists Pacific island countries and territories by:

- providing advice to foster on-the-ground management actions, including the development of new projects;
- helping to lead the adoption and the development of best practice and innovation in the region;
- sharing technical information as far as practical for publication or training materials;
- providing training, coaching, and project-planning support for project execution; and
- providing donors with customised and successful options.

The founding PRISMSS Partners are (in alphabetical order):



FOR MORE INFORMATION CONTACT prismss@sprep.org

VIDEO The PRISMSS Services in the Pacific (<https://youtu.be/dniOWQtLReU>)

Rationale and History of this *Guiding Framework*

Invasive species are an international, cross-cutting problem. Thus, their efficient and effective management requires a comprehensive and integrated approach with coordinated action by national and territorial governments, the private sector, local communities, and regional agencies. To facilitate this approach, SPREP has been mandated by its member countries to develop strategies and guidance since the late 1990s. The approach to creating these strategies and guidance has evolved and now includes input from the PRISMSS, territory and country partners. The previous version of the *Guidelines for Invasive Species Management in the Pacific* was endorsed by the Meetings of SPREP and SPC. This revision of the *Guiding Framework* aligns with the plant protection systems and processes run by SPC and the current and future invasive species and biosecurity-related projects and programmes run by SPREP, SPC, and other PRISMSS partners (see Box 1).

The Guidelines were initially produced at the request of the Pacific countries and territories that are members of SPC and SPREP. This framework is intended to help them address the serious problem of invasive species, one of the major threats to livelihoods and biodiversity across the region, to which small island states and territories are especially vulnerable. This second version of the *Guiding Framework* has been endorsed by the 30th meeting of SPREP Council Meeting in September 2023 and the SPC Heads of Agriculture and Forestry in TBD.

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SCOPE, PRINCIPLES AND RELATIONSHIPS

This document addresses invasive plants, animals, diseases, and other organisms in marine, freshwater, and terrestrial environments plus their economic and social impacts. The reader is referred to the [2009 edition of the Guidelines](#) for an account of the origins of the present edition. It takes the nine main themes identified in the 2009 *Guidelines* and uses the same logical structure, founded on the following principles:

- Ecologically and culturally important sites should be managed for multiple invasive species to reduce their impact and avoid losing further biodiversity and ecosystem function.
- Not all introduced species are invasive so work should be prioritised to deal first with those currently causing, or with potential to cause, the most harm.
- To maximise effectiveness and value for money, invasive species risk assessment, prioritisation, and management must be based on the best available scientific knowledge.
- Climate change is likely to increase the vulnerability of island ecosystems to new invasions and/or increase the chances of existing non-native (or even native) species becoming invasive.
- The ‘precautionary principle’⁶ (with respect to invasive species and biosecurity, being willing to take immediate steps to avoid, control or remove a threat even in the absence of complete scientific and technical knowledge) has been integrated into Conference of Parties decisions in the Convention for Biodiversity Conservation and the Cartagena Protocol on Biosafety (2000), and should be applied to the management of introduced species. Where scientific knowledge is insufficient to assess accurately either the risk of a species becoming invasive or its present or future impact, it should be assumed that negative impacts will occur, and action should be taken to prevent the species from spreading or becoming established.
- A hierarchical approach to managing invasive species and the biosecurity of sites should be adopted as follows (see also Figure 1)⁷:
 1. Prevention is more effective and cheaper than management or eradication of established invasive species, so exclusion of invasive species using accepted biosecurity protocols and border control is the first line of defence.
 2. If an incursion occurs, then [Early Detection and Rapid Response](#) protocols are necessary to prevent the invasive species becoming established and a threat to natural or human values.
 3. Eradication is more effective and cheaper in the long term than permanent or long-term control of a pest population, so eradication should be considered where feasible.
 4. Species that cannot feasibly be eradicated or controlled over an acceptable period (in terms of the risks to natural values from the invasive species) using chemical and/or physical methods should be considered candidates for biological control.
 5. Species that cannot feasibly be eradicated or controlled biologically, especially species whose value to people prevents the use of biocontrol, should be contained within delimited areas where feasible to stop them becoming a threat to natural or human values outside that site.
 6. Permanent control of an established pest population using chemical and/or physical methods should normally be considered the last-resort approach, where eradication, biological control, and containment are all deemed not feasible with available resources or technical ability.

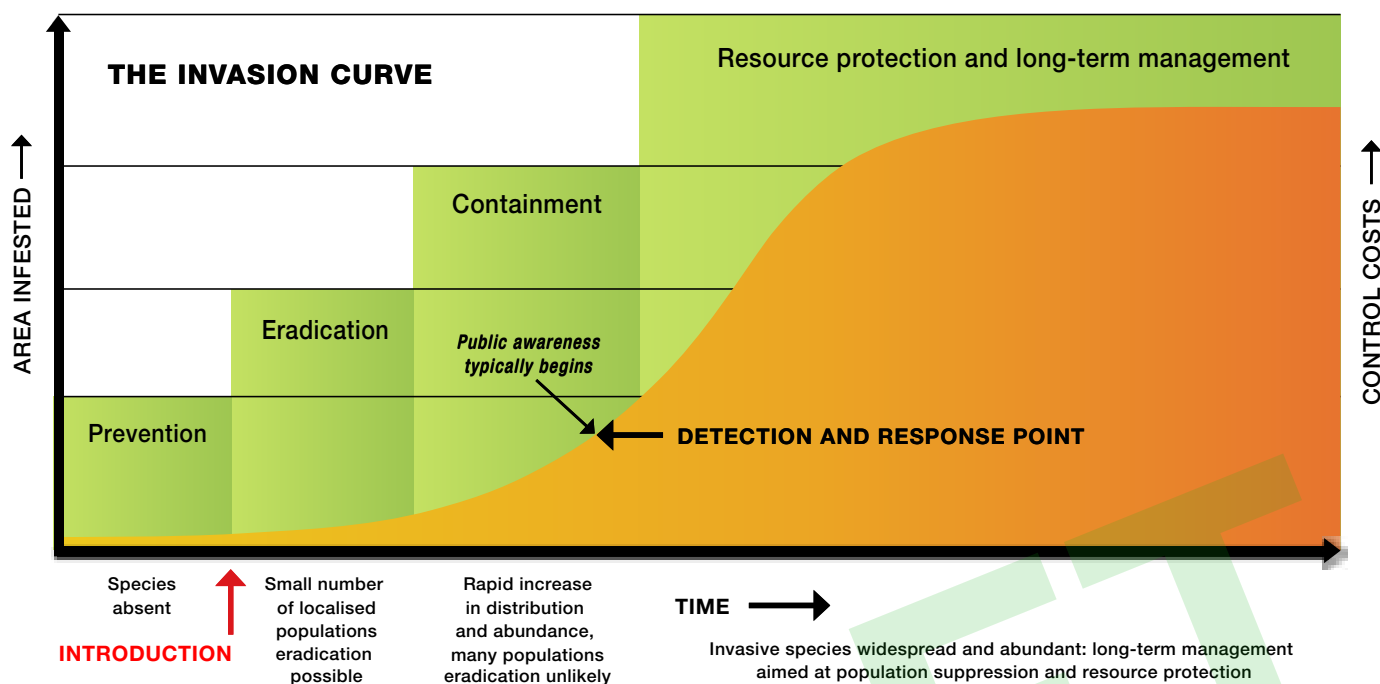


FIGURE 1: Simulated invasion curve and structuring the management of Invasive Species⁷

This *Guiding Framework* provides a comprehensive framework for invasive species management in the Pacific for the foreseeable future. Therefore, they do not have a defined lifespan because the nine thematic areas and their objectives are required permanently for the management of an invasive species threat. The efficacy of this *Guiding Framework* (along with country and territory NISSAPs) will be monitored and evaluated using tools including the [Pacific Islands Pest List](#) and the [Pacific Invasive Species Indicators Survey Database](#) (managed by SPC and SPREP respectively).

This *Guiding Framework* is designed to be compatible with relevant international, regional, and national conventions, protocols, and strategies and to coordinate their application where appropriate. Some of the most important global instruments covering invasive species issues include the Convention on Biological Diversity and its Cartagena Protocol on Biosafety, the International Plant Protection Convention, the International Convention for Control and Management of Ships' Ballast Water and Sediments, and the World Trade Organisation Sanitary and Phytosanitary Measures Agreement. Relevant regional strategies include the [Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025](#), the [Framework for Pacific Regionalism](#) (2014), and the regional strategy on [Shipping-Related Introduced Marine Pests in the Pacific Islands](#) (SRIMP-PAC 2005). Relevant national strategies include National Biodiversity Strategies and Action Plans (NBSAPs) under the Convention on Biological Diversity, National Invasive Species Strategic Action Plans, National Biosafety Frameworks, National Adaptation Plans (under the United Nations Framework Convention on Climate Change), and National Development Strategies.

GOAL

To enable Pacific Island countries and territories to plan and implement effective management of invasive species and biosecurity and in so doing minimise the negative impacts of invasive species on their native biodiversity, ecosystems, economies, and public health.

This *Guiding Framework* is intended to:

- establish a comprehensive framework for all invasive species and biosecurity work in the Pacific;
- address all aspects of and demonstrate how to prioritise work on invasive species and biosecurity;
- increase action and improve implementation;
- increase efficiency and cooperation, while reducing duplication; and
- guide the work of international and regional agencies, the focus of donor funding, and the development of country/territory programmes and financing

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THEMATIC AREAS

Foundations

- A1. Generating Support and Changed Behaviour** — Raising awareness of and concern about the impacts of invasive species on biodiversity, the economy, livelihoods, human health, and socio-cultural values and mobilising support for action to manage and reduce impacts.
- A2. Building Capacity** — Developing institutions, skills, infrastructure, technical support, information management, linkages, networks, and exchanges required to effectively manage invasive species and biosecurity.
- A3. Legislation, Regulation, Policy, and Protocols** — Ensuring that appropriate legislation, regulations, policies, protocols, and procedures are in place and operating, to underpin the effective management of invasive species.

Problem Definition, Prioritisation, and Decision-making

- B1. Baseline, Monitoring, and Evaluating Change** — Establishing a baseline of information on the present status and distribution of invasive species in the Pacific and a programme for detecting change, including the establishment of new high-risk invasive species, range changes, and emerging impacts due to existing and/or new invasive species.
- B2. Prioritisation** — Establishing and implementing effective systems for assessing risk and prioritising biosecurity and invasive species for prevention, management, and planning.
- B3. Research on Priorities** — Understanding priority invasive species including species biology, impacts, and vectors, and developing effective management techniques.

Management Action

- C1. Biosecurity** — Preventing the spread of invasive species across international or internal borders.
- C2. Management of Established Invasive Species** — Reducing or eliminating the impacts of established invasive species, by eradication, containment, exclusion, or population reduction through physical, chemical, or biological control.
- C3. Restoration** — Supporting site-led management to restore ecological function by reducing the impacts of invasive species to a predetermined state whereby natural assets and values are secured.

BOX 2 Invasive Species Battler Resource Base

The Resource Base is a searchable online technical resource available to all involved in their battle against invasive species and those working in biosecurity. It houses the latest version of the *Guiding Framework* and the Pacific Invasive Battler Series, which covers a wide range of issues common to the Pacific countries and territories. The website acts as a portal for access to technical reports, educational materials, and support services provided by PRISMSS member agencies and others.



The Invasive Species Battler Resource Base is regularly updated with the latest publications and news relating to invasive species and biosecurity relevant to the Pacific islands and beyond. The Battler Resource Base acts as a 'one-stop-shop' for all, with many of its resources also available in French.

FOR MORE INFORMATION <https://brb.sprep.org>



Participants knowledge sharing at the Regional Data Mobilisation Workshop 2022.



FOUNDATIONS

A1 GENERATING SUPPORT AND CHANGED BEHAVIOUR

Raise awareness and concern about the impacts of invasive species on biodiversity, economies, livelihoods, human health, and socio-cultural values and how these are compounded with climate change. Mobilise support for action and changed behaviour which will manage and reduce these impacts.

JUSTIFICATION

Decision-makers, the private sector, and the general public have limited understanding of the threats posed by invasive species to the natural environment, economies, human health, and cultural values. It is not well understood how the potential impacts of climate change may be exacerbated by invasive species. Similarly, it is not well understood how climate change may aggravate the impacts of invasive species. Invasive species management must compete for funding with many other demands for resources. Lack of awareness, support, and funding are key constraints limiting the effectiveness of invasive species management in the Pacific. Active public engagement, state-of-the-art methods, and adequate financial investment are critical to successful invasive species management. There is a need to increase support for this work, develop shared responsibility and best practices, and foster individual efforts and voluntary compliance.

AIM

All components of society and its administration (such as environment, agriculture, fisheries, health, and transport sectors) are aware and concerned about the threats posed by invasive species and the importance of biosecurity. The benefits of preventing new invasive species incursions and the control or eradication of existing ones are recognised and supported, with sufficient resources allocated to address all national and regional priorities. Best practices and attitudes involving biosecurity and invasive species prevail in administrations, the private sector, and public sector, with recognition of the increased threat from climate change.

Invasive species awareness raising programmes conducted at primary education.



OBJECTIVE A1.1

Develop awareness-raising programmes and materials for key regional, national, sectoral, and community target groups, including curriculum development for the education sector and materials addressing the relationship between invasive species and climate change.

SPECIFIC OBJECTIVES

- A1.1.a** Identify priority audiences for awareness programmes.
- A1.1.b** Collate baseline surveys which assess awareness including the effectiveness of relevant programmes and carry out further surveys when necessary.
- A1.1.c** Identify priority messages and understandable, convincing approaches for raising awareness and concern with different target groups.
- A1.1.d** Incorporate invasive species issues into existing public awareness programmes where practicable.
- A1.1.e** Incorporate information about invasive species into primary, secondary, tertiary, and adult or outreach education.
- A1.1.f** Develop regional awareness-raising resources including the mechanisms for information collection, compilation and dissemination that can be customised for implementation in specific countries or territories.



Invasive species awareness raising programmes conducted at primary education.

OBJECTIVE A1.2

Gain national support by mainstreaming invasive species and biosecurity issues with national and regional decision-makers.

SPECIFIC OBJECTIVES

- A1.2.a** Demonstrate the potential economic and climate change-related costs of invasive species in the region and the necessity of adequately financing effective biosecurity and rapid-response plans.
- A1.2.b** Demonstrate the economic and climate change-related costs of existing invasive species threats in the region and the economic benefits of financing action to combat invasive species.
- A1.2.c** Publicise success stories in invasive species prevention and management.
- A1.2.d** Advocate for and facilitate the inclusion of invasive species and biosecurity issues in high-level regional and national meetings.
- A1.2.e** Develop mechanisms to ensure invasive species management and biosecurity are included in national and regional decision-making processes on trade and transport, economic development, and land-use planning.
- A1.2.f** Develop mechanisms (including legislation/policies/regulations) that incorporate early detection and rapid response to new incursions of invasive species. These mechanisms should be included in national and regional disaster management planning and funding.



Shallow rooted Albizia causing blockage to river ways affecting infrastructure in Samoa during Cyclone Evan.

OBJECTIVE A1.3

Identify and develop long-term external and domestic funding mechanisms for the support of invasive species management and biosecurity in Pacific island countries and territories.

SPECIFIC OBJECTIVES

- A1.3.a** Use this *Guiding Framework* and any relevant Action Plans (such as NISSAPs) to identify priority actions to justify funding from donors and in-country agencies.



Director of Niue Department of Environment receives the Niue Battler Vehicle funded through the GEF 6 Regional Invasives Project

OBJECTIVE A1.4

Secure support for invasive species and biosecurity issues among local communities.

SPECIFIC OBJECTIVES

- A1.4.a** Ensure long-term local commitment and sustainability by promoting full participation of local communities and jurisdictions in all aspects of invasive species management, including collection of information, awareness-raising, identification and ranking of priorities, biosecurity and prevention of the introduction and spread of invasive species, and project development, management, implementation, and evaluation.
- A1.4.b** Encourage priority projects which have been identified by processes involving full community participation.

BOX 3 Including people in invasive species management

Working with communities to understand their values, perspectives, and perceptions is foundational to the long-term sustainability of environmental management. Although all people are affected by species invasions, the scale and the perceptions of such impacts are uneven and the burden of negative impacts may be borne disproportionately by those most vulnerable.



Apolima Island community consultation.

Inclusion matters for invasive species management. Some groups have less involvement in decision-making for environmental management, although they may have unique knowledge and deep connections to specific environments and species through their daily activities, interests, and expert work. Specific efforts to incorporate diverse knowledge-holders in management planning and action can provide benefits in terms of efficiency, sustainability, and effectiveness.

Among other factors, gender influences people's natural resource management experiences, concerns, and opportunities. Gender relations influence how habitats are managed and used across time.

Taking on multiple perspectives in invasive species management is helpful when assessing problems, creating and implementing solutions, and monitoring and evaluating outcomes. Social perspectives have direct bearing on invasive species management measures, perhaps most obviously for those species that may be invasive but are also valued for food, medicinal preparations, art, and other uses.

Incorporating diverse perspectives can improve understanding of the impacts, increase the effectiveness of invasive species prevention and management, and contribute to social equality.

Local contexts can and should influence program design and implementation. Inclusive approaches may include creating spaces for interactions with diverse community members and providing opportunities for adjustment of management action in response.

Research conducted within the PRISMSS coordinating mechanism (Box 1) is contributing to a greater understanding of societal perceptions and needs for invasive species management. In 2022–2023, surveys were conducted with households in Samoa, Tonga, and Niue. These surveys are part of an effort to develop a Pacific Protocol for countries to incorporate gender equity and social inclusivity within invasive species management programmes.

FOR MORE INFORMATION

WORKSHOP RECORDING

[Invasive Species or Community Resilience](#)
(May 2023)

VIDEOS

[Creature Feature | Why Gender and Social Inclusion is crucial for managing Invasive Species](#)

[Out and About | Women and Men working in Environmental Conservation in the Pacific](#)

A2 BUILDING CAPACITY

Develop the institutions, skills, infrastructure, technical support, information management, linkages, networks, and collegial exchanges required to manage invasive species and biosecurity effectively.

JUSTIFICATION

The ability to manage invasive species in the Pacific depends on competent national and regional institutional structures as well as ready access to adequate infrastructure, equipment, skills, and accurate, up-to-date information. Compared to the scale of the problem, there is a serious lack of trained personnel, strategic planning, infrastructure and equipment, and technical, taxonomic, and information to support managing invasive species and biosecurity in the Pacific. Invasive species workers are often isolated from colleagues in other agencies and countries and from the information and skills necessary to plan and achieve their management objectives. Much information on the biology, impacts, and control of invasive species is in unpublished local reports or is not even recorded. Training, ongoing expert advice, information services, networking, and skill sharing are thus of paramount importance to achieve the most effective management of invasive species in the region.

AIM

Key agencies collaborate and have sufficient, adequately trained staff. Communities have the capacity to participate fully in invasive species management. Sufficient infrastructure and equipment for effective biosecurity and invasive species management are available. Sufficient identification services exist which are efficiently linked to end-users. Information on invasive species biology, impacts, and management is readily available throughout the Pacific. These resources and services are available through a centralised mechanism and partnership of agencies such as the PRISMSS, whose main purpose is to ensure effective and efficient invasive species and biosecurity activities in the Pacific (see Box 1: 'Pacific Regional Invasive Species Management Support Service').



Completion of PRISMSS Programme management course 2019.

OBJECTIVE A2.1

Establish and maintain competent regional support and coordination for invasive species and biosecurity management in Pacific Island countries and territories.

SPECIFIC OBJECTIVES

- A2.1.a** Maintain the Pacific Invasives Partnership under the auspices of the [Pacific Islands Roundtable for Nature Conservation](#) as a permanent regional invasive species and biosecurity cooperative body assisting with coordination (such as of NISSAPs) and other services alongside the PRISMSS partnership (see Box 1).
- A2.1.b** Maintain the PRISMSS systems and processes for monitoring progress reducing the invasive species problem and improving biosecurity in countries and territories, including the associated online technical resource base.
- A2.1.c** Establish and maintain an adequate coordination and collaboration mechanism and support service, including key regional agencies such as the PRISMSS partnership.
- A2.1.d** Review and strengthen staffing expertise in invasive species and biosecurity in key regional agencies belonging to the PRISMSS and other relevant agencies.
- A2.1.e** Establish and promote regional and sub-regional cooperative initiatives for invasive species management and biosecurity (such as the Micronesia Invasive Species Council, Micronesia Challenge, PILN, and the Pacific Plant Protection Officer network).
- A2.1.f** Establish and maintain regional online, centralised technical resources (such as those compiled by the PRISMSS/SPREP). An example is the [Pacific Invasive Species Battler Series](#) (see Box 2).



Seventh PRISMSS Partners Meeting, held in 2023 in Apia, Samoa.

OBJECTIVE A2.2

Strengthen and maintain competent national and territorial institutions and staff, to coordinate and manage invasive species and biosecurity programmes and to promote full participation, including local communities.

SPECIFIC OBJECTIVES

- A2.2.a** Establish and maintain national and territorial invasive species committees (such as NISSAP committees), with multi-agency representation and focal points, with mechanisms to link the committees with senior decision-makers and community representatives.
- A2.2.b** Develop guidelines describing key skill areas, responsibilities, and resources that should be represented in or made available from regional agencies (such as SPREP and SPC) to the main invasive species management agencies in countries and territories.
- A2.2.c** Establish and support NISSAP and biocontrol coordinators in all Pacific island countries and territories whose work is integrated with the PRISMSS and, where possible, other relevant regional programmes.
- A2.2.d** Establish scientific training opportunities for Pacific Islanders with the aim of developing a regional network of Pacific Island experts capable of providing expert support to tackling invasive species and biosecurity threats.

OBJECTIVE A2.3

Promote existing training programmes and develop new ones to cover all aspects of invasive species management and biosecurity processes, from planning and fundraising to implementation and dissemination of lessons learnt.

SPECIFIC OBJECTIVES

- A2.3.a** Periodically compile and review training that has been delivered in recent years and identify important gaps and target groups for ongoing capacity development.
- A2.3.b** Produce guidelines for a range of training methods and content for different target groups, including formal courses, participation in demonstration projects, etc.
- A2.3.c** Design and implement a regional invasive species and biosecurity training plan which includes periodic repeat courses to train new recruits as well as post-training capacity development.

OBJECTIVE A2.4

Develop and upgrade regional and national facilities for invasive species management and biosecurity.

SPECIFIC OBJECTIVES

- A2.4.a** Review regional and national invasive species management and biosecurity facilities and produce long-term development and operational plans for them.
- A2.4.b** Strengthen regional and national (including inter-island) facilities, such as inspection and quarantine stations and rapid response centres.
- A2.4.c** Develop and promote links to regional and international institutions providing facilities and services which are otherwise unavailable within individual countries and territories (such as biocontrol or rapid-response support).



Storage facilities in Tonga.

OBJECTIVE A2.5

Develop regional and national taxonomic support for invasive species management.

SPECIFIC OBJECTIVES

- A2.5.a** Support development of and access to web-based/on-line image recognition systems including support from reputable institutions and their collections held by reputable institutions, such as [Landcare Research New Zealand Ltd](#), and consultative services provided by specialist taxonomists and databases, such as the Global Biodiversity Information Facility.



BOX 4 Pacific Invasives Learning Network (PILN)

The Pacific Invasives Learning Network (PILN) was launched in 2006. PILN runs an email information and linkage service for all invasive species workers in the Pacific, which anyone can join by writing to piln@sprep.org. In addition to providing a professional network for invasive species workers, PILN carries out activities with individual countries and territories in the region. PILN promotes and assists with the formation of national invasive species committees or teams, with each team having a comprehensive membership of all agencies with responsibility for any aspect of invasive species management in their country or territory. PILN also manages an exchange and training scheme, to assist Pacific invasive species workers to gain skills and experience at training workshops or by exchange visits to related projects managed by colleagues in other islands. PILN acts as a linkage to other regional invasive species services that can be provided by NGOs and similar agencies, including the PRISMSS, which can assist with project design, monitoring, and evaluation as well as provide training, professional expertise, and a range of tools for invasive species management.

FOR MORE INFORMATION

www.sprep.org/piln



▲ PILN meeting, Mo'orea, French Polynesia, 2007.



▲ PILN meeting, 2016, Salepaga, Samoa.

OBJECTIVE A2.6

Develop regional information resources on invasive species, including Internet-based information systems, which are easily accessible both within and outside the region.

SPECIFIC OBJECTIVES

- A2.6.a** Establish and maintain a regional database of invasive species projects, including technical information, objectives, results, outcomes, and lessons learnt (such as the work facilitated through the PRISMSS and the SPREP Pacific Invasive Species Battler Series).
- A2.6.b** Support the further development and maintenance of global information resources, such as the [Global Invasive Species Database \(GISD\)](#), [Global Register of Introduced and Invasive Species](#), [Pacific Biodiversity Information Facility \(PBIF\)](#) and [Global Biodiversity Information Facility \(GBIF\)](#), as key repositories of global invasive species information useful for the Pacific.
- A2.6.c** Develop and maintain regional information resources, such as the [Pacific Biodiversity Information Facility \(PBIF\)](#), the [Pacific Pest List Database](#), and the SPREP [Battler Resource Base](#) as services for information circulation and supply.
- A2.6.d** Encourage and facilitate the input of Pacific information to regional and international information resources, such as GBIF, PBIF, and GISD.
- A2.6.e** Maintain current technical information on common pesticides used in the Pacific region available through repositories such as the SPREP Invasive Species Battler Series and the [Pesticide Regulatory Forum and associated Pesticide Registration Scheme](#) (supported by SPC).

PACIFIC INVASIVE SPECIES BATTLER SERIES

The Battler series provides the latest information on invasive species issues, case studies, and introductory guides on common invasive species issues for the Pacific region. There are currently 16 English language how-to guides for practical action, available on the Battler Resource Base.



OBJECTIVE A2.7

Strengthen and maintain networks of expertise, resources, linkages meetings, workshops, and exchanges between countries, territories, scientific or technical institutions, and other sources of technical and research assistance that facilitate communication, cooperation, and information-sharing between invasive species and biosecurity workers.

SPECIFIC OBJECTIVES

A2.7.a Support and strengthen global, regional, and sub-regional invasive species and biosecurity networks, exchanges, and skill-sharing mechanisms, such as the [PRISMSS](#) (Box 1), [PILN](#) (see Box 4), [Pestnet](#) and the [Pacific Invasive Ant Toolkit](#).



2016 PILN Meeting, Saleapaga, Samoa.

A3 LEGISLATION, REGULATIONS, POLICY, AND PROTOCOLS

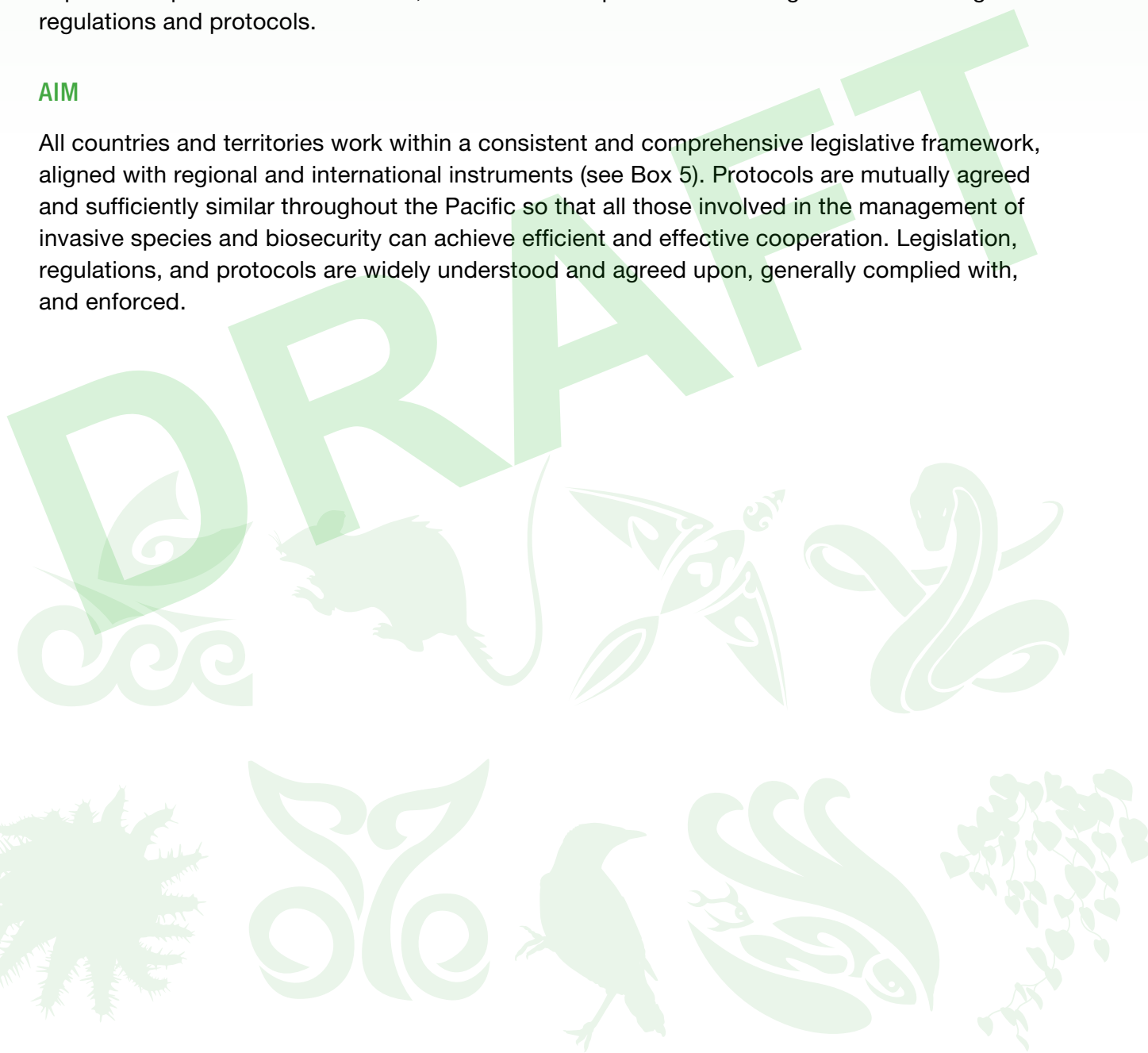
Ensure that appropriate legislation, regulations, policies, protocols, and procedures are in place and operating, to underpin the effective management of invasive species.

JUSTIFICATION

Invasive species have economic, environmental, social, and cultural impacts, so their management can involve many different agencies working towards implementing different pieces of legislation, policy, and regulations. To work effectively and efficiently, these components need to be clear, comprehensive, consistent, and coupled with strong enforcement. Meeting these demands requires inter-agency cooperation. In many countries and territories, the requisite legislation, policies, and regulations already exist and now need improved implementation. In others, more work is required to create legislation and design regulations and protocols.

AIM

All countries and territories work within a consistent and comprehensive legislative framework, aligned with regional and international instruments (see Box 5). Protocols are mutually agreed and sufficiently similar throughout the Pacific so that all those involved in the management of invasive species and biosecurity can achieve efficient and effective cooperation. Legislation, regulations, and protocols are widely understood and agreed upon, generally complied with, and enforced.



BOX 5 Managing invasive species to meet international agreements

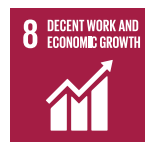
Managing the threat from invasive species is relevant to most aspects of sustainable development in the Pacific islands and hence the United Nations [2030 Agenda for Sustainable Development](#). Specifically, removing or managing invasive species can [contribute directly or indirectly](#) to 10 of the UN Sustainable Development Goals and 42 of the associated targets. If one accepts that the main driver of island ecosystem degradation is invasive species⁸, then the reduction or eradication of invasive species is one of the most directly beneficial actions towards achieving the Sustainable Development Goals in Small Island Developing States.

Invasive species influence progress towards many of the SDGs in Small Island Developing States (most relevant SDGs and related Targets noted below).

- **Invasive species have direct socio-economic impacts.** For example, red imported fire ants (*Solenopsis invicta* Buren) [could cause damage](#) amounting to over USD 329 million per year or approximately 0.7% of the combined Gross Domestic Product of the Pacific islands and territories. **SDG 1, 2, 3, 6, 8, 14 and 15. Most Targets.**
- **Invasive species negatively impact food security** in the Pacific islands through weed invasion of crops, transmission of animal and plant diseases, consumption by pests, and contamination and spoilage of harvest. Invasive rats, for example, have been a major constraint on agricultural production in the Pacific for many decades and continue to [represent a major source of lost food production](#) for local communities. **SDG 2, Target 2.4.**
- **Invasive species impact fisheries through competition, predation, and disease transmission.** Invasive species may change the entire near-shore marine environment – structurally and biologically – leading to the collapse of fisheries and marine communities and further endangering individual species. Some invasive algal species may pose a threat to human health by contaminating seafood. **SDG 14, Target 14.2.**
- **Invasive species cause human disease** through the transmission of pathogens such as rats transmitting Leptospirosis, scrub Typhus, Toxoplasmosis, Cryptosporidium, and rat lung worm. **SDG 3, Target 3.3.**

Progress towards other UN-based and allied agreements is also affected by invasive species, as are global initiatives including the [UN Decade on Ecosystem Restoration](#) (2021 to 2030).

SUSTAINABLE
DEVELOPMENT
GOALS



The UN Framework Convention on Climate Change (UNFCCC) and associated Paris Agreement of 2016 recognises that the effects of invasive species [may be exacerbated](#) by climate change, particularly in Small Island Developing States [such as the Pacific islands](#). Resilience and adaptation to climate change (implemented via National Adaptation Plans) can be supported by preventing the introduction of and managing the threats posed by invasive species. See Box 8 for more information.

The UN [Convention on Biological Diversity](#) (CBD) recognises invasive species as a “cross-cutting” issue (affecting all aspects of the conservation of biological diversity). The global Aichi Biodiversity Target 9 specifically addressing invasive species was not met by its 2020 deadline. That said, the Pacific islands region was highlighted for its management of invasive species in the CBD’s fifth [Global Biodiversity Outlook](#). The report states only six targets were partially achieved by the 2020 deadline, one being Target 9 on Invasive Species. The Pacific region was noted for its contribution to increased eradication of invasive alien species and awareness, evidenced by the successful collaboration with local communities in the development of a Pacific-wide strategy to combat invasive alien species. The Kunming–Montreal Global Biodiversity Framework agreed in 2022 urges the global community to act on the threat of invasive species, particularly in priority sites such as islands. Pacific delegates were instrumental in ensuring a global focus on priority sites within [Target 6](#). See: <https://www.cbd.int/invasive/>

Under the CBD, the [Cartagena Protocol on Biosafety](#) is a legally binding global protocol that seeks to contribute to ensuring the safe transfer, handling and use of living modified organisms (LMOs) created through modern biotechnology. Potential applications of genetic manipulations to help control invasive species raise new questions for regulators, particularly considering transboundary movements of genetically modified organisms. It will be important to take the lessons learned from the Cartagena Protocol Guidance on Risk Assessment of LMOs into account.¹

The Small Island Developing States Accelerated Modalities of Action (SAMOA Pathway) was adopted by the UN General Assembly in 2014. Initiatives such as this Guiding Framework, PRISMSS, and the Battler Resource Base directly address key references to invasive species in the [UNGA 2014 Outcome Document](#).

The [Pacific Islands Framework for Nature Conservation and Protected Areas 2021 to 2025](#) includes at least two objectives relevant to invasive species: restoring ecosystems, habitats and priority natural and cultural sites (objective 3) and managing and reducing threats to Pacific environments and drivers of biodiversity loss (objective 5).

¹ See: Mitchell HJ, Bartsch D. 2020. Regulation of GM organisms for invasive species control. *Frontiers in Bioengineering and Biotechnology* 7:00454. <https://doi.org/10.3389/fbioe.2019.00454>



OBJECTIVE A3.1

Develop, promote, and adopt effective and comprehensive guidelines for legislation, regulations, and policy to support island countries and territories in the Pacific region.

SPECIFIC OBJECTIVES

- A3.1.a** Review environmental legislation, regulations, and policies relating to fisheries, agriculture, aquaculture, forestry, horticulture, and biosecurity in each Pacific Island country and territory to determine their adequacy for protecting biodiversity, ecosystems, economies, and human/animal health against invasive species.
- A3.1.b** Develop, disseminate, and adopt practical legislative, regulation, and policy guidelines covering all activities that affect invasive species management and biosecurity, including export-import trade, transport, construction, military activities, emergency response, development/aid assistance, research, aquaculture, horticulture, agriculture, tourism, surveillance, risk analysis, biocontrol, eradication, declaration of noxious pests, and so on, using this *Guiding Framework* and other internationally accepted standards (such as CBD Guiding Principles and standards under the Global Strategy for Plant Conservation, International Plant Protection Convention, International Maritime Organisation Ballast Water Convention, and Cartagena Protocol).
- A3.1.c** Ensure the full participation by all stakeholders, including local communities, in the design and implementation of legislation, regulations, and policies.
- A3.1.d** Incorporate economic principles into national legislation for addressing invasive species and biosecurity including appropriate taxes, the user-pays principle, and public investment when invasive species and biosecurity management yields public benefits.
- A3.1.e** Develop mechanisms to improve compliance with and enforcement of invasive species and biosecurity legislation, regulations, and policies.

OBJECTIVE A3.2

Develop and promote robust policies and effective, standardised protocols, strategies, and action plans which are underwritten by legislation and comply with relevant international requirements for invasive species management in the region – all based on the best available scientific information and management principles.

SPECIFIC OBJECTIVES

- A3.2.a** Periodically conduct comprehensive reviews of existing national and regional policies and best practice with a view to upgrading them in the light of new knowledge.
- A3.2.b** Develop model technical protocols and procedures for the Pacific, enabling countries and territories to use best practice in developing or improving their internal procedures.

OBJECTIVE A3.3

Ensure full Pacific participation in the development of international standards, conventions, and programmes that govern or affect invasive species and biosecurity issues.

SPECIFIC OBJECTIVES

- A3.3.a** Promote membership of and contributions to international conventions and protocols, committees, and working groups by Pacific Island countries, territories, and agencies.
- A3.3.b** As far as practicable, ensure that national and regional contributions by Pacific countries and territories to international policy-making are consistent and based on full consultation of all concerned sectors.

OBJECTIVE A3.4

Develop national invasive species strategies and action plans.

SPECIFIC OBJECTIVES

- A3.4.a** Develop national invasive species strategy and action plans that supplement NBSAPs, using sound planning methods and this *Guiding Framework*, in a fully consultative process including all levels from national government to local communities.
- A3.4.b** Incorporate economic principles into national invasive species and biosecurity strategies, including public investment when invasive species management provide public benefits and the user-pays principle where benefits apply specifically to certain sectors.
- A3.4.c** Develop national invasive species action plans to systematically address specific problems identified in national strategies, such as strategies for priority species, pathways, and vectors or vulnerable sites and ecosystems.



Tonga Prime Minister and Members of Cabinet during the launch of the *National Invasive Species Strategy and Action Plan (NISSAP) 2021–2027*.

PROBLEM DEFINITION, PRIORITISATION, AND DECISION-MAKING

B1 BASELINE, MONITORING, AND EVALUATING CHANGE

Establish a baseline of information on the present status and distribution of invasive species in the Pacific and a programme for detecting change, including the establishment of new high-risk invasive species, range changes, and emerging impacts due to existing and/or new invasive species.

JUSTIFICATION

Lack of information on the status and distribution of invasive species and potentially invasive species (and hence on the biosecurity risk they present) in the region hampers their management. Information on the status and distribution of invasive species and of native biodiversity is essential for monitoring the movement and impacts of invasive species, prioritising species for management, planning effective management projects, and evaluating their success. Monitoring is also essential for detecting trends and emerging threats, such as the effects of climate change on invasive species. Effective management is supported by accessible compilations of information such as the [Threatened Island Biodiversity Database](#).

AIM

Knowledge of the status and distribution of invasive species and native biodiversity in the region is comprehensive and readily available to all throughout the region for assisting in setting priorities and planning effective management. Efficient systems are in place for monitoring the movement of invasive species within and between countries and islands and for monitoring the outcomes of interventions.

OBJECTIVE B1.1

Generate, update, and make available status and distribution information and checklists of invasive and native species for all Pacific Island countries and territories.

SPECIFIC OBJECTIVES

- B1.1.a** Periodically review existing species information (such as status and distribution) and checklists, identify gaps (focusing on ecosystems, countries, or taxonomic groups), and plan priority surveys.
- B1.1.b** Carry out priority surveys and compile status and distribution information resources, including checklists and geographic information systems.
- B1.1.c** Publish available information locally and online, including in the resources listed under A2.7 above.

OBJECTIVE B1.2

Design and promote a series of standard techniques for monitoring the spread of invasive species within islands.

SPECIFIC OBJECTIVES

- B1.2.a** Identify priority, high-risk species for immediate monitoring in each country and territory.
- B1.2.b** Design and promote a series of standard techniques for monitoring the spread of high-risk invasive species within islands, in sensitive natural areas, and at other vulnerable high-value sites.
- B1.2.c** Design and implement individual monitoring plans for high-risk invasive species and publish results locally and online.

B2 PRIORITISATION

Establish and implement effective systems for assessing risk and prioritising biosecurity and invasive species for prevention, management, and planning.

JUSTIFICATION

Most countries and territories contain large and increasing numbers of species introduced from other places by people, either deliberately or accidentally. Some of these species are known to have serious impacts, while others do not, and many are valuable crops, ornamentals, or other valued resources. Perhaps the largest group is species that are not yet causing problems in a given country but which may become invasive in the future, including recently introduced species. Risk and pathway analysis has three main functions: (1) to determine which species among the total of introduced species already present in a country may become future serious problems, (2) to determine whether to permit or refuse the introduction of a new species into a country, territory, or island, and (3) to identify and assess the importance of pathways for the introduction of known pests.

AIM

Country and regional planners are able to determine invasive species risks as objectively as possible, using effective decision tools to prioritise management action. Resources are dedicated to the species causing the most damage or posing the greatest risks.

OBJECTIVE B2.1

Design, develop, and implement simple and effective invasive species risk assessment and prioritisation systems and processes throughout the Pacific.

SPECIFIC OBJECTIVES

- B2.1.a** Design and promote model risk assessment systems for all invasive taxa, which can be applied to both import control decision-making and to planning the management of established invasive species.
- B2.1.b** Develop databases of key invasive species which can be imported into standardised risk-assessment systems and adapted for use in different island jurisdictions.
- B2.1.c** Apply effective species and pathway risk assessment to both import control decision-making and to planning established invasive species management in all countries and territories.

BOX 6 Pacific plant protection officers support integrated pest management

The Pacific Plant Protection Organization (PPPO) is a Regional Plant Protection Organisations recognised by the [International Plant Protection Convention](#) and exists to provide advice on phytosanitary measures in order to facilitate trade without jeopardizing the plant health status of the importing Members and countries.

The PPPO has the responsibility of coordinating harmonization of phytosanitary measures and fostering co-operation in plant protection and other phytosanitary matters among and between Members and countries and organisations outside the Pacific region. The PPPO also acts for the members in developing contacts with and, where appropriate, providing input into other global and regional organisations that have authority in such matters.

In particular, PPPO officers work to:

- ensure that the views and concerns of Pacific members are adequately taken into account in the development and implementation of a global phytosanitary measure;
- assist in the development and implementation of effective and justified phytosanitary measures;
- provide a framework for regional and global cooperation in phytosanitary matters consistent with international principles for trade in plants and plant products;
- facilitate the flow of information among Members and with other regional plant protection organizations; and
- collaborate with the SPC Plant Protection Service on specific issues including pesticides and integrated pest management.

The PPPO was founded in October 1994. The Biosecurity & Trade Support unit of the Land Resources Division of the Pacific Community (SPC-LRD) is the Secretariat of PPPO and administers its affairs.

FOR MORE INFORMATION

<https://www.ippc.int/en/external-cooperation/regional-plant-protection-organizations/pacificplantprotectionorganisation/>



B3 RESEARCH ON PRIORITIES

Improve understanding of invasive species and why they are a priority, including their ecology, impacts, vectors, and developing effective management, eradication, or biocontrol techniques.

JUSTIFICATION

Prioritisation identifies species for immediate management action and may also identify species for which further research is needed to better define priorities such as possible impacts. Effective invasive species management requires an understanding of the target species' ecology and population dynamics. Effective techniques for managing a species may not exist and will then need to be developed. Acquiring the necessary knowledge for effective management thus requires species-focused research. Research is also required to improve management practice, based on better evaluation of management outcomes.

AIM

Invasive species managers have access to the technical information necessary for designing effective management projects for priority invasive species.

OBJECTIVE B3.1

Carry out research on the impacts, ecology, biology, and control of high-priority invasive species.

SPECIFIC OBJECTIVES

- B3.1.a** Develop regional and national invasive species research plans based on an objective priority-setting system.
- B3.1.b** Investigate the environmental, economic, and other impacts of invasive species which are unconfirmed but suspected to be serious.
- B3.1.c** Investigate the ecology, biology, and population dynamics of priority invasive species.
- B3.1.d** Review current knowledge of management techniques for high-priority invasive species and develop improved effective techniques where necessary.
- B3.1.e** Develop best-practice procedures for prevention, eradication, control, and restoration projects including cost-benefit analyses of using various options tackling invasive species and biosecurity practices.

MANAGEMENT ACTION

C1 BIOSECURITY

Prevent the spread of invasive species across international or internal borders.

JUSTIFICATION

Preventing the passage of unwanted species across borders is the most cost-effective way of managing or controlling the threat they pose. Costs per potential invasive species are lower for prevention than for management or eradication of established invasive species. Prevention avoids risking the potential impacts of an invasive species, whereas management or control is usually implemented only after impacts have occurred. Prevention works by identifying pathways and establishing four barriers: (1) Pre-export controls and regulations which aim to prevent the export of known pests from places where they are established to other islands, (2) Pre-border controls and regulations regulating importation to an island or country, (3) At-border controls which aim to prevent the arrival of species on-island, and (4) Post-border early detection and rapid response (including immediate eradication) which aims to eliminate newly arrived pests before they can spread far beyond the point of arrival. An effective biosecurity system must include all these four elements. Rapid response is cheaper soon after an arrival is detected, when the invaders are more likely to be fewer and confined to a manageable area. Costs rise (often exponentially) as action is delayed and the invader spreads. 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 of new species into islands which may become invasive and to detect and manage unauthorised or accidental introductions of new species across borders.



Border biosecurity detector dogs in French Polynesia.

OBJECTIVE C1.1

Pre-export control. Continually 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 and known high-risk pathways, such as container hygiene systems.
- C1.1.b** Review and identify problems with export inspection procedures directed at specific priority invasive species and their pathways.
- C1.1.c** Develop and implement adequate export controls that prevent 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 vectors between countries and within a country.

SPECIFIC OBJECTIVES

- C1.2.a** Establish and implement national and internal (such as inter-island) risk and impact assessment for proposed deliberate movements of species and for the movement of materials or other vectors that may accidentally carry invasive species.
- C1.2.b** Facilitate a common regional approach to decision-making on proposed introductions, including how to categorise species as (1) low-risk, (2) minimally restricted “permitted” species, (3) moderate-risk “restricted” species, (4) high-risk “prohibited” species, and (5) the automatic prohibition of any organism or product or vector not included on the permitted or restricted lists.
- C1.2.c** Undertake pathway analyses between countries and within countries which identify means by which invasive species may enter a country or move between islands or areas within a country and identify how these high-risk pathways may be cost-effectively managed.

OBJECTIVE C1.3

At-border control. Establish and maintain effective quarantine, detection, transport, and border-control systems, such as at national borders and between islands within countries or territories.

SPECIFIC OBJECTIVES

- C1.3.a** Review existing border controls, transport controls, and quarantine systems to identify gaps in country or pathway coverage (such as movement of ships, planes, people, other organisms, and goods) and technical or resource constraints.
- C1.3.b** Develop and implement adequate border controls and terrestrial and marine quarantine detection and control systems throughout the Pacific.
- C1.3.c** Develop domestic biosecurity Standard Operating Procedures for high-risk priority invasive species.

OBJECTIVE C1.4

Post-border rapid response. Establish and maintain effective monitoring systems to detect movement between countries, territories, and archipelagos and to detect incursions of invasive species early on at entry points, such as ports, and trigger rapid responses to detected incursions.

SPECIFIC OBJECTIVES

- C1.4.a** Review existing port and border surveillance, delimitation 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 standard techniques.
- C1.4.c** Develop a regional information resource 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 with evaluations which are shared.
- C1.4.e** Develop and maintain regional Standard Operating Procedures for surveillance and response for regional priority high-risk species that can be implemented by countries.

C2 MANAGEMENT OF ESTABLISHED INVASIVE SPECIES

Reduce or eliminate the impacts of established invasive species by eradication, containment, exclusion, or population reduction through physical, chemical, or biological control.

JUSTIFICATION

For management of invasive species that are established in a country or island, a hierarchical approach to choosing the optimal management goal is adopted: (1) Eradication (complete removal of the species from an island), if feasible, is the preferred goal because the management cost is minimal after eradication is achieved, although continued surveillance and other biosecurity measures are required to ensure that re-invasion does not occur; (2) If assessment shows that eradication is not feasible with available resources, then biological control should be considered because, if successful, it also requires minimal further investment; (3) Species that cannot feasibly be eradicated or controlled biologically, especially species whose value to people prevents the use of biocontrol, should be contained within delimited areas or excluded from important areas where feasible; and (4) Permanent control of an established pest by chemical or physical methods requires permanent investment and therefore should be considered the last resort. To ensure value for investment, all management projects should monitor operational effectiveness (success in achieving pest control) and outcomes (success in protecting biodiversity or other values) and disseminate results to allow improved future management practice.

AIM

Impacts of established invasive species are reduced to prescribed levels or eliminated by means of effective eradication, biocontrol, containment/exclusion, or chemical-physical control.



OBJECTIVE C2.1

Develop and implement decision tools to assist in choice of management goal and technique.

SPECIFIC OBJECTIVES

C2.1.a Design and adopt decision tools for management planning throughout the region to assist in the selection of management goals based on the feasibility and costs of different management options and to ensure the efficient and most effective use of limited resources.

OBJECTIVE C2.2

Design and implement effective management programmes appropriate for each species and situation using accepted best practices and scientific and technical knowledge.

SPECIFIC OBJECTIVES

C2.2.a Design all management projects to best-practice standards based on the latest technical and scientific information and with full participation of all stakeholders. The projects should include high standards of monitoring results and evaluating success.

C2.2.b Design and implement eradication projects for species in situations where eradication is determined to be feasible following a formal study and assessment.

C2.2.c Design and implement effective biological control projects for species which have been formally assessed as high-priority species, especially widely distributed species that are difficult to manage by other means.

C2.2.d Design and implement containment or exclusion projects for species in appropriate situations, including containment of species that may be of value but potentially invasive (such as crop species) and exclusion of priority invasive species from sites of exceptional conservation value.

BOX 7 Measuring progress in invasive species management

Taking stock of our progress is an important part of managing invasive species. Identifying what is needed, what is working well, and what needs more support helps direct resources efficiently and effectively.

Monitoring can be broken down into (1) monitoring of invasive species and their impacts and (2) monitoring of the management actions taken. [Section B](#) of the regional *Guiding Framework* addresses the first type, gathering information on the present status and distribution of invasive species. As noted in [Section C](#), to ensure value for investment, all management projects should monitor operational effectiveness (success in achieving pest control) and outcomes (success in protecting biodiversity or other values) and disseminate results to allow improved future management practice.

The Pacific Invasive Species Indicators are used for annual update and reporting in the thematic areas of the regional *Guiding Framework*. Data for the indicators are collated by SPREP in partnership with national invasive species coordinators. This information is used to monitor the status and progress of invasive species management and consequently to identify gaps and inform on priority needs for technical assistance.

For a summary of the state of achievement among the three thematic areas of the *Guiding Framework*, see [Figure 19.1](#) in the [State of Environment and Conservation in the Pacific Islands](#) (SOEC 2020).

Pacific Leaders have endorsed regional indicators for reporting every five years, first assessed in the [SOEC 2020](#). Two of these indicators ([Indicators 19 and 20](#)) are specific to invasive species, assessing the share of identified priority invasive species eradicated from defined areas or under formal management and the number of priority sites with multi-invasive taxa management programmes.

Regional action should also be reflected in global reporting. The [global goals and targets](#) under the Convention on Biological Diversity, to which all Pacific island countries are Party, set out the international biodiversity agenda towards 2030 and 2050. [Target 6](#) focuses on invasive species:

Eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by identifying and managing pathways of the introduction of alien species, preventing the introduction and establishment of priority invasive alien species, reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50 percent, by 2030, eradicating or controlling invasive alien species especially in priority sites, such as islands.

A monitoring framework for the CBD targets is under development at the time of writing in 2023. Although the world failed to meet the previous target, Aichi Target 9, the Pacific islands region was highlighted for its management of invasive species (see Box 5).

C3 RESTORATION

Support site-led management to restore ecological function by reducing the impacts of invasive species to a predetermined state whereby natural assets and values are secured. Restoration may include the re-introduction of indigenous species that have become locally extinct or to improve habitat structure or function.

JUSTIFICATION

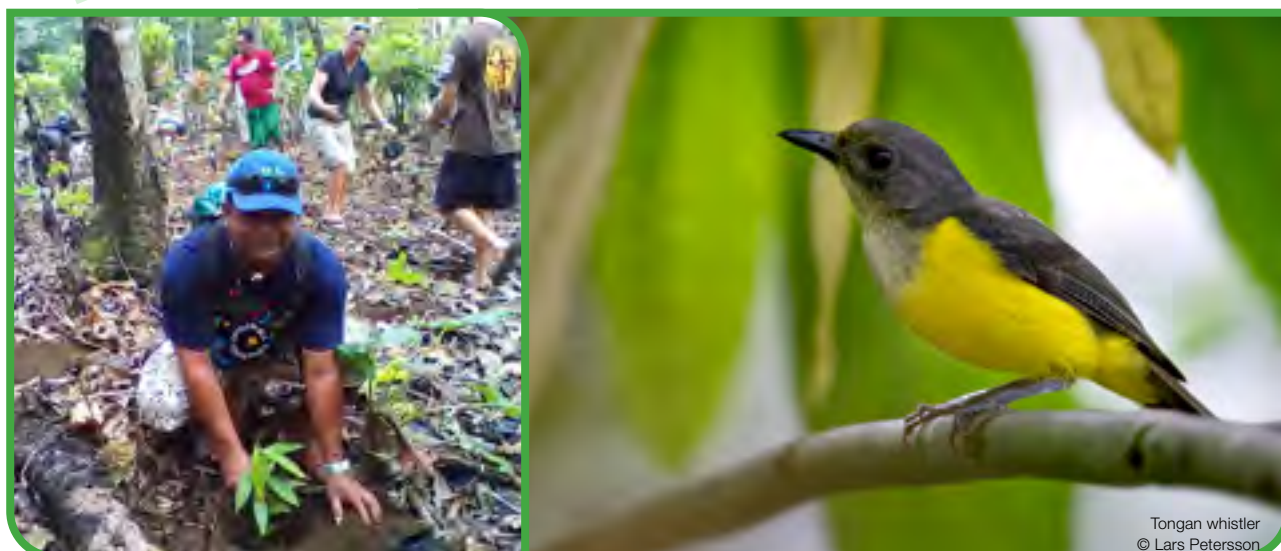
Threatened species and ecosystems often exist within high-value areas on large islands where invasive species cannot be removed from the whole island and so will continue to be a threat. A site-led approach to manage multiple invasive species and to re-introduce lost native species and ecosystem structure over a longer period is the last remaining option to restore and maintain these ecosystems. Site-based action can be used to control multiple invasive species to support the natural regenerative processes of native ecosystems, with the goal of restoring structure and function. Although invasive species will continue to be a problem outside of the selected intensively managed site, the high-priority site and the threatened species within will benefit from holistic management. Such holistic management might include the re-introduction of species that have vanished from the site. The need for management of restoration sites is ongoing; therefore, restoration usually requires the ongoing support of local communities or interest groups.

Some of the reasons for restoration include:

- maintaining or restoring the ecological function of a high-value area,
- securing key habitats for endangered or high-value indigenous species,
- improving the productivity and resilience of ecosystems and ecosystem services (such as to climate change and/or extreme weather events), and
- improving ecosystem integrity in areas that are important to human communities.

AIM

Ecological function is restored and maintained in valued natural areas through managing invasive species. Indigenous species that are missing and were previously found in a managed area may be re-introduced.



Community replanting activities and reintroduction of the rare Tongan whistler after years of restoring Mt Talau forest.

BOX 8 Compounding effects of climate change and invasive species

Climate change may predispose ecosystems to the successful establishment of invasive species and/or aggravate the impacts of established invasive species. Examples are becoming more abundant:

- Long-term temperature changes can alter the distribution of species, as the distribution of their suitable habitat changes. Invasive species are more likely to tolerate a wide range of environments.
- More frequent extreme weather events, such as cyclones with their high winds and flooding, have increased the ecological opportunity for invasive species to expand their range and/or extent of impact. This expansion or impact may arise because invasive species, such as weeds, are often faster than native plants to colonise the new space opened up by an extreme weather event. Invasive rat species have also capitalised on ecological opportunities created after a cyclone, increasing the level of associated harm after the cyclone. High winds and flooding may directly disperse invasive species and allow them to subsequently expand their negative impacts. Communities recovering from an extreme event may also have fewer resources to direct towards invasive species management.
- Climate change may also cause increases in average temperature and aridity that promote the establishment or dominance of invasive species. For example, some weeds may increase the fire fuel load in an ecosystem, increasing the likelihood of more frequent and/or intense fires which in turn further exposes the ecosystem to more invasive species.

Generally, because invasive species impact ecosystem services (such as the services provided by a water catchment), any impact will be exacerbated by increasing numbers of invasive species.

Invasive species are clearly a major threat to native biodiversity and ecosystems as well as their accompanying ecosystem services.

In turn, the management or eradication of invasive species will increase that ecosystem's health and resilience to climate change. Both mitigation and adaptation initiatives can be supported by invasive species management because of the positive impacts on native biodiversity and forest systems when invasive species are controlled.

FOR MORE INFORMATION

[*Build resilient ecosystems and communities by managing invasive species in high-priority sites*](#)

VIDEO

[Managing Invasive Species to Create a Great Green Line of Defence for the Pacific](#)

WORKSHOP RECORDINGS

[Regional weeds prioritisation workshop, Session 3: Considering climate change implications](#) (December 2022)

[CBD COP15: Managing invasive species for a resilient Pacific panel event](#) (December 2022)

[UNFCCC COP 27 Summary: Panel discussion on Restoring Island Resilience](#) (November 2022)

OBJECTIVE C3.1

Design and implement site and habitat-based restoration projects with accepted design standards for projects which require tools including invasive species management.

SPECIFIC OBJECTIVES

- C3.1.a** Use standard protocols and methodology for restoration projects of sites and habitats using invasive species management (with reference to resources such as the Pacific Invasive Species Battler Series), including outcome monitoring over appropriate periods relevant to the project objectives and/or the health of the restored site or habitat.
- C3.1.b** Systematically identify and use, if required, other tools (such as the re-introduction of threatened species, replanting, or catchment stabilisation) to achieve restoration at sites or habitats, in addition to invasive species management alongside relevant monitoring and evaluation.
- C3.2.a** Design and implement effective projects for the management of invasive species at formally identified priority sites which may be invaded by a variety of introduced species.



PhD student engaging with communities to better understand local perspectives towards invasive species to inform management protocols in the Pacific.



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