

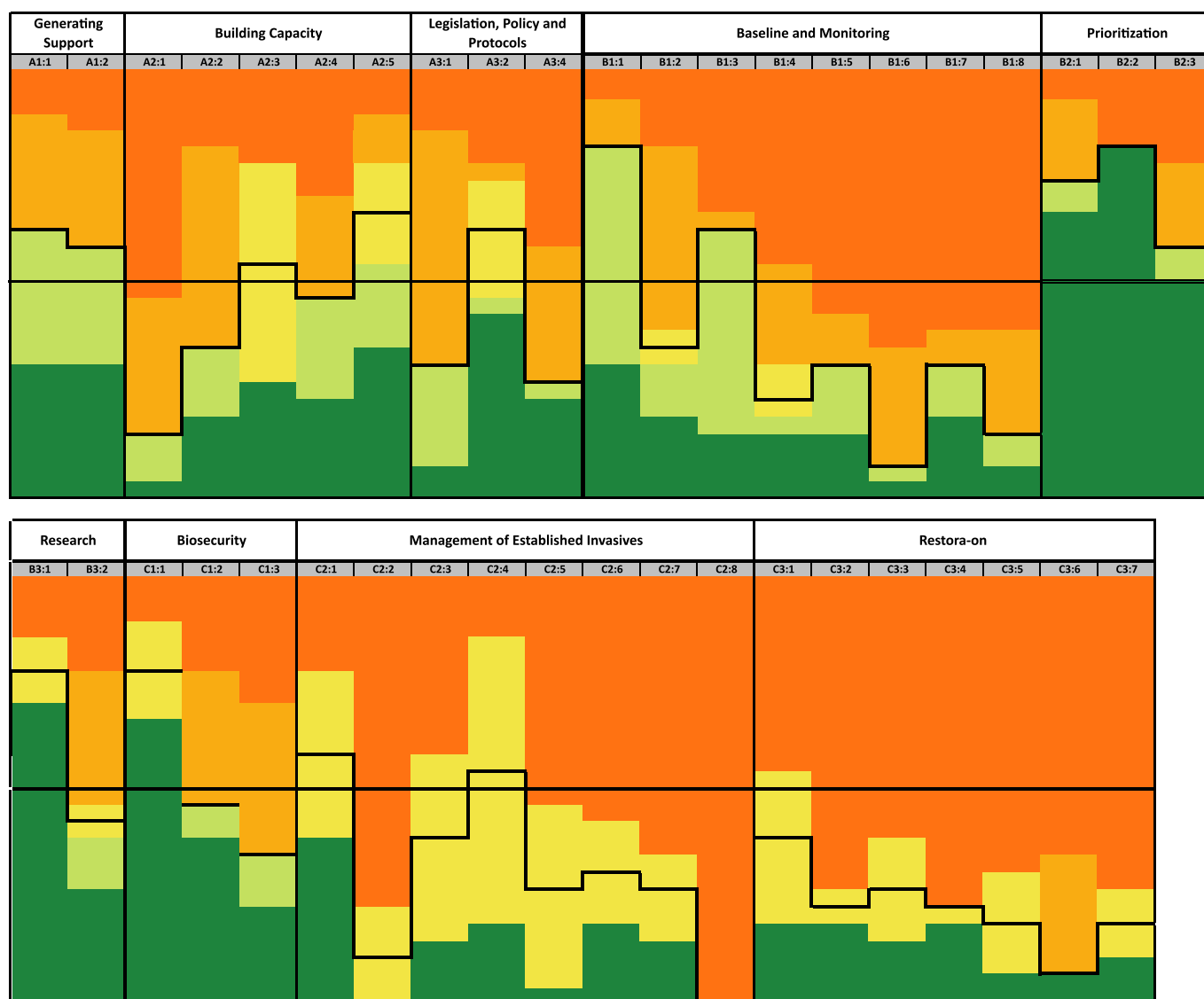
Invasive species are the primary cause of extinction on islands (IUCN Red List 2020, SPREP 2016, SOCO 2017). Invasive species have been formally identified as a threat for 1,531 species in the Pacific islands region to date (IUCN Red List, 2020).

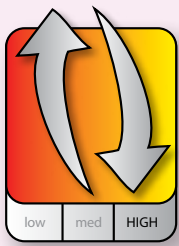
Pacific leaders have established two core regional indicators for invasive species management. Efforts for invasive management are ongoing in almost all Pacific island countries and territories.

Invasive species management is recognised globally and is increasingly being used in Oceania to protect native biodiversity, natural resources, food security, economic development, human health, and ecosystem services, such as water resources, nutrient cycles, and regulated erosion and fire regimes.

Invasive species can be terrestrial, aquatic, or marine-based. The spread of invasive species can be facilitated by increasing trade, travel, and the transport of goods through the movement of, for example, ships, containers, cars, and soil. For more about threats to Pacific species, please see Regional Indicator: [IUCN Red List Summary](#).

**FIGURE 19.1: Progress toward the regional objectives, classified by achievement and divided among the three thematic areas of the Guidelines for Invasive Species Management in the Pacific (2009).** All data are for 2019 with the following exceptions: Commonwealth of the Northern Mariana Islands (2018), Palau (2018), Phoenix Islands (Kiribati) (2018), Pohnpei (Federated States of Micronesia) (2017). The horizontal line represents 50%. Thick black lines represent the median for that particular objective. If the thick line is above the median, that means the region is over halfway to success for that objective indicator. Green to red: achieved to not achieved.



**Status**

Poor to fair

**Trend**

Mixed

**Data confidence**

High

Lantana (*Lantana camara*). © Posa Skelton**PRESENT STATUS**

We focus on the concept of placing invasive species under formal management. It is difficult to quantify all invasive species within a country, let alone a site, because the exact number of invasive species is subject to rapid change without being easily identified as new incursions arrive, possibly daily. The percentage of new arrivals (if known) would most likely always be greater than the number of species that could be declared eradicated in any one year. The best measure may be the percentage of *identified priority* species under management or eradicated relative to the number of priority species.

Countries have made efforts to define priority species in their NISSAP, although priorities might shift rapidly and might differ among sites within a country.

The status of the region's invasive species management and eradication was deemed *poor to fair*, with the majority of Pacific islands having specific laws and action plans for invasive species management. About half of the Pacific island countries and territories have a specific National Invasive Species Strategy and Action Plan or equivalent, although many of these plans extended only to 2020.

The overall trend in the extent of invasive species management and eradication is considered to be *mixed*. Management measures are improving but the risk of invasive species is growing with increasing travel and movement of goods alongside co-occurring environmental pressures that reduce the capacity of native species to compete with invasive species. The situation with regard to invasive species in some countries

is deteriorating regardless of further invasive species arriving.

The availability and quality of data was scored *high*, with growing efforts toward baseline and monitoring (see Figure 19.1). Data regarding the number of species and eradications are available from the Global Biodiversity Information Facility, the Global Invasive Species Database and the Database of Island Invasive Species Eradication (for vertebrate eradications). Information regarding policies and management actions are available from the Battler Resource Base of the Pacific Invasive Learning Network.

Regionally, at the start of 2020, there are:

- 116 priority invasive plant species management programmes
- 8 priority invasive plants species management programmes that resulted in eradication
- 67 occasions where biocontrol is being used to reduce invasive plant species impact
- 78 programmes where priority invasive animals are being managed
- 25 priority invasive animal programmes that resulted in eradication
- 85 occasions of eradicating a species of rat from an island
- 16 priority marine invasive management programmes
- 0 eradications of priority marine invasive species.

Managers have completed 183 vertebrate eradications involving 49 species on 134 islands in Oceania, including Australia and New Zealand.

Source: Database of Island Invasive Species Eradication

## Priority sites with invasive species managed



### Status

Poor

### Trend

Deteriorating

### Data confidence

Medium



Tava (*Pometia pinnata*) seedlings (regeneration). © Josef Pisi

**DEFINITION** Number of priority sites with multi-invasive taxa management programmes

**PURPOSE** Indicates the effectiveness of invasive species management in protecting ecologically valuable sites/protected areas

**DESIRED OUTCOME** All sites or positive trend in the number of priority sites where invasive species are managed

## PRESENT STATUS

The status of the region's prioritization of sites for invasive species management is *poor*. Prioritisation of specific sites varies from designated planting sites without invasive species management *per se* to priority sites with defined action plans and allocated resources. The roughly 5,000 hectares with plant or predator control cover a small fraction of the Pacific region.

The majority of Pacific islands have established national priorities (see Figure 19.1), and about half of the countries and territories have a National Invasive Species Strategy and Action Plan or equivalent, although many of these plans extended only to 2020. Establishing baselines and regular, sustainable monitoring programmes for these priority sites requires long-term support.

Not all Pacific priority sites currently address multiple taxa in direct management, but the management plans directly address multiple species and many are working towards managing multiple taxa. In terms of impacts, priority sites already address multiple taxa because the management of one invasive species, such as a rat species, has far-ranging benefits for the surrounding habitats as well as for other species, such as plants and birds.

## PRESSURES AND OPPORTUNITIES

The presence of an invasive species management plan alone is not a complete measure of the risk or of the success of management actions. The policy efforts Pacific leaders have made require sustained national and regional support for the implementation of the national action plans and institutionalisation of core invasive species management roles.

Tropical conditions are amenable to a wide range of potentially invasive species, requiring constant vigilance, partnerships with host and destination countries, and resourcing of biosecurity measures.

The strong reliance on imported goods, with large-volume container trade, makes the islands susceptible to continued re-introduction of pest species. For this reason, ports and shipyards are a standard high-priority site for biosecurity and invasive species management.

The geographic remoteness of some Pacific islands is beneficial for the successful eradication of invasive species but also increases the cost and difficulty of long-term management measures.

The costs of invasive species management are lower than the costs to replace damaged infrastructure or ecosystem services. Control of the populations of introduced invasive species often costs less than engineering-based solutions to restrict their spread or impacts (ISAC 2016).

As part of the new PRISMSS initiative, the SPREP Invasive Species and PIPAP teams will be working to identify existing and most urgent areas of overlap between protected areas and priority sites for invasive species management. These efforts will build on existing invasive species management in the region, with information collected regularly (see Annex E for an example of the questionnaire).

## CRITICAL CONNECTIONS

Invasive species can directly and indirectly threaten the health and abundance of native species. By eating seeds, eggs, and animals that would distribute native species, invasive species change the habitats, sounds, and appearance of our islands. Invasive species threaten protected areas, on land and at sea.

The presence of invasive rats has been linked to nearshore water quality and reef communities, including fish (Graham et al. 2018). Lagoon water quality relies on well-managed native forests, both upland and coastal.

Invasive species management helps to build climate resilience. For islands, invasive species management should be considered as one of the most important tools in programmes supporting adaptation and response. Assessment of success should also involve tracking national and project budgets (see Regional Indicator: [Environment Ministry budget allocation](#)).

Invasive species can be introduced to new sites on floating plastic debris and place an extra burden on waste management systems.

## ERADICATING INVASIVES SAVES NATIVE SPECIES

The ko'ko', Guam Rail *Hypotaenidia owstoni*, is the second bird in history to recover from being declared extinct in the wild (IUCN Red List 2019). The accidental introduction of the brown tree snake (*Boiga irregularis*), which became invasive, devastated the populations of this small bird and changed the forests of Guam. With fewer birds, spiders became more abundant. Without birds to spread seeds, native plants and trees declined.

At the brink of extinction with only 21 individuals left in 1987, the ko'ko' were saved with the extreme measure of a captive breeding programme and 35 years of careful management. There is now a small population of ko'ko' established on Cocos Island, which remains free of brown tree snakes. With the invasive snakes still threatening mainland Guam, the rail population is still classified as Critically Endangered and may remain so unless the brown tree snake is eradicated.

Source: BirdLife and IUCN Red List 2019

Guam Rail © Andersen Air Force



## REGIONAL RESPONSE RECOMMENDATIONS

Regional support is essential for a Pacific response to invasive species. Effective biosecurity combined with early detection and rapid response can substantially reduce the risk, and costs, of new invasions. The Pacific Regional Invasive Species Management Support Service (PRISMSS) is a coordinating regional mechanism to scale up invasive species management.

The management of species that have already arrived is key for the survival of Pacific species in fragile, small environments. Sustainability of invasive species management requires human capacity and resources for the targeted work, including the engagement of staff, decision-makers, and communities.

In addition to long-term monitoring of the defined indicators, key needs include training to increase the technical capacity of local staff, transportation of experts and materials throughout the large region, and technological capacity, including tools and compounds used for management.

The status of and effective management measures for marine invasive species is a significant data gap for the Pacific islands region, as it is globally. The 2017 entry into force of the Ballast Water Management Convention requires vessel

retrofitting and adoption of safe ballast water practices to avoid transporting marine invasive species.

Acting regionally supports the critical need to:

- Measure and monitor the presence and impacts of invasive species, with attention to filling knowledge gaps on the results of the defined management actions and the socioeconomic impacts of invasive species;
- Plan to prevent movement of invasive species into and among the islands;
- Enforce protection of priority sites and species through partnerships with biosecurity, land-use planning, and communities with traditional knowledge and cultural uses of priority sites;
- Restore native species and habitats, with long-term monitoring of cascading impacts and benefits; and
- Partner for biosecurity, knowledge sharing of best practices, and regional resourcing of invasive species management and native habitat restoration.

## INVASIVE SPECIES AFFECT INFRASTRUCTURE, HEALTH, AND ECONOMIES

Tamaligi (*Albizia falcataria*) are prone to wind damage, breaking more easily than native species. Large amounts of broken limbs and trees threaten infrastructure such as power lines, roads, and bridges and may stimulate flooding due to log jams created during extreme rain events (ISAC 2016).

Brown tree snakes (*Boiga irregularis*) have caused thousands of power outages in Guam, costing over USD 4.5 million per year in the 1990s in lost services (without considering repair costs and lost revenues; Fritts 2002). Estimated costs to the Hawaiian economy if the brown tree snake were to invade range from USD 500 million to over 2 billion annually (Schwiff et al. 2010).

Giant African snails (*Achatina fulica*) cause despair on many Pacific plantations and gardens (Stronge 2016). Invasive on all continents, these snails can devastate crops and carry rat lungworm *Anigiostrongylus cantonensis*, which causes eosinophilic meningitis in humans.



Tackling widespread invasives, Niue.  
© Niue Department of Environment

## INDICATOR IN ACTION

SDGs 6.6, 14.c, 15.1, 15.8 · UNCCD · SAMOA Pathway (95) · Noumea Convention ·  
Regional Environment Objectives 2.1, 2.3, 2.4 · Pacific Islands Framework for Nature Conservation Objective 5

## FOR MORE INFORMATION

The SPREP Invasive Species Team supports the Pacific Regional Invasive Species Management Support Service (PRISMSS; [www.sprep.org/invasive-species-management-in-the-pacific/prismss](http://www.sprep.org/invasive-species-management-in-the-pacific/prismss)), Pacific Invasives Learning Network, and the Pacific Invasives Partnership, a working group of the Roundtable for Nature Conservation in the Pacific Islands.

DIISE (2018) The Database of Island Invasive Species Eradications, developed by Island Conservation, Coastal Conservation Action Laboratory UCSC, IUCN SSC Invasive Species Specialist Group, University of Auckland and Landcare Research New Zealand. <http://diise.islandconservation.org>

Fritts TH (2002) Economic costs of electrical system instability and power outages caused by snakes on the Island of Guam. *International Biodeterioration & Biodegradation* 49:93–100. DOI: 10.1016/S0964-8305(01)00108-1

Graham et al. (2018) Seabirds enhance coral reef productivity and functioning in the absence of invasive rats. *Nature* 559:250–253 DOI:10.1038/s41586-018-0202-3

Schwiff SA, Gebhardt K, Kirkpatrick KN, Schwiff SS (2010) Potential economic damage from introduction of brown tree snakes, *Boiga Irregularis* (Reptilia: Colubridae), to the islands of Hawai'i. USDA National Wildlife Research Center - Staff Publications. 967. [https://digitalcommons.unl.edu/icwdm\\_usdanwrc/967](https://digitalcommons.unl.edu/icwdm_usdanwrc/967)

SPREP (2009) Guidelines for invasive species management in the Pacific: a Pacific strategy for managing pests, weeds and other invasive species. Apia, Samoa: Secretariat of the Pacific Regional Environment Programme.

SPREP (2017) Battling invasive species in the Pacific: Outcomes of the regional GEF-PAS IAS Project. Apia, Samoa: SPREP.

Stronge D (2016) Invasive alien species: a threat to sustainable livelihoods in the Pacific? : an assessment of the effects of *Wasmannia auropunctata* (little fire ant) and *Achatina fulica* (giant African snail) on rural livelihoods in the Solomon Islands. PhD dissertation, Massey University, Manawatū, New Zealand.

ISAC (2016) *Invasive species impacts on infrastructure*. Washington, DC: Invasive Species Advisory Committee, US Department of the Interior.

Indicators 19 and 20 of 31 in *State of Environment and Conservation in the Pacific Islands: 2020 Regional Report*



The Secretariat of the Pacific Regional Environment Programme (SPREP) supports 14 countries and 7 territories in the Pacific to better manage the environment. SPREP member countries and members of the Pacific Roundtable on Nature Conservation (PIRT) have contributed valuable input to the production of this indicator. [www.sprep.org](http://www.sprep.org)

National and regional environment datasets supporting the analysis above can be accessed through the Pacific Environment Portal. [pacific-data.sprep.org](http://pacific-data.sprep.org)

For protected areas information, please see the Pacific Islands Protected Area Portal. [pipap.sprep.org](http://pipap.sprep.org)