Factsheet

Invasive Species

The Pacific is biologically unique, as its isolated islands provide ideal conditions for the evolution of new species. Thus, Pacific islands have high numbers of "endemic" species - species that are restricted to only one or a few islands and found nowhere else in the world.

The population of many of these species is naturally very small in the islands, making them extremely vulnerable to disturbance.

While one of the key threats to species and ecosystems globally is land clearing or habitat loss, invasive species often pose an even greater risk for islands.

What is an invasive species?

Some species arrived naturally on islands, such as by flying or floating there, or by being carried as seeds by birds. These are "native" species, and they arrived gradually, over millions of years, after islands emerged from the sea. Rates of arrival of native species are very slow - often in the order of one species every 10,000 years. Since the arrival of humans on Pacific islands, other species have been carried there by people, either deliberately (as food, timber, or ornamentals) or accidentally (such as insect pests). These are "introduced" species, sometimes also called "alien" or "exotic" or "non-native" species. The rate of introduction of introduced species is much faster than the natural rate of arrival of native species - typically more than one species per year, or 10,000 times the natural rate. Many introduced species are useful, and most of them do not cause serious environmental problems. However, some of them get out of control and can cause enormous ecological, economic or health problems. These are called "invasive" species, also known as "pest" species.

Invasive species are usually highly adaptable. They can live in a wide range of environments. They breed fast, spread easily, and quickly become widespread. When they arrive in a new country, they have usually left the diseases and predators that would have kept their numbers under control back in their home country.

Invasive species can come from any group of living things, including plants, rats, mongooses, ants, snails, mosquitoes and disease agents. There are also invasive birds such as mynas, and invasive aquatic species, both freshwater and marine.

Guam and the Brown Tree Snake

A brown tree snake on Guam. Photo: USGS..

Since its accidental introduction in the 1940s, the Brown Tree Snake (*Boiga irregularis*) has caused ecological devastation on Guam, including the extinction of nine of the the island's eleven native bird species and five species of its lizards. There are an estimated 80 million Brown Tree Snakes on Guam today, and by climbing on wires they cause power outages every 4-5 days, damaging electrical infrastructure and household appliances, and resulting in research and control costs totalling over $US 5 million a year. Given Guam's role as a transport hub, there is a great danger of the snake spreading to its major trading partners, many of which are other Pacific islands. The snake may recently have become established on the Northern Mariana Islands, posing an immediate and major danger to the endemic species there.

Effects of invasive species

Invasive species threaten many species with extinction. They interfere with ecosystems and change the way these function. They have negative impacts on the resources people rely on to live - food, clean water, and shelter. They carry diseases and can directly harm humans. They can impact on species we rely on for our livelihoods, such as crops and farm animals. Some of them even damage buildings, bridges and other structures, or can reduce the tourist potential of an area by damaging the environment and other attractions. They obviously can have a great impact on Pacific islanders' traditional activities and modern livelihoods.

A full 90% of all animals that have become extinct since 1800 were island birds, and of these 90% fell victim to invasive species. Many endemic bird species are in trouble in the Pacific, some directly threatened by predators such as rats, cats and mongooses, others threatened indirectly by habitat and food losses caused by invasive trees or vines.

Samoa and Taro Leaf Blight

A dramatic example of the economic impacts of invasives was seen in Samoa in the 1990s, when taro leaf blight, a fungal disease, arrived and decimated taro production, a key part of the Samoan economy. It is estimated to have cost Samoa $US 40 million, more than the impact of three cyclones, to replace domestic consumption, lost exports and the cost of measures to control the disease.

Regardless of where we live, invasive species can impact on us all. Every Pacific country has invasive species that cause problems and is at risk of getting new ones.

How do they arrive and spread?

Some invasives were introduced deliberately by people as food, or for medicinal or other uses, and some are introduced as pets or ornamental plants. A few species, such as mongooses, have been deliberately introduced in attempts to control other invasive pests.

Among the many accidental introductions, plant pests, ants and diseases have been introduced to many islands as contaminants of fruits, vegetables, soil, plants, timber and commercial feed, while others arrive in cargo. Invasives can be carried in cars, on military equipment or used machinery, in personal effects such as hiking boots and camping equipment, or in the ballast water of ships or clinging to ship's hulls.

The rate of accidental introductions is increasing, as there is more movement of people and goods around the region. Quarantine often exists at international borders of countries but not between islands within a country. Increased movement increases the risk of invasion of new islands.

What can we do about them?

1. *Prevention* is the best solution - it is cheaper and usually easier to keep something out than to treat an established pest. It is also more effective at preventing impacts - excluding a pest results in no impacts of it. So exclusion by quarantine is the first line of defence.

2. *Eradication*. However, once a species has reached an island it must be managed. The best option for managing an established invasive species is to eradicate it entirely from an island. This can often be done if the species is detected quickly enough after it arrives, or before it has spread very widely. The advantages of eradication are that it eliminates the impact entirely and management costs are minimal once the pest has been eradicated (only monitoring and quarantine to prevent re-invasion).

3. *Containment* or *exclusion* means preventing the pest from spreading out of or into a defined area. This can be used to keep important (but invasive) crop species from escaping from farmland, or to keep invasives from spreading into nature reserves or other natural areas.

4. *Site-specific control* means keeping the pest's population below a certain level in defined areas, such as reserves or other natural areas.

5. *Biological control* means introducing a natural enemy of the pest, such as a predator or disease of it, to control its population. Poorly planned biocontrol, such as introducing organisms that attack a wide range of prey or hosts, has caused enormous problems on some islands, but properly researched biocontrol, using carefully selected agents that attack only the target species, can sometimes bring serious pests under control without causing additional problems. An advantage of biocontrol is that once established, the control agent often maintains itself, and no further cost is incurred.

SPREP's work on invasives

The Pacific is a leader in using a regional approach to address invasive species. The 2000 Draft Regional Invasive Species Strategy, developed by SPREP at the request of and with the collaboration of its member countries, was the first regional strategy of its kind in the world.

This was updated and revised in 2008 as new *Guidelines for Invasive Species Management in the Pacific* which provides a guide to the activities that need to be implemented regionally and in individual countries and territories, in order to achieve comprehensive and integrated invasive species management throughout the Pacific. It forms the strategy for the Invasive Species Working Group of the Roundtable for Nature Conservation in the Pacific Islands, serving to coordinate action by agencies across the region.

Coordination is a large part of SPREP's role, and SPREP shares with SPC a regional mandate to lead invasive species planning and technical assistance in the Pacific. SPREP is a member of the steering committee of the Pacific Invasives Learning Network (PILN) and the Pacific Invasives Initiative (PII) , and hosts the PILN Coordinator.

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SPREP Factsheet No. IE-002
First Published 2005; revised October 2008.