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What are invasive alien species?

When biologists talk about invasive alien species (or IAS for short), they're not referring to Martians left behind by Unidentified Flying Objects (UFOs). Instead, the invasive alien species they study are actually biological species (such as plants, animals, fungi and bacteria) that spread outside their natural past or present distribution range and threaten biodiversity in these new areas.

Invasive species leading to loss of native species and habitats in Cyprus

Fauna

- *Lagocephalus*
- *Rattus rattus*
- *Capra hircus*

Flora

- *Acacia saligna*
- *Acanthus mollis*

The development of trade, tourism and the transport of goods across borders has accelerated the rate of spread of invasive species.

In many cases, these non-native species adapt poorly to their new surroundings and quickly disappear. In other cases, however, they survive, reproduce and are installed in their new environment. Sometimes, these new arrivals survive so well that they are no longer a biological curiosity but a real threat, causing serious damage not only to ecosystems but also to crops and livestock, disrupting the local ecology, impacting man's health and having serious economic consequences. Non-native species that have such negative effects are known as Invasive Species.

How do invasive alien species spread?

Invasive alien species may be the world's greatest hitchhikers. They find ways to sneak across geographic borders and into new territories. Often, they receive lots of help from humans. Sometimes this help is deliberate, other times it is accidental.

The pathway and the vector that transports invasive alien species are important factors in enabling IAS to arrive and establish themselves in new territories. A pathway is any way that lets IAS enter or spread in a new territory. A vector is any living or non-living thing that transports living organisms, either deliberately or accidentally.

The spread of Lagokefalou (*Lagokefalos sceleratus*) in Cyprus seas



Lagocephalus produces a toxic substance and can cause even death, due to pulmonary insufficiency, to those who consume it. The symptoms are paralysis, stomach pain, diarrhea, vomiting and shortness of breath.

Many fish species have invaded the Mediterranean from the channel Souez and Gibraltar and have spread to the Greek and Cypriot seas



Lagocephalus suezensis



Lagocephalus scleratus

Stephanolepis diaspros



Sphoeroides pachygaster

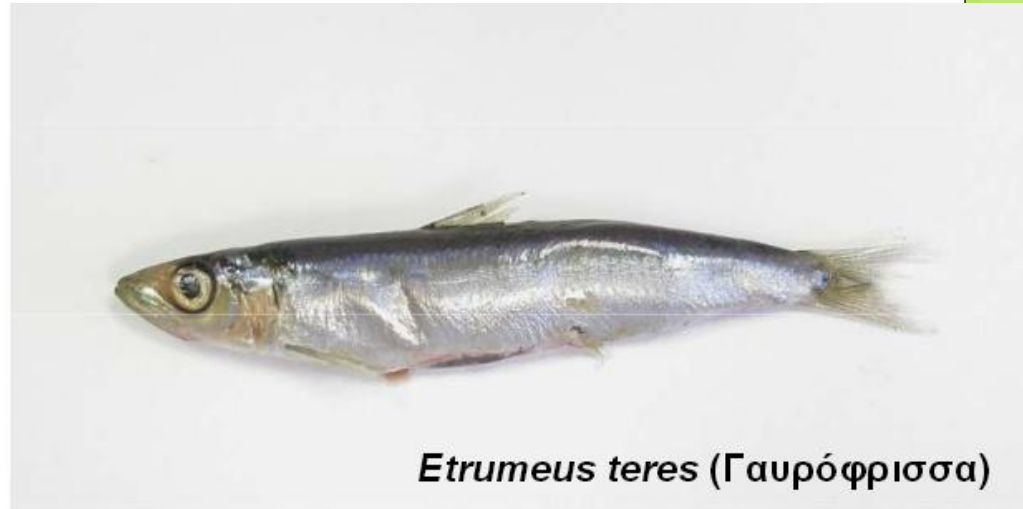
Some of these species are now commercially



Siganus luridus (Γεουανός)



Siganus rivulatus (Γερμανός)



Etrumeus teres (Γαυρόφρισσα)

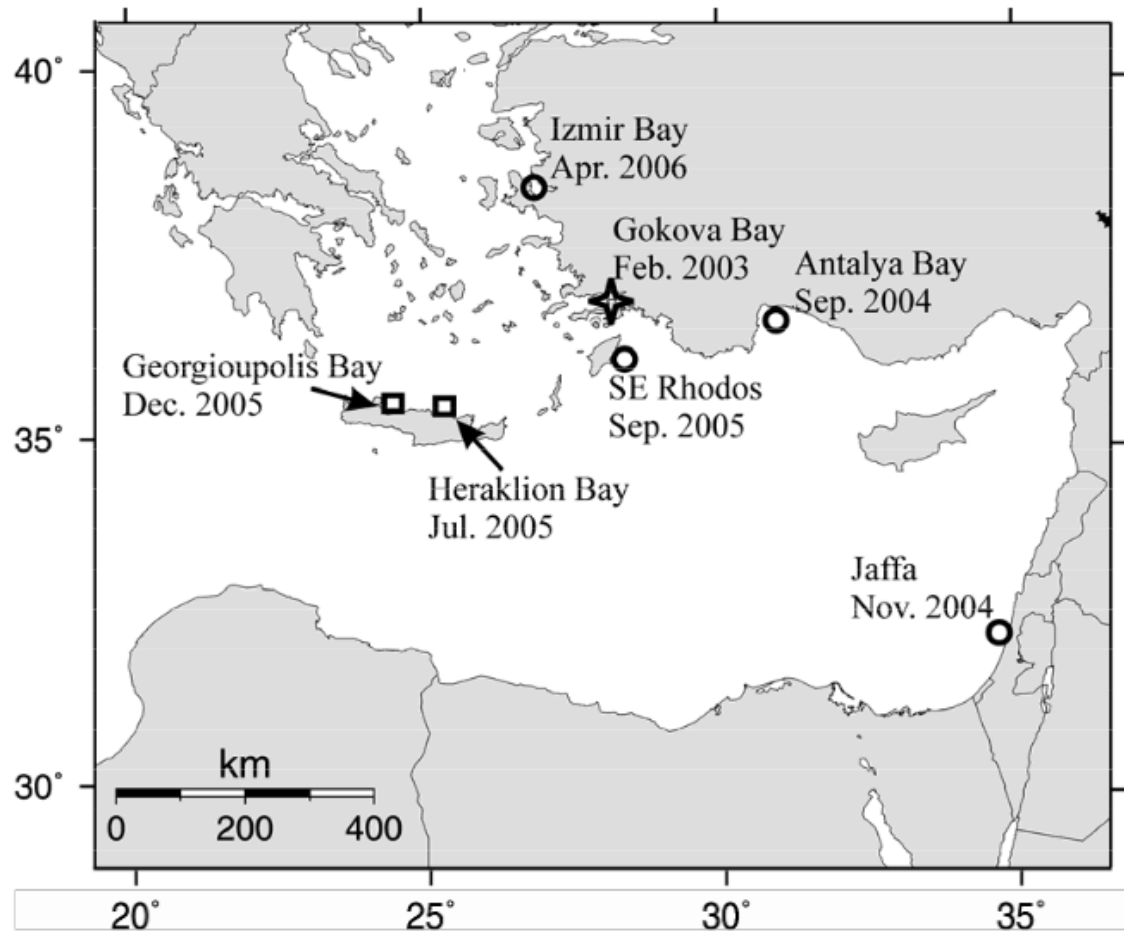


Upeneus moluccensis
(Μπαρμπούνη λοχίας)

the last years invades at Mediterranean a new kind, the Lagokefalos (*Lagocephalus sceleratus*), where creates “noise” for two reasons:

1st reason:
It spreads
unusually
quickly

1st scientific record
at Mediterranean
the February of
2003 in Smyrni



The spread of Lagokefalou (Lagokefalos sceleratus) in Cyprus seas

2nd reason: poison fish

Lagocephalus produces a toxic substance and can cause even death, due to pulmonary insufficiency, to those who consume it. The symptoms are paralysis, stomach pain, diarrhea, vomiting and shortness of breath.



Rattus rattus

They are a threat to many natural habitats because they feed on birds and insects.

They are also a threat to many farmers since they feed on a variety of agricultural-based crops, such as cereals, sugar cane, coconuts, cocoa, oranges, and coffee beans.



Description Rattus Rattus

A slender rat with large hairless ears, the ship rat (*Rattus rattus*) may be grey-brown on the back with either a similarly coloured or creamish-white belly, or it may be black all over. The uniformly-coloured tail is always longer than the head and body length combined. Its body weight is usually between 120 and 160 g but it can exceed 200 g.

The work of Yosida (1980) and his co-workers has shown that there are two forms of *R. rattus* that differ in chromosome number. The more widespread Oceanic form has 38 chromosomes and is the ship rat of Europe, the Mediterranean region, America, Australia and New Zealand. Present indications are that it is the Oceanic form that has reached islands in the South Pacific, but studies are needed to confirm this. The Asian form has probably reached some islands north of the equator, e.g. the Caroline Islands. On the basis of colour variation in rats on Ponape and Koror Islands, described by Johnson (1962) as *Rattus rattus mansorius*, we suspect that these rats may be the Asian form of *R. rattus* (SPREP, 2000).

This species has been nominated as among 100 of the "World's Worst" invaders

Capra hircus



Capra hircus males weigh between 45 and 55 kilos and females weigh between 25 and 35 kilos. Colouration is highly variable from mostly black to various shades of brown, and from single-coloured to multi-coloured. These goats alter plant communities and forest structure and threaten vulnerable plant species.



Capra hircus



The reduction of vegetation reduces shelter options for native animals and overgrazing in native communities leads to ecosystem degradation. Feral goats spread disease to native animals.



Acacia saligna

Acacia saligna is known to form dense monospecific stands, excluding native species and preventing their regeneration



Acacia saligna grows as a small, dense, spreading tree with a short trunk and a weeping habit. It grows up to eight metres tall. Like many **Acacia** species, it has **phyllodes** rather than true leaves; these can be up to 25 centimetres long. At the base of each phyllode is a **nectary gland**, which secretes a sugary fluid. This attracts **ants**, which are believed to reduce the numbers of **leaf-eating** insects. The yellow flowers appear in early spring and late winter, in groups of up to ten bright yellow spherical flower heads. The fruit is a legume, while the seed is oblong and dark to black in colour.

Acacia saligna

A natural colonizer, Coojong tends to grow wherever soil has been disturbed, such as alongside new roads. Its seeds are distributed by ants, which store them in their nests to eat the seed-stalks. Disturbance of the soil brings them to the surface and allows them to germinate. Seeds germinate readily, and hundreds of seedlings can sometimes be found beneath a single parent tree. It is also extremely vigorous when young, often growing over a metre per year.



Acacia saligna

Invasive potential

Acacia saligna has become an invasive species outside its natural range due to the following contributing factors:

1. Widespread planting outside its native area
2. Rapid growth in soil with low levels of nutrients
3. Early reproductive maturity
4. Large quantity of seeds produced
5. Ability of seeds to survive fire
6. Ability to germinate after cutting or burning
7. Tolerance to many different substrates nitrogen fixation
8. Extensive root system

Taller growth (by more than 3m in some places) than indigenous plants
It was planted in the northern suburbs of Sydney in the 1950s by well-meaning native plant enthusiasts, and has subsequently become a major weed in eastern New South Wales, Victoria and South Australia.

Acanthus mollis

It can form dense infestations under forest canopies, which suppress growth and regeneration of native plants species.



Acanthus mollis can form dense infestations under forest canopies, which suppress growth and regeneration of native plants species. Acanthus mollis is a rhizomatous, perennial herb. It has upright stems that grow up to 1 m long and are hairless. The characteristic inflorescence, which can bring the total height of the A. mollis plant up to 2 m, has white corollas with purple veins and appears in summer.

Actions against invasive species

All around the world people are working to prevent invasive alien species from impacting native biodiversity and to minimize their impact if they have already established themselves.

- 1. Prevention** is the first line of defense against IAS. It is also the cheapest (in the long run) and most practical. Prevention involves regulating deliberate species introductions and minimizing accidental species introductions by identifying high risk species and pathways.

Actions against invasive species

2. **Eradication** is eliminating an IAS from a country or a zone. The longer an IAS is left to establish itself, the harder and more expensive it is to eradicate, so early action is very important. Removing an IAS from an area is often enough to allow native flora and fauna to return.

3. **Containment of IAS** is a special form of control that restricts the spread of an IAS and keeps the population inside a specific geographic range. Containment works best if the IAS is detected early and if there are barriers preventing the spread of the IAS.

Actions against invasive species

4. If eradication, containment and control are not options or haven't worked, the last option available is **mitigation**. The goal of mitigation is to “live with” the IAS and minimize impacts on biodiversity and the economy. In mitigation strategies, the focus is on helping native and endangered species, perhaps by moving them to another area without any IAS.

Actions against invasive species

While governments, international environmental agreements (also called multilateral environmental agreements) and non-governmental organizations (NGOs) are working at their level to deal with IAS, there are lots of things you can do.

1. If you buy a pet, make sure it's from a reputable seller. Non-native pets should be properly labeled, legally imported and free from foreign pests and diseases that could spread to wildlife.
2. Don't release any unwanted pets or aquarium fish or plants into the wild. Instead, give it to a friend or return it to your local pet shop.
3. After hiking, wash your shoes. Invasive weed seeds and fungus spores are common hitchhikers.
4. Leave natural items in their natural habitats. Don't bring back seeds or animals from your travels.
5. Clean your boat before putting it in the water. Remove all aquatic plants and animals from the hull, propellers, intakes, trailers and other gear, and dispose of them in a place where they can't wash back into the water.

Actions against invasive species

While governments, international environmental agreements (also called multilateral environmental agreements) and non-governmental organizations (NGOs) are working at their level to deal with IAS, there are lots of things you can do.

6. After going out in your boat, wash it with hot, high pressure tap water. Let it dry for five days before putting it into a new body of water.
7. Don't release live fish, including bait, into a body of water.
8. Plant native species in your garden that provide food, cover and nesting sites for local wildlife, especially birds and butterflies.
9. Drain containers where invasive mosquitoes breed.
10. Volunteer to help with your local invasive plant eradication or control project. Parks and nature reserves are often looking for young people to help out. Plus, it's great exercise and a fun way to explore your local environment.
11. Tell others about IAS.