



ALIEN SPECIES IN ITALY: DISTRIBUTION, IMPACTS AND LEGISLATION

Lucilla Carnevali, Andrea Monaco and Piero Genovesi



Conferenza finale

Isola del Giglio 23,24 Ottobre 2024



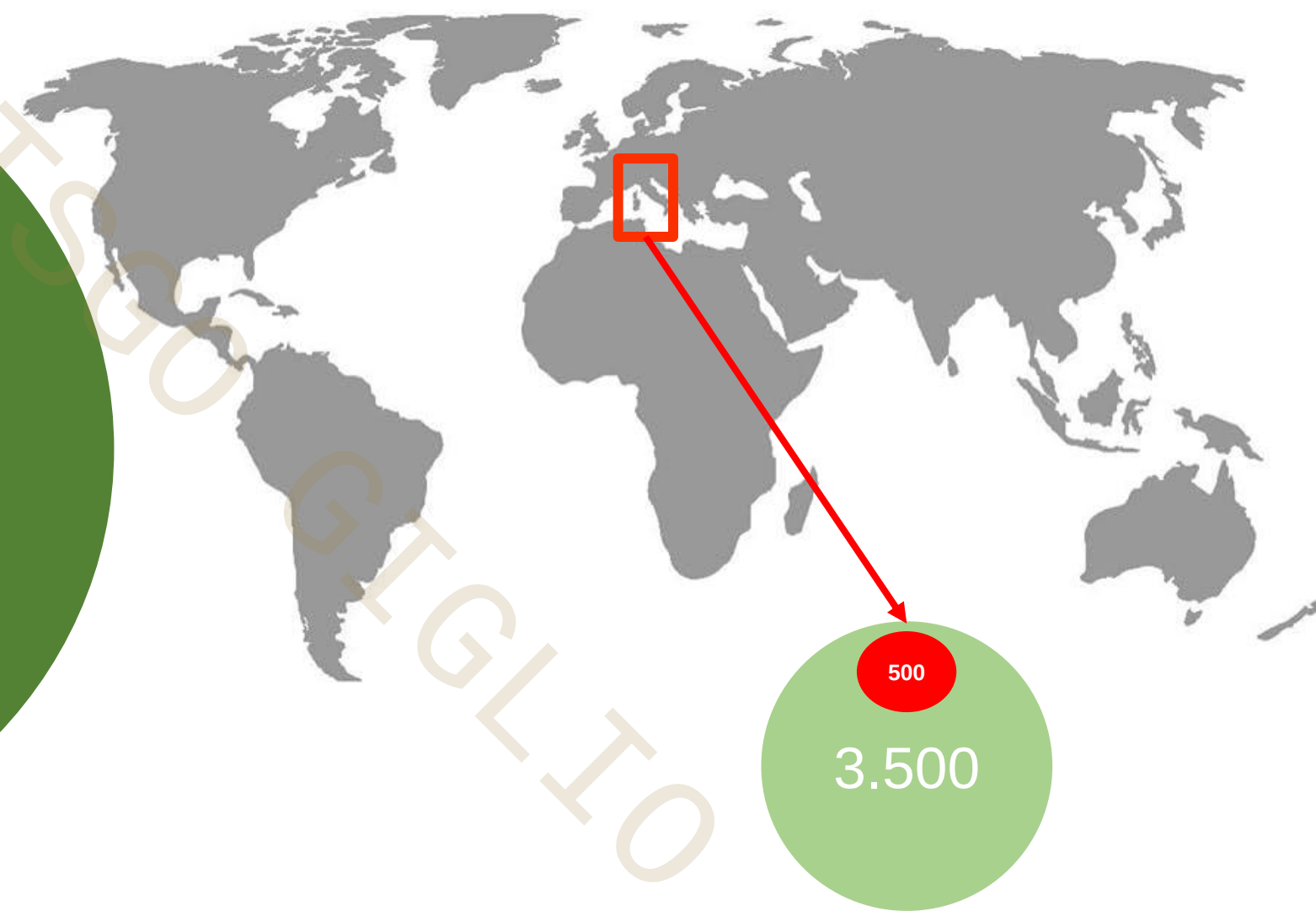
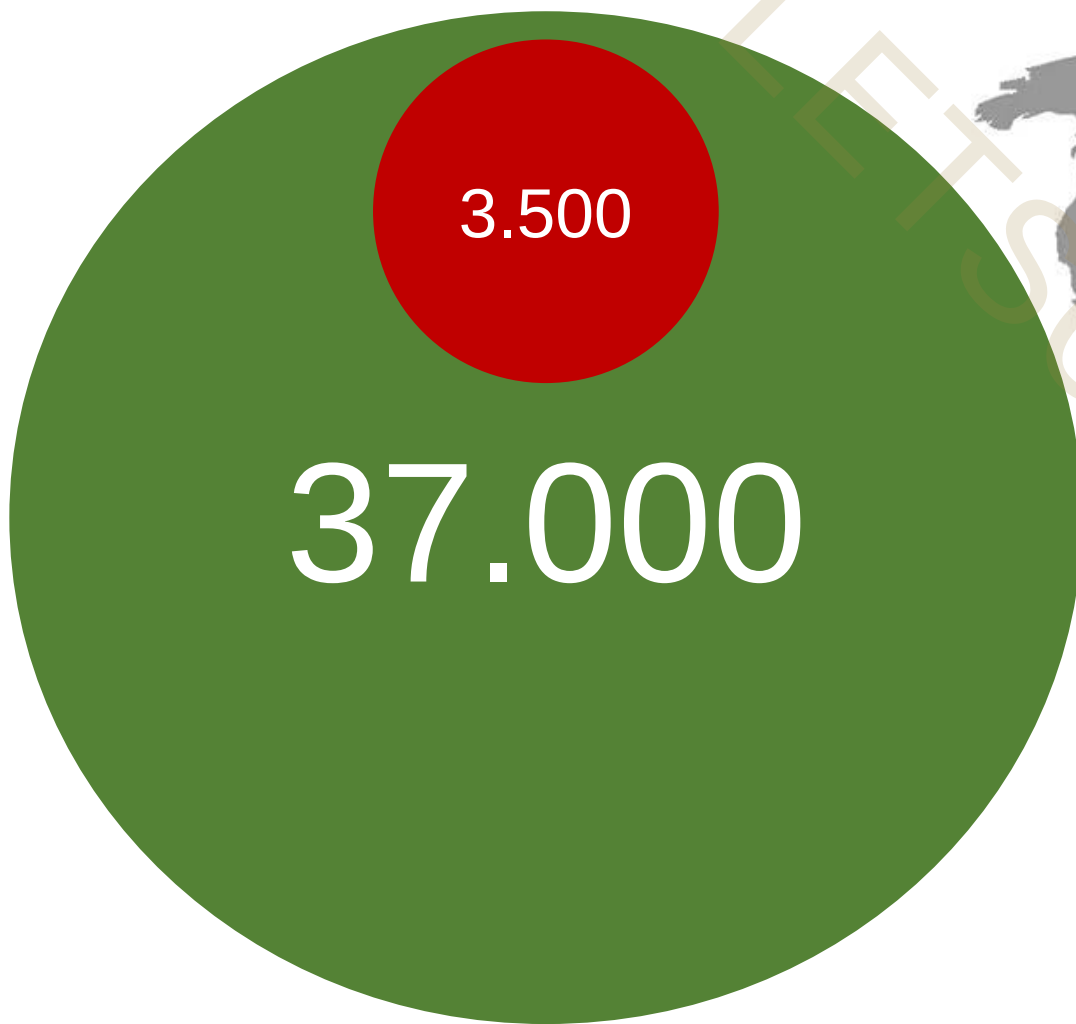
Progetto realizzato con
il cofinanziamento della
Commissione Europea



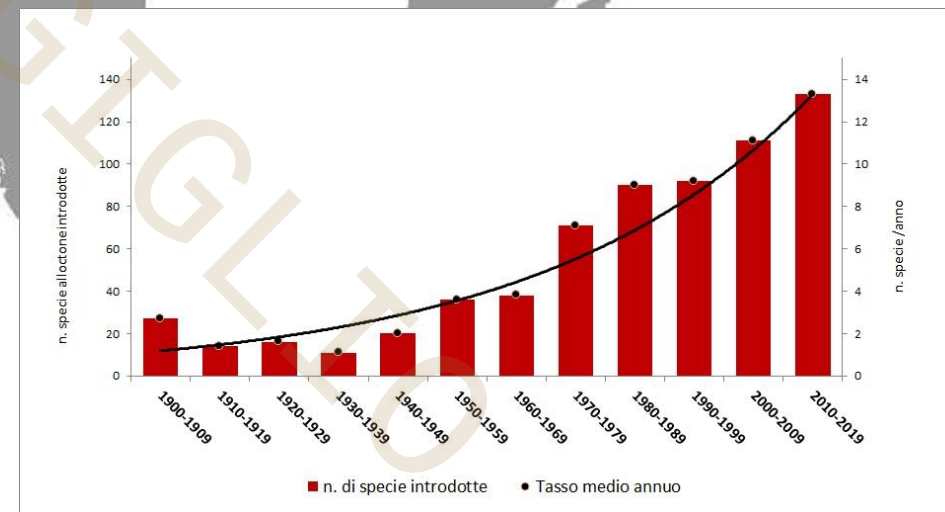
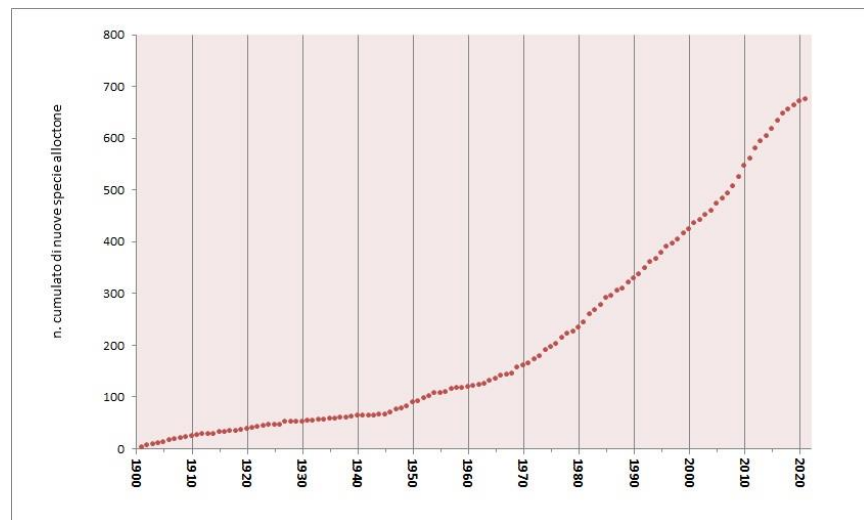
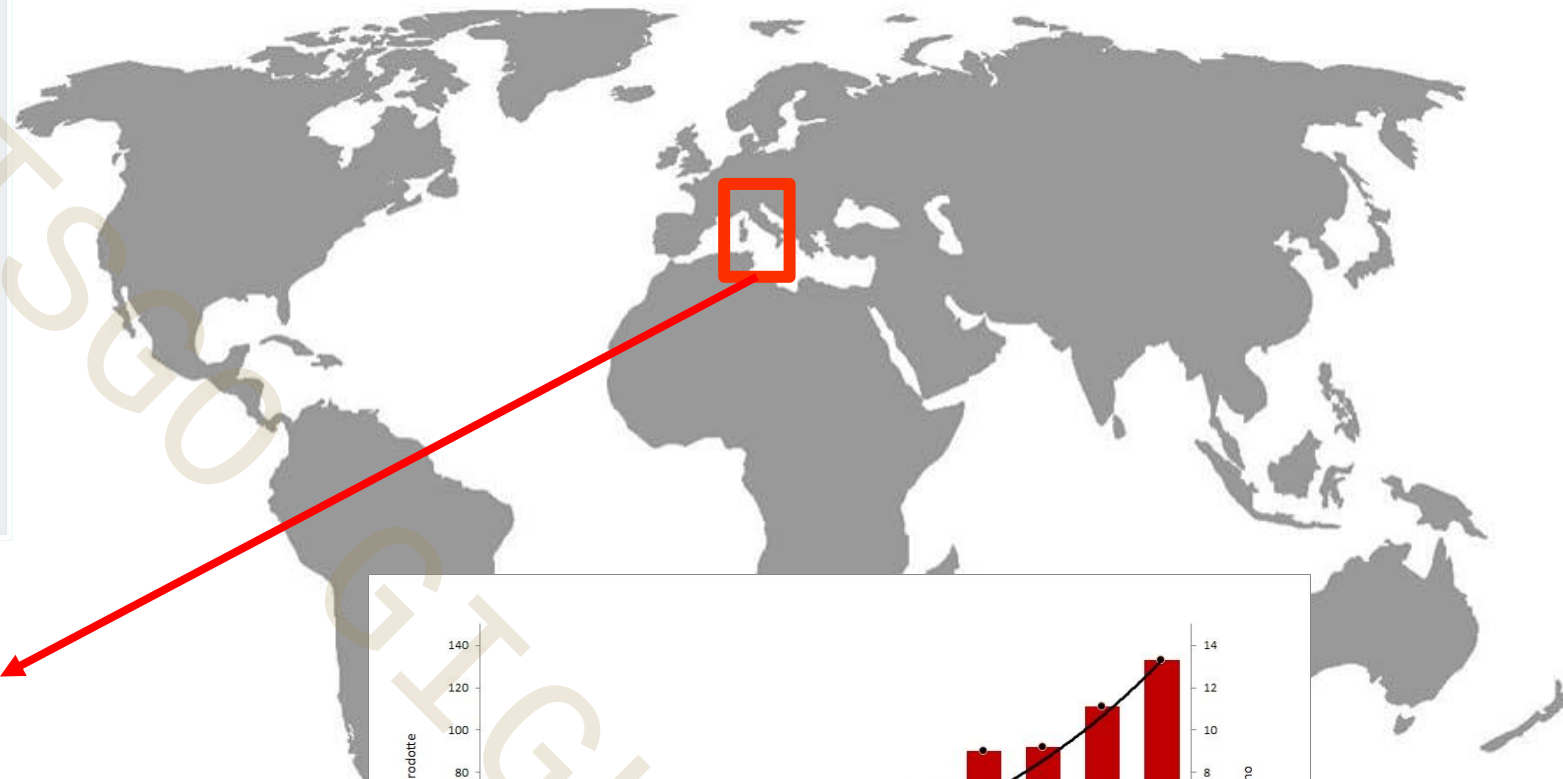
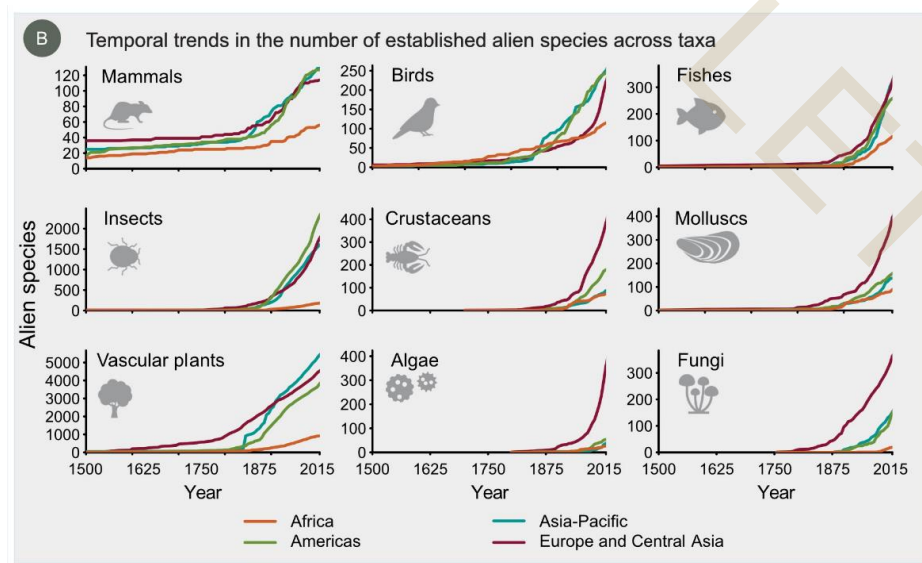
Project implemented with
co-funding from the
European Commission



Global and national numbers



Temporal trends

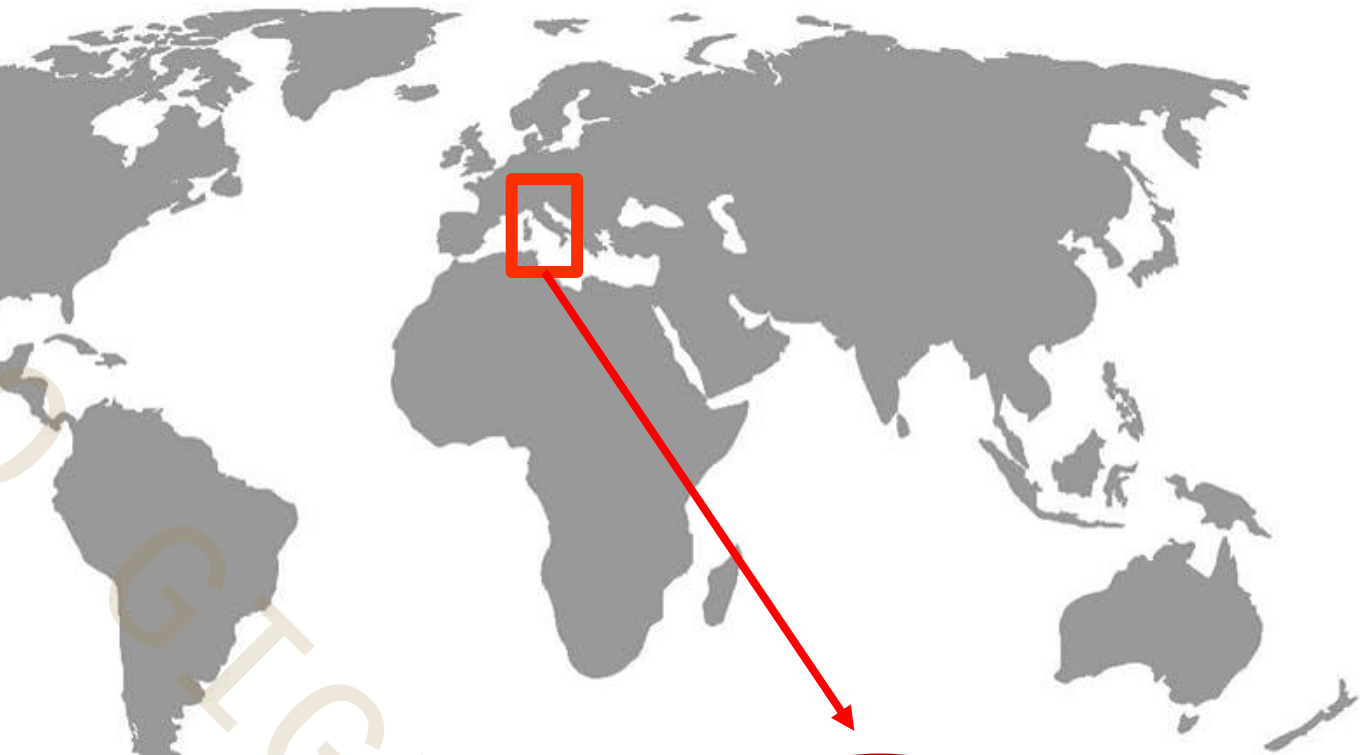
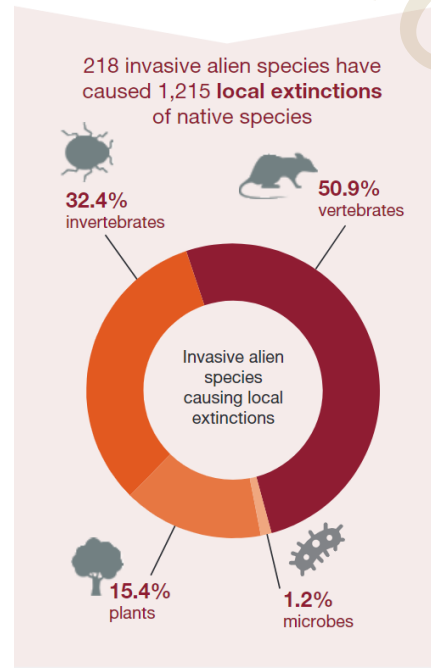


Ecological impacts

IAS have contributed solely or alongside other drivers of changes to....

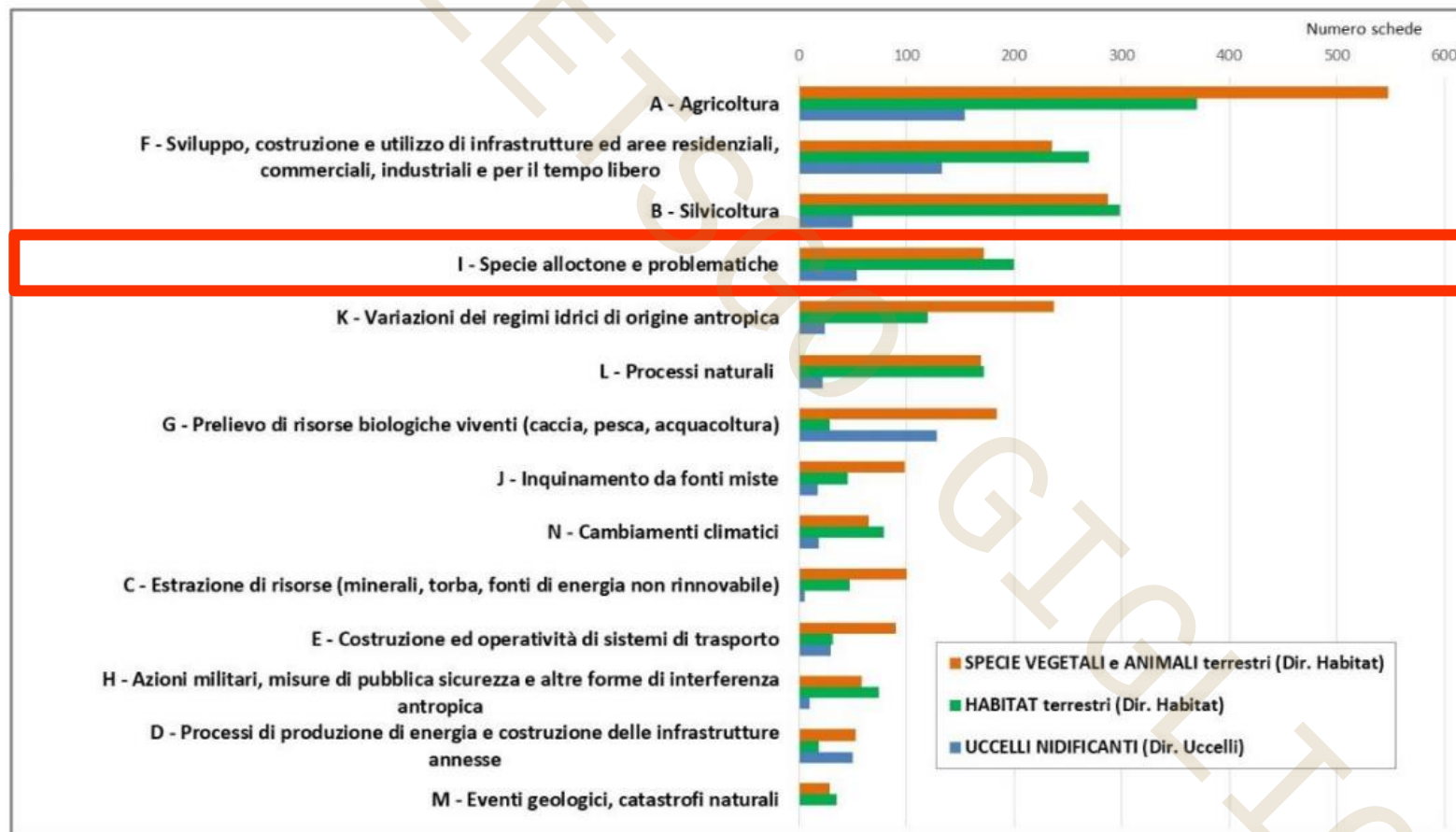
60%
extinctions

of which 90% occurred on islands



????

Ecological impacts in Italy

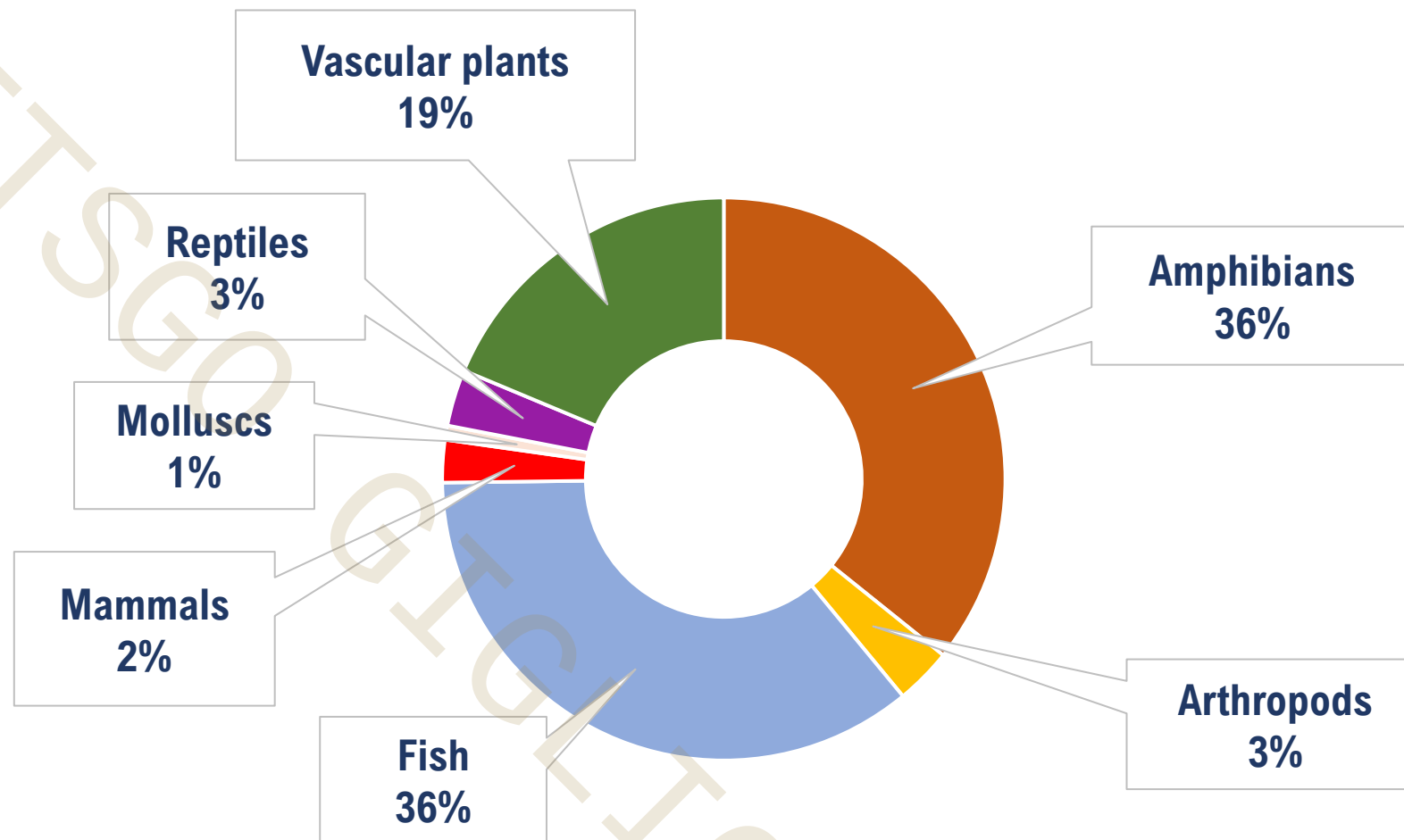


Ecological impacts in Italy

70 native
species

Protected by HD
and affected by alien species

58 species (83%)
in **UNFAVOURABLE**
Conservation Status



Economic impacts

>\$423
billion

The estimate of
the **global annual**
costs of biological
invasions **in 2019**

X 4 every 10 years



\$50
million

Economic impacts in Italy

**\$50
million**

Underestimation!

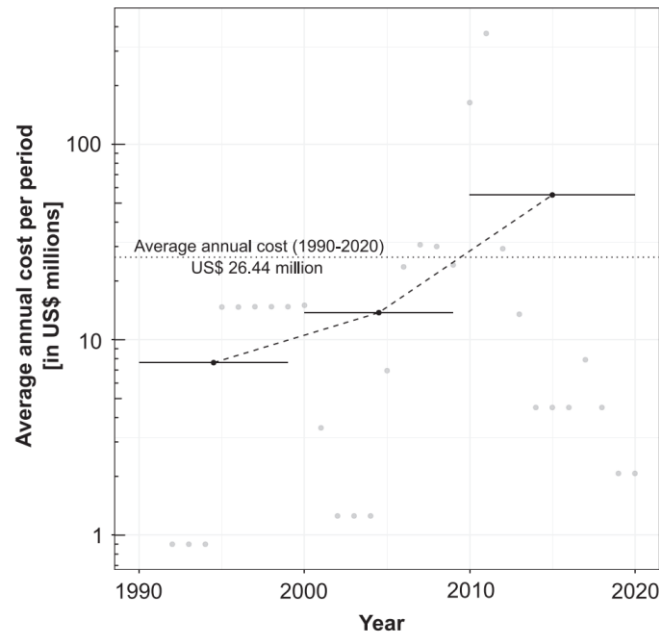


Table 1. List of invasive alien species entries with reported costs in Italy, alongside associated taxonomic groupings. Data sourced from the InvaCost database.

Class	Order	Family	Genus	Species	Database entries	Cost in US\$ million
Insecta	Diptera	Culicidae	<i>Aedes</i>	<i>albopictus</i>	21	95.95
		Lauxaniidae	<i>Drosophila</i>	<i>suzukii</i>	7	20.27
	Hemiptera	Pentatomidae	<i>Halyomorpha</i>	<i>halys</i>	1	3.40
	Coleoptera	Cerambycidae	<i>Anoplophora</i>	<i>chinensis</i>	23	8.99
		Curculionidae	<i>Rhynchophorus</i>	<i>ferrugineus</i>	4	6.70
		Chrysomelidae	<i>Diabrotica</i>	<i>virgifera</i>	1	138.12
Plantae	Asterales	Asteraceae	<i>Ambrosia</i>	<i>artemisiifolia</i>	5	344.80
Mammalia	Artiodactyla	Cervidae	<i>Dama</i>	<i>dama</i>	6	0.38
		Muridae	<i>Rattus</i>	<i>rattus</i>	1	2.34
	Rodentia	Sciuridae	<i>Sciurus</i>	<i>carolinensis</i>	1	0.02
		Myocastoridae	<i>Myocastor</i>	<i>coypus</i>	80	147.07
Secernentea		Aphelenchidae	<i>Bursaphelenchus</i>	<i>mucronatus</i>	13	26.91
Bivalvia	Myida	Dreissenidae	<i>Dreissena</i>	<i>polymorpha</i>	11	0.37
Malacostraca	Amphipoda	Gammaridae	<i>Dikerogammarus</i>	<i>villosus</i>	6	0.18
	Decapoda	Diverse	Diverse	Diverse	27	24.27

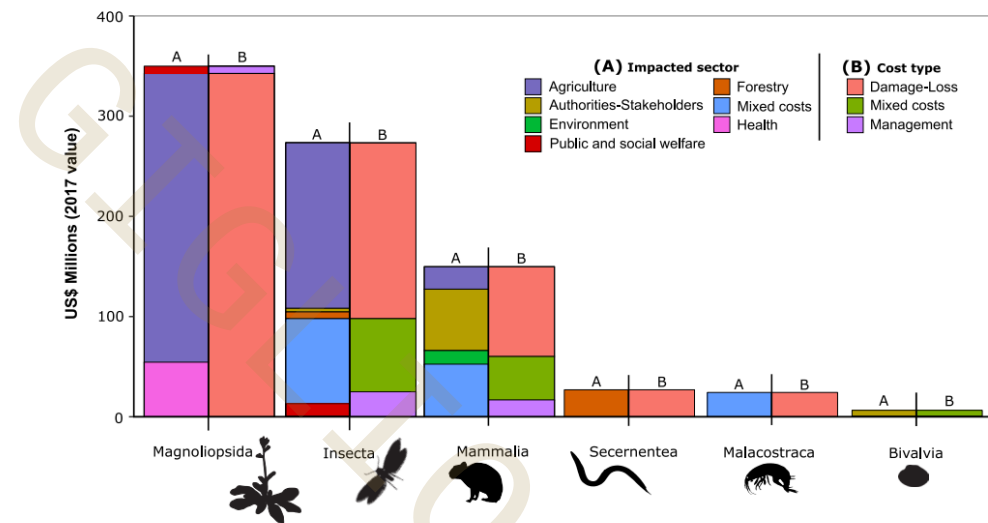
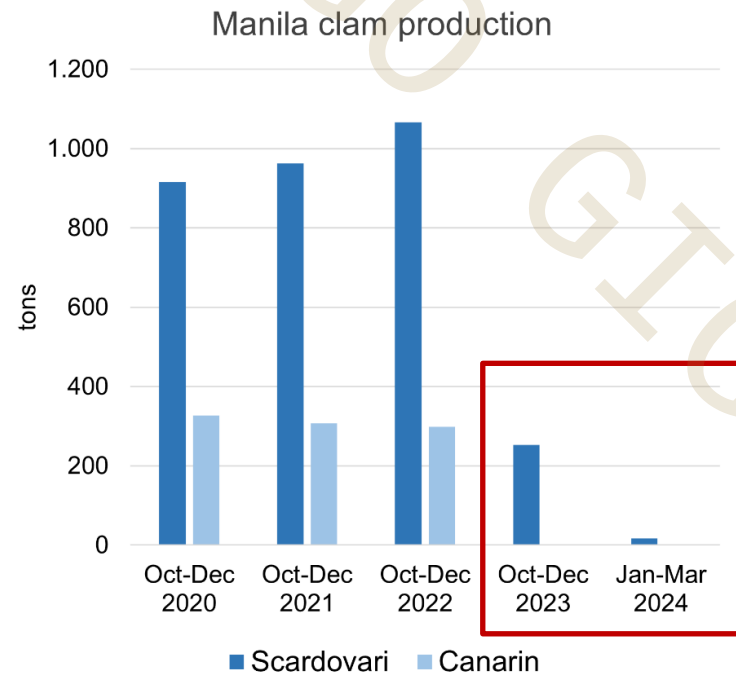


Figure 2. Total invasion costs estimates (in US\$ millions) in Italy between 1990 and 2020 according to cost types and impacted sectors according to the species classes.

Economic Impact of the Blue Crab

>\$100
million

Loss of commercial product and
natural seed up to 100%
(Source: Coldiretti Pesca)



Legal framework

D.P.R. 357/97 and amendments Regulation implementing Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

Prevention through **voluntary pathways** management

Regulation (EU) no. 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species

List of **priority species** (Species of Union Concern)

Legislative Decree No. 230/17 adapting national legislation to the provisions of Regulation (EU) No. 1143/2014

Priority pathways of **unintentional introduction**

National law No. 157/92 Rules for the protection of homeothermic wildlife and for hunting

Eradication and control of **alien mammals and birds**

National law no. 157/92 and amendments

Art.2

In any case, for **alien species** (...), management is aimed at **eradication or in any case at the control of populations**; control or eradication interventions are carried out as provided for in Article 19

Art.19 TER

Containment activities provided for in the extraordinary plan are also implemented in protected areas pursuant to Law No. 394/91

D.P.R. 357/97 and amendments

2019

D.P.R. 102/2019 Regulation containing further amendments to Article 12 of D.P.R. 357/97

- It reaffirms the **prohibition of the release into nature** of alien species and populations (art.12 paragraph 3)
- It specifies that the **ban also applies to native species and populations in Italy**, when their introduction is planned in territories outside the natural distribution area
- It introduces a **possibility of derogation** from the prohibition of release into nature (paragraph 4): an authorization from the ministry of the Environment is required, subject to an SNPA opinion, following the assessment of a specific study of the risk that the release entails.

Legislative decree no.230/2017

List of invasive alien species of Union Concern

Strict prohibitions on **introduction, transport, possession (even in contained holding), use or exchange, breeding/cultivation, reproduction, trade and release into the environment**, for public and private entities (including individual citizens) are provided

Legislative decree no.230/2017

- ✓ Obligation to establish a **surveillance system** to collect and record frequency data in the environment and confirm early detection of the introduction or presence of IAS of Union Concern (art.18)
- ✓ Obligation of **rapid eradication** (art.19)
- ✓ Obligation of **eradication or control** of IAS, including the restoration of damaged ecosystems (art.22)
- ✓ Obligation to establish and implement action plans to **address the priority pathways** of unintentional introduction and spread of IAS (art.13)

Invasive alien species of Union Concern (88)

47 species already present in nature (+3 present in cultivation +2 presences to be confirmed)

25-27/47
animals

Invertebrates



Arthurdendyus triangulatus

Eriocheir sinensis

Faxonius rusticus

Limnoperna fortunei

● *Orconectes (Faxonius) limosus*

● *Orconectes virilis*

● *Pacifastacus leniusculus*

● *Procambarus clarkii*

○ *Procambarus fallax f. virginalis*

○ *Solenopsis geminata*

○ *Solenopsis invicta*

○ *Solenopsis richteri*

○ *Vespa velutina nigrithorax*

○ *Wasmannia auropunctata*

● Widespread

○ Localized

Anfibes and Reptiles



Lampropeltis getula

○ *Lithobates (Rana) catesbeianus*

● *Trachemys scripta*

○ *Xenopus laevis*

Fish



● *Ameiurus melas*

Channa argus

Fundulus heteroclitus

● *Gambusia affinis*

● *Gambusia holbrooki*

● *Lepomis gibbosus*

Morone americana

Perccottus glenii

Plotosus lineatus

● *Pseudorasbora parva*

Birds



○ *Acridotheres tristis*

○ *Alopochen aegyptiaca*

Corvus splendens

○ *Oxyura jamaicensis*

Pycnonotus cafer

● *Threskiornis aethiopicus*

Mammals



Axis axis

○ *Callosciurus erythraeus*

○ *Callosciurus finlaysonii*

○ *Eutamias sibiricus*

Herpestes javanicus

Muntiacus reevesii

● *Myocastor coypus*

Nasua nasua

○ *Nyctereutes procyonoides*

Ondatra zibethicus

○ *Procyon lotor*

● *Sciurus carolinensis*

Sciurus niger

Invasive alien species of Union Concern (88)

47 species already present in nature (+3 present in cultivation +2 presences to be confirmed)

22-25/41
plantes and
algue



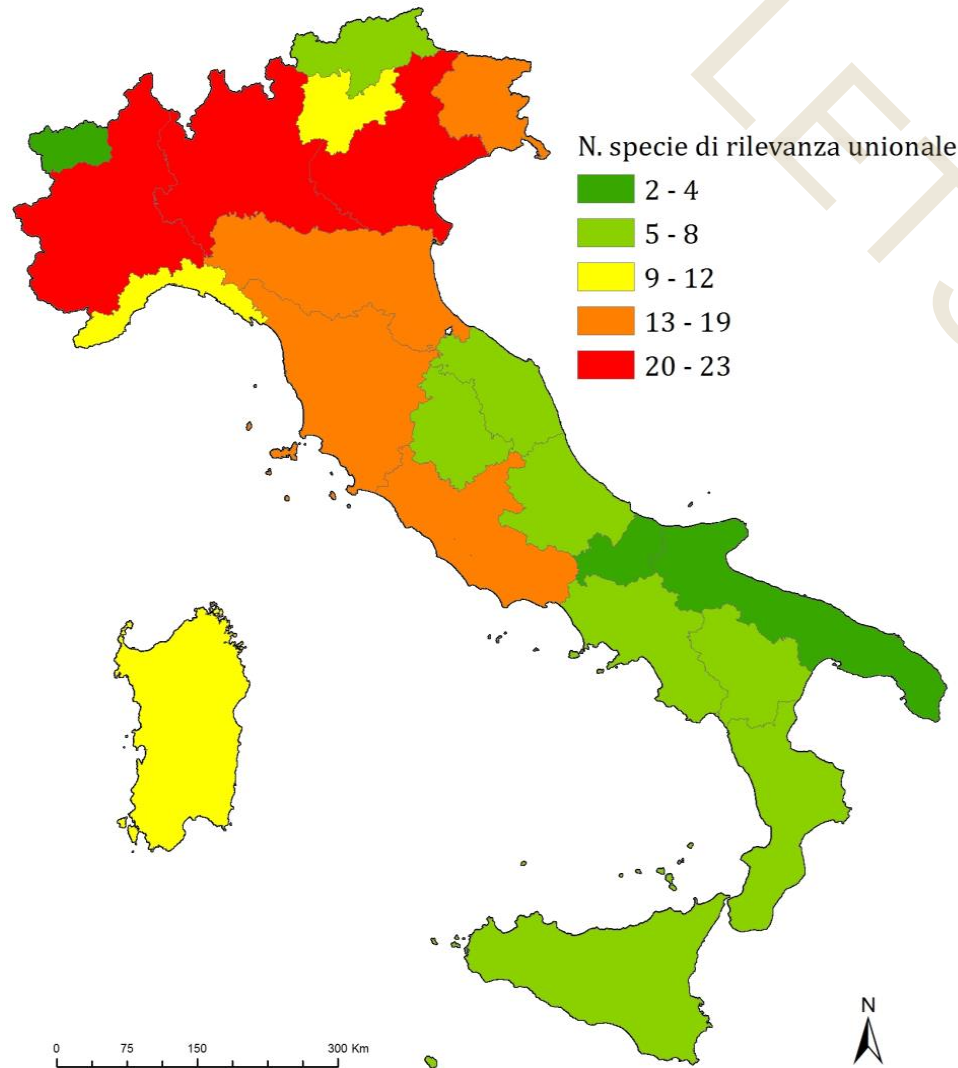
- Widespread
- Localized

- *Acacia saligna*
- *Ailanthus altissima*
- *Alternanthera philoxeroides*
- *Andropogon virginicus*
- *Asclepias syriaca*
- *Baccharis halimifolia*
- *Cabomba caroliniana*
- *Cardiospermum grandiflorum*
- *Celastrus orbiculatus*
- *Cortaderia jubata*
- *Ehrharta calycina*
- *Eichhornia (Pontederia) crassipes*
- *Elodea nuttallii*
- *Gunnera tinctoria*
- *Gymnocoronis spilanthoides*
- *Hakea sericea*
- *Heracleum mantegazzianum*
- *Heracleum persicum*
- *Heracleum sosnowskyi*
- *Humulus scandens (japonicus)*

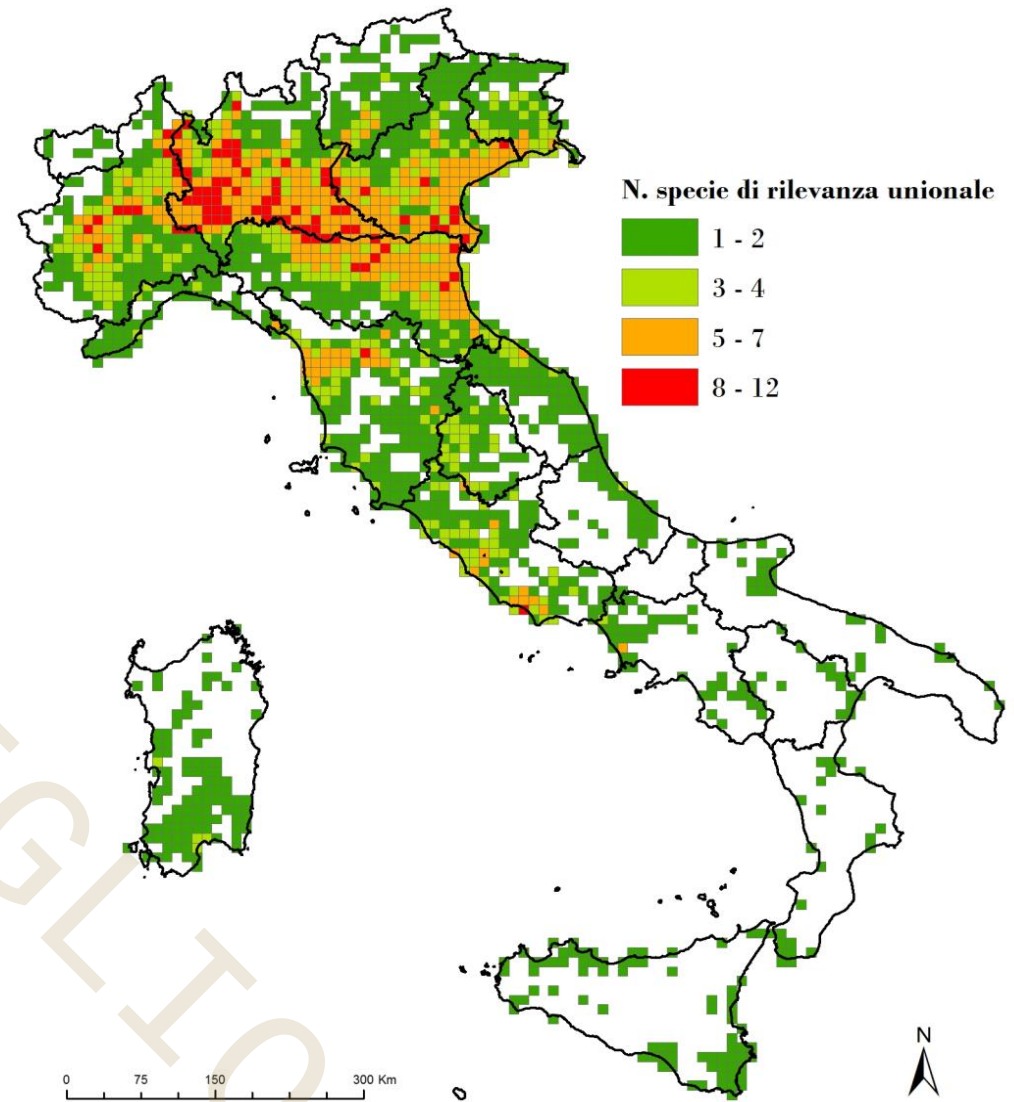
- *Hydrocotyle ranunculoides*
- *Impatiens glandulifera*
- *Koenigia polystachya*
- *Lagarosiphon major*
- *Lespedeza cuneata*
- *Ludwigia grandiflora*
- *Ludwigia peploides*
- *Lygodium japonicum*
- *Lysichiton americanus*
- *Microstegium vimineum*
- *Myriophyllum aquaticum*
- *Myriophyllum heterophyllum*
- *Parthenium hysterophorus*
- *Pennisetum setaceum (Cenchrus setaceus)*
- *Persicaria perfoliata*
- *Pistia stratiotes*
- *Prosopis juliflora*
- *Pueraria montana*
- *Salvinia molesta*
- *Triadica sebifera*
- *Rugulopterix okamurae*



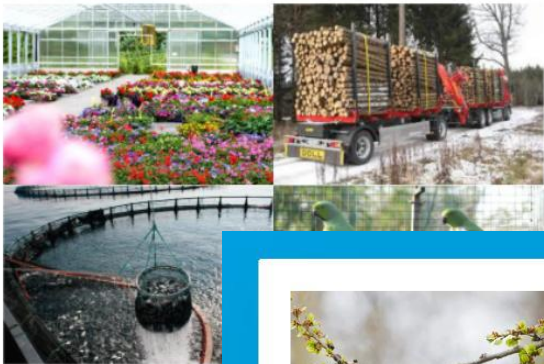
Invasion Rate by Region



Report 2019
(49 species)



Legislative decree no.230/2017



ANALISI E PRIORITÀ
DI INGRESSO D

VAI A



ADOTTATO IL PIANO D'AZIONE PER LE
SPECIE ALIENE DA COMPAGNIA

VAI AL PIANO



ADOTTATO IL PIANO D'AZIONE PER LE
SPECIE ALIENE DI PIANTE DI INTERESSE
ORNAMENTALE

VAI AL PIANO



LINEE GUIDA MONITORAGGIO

VAI AL DOCUMENTO

National Management Plans (Art.22)

13 plans

officially adopted by the
Ministry of the Environment

25 plans

under consultation

The plans for all other IAS of Union concern and present in Italy developed and available for the Ministry between 2025.

6 years validity

Competent authorities: Regions, Autonomous Provinces, National parks

<https://www.mase.gov.it/pagina/piani-di-gestione-nazionali-approvati> et
<https://www.specieinvasive.isprambiente.it/documenti-utili/piani-di-gestione>



National Management Plans (Art.22)

Legal framework

Distribution

National and regional goals

Actions

- Prevention

- Management (techniques and efficiency)

- Carcass/waste treatment

- Personnel

Surveillance

- Early detection of new introductions

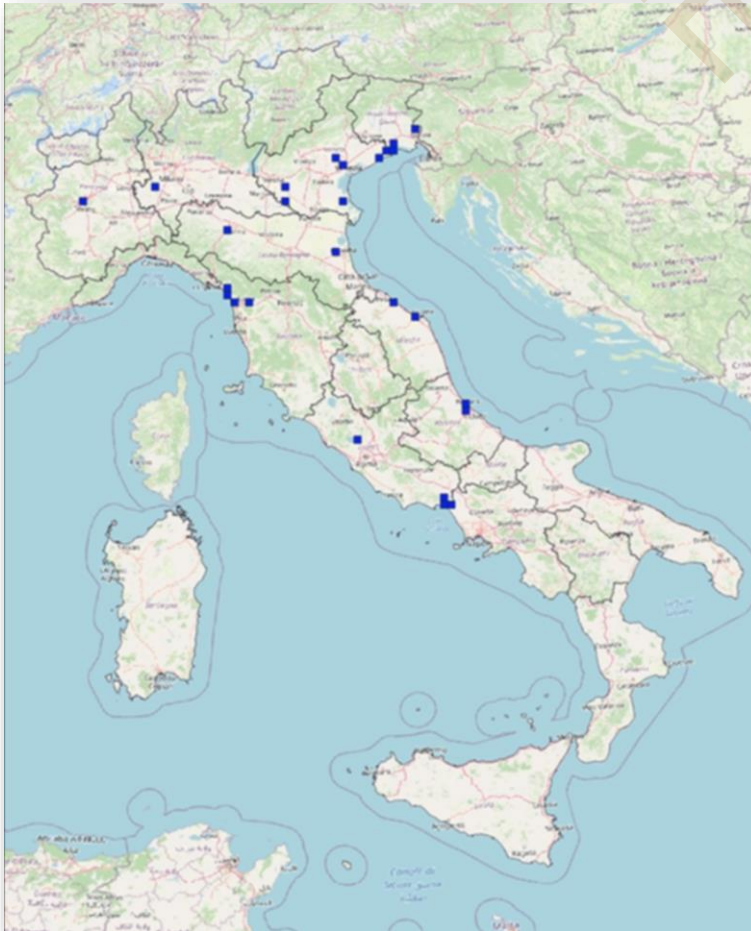
- Evaluation of the spread

- Evaluation of the effectiveness of management measures



Myriophyllum aquaticum

National goal: Control



Regional goals

Regione	Prevenzione	Eradicazione (art.22)	Controllo/ contenimento (art.22)	Risposta rapida (eradicazione rapida art.19)	Monitoraggio
Abruzzo	X	X			X
Basilicata	X			X	X
Bolzano	X			X	X
Calabria	X			X	X
Campania	X		X		X
Emilia Romagna	X	X			X
Friuli Venezia Giulia	X	X			X
Lazio	X		X		X
Liguria	X			X	X
Lombardia	X	X			X
Marche	X		X		X
Molise	X			X	X
Piemonte	X			X	X
Puglia	X			X	X
Sardegna	X			X	X
Sicilia	X			X	X
Toscana	X	X			X
Trento	X			X	X
Umbria	X			X	X
Valle d'Aosta	X			X	X
Veneto	X		X		X

Principale lacune: Manque de fonds dédiés

5 millions
€

Period = 2022-2024

Eradication, confinement or control
of IAS of Union Concern (not
surveillance!)

Regione	Superficie (Kmq)	%	Euro
Abruzzo	10832	3,6	180.000
Basilicata	10073	3,3	165.000
Calabria	15222	5,0	250.000
Campania	13671	4,5	225.000
Emilia-Romagna	22445	7,4	370.000
Friuli Venezia Giulia	7932	2,6	130.000
Lazio	17232	5,7	285.000
Liguria	5416	1,8	90.000
Lombardia	23863	7,9	395.000
Marche	9401	3,1	155.000
Molise	4460	1,5	75.000
Piemonte	25387	8,4	420.000
Puglia	19541	6,5	325.000
Sardegna	24099	8,0	400.000
Sicilia	25833	8,6	430.000
Toscana	22987	7,6	380.000
Umbria	8464	2,8	140.000
Valle d'Aosta	3261	1,1	55.000
Veneto	18345	6,1	305.000
P.A. Bolzano	7398	2,4	120.000
P.A. Trento	6207	2,1	105.000
	302068	100	5.000.000

Early detection and rapid eradication

- The Regions and Autonomous Provinces **notify without delay** the Ministry of Environment and ISPRA of the early detection on its territory or part of it of IAS of Union Concern whose presence was not until then known moment in your territory or part of it.
- The Ministry notifies the commission of the new presence and **establishes the eradication measures**
- Regions and Autonomous Provinces **apply** rapid eradication measures



Early detection and rapid eradication



Conservation
before publication!



CellPress

Correspondence The invasive ant *Solenopsis invicta* is established in Europe

Mattia Menchetti^{1,2,*}, Enrico Schifani^{1,2},
Antonio Alicata³, Laura Cardador⁴,
Elisabetta Sbrega¹, Eric Toro-Delgado¹,
and Roger Vila^{1,5}

cargo harbors of the island, the Augusta port (~13 km northward), may be relevant for its introduction.

Long-range dispersal of ant queens during nuptial flights tends to be aided by wind and follow its direction⁴. Locally prevailing wind directions at ground level indicate that, if arrived by flight, queens colonizing the invaded site may have come from the north-west, where further monitoring efforts should be prioritized (Figures 1A and S1). Likewise, swarming queens are likely to be directed south-east and therefore towards the sea, which may represent a limiting factor

as suitable. This is concerning because most suitable urban areas are coastal Mediterranean cities highly connected by seaports, potentially favoring the spread of the species. Worryingly, future projections depict a far worse scenario, in which the suitable range of *S. invicta* largely increases (Figures 1H,I and S2, and Data S1D).

Coordinated efforts for early detection and action in the region are key for successfully managing this new threat. Citizen science may play a key role in the detection of *S. invicta* considering that it is frequently encountered in urban and

Current Biology
Magazine

The invasive brown seaweed *Rugulopteryx okamurae* (Dictyotales, Ochrophyta) continues to expand: first record in Italy.

Aut
Tin

Riunione Scientifica Annuale
27-28 ottobre 2023, Napoli

First record of the invasive brown alga *Rugulopteryx okamurae* in the southern Adriatic Sea (Bari, Italy)

Grazie!

www.isprambiente.gov.it/it