



Agenzia Regionale  
per la Protezione  
Ambientale dell'Umbria

# Towards a regional list of alien aquatic and wetland species in Umbria

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# The Activities of ARPA Umbria



Knowledge	INSPECTIONS	Environmental controls on production activities
		Surveillance of environmental matrices
	MONITORING	Surface and ground waters
		Air quality and atmospheric emissions
		Physical agents (noise, electromagnetism, radiation)
		Soil; Waste
	ENVIRONMENTAL INFORMATION	Registers, databases, inventories
		Environmental reporting
		Environmental communication and education
	RESEARCH AND INNOVATION	Development of research programs
		Collaborations with research institutions
		European Projects
Prevention	SUPPORT TO PRIMARY PREVENTION	Lab analyses and support to the Regional Health Authority
		Studies on population exposure to pollution critical areas
	ENVIRONMENTAL ASSESSMENT/EVALUATION ACTIVITIES	Advice and technical investigations, autorizations to production activities
		Support to the relevant authorities for evaluation (EIA, SEA, IPPC)
ORGANIZATION AND MANAGEMENT	Quality, Safety, Certification, Training	
	Administration, legal affairs	
	Information systems	

# Centre

## “Climate Change and Biodiversity of Lakes and Wetlands ”



## Why a Centre on “Biodiversity and Climate Change” ?

The importance of **biodiversity** is globally recognized because of its key role in maintaining the ecosystems services, which are essential for our persistence in health and in balance with our planet.

*Our life depends on biodiversity*

**Climate change**, together with the destruction of natural habitats, the introduction of alien species, is the main factor contributing to human decline in biodiversity.





## The role of wetlands for biodiversity conservation

- one of the most vulnerable ecosystems with the most high rate of disappearing in the last decades
- they are **biodiversity hotspots** ( threatened species)
- ecosystems whose role is central to the balance of aquatic environments
- they carry out numerous **ecosystem services**

### The archipelago of small wetlands and ponds

- heterogeneous type of waters
- recognized as “**stepping stones**” in the Habitats Directive for their indispensable linking function for migration, geographic distribution and genetic exchange of wild species



# Centre

## “Climate Change and Biodiversity of Lakes and Wetlands ”

### Main goal

conservation and restoration of biodiversity  
at all levels:  
genetic, species, ecosystem



# Main objectives



- encourage development and coordination of basic and applied research on biodiversity conservation, in collaboration with researchers, practitioners and professionals, at national and international level;
- promote effective actions for the conservation and restoration of ecosystems, with a special focus on lakes and wetlands, including small ones such as ponds, and support their sustainable management;

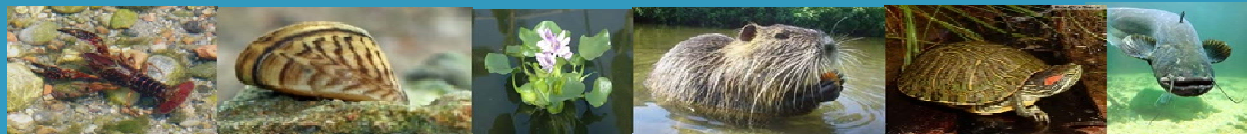


# Main objectives

- support adaption measures to reduce the impacts caused by the globally recognized threats to biodiversity:
  - conversion and degradation of natural environments,
  - spread of alien species
  - climate change;
  
- boost the use of innovative methodologies for the protection of biodiversity;
  
- disseminate environmental information by enhancing public awareness of the role of wetland biodiversity in maintaining the functionality of ecosystems and the ecosystem services they provide to the community.

# Main focus of proposed action

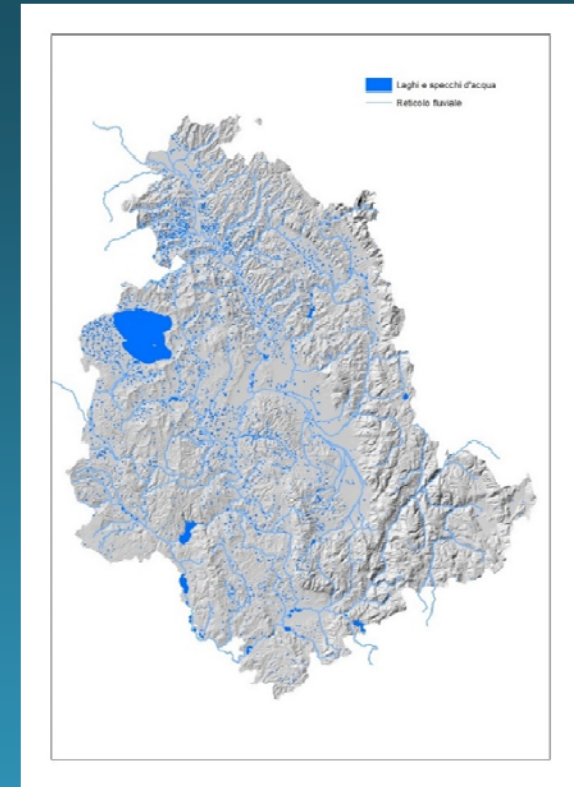
- Lake and wetland regional system
- Benthic diatom biodiversity of lakes and wetlands of Umbria - *Colfiorito swamp; Trasimeno Lake-*
- Characterization of aquatic alien species in Umbria
- Collaborations at regional, national and international level
- Actions with academic institution



# Lake and wetland regional system

Key component for biodiversity conservation at regional level:

- "reservoirs" of species;
- natural areas for strengthening the resilience of agro-ecosystems and for adapting to the impact of climate change in Umbria.



## Objective

consolidate a support database for the management of regional wetlands and promote innovative methodologies for their monitoring, including through pilot projects



# Biodiversity of Polvese Island



Study on the mycological diversity  
in collaboration with AMI and the University of Perugia

*Le specie fungine lignicole nell'Isola Polvese  
del Lago Trasimeno (Granetti, 2016)*



Study of mammals in collaboration with  
University of Perugia,  
Umbria region



Regione Umbria

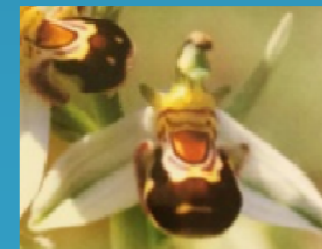


Study of vegetation  
in collaboration with the University of Perugia,

Study on wild orchids



in collaboration with GIROS and  
Plestina Ambiente e territorio

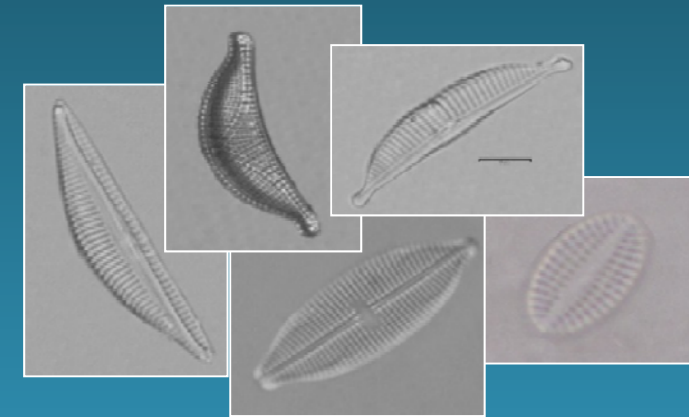


# Benthic Diatoms of lakes and wetlands

Microalgae with biological and ecological characteristics that make them excellent bioindicators



*Using of Electronic Scan technologies*



## Objective

Evaluate biodiversity, create check-lists, draw up atlas and propose standardized methods to outline future wetland monitoring

# Collaborations at regional, national and international level



## Farmer scientist

Multifunzionalità nelle Aree Parco

PSR Umbria 2014-2020

Misura 16.1

“Sostegno per costituzione e gestione **Gruppi Operativi** dei PEI in materia di produttività/sostenibilità dell'agricoltura”

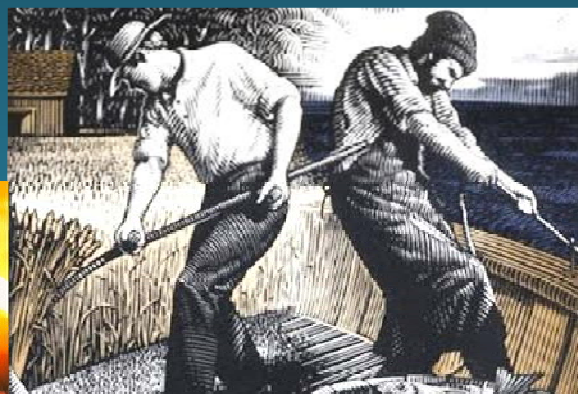
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Focus Area 6.B

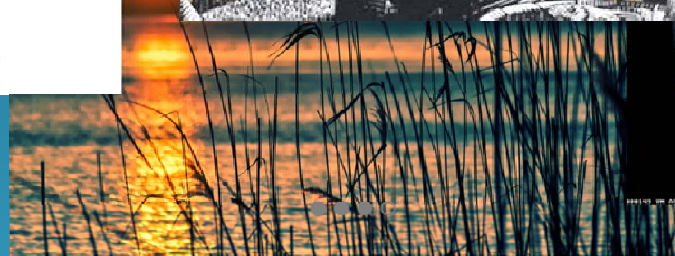
Progetti di innovazione per stimolare lo sviluppo locale nelle zone rurali attraverso il ruolo della multifunzionalità delle aziende agricole



Regione Umbria  
Giunta Regionale



MULTI.PARK



LifEWATCH

E-Science European Infrastructure for Biodiversity and Ecosystem Research



U-SAVEREDS

U-SAVEREDS, 13 aprile 2018



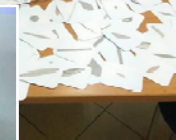
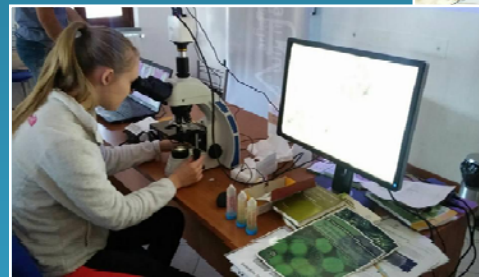
# Actions with academic institution

## Training in Polvese Island

Texas A&M University –  
Study Centre Santa Chiara

Loyola University of Chicago –  
JF Rome Center  
*“Experiential Learning On Site”*

## *Summer School*

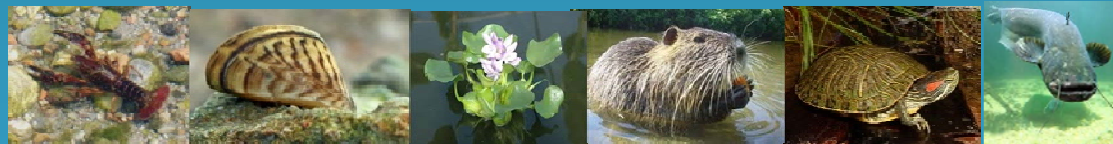


# Characterization and diffusion of aquatic alien species in Umbria

Globally, one of the main threats to biodiversity  
They can cause socio-economic impacts

## Objective

Establish a supporting database for the management of aquatic alien species in the region





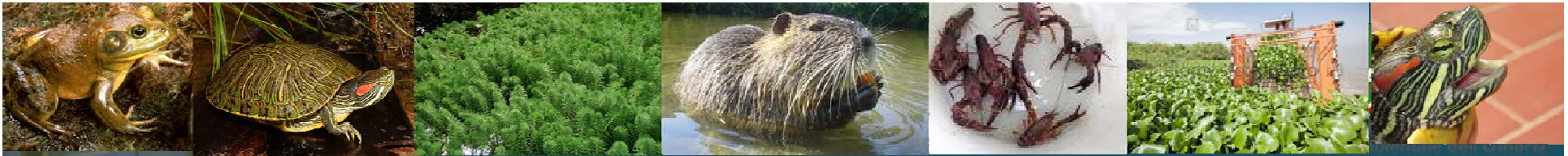
# A new alien in Umbria: the killer shrimp invades the Trasimeno

## *Dikerogammarus villosus* (Sowinsky, 1894) Killer shrimp

- reported in the Trasimeno lake (May 2017)
- among the 100 worst invasive species in Europe (DAISIE, 2009)
- extremely negative local impacts







# Characterization and diffusion of aquatic alien species in Umbria

Creation of a system of lists of alien aquatic species of regional relevance

European Strategy on Invasive Alien Species

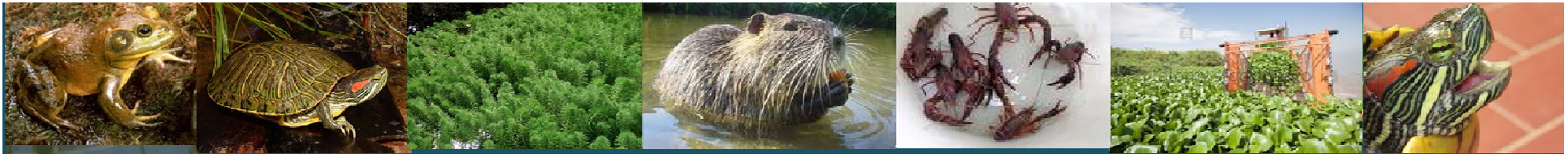
EU Regulation 1143/2014

EU Reg 1263/2017

D. Lgs 230/2017



SAVEREDS



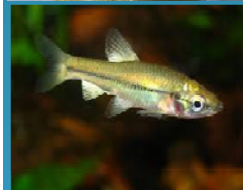
# Characterization and diffusion of aquatic and wetland alien species in Umbria

## Working Group

with the aim to assess the main threats to the regional aquatic biodiversity caused by biological invasions

### Taxonomic groups investigated

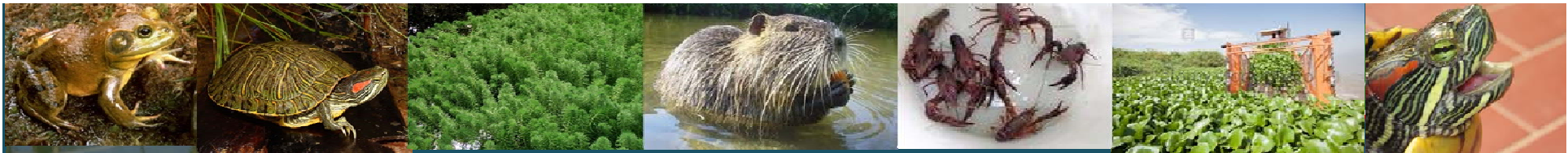
*Cyanobacteria, algae, plants, fungi, invertebrates, amphibians, reptiles, fish, birds, mammals*



SAVEREDS







# Characterization and diffusion of aquatic and wetland alien species in Umbria

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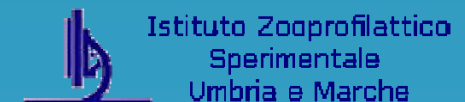
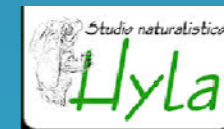
University of Perugia



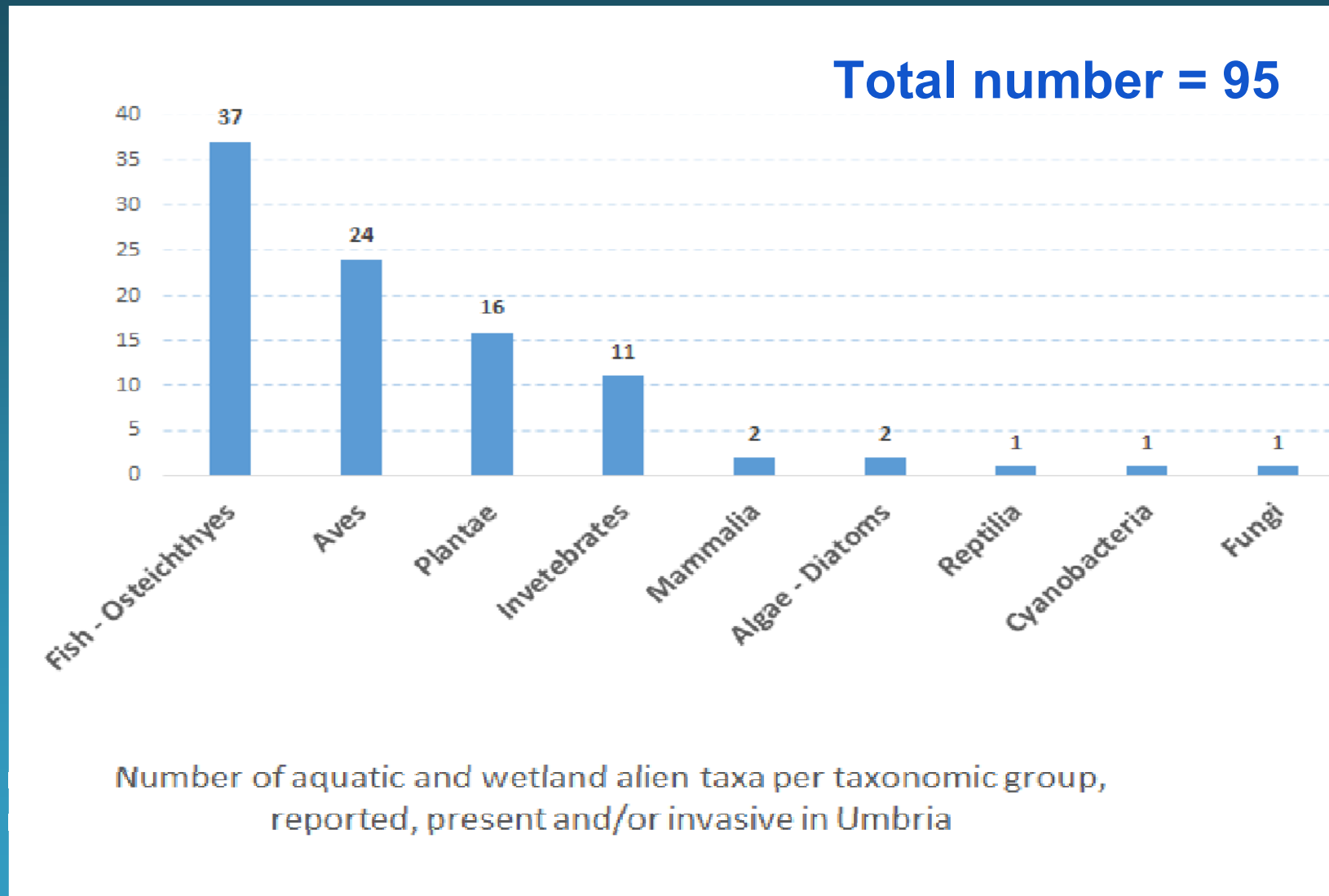
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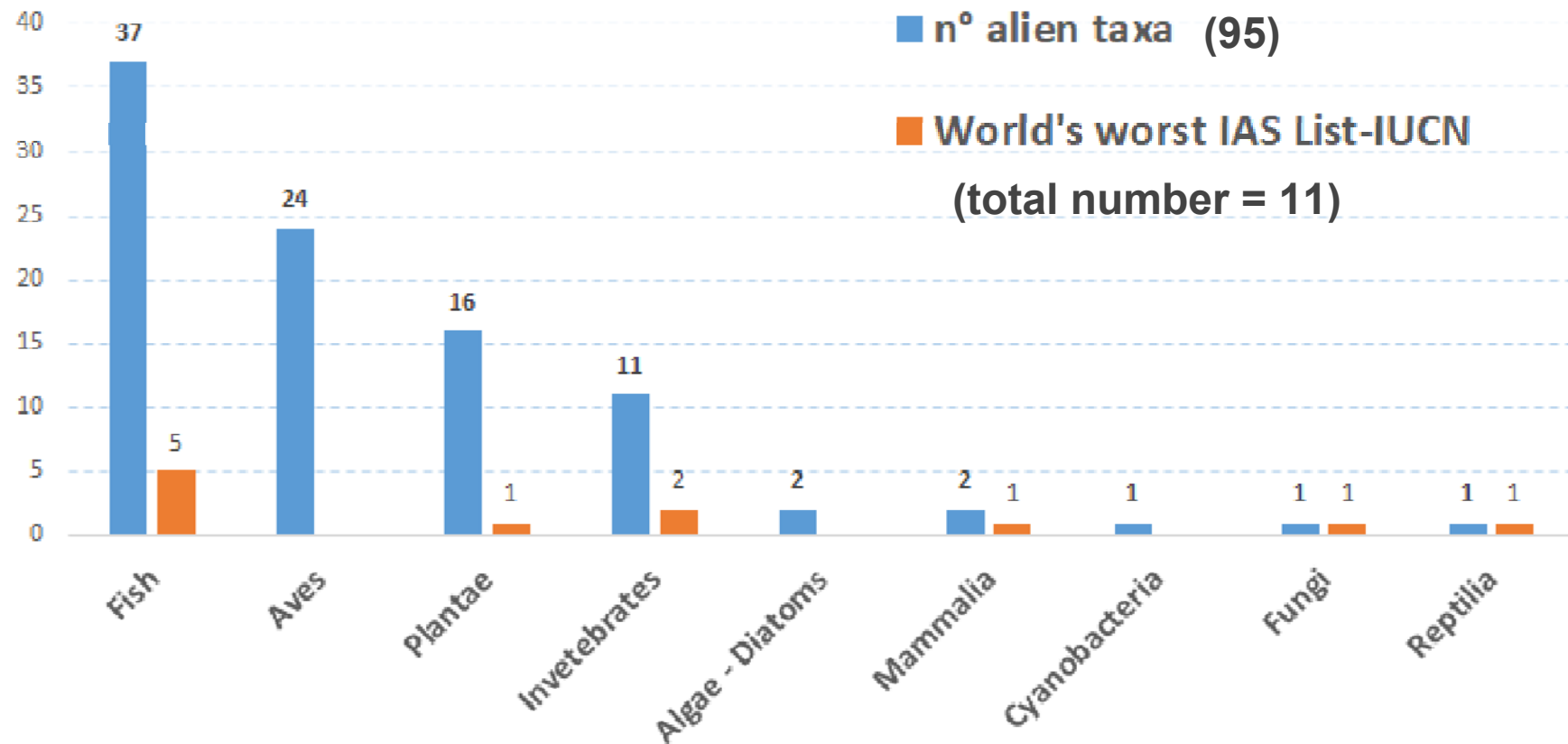
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# Characterization and diffusion of aquatic and wetland alien species in Umbria

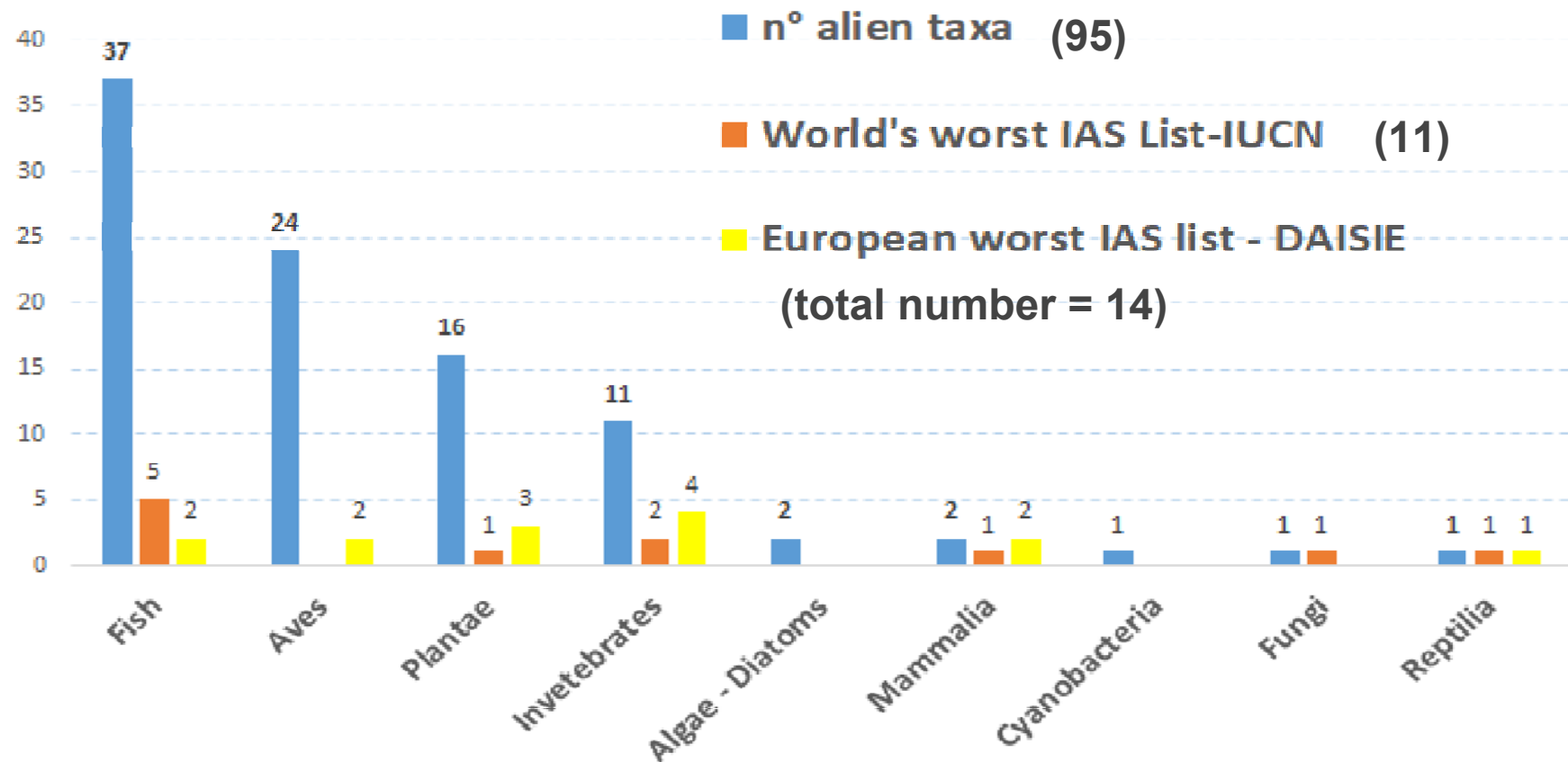


# Characterization and diffusion of aquatic and wetland alien species in Umbria



Number of aquatic and wetland alien taxa, per taxonomic group, present in the list of worst invasive alien species of the world (IUCN)

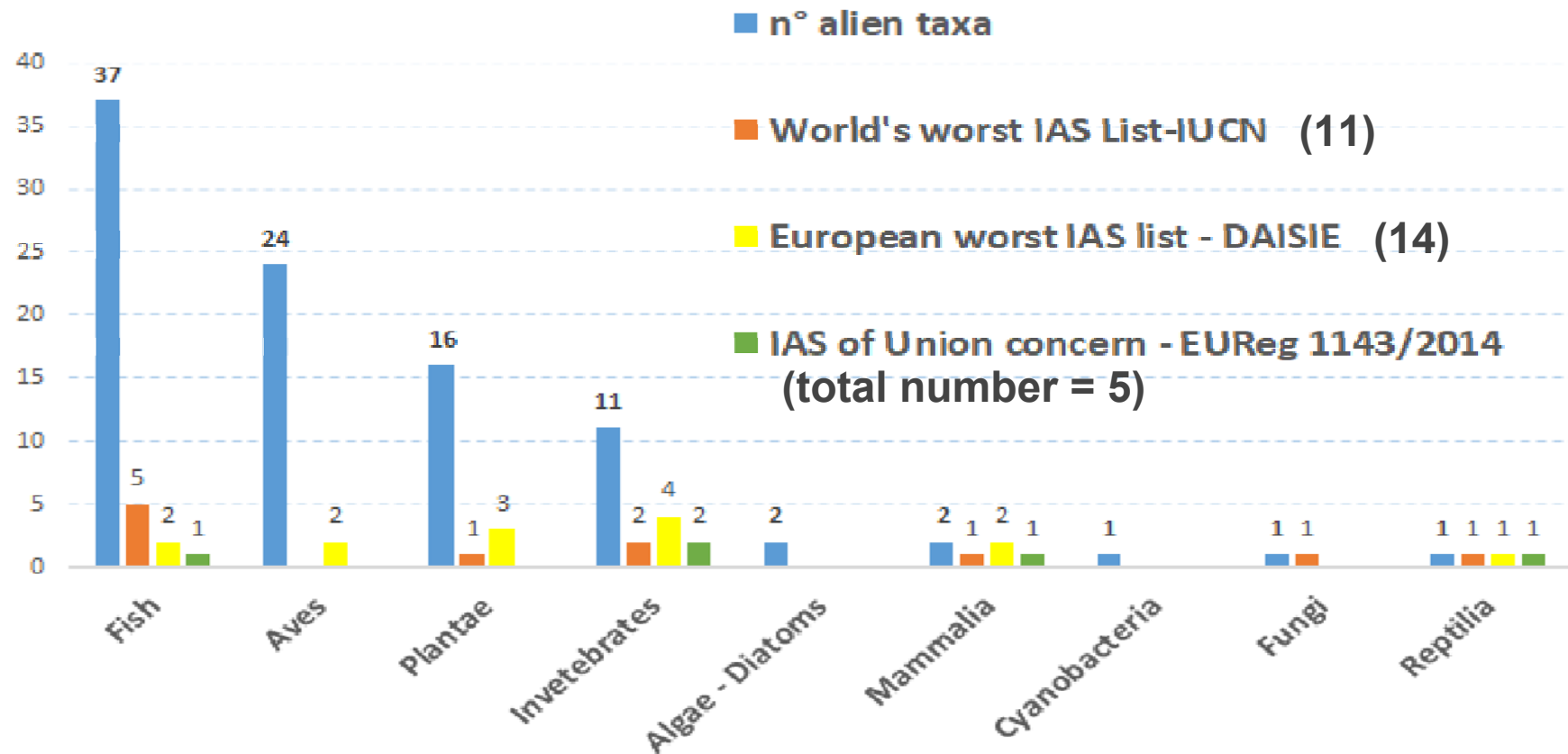
# Characterization and diffusion of aquatic and wetland alien species in Umbria



Number of aquatic and wetland alien taxa, per taxonomic group, present in the list of worst invasive alien species of the world (IUCN) and in the list of worst alien species in Europe (DAISIE)



# Characterization and diffusion of aquatic and wetland alien species in Umbria

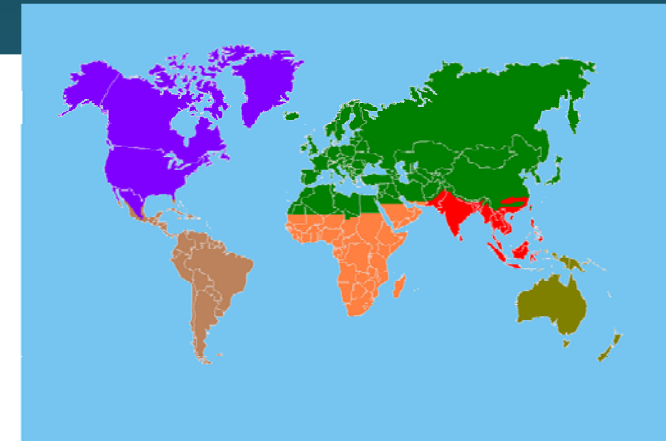
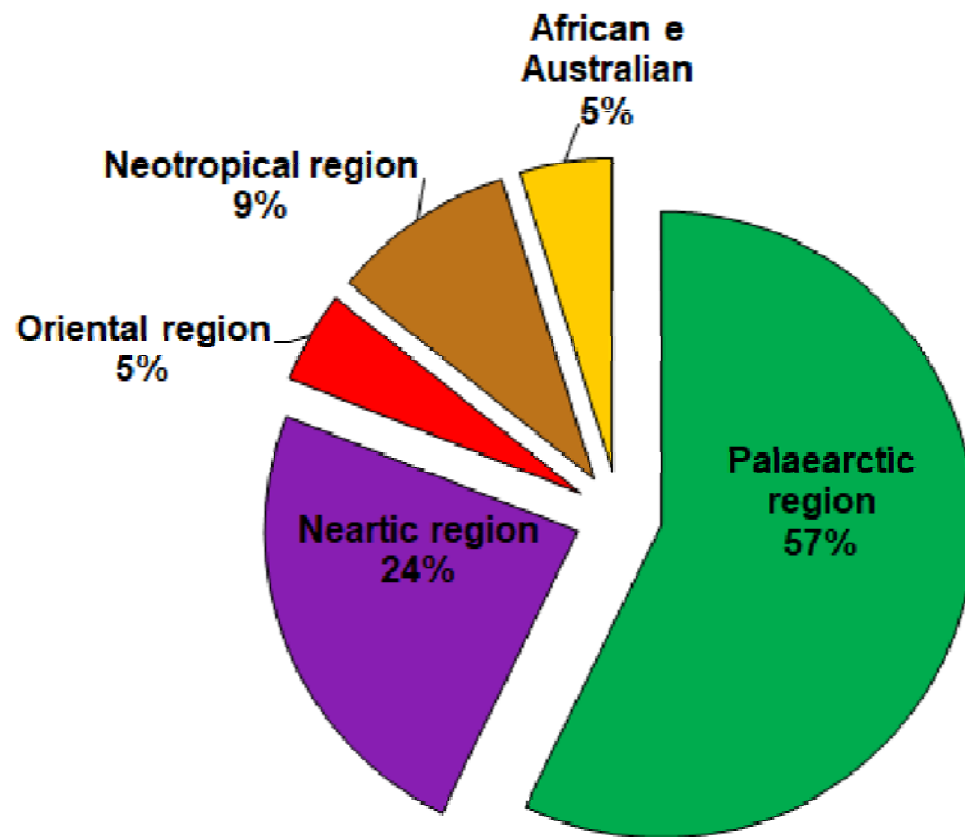


Number of aquatic and wetland alien taxa, per taxonomic group, present in the list of worst invasive alien species of the world (IUCN), in the list of worst alien species in Europe (DAISIE) and in the list of EU Regulations

# Characterization and diffusion of aquatic and wetland alien species in Umbria

**IAS = 21%**

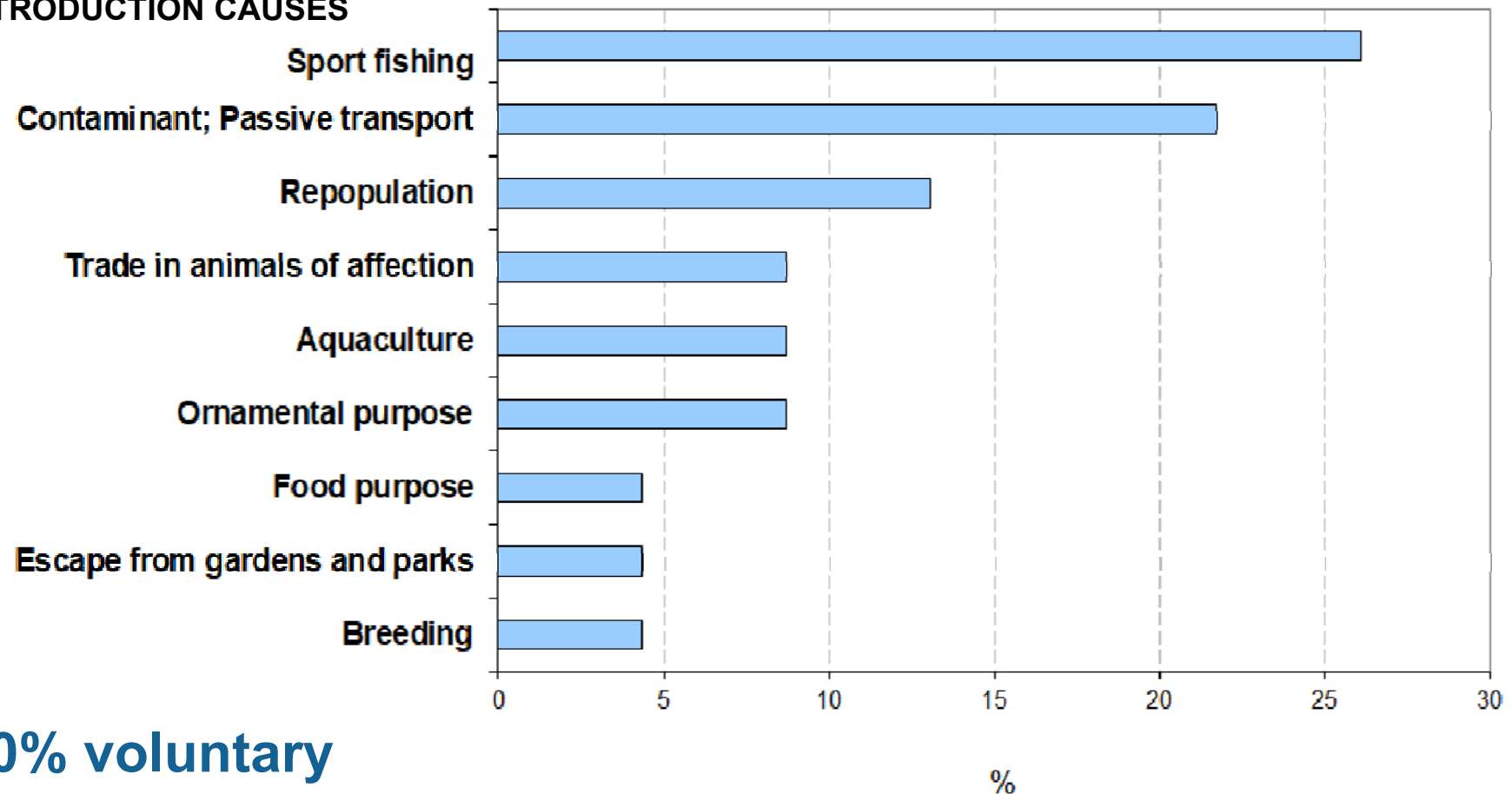
**Geographic region of origin**



- Palaeartic region
- Neartic region
- Oriental region
- Neotropical region
- African e Australian

# Characterization and diffusion of aquatic and wetland alien species in Umbria

## INTRODUCTION CAUSES



# Conclusions



- It is essential to guarantee monitoring and research activities
- The phenomenon of biological invasions, being strictly connected to human behavior, can not be dealt with only by legislative instruments
- It is essential to raise awareness on the issue of alien species, particularly in the internal waters of our territory, in order to contain the spread and prevent other introductions of invasive alien species
- It is essential that citizens and the whole society adopt more responsible behavior and help public bodies to identify new invasive alien species and to intervene when necessary



We cannot win this battle to save species and environments without forging an emotional bond between ourselves and nature as well - for we will not fight to save what we do not love.

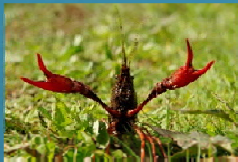
Non vinceremo mai la battaglia di preservare specie ed ecosistemi se non creiamo un legame emotivo tra l'uomo e la natura. Perché nessun uomo salverà mai quello che non ama.

Stephen Jay Gould



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# THANKS FOR THE ATTENTION!



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