



Project funded by  
EUROPEAN UNION



**Common borders. Common solutions.**

# **The most common alien invasive plant species of Danube Delta Biosphere Reserve territory**

**IASON Project Code: BSB-1121**

Covaliov Silviu, Mihai Doroftei, DDNI – Tulcea - Romania

**IASON Internațional Conference**

**02 - 04 June 2022**



**Common borders. Common solutions.**

## The most common

- Invasive species - naturalized plant species whose presence in another region than the one of origin is caused by man by intentional or accidental introduction and which by its presence threatens the habitats and natural species in that region. This type of species reproduces naturally through shoots, seeds, roots, stolons and stems, with a high potential for adaptation and spread.
- Adventive (alien) species - a species that has a low fidelity to the community in which it is located and which was accidentally introduced as a result of human activity, the distribution of the species exceeding natural barriers.



## Common borders. Common solutions.

The most important aspect of non-native species is how they adapt to new environmental conditions

- competes with or replaces vulnerable and rare species in their specific habitats;
- reduces or eliminates stenophyte plant species;
- disrupt the plant-animal relationship in the process of spreading seeds (in the case of zoocore plants);
- intervenes in the plant-insect pollination relationship (in the case of honey plants); reduces and eliminates native host plants for insects and other native wildlife;
- replaces native plant species in the trophic spectrum of animals;
- modifies the germination process of native tree and shrub species;
- reduces the amount of water, light, space and nutrients that is normally available to native species; changes the texture and chemical characteristics of the soil.



**Common borders. Common solutions.**

## Purpose of the study

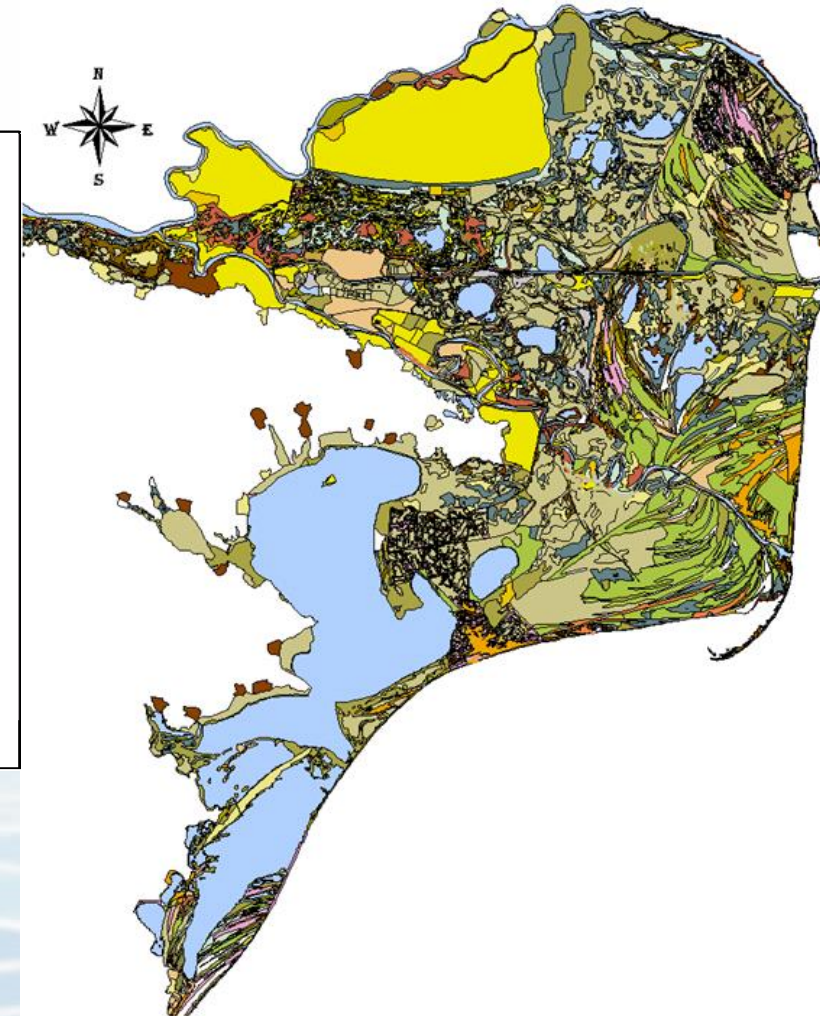
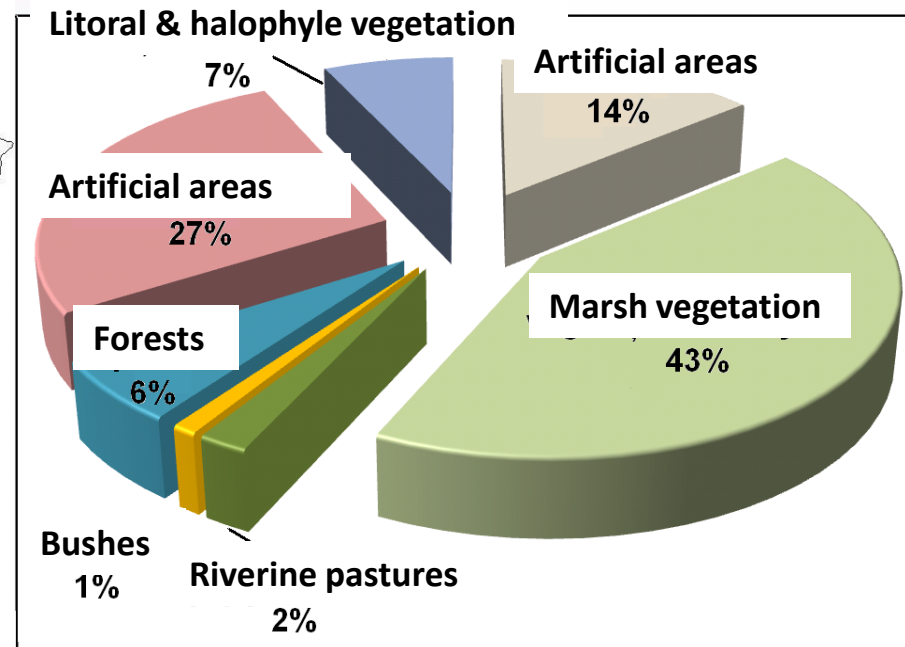
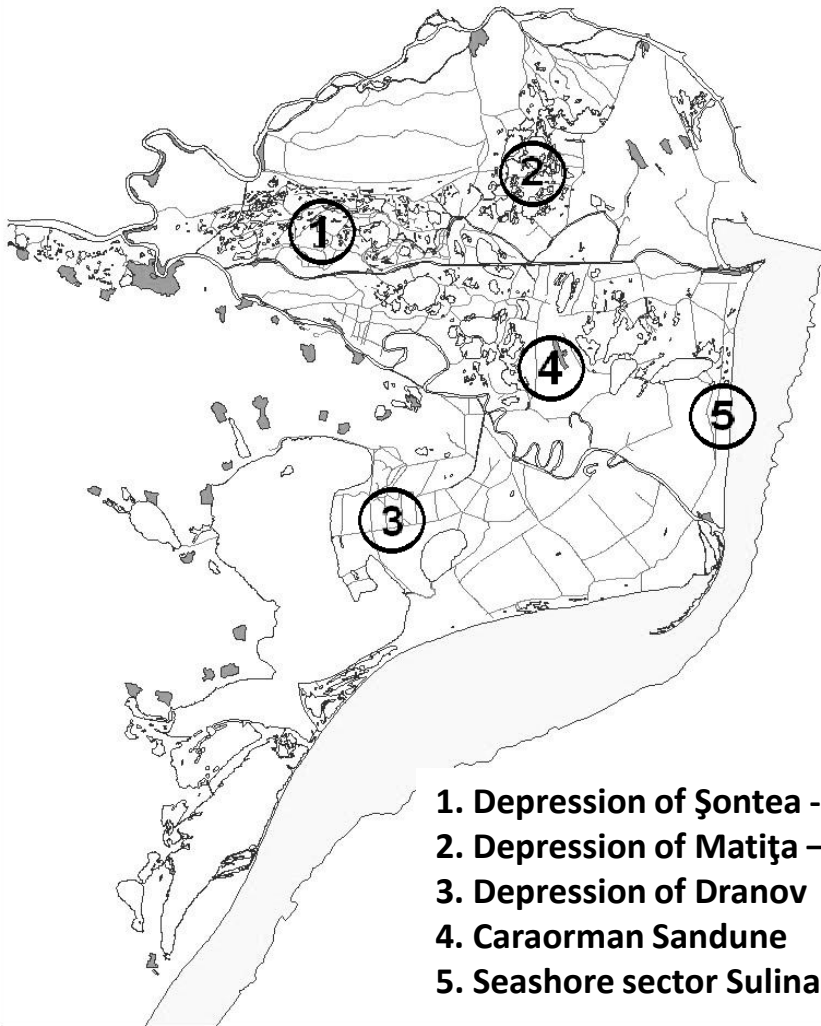
- Scientific support for completing data on the ecology of adventive plants;
- Mapping of the most common invasive plant species;
- Elaboration of the list of most common adventive plants species and of the black list (invasive species);
- Establishing the evolutionary trends of the adventive species based on phyto-population indices.
- Proposals of effective management practices



Project funded by  
EUROPEAN UNION



## Common borders. Common solutions.



1. Depression of Şontea - Fortuna
2. Depression of Matița – Merhei
3. Depression of Dranov
4. Caraorman Sandune
5. Seashore sector Sulina – Sfântu Gheorghe

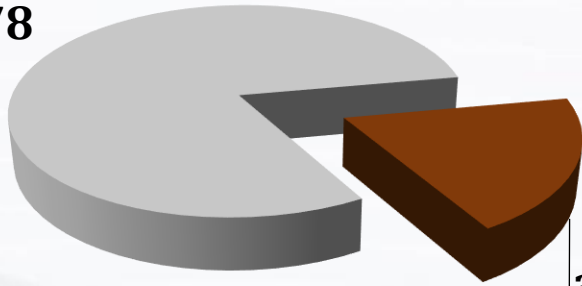


Project funded by  
EUROPEAN UNION



## Common borders. Common solutions.

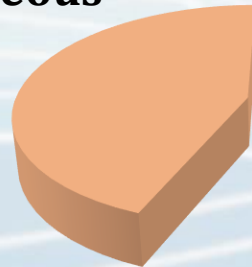
**native;  
478**



**alien;  
116**

- 1 - Şontea - Fortuna
- 2 - Dunăvăţ - Dranov
- 3 - Matîţa - Mehei
- 4 - Caraorman
- 5 - Cordon litoral

**Herbaceous  
51**



**Ligneous 65**

Vascular flora analyze : 594 species  
identified



Project funded by  
EUROPEAN UNION

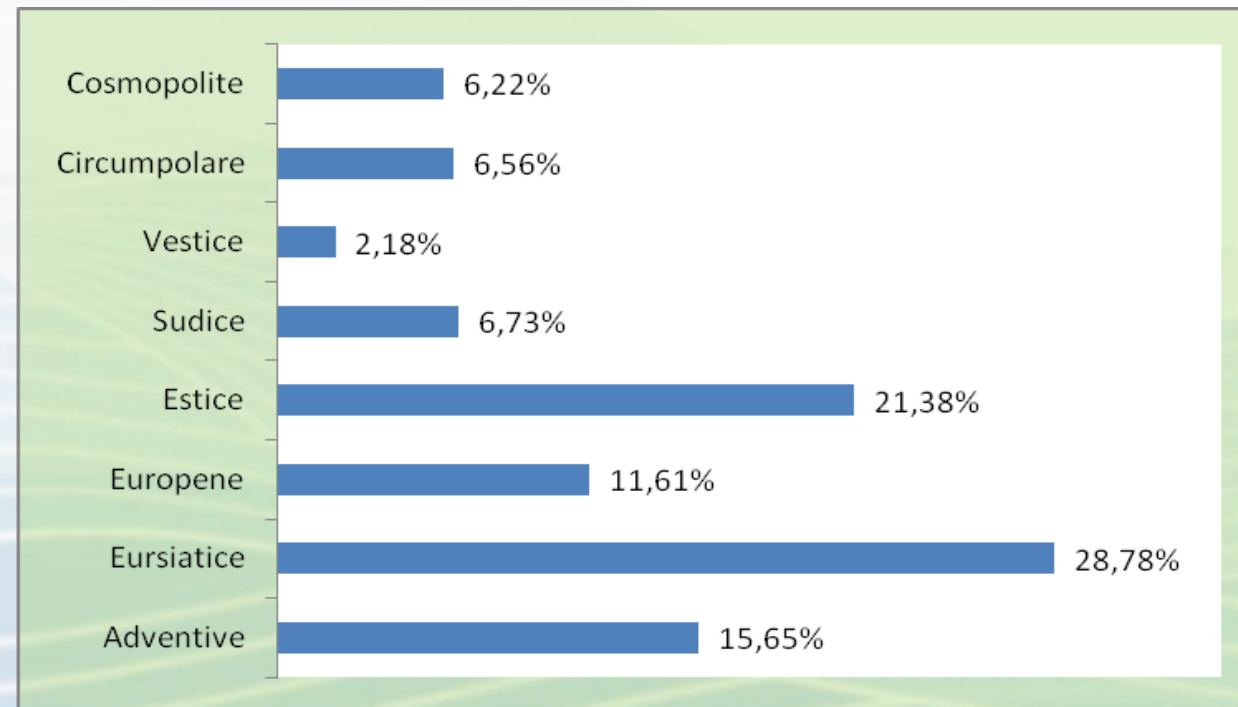


## Common borders. Common solutions.

Vascular flora analyze : geoelements

**116 de adventive species  
from wich**

**25 species invazive**



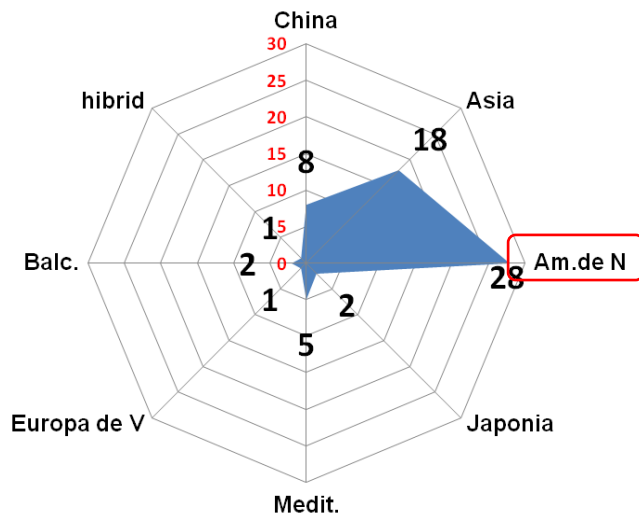
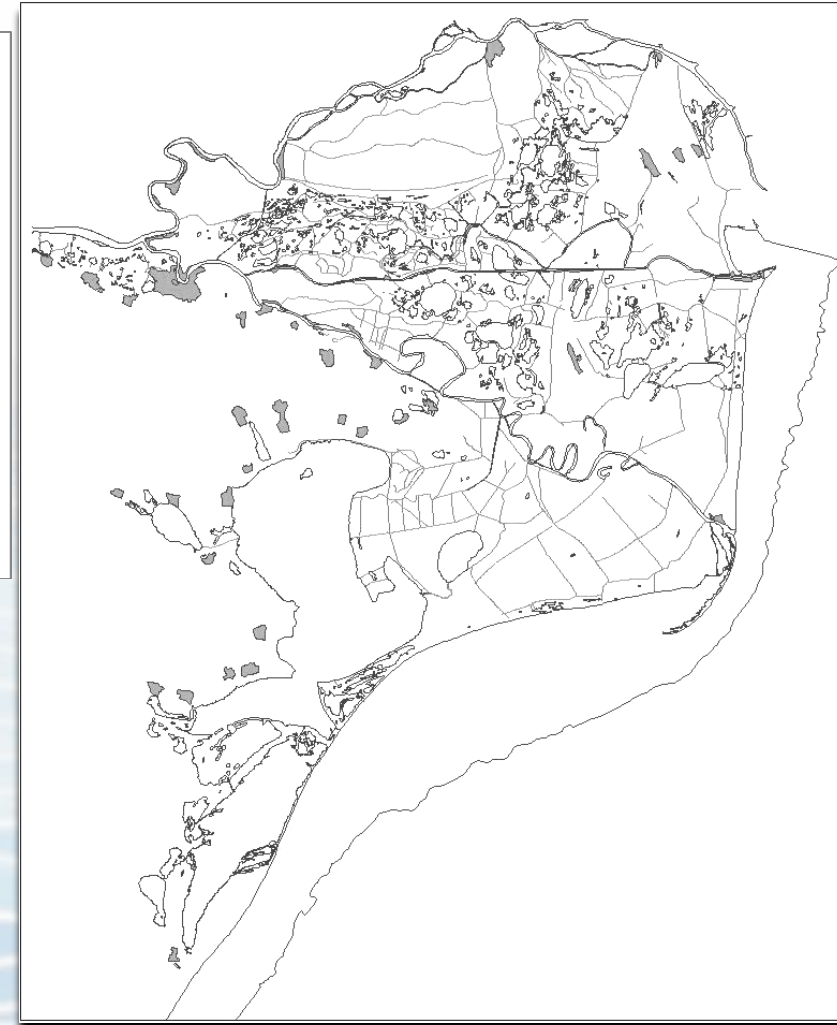
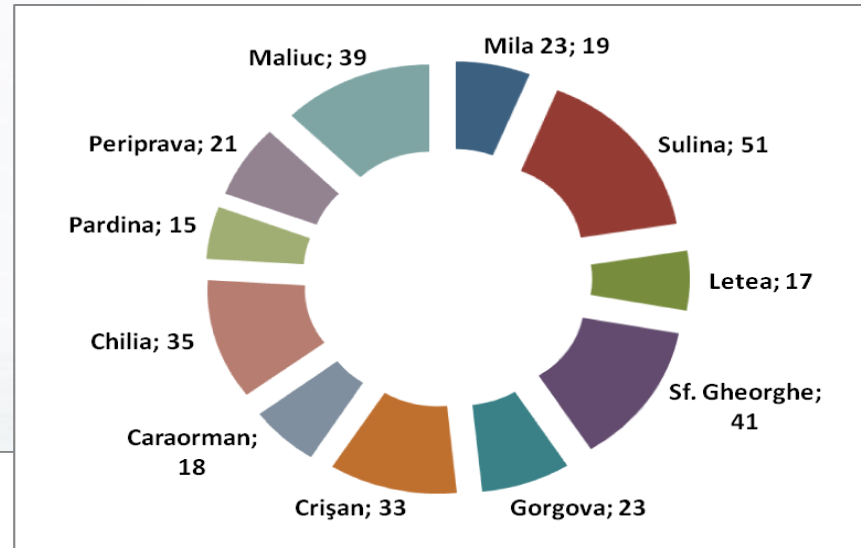


Project funded by  
EUROPEAN UNION



## Common borders. Common solutions.

Vascular flora analyze:  
65 species









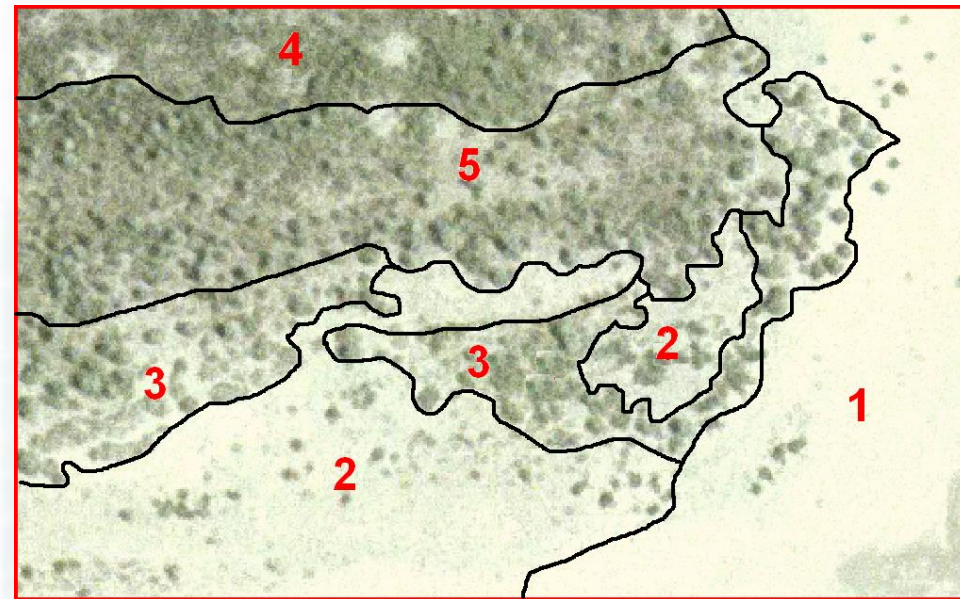
Project funded by  
EUROPEAN UNION



## Common borders. Common solutions.

Profil de vegetație zona Sf.Gheorghe:

- 1 - *Atripliceto hastatae* – *Cakiletum euxinae*;
- 2 - *Argusietum sibiricae*;
- 3 - *Calamagrostio-Tamaricetum ramosissimae*;
- 4 - *Juncetum acuti-maritimi*;
- 5 - *Calamagrostio epigei* – *Hippophaetum rhamnoides*



- 1,2... Asociații vegetale
- Loc. Sf.Gheorghe
- Zona investigată





**Common borders. Common solutions.**

## The list of invasive plant species in Danube Delta Biosphere Reserve

- On basis of reference literature and of Danube Delta National Institute for Research and Development Tulcea research database, the alien plant species present in Danube Delta have been selected. The present list includes 187 alien species, most of which are originary from Northern America and Asia.
- the species with the highest impact index (competitive ability index) have been extracted on the basis of ecological features



Project funded by  
EUROPEAN UNION



**Common borders. Common solutions.**

$$I_{\text{impact}} = \sqrt{(N_{ci} \times 100 / N)}, \text{ where:}$$

$I_{\text{impact}}$  - represents the competitive ability index of the invasive species;

$N_{ci}$  – represents the number of characteristics registered by the invasive species;

$N$  – represents the total number of characteristics.

impact index formula are confined between **1 (reduced impact)** and **10 (major impact)**



Project funded by  
EUROPEAN UNION



## Common borders. Common solutions.

The impact index of invasive species

<i>*Acer negundo</i>	<i>*Ailanthus altissima</i>	<i>*Amaranthus albus</i>	<i>*Amorpha fruticosa</i>	<i>**Azolla filiculoides</i>	<i>**Cuscuta campestris</i>	<i>*Conyza canadensis</i>	<i>**Elaeagnus angustifolia</i>	<i>*Elodea nuttallii</i>	<i>**Fraxinus pennsylvan.</i>	<i>**Gleditsia triacanthos</i>	<i>*Iva xanthifolia</i>	<i>*Lindernia dubia</i>	<i>*Lycium barbarum</i>	<i>**Morus alba</i>	<i>**Paspalum paspalodes</i>	<i>*Robinia pseudacacia</i>	<i>**Vallisneria spiralis</i>	<i>*Xanthium strumarium</i>	<i>**Xanthium spinosum</i>	<i>*Xanthium italicum</i>
7,52	8,16	8,16	9,12	7,74	7,74	8,16	8,16	8,16	7,30	7,74	8,16	8,16	8,56	7,95	8,16	8,94	7,74	8,56	8,56	8,56

Ligneous terrestrial species

Macrophyte species

Herbaceous terrestrial species

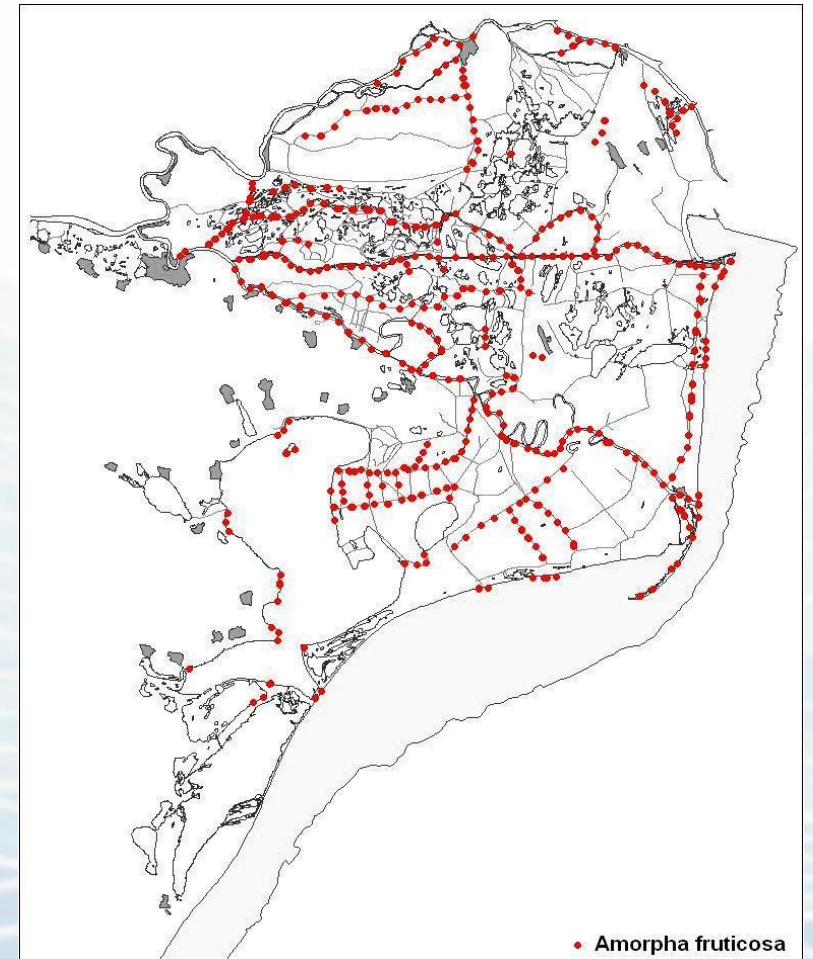


Project funded by  
EUROPEAN UNION



Common borders. Common solutions.

# *Amorpha fruticosa* in Danube Delta



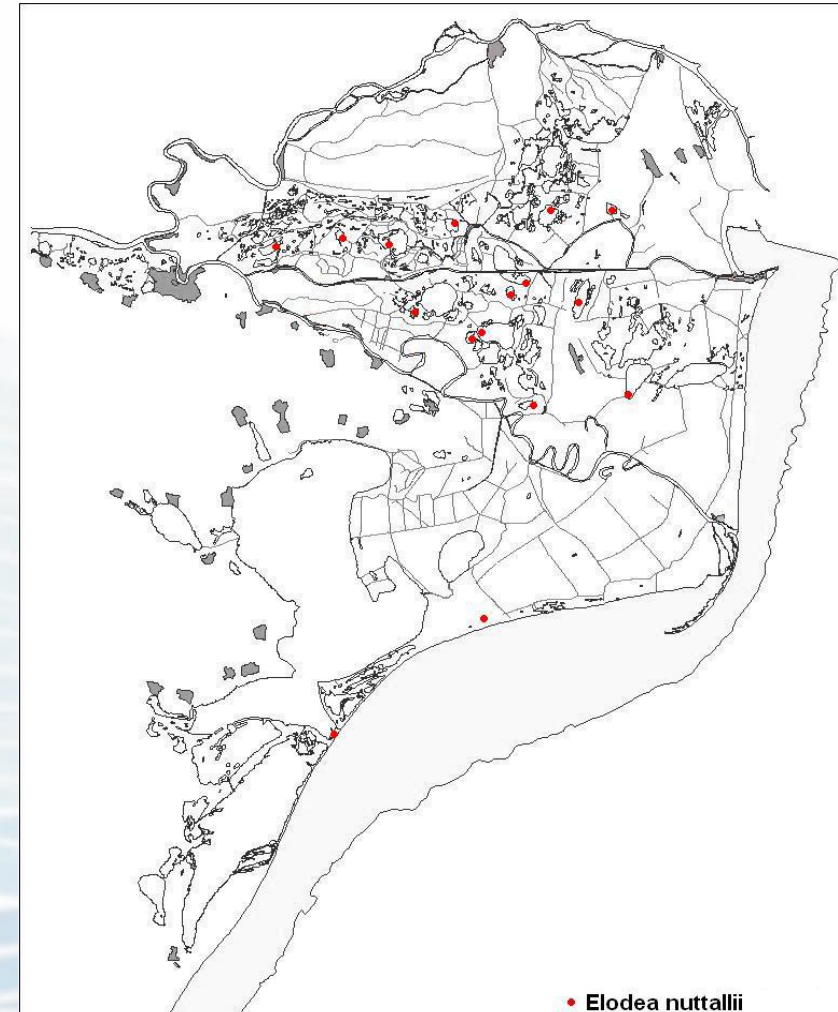


Project funded by  
EUROPEAN UNION



Common borders. Common solutions.

# *Elodea nuttallii* in Danube Delta



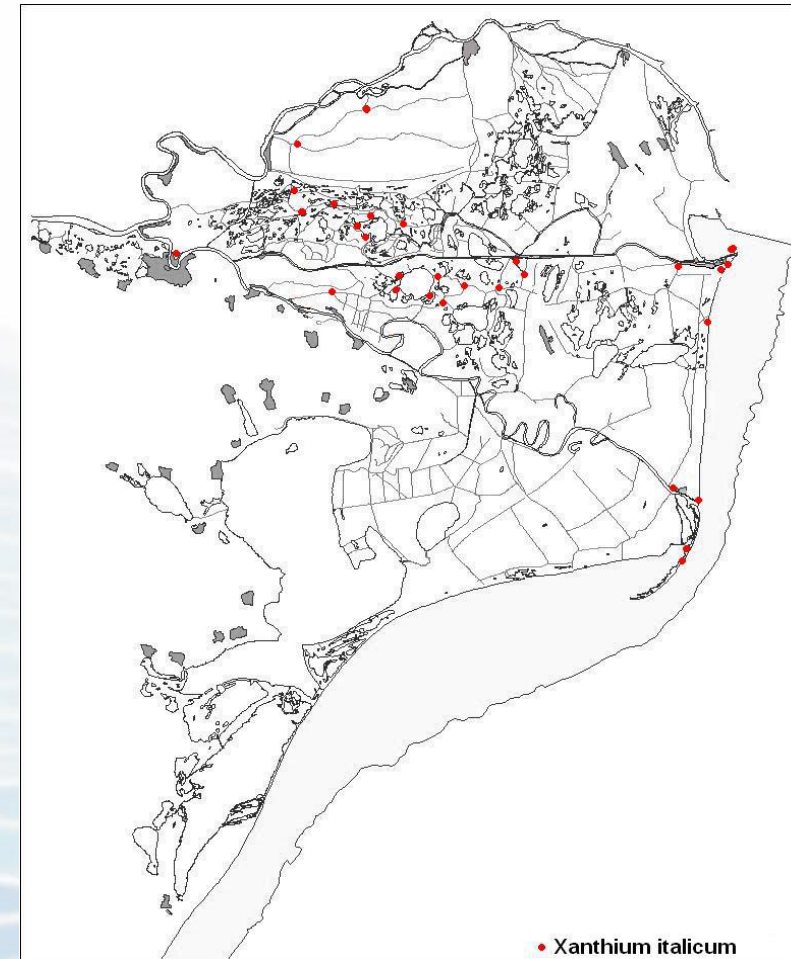


Project funded by  
EUROPEAN UNION



Common borders. Common solutions.

# *Xanthium italicum* in Danube Delta



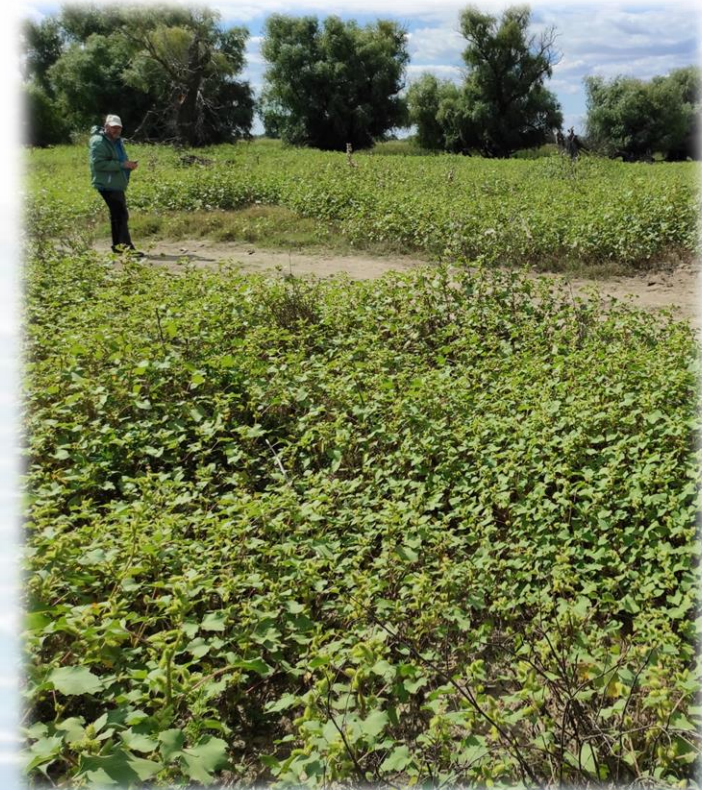




**Common borders. Common solutions.**

## The management of alien invasive alien species involves:

- the initial assessment of the situation,
- the process of identifying the species of highest priority for a management programme,
- detailed information on methods for eradication, containment, control, and mitigation for the various biological groups,
- an introduction to monitoring approaches,
- identification of major principles for projects, activities to secure resources,
- the importance of stakeholder commitment and involvement, and
- training in control methods.





Common borders. Common solutions.

## The initial assessment of the situation

- Vectors
- Spreading ways
- Species behaviour





Common borders. Common solutions.

## The main strategies for dealing with established invasive alien species

- **Prevention,**
- Eradication,
- Containment,
- Control and mitigation.



**Common borders. Common solutions.**

## Eradication

- mechanical control, e.g. hand-picking and hand-pulling of weeds;
- chemical control;
- habitat management, e.g. grazing and prescribed burning.

Each single situation needs to be evaluated to find the best method in that area under the given circumstances.





Common borders. Common solutions.

## Containment

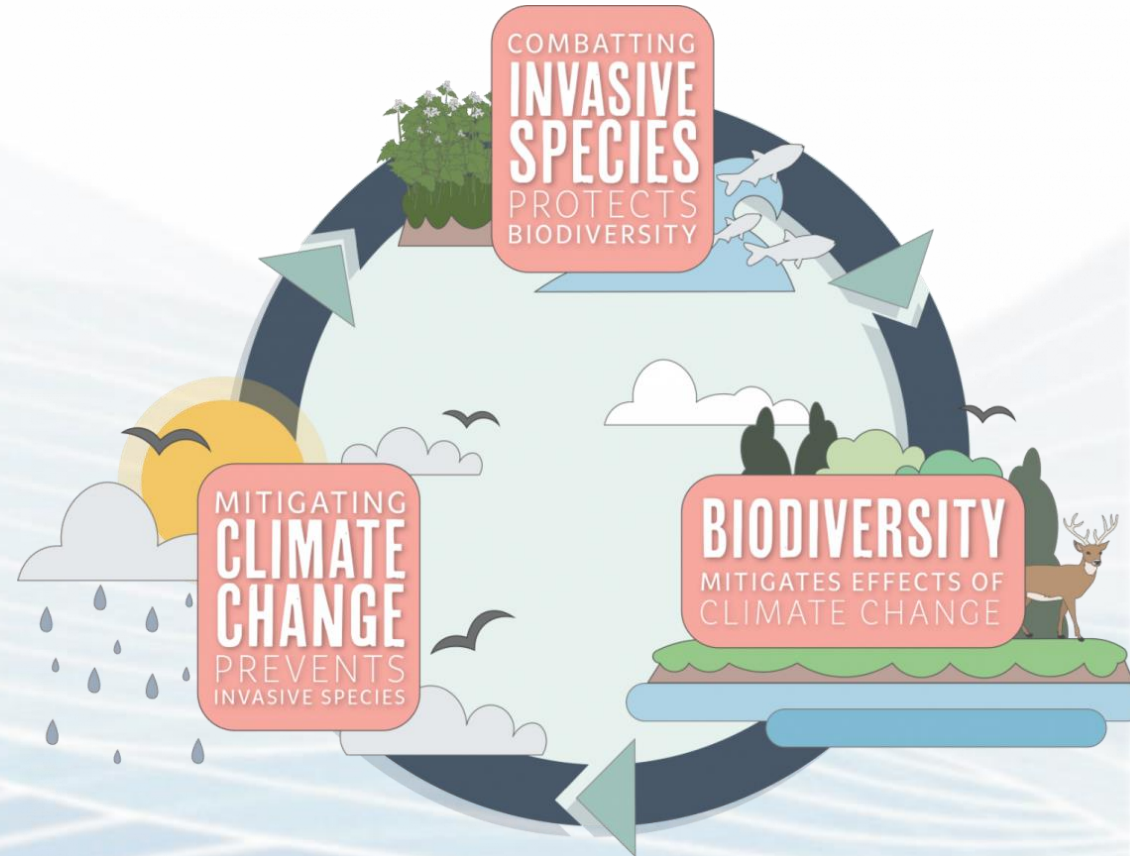
- The aim is to restrict the spread of an alien species and to contain the population in a defined geographical range
- Containment programmes also need to be designed with clearly defined goals:
  - barriers beyond which the invasive species should not spread,
  - habitats that are not to be colonized and invaded, etc.



Common borders. Common solutions.

## Control and mitigation

- The control of non-indigenous invasive species aims for the long-term reduction in density and abundance to below a pre-set acceptable **threshold**.
- The harm caused by the species under this threshold is considered acceptable with regard to damage to biodiversity and economy





Programme funded by  
EUROPEAN UNION

Common borders. Common solutions.



# Make it count for the region!



Website: [iasonbsb.eu](http://iasonbsb.eu)

<https://www.facebook.com/iason.bsb>





Project funded by  
EUROPEAN UNION



**Common borders. Common solutions.**

**Thanks for your attention**