

Carpathian List of Invasive Alien Species

(guideline)

Introduction

Expansion of natural range of various organisms has always taken place, but the speed at which this happens dramatically increases and is of growing concern. A great number of species have already achieved distribution areas they would never have reached without help of humans (Carlton 1999). The introduction of non-native species has been considered the second greatest threat to biological diversity. Many of introduced plant and animal species are beneficial for humans. However, some of them are harmful and may have significant negative impacts on native biodiversity, economy and even human health. Globalisation processes have created new pathways for the introduction of non-native species to Europe including the Carpathian region. Complete lists of alien flora and fauna or in particular lists of invasive alien species are a helpful tool to address invasive alien species issues on national or regional level. Therefore, in the last decades detailed catalogues of alien flora or fauna or various lists of invasive alien species causing impacts on biodiversity, economic activities and human health have been produced from local to global level. One of the challenges of the project (BIOREGIO) is to give the picture of the status of alien species in the Carpathian region and to generate the first list of invasive alien species enabling thus to prepare the starting point for the future studies not only on e. g. trends in invasive alien species but also for their management and mitigation of impacts or regional/national policy.

Methodology and Terminology

For the purpose of compiling the Carpathian List of Invasive Alien Species (IAS) there is a proposal to use flora and fauna databases or catalogues or lists of alien species or lists of IAS already existing in the project countries. As the available data vary from country to country involved, there is an option to compile a country list just for purpose of Carpathian List of IAS.

In order to avoid misunderstandings, there is a proposal to follow a few general principles:

- a) Respect the borders of the Carpathian region as outlined in the map used in previous projects and in the Carpathian Biodiversity Information System <http://www.carpat.es.org/cbis/orogs.html> with orographical units (309).
- b) For species evaluation use the orographical units (309) within the Carpathian region as outlined in the map above.
- c) For names of plant and animal species follow the names used in the DAISIE database
- d) For alien species or IAS use definitions agreed by the Conference of the Parties to the Convention on Biological Diversity (CBD) for the purpose of the CBD *Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species* (annexed to CBD Decision VI/23) as follows:
 - **alien species**: a species, subspecies or lower taxon, introduced outside its natural past or present distribution, includes any part, gametes, seeds, eggs or propagules of such species that might survive and subsequently reproduce
 - **invasive alien species**: an alien species whose introduction and/or spread threaten biological diversity
 - **introduction**: the movement by human agency, indirect or direct, of an alien species outside of its natural range (past or present). This movement can be either within a country or between countries or areas beyond national jurisdiction.

- **intentional introduction:** the deliberate movement and/or release by human of an alien species outside its natural range
- **unintentional introduction:** all other introductions which are not intentional

For listing a particular species the assessment of the species should be done and according to Pyšek et al. (2004) the assessment should take into account its taxonomic identity, time of immigration and invasion status. When defining the status of a species in a region/country, it is necessary to take into account:

- a) origin status - whether the taxon is native or alien to the region/country
- b) residence status – when was the taxon introduced and what is its position in the invasion process
- c) invasion status – what is the degree of its naturalization and possible invasion

Origin status (native/alien)

A species is considered as native to a region/country, if the species arrived in the territory before the beginning of the Neolithic era or came to a region/country afterwards through methods entirely independent of human activity (Webb 1985). Hybrid between native and alien species is considered as alien species.

Residence status

Time of the arrival of a species in the territory:

- *archaeophytes* – introduced before the discovery of America, year 1492 (approx. 1500 A.D.)
- *neophytes* – introduced after that date

Invasion status

Stage in naturalization/invasion process.

For plant species scheme according to Richardson et al. (2000) can be used:

- *casual alien plant species*: a species that may flourish and reproduce occasionally in an area, but which do not form- self-replacing populations, and which rely on repeated introduction for their persistence;
- *naturalized alien plant species*: a species that reproduces consistently and sustain populations over more than one life cycle without direct interventions by humans (or in spite of human intervention); it often recruit offspring freely, usually close to adult plant, and not necessarily invasive natural, semi-natural or human-made ecosystems;
- *invasive alien plant species*: a naturalized species that produces reproductive offspring, often in very large numbers, at considerable distances from parent plant (approx. scale: more than 100 m in 100 years for taxa spreading by seeds and other propagules; less than 6 m in 3 years for taxa spreading by roots, rhizomes, stolons, or creeping stems), and thus have the potential to spread over a considerable area.

For animal species the scheme as follows can be used:

- *not established alien animal species* - a species that has not formed self-reproducing populations (but it is found as a casual or incidental species);
- *rare alien animal species* - a species that has a few sites where it is found in the country/region;
- *local alien animal species* – a species that is locally abundant, many individuals in some areas of the country/region;
- *common alien animal species* – a species that has many sites in the country/region;
- *very common alien animal species* – a species that has any sites and many individuals.

There is also a proposal to have for animal species the same categories as used in the assessment of plant species. So the combined definitions for animal species could be used as follows:

- *casual alien animal species*: not established alien animal species
- *naturalized alien animal species*: rare and local alien animal species
- *invasive alien animal species*: common and very common alien animal species

In case that:

a plant or animal alien species has not been found in the country/region yet, use the category

„**Not found** „

- no information is available at the moment, use the category „ **Not known**“.

National List of IAS in the Carpathian region

Each project country provides the national list of IAS within the Carpathian region. The list should be compiled according to the main systematic groups as follows:

Vascular plants

Non-vascular plants (the more detailed division, e.g. Bryophytes, Lichens etc. could be taken into account, however, depends on data availability)

Vertebrates:

- Mammals
- Birds
- Amphibians
- Reptiles
- Fishes

Invertebrates: (the more detailed division, e.g. Molluscs, Arthropods etc. could be taken into account, however, depends on data availability)

Listed species should be supported by the fact sheet/database/distribution map (GIS layer) with basic information as follows:

1.

Name of the species: a) scientific (Latin)

b) synonyms

Higher taxon – optional

2.

Introduction: a) year of introduction in to the country (if known)

b) mean of introduction (if known)

3.

Ecology/Habitats

Identify main types of habitats preferably occupied by the species within of the country (its Carpathian part).

For habitats preferences use EUNIS Habitats Classification Scheme (list of habitats is attached to the on-line form).

4.

Distribution

Distribution map using orographical units of the country (its Carpathian part) or points within the units.

Distribution map is supported by:

- a) general information (description) of the population of the species within the county (its Carpathian part);
- b) general information (description) of distribution of the species within the county (its Carpathian part) and detailed information on the species occurrence in orographical units.

5.

Impacts/Problems

- focus on impacts on biodiversity
- effects on human health or economy – optional

6.

Mitigation of impacts

Describe the main actions/measures taken to mitigate the impacts of the species.

7.

Additional information

Any relevant and useful information.

8.

References (Bibliography)

Carpathian List of IAS

From the national lists of IAS provided by each project country a table summarizing the data will be compiled. So each species from the national lists will be included into the table and first of all its status will be completed as indicated in the table below. The expert team will evaluate each listed species as a candidate species for the Carpathian List of IAS.

Proposed criteria for listing a candidate species: number of countries/orographical units and area occupied by the species as well as impacts on biodiversity (human health/economy - optional) should be taken into account.

Example of evaluation:

If the evaluated species occurs in four from seven project countries and/or is present in more than 150 orographical units (from 309 units) and covers/threatens more than one third of the area of the Carpathian region, the candidate species should be included into the Carpathian List of IAS.

Table (given data are just for illustration)

Country/ Species	Czech Rep.	Hunga ry	Poland	Roma nia	Serbia	Slova kia	Ukraine	Area covered in km ²	Com ment for listing
<i>Heracleum mantegazzianum</i>	inv	inv	inv	cas	not present	inv	nat	2000	yes

Abbreviations: inv – invasive species
 nat – naturalized species
 cas – casual species

The final list should contain just scientific names of listed species in main (and agreed) taxonomic groups. Use of common names is optional, however, it is recommended as the Carpathian List of IAS should be used for communication with general public too.

The Carpathian List of IAS should be also supported by the fact sheet/database/distribution map (GIS layer) with basic information as follows:

1.

Name of the species: a) scientific (Latin)
 b) common name (English)
 c) common name (national)
 d) synonyms

Higher taxon – optional

2.

Introduction: a) first year of introduction in to the Carpathian region (if known)
 b) mean of introduction (if known)

3.

Ecology/Habitats

Main types of habitats preferably occupied by the species within the Carpathian region. For habitats preferences use EUNIS Habitats Classification Scheme (list of habitats is attached to the on-line form).

4.

Distribution

Distribution map using orographical units of the country or points within the units.

Distribution map is supported by:

- a) general information (description) of the population of the species within the Carpathian region
- b) general information (description) of distribution of the species within the Carpathian region and detailed information on the species occurrence in orographical units.

5.

Impacts/Problems

- focus on impacts on biodiversity
- effects on human health or economy – optional

6.

Mitigation of impacts

Describe the main actions/measures taken to mitigate the impacts of the species.

7.

Additional information

Any relevant and useful information.

8.

References (Bibliography)

References:

Carlton J.T., 1999: Invasions in the sea: six centuries of reorganizing the earth's marine life. In: Sanlund O.T., Schei P.J. and Viken A. (eds.): *Invasive Species and Biodiversity Management*. Kluwer Academic Publishers. Printed in the Netherlands. Pp. 195 – 212.

Pyšek P., Richardson D. M., Rejmánek M., Webster G. L., Williamson M. & Kirschner J., 2004: Alien plants in checklists and floras: towards better communication between taxonomists and ecologists. – *Taxon* 53: 131–143.

Richardson D. M., Pyšek P., Rejmánek M., Barbour M. G., Panetta F. D. & West C. J., 2001: Naturalization and invasion of alien plants: concepts and definition. *Divers. Distrib.* 6: 93–107.

Taschenkevich, 1998: *Flora of the Carpathians*

Webb D. A., 1985: What are the criteria for presuming native status? – *Watsonia* 15: 231–236.

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