



Invasive Alien Species In Hungary

NATIONAL ECOLOGICAL NETWORK NO. 6





Foreword

The concept and definition of invasive species are known not only to biologists. But what exactly do we mean by this term?

Invasive alien species (IAS) are species introduced deliberately or unintentionally outside their natural habitats where they have the ability to establish themselves, invade, outcompete natives and take over the new environment. They are widespread in the world and are found in all categories of living organisms and all types of ecosystems. They are known to affect biological diversity whether within or outside protected areas and influence ecosystems, natural habitats and surrounding populations. They can cause significant irreversible environmental and socio-economic damages at the genetic, species and ecosystem levels.

Their spreading, multiplication and integration into previously unaffected habitats are facilitated by international trade and healthily developing tourism through relatively more open borders. To a degree varying species by species, the distribution is probably also affected by global or local climate changes and intentional introductions have also occurred.

Nearly every geographical region fights against its own invasive species, a number of which are problematic to several regions due to their wider tolerance. Naturally, each country is affected or threatened in a different way. The level of activity, the magnitude of amount invested in research on and measures against invasive species, the inclination of the government and the

sensibility of the society also vary country by country.

European countries have noticed the deficiencies and the threats. In certain European countries, for example in the United Kingdom and in Hungary, projects have been launched and the classification and list of invasive species have been precisely determined. In numerous countries, however, there is only scattered research, and classification is often based on subjective factors.

Hungary provides high priority to measures against the invasion of Common Ragweed (*Ambrosia artemisiifolia*), which becomes more and more threatening even to human health. The total area covered by this weed is estimated around 360 000 ha, a figure increasing by about 6% every year. Approximately 2.5–3 million people are

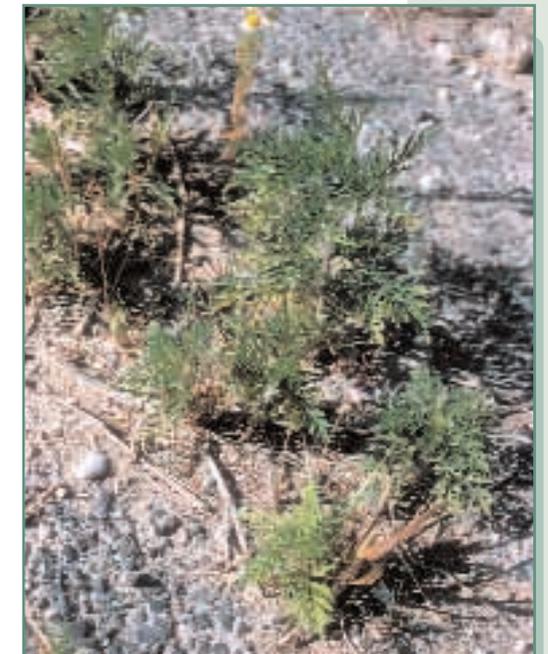


Photo 2: *Ambrosia artemisiifolia*

particularly sensitive to the pollen of this plant. Restricting and eradicating it is not just a matter of financing: land protection and plant protection regulations and their enforcement involve the whole society in the issue.

According to a 1998 survey, 20.6% of the protected grasslands in Hungary, that is roughly 44 000 ha have been infected with invasive plant species, such as the Giant and Canadian Golden Rod (*Solidago gigantea* and *S. canadensis*). The estimated cost of their eradication exceeds one billion Hungarian Forints. A new assessment and eradication project is just about to be launched.

There is great necessity to speak about invasive alien species, their ever more vigorous expansion and about the necessity of international co-operation unhindered by political boundaries.

It is highly necessary to speak about this subject at the time of establishing the Pan-European Ecological Network and when the importance of transboundary protected areas gains general recognition. Perhaps, while putting “open borders” and the renewal of Europe into the limelight, not enough attention is devoted to invasive alien species.



Photo 3: Mismanaged rural area overrun by invasive species

Present state

The invasion of mainly exotic plant and animal species has become increasingly important during the last decade and has raised public attention. Damage to building property, damage to forestry, congestion of navigable waterways, allergenic effect and impacts of certain species tend to highlight problems of invasive alien species to the public.

However, invasion of alien species does not merely influence the society and economic sector but has major impacts on biological diversity and nature conservation. Invasive alien species are now acknowledged as one of the major threats to biodiversity, together with habitat loss and fragmentation.

Different terms are used for alien species in general (non-indigenous, non-native, exotic, foreign, new) and for the subset that cause damage (pest, weed, harmful, injurious, invasive, environmentally

dangerous). There are marked differences in the use of terms in different sectors. Sanitary and phytosanitary instruments use such terminology as “pest” and “weed” terminology, backed by clear definitions, and do not distinguish by source or origin: this means, that they also cover native pests. The International Plant Protection Convention (IPPC) uses the term “quarantine pest” to distinguish by source and by level of damage. Multilateral environmental agreement requirements usually refer to “alien” or “exotic” species (almost never defined) in combination with harm/invasiveness criteria to identify those species that should be subject to controls. This generally excludes native species that become invasive.

Updated definitions adopted by the sixth meeting of the Conference of the Parties (COP) of the Convention on Biological Diversity (CBD) (UNEP/CBD/COP/6/18/Add.1):

“Alien” or “alien species” refers to a species, subspecies or lower taxon, introduced outside its normal past or present normal distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce.

“Invasive alien species” refers to alien species whose introduction and spread threaten ecosystems, habitats with economic or environmental harm.

In addition to the threats to biodiversity, the direct costs of IAS are immense. It is difficult to estimate precisely the economic losses caused by biological invasions. They include the impact of weeds on crop production, the increased costs of control,

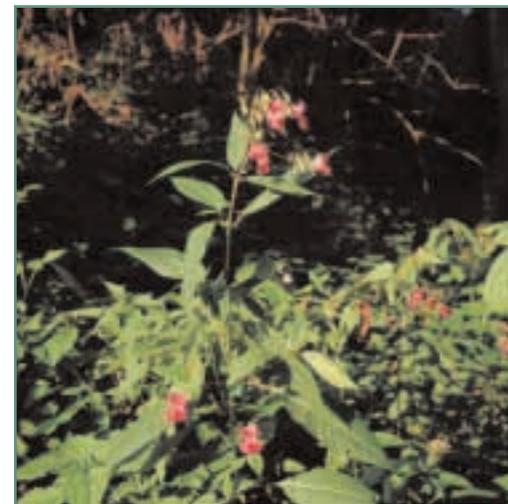


Photo 4: *Impatiens grandulifera*

the decreased water supply, the management costs of reducing the alterations of protected areas, the impact of introduced pathogens affecting wildlife and public health, and the impact of marine organisms transported by ships (mainly ballast water and hull-fouling).

The need to prevent unwanted introductions of alien species and to mitigate the impacts of biological invasions, has been repeatedly addressed at international and regional levels. However, widespread concern about the threats posed by biological invasions, and general recognition of the urgent need to define and implement actions to reduce these threats, are faced with several obstacles.

The complex scientific, technical and political aspects pose main difficulties. These include the very diverse sources of invasions, pathways and modes of entry, the economic importance of many intentional introductions, the human

dimension of alien species introductions, the inadequate methods to detect and control new invasions, and their public acceptability.

In order to deal with biological invasions, it is fundamental to address very different aspects, including international trade regulations, control during transport, border controls and quarantine, detection of new propagules and public perception of control methods. A holistic approach is this needed, based on greater awareness of the public and decision-makers, prevention of unwanted introductions and, where prevention fails, eradication when feasible and desirable or containment and effective control of new IAS.

This approach requires a framework of biosecurity policies, actions and clear allocation of roles and responsibilities. The problem of IAS is a cross-cutting issue, which requires co-ordination and commitment of several different sectors,

close co-operation between ministries with different mandates and international co-ordination of relevant efforts and strategies. In practice, however, the generally limited public and political awareness of the IAS threat often leads to inadequate participation and political commitment.



Photo 5: Aster species are also listed at Annex I.

To manage the biological invasion, some countries and some regions have begun to implement comprehensive bio-security policies, managing in some cases markedly to reduce threats posed by IAS. In contrast, Europe lacks a regional strategy and common policy on IAS. European States are required to address the invasive alien species issue under several international instruments. The main aim is to prevent or minimise biological diversity loss caused by invasive alien species in Europe through the development and implementation of a co-ordinated European strategy.

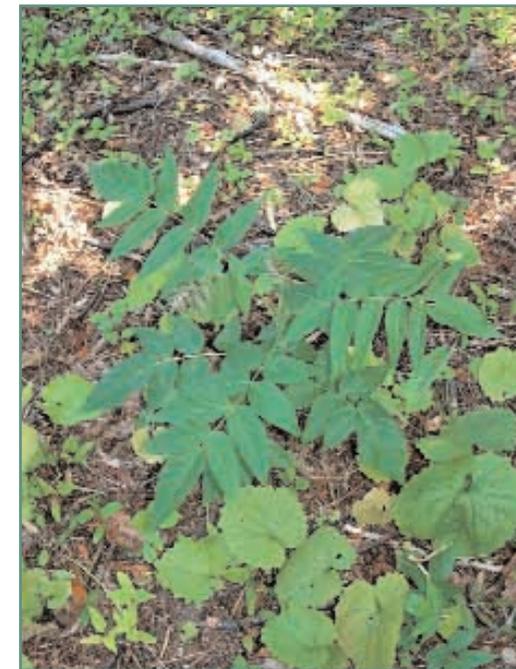


Photo 6: Ailanthus altissima

International Actions: Global level

Recognising the problem, several international conventions, governmental and non-governmental organisations deal in some sort with the biodiversity loss caused by alien species.

At the 7th meeting of the Conference of the Contracting Parties to the Convention on Wetlands (Ramsar Convention) invasive species and their impacts on wetlands were among the most important questions.

At the 17th meeting of the Animals Committee of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 2001, it was noted that few CITES listed species were actually invasive, but there remained general support for maintaining contact with the IUCN/SSC Invasive Species Specialist Group (ISSG) and the CBD on this issue. ISSG agreed to collaborate in the production of a list of potentially invasive CITES species.

According to Article 8 (h) of the Convention on Biological Diversity (CBD) "Each Contracting Party shall, as far as possible and as appropriate prevent the introduction of, control or eradicate those alien species, which threaten ecosystems, habitats or species".

The Day for Biological Diversity (22nd of May) was devoted to the issue of IAS in 2001. It shows the importance of the issue, expressed in Article 8.

Answers to the pre-formulated questions 86-102 of the Second National Reports on the implementation of the CBD focus on

the impacts of biological invasion and alien species. Decisions of the COP and recommendations of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) call on Parties to take action to monitor and prevent invasions, and to rehabilitate ecosystems that have been invaded.

The 5th meeting of the COP of the CBD urged Parties, other governments, and other relevant bodies to give priority to the development and implementation of invasive alien species strategies and action plans.

In 2002, COP-6 of the CBD drew up recommendations and Guiding Principles to assist in the implementation of Article 8(h). Decision VI/23 deals with “Alien species that threaten ecosystems, habitats

or species”. The COP recognised that invasive alien species represent one of the primary threats to biodiversity, especially in geographically and evolutionary isolated ecosystems, such as small island developing States, and that risk may be increasing due to increased global trade, transport, tourism and climate change.

It called on Parties, other governments and relevant bodies to prioritise the development and implementation of IAS strategies and action plans at national and regional level.

The IUCN Species Survival Commission (SSC) – ISSG has developed a Global Invasive Species Database (and Early Warning System). Key features of this database include its accessibility (it is available on Internet) and ease of use.



Photo 7: *Impatiens parviflora*

A simple habitat-matching model is used to predict which other global regions are potentially at risk of invasion. These developments are carried out as part of the Global Invasive Species Programme (GISP), co-ordinated by the Scientific Committee on Problems of the Environment (SCOPE). IUCN, CAB International and UNEP are partners in GISP. The IUCN Species Survival Commission (SSC) – ISSG published the “IUCN Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species” in 2000.

The 100 of the World's Worst Invasive Alien Species list and database are an integrated subset of the Global Invasive Species Database. This list focuses mainly on American and Australian circumstances, so a European regional list is needed.

A Nordic/Baltic regional workshop was held in Estonia to develop a network of interoperable databases on invasive or invasive alien species of the Nordic/Baltic region. During this workshop participants worked on the development of a regional database network to facilitate information exchange on invasive alien species both within the region and globally.

International Actions: European Level

Several international, regional and sub-regional instruments ratified or adopted by a large number of European countries address various aspects of the IAS issue. The earliest instruments aim to control the introduction and spread of pests and diseases to protect human, animal and plant health. Conservation treaties reference alien species for their possible impacts on native species and ecosystems. Technical guidelines have been developed for some transport and production sectors that present risks of unintentional introductions or escapes from containment. These instruments indicate

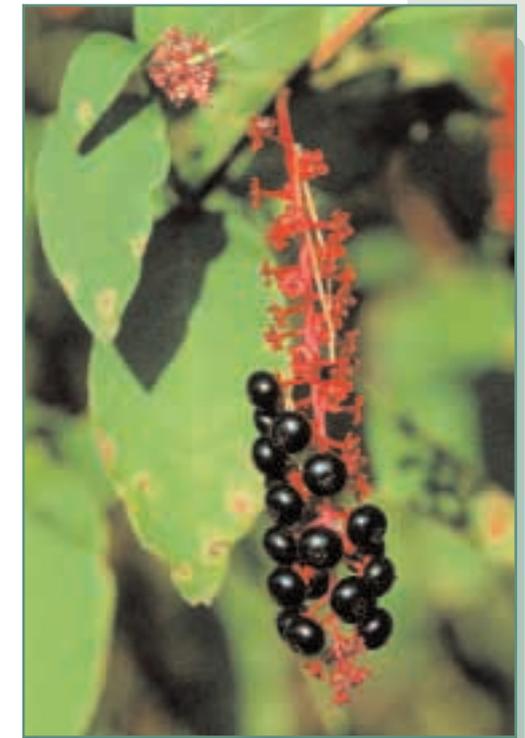


Photo 8: *Phytolacca americana* with fruits

actions that States need to take: several generally urge States to improve working programmes, avoid duplication of efforts, promote co-operative actions and explore synergies among actors. In addition, because alien species use transport and trade pathways, regional and national measures to prevent or minimise unwanted introductions have implications for the multilateral trading system. The World Trade Organisation (WTO), mainly through the Agreement on the Application of Sanitary and Phytosanitary Measures, sets out binding principles and rules and recognises sources of international standards that should, where available, be followed in national measures.

In Europe, at the political level, two main institutions are responsible for



Photo 9: *Echinocystis lobata*

regional conservation policies: the Council of Europe, which with 42 member States represents a large proportion of the entire European region, and the European Union (EU), which currently has 15 member States and the accession of further states is on the agenda.

Council of Europe

Within the Council of Europe, the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention, 1979) is the main legal instrument for the development and implementation of conservation policies. In Article 11 paragraph 2.b, the Convention specifically requires “each Contracting Party to undertake to strictly control the introduction of non-native species”.

The Bern Convention is one of the very few international instruments that has developed specific technical references for addressing IAS. These include the adoption of recommendations on general IAS issues and specific problems, production of technical reports, organisation of workshops and establishment of an IAS experts' group in collaboration with the European Section of the IUCN ISSG.

In 2000, this group began work on developing elements for a draft European Strategy on Invasive Alien Species to promote implementation of Article 8(h) of the CBD.

The 6th meeting of SBSTTA of the CBD (Montreal, 12–16 March 2001) was mainly devoted to discussion of Invasive Alien Species. A “side-event” was organised to present in more details the actions of the

Bern Convention on IAS. At SBSTTA-6, a draft recommendation was adopted that “welcome(d) the initiative of Council of Europe (Bern Convention) to help the implementation of Article 8(h), including the development of a European Strategy on Invasive Alien Species”.

In 2002, this regional approach was endorsed at the Second Intergovernmental Conference on Biodiversity in Europe in Budapest and welcomed by the CBD at COP6.

The first wide-range discussion on the draft European Strategy on Invasive Alien Species was held in Horta, Azores, Portugal (Workshop on Invasive Alien Species on European Island and Evolutionary Isolated Ecosystems and Group of Expert on Invasive Alien Species; 10–12 October 2002). The draft Strategy provides a tool to help States to implement international commitments and best practice and to develop practical policies, measures and priorities for action.



Photo 10: Humid grassland overrun by Giant Goldenrod

European Union

Within the EU, conservation policies are defined through the EU Biodiversity Strategy and implemented through regulations or directives that are binding instruments for member States. With regards to IAS, member States must take measures to ensure that any introduction of an alien bird species does not prejudice the native fauna and flora (Council Directive 79/409/EEC on the Conservation of Wild Birds).

They must also regulate the deliberate introduction in the wild of any alien species so as not to prejudice natural habitats and wild native fauna and flora (Council Directive 92/43/EEC on the Conservation of Natural habitats and of Wild Fauna and Flora).

The EC regulation for the implementation of CITES within the EU provides a basis for controlling imports of certain species that may become invasive (Regulation 338/97, Article 4.6(d)).

More recently, the EC Biodiversity Strategy states that: “The presence or introduction of alien species or sub-species can potentially cause imbalances and changes to ecosystems. It can have potentially irreversible impacts, by hybridisation or competition, on native components of biodiversity. Applying the precautionary principle, the Community should take measures to prevent that alien species cause detrimental effects on ecosystems, priority species or the habitats they depend on and establish measures to control, manage and wherever possible remove the risks that they pose” (COM (1998)42).

National actions in Hungary

Biological invasion in Hungary deserves the attention of researchers, decision-makers and the public as well. Public interest focuses mainly on human health impacts of some allergenic species, but the society is also sensitive to the degradation of natural values of protected and urban areas. However, the degree of personal responsibility for controlling invaders and its relation to land use practice is very low.

Two main laws consider the problem of biological invasion in Hungary, one is the Promulgation of the Convention on Biological Diversity (Act No. LXXXI of 1995), and the other is Act No. LIII of 1996 on the Conservation of Nature (hereinafter:



Photo 11: Blooming *Acer negundo*



Photo 12: *Acer negundo* fruits

Nature Conservation Act). Article 8 (3) and (4) of the latter deal with “introduced organism” (meaning any organism which has become part of Hungary's flora and fauna due to man's intentional or unintentional introduction) and “harmful introduced species” (meaning any living organisms which does not qualify as native from the phytogeographical or zoogeographical point of view, and in case it establishes and adapts itself, it may be capable of modifying the natural processes of the Hungarian wildlife communities unfavourably for the native species).

According to the Act:

- The introduction of any new organism (new to Hungary from phytogeographical or zoogeographical aspect) may only be

authorised if this colonisation does not harm natural processes within Hungary's communities for the disadvantage of native species (Article 9 (4)).

- Wild organisms shall be exported, imported, transported through the country, propagated within artificial conditions, kept, bred routinely, hybridised, released into nature or marketed by the conditions and methods laid down in Government Decree (Article 10 (1)).

- In the event of the over-population of game animal or course fish species, or in order to liquidate non-native or non-naturalised species (which are alien to the Hungarian fauna) the Directorate may initiate, at the authorities responsible for hunting (fishing), an order of population control or liquidation (Article 12 (2)).

- In order to introduce a non-native wild animal species which is not by declaration a game species or to reintroduce a wild animal species it is necessary to hold an authorisation of the Minister (which is granted with the approval of the Minister of Agriculture) (Article 13 (2)).

- The authority responsible for hunting may obligate game-licence holders to reduce or liquidate the populations of harmful introduced wild animals by hunting techniques (Article 13 (3)).

- With the exception specified under paragraph (Article 13(2)) above, in order to introduce any non-native living organism or to reintroduce any living organism it is necessary to hold an authorisation of the Minister (which is granted with the approval of the Minister of Agriculture) (Article 13 (4)).



Photo 13: Goldenrod in the sunset

- It shall be prohibited to introduce non-native fish species into natural or semi-natural waters, or to transfer such species from fish farms into any other wetland (Article 14).

- Wherever the habitat conditions make it possible, afforestation shall be exercised primarily with native tree species, in a natural species composition and using nature-friendly techniques (Article 16 (3)).

- In forests situated in protected natural areas, reforestation shall be carried out only with indigenous tree species that occur naturally in the given site and - with the exception provided under paragraph (5) section a) below – only by natural regeneration methods (progressive regeneration or shelterwood felling and selective felling systems (Article 33 (3) b)).

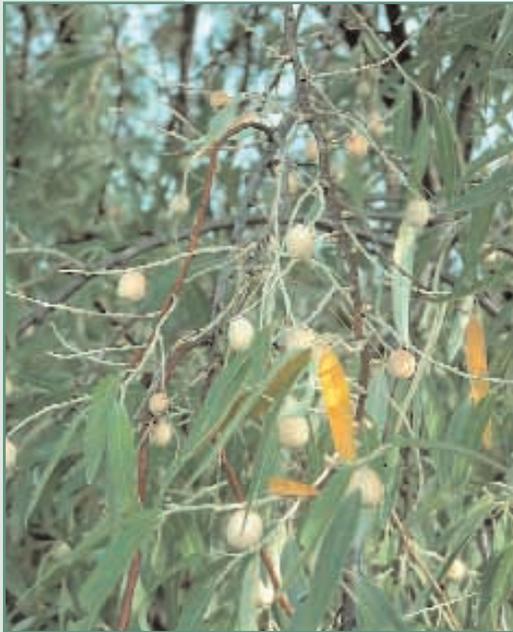


Photo 14: *Elaeagnus angustifolia*

- In forests situated in protected areas, clear-cutting may only be authorised in forest stands unable to regenerate naturally, or consisting of non-native species and being of a maximum block size of 3 ha (Article 33 (5) a)).

- In forests situated in protected natural areas, consisting of non-native tree species, efforts shall be made to establish close-to-natural conditions by replacing, complementing, restructuring such forest stands, by changing the tree species and by regulating the species composition, thus eliminating monocultures (Article 33 (7)). Government Decree No. 67/1998. (IV. 3.) on the Restrictions and Prohibitions Pertaining to the Protected and Strictly Protected Wildlife Communities also deals with non-native living organisms or locally invasive plant and animal species.

The agricultural administration also has long developed legal measures against pests, diseases and weeds. There is a strict need for integrated controlling methods against weeds with unfavourable effects to human health (like *Ambrosia artemisiifolia*). Act No. XXXV of 2000 on Plant Protection attends to pesticide products containing non-native living organisms (natural enemies, biopesticides etc.). The Ministry of Environment and Water plays a special role in the pesticide regulation process in this case (Article 19. (3)). There are data requirements on the origin and other ecological properties of living organisms in the registration dossiers (Ministerial Decree No. 6/2001 FVM on release of pesticides Annex 1 and 2.). Quarantine actions are also mentioned (Ministerial Decree No. 7/2001 FVM on the objectives of plant protection quarantine),

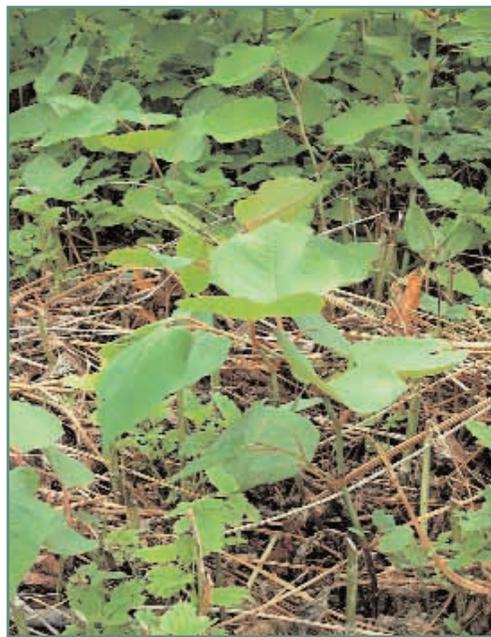


Photo 15: *Fallopia spp.*

but IAS are not specially targeted in these legal instruments.

Invasive plant species

The most dangerous invasive plant species of Hungarian habitats were listed by a scientific symposium in 1998. Researchers and nature conservation experts selected 35 invasive plant species (Annex I.). The most susceptible habitats in Hungary are mismanaged agricultural and rural areas and water-determined ecosystems.

Dry grasslands and semi-natural forests can better resist plant invasions, but disturbance can greatly increase the probability of their mass occurrence.

In several cases, invading species not only degrade the habitat but also outcompete

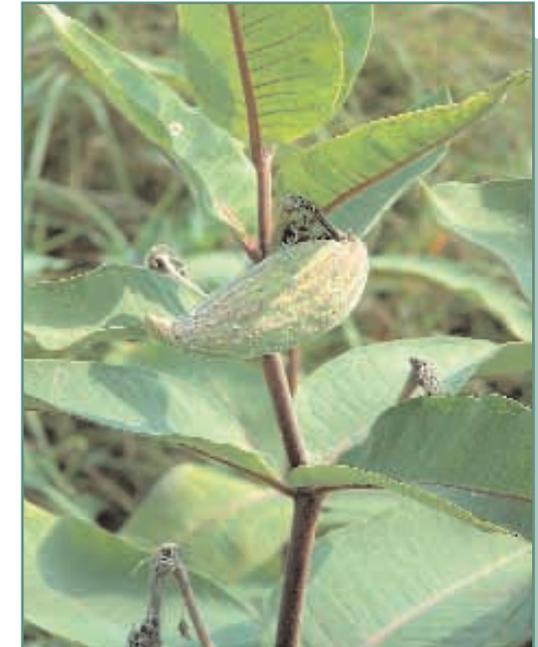


Photo 17: *Asclepias syriaca*

certain valuable, protected species occupying similar ecological niches in the community.

According to the latest information about 45 000 ha of grassland are affected with invasive plants (like *Solidago* species, *Ailanthus altissima*, *Elaeagnus angustifolia* and *Asclepias syriaca*) in nationally designated sites.

The state nature conservation organisation has initiated several programmes for the mechanical control of invasive plant species in protected areas, with only locally apparent results so far. Plans for mechanical and nature-friendly chemical control are under development, but recent calculations indicate that these projects would cost more than 4.2 million euros.



Waiting for the wind (*Asclepias syriaca*)



Photo 18: *Elaeagnus* forest before control in Kiskunság National Park



Photo 19: *Elaeagnus* forest after mechanical control at the same place

Invasive animal species

One can immediately understand why it is important to pay more attention than ever to “undesired invaders” even here, on the ‘Old Continent’, by looking at the distribution (Figure 1) of an incidentally introduced American pest, the Western Corn Rootworm (WCR, *Diabrotica virgifera virgifera*), first found in Europe near the International Airport of Belgrade in 1992. It took only ten years for the species from the Novi Sad area to reach even the Po Valley in Italy. By the end of 2001 it had spread over 182,000 km² in Europe (Bulgaria, Bosnia-Herzegovina, Croatia, Hungary, Romania, Slovakia and Yugoslavia). WCR beetles were trapped in 1998 and 1999 in Italy, near Venice airport and in 2000 in Switzerland, near Lugano.



Photo 20: WCR on corn

WCR spread in Europe has continued in all directions from the original infestation point. It has become an economic pest of corn in Yugoslavia (yield losses up to 70%). Several research projects focus on the potential of biological control of these pests.

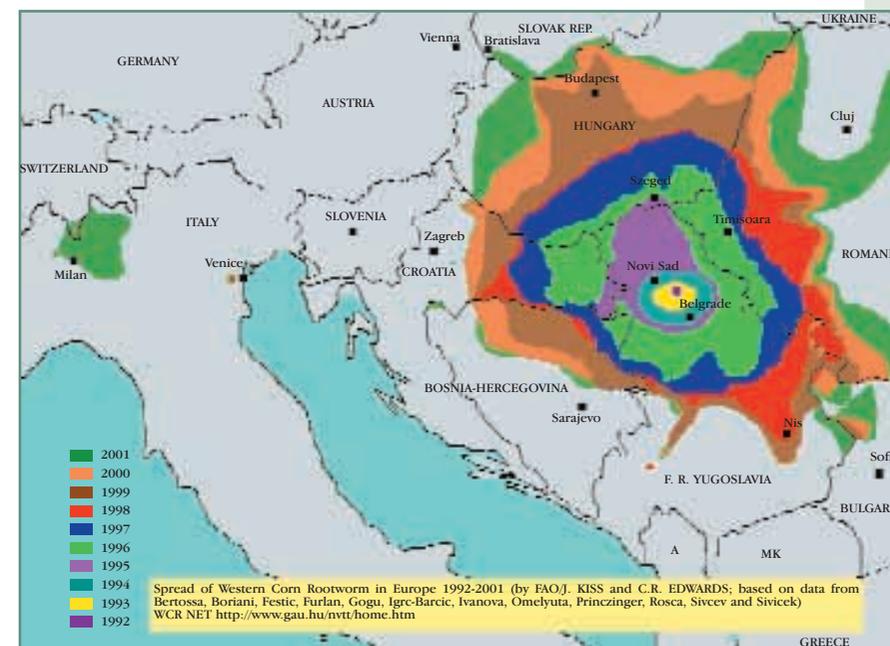


Figure 1: Spread of Western Corn Rootworm (*Diabrotica virgifera*)

Long-standing forestry and agricultural light-trap or other forecasting networks play a potentially important role in the early detection of invasive species (e.g. *Helicoverpa armigera* and *Colias erate* which are migrating moth species occasionally invasive in agricultural cultures).

The horse-chestnut leaf-miner (*Cameraria obridella*) was recorded for the first time in Macedonia in 1985 attacking horse-chestnut. This moth was described as a new species of the genus *Cameraria* in 1986. There has been some discussion that this species might have been carried to Macedonia from America, and then it spread. However, nowadays it is quit certain that the origin is not American. There has been discussion for

a long time about the possibility of conveyance by human beings. The effects of global climate change have been mentioned. First sighting in Hungary was in made in 1993, and serious damage caused by it has been detectable throughout the country since 1994.

The invasive *Lasius neglectus* is the most recently introduced ant species in Europe.



Photo 21: Damage on chesnut caused by *Cameraria*

Only ten years after its first observation in Hungary in 1987, numerous infestations have been identified across Europe. The exceptional spreading ability of this ant is due to its transportation via potted plants, which explains that new infestations are often found in public parks.

In the last few years a locally problematic mollusc species with invasive tendency called Spanish slug (*Arion lusitanicus*) has been noted. This species causes remarkable damage in gardens in the south-western part of Hungary, just as in some other parts of Europe.

Some fish species have been introduced for consumption and to limit algal production during the 1960s, like the grass carp (*Ctenopharyngodon idella*) and the

silver carp (*Hypophthalmichthys molitrix*) that became abundant and threaten the native fish fauna despite intensive fishing. A recent invador of watercourses is the bighead goby (*Neogobius kessleri*) that has arrived form the brackish waters of the Danube Delta and feeds on fish fry.



Photo 22: *Nyctereutes procyonides*



Photo 23: *Procyon lotor*

The situation of mammals is similar to that of fishes, as the population of game animals and non-protected carnivores is regulated. Two introduced species seem to have the potential of becoming invasive, the racoon dog (*Nyctereutes procyonides*) and the racoon (*Procyon lotor*).

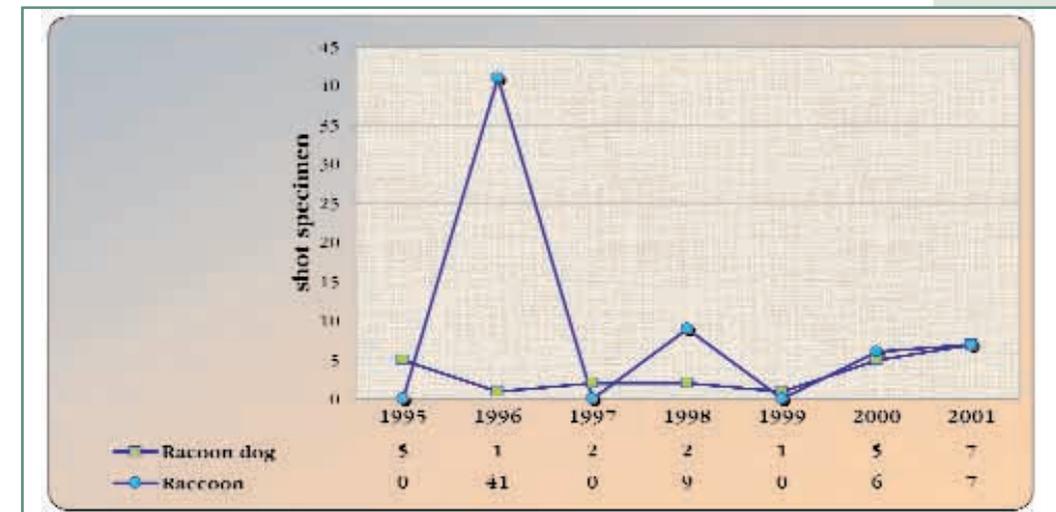


Figure 2: Shot specimen of racoon and racoon dog in Hungary

Monitoring

Recognising the importance of invasion in the survival of the native biota, the Hungarian Biodiversity Monitoring System (HBMS) has included the repeated survey of invaders in its programme. Invasive plant species are monitored in 124 selected plots (see below) of 5x5 km as part of habitat mapping. The Hungarian National Habitat Classification System provides the basic units for habitat mapping.

The HBMS monitors 5 invasive plant



species (*Ailanthus altissima*, *Amorpha fruticosa*, *Asclepias syriaca*, *Solidago gigantea*, *Solidago canadensis*) at the landscape, community and population levels since 1998. The first results have described the present conditions and serve as baseline data.

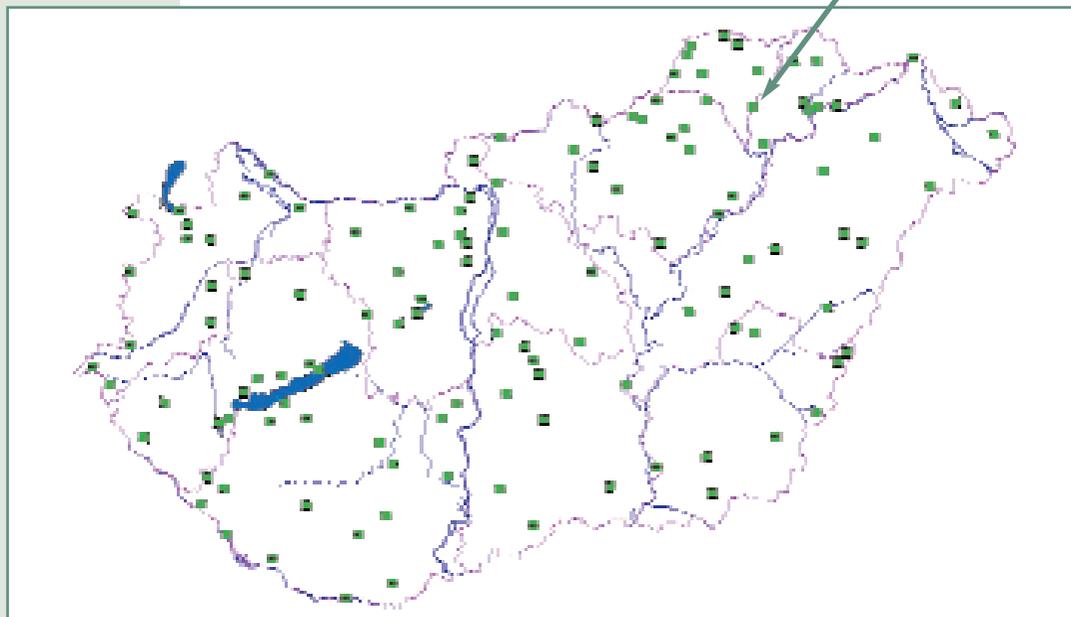


Figure 3: Distribution and abundance of *Solidago gigantea* and *S. canadensis* in O5x5_003 plot (darker markings indicate heavier infection)

Plans for the future

The Authority for Nature Conservation of Ministry of Environment and Water has commissioned a basic study for a Hungarian invasive alien plant species strategy. Several scientists are currently working on this programme and the first results of this analysis will be published in the winter of 2002. Based on this study, a National Invasive Plant Species Strategy will be prepared, as well as scientific and educational publications will be produced.

The Authority plans to fund a similar study and strategy on animal species, but current information and knowledge on these species is scarcer.

Further nature conservation programmes for monitoring invasive terrestrial and aquatic snails and insect species are absolutely necessary and scheduled for the near future.

The National Invasive Plant Survey and Control Programme is under development by the Ministry of Environment and Water. The first task is to provide a national assessment of occurrence of the selected 35 invasive species (Annex I.). The objective of this programme is to develop a nation-wide survey and environmentally friendly control strategy of invasive plants that can be applied in protected areas.



Photo 24: A native species with invasive tendencies (*Calamagrostis epigeios*)

Annex I.

Invasive plant species in Hungarian protected areas

Adventive species:

1. *Acer negundo*
2. *Ailanthus altissima*
3. *Ambrosia artemisiifolia*
4. *Amorpha fruticosa*
5. *Asclepias syriaca*
6. *Aster spp.*
7. *Celtis occidentalis*
8. *Cenchrus incertus*
9. *Conyza canadensis*
10. *Echinocystis lobata*
11. *Elaeagnus angustifolia*
12. *Erechtites hieraciifolia*
13. *Erigeron annuus*
14. *Fallopia japonica*
15. *Fallopia sachalinensis*
16. *Fraxinus pennsylvanica*
17. *Helianthus decapetalus*
18. *Helianthus tuberosus*
19. *Heracleum mantegazzianum*
20. *Humulus scandens*
21. *Impatiens grandulifera*
22. *Impatiens parviflora*
23. *Padus serotina*
24. *Parthenocissus spp.*
25. *Phytolacca americana*
26. *Robinia pseudoacacia*
27. *Rudbeckia hirta*
28. *Rudbeckia laciniata*
29. *Solidago canadensis*
30. *Solidago gigantea*
31. *Vitis rupestris*
32. *Vitis vulpina*

Dangerous native species that occur in selected areas of Hungary, but show tendencies to become invasive:

1. *Calamagrostis epigeios*
2. *Phragmites australis*
3. *Rubus fruticosus agg.*

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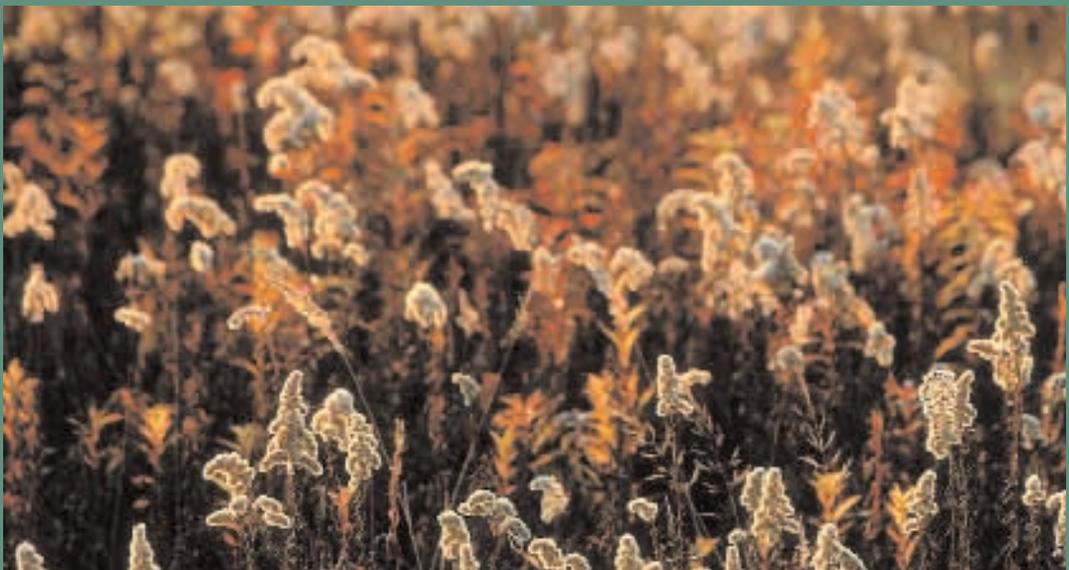
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