



# Invasive Alien Species of Union concern



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## Contents

# plants

<i>Alternanthera philoxeroides</i> (Alligator weed).....	8
<i>Asclepias syriaca</i> (Common milkweed).....	8
<i>Baccharis halimifolia</i> (Eastern baccharis).....	9
<i>Cabomba caroliniana</i> (Carolina fanwort).....	9
<i>Eichhornia crassipes</i> (Water hyacinth).....	10
<i>Elodea nuttallii</i> (Nuttall's waterweed).....	10
<i>Gunnera tinctoria</i> (Chilean rhubarb).....	11
<i>Heracleum mantegazzianum</i> (Giant hogweed).....	11
<i>Heracleum persicum</i> (Persian hogweed).....	12
<i>Heracleum sosnowskyi</i> (Sosnowsky's hogweed).....	12
<i>Hydrocotyle ranunculoides</i> (Floating pennywort).....	13
<i>Impatiens glandulifera</i> (Himalayan balsam).....	13
<i>Lagarosiphon major</i> (Curly waterweed).....	14
<i>Ludwigia grandiflora</i> (Water-primrose).....	14
<i>Ludwigia peploides</i> (Floating primrose-willow).....	15
<i>Lysichiton americanus</i> (American skunk cabbage).....	15
<i>Microstegium vimineum</i> (Japanese stiltgrass).....	16
<i>Myriophyllum aquaticum</i> (Parrot's feather).....	16
<i>Myriophyllum heterophyllum</i> (Broadleaf watermilfoil).....	17
<i>Parthenium hysterophorus</i> (Whitetop weed).....	17
<i>Pennisetum setaceum</i> (Crimson fountaingrass).....	18
<i>Persicaria perfoliata</i> (Asiatic tearthumb).....	18
<i>Pueraria lobata</i> (Kudzu vine).....	19

<i>Alopochen aegyptiacus</i> (Egyptian goose) .....	20
<i>Callosciurus erythraeus</i> (Pallas' squirrel).....	20
<i>Corvus splendens</i> (Indian house crow).....	21
<i>Eriocheir sinensis</i> (Chinese mitten crab).....	21
<i>Herpestes javanicus</i> (Small Asian mongoose) .....	22
<i>Lithobates catesbeianus</i> (American bullfrog).....	22
<i>Muntiacus reevesi</i> (Muntjac deer).....	23
<i>Myocastor coypus</i> (Coypu) .....	23
<i>Nasua nasua</i> (Coati).....	24
<i>Nyctereutes procyonoides</i> (Raccoon dog).....	24
<i>Ondatra zibethicus</i> (Muskrat).....	25
<i>Orconectes limosus</i> (Spiny-cheek crayfish).....	25
<i>Orconectes virilis</i> (Virile crayfish).....	26
<i>Oxyura jamaicensis</i> (Ruddy duck).....	26
<i>Pacifastacus leniusculus</i> (Signal crayfish).....	27
<i>Percottus glenii</i> (Amur sleeper).....	27
<i>Procambarus clarkii</i> (Red swamp crayfish) .....	28
<i>Procambarus fallax f. virginalis</i> (Marbled crayfish).....	28
<i>Procyon lotor</i> (Raccoon).....	29
<i>Pseudorasbora parva</i> (Stone moroko) .....	29
<i>Sciurus carolinensis</i> (Grey squirrel) .....	30
<i>Sciurus niger</i> (Fox squirrel) .....	30
<i>Tamias sibiricus</i> (Siberian chipmunk).....	31
<i>Threskiornis aethiopicus</i> (Sacred ibis).....	31
<i>Trachemys scripta</i> (Red-eared, yellow-bellied and Cumberland sliders).....	32
<i>Vespa velutina nigrithorax</i> (Asian hornet).....	32
Sources .....	33
Invasive Alien Species images, photographers' credits.....	33



# Invasive Alien Species of Union concern

## Introduction

Alien species are animals and plants that have been introduced through human action to a new natural environment from other parts of the world. Some alien species have been brought to Europe deliberately, such as the American skunk cabbage as an ornamental plant, the pond slider for the pet trade, the signal crayfish for the food industry, and the nutria for fur farming. Others, such as the Asian hornet or the Indian house crow, have found their way into the EU as blind passengers on board of ships, or they have been accidentally imported as a contaminant with commercial goods.

Not all alien species cause trouble in their new environment. They often have difficulties growing and reproducing. Many are largely beneficial and impossible to think away from our lives. For others, however, including the ones mentioned above, the new natural environment turns out to be surprisingly favorable, in particular in the absence of their natural enemies. This allows them to spread and reproduce excessively, feeding on native species or out-competing them for habitat and resources; sometimes also carrying parasites and diseases that are lethal to native wildlife or dangerous to human health.

Ecological barriers like oceans and mountain ranges have allowed ecosystems to evolve independently, so that the species within them are adapted to each other and interact in a delicate balance. Moving species across those barriers can severely disrupt this balance and may even change these ecosystems entirely. Indeed, invasive alien species are recognised as one of the main drivers of species extinction and global biodiversity loss<sup>(1)</sup>. Invasive alien species also cause damage amounting to many billions of euros to the European economy every year.

Invasive alien species can easily spread across borders. This is why the EU has adopted a law - the IAS Regulation<sup>(2)</sup> - to tackle the problem in a coordinated, joint effort across all Member States. The IAS Regulation is fairly young: it entered into force in January 2015. It also implements the EU Biodiversity Strategy to 2020 which sets a specific target to combat the threat of invasive alien species in order to halt the loss of biodiversity and ecosystem services.

At the core of the IAS Regulation is a list of invasive alien species of Union concern (the Union list), including some of those species that cause the most damage to native biodiversity, and for which concerted measures are required across the EU. The IAS Regulation imposes restrictions on the keeping, importing, selling, breeding and growing of the listed species. Member States are also required to take measures for their early detection and rapid eradication, and to manage populations that are already widely spread in their territory. Prevention is the priority because established populations can be expensive to manage and difficult or impossible to eradicate.

As new information and evidence become available, the Union list gets updated at regular intervals. The process of putting new species on the list starts with a proposal by an EU Member State or by the European Commission, underpinned by a risk assessment; followed by an expert evaluation of the robustness of the available evidence and consultations with a range of stakeholders and the Member States, followed by approval by a Committee with Member States' representatives and adoption by the Commission.

This brochure presents at a glance the currently listed invasive alien species of Union concern, offering brief, non-technical and informal summaries of their origin, their present distribution in the EU, how they threaten our native biodiversity, and how the applicable restrictions and obligations will help mitigate their negative impacts. You can read more on the scientific evidence and risk assessments on the Commission's official webpage dedicated to invasive alien species<sup>(3)</sup>.

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<sup>(1)</sup> <https://www.cbd.int/invasive/>

<sup>(2)</sup> Regulation (EU) 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 (IAS Regulation)

<sup>(3)</sup> [http://ec.europa.eu/environment/nature/invasivealien/index\\_en.htm](http://ec.europa.eu/environment/nature/invasivealien/index_en.htm)

## *Alternanthera philoxeroides* (Alligator weed)



The alligator weed is a dense mat-forming aquatic plant native to the Parana River basin in Brazil. It is not clear how this species established itself in Europe as it is not widely traded as an aquarium plant. It might have been introduced by mistake along with other similar ornamental specimens or as a contaminant of these.

It is currently only established in France and Italy but there is a high risk that it could spread throughout the Mediterranean, as well as in countries with hot thermal springs. Once established the alligator weed rapidly chokes up riverine habitats, reducing both the quality and flow of water and preventing light and oxygen from entering the water column with drastic consequences for the ecosystem and its biodiversity.

As the plant is still in an early stage of invasion, placing it now on the Union list will help prevent it from becoming a problem across the EU, by imposing a sales ban, by possibly taking measures on the pathways of unintentional introduction and spread, as well as by taking measures for the rapid eradication of any newly emerging populations and for the management of established populations.

## *Asclepias syriaca* (Common milkweed)



The common milkweed is a large herb native to North America that gets its name from the thick white latex that emerges when parts of the plant are broken. The species was cultivated in Europe for its fibres in the late 19<sup>th</sup> century. Today, it is traded and cultivated as an ornamental and for beekeeping.

It is currently established in 13 Member States: Austria, the Czech Republic, Bulgaria, Denmark, France, Croatia, Hungary, Italy, Lithuania, the Netherlands, Poland, Romania and Slovakia. It poses a high risk to native biodiversity by overwhelming valuable habitats such as grasslands, dune areas and river valleys. Milkweed is also toxic to humans and herbivores.

Placing the species on the Union list will contain its further spread across the EU, by imposing a cultivation and sales ban, by possibly taking measures on the pathways of unintentional introduction and spread, as well as by taking measures for the rapid eradication of any newly emerging populations and for the management of established populations.



## *Baccharis halimifolia* (Eastern baccharis)



The Eastern baccharis or groundsel tree is a long-living shrub native to North America. It was first imported into Europe as an ornamental plant and, in some areas, was also intentionally introduced to act as a windbreak along coastal dunes. It is now well established in parts of Belgium, France, Italy, Spain and the United Kingdom where it has spread into a wide range of habitats, including saltmarshes, dunes, woodlands and other coastal areas.

The shrub can grow into dense impenetrable thickets that choke all other native vegetation, altering the structure of the original habitats and causing serious damage to the ecosystem services they provide. It can also be toxic for livestock. The Eastern baccharis produces abundant

amounts of seeds which increases the chances of the species spreading further into Member States.

EU-wide measures to prevent further invasion include the prohibition of sales and of keeping, planting or propagating the species. Furthermore, they provide for the rapid eradication of any newly establishing population and the management of existing populations.

## *Cabomba caroliniana* (Carolina fanwort)



The Carolina fanwort is a decorative aquatic plant with feathery leaves. Native to southern Brazil, Paraguay, Uruguay and northeast Argentina, the plant was brought to Europe for the aquarium trade.

The species has since escaped into the wild where it has spread rapidly due to its ability to grow from tiny stem fragments. In many areas, the resulting dense mats have clogged up lakes, ponds and other small watercourses, causing major environmental and economic damage. It is currently present in nine Member States (Austria, Belgium, Denmark, France, Hungary, the Netherlands, Poland, Sweden and the United Kingdom).

The risk of the plant spreading into the Mediterranean region and Eastern European countries is high. EU-level

action includes a ban on sales and any planting or keeping, including in aquaria, as well as rapid eradication of any new populations to avoid the excessively high costs associated with its management later on. In addition, appropriate management measures have to be taken where the species has become widely spread.

## *Eichhornia crassipes* (Water hyacinth)



The water hyacinth is a free-floating aquatic plant native to the Amazon basin. It was imported into Europe as an ornamental plant with attractive flowers and it became popular in horticulture, from where it easily spread into the environment. The species has since invaded river basins in France, Italy, Portugal and Spain.

The plant grows extremely fast and develops into thick floating mats which, if uncontrolled, can cover entire water bodies. These mats block out the light and deplete the water of oxygen, smothering out all other native plants and animals. It also hinders water circulation, clogs up navigation routes, and causes immense damage to agriculture through increased water loss.

EU-level action includes a ban on sales and planting or keeping the plant, including in isolated ponds. Any new populations should be eradicated rapidly in order to avoid the excessively high costs associated with its management later on. Where the species has become widely spread, appropriate management measures have to be taken.

## *Elodea nuttallii* (Nuttall's waterweed)



Native to the temperate regions of North America, the Nuttall's waterweed is an aquatic plant that was introduced into Europe as an oxygenating plant for the aquarium trade. It has since established itself in slow-flowing water bodies, lakes and ponds across 17 Member States: Austria, Belgium, Bulgaria, Denmark, France, Germany, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Poland, Romania, Slovakia, Slovenia, Sweden, and the United Kingdom.

Due to its rampant growth, Nuttall's waterweed develops rapidly into a tangled mass. It blocks out the light and alters the entire ecosystem beneath. As a result, native aquatic plants and animals are unable to survive. The plant also causes significant economic damage by

choking up water channels and hydroelectric plants and impairing water-based recreational activities.

As the species is difficult to eradicate, it is important to prevent it from spreading into other EU countries. EU-level action includes a ban on sales, planting or keeping, measures on pathways of unintentional introduction and spread and a rapid eradication obligation for newly establishing populations. Where the species has become widely spread, appropriate management measures have to be taken.

# Invasive Alien Species of Union concern

## *Gunnera tinctoria* (Chilean rhubarb)



The Chilean rhubarb is native to South America. It looks similar to our native rhubarb on a grand scale, but is completely unrelated. It was introduced into Europe as an ornamental plant but has since escaped into the wild and is now established in five Member States: France, Ireland, Portugal (only in the Azores), Spain and the United Kingdom.

A prolific species, it invades streams and river banks, lake and pond margins and coastal cliffs, where its large leaves prevent other plants from growing beneath, causing the local disappearance of native species and the alteration of entire ecosystems. It can also block drains and streams, degrade agricultural land and recreational areas, and cause soil erosion.

Placing it on the Union list puts an end to its growing and selling, may trigger measures on pathway management, will ensure rapid eradication of newly establishing invasions and management of established populations.

## *Heracleum mantegazzianum* (Giant hogweed)



The giant hogweed is a more than 2 meters high flowering plant native to the Western Greater Caucasus. It was first introduced into Europe as an ornamental plant but has since spread rapidly via wind and water to a wide range of semi-natural or degraded habitats. The species' appearance and environmental impacts are similar to those of the Persian hogweed and the Sonowski's hogweed.

It is now well established in 20 Member States: Austria, Belgium, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Luxembourg, Poland, the Netherlands, Slovakia, Slovenia, Sweden and the United Kingdom. In these countries, it has become a major pest capable of

invading and completely transforming the landscape. The plant is highly phototoxic: contact with its juice can cause major skin inflammations and even severe burns upon exposure to sunlight.

EU-level action includes a ban on sales and on any planting or keeping, a rapid eradication of newly establishing populations, and appropriate management measures where the species is already widely spread.

## *Heracleum persicum* (Persian hogweed)



The Persian hogweed is a large flowering plant native to Turkey, Iraq and Iran. It was first introduced into Northern Europe as an ornamental curiosity and has since become established in coastal habitats, wetlands and pastures in six Member States (Czech Republic, Denmark, Estonia, Finland, Sweden and the United Kingdom). The species' appearance and environmental impacts are similar to those of the Sosnowsky's hogweed and the giant hogweed.

Because of its ability to form dense impenetrable stands, the Persian hogweed has a tendency to suffocate out all other native plants and wildlife, causing significant ecological damage, particularly in Natura 2000 sites. It also has a major economic impact due to its erosive effects and impaired drainage along river courses.

Contact with the plant's sap, if exposed to sunlight, can cause severe skin burns. Some recreational areas have become completely inaccessible as a result.

EU-level action includes a ban on sales and any planting or keeping, including in gardens, and a rapid eradication of any new populations to avoid the excessively high costs associated with its management later on. Where the species has become widely spread, appropriate management measures have to be taken.

## *Heracleum sosnowskyi* (Sosnowsky's hogweed)



Sosnowsky's hogweed is a large flowering plant native to the Caucasus, Transcaucasia and North-East Turkey. It was first introduced for silage in the 1940s but has since spread rapidly via wind and water to a wide range of semi-natural or degraded habitats. The species' appearance and environmental impacts are similar to those of the Persian hogweed and the giant hogweed.

It is now well established in seven Member States (Denmark, Estonia, Finland, Hungary, Latvia, Lithuania, Poland), where it has become a major pest due to its ability to completely invade and transform the landscape. The plant is highly toxic to humans and even a few small drops of the plant's juice can cause major burns on the skin.

Once established, the species is almost impossible to eradicate because the seeds remain viable for many years and the plants can re-sprout readily. EU-level action includes a ban on sales and on any planting or keeping, including in gardens. Furthermore, as to prevent spread into other areas and avoid the excessively high costs associated with its management later on, any new populations have to be eradicated rapidly. Where the species has become widely spread, appropriate management measures have to be taken.

# Invasive Alien Species of Union concern

## *Hydrocotyle ranunculoides* (Floating pennywort)



The floating pennywort is a fast-growing aquatic plant native to North, Central and South America. Widely sold as an ornamental plant for aquaria and garden ponds in Europe, it has since escaped into the wild and is now present in nine Member States (Belgium, France, Germany, Hungary, Italy, the Netherlands, Portugal, Spain and the United Kingdom).

The plant has an extremely rapid growth rate: it can quickly dominate any water body blocking out the light, depleting oxygen levels and reducing water flows and temperatures, thereby posing a major threat to biodiversity and the economy. In Belgium, it is known to halve the number of native aquatic plant species found in a typical watercourse.

There is a high risk of the species spreading further into other Member States. EU-level action includes a ban on sales and on any planting or keeping, including in isolated ponds. A rapid eradication of any new populations is required to avoid the excessively high costs associated with its management later on. Where the species has become widely spread, appropriate management measures have to be taken.

## *Impatiens glandulifera* (Himalayan balsam)



The Himalayan balsam is native to the foothills of the Himalayas from north-west Pakistan to northern India. A tall, attractive, annual herb, it was first introduced as a garden plant in the early 19<sup>th</sup> century and has since escaped in the wild. It was also sown by beekeepers. The species invaded most EU countries, but has not yet appeared in Malta, Cyprus and many parts of other Member States.

The species spreads rapidly by means of explosive seed heads and out-competes native species, particularly along river banks, floodplain forests and wet meadows. Its dense stands can impede the flow of high rainfall, increasing the likelihood of flooding and erosion.

The listing of the species puts an end to trade and the deliberate planting and keeping of this species, e.g. for honey production. Newly establishing populations will be rapidly eradicated, and widely spread populations will be managed in order to mitigate its major impact on protected areas and vulnerable natural habitats. EU cooperation is important, taking into account that this species is spreading mostly with water courses that can flow through more than one country.

## *Lagarosiphon major* (Curly waterweed)



The curly waterweed is a delicate aquatic plant with whirly leaves. Native to South Africa, the species was introduced into Europe as an oxygenating plant for the aquarium trade. It has since established itself in slow-flowing water bodies, lakes and ponds across 11 Member States (Austria, Belgium, France, Germany, Hungary, Ireland, Italy, the Netherlands, Portugal, Spain, and the United Kingdom).

Due to its rampant growth, it develops rapidly into a tangled mass that blocks out the light and alters the entire ecosystem beneath. As a result, native aquatic plants and invertebrates are unable to survive. The plant also causes significant economic damage by choking up water channels and hydroelectric plants and

by impairing boating and other water-based recreational activities.

As the species is difficult to eradicate, it is important to prevent it from spreading into other EU countries. EU-level action includes a ban on sales and any planting or keeping, including in isolated ponds. Furthermore, a rapid eradication of any new populations is required, to avoid the excessively high costs associated with its management later on. Where the species has become widely spread, appropriate management measures have to be taken.

## *Ludwigia grandiflora* (Water-primrose)



The water-primrose is a herbaceous perennial plant originating from the American continent. It was introduced in France in the 19<sup>th</sup> century as an ornamental plant but has since spread into nine Member States (Belgium, France, Germany, Hungary, Ireland, Italy, the Netherlands, Spain and the United Kingdom) where it thrives in slow flowing rivers, streams, lakes and ponds.

The plant develops into a dense impenetrable blanket covered in yellow flowers that reduces the oxygen content of the waterbody. It further releases chemicals that suppress other organisms, leading to the accumulation of toxins and the poisoning of entire water ecosystems. The plant also obstructs water bodies, disrupts drainage and increases the risk of flooding, thereby causing major

economic damage as well.

EU-level action includes a ban on sales and on any planting or keeping, including in isolated ponds. The rapid eradication of any new populations is required to avoid the excessively high costs associated with its management later on. Where the species has become widely spread, appropriate management measures have to be taken.

## *Ludwigia peploides* (Floating primrose-willow)



The floating primrose-willow is a perennial aquatic plant native to the American continent. It was imported into France in the 19<sup>th</sup> century as an ornamental curiosity and has since become established in Belgium, France, Greece, Italy, the Netherlands and Spain.

The plant is very fast-growing, being capable of doubling in extent in just three to four weeks. It not only shades out any other submerged plants but alters the chemistry of the aquatic environment, thereby reducing dissolved oxygen levels and disrupting entire freshwater ecosystems. Additionally, it blocks up economically important waterways that are used for instance for recreation, fishing or navigation, causing major economic damage.

Given its prolific nature, there is a high risk that it will spread rapidly into further Member States. Once established, the species is difficult to manage. EU-level action therefore includes a ban on sales and any planting or keeping, including in isolated ponds. Furthermore, the rapid eradication of any new populations is required to avoid the excessively high costs associated with its management later on. Where the species has become widely spread, appropriate management measures have to be taken.

## *Lysichiton americanus* (American skunk cabbage)



The American skunk cabbage is a North American plant with large leathery leaves and bright yellow flowers. Its name comes from the putrid odour the flowers produce in spring. It grows in swamp forests and associated wetlands, fens, wet meadows, bogs, alluvial woodlands as well as along streams, riverbanks, lakes and ponds.

This attractive plant was first introduced into Europe a century ago as an ornamental garden plant. Having escaped into the wild, it is now present in nine Member States (Belgium, Denmark, Finland, France, Germany, Ireland, the Netherlands, Sweden and the United Kingdom). After some years, its huge leaves build dense layers of vegetation that exclude all light and render the water beneath devoid of life. This is especially a

problem in ecologically sensitive natural areas.

In view of its potentially serious harmful impact on Natura 2000 sites, sales and any planting or keeping, including in gardens, is now banned and concerted action is required to contain its invasion and prevent its spread into other countries.

## *Microstegium vimineum* (Japanese stiltgrass)



The Japanese stiltgrass is a plant native to Asia. It has become established in Turkey but is not yet present in the EU.

The plant possesses many of the characteristics that are typical of invasive alien species: it grows quickly, fruits within a single season, produces abundant seed, and readily invades a wide range of natural habitats. Once established, it creates dense impenetrable stands that crowd out the native vegetation within 3-5 years with cascading ecological effects on other species, especially in areas of high conservation value. It also intensifies forest fires, after which it rapidly spreads in the following growing season.

A trade ban and pathway management is required to prevent this very damaging species from invading the EU. Its seeds can spread as contaminants on shoes and clothes, machinery, bird seed, soil or plants for planting.

## *Myriophyllum aquaticum* (Parrot's feather)



The parrot's feather is a freshwater plant native to South America characterized by its distinctive green feathery leaves. The plant was first introduced into Europe for use in aquaria and garden ponds but has escaped into the wild. It is now established in 13 Member States (Austria, Belgium, France, Germany, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Romania, Spain and the United Kingdom) where it is found in a range of freshwater bodies including wetlands, lakes, ponds, ditches, slow-running streams and canals.

The plant can grow rapidly into dense mats that overwhelm the native vegetation and render the water beneath virtually lifeless. Entire ecosystems can be seriously disrupted by its presence. In addition, it causes

significant economic damage to fisheries, water abstraction and irrigation, transport, hydropower and recreation.

Union action includes a ban on sales and any planting or keeping, including in isolated ponds. Furthermore, the rapid eradication of any new populations is required to avoid the excessively high costs associated with its management later on. Where the species has become widely spread, appropriate management measures have to be taken.



## *Myriophyllum heterophyllum* (Broadleaf watermilfoil)



Native to the Eastern United States, the broadleaf watermilfoil is a popular plant in the aquarium and water gardening trades and can be readily obtained under a variety of names. In Europe, the species has become established in the wild in seven Member States: Austria, Belgium, Germany, Spain, France, Hungary and the Netherlands.

The broadleaf watermilfoil poses a major threat to biodiversity because of its rampant growth and the formation of dense mats of submerged plant matter through the entire water depth and on the surface. The mats impede the water flow and reduce sunlight and oxygen availability, causing the loss of native species and significant alterations to the ecosystem. It affects

all types of freshwater bodies, including wetlands.

The risk of the plant spreading into other European countries is high. EU-level action includes a ban on sales and any planting or keeping, including in aquaria, as well as rapid eradication of any new populations to avoid the excessively high costs associated with its management later on.

## *Parthenium hysterophorus* (Whitetop weed)



The whitetop weed is a vigorous aromatic plant from the daisy family that originates from the subtropics of North and South America. It is a pioneer species that grows in a wide range of habitats, including degraded pastures, crops, orchards, forests, as well as along railway tracks and roadsides, recreation areas, riverbanks and floodplains. While it is not yet considered established in the EU, its presence has been recorded in Belgium.

Its spread can be facilitated by accidental contamination of agricultural produce and farm machinery. Once established it readily outgrows native species, leading to a decline in natural habitats. It also produces substances that inhibit the growth of other plants,

including crops. Frequent contact with the plant or its pollen can produce serious allergic reactions in humans and livestock, especially horses.

Addressing potential pathways of introduction and rapidly eradicating any emerging invasion should help to keep this species out of Europe.

## *Pennisetum setaceum* (Crimson fountaingrass)



Native to Northern Africa, the crimson fountaingrass is an attractive grass with feathery purple flower spikes. The species was first introduced into Europe as an ornamental plant but has since escaped into the wild. It is currently established in five Member States: Spain, France, Italy, Malta and Portugal. It has high dispersal ability through seeds and roots, and therefore the potential to spread rapidly throughout the Mediterranean. Its seeds can also spread accidentally via vehicles and machinery.

An aggressive plant that forms dense thickets, it can readily outcompete native plants with important negative impact on vulnerable native species, especially in protected areas. The Crimson fountaingrass is also a

very inflammable species, increasing the intensity and spread of fires, and spreading even faster in the growing season following a fire.

The risk of the plant increasing its spread throughout the Mediterranean area is high. EU-level action includes a ban on sales and any planting or keeping, as well as rapid eradication of any new populations to avoid the excessively high costs associated with its management later on.

## *Persicaria perfoliata* (Asiatic tearthumb)



The Asiatic tearthumb – sometimes referred to as the mile-a-minute plant – is a fast-growing herbaceous vine native to Asia. It is usually found in open areas along the edges of woods, wetlands, riverbanks, roadsides, and uncultivated fields where it scrambles over shrubs and other vegetation, blocking out the light, and eventually suffocating all that lies beneath.

Large infestations can reduce the biodiversity of natural habitats, resulting in the local extinction of rare native plants with restricted ranges. It can also cause economic losses to orchards, nurseries, and horticultural crops.

Although not yet established in the EU, the plant is already a major pest in other parts of the world, such as the US. Concerted action at EU level will prevent the species from being introduced to Europe by addressing its introduction pathways, such as inter alia contaminated soil, plant or seed imports, and by rapidly eradicating any emerging invasion.

## *Pueraria lobata* (Kudzu vine)



The Kudzu vine is a densely-packed climber with large hairy dark brown stems that grow up to 15 meters in length. Native to eastern Asia, it has been imported into the EU only recently as a horticultural curiosity. So far, the species has only escaped into the wild in Italy (as well as in Switzerland).

The vine typically grows in mixed forests but has also been found in managed habitats such as road and rail embankments, pastures, conifer plantations and riverbanks. The potential for damage is high because the mass of scrambling leaves can radically alter forest areas and crowd out native shrubs and trees. It can also have negative effects on recreational facilities, as well as on forestry activities and crop production.

Once the species is well established, management becomes very difficult. EU-level action includes a ban on sales and any planting or keeping, including in gardens, and a rapid eradication of any new population to avoid the excessively high costs associated with its management later on. Where the species has become widely spread, appropriate management measures have to be taken.

## *Alopochen aegyptiacus* (Egyptian goose)



The Egyptian goose can be recognised by its distinctive brown eye patch and reddish brown plumage. Native to Africa, the species was first introduced to Europe as an ornamental specimen for zoological collections and urban parks. It has since escaped into the wild and is now established in eight countries: the United Kingdom, the Netherlands, Belgium, Germany, Sweden, Cyprus, Denmark and Poland.

The Egyptian goose adapts easily to a wide range of environments. It is an aggressive species that is known to hybridize with other goose and duck species and it out-competes native fauna for food and nesting sites. When present in large numbers, its impacts include overgrazing, eutrophication and spread of diseases.

A sales ban, the phasing out from zoos, collections and any other ownership, a rapid eradication of any newly emerging populations and the management of established populations should prevent the species from becoming a wider problem across the EU.

## *Callosciurus erythraeus* (Pallas' squirrel)



The Pallas' squirrel is a red-bellied tree squirrel native to South East Asia. It was first introduced in the 1970s to Southern France as a pet. Following escapes and intentional releases, it has since established itself in forests, parks and gardens, in both suburban and rural areas. It is currently present in four Member States (Belgium, France, Italy and the Netherlands).

The Pallas' squirrel is a particularly successful invasive alien species because it is highly adaptive and opportunistic, feeding on almost anything from insects to nuts. Feral populations can start from a few individuals and expand rapidly, thereby out-competing, and sometimes completely eradicating the native red squirrel. Its habit of stripping the bark off trees can also

bring about significant economic damage for the forestry sector.

The import of this species has already been banned through the EU Wildlife Trade Regulation, but its inclusion on the Union list of Invasive Alien Species will ensure further concerted action to contain its invasion and prevent its spread into other countries.

# Invasive Alien Species of Union concern

## *Corvus splendens* (Indian house crow)



The Indian house crow is a medium-sized black crow with a distinctive grey shawl across the back of its neck. It is native to the Indian sub-continent and most likely came to Europe by accident as a stowaway on a ship. It has since established itself in the Netherlands.

The species is closely associated with human settlements, scavenging on discarded food and refuse dumps, making it a potential danger to human health. It also causes damage to crops and, because it is known to predate on other bird species and small mammals, it could have a serious impact on native species as well.

Although only present in one Member State so far, the Indian house crow has the capacity to establish itself in

any urban area within Europe. Therefore, EU-level action will address its potential pathways of introduction and ensure its early detection and rapid eradication to prevent its further introduction and spread into other areas and countries.

## *Eriocheir sinensis* (Chinese mitten crab)



The Chinese mitten crab is native to eastern Asia. It owes its name to the distinctive dense mat of hair on its claws. It probably entered Europe in the early 1900s on board merchant ships hidden inside the vessels' ballast waters. It is now established in Belgium, Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Romania, Slovakia, Spain and the United Kingdom, where it has spread rapidly from marine and estuarine habitats to inland freshwater systems.

The species is a disruptive "ecosystem engineer" causing major economic and ecological damage to riverbanks and flood defences through its burrowing activities. It also damages commercial fishing gear and has a

negative impact on biodiversity due to predation and competition with native species.

Once established, the Chinese mitten crab is very difficult to control. Therefore, it is important not only to manage the existing populations but also to prevent them from being introduced and spread out further. Management measures could include its consumption as a source of food or animal feed, subject to the control of their pollutant concentrations and provided that this is integrated in the management measures of the Member State.

## *Herpestes javanicus* (Small Asian mongoose)



The Small Asian mongoose is a small mammal whose natural range extends from Iran to northern India and Indochina. The species was deliberately introduced to a number of Croatian islands in the early 20<sup>th</sup> century to control populations of the venomous horned viper. However, being an opportunistic feeder, it has also devoured significant numbers of native reptiles, amphibians and farmland birds, causing a major loss of biodiversity as well as significant economic damage.

Because the species is so adaptable, it could readily spread to other Southern European countries (Bulgaria, Cyprus, France, Greece, Hungary, Italy, Malta, Romania, Slovenia, Portugal and Spain) if the opportunity arose.

The species is already a major pest in many locations

across the world and it is listed by the International Union for Conservation of Nature among the world's 100 worst invaders.

A sales ban, the phasing out from zoos, collections and any other ownership, and a rapid eradication of any newly emerging populations should prevent the species from spreading further within the EU. On the invaded Croatian islands, appropriate management measures have to be taken.

## *Lithobates catesbeianus* (American bullfrog)



The American bullfrog is the largest of the North American frogs, weighing up to half a kilo. Its name comes from its distinctive bellowing calls. Originally introduced into Europe for consumption and as a pet, it has since escaped into the wild, colonising a wide range of habitats, including ponds, swamps, reservoirs, marshes and irrigation channels.

Its size, breeding capacity, and voracious appetite enable it to outcompete and displace other native amphibian species. It is also known to pass on lethal diseases to wildlife, such as the chytrid fungus, implicated in massive die-offs of amphibians worldwide.

The American bullfrog is currently established in seven Member States (Belgium, France, Germany, Greece, Italy, Slovenia and the United Kingdom), and it could easily invade other countries. The import of this species has already been banned through the EU Wildlife Trade Regulation, but its inclusion on the Union list of Invasive Alien Species will ensure further concerted action to contain its invasion and prevent its spread into other countries.

# Invasive Alien Species of Union concern

## *Muntiacus reevesi* (Muntjac deer)



Muntjac deer is a small deer native to South Asia. It was first introduced into European country parks in the early 1900s and has since become established in the wild in six Member States (Belgium, Denmark, Germany, Ireland, the Netherlands and the United Kingdom). It is mostly associated with forest edges and dense woodlands.

In large numbers, the muntjac deer has a profound impact on the structure and ground layer of native woodlands and can destroy a wide range of natural habitats that are important for native wildlife. The species can be problematic particularly in Natura 2000 sites where it can overgraze rare plants and prevent coppice growth. In forestry, trees often require protection from deer during their early years.

A sales ban, the phasing out from zoos, collections, and any other ownership, a rapid eradication of any newly emerging populations, and the management of established populations should prevent the species from establishing itself and causing further serious damage to Europe's biodiversity.

## *Myocastor coypus* (Coypu)



The coypu or nutria is a large rodent from South America. It was first introduced into Europe in the 19<sup>th</sup> century for fur farming. While farming has been abandoned in the meantime, the species has since colonised coastal marshes, swamps and other wetland areas in no less than 19 Member States (Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Poland, Romania, Slovakia, Slovenia and Spain). It has, however, already been eradicated from the United Kingdom.

Considered a major pest across much of the EU, the coypu is estimated to cost over 65 million euros a year in economic damage and management costs. Because of its voracious appetite, it severely disrupts the natural habitats and alters the composition of local plant communities. Additionally, it degrades river banks and irrigation systems through its extensive burrowing activities and has a major impact on agriculture.

A ban on sales, a phasing out of any ownership, a rapid eradication of any newly emerging population, and the management of established populations should help to contain the invasion.

## *Nasua nasua* (Coati)



The coati is easily recognised by its ringed tail and long snout. Native to South America, it was first imported into Europe for the pet trade and has since established itself in a number of key Natura 2000 sites on the island of Majorca in Spain. It also survived out of captivity in France and Germany.

Its rapid spread in Majorca demonstrates the strong invasive potential of the species. Being an opportunistic feeder, the coati can cause the local decimation of rare native species, such as the Majorcan midwife toad. Further potential risks could include economic damage to agriculture and the transmission of diseases to farmed animals and humans.

A sales ban, the phasing out from zoos, collections and any other ownership, a rapid eradication of any newly emerging populations, and the management of established populations should prevent the species from being introduced or spreading into other Southern European countries.

## *Nyctereutes procyonoides* (Raccoon dog)



The raccoon dog is native to Eastern Asia. It is named for its superficial resemblance to the North American raccoon to which it is not closely related. In Europe, the raccoon dog has spread rapidly in the wild after escaping from fur farms or from pet owners, as well as following massive introductions into the wild in the former Soviet Union in the first half of the 20<sup>th</sup> century. Wild populations are now established in 14 Member States: Bulgaria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Latvia, Lithuania, Poland, Romania, Sweden and Slovakia.

The raccoon dog is one of the most successful alien carnivores in Europe thanks to its high reproductive capacity, flexible feeding habits and adaptive behaviour.

It has a major impact on biodiversity, predated on many native species such as waterfowl, amphibians, rodents, reptiles and insects. It is also a very important vector of rabies, parasitic worms, ticks, sarcoptic mange and other parasites and diseases dangerous for native wildlife, as well as for humans.

Union level action includes a ban on keeping and selling the species, a rapid eradication obligation of newly emerging populations and the management of established populations in order to prevent the species from becoming a wider problem across the EU and to keep them out of protected areas.



# Invasive Alien Species of Union concern

## *Ondatra zibethicus* (Muskrat)



The muskrat is native to North America. The species was originally introduced for fur farming in the early 1900s but has since escaped or been deliberately released into the wild. It is currently established in 19 Member States: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Romania, Spain, Sweden, having been successfully eradicated in Ireland and in the United Kingdom in the 1930s.

Musk rats are a fast growing, gregarious species, with a high reproductive potential and a nomadic lifestyle, which makes them highly adaptable to different freshwater environments. They change the composition and structure of native wetland vegetation, which in

turn affects aquatic invertebrates and destroys fish nurseries. Their burrowing activities degrade river banks and affect river flow. They can also exert a strong predation pressure on endangered species such as the freshwater pearl mussel. The economic impact of the muskrat is no less significant. It causes extensive damage to crops, irrigation systems, roads, railroads, dams and flood protection systems.

Union level action includes a ban on keeping and selling, a rapid eradication of newly establishing populations and containment of the invasion, especially keeping them out of protected areas.

## *Orconectes limosus* (Spiny-cheek crayfish)



The spiny-cheek crayfish is a small North American crayfish that was deliberately introduced into Europe to supplement dwindling stocks of Europe's native crayfish (*Astacus astacus*). Although it failed as a commercial venture, the species has managed to colonise rivers, streams, ponds and lakes in 19 EU Member States (Austria, Belgium, Bulgaria, Croatia, the Czech Republic, France, Germany, Hungary, Italy, Latvia, Lithuania, Luxemburg, the Netherlands, Poland, Romania, Slovakia, Slovenia, Spain and the United Kingdom).

As other invasive alien crayfish, its high reproductive rate and tolerance to a wide range of environmental conditions has enabled it to spread far and wide. It is now one of the primary causes of the decline of native

European crayfish species, through both competition for resources and the spread of the crayfish plague.

A ban on releasing or restocking the species, rapid eradication of any newly emerging populations, and the management of established populations should contain the species. Part of the management solution also lies in its continued commercial fishing, provided that their pollutant concentrations are monitored, and provided that this is integrated in the management measures of the Member State.

## *Orconectes virilis* (Virile crayfish)



The virile crayfish, native to North America, was imported to Europe for the aquarium trade. It was first recorded in the wild in 2004 in the Netherlands and is now also present in the United Kingdom. It is most likely to have been deliberately released into the wild due to the disposal of unwanted aquarium collections.

As with other invasive alien crayfish, the virile crayfish can spread very rapidly into new waterbodies due to its high reproductive rate and fast growth. High population density impacts heavily on freshwater habitats since they consume massive quantities of food and disrupt the natural food chain.

In view of the species' strong invasive potential, a ban on keeping, including in aquaria, or releasing the species, a rapid eradication of any newly emerging populations, and the management of already established populations should prevent the species from spreading or being introduced to other areas or Member States. At present there is no easy or cost-effective way to control any of the non-native crayfish populations once they become established.

## *Oxyura jamaicensis* (Ruddy duck)



The ruddy duck, native to North America, was first introduced into Europe as part of a wildfowl collection in the 1940s but it has since escaped into the wild in 12 Member States (Austria, Belgium, the Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, the Netherlands, Portugal and the United Kingdom).

Ruddy ducks can interbreed with the much rarer native white-headed duck (*Oxyura leucocephala*), which was originally present throughout southern Europe but is now only breeding in Spain. If the ruddy duck's range is allowed to spread further into the remaining breeding ranges of the white-headed duck, it will almost certainly lead to the extinction of the native species. The only real solution would be to eradicate the species completely from Europe.

Its import has already been banned through the EU Wildlife Trade Regulation, but placing it on the Union list will further contain the invasion by prohibiting its sale, phasing out its keeping and requiring a rapid eradication of any newly observed populations. The eradication of the ruddy duck in the Western Palaearctic by 2020 was recommended within the framework of the Convention on the Conservation of European Wildlife and Habitats.

## *Pacifastacus leniusculus* (Signal crayfish)



Originating from North-Western US and Canada, the signal crayfish was first introduced into Europe over 100 years ago to revive the dwindling crayfish industry. It is now one of the most widespread non-native crayfish species in Europe present in 23 Member States (Austria, Belgium, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxemburg, the Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom).

As with other invasive alien crayfish, the signal crayfish outcompetes native species and alters the habitat structure. It is also a vector of the crayfish plague, which has led to large-scale mortalities amongst European

crayfish populations.

Today, the signal crayfish supports a large, commercially and recreationally important fishery sector, especially in Sweden, Finland and the Netherlands. Placing the species on the Union list does not need to undermine its current socio-economic value, but a ban on releasing or restocking the species, pathway management and the rapid eradication of new invasions should help contain its further spread. Continued fishing will therefore be part of the management solution, provided that this is integrated in the management measures of the Member State.

## *Percottus glenii* (Amur sleeper)



The Amur sleeper is a small, streamlined fish, native to North Korea and far eastern Russia. It is now one of the most widespread and successful invasive fish species in European inland waters, especially in ponds in Eastern Europe and in large parts of the Danube, the Vistula and other

river basins. The species is currently present in nine Member States (Bulgaria, Croatia, Estonia, Germany, Hungary, Lithuania, Poland, Romania and Slovakia).

The Amur sleeper is a voracious predator. It can have a significant negative impact on native aquatic species, especially amphibians and other freshwater fish, not only through competition for food and predation but also possibly through the transmission of diseases and the disruption of the food chain.

Given the difficulties and the costs associated with eradicating or controlling this species, management of potential pathways and the rapid eradication of any newly emerging populations should prevent the species from spreading into yet unaffected water bodies. Stowaway individuals in consignments of other fish species is probably the most important pathway of introduction and spread.

## *Procambarus clarkii* (Red swamp crayfish)



The red swamp crayfish is a highly adaptable freshwater crayfish, native to South-Eastern USA. It is commonly found in slow-flowing rivers, marshes, canals and rice paddies. Originally introduced into Europe for aquaculture, it has since escaped into the wild and is now present in 10 Member States (Austria, Belgium, Cyprus, France, Germany, Italy, the Netherlands, Portugal, Spain, and the United Kingdom).

Along with other invasive alien crayfish, the red swamp crayfish is responsible for the dramatic decline of the native crayfish *Austropotamobius pallipes* to which it transmits a lethal fungal disease. In addition, it is known to change the structure of entire wetland habitats by disrupting the native species composition and it causes

significant damage to drainage and irrigation systems, especially in rice-growing areas.

A ban on releasing or restocking the species, pathway management and rapid eradication of any newly emerging populations will prevent invasion into new areas and other Member States. Part of the management solution will be to continue fisheries, provided that this is integrated in the management measures of the Member State.

## *Procambarus fallax f. virginalis* (Marbled crayfish)



The marbled crayfish is a medium-sized crayfish with a distinct marbled pattern. It is the only crayfish with the capacity to clone itself. All individuals are female which means the offspring are genetically identical to the parent. A popular species for the aquarium trade, it has since escaped or been released into the wild in six Member States (Croatia, the Czech Republic, Germany, Italy, the Netherlands, and Slovakia). Its origin is unknown.

Although the species is still quite limited in distribution and there is little evidence of it having a major impact so far, it could potentially become a major threat to native European crayfish species through competition and the spread of the crayfish plague. As other

introduced crayfish, it is also likely to disrupt natural wetlands through its extensive burrowing activities.

A ban on keeping, including in aquaria, or releasing the species, pathway management and the rapid eradication of any newly emerging populations will prevent the species from being introduced into other parts of the EU.

# Invasive Alien Species of Union concern

## *Procyon lotor* (Raccoon)



The raccoon is a medium-sized carnivore originating from North America with a distinctive black eye mask and a ringed bushy tail. It was brought into Europe in the mid-20th century for the fur trade and has since escaped into the wild. It is a cute-looking animal that became popular in zoos and as a pet. It is now present in 16 Member States (Austria, Belgium, Croatia, the Czech Republic, Denmark, France, Germany, Hungary, Ireland, Italy, Luxemburg, Poland, Romania, Slovakia, Slovenia and Spain).

Raccoons can survive in a wide range of habitats. They are omnivorous and opportunistic, eating eggs, chicks and adult birds, especially waterfowl. Their impact on biodiversity can be severe, especially in Natura 2000

wetlands. They are also known to damage fruit trees, vineyards and chicken farms and they carry important diseases and parasites, such as rabies, roundworms and toxoplasmosis.

A sales ban, the phasing out from zoos, collections or any other ownership, a rapid eradication of any newly emerging populations, and the management of established populations should prevent the species from invading the rest of the EU.

## *Pseudorasbora parva* (Stone moroko)



The stone moroko is a small fish native to Eastern Asia. It typically inhabits small ponds and ditches, but also sometimes larger lakes and streams. It is now present in 19 Member States (Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Luxemburg, the Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, and the United Kingdom).

It was first introduced to the EU either by accident as a hitch-hiker on carp species imported for aquaculture, or intentionally for recreational fishing or the ornamental fish trade. Because the species is tolerant of a wide range of environmental conditions and occasionally predated on the eggs of other fish species, such as the

indigenous gudgeon, it can quickly dominate new water bodies, causing the loss of native species.

An EU-level ban on keeping, including in aquaria, or releasing the species, action on pathways of introduction and spread, and rapid eradication of any newly emerging population will prevent its further invasion into other Member States. Where the species has become widely spread, appropriate management measures have to be taken.

## *Sciurus carolinensis* (Grey squirrel)



The grey squirrel is a medium-sized tree squirrel native to the forests of North America. It was introduced in Italy, Ireland and the United Kingdom where it is now expanding in range.

The grey squirrel can be found in natural forests, as well as in planted forests, scrublands, urban parks and gardens. Due to its competitive nature and propensity to carry diseases, it is now one of the main threats to the survival of the native red squirrel. It can also cause significant economic and ecological damage through its habit of bark stripping, which increases the risk of fungal infections and insect damage to trees.

The import of this species has already been banned through the EU Wildlife Trade Regulation, but placing it on the Union list will further contain the invasion by prohibiting its sales, phasing out its keeping and requiring a rapid eradication of any newly observed population and management of the established populations.

## *Sciurus niger* (Fox squirrel)



The fox squirrel is a relatively large squirrel with a long, bushy tail native to North America. Until recently, it was imported to Europe for the pet trade. It has not yet established itself in the wild.

There is a strong likelihood that the species will become invasive if it were to escape into the wild, as the conditions in many European countries are similar to those in its native home range. As other invasive squirrels, it could outcompete the native red squirrel and pass on diseases and parasites to which the native fauna is not resistant.

The import of this species has already been banned through the EU Wildlife Trade Regulation, but placing it on the Union list will further prevent the invasion

by prohibiting its sales, phasing out its keeping and requiring a rapid eradication of any newly observed population.

# Invasive Alien Species of Union concern

## *Tamias sibiricus* (Siberian chipmunk)



The Siberian chipmunk is a small squirrel native to the Siberian taiga. It was introduced into Europe as a pet in the 1960s. Since then, individuals have most probably escaped or been deliberately released from captivity. So far, isolated wild populations have been recorded in woodlands, suburban forests and urban parks in Belgium, France, Germany, Ireland, Italy and the Netherlands.

It is suspected to compete with native rodents and may have a local impact on ground-nesting birds, although the numbers of studies investigating its potential impact on biodiversity are currently limited. It can also cause significant damage to crops, gardens and orchards and it is a potential host for various infectious diseases,

such as Lyme disease or rabies, and parasites.

A sales ban, the phasing out from zoos, collections and any other ownership, a rapid eradication of any newly emerging populations and the management of established populations should prevent the species from becoming a wider problem.

## *Threskiornis aethiopicus* (Sacred ibis)



The sacred ibis is an easily recognisable large bird with a bald, black head and neck, a thick curved bill and black legs. A native to sub-Saharan Africa, it was first brought into France and Italy as a zoological specimen in the 19<sup>th</sup> century but has since escaped into the wild. It is currently present in eight Member States (Belgium, France, Greece, Italy, Latvia, Lithuania, Portugal and Spain).

Sacred ibises are highly mobile and adaptable. They feed in a variety of man-made habitats including rubbish tips, farmyards and ploughed fields but are mostly found in wetlands, often in large colonies. Through its feeding habits,

it can outcompete and even predate on native water birds, thus causing severe biodiversity losses locally. Colonial-nesting species such as terns and seabirds are particularly vulnerable.

A sales ban, the phasing out from zoos, collections and any other ownership, a rapid eradication of any newly emerging populations and the management of established populations should prevent the species from becoming a wider problem in other areas and Member States.

## *Trachemys scripta* (Red-eared, yellow-bellied and Cumberland sliders)



The slider is a large freshwater turtle, native to Eastern and Central US. There are three sub-species: red-eared, yellow-bellied and Cumberland sliders. In the past, over 50 million individuals have been imported into Europe for the pet trade. Many have since escaped or been deliberately released into the wild. The species is now present in 22 Member States (Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Luxembourg, Poland, Portugal, Romania, Slovakia, Slovenia and Spain).

The slider is a serious threat to endangered populations of indigenous turtle species, such as the European pond turtle *Emys orbicularis* or the Mediterranean

turtle, *Mauremys leprosa* because it competes for basking and nesting sites. With its voracious appetite, it disturbs aquatic habitats and poses a human health risk, being a possible reservoir for salmonella.

The import of the red-eared, yellow-bellied and Cumberland sliders has already been banned through the EU Wildlife Trade Regulation, but placing all three sub-species on the Union list will further contain the invasion.

## *Vespa velutina nigrithorax* (Asian hornet)



The Asian hornet is native to South-East Asia and was probably introduced by accident through imported goods from China. Since its first recording in France in 2005, it has spread rapidly into Germany, Italy, Portugal, and Spain.

The Asian hornet is a highly effective predator of honeybees, wasps and other important pollinators, such as hoverflies. The huge size of its colonies (consisting of up to 10,000 individuals per season) means that they can rapidly decimate entire beehives. Observations in France noted losses of 14,000 honeybees per hive per month. Due to its aggressive nature and feeding habits, it could have a serious impact on native insect biodiversity and on pollination services in general.

Given that queen hornets are highly mobile and very adaptable, there is a strong risk that the species will be able to spread rapidly across the landscape, causing significant economic and ecological damage. EU-level action seeks to prevent this spread by inter alia rapidly destroying its nests. In addition, where the species has become widely spread, appropriate management measures have to be taken.



# Invasive Alien Species of Union concern

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