

2022



**MANAGEMENT OF VERTEBRATE
INVASIVE ALIEN SPECIES OF UNION CONCERN,
INCORPORATING ANIMAL WELFARE**

Management of vertebrate invasive alien species of Union concern, incorporating animal welfare

Invasive alien species (IAS) are a major driver of biodiversity loss. Since 2015, IAS have been regulated at the EU level by the EU Regulation 1143/2014. As of February 2021, the regulation lists 22 vertebrate species of 'Union concern', and requires that animal welfare is taken into consideration during their management. A manual for the management of vertebrate IAS of Union concern that explicitly assesses the impacts to animal welfare alongside effectiveness of measures that are available to eradicate, control, or contain these species has recently been produced.

Users of the manual are **strongly encouraged to adopt the method with the lowest welfare impact, as appropriate to the specific circumstances of the Member States and without compromising the effectiveness of the management measures**, so that control measures cause the least animal welfare harms to the least number of animals, taking into account other considerations such as costs, needs, benefits, feasibility and public perception.

The manual can be accessed on the [European Commission \(EC\) page on IAS](#).

Using traps as part of the management of the Raccoon Dog (*Nyctereutes procyonoides*) in the north-European countries © LIFE09 NAT/SE/000344.



What is an invasive alien species, and why do we need to manage them?

An **invasive alien species** (IAS) is an animal, plant, fungi or micro-organism whose introduction or spread to areas outside its natural range has been found to threaten or adversely impact biodiversity and related ecosystem services.

IAS are known to be one of the **major drivers of biodiversity loss** and species extinctions across Europe and the world, particularly in geographically and evolutionary isolated systems such as islands. The ways in which they impact native biodiversity vary, but can include predation, competition, and the transmission of diseases. The threat posed by IAS is reflected in the EU's Biodiversity Strategy for 2030, which has a commitment to decrease the number of Red List species threatened by IAS by 50%.

To minimise damage by IAS, their introduction and spread to new areas needs to be prevented. In addition, those IAS populations that are already established and that have a negative impact on the environment may need to be eradicated, or if this is not feasible, to be managed so that their impacts are minimised.

In 2015, the **EU Regulation on invasive alien species** came into force. At the core of the Regulation is a list of IAS of Union concern, which currently contains 30 animal and 36 plant species (including the 22 vertebrate species which are the subject of the manual). The Regulation requires EU Member States to implement measures that focus on the prevention, early detection and rapid eradication, as well as management of these IAS of Union concern (see **infographic** on page 4).

The American bullfrog (*Lithobates catesbeianus*) is currently established in six EU Member States, where its size, breeding capacity and voracious appetite enable it to outcompete and displace other native amphibian species. © Katja Schulz Attribution 2.0 Generic (CC BY 2.0) via Flickr.





IUCN guide to the EU Regulation on Invasive Alien Species

1143/2014

Regulation applies to:

All invasive alien species (IAS)*

- Introduced outside natural range
- Live specimens that may reproduce
- Adversely impact biodiversity and related ecosystem services

Listing criteria:

- Alien to the Union (exc. outer regions)
- Capable of establishing & spreading in > 2 Member States or 1 marine region
- Adverse impacts to biodiversity and ecosystem services
- Risk Assessment shows concerted action at Union level required
- Inclusion on the *Union List* will effectively prevent, minimise or mitigate impacts

List of IAS of Union concern

Prevention measures

Emergency measures

- For IAS of imminent risk of introduction not on *Union List*
- IAS need to likely meet criteria for inclusion on *Union List*
- Member States (MS) may apply temporary *Restrictions*
- MS must notify Commission – to decide if apply EU wide
- MS must carry out Risk Assessment and submit for inclusion on *Union List*

IAS of Member State/regional concern

- MS may establish a national list of IAS and apply *Restrictions* and other measures at national level
- For IAS that require enhanced regional co-operation MS may request Commission to require MS concerned to apply the following measures: Action plans, Surveillance, Early detection, Rapid eradication, Management, and Restoration

* Regulation 1143/2014 scope excludes:

- Species that expand range without human intervention
- Non-native species covered by other EU legislation

'Union List' = 66 species

- 2016 = 37 species listed (23 animals and 14 plants)
- 2017 = 12 species listed (3 animals and 9 plants)
- 2019 = 17 species listed (4 animals and 13 plants)

Prevention measures

Restrictions

- IAS of Union concern shall not intentionally be; brought into the Union, kept, bred, transported, sold, used or exchanged, permitted to reproduce, grown or cultivated, released into the environment

Action plans

- Pathways analysis of unintentional introduction for IAS of Union concern
- Pathway action plans implemented for priority pathways (within 3 years of adoption)

Authorisations

- In exceptional cases for reasons of compelling public interest (incl. social or economic) MS may permit activities
- Authorisation required from Commission

Permits

- Permits issued by MS allowing for research or ex-situ conservation activities

Management of widespread IAS

Management

- MS have in place effective management measures for IAS of Union concern that are widespread in their territory (18 mo. of adoption)
- Based on cost-benefit analysis

Management

- MS carry out restoration to assist ecosystem recovery degraded by IAS of Union concern
- Based on cost-benefit analysis

Early detection and rapid eradication

Surveillance

- MS establish a surveillance system for IAS of Union concern
- Needs to be able to rapidly detect new introductions

Controls

- MS have in place risk-based controls to goods imported to verify they are not on the *Union List* or are covered by a valid Permit

Early detection notification to EC

Rapid eradication

- MS undertake eradication (complete & permanent) within 3 months of notification
- Methods used with due regard to human health, environment and animal welfare

Derogations

- Within 2 months of detection, MS may not eradicate if one of the following apply:
 - Technically unfeasible
 - Cost-benefit analysis show costs disproportionate to benefits
 - Eradication methods not available or have serious impacts to human health or environment
- Can be rejected by Commission within 2 months

Management of IAS and animal welfare

The management of vertebrate IAS included on the Union List may raise concerns for animal welfare, not least because management can impact large numbers of animals for sustained periods of time, bearing in mind also the need to minimise the impact on non-targeted species and their habitats. The Regulation acknowledges that ***eradication and management of IAS may induce pain, distress, fear or other forms of suffering to the animals, even when using the best available technical means***. There is an increasing public concern for invasive alien animals as sentient beings, and, more generally, an increasing interest by civil society in the humane treatment of animals.

The requirements of the EU IAS Regulation relevant to the rapid eradication and management of IAS

on the Union List explicitly refer to consideration of animal welfare. The Regulation states that when applying management measures, Member States shall ***ensure that animals are spared any avoidable pain, distress or suffering, taking into account as far as possible the best practices in the field and without compromising the effectiveness of the management measures***. Based on these requirements, it is the responsibility of individual Member States to select management measures that suit their own specific circumstances. Inappropriate measures could lead to unnecessary animal suffering, a lack of public acceptance and failure to achieve the objectives of the IAS Regulation.

A manual to support competent authorities and practitioners to incorporate animal welfare in the management of IAS

A management manual has been produced to support Member States and others in making choices about measures for the humane management of the species of Union concern. The manual identifies the available lethal and non-lethal measures that can be used to eradicate, control or contain populations of the 22 vertebrate species on the Union List (see the ***toolbox*** at the end of this brochure).

The effectiveness, cost, and side effects of each measure are discussed and, crucially, their **impacts upon animal welfare are assessed**. Measures are not defined as ‘humane’ or ‘inhumane’, as this would be an oversimplification of the issue, and may discourage operators from continually striving for the approach with the least welfare impact. The aim is

rather to describe measures along an axis of welfare impact to permit decision-making that selects the methods producing least negative welfare impacts as a matter of principle.

The humaneness assessment for each measure is based on a welfare assessment model devised by Sharp & Saunders (2011) and based on the *5 Domains Model* (Mellor & Red, 1994). Each measure is assessed according to (A) the ‘*overall welfare impact*’ which assesses the welfare impact of a measure, excluding the actual killing of the animal (if the measure involves killing); and (B) the ‘*mode of death*’ which assesses the welfare impact of the killing method (if the measure involves killing).

The 22 vertebrate IAS of Union concern

Mammals



Callosciurus erythraeus
Pallas' squirrel



Herpestes javanicus
Small Indian mongoose



Muntiacus reevesi
Muntjac deer



Myocastor coypus
Coypu



Nasua nasua
Coati



Nyctereutes procyonoides
Raccoon dog



Ondatra zibethicus
Muskrat



Procyon lotor
Raccoon



Sciurus carolinensis
Grey squirrel



Sciurus niger
Fox squirrel



Tamias sibiricus
Siberian chipmunk

Birds



Acridotheres tristis
Common myna



Alopochen aegyptiaca
Egyptian goose



Corvus splendens
Indian house crow



Oxyura jamaicensis
Ruddy duck



Threskiornis aethiopicus
Sacred ibis

Amphibians and reptiles



Lithobates catesbeianus
North-American bullfrog



Trachemys scripta
Red-eared, yellow-bellied and
Cumberland sliders

Fishes



Lepomis gibbosus
Pumpkinseed



Percottus glenii
Amur sleeper



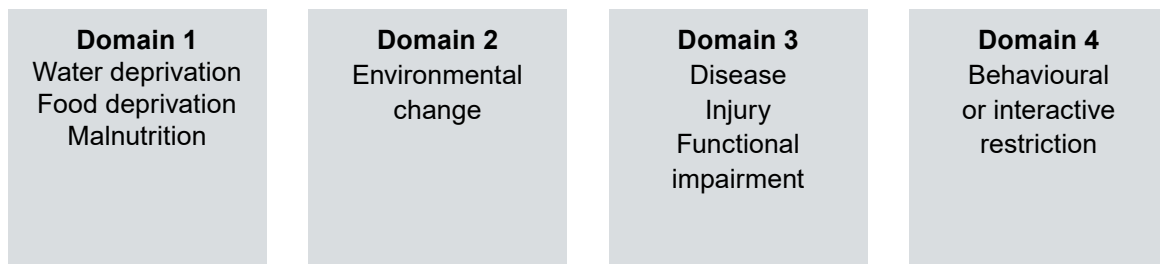
Plotosus lineatus
Striped eel catfish



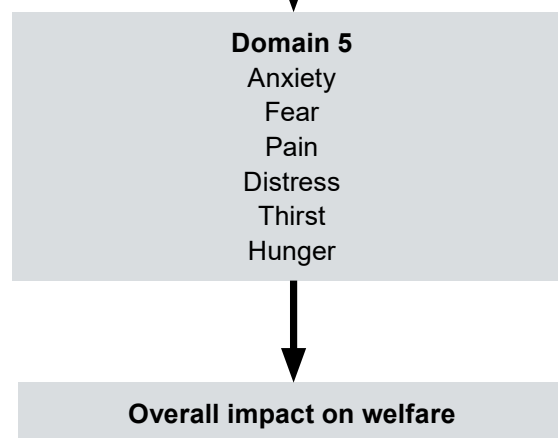
Pseudorasbora parva
Stone moroko

Five domains of potential welfare impact divided broadly into physical and mental components

Physical components



Mental components



Adapted from Sharp & Saunders (2011)

The manual consists of the following sections:

- An overview of international, EU, and Member State standards and rules on animal welfare of relevance to the management of invasive alien vertebrate species populations.
- A toolbox of measures, presenting which measures are available to manage the 22 vertebrate invasive alien species of Union concern.
- Humaneness summaries for individual measures, according to their overall welfare impact, and mode of death.
- Species accounts highlighting the management measures available for each species, discussing their effectiveness and costs.
- An appendix of assessments for individual measures, which contain details on their application, humaneness, effectiveness, costs, and side effects.
- An appendix of legal frameworks and species status within each Member State.

Where to find the manual

The manual for the management of vertebrate IAS of Union concern, incorporating animal welfare, can be found at the [EC IAS page](#).

References

Mellor, D.J. & Reid, C.S.W. 1994. Concepts of animal well-being and predicting the impact of procedures on experimental animals. In Proceedings of Improving the Well-being of Animals in the Research Environment, Marriott Hotel, Sydney, Australia, October 1993; pp. 3–18.

Sharp, T. & Saunders, G. 2011. A model for assessing the relative humaneness of pest animal control methods, Department of Agriculture, Fisheries and Forestry Canberra, Australia.

Pumpkinseed (*Lepomis gibbosus*) © Matt Tillett Attribution-NonCommercial-NoDerivs 2.0 Generic (CC BY-NC-ND 2.0).



Toolbox of the assessed measures for the 22 vertebrate species of Union concern

Below is a matrix of the 32 measures assessed in the manual, identifying if they are available to manage the 22 vertebrate species of Union concern. Note that the manual presents an assessment of each measure's

impacts upon animal welfare, alongside information on their effectiveness for different management objectives (rapid eradication, eradication, population control and containment), and on costs and side effects.

Category	Measure name	<i>Acridotheres tristis</i> Common myna	<i>Alopochen aegyptiaca</i> Egyptian goose	<i>Callosciurus erythraeus</i> Pallas' squirrel	<i>Corvus splendens</i> Indian house crow	<i>Herpestes javanicus</i> Small Indian mongoose	<i>Lepomis gibbosus</i> Pumpkinseed	<i>Lithobates catesbeianus</i> North-American bullfrog	<i>Muntiacus reevesi</i> Muntjac deer
Biological control	Native predators						P	A	
Habitat manipulation	Aquatic barriers – physical & non-physical						P	A	
	Aquatic habitat management – pond drying/drainage						A	A	
	Physical terrestrial barriers							P	
Hand removal	Hand removal	P	A		A		P	A	A
	Physical fishing methods						A	A	
Other	Egg oiling	P	A		A				
	Electrofishing						A	A	
	Fertility control – chemical (in bait) & injection			P				U	P
	Hunting dogs (tracking/baying)			P		A			P
	Judas animals	P			P	P			P
Poisoning or toxicants	Stupefying bait	U	P		U				P
	Chemical treatment of the habitats						P	P	
	Poisons and toxins in bait					P			
Shooting	Shooting	A	A	A	A	A		A	A
Trapping	Drowning traps								
	Goodnature self-resetting traps			P		A			
	Spring traps			P		A			
	Cage traps	A	A	A	A	A			A
	Neck-hold traps, and snares					P			
	Live decoy traps	A	A		P				
Dispatch/removal only once captured	Cervical dislocation	P	P	A	P	P	P	P	
	Cranial depression	A	A	U	P	P	P	A	A
	Decapitation	P	P	P	P		P	P	
	Electrocution	P	P	P	P	P	P		P
	Freezing						A	A	
	Injection euthanasia	P	P	P	P	P	P	P	P
	Keeping in captivity	P	P	A	P	P	P	P	P
	Modified atmospheres	A	A	A	P	P			
	Shooting – dispatch restrained animals	P	P	P	P	P			P
	Slaughter (knife)	P	P	P	P	P	P	P	P
Surgical sterilisation	P	P	P	P	P			P	

Measure availability:

A = Available U = Under development P = Potential

<i>Mycastor coypus</i> Coypu	<i>Nasua nasua</i> Coati	<i>Nyctereutes procyonoides</i> Raccoon dog	<i>Ondatra zibethicus</i> Muskrat	<i>Oxyura jamaicensis</i> Ruddy duck	<i>Perocottus glenii</i> Amur sleeper	<i>Plotosus lineatus</i> Striped eel catfish	<i>Procyon lotor</i> Raccoon	<i>Pseudorasbora parva</i> Stone moroko	<i>Sciurus carolinensis</i> Grey squirrel	<i>Sciurus niger</i> Fox squirrel	<i>Tamias sibiricus</i> Siberian chipmunk	<i>Threskiornis aethiopicus</i> Sacred ibis	<i>Trachemys scripta</i> Red-eared, yellow-bellied and Cumberland sliders
					A			A	P				P
					A			A					
					A			A					A
													P
	A			A	P	P		A				A	A
					P	P		A					A
				A								A	
					A			A					
	P	P	P				P		A	P	P		
A	P	A	P				A		P	P	P		A
U	P	A	P				U					P	U
												A	
P			P		P			A					
			P						A				
A	A	A	A	A			A		A	P	P	A	A
A			A										
									A	P	P		
A	P	A	A				A		A	P	P		
A	A	A	A	A			A		A	A	A	P	A
P	P	P					A						
				P	P	P		P	A	A		P	P
P	P	P	P	P	P	P		P	A	A		P	P
								P					P
P	P	P	P	P	P		P	P	A	A	P	P	A
P	P	P	P	P	P	P		P	P	P	P	P	A
A	A	P	P	P			P		A	A	P	P	P
A	A	P	P	P			A		A	A	P	P	A
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A	P	P	P	P			A		A	P	P	P	A

Photo credits

Page 6: Mammals

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