

# Alien invasive birds

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## Summary

A bird species is regarded as alien invasive if it has been introduced, intentionally or accidentally, to a location where it did not previously occur naturally, becomes capable of establishing a breeding population without further intervention by humans, spreads and becomes a pest affecting the environment, the local biodiversity, the economy and/or society, including human health.

European Starling (*Sturnus vulgaris*), Common Myna (*Acridotheres tristis*) and Red-vented Bulbul (*Pycnonotus cafer*) have been included on the list of '100 of the World's Worst Invasive Alien Species', a subset of the Global Invasive Species Database.

The 'Delivering Alien Invasive Species Inventories for Europe' project has selected Canada Goose (*Branta canadensis*), Ruddy Duck (*Oxyura jamaicensis*), Rose-ringed Parakeet (*Psittacula krameri*) and Sacred Ibis (*Threskiornis aethiopicus*) as among 100 of the worst invasive species in Europe.

For each of these alien bird species, the geographic range (native and introduced range), the introduction pathway, the general impacts and the management methods are presented.

## Keywords

Alien bird species – Birds – Geographic range – Impact – Introduction pathway – Management methods.

## Introduction

The occurrence and spread of a bird species in a new area can result from one of the three following processes: colonisation, irruption or introduction.

### Colonisation

Colonisation is the process in biology by which a species naturally spreads into new areas, as opposed to introduction by human agency. The term can be used to describe colonisation on a small scale (i.e. where a species moves into new areas at a particular site or into new

ecosystems, perhaps as a result of a change in environmental or climatic conditions) or on a large scale (i.e. where a species expands its range to encompass new areas; here, the term 'range expansion' is often used). Some large-scale notable colonisations by birds in the 20th Century are:

- the colonisation of the New World by the Cattle Egret (*Bubulcus ibis*) (Fig. 1)
- the westward spread of the Collared Dove (*Streptopelia decaocto*) across Europe
- the colonisation of Britain by the Little Egret (*Egretta garzetta*).

**Fig. 1****Cattle Egret (*Bubulcus ibis*)**

The Cattle Egret has considerably expanded its distribution range during the last decades of the 20th Century

**Irruption**

Bird migration is the travelling of distances in search of a new habitat. The trigger for the migration may be local climate, local availability of food, or the season of the year. To be counted as true migration, and not just a local dispersal or irruption, the movement of the animals should be an annual or seasonal occurrence. Some species, such as Bohemian Waxwings (*Bombycilla garrulus*), are irruptive, moving well beyond their normal range, in unpredictable migration patterns from year to year, and particularly moving south. If the berry supply fails in winter, waxwings can irrupt, often in flocks that on occasion number in the thousands (7, 21).

**Introduction**

An introduced species is a species living outside its native distributional range, which has arrived there by human activity, either deliberate or accidental. The term 'invasive species' refers to a subset of those species defined as introduced species. A bird species is regarded as invasive if it has been introduced to a location, area, or region where it did not previously occur naturally (i.e. is not a native species), becomes capable of establishing a breeding population without further intervention by humans, spreads and becomes a pest in the new location, affecting the environment, the local biodiversity, the economy and/or society, including human health.

Introduction pathways to new locations are various. Numerous bird species have been intentionally introduced into new areas:

- by acclimatisation societies (these societies, which were popular in the 19th Century, particularly in European colonies, introduced plants and animals into regions in which the fauna was considered deficient)

- for biological control (control of insect populations)
- for ornamental purposes
- as game birds, for hunting purposes
- by natural dispersal from a new location
- by deliberate release of captive pet or ornamental birds.

Not all introductions of birds have been intentional. In the past few decades the exotic bird trade has been responsible for escapes and releases of captive companion animal or ornamental birds (e.g. wildfowl collections, zoos, botanic gardens). This trade has caused introductions of Psittacidae (parrots, parakeets), Columbidae (doves) (Fig. 2), Anatidae (e.g. geese, ducks), Ciconiiformes (e.g. ibis) that have been able to build large, sustainable populations and become invasive. Accidental introductions of some species into new areas through sea freight (container/bulk) have also been described.

**Fig. 2****Collared Dove (*Streptopelia decaocto*)**

The spread of the Collared Dove into new areas is the result of two different processes: natural colonisation in Europe and introduction into North America

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**Invasive bird species**

A Global Invasive Species Database ([www.issg.org/database/welcome/](http://www.issg.org/database/welcome/)) was developed in order to identify invasive plants, animals and other organisms, increase awareness about these alien species and to facilitate effective prevention and management activities. The Database is managed by the Invasive Species Specialist Group (ISSG) of the International Union for Conservation of Nature (IUCN) Species Survival Commission.

As part of the Database, a list of '100 of the World's Worst Invasive Alien Species' has been created, funded by Total

Foundation. Three bird species have been included on this list: *Sturnus vulgaris* (*European Starling*), *Acridotheres tristis* (*Common Myna*) and *Pycnonotus cafer* (*Red-vented Bulbul*).

The Delivering Alien Invasive Species Inventories for Europe project (funded by the European Commission: [www.europe-aliens.org](http://www.europe-aliens.org)) has established a list of 100 of the worst alien invasive species in Europe, and the following four birds are included among them: *Branta canadensis* (*Canada Goose*), *Oxyura jamaicensis* (*Ruddy Duck*), *Psittacula krameri* (*Rose-ringed Parakeet*), *Threskiornis aethiopicus* (*Sacred Ibis*). The present geographic range (native and introduced range), the introduction pathway, the general impacts and the management methods for each of these seven alien bird species are presented below.

### European Starling (*Sturnus vulgaris*)

Native to Europe, Asia and North Africa, the European Starling (Fig. 3) has been introduced globally (1), except in neotropical regions. The starling prefers lowland habitats and is an aggressive omnivore.



**Fig. 3**

#### European Starling (*Sturnus vulgaris*)

The European Starling is an aggressive omnivore and competes with native bird species for food

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There were four distinct introduction pathways:

- biological control: European Starlings were introduced to New Zealand to control local insect populations
- ornamental purposes: European Starlings were allegedly introduced to the United States as part of a movement to introduce all the birds of Shakespeare into the country
- natural dispersal: European Starlings have spread into Canada and northern Mexico from the United States

- transportation of domesticated animals: people may move European Starlings to new areas by taking their pet birds with them.

European Starlings cause damage to agricultural crops. When significant numbers are present starling flocks may descend on fruit and grain crop fields to forage, causing massive damage, and having serious economic consequences. European Starlings are extremely aggressive omnivores, and will compete with native fauna for food. The birds use open-bill probing to search for ground invertebrates, which are their preferred food. This provides the European Starling with an evolutionary advantage over frugivores. Fruit damage is often found to be caused by juveniles, which have underdeveloped probing skills. Usurping nests by contamination (as well as physical competition) is also a major problem (e.g. native parrots use little, if any, bedding, whereas starlings will rapidly fill and contaminate tree hollows). European Starlings are also a public nuisance and can damage infrastructure, roof linings, etc. and negatively affect aesthetics (20).

Manual methods such as exclusion, trapping, and shooting have been employed in an attempt to control European Starling populations. Mechanical controls include scaring with the use of sonic devices (1, 13).

### Common Myna (*Acridotheres tristis*)

*Acridotheres tristis* originated from central and southern Asia (6). Their approximate range is from eastern Afghanistan to India and from Sri Lanka to Bangladesh. Mynas are originally from tropical climates but have a surprising ability to adapt to a wide range of climates.

Mynas spread throughout much of Southeast Asia in the 1900s and have been widely introduced around the world (acclimatisation societies, escape from botanical gardens/zoos, insect pest control). They are established in South Africa, eastern and south-eastern Australia, the North Island of New Zealand, the Solomon Islands, New Caledonia, Fiji, Western Samoa, the Cook Islands, Hawaii and Réunion. Recently, reports have detailed breeding of Common Mynas in northern France (6).

*Acridotheres tristis* may prey on the eggs and nestlings of other birds and aggressively defend territories and nesting sites, which is obviously of great concern if native bird species are affected. This has been particularly concerning in Australia (16). Mynas may also exhibit 'mobbing' behaviour against birds or mammals (which is a problem in Australia, where native possums [Phalangeriformes] are affected) (17).

Mynas may consume grapes, apricots, apples, pears, strawberries, gooseberries and other fruit, damaging food crops. Mynas may also be a source of annoyance to

humans due to their communal roosting behaviour; especially in highly populated areas. The disruptive noise and fouling of the environment through droppings and other associated mess cause a variety of problems (22). It has been said that they also spread mites and have the potential to spread diseases that affect people and farm stock (17). Presumably, populations of the bird may provide reservoirs of a disease that affects native birds, while they themselves remain largely unaffected. Long-term management practices may include the modification of habitats, the limiting of food resources, and education of the public. Attempts to restrict food may be fraught with difficulty as the Common Myna's highly varied diet allows it to resort to other sources of food, even if its preferred food is removed.

### Red-vented Bulbul (*Pycnonotus cafer*)

*Pycnonotus cafer* lives around secondary growth and shrub, parks and gardens. They are also found in forest and agricultural areas. These birds occur naturally from Pakistan to south-west China and have been introduced into many Pacific Islands, including the Marshall Islands. It was speculated that their arrival in these islands was the result of a pair of birds that constructed a nest in a container ship (18). Alternatively, a fishing boat, originating from an Asian or another Pacific Island where the Red-vented Bulbul is established, could have brought some birds with them (18). In most parts of the Pacific, introduction is usually blamed on the release, either intentional or accidental, of caged birds (8).

Red-vented Bulbuls are reported to destroy flowers, beans, tomatoes, peas and ripe fruit (e.g. bananas and other soft fruits). They may also help in the spread of seeds of other invasive species.

### Canada Goose (*Branta canadensis*)

This species is native to North America where it occupies a wide range of habitats, from tundra to woodland lakes and prairie (Fig. 4). The range of migratory Canada Geese along the Atlantic coast extends from north-east and central Canada to South Carolina. Introduced populations now reside in much of the United States, south of the normal breeding range, as well as in many European countries. This species was introduced and is now established in eleven countries in northern Europe, and across north-central Europe from Belgium to Russia. It has also been introduced, but not yet become established, in an additional seven central and southern European countries, including Austria, Italy, Poland, the Czech Republic and Switzerland. In areas of Europe where it has been introduced, this species is closely associated with large water bodies, both coastal and freshwater. Individuals

were introduced into Sweden for the purpose of establishing a population for hunting (11). The population explosion of Canada Geese is largely due to human factors such as increased hunting restrictions and the creation of artificial sources of food and water, in addition to humans giving 'handouts' to the geese (14). In England, the Canada Goose is reported to have been introduced by Charles II. It escaped from aviaries, was released for hunting and naturally spread to neighbouring European countries.



**Fig. 4**  
**Canada Geese (*Branta Canadensis*)**

Flocks of Canada Geese can change grassland and wetland habitats through grazing and enrichment caused by their droppings  
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The population growth of this species over the last few years has caused a variety of environmental, aesthetic, and human health problems.

Experiments have shown that, in some regions, the faeces of the Canada Goose contain faecal coliform bacteria. Owing to the large amounts of faecal deposits in the water this may contribute to the pollution of water systems (2). Aircraft collisions with Canada Geese are a huge issue because of the damage caused to the aircraft as well as the threat to the lives of people aboard (4). Flocks of Canada Geese can dramatically change grassland and wetland habitats through trampling, grazing and enrichment caused by their droppings. Individuals can be aggressive at times. They will charge people and pets and even bite them. Canada Geese are suspected of transmitting salmonella to cattle, and the potential exists for individuals to transmit disease or parasites to humans (16). Canada Geese are also susceptible to influenza A virus and may be a risk factor if individuals are living close to domestic poultry (5). Overall, the actual or perceived problems that are associated with large numbers of Canada Geese include difficulties related to finance (crop loss), aesthetics (unsightly droppings), the environment

(eutrophication of waterways), and human health (pathogenic bacteria in droppings, aircraft strikes, nuisance) (14).

A combination of habitat management, behavioural modification of birds, and, where necessary, population reduction, is necessary for the management of Canada Geese (3). An integrated approach combining several techniques is usually the key to successful programmes. Long-term solutions usually require some form of population management to stabilise or reduce goose numbers (16).

### Ruddy Duck (*Oxyura jamaicensis*)

*Oxyura jamaicensis* is native to North America, but it was imported into wildfowl collections in the United Kingdom (UK) in the 1940s. It subsequently escaped to form a feral population from which birds are now spreading as far as Spain, where they threaten the globally endangered Old World White-headed Duck (*Oxyura leucocephala*) with extinction through introgressive hybridisation and competition (9). There have been sightings of these birds in 19 other countries in Europe and North Africa (10), with their annual presence during the breeding season being recorded in nine (Belgium, France, Germany, Iceland, Ireland, Morocco, the Netherlands, Spain and Sweden). Population modelling suggested that shooting, and breeding-season shooting in particular, was the most efficient technique for Ruddy Duck control. Summer shooting was at least 2.5 times as efficient as nest-trapping, and at least 3.5 times as efficient as egg destruction. A regional trial of control methods (1999-2002), which controlled over 2,000 Ruddy Ducks, showed that shotgun-shooting from boats, throughout the year, was even more cost effective. National control programmes for Ruddy Ducks and hybrids are now in place in Spain, France and Portugal, but not in other key countries, such as the Netherlands, Belgium, and Morocco.

### Rose-ringed Parakeet (*Psittacula krameri*)

Rose-ringed Parakeets were highly traded as a cage bird during the late 1960s and 1970s and have escaped from aviaries (Fig. 5). However, spreading has occurred naturally in human-dominated habitats.

Its native range extends across west-central to east-central Africa (from southern Mauritania, Guinea and Senegal in the west to western Uganda and southern Sudan in the east) Afghanistan, West Pakistan, the Indian sub-continent, and Myanmar. It has been introduced to twelve countries in Europe, from Belgium and the UK in the west across north-central Europe to Greece and Slovenia. The population size and distribution of these birds has



**Fig. 5**  
**Rose-ringed Parakeet (*Psittacula krameri*)**

The population size and distribution of the Rose-ringed Parakeet is increasing in several countries in Western Europe. The spread of this species may have detrimental effects on biodiversity as it competes with native cavity-nesters

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increased in several countries in Western Europe (Belgium, the Netherlands, and the UK) as well as in Turkey and Israel.

It has been suggested that the Rose-ringed Parakeet may have detrimental effects on other cavity-nesters. In many habitats (mainly managed ones), the number of cavities is a major factor regulating the population densities of cavity-nesters. Parakeets, which begin breeding prior to most other secondary cavity-nester species, may reduce the resources available for species such as the House Sparrow (*Passer domesticus*), Stock Dove (*Columba oenas*), European Nuthatch (*Sitta europaea*) and European Starling (*Sturnus vulgaris*).

The Rose-ringed Parakeet is considered by some to be an avian pest in its native range. It is a major crop pest in India, damaging flowers, grain products and fruits and, in one study, reducing the yield of maize crops by up to 81%.



**Fig. 6**

**Sacred Ibis (*Threskiornis aethiopicus*)**

In France, the Sacred Ibis is proving to be a predator of bird and amphibian species

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**Sacred Ibis (*Threskiornis aethiopicus*)**

The Sacred Ibis is native to Africa, south of the Sahara. There are also populations in Southern Iraq, Madagascar and Aldabra Island (Fig. 6).

There are several pockets of introduced feral populations distributed around the world, in West and South Europe, the Arabian Peninsula, Chinese Taipei, and Florida. Sacred Ibises have escaped from captivity and been seen in the wild in Europe since the 19th Century, but this remained a rare event until the 1970s when it became fashionable to breed free-flying groups of ibises in zoological gardens. This led to a regular flow of escapes, which resulted in the establishment of breeding populations in Spain, Italy, France and the Canary Islands (23). In western France, the feral population increased to over 5,000 individuals in 30 years from a single source, and in southern France, 200 individuals in 6 years.

The feeding habits of this species are cause for real concern. The Sacred Ibis is an opportunistic feeder which favours invertebrates when foraging in meadows and marshes, but also takes larger prey when available, including eggs and young birds.

In some areas, it is proving to be a serious predator of other bird species of conservation concern. In western France, predation has been observed in Sandwich Tern (*Sterna sandvicensis*), Black Tern (*Chlidonias niger*), Whiskered Tern (*Chlidonias hybridus*) and Common Tern (*Sterna hirundo*) colonies (18). In southern France, Sacred Ibises have been observed attacking the nests of Cattle Egrets. Also, they have been seen competing for nest sites with both Cattle Egrets and Little Egrets (12). Apart from other birds, the

Sacred Ibis also preys on amphibians, and there is concern that this may have detrimental effects on threatened species.

In most cases, no action has been taken against ibises. However, the feral population in Barcelona, Spain, was culled in 2001. Elimination campaigns started in France in 2008 with the aim of removing the majority of ibises in western and southern areas by shooting them at roost sites and feeding places.

## Conclusions

The seven alien bird species presented above are of continental or world concern. Nevertheless, dozens of other introduced bird species are considered invasive at regional or national scale.

The above examples illustrate how what may be first considered positive for the environment may eventually damage the fragile natural equilibrium. The introduction of the Canada Goose for hunting purposes has ultimately been detrimental for hunting activities. The number of other game waterfowl has decreased as the demographic explosion of the population of this large herbivorous waterfowl has led to large-scale eutrophication of wetlands and increasing competition with other waterfowl for nesting sites. Similarly, Rose-ringed Parakeets, which were intentionally released to 'enhance' biodiversity, have in fact contributed to its decrease by competing with native cavity-nesters.

It is thus worth considering the consequences of any appearance of an alien bird species even if the population numbers a few individuals. In order to be objective but also to be sure that the meagre financial resources available for nature conservation are adequately invested, it is essential to promote a global system for evaluating the risk caused by every alien bird population.

If such risk assessment concludes that the species will have a detrimental effect on native species and habitats, appropriate measures need to be taken without delay. This aspect is particularly problematic with birds. Most bird species are popular with the public for aesthetic reasons. Consequently, decision-makers who are responsible for implementing control programmes, including culling, are usually reluctant to launch such actions. It is hoped that increased awareness of the problem among the public will help resolve this situation.

■

## Oiseaux exotiques envahissants

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### Résumé

Pour qu'une espèce aviaire soit définie comme exotique et envahissante, il faut qu'elle ait été introduite, intentionnellement ou accidentellement, dans une région d'où elle était auparavant absente, qu'elle s'y établisse en nombre en se reproduisant sans aucune autre intervention humaine et qu'elle se propage ensuite à partir de ce site d'introduction jusqu'à prendre les dimensions d'un nuisible affectant l'environnement, la biodiversité, l'économie, la société humaine et la santé publique.

L'étourneau sansonnet (*Sturnus vulgaris*), le martin triste (*Acridotheres tristis*) et le bulbul à ventre rouge (*Pycnonotus cafer*) ont été ajoutés à la liste des «100 espèces exotiques envahissantes parmi les plus néfastes au monde», une sélection de la Global Invasive Species Database.

Le projet DAISIE (Delivering Alien Invasive Species Inventories for Europe) a classé la bernache du Canada (*Branta canadensis*), l'érismature rousse (*Oxyura jamaicensis*), la perruche à collier (*Psittacula krameri*) et l'ibis sacré (*Threskiornis aethiopicus*) parmi les 100 espèces envahissantes les plus néfastes en Europe.

Les auteurs décrivent la distribution géographique d'origine, la distribution suite au processus d'invasion, la voie d'introduction, les impacts majeurs et les méthodes de gestion pour chacune de ces espèces exotiques.

### Mots-clés

Distribution géographique – Espèce d'oiseau exotique – Impact – Méthode de gestion – Voie d'introduction.



## Aves foráneas invasoras

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### Resumen

Un ave se considera especie foránea invasora si, tras ser introducida deliberada o accidentalmente en un lugar en el que hasta entonces no estaba presente de modo natural, resulta capaz de fundar una población reproductora sin ulterior intervención humana y se disemina y convierte en una plaga que afecta al medio ambiente, la biodiversidad local y la economía y/o la sociedad, comprendida la salud pública.

Estornino pinto (*Sturnus vulgaris*), miná común (*Acridotheres tristis*) y bulbul café (*Pycnonotus cafer*) figuran en la lista de las "100 peores especies foráneas invasoras del mundo", que constituye un subconjunto de la Base de datos mundial de especies invasoras.

Asimismo, como parte del proyecto DAISIE (Delivering Alien Invasive Species Inventories for Europe: creación de inventarios de especies extranjeras invasoras en Europa), barnacla canadiense (*Branta canadensis*), malvasía canela (*Oxyura jamaicensis*), cotorra de Kramer (*Psittacula krameri*) y ibis sagrado africano (*Threskiornis aethiopicus*) fueron incluidas entre las 100 peores especies foráneas invasoras de Europa.

Para cada una de estas especies aviares foráneas los autores exponen la distribución geográfica (original y tras la introducción), la ruta de introducción, los efectos generales y los métodos de gestión.

#### Palabras clave

Distribución geográfica – Especie de ave foránea – Impacto – Método de gestión – Ruta de introducción.



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