

REPORT 2021-2023

INTRODUCED BIRD INTERACTION SURVEY



IBISurvey: Introduced Bird Interaction Survey

LabOr: Laboratory of Ornithology
MED: Mediterranean Institute for Agriculture,
Environment and Development
University of Évora, Portugal

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Photos

All photos correspond to observations submitted on the IBISurvey project platform. The authors are identified alongside the correspondent photo, except for the cover photo (*Psittacula eupatria* by Cristina Krippahl), page 2 and back cover (*Leiothrix lutea* and *Alopochen aegyptiaca* by Pedro Filipe Pereira).

Bird & Plant Illustrations

Pedro Filipe Pereira

Maps

All maps were prepared with My Maps on top of Google Maps.

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Introduction

There is a growing number of exotic species (synonym of introduced or alien species) colonising our cities and countryside. Some were taken from their area of origin to produce food or fibres, or for aesthetic reasons. Other species were introduced accidentally due to escapes from captivity or because they hitch a ride from their places of origin via ships or other transport. **Exotic species can have an impact on ecosystems or human activities. However, information about exotic birds in the European context this is still scarce.**

Given this lack of knowledge, we created a citizen science project aiming to involve the entire community in collecting observations of exotic birds in wild conditions in Europe: **the IBISurvey - Introduced Bird Interaction Survey**. Having its beginning in 2021, the project was originally conceived to obtain data for 76 exotic bird species (1) that were successfully introduced (i.e. established) in Europe or (2) frequently observed in the wild but without known established populations. We are particularly interested in exotic birds interacting with the environment as an indicator of their potential impact. However, observations of species that are native to some European countries but are introduced in other countries are also welcome.

Overcoming the challenge of surviving and reproducing in a place different from its origin is the first indicator of success for an exotic species. For birds, breeding requires a mate, food availability, material for nesting and a safe place to lay eggs and raise the chicks. Thus, we divided interactions with the environment into reproductive or non-reproductive contexts.

Depending on the species, the nest and nesting site are different. When the availability of nesting sites is limited, greater use by one species implies lesser use by others. Cavity nests are limited, especially those not built by birds. Therefore, if a parakeet starts using a hole in a tree, building, or even a nest box in January or February, it will not be available for nesting by native birds (e.g. tits, nuthatches, starlings, jackdaws) during the following Spring. In some cases, interactions may not be direct, as the occupation of a cavity by a parakeet may be enough to drive away some species native to the area. In other cases, aggressive interactions may occur between species competing for the nesting site, such as an aggressive displacement (e.g., pointing the bill towards the opponent or opening the bill or the wings, inflating the plumage), a chase, an attack, etc.

Ring-necked Parakeet

Using a tree hole as a nest
(London plane –
Platanus × hispanica)

Maria da Conceição Pinto,
Portugal



The number of places available for bat hibernation may also decrease. Nests on platforms, typical of herons, storks, and birds of prey, are another type of nest that may be subject to competition between native and exotic birds, particularly with some species of introduced geese.

The breeding status of exotic birds does not always imply competition or aggression. Exotic birds can socialize with native species in mixed flocks without any apparent negative effects on the native species. Most exotic bird species are social species, thus flocking with native species may occur frequently. Furthermore, in some cases, both species may benefit from mixed flocks because more individuals can detect predators more efficiently. However, if exotic birds are more colourful or louder than native birds, the effect could be the opposite. In some cases, associations between different species can lead to hybridization. Hybridization is most likely when exotic species associate with native species that are close relatives. This situation is particularly common among geese and ducks and can be a conservation problem for some rare native species.

The way exotic birds interact with their food is another indicator of their impact. Some species feed on animals (predation), which implies negative consequences for the species consumed. However, eating plants can have several different effects on the environment and economy. For example, if a bird consumes the flower or seed, it may be preventing the plant from reproducing; if it consumes the fruit of an invasive plant and later defecates the seeds elsewhere, it might promote the plant dispersion. In the case of cultivated plants, their consumption could have negative consequences, particularly if the part consumed is that intended for production. Many species of exotic birds are opportunistic and benefit from food of human origin, including artificial feeders that are generally used to attract native birds. Artificial feeders can allow individuals of different species to gather at the same time in the same place, making it possible to observe interactions between exotic and native bird species. In this situation, birds may ignore each other, wait to eat one after the other or behave aggressively towards each other.



Alexandrine Parakeet
Attacking a native species
(starling – *Sturnus vulgaris*)
Cristina Krippahl,
Germany

Objectives of the project



Egyptian Goose
Attacking a native species
(white stork – *Ciconia ciconia*)
Christophe Hoenen,
France

The main objective of **IBISurvey** is the assessment of the environmental, societal and economic impacts of introduced birds in European countries. Reporting the behaviour of introduced birds is key to determine their impacts, including feeding on agricultural crops and behaving aggressively towards individuals of native species. Specifically, the project aims:

- (1) to make easier the identification of exotic birds to the general public,
- (2) to obtain information on the distribution, abundance and behaviour of introduced species, and
- (3) to increase public awareness about the impact of introduced species.

How can people participate in the project?

IBISurvey is open to people of varied interests – from skilled wildlife photographers and avid bird watchers to passionate naturalists and general nature enthusiasts.

Participation in IBISurvey is carried out through the submission of observations using its online platform:

<https://ibisurvey.uevora.pt>

The platform primarily comprises a form designed for registering observations of exotic bird species and detailing their interactions within the environment. For those less familiar with exotic bird species, the platform features a visual guide enhancing the ease of identification.

We are interested in the breeding behaviour of exotic bird species, the items they feed on, and in social behaviour with other species, including mixed flocking or aggressive interactions.

We recommend sending photos of the observation because to help us confirming the identification of the bird species, its behaviour, or its type of food (particularly important in the case of plants).

Wood Duck

Social behaviour with native species (mallard – *Anas platyrhynchos*)
Sergio Rodríguez,
Spain



Canada Goose x Greylag Goose

Hybrid with a native species
Ronie Bouchon,
France

Target species



Bar-headed Goose
(*Anser indicus*)



Emperor Goose
(*Anser canagicus*)



Snow Goose
(*Anser caerulescens*)



Ross's Goose
(*Anser rossii*)



Swan Goose
(*Anser cygnoides*)



Cackling Goose
(*Branta hutchinsii*)



Canada Goose
(*Branta canadensis*)



Black Swan
(*Cygnus atratus*)



Upland Goose
(*Chloephaga picta*)



Egyptian Goose
(*Alopochen aegyptiaca*)



Ruddy Shelduck
(*Tadorna ferruginea*)



South African Shelduck
(*Tadorna cana*)



Muscovy Duck
(*Cairina moschata*)



Ringed Teal
(*Callonetta leucophrys*)



Wood Duck
(*Aix sponsa*)



Mandarin Duck
(*Aix galericulata*)



Cinnamon Teal
(*Spatula cyanoptera*)



White-cheeked Pintail
(*Anas bahamensis*)



Ruddy Duck
(*Oxyura jamaicensis*)



Helmeted Guineafowl
(*Numida meleagris*)



Northern Bobwhite
(*Colinus virginianus*)



California Quail
(*Callipepla californica*)



Japanese Quail
(*Coturnix japonica*)



Indian Peafowl
(*Pavo cristatus*)



Barbary Partridge
(*Alectoris barbara*)



Erckel's Francolin
(*Pternistis erckelii*)



Reeves's Pheasant
(*Syrmaticus reevesii*)



Golden Pheasant
(*Chrysolophus pictus*)



Lady Amherst's Pheasant
(*Chrysolophus amherstiae*)



Common Pheasant
(*Phasianus colchicus*)



Wild Turkey
(*Meleagris gallopavo*)



Cockatiel
(*Nymphicus hollandicus*)



Alexandrine Parakeet
(*Psittacula eupatria*)



Ring-necked Parakeet
(*Psittacula krameri*)



Budgerigar
(*Melopsittacus undulatus*)



Rosy-faced Lovebird
(*Agapornis roseicollis*)



Fischer's Lovebird
(*Agapornis fischeri*)



Yellow-collared Lovebird
(*Agapornis personatus*)

GALLIFORMES

Partridges, pheasants and other gallinaceous birds

ANSERIFORMES

Ducks, geese and swans

PSITTACIFORMES

Parrots and parakeets

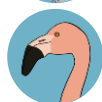
PSITTACIFORMES

Parrots and parakeets

**Senegal Parrot**
(*Poicephalus senegalus*)**Monk Parakeet**
(*Myiopsitta monachus*)**Yellow-headed Parrot**
(*Amazona oratrix*)**Turquoise-fronted Parrot**
(*Amazona aestiva*)**Nanday Parakeet**
(*Aratinga nenday*)**Blue-crowned Parakeet**
(*Thectocercus acuticaudatus*)**Mitre Parakeet**
(*Psittacara mitratus*)**Red-masked Parakeet**
(*Psittacara erythrogenys*)**House Crow**
(*Corvus splendens*)**Red-vented Bulbul**
(*Pycnonotus cafer*)**Red-whiskered Bulbul**
(*Pycnonotus jocosus*)**Vinous-throated Parrotbill**
(*Sinosuthora webbiana*)**Ashy-throated Parrotbill**
(*Sinosuthora alphonsiana*)**Red-billed Leiothrix**
(*Leiothrix lutea*)**Common Myna**
(*Acridotheres tristis*)**Crested Myna**
(*Acridotheres cristatellus*)**Village Weaver**
(*Ploceus cucullatus*)**Black-headed Weaver**
(*Ploceus melanocephalus*)**Red-billed Quelea**
(*Quelea quelea*)**Yellow-crowned Bishop**
(*Euplectes afer*)**Orange-cheeked Waxbill**
(*Estrilda melpoda*)**Black-rumped Waxbill**
(*Estrilda troglodytes*)**Common Waxbill**
(*Estrilda astrild*)**Red Avadavat**
(*Amandava amandava*)**Zebra Finch**
(*Taeniopygia guttata*)**Indian Silverbill**
(*Euodice malabarica*)**Scaly-breasted Munia**
(*Lonchura punctulata*)**Chestnut Munia**
(*Lonchura atricapilla*)**Pin-tailed Whydah**
(*Vidua macroura*)**House Finch**
(*Haemorhous mexicanus*)

PASSERIFORMES

Song / passerine birds

**Greater Rhea**
(*Rhea americana*)**Chilean Flamingo**
(*Phoenicopterus chilensis*)**American Flamingo**
(*Phoenicopterus ruber*)**Lesser Flamingo**
(*Phoeniconaias minor*)**African Collared Dove**
(*Streptopelia roseogrisea*)**Pink-backed Pelican**
(*Pelecanus rufescens*)**African Sacred Ibis**
(*Threskiornis aethiopicus*)**Harris's Hawk**
(*Parabuteo unicinctus*)

OTHER BIRD SPECIES

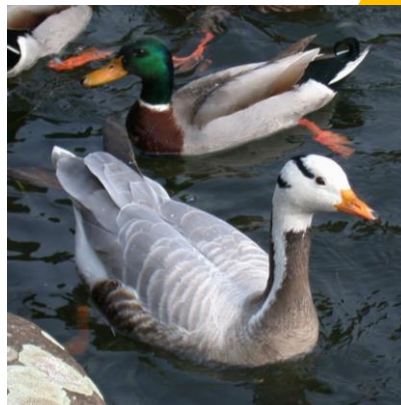
PASSERIFORMES

Song / passerine birds

Target behaviours



Scaly-breasted Munia
Feeding on wild plants
(*Echinochloa crus-galli* seeds)
João Amado, Portugal



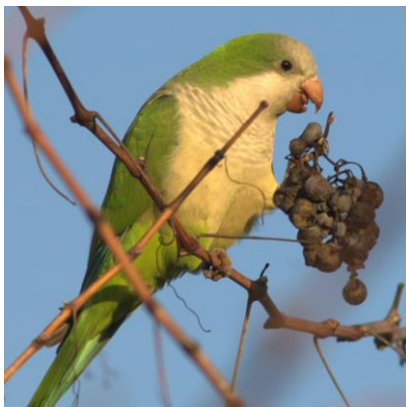
Bar-headed Goose
Social behaviour with native species
(mallard – *Anas platyrhynchos*)
Maurizio Sighele, Italy



House Finch
Feeding on ornamental plants
(almond – *Prunus amygdalus* flowers)
Aris Vouros, Greece



Ring-necked Parakeet & Monk Parakeet
Feeding on wild plants (*Sesuvium portulacastrum* fruits), social behaviour between exotic species
Xabier Ramirez, Spain



Monk Parakeet
Feeding on crops (grapes)
Paolo Vacilotto, Italy



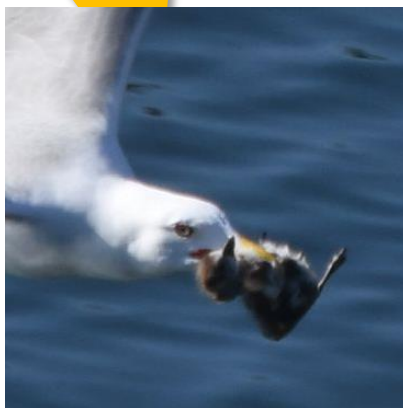
African Sacred Ibis
Social behaviour with native species
(cattle egret – *Bubulcus ibis*), feeding on animals (invertebrates)
Gabriele Vaudano, Italy



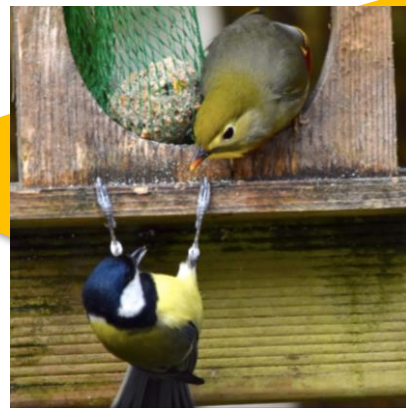
Indian Siverbill
Feeding at artificial feeders
Philippe Andreotti, France



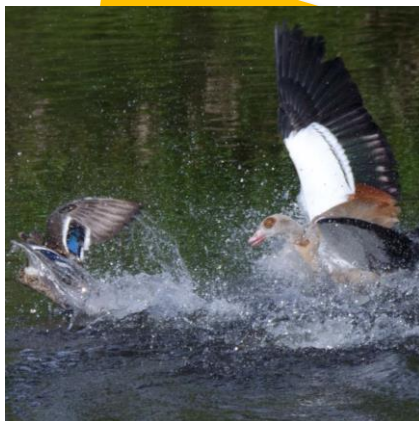
Red-billed Leiothrix
Being attacked by a native species
(nuthatch – *Sitta europaea*)
Pouraillet Laurent, France



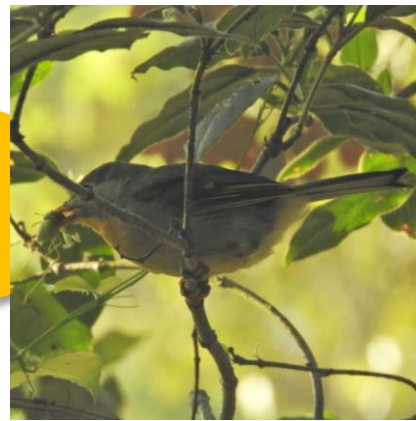
Egyptian Goose
Being attacked by a native species
(yellow-legged gull – *Larus michahellis*)
Samuel Büttler, Switzerland



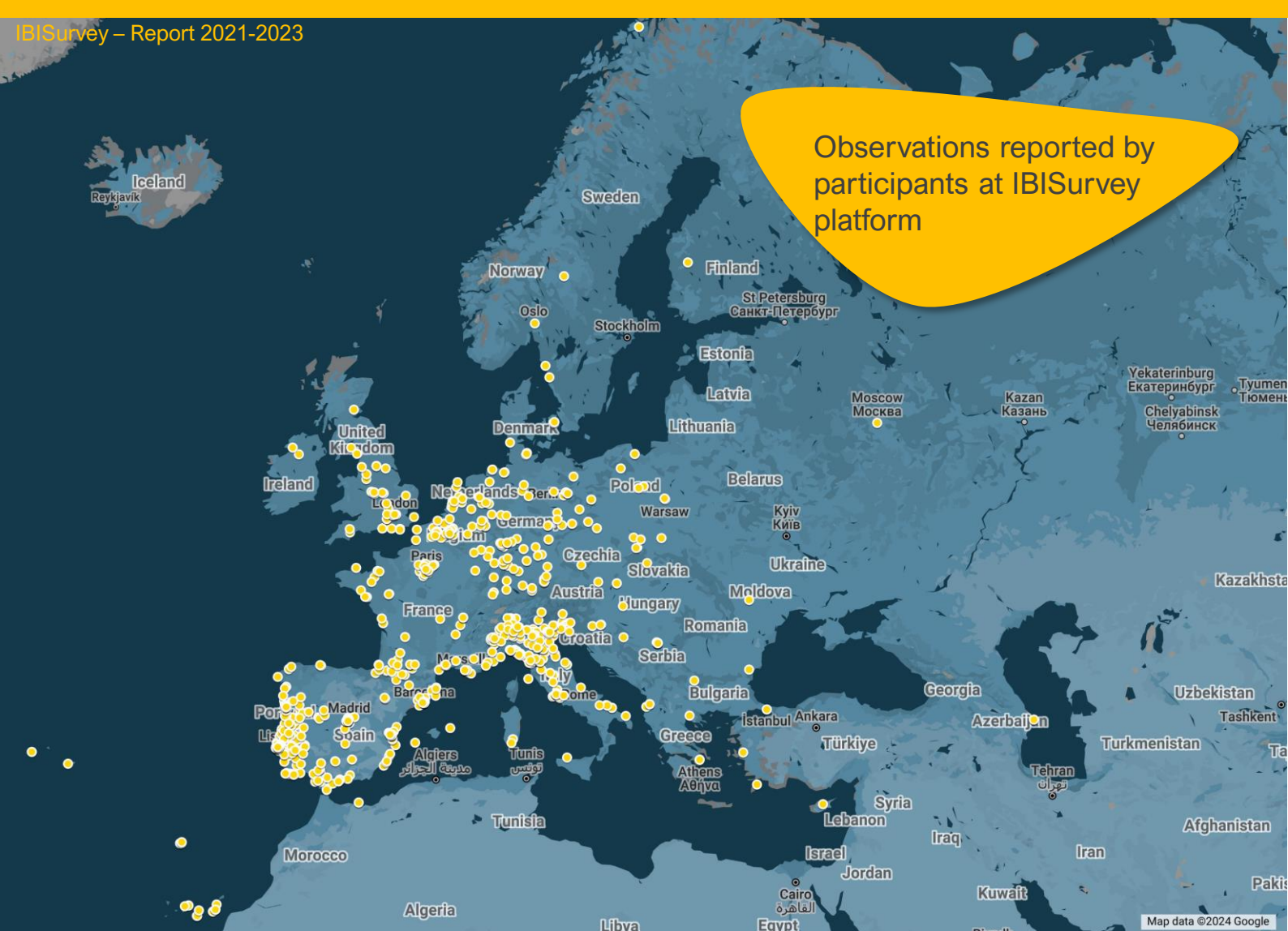
Red-billed Leiothrix
Attacking a native species (great tit –
Parus major), feeding at artificial feeders
Ribes Claudette, France



Egyptian Goose
Attacking a native species
(mallard – *Anas platyrhynchos*)
Thomas Fillmann, Germany



Red-billed Leiothrix
Feeding on animals (bush cricket –
Tettigoniidae)
Nicolás Tamargo, Spain



General results

This report includes data since the beginning of the project on 30th March 2021 to 31st December 2023. **During this period of almost three years, we received 1481 observations made by 750 participants. In all, 75 exotic bird species detected in 30 European countries are a valuable number of records.** Participants have made observations of exotic birds from the Azores to Azerbaijan and from northern Norway to the Canary Islands. **The number of observations supported by photographs or videos was 515 (35%).**

Most records were made in the period after the starting of the project (89%). Participants also sent 167 older records, which allowed us to increase the temporal range of the data. The three oldest records were from 1985 (Spain), 1998 (Belgium) and 2003 (Italy).

Observations were made in six environments: coastal zones (beach, port, estuary, salt pan...), wetlands (lake, river, reed bed, rice field...), farming systems or grasslands, forests, mosaics (vineyard, orchard, hedges, forest edges, moorland...), and urban areas (parks, gardens, avenues, backyards, buildings...). Most data came from urban areas, with more than half of all records, followed by wetlands (27%).



Number of
Observations

1481



Number of
participants

750



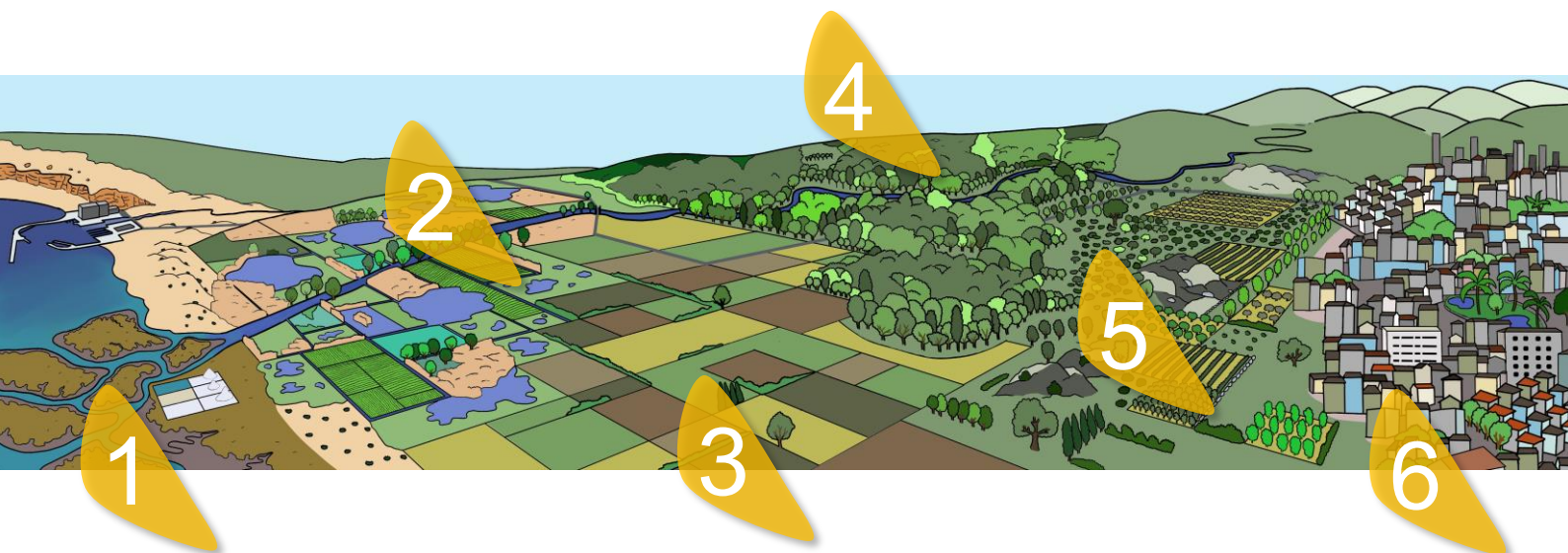
Number of
exotic bird species

75



Number of
countries

30



Number of observations reported at IBISurvey platform according to the environment

1 Coastal zone

50 observations (3%)

2 Wetland

399 observations (27%)

3 Agriculture or grassland

133 observations (9%)

4 Forest

45 observations (3%)

5 Mosaic

103 observations (7%)

6 Urban area

751 observations (51%)

Top 5 countries

Participants from five countries contributed with more than 100 observations to IBISurvey: Germany, France, Spain, Italy, and Portugal. All other 25 countries had less than 50 observations, and 13 of them only got one or two observations.

Portugal registered a total of 489 observations across 32 exotic bird species. The Ring-necked Parakeet was the most recorded species with 181 observations.

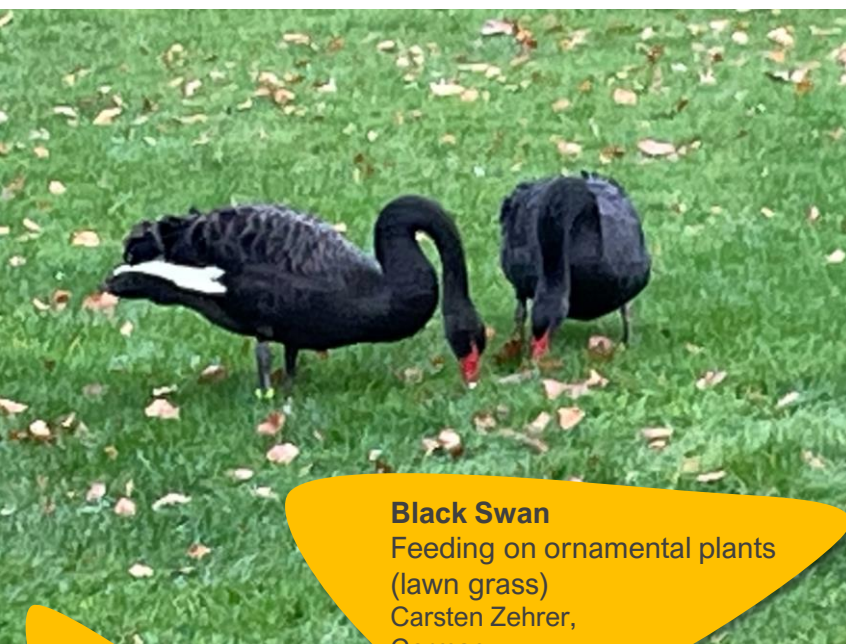
Italy followed with 353 observations of also 32 exotic species. In this country, the most recorded bird species was the African Sacred Ibis with 105 observations.

Spain was placed third with 182 observations of 32 species and the most recorded species was the Monk Parakeet with 47 observations.

In France participants registered a total of 23 species which correspond to 173 observations. Like Portugal, the most recorded bird species was the Ring-necked Parakeet with 59 observations.

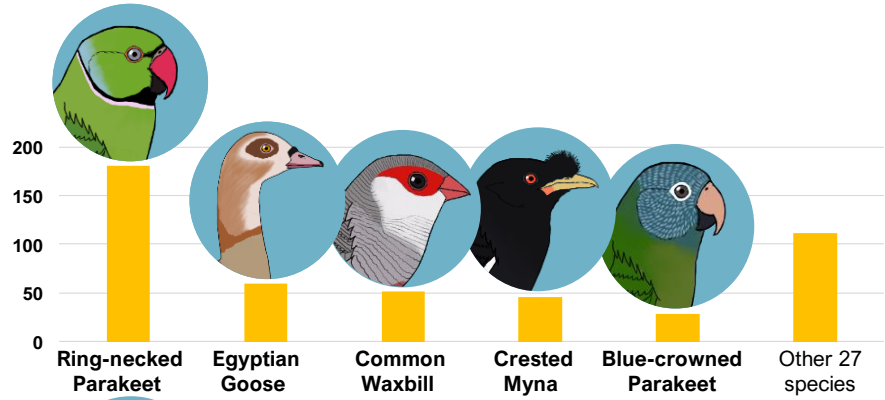
Germany, the fifth country in the top 5, had 106 observations of 15 species exotic bird species. The most recorded bird species was the Egyptian Goose with 45 observations.

| | |
|----------------------|------------|
| Portugal (PT) | 489 |
| Italy (IT) | 353 |
| Spain (ES) | 182 |
| France (FR) | 173 |
| Germany (DE) | 106 |
| United Kingdom (UK) | 45 |
| Netherlands (NL) | 22 |
| Switzerland (CH) | 18 |
| Belgium (BE) | 17 |
| Poland (PL) | 17 |
| Greece (GR) | 12 |
| Serbia (RS) | 10 |
| Croatia (HR) | 5 |
| Albania (AL) | 4 |
| Turkey (TR) | 4 |
| Slovakia (SK) | 3 |
| Sweden (SE) | 3 |
| Azerbaijan (AZ) | 2 |
| Bulgaria (BG) | 2 |
| Denmark (DK) | 2 |
| Luxembourg (LU) | 2 |
| Norway (NO) | 2 |
| Austria (AT) | 1 |
| Cyprus (CY) | 1 |
| Czechia (CZ) | 1 |
| Finland (FI) | 1 |
| Hungary (HU) | 1 |
| Ireland (IE) | 1 |
| Romania (RO) | 1 |
| Russia (RU) | 1 |

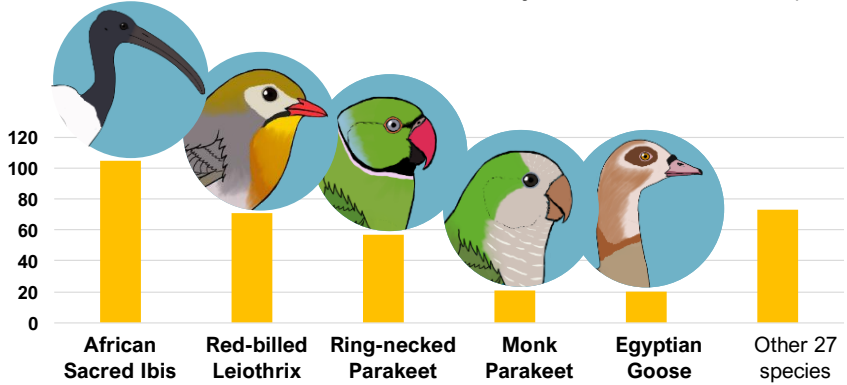


Black Swan
Feeding on ornamental plants
(lawn grass)
Carsten Zehrer,
Germany

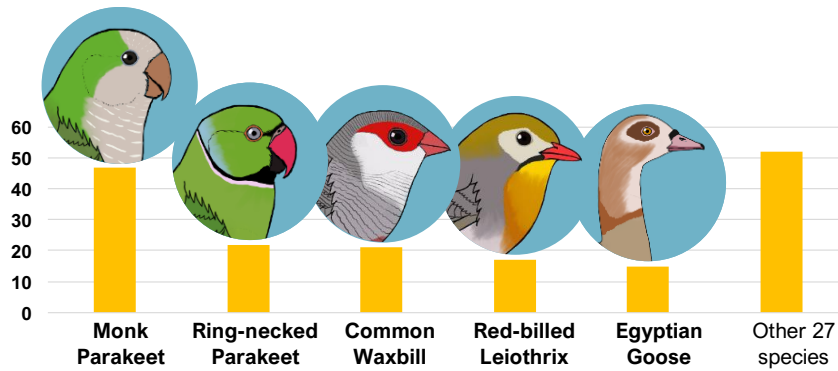
1st



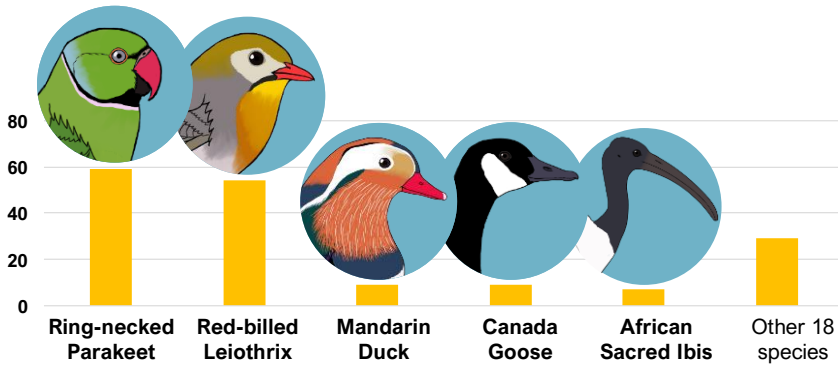
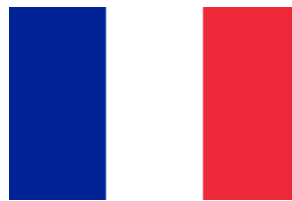
2nd



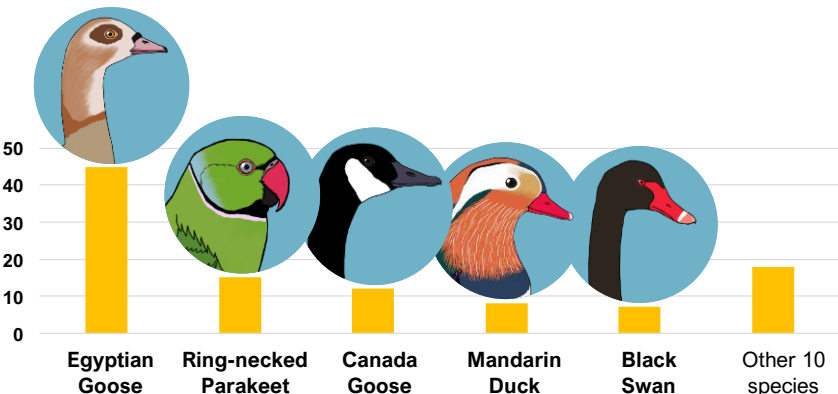
3rd



4th



5th



Top 10 species

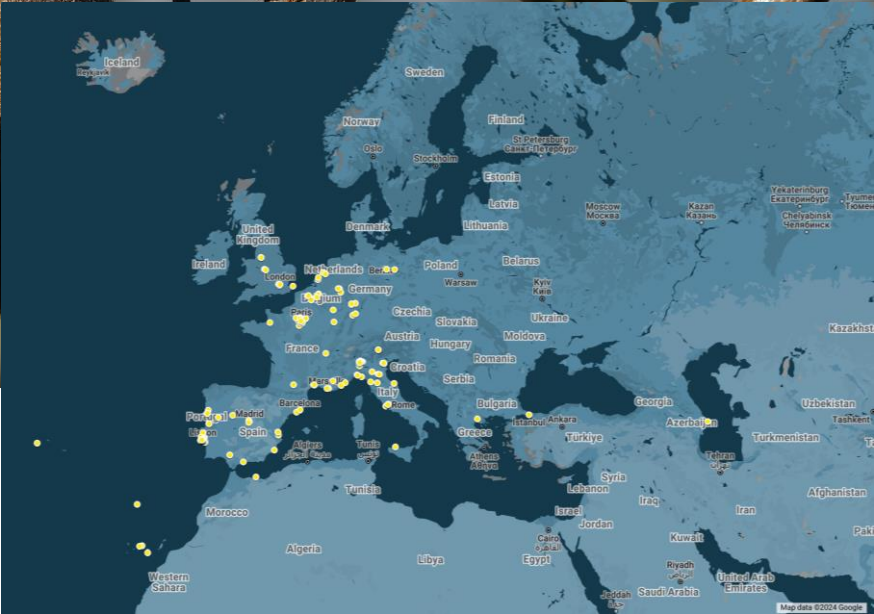
Participants reported 59 out of the 76 target species. Sixteen additional species were also observed. The group of parrots and parakeets (Psittaciformes) was the largest in terms of species observed and number of records. Partridges, pheasants, and other gallinaceous birds (Galliformes) account for the lowest number of observations.

Galliformes group was the only one that did not have any species among the 10 most observed species. For instance, participants reported only 22 observations of the Common Pheasant. A small number of observations (27) corresponded to native species or birds for which it was not possible to identify to the genus or species considering the provided description.

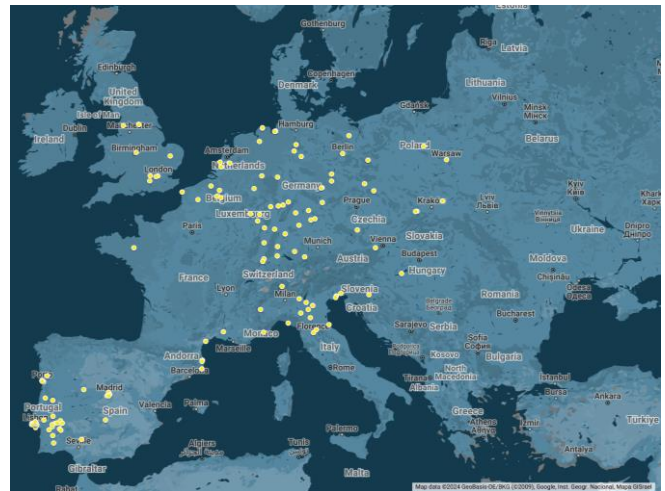


The **Ring-necked Parakeet** was the most recorded species with 358 observations in 12 countries with most observations made in urban areas (85%). This species, which is native to Africa and Asia, is established in the United Kingdom since 1925. Currently, it is also established in Azerbaijan, Belgium, France, Germany, Greece, Italy, Netherlands, Poland, Portugal, Spain, and Turkey, and may become established in Lithuania and Slovenia in the future. The main introduction vector in Europe is accidental escaping from captivity. It feeds mainly on fruits and seeds and nests in holes in trees and buildings between January and June. The European population was estimated between 10,000 – 99,000 breeding pairs with an increasing trend (2021).

Ring-necked Parakeet
Feeding on crops (Kiwifruit)
Ângelo Almeida,
Portugal



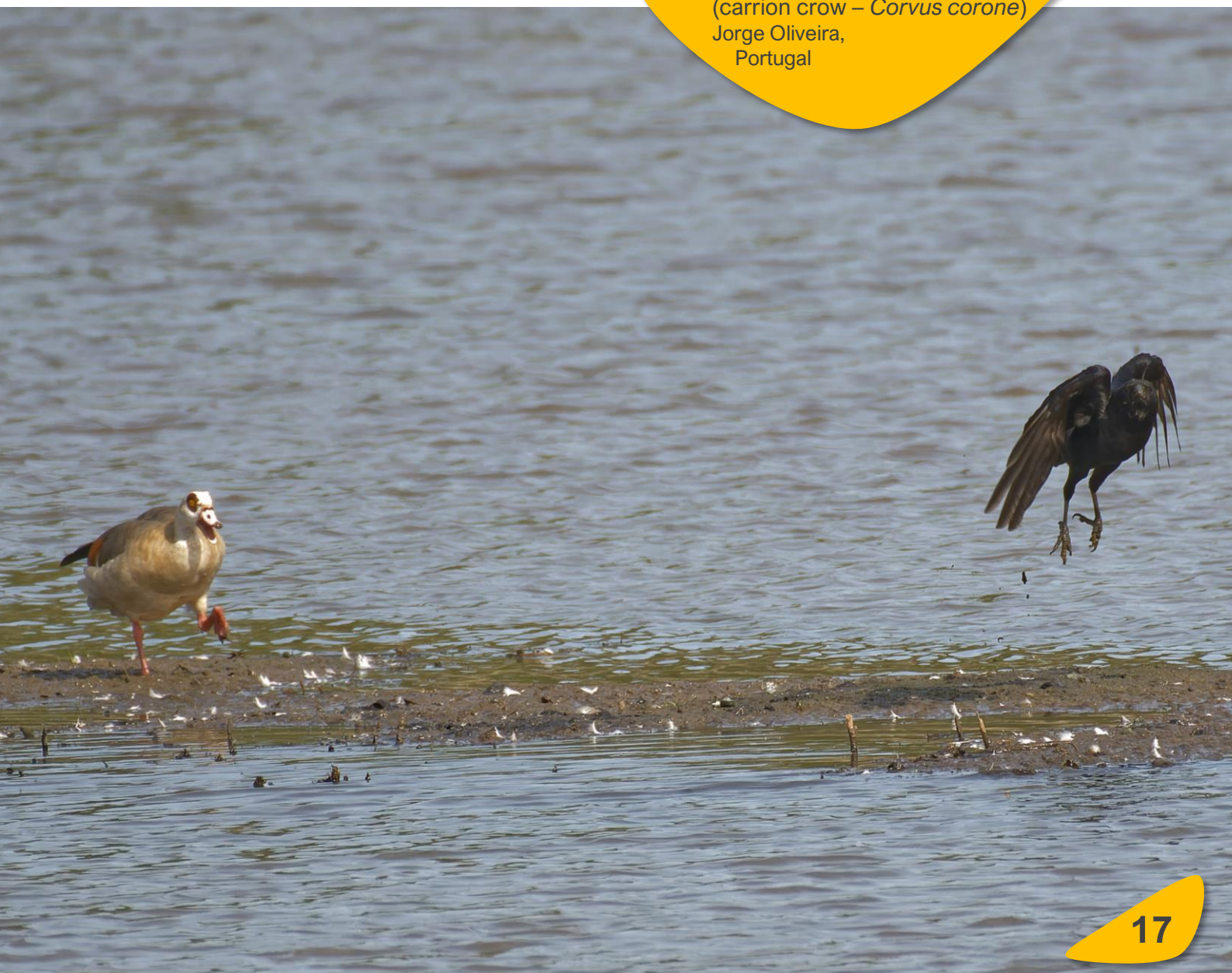
The **Egyptian Goose** was the second most recorded species with 185 observations in 14 countries with most observations made in wetlands (50%). Native to Africa, the species is established in the United Kingdom since the XIX century. Currently, it is also established in Belgium, Czechia, Denmark, France, Germany, Italy, Luxembourg, Netherlands, Poland, Portugal, Spain, Switzerland, and may become established in Austria, Norway, Romania, Slovakia, and Sweden in the future. The main introduction vectors in Europe are accidental escaping from captivity and deliberated introduction in urban parks. It feeds mainly on grass and invertebrates and nests, all around the year, in platforms or holes in trees, cliffs, and buildings. The European population was estimated between 10,000 – 99,000 breeding pairs with an increasing trend (2021).



Egyptian Goose

Attacking a native species
(carrion crow – *Corvus corone*)

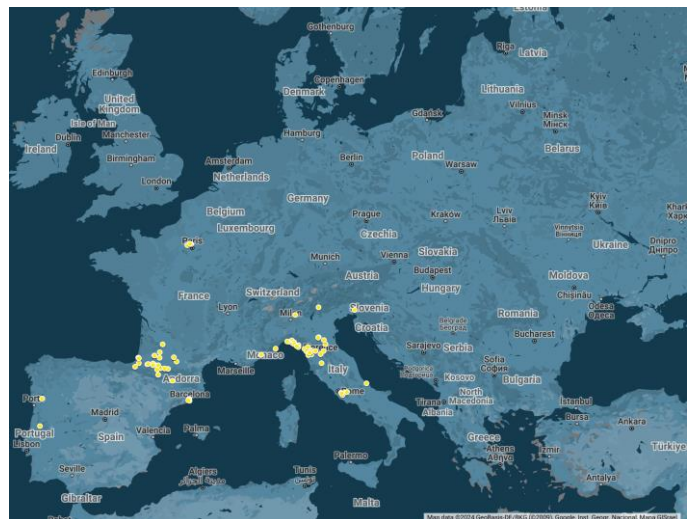
Jorge Oliveira,
Portugal

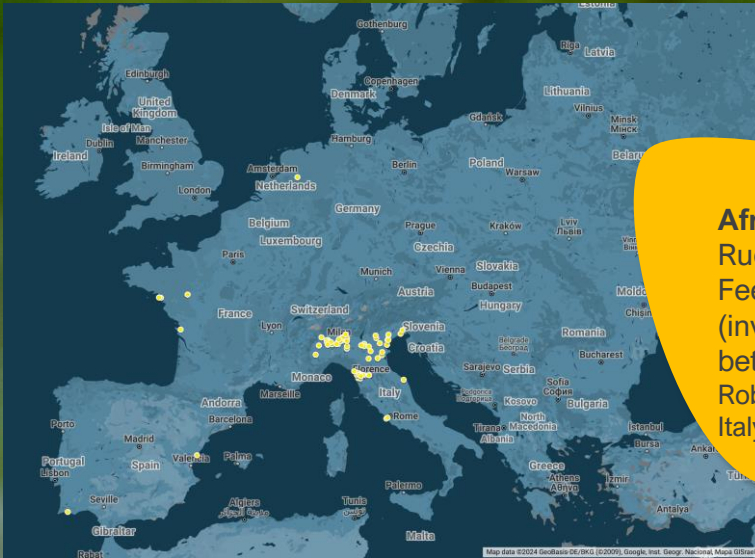


Red-billed Leiothrix
 Feeding at artificial feeders
 Maria Luisa Trinci,
 Italy



The **Red-billed Leiothrix** was the third most recorded species with 144 observations from four countries and with most observations made in urban areas and mosaic environments (56% if combined). This species, which is native to Asia, is established in France since 1990. Currently, it is also established in Italy, Portugal, and Spain, and may become established in Germany, Slovenia, and the United Kingdom in the future. The main introduction vector in Europe is accidental escaping from captivity. It feeds mainly on fruits, seeds, and invertebrates and nests in a cup built in shrubs and bamboos, between April and September. The European population was estimated between 1,000 – 9,000 breeding pairs with an increasing trend (2021).

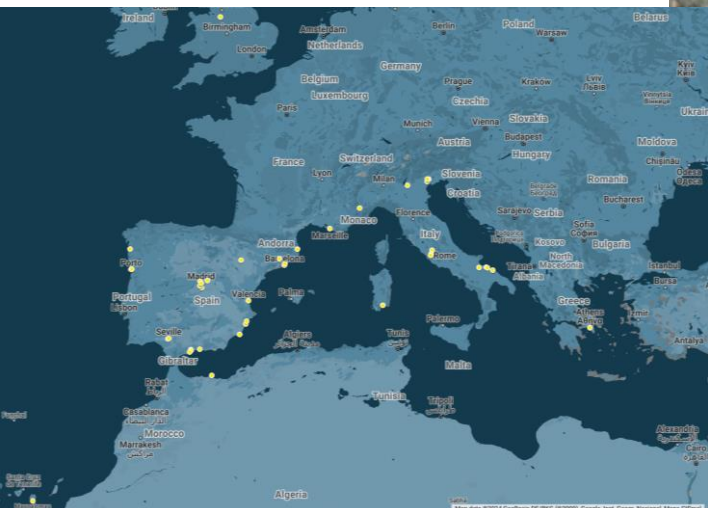




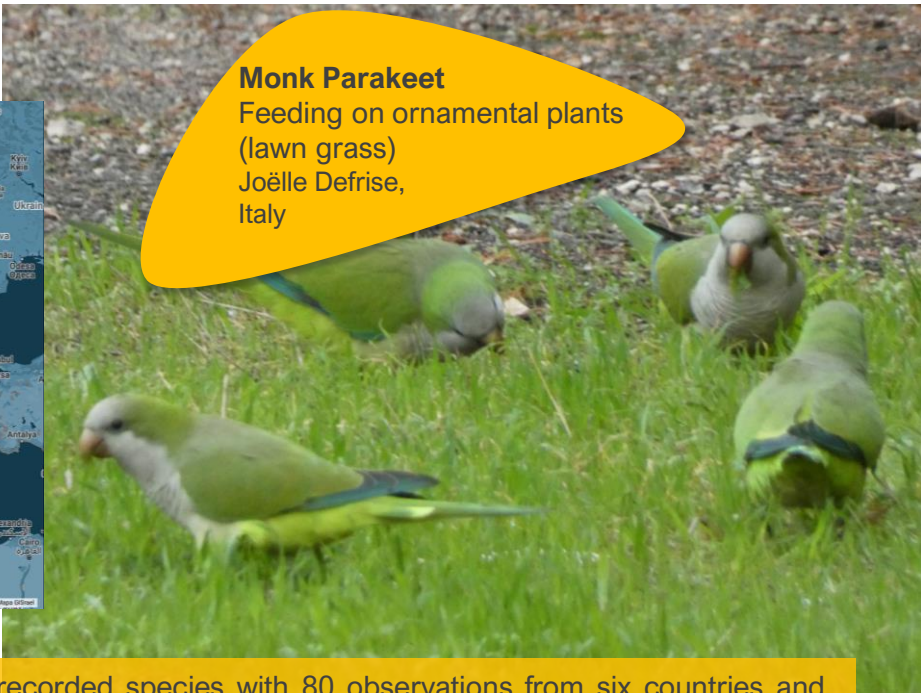
African Sacred Ibis & Ruddy Shelduck
Feeding on animals (invertebrates), social behaviour between exotic species
Roby, Italy



The **African Sacred Ibis** was the fourth most recorded species with 115 observations from five countries and with most observations made in wetlands (50%). The species is native to Africa and is established in France since 1974. Currently, it is also established in Italy, and may become established in Germany and Spain in the future. The main introduction vectors in Europe are accidental escaping from captivity and deliberate introduction in zoologic parks with free access to the wild. It feeds mainly on small animals (including insects, fish, etc.) and nests in platforms on the ground and in trees or cliffs, between May and July. The European population was estimated between 1,000 – 9,000 breeding pairs with an increasing trend (2021).



Monk Parakeet
Feeding on ornamental plants (lawn grass)
Joëlle Defrise,
Italy

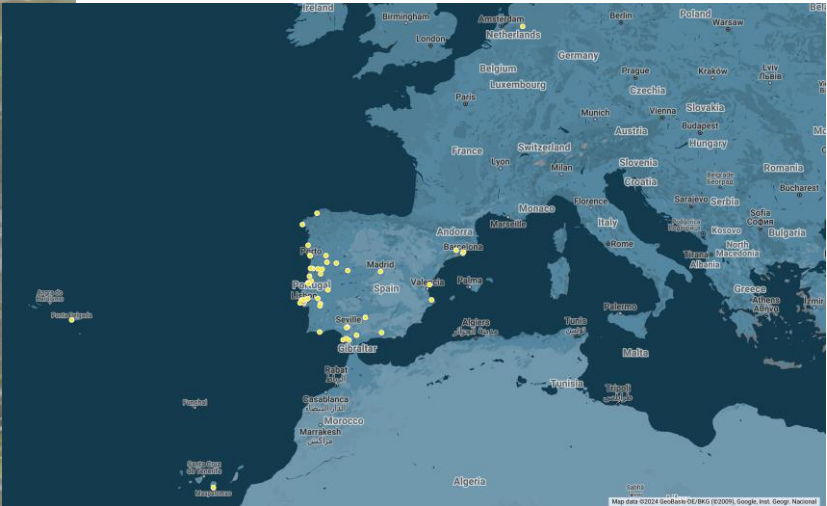


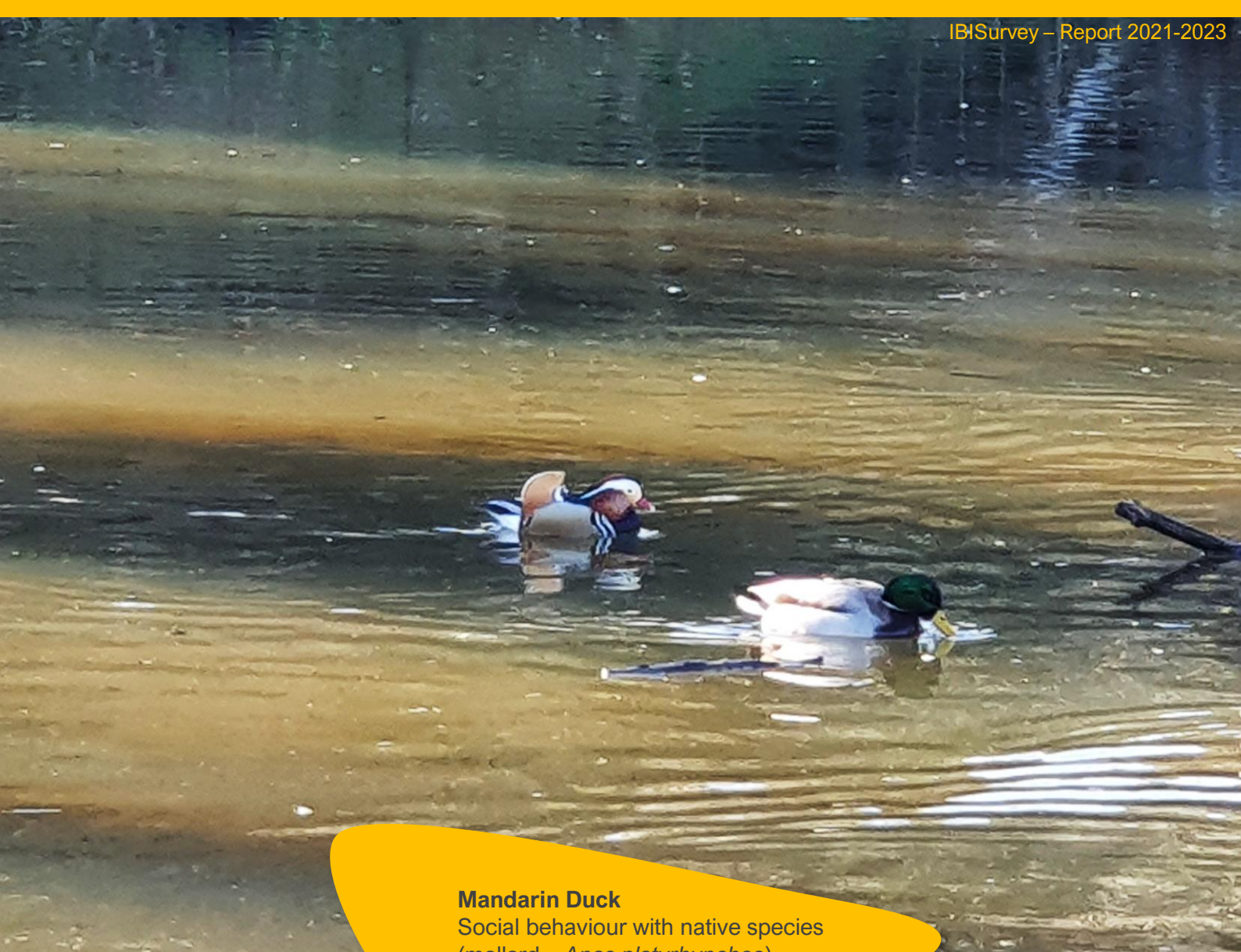
The **Monk Parakeet** was the fifth most recorded species with 80 observations from six countries and most observations made in urban areas (83%). Native to South America, the species is established in Spain since 1975. Currently, it is also established in Belgium, Italy, Greece, Netherlands, and Portugal and may become established in Czechia, Denmark, France, and United Kingdom in the future. The main introduction vector in Europe is accidental escaping from captivity. It feeds mainly on fruits, seeds, and invertebrates and builds huge domed nests in trees and poles, between March and September. The European population was estimated between 10,000 – 99,000 breeding pairs with an increasing trend (2021).



Common Waxbill
Feeding on ornamental plants (*Pennisetum setaceum*)
Luís Ferreira,
Portugal

The **Common Waxbill** was the sixth most recorded species with 73 observations from three countries, with observations made in wetlands and urban areas (63% if combined). This species, which is native to Africa and is established in Portugal since 1964. Currently, it is also established in Spain. The main introduction vector in Europe is accidental escaping from captivity. It feeds mainly on seeds and invertebrates and builds spherical nests in reeds, shrubs or trees, between February and November. The European population was estimated between 10,000 – 99,000 breeding pairs with an increasing trend (2021).

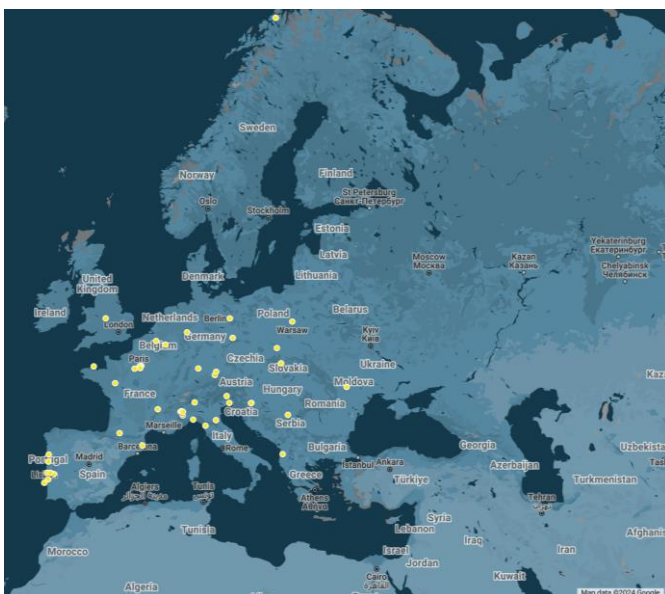




Mandarin Duck

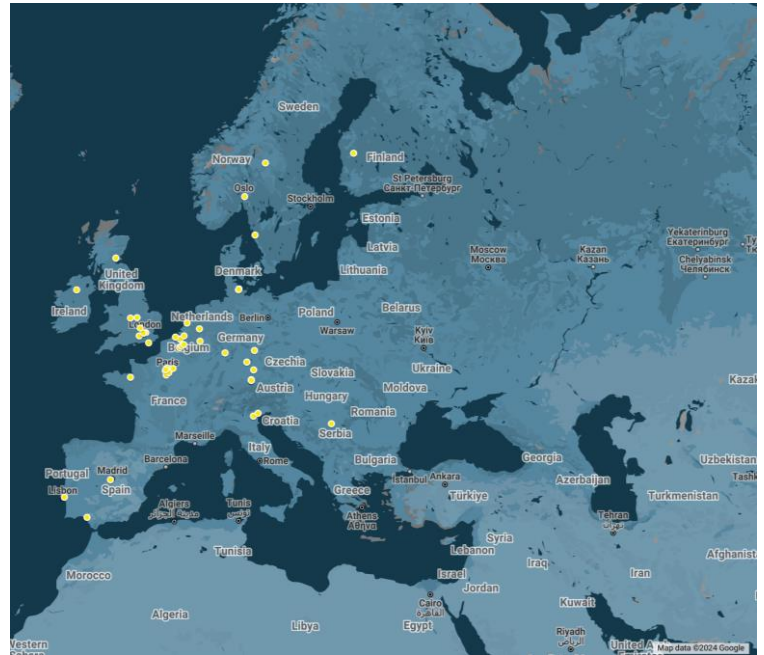
Social behaviour with native species
(mallard – *Anas platyrhynchos*)

Riccardo Gherardi,
Italy



The **Mandarin Duck** was the seventh most recorded species with 51 observations from 14 countries made in wetlands (55%). This species is native to Asia and established in the United Kingdom since 1928. Currently, it is also established in Austria, Belgium, Czechia, France, Germany, Ireland, Netherlands, Poland, Romania, and Switzerland, and may become established in Croatia, Denmark, Estonia, Finland, Italy, Iceland, Norway, Russia, Slovenia, Spain, Sweden, Russia, and Ukraine in the future. The main introduction vectors in Europe are accidental escaping from captivity and deliberate introduction in urban parks. It feeds mainly on grass, seeds and small aquatic animals and nests in a tree hole, between April and July. The European population was estimated between 1,000 – 9,000 breeding pairs with an increasing trend (2021).

The **Canada Goose** was the eighth most recorded species with 50 observations in 12 countries, obtained predominantly in wetlands (52%). The species is native to North America and established in the United Kingdom since the century XVII. Currently, it is also established in Belgium, Denmark, Estonia, France, Finland, Germany, Italy, Lithuania, Lithuania, Netherlands, Norway, Poland, and Sweden, and may become in Austria, Czechia, Belarus, Greece, Iceland, Portugal, Spain, Switzerland, Russia, and Ukraine, in the future. The main introduction vectors in Europe are deliberated introduction in urban parks and due to hunting purposes. It feeds mainly on grass, seeds, fruits and aquatic invertebrates and nests on the ground or in a platform in a tree, between March and August. The European population was estimated between 10,000 – 99,000 breeding pairs with an increasing trend (2021).



Canada Goose

Feeding on ornamental plants (lawn grass)
 Thomas Schock,
 Germany



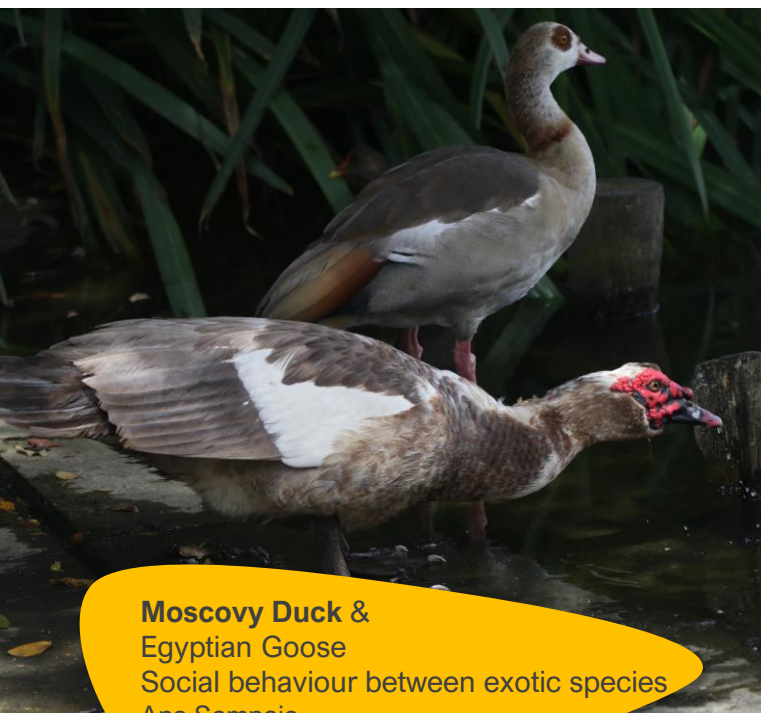


Crested Myna

Feeding on animals (invertebrates),
social behaviour with native species
(blackbird – *Turdus merula*)

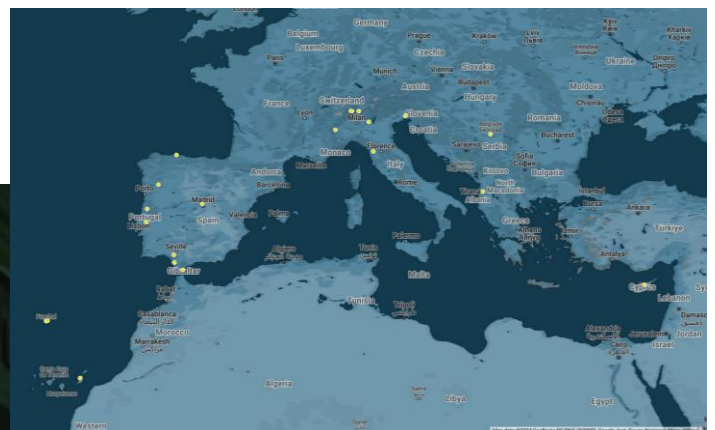
António Teixeira,
Portugal

The **Crested Myna** was the ninth most recorded species with 46 observations in Portugal, mostly of them made in urban areas (96%). The species is native to Asia and established in Portugal since 1997. The main introduction vector in Europe is accidental escaping from captivity. It feeds mainly on seeds, fruits and small animals and nests in a hole in a building, tree, or cliff between April and August. The European population was estimated between 100 – 999 breeding pairs with an increasing trend (2021).



Muscovy Duck & Egyptian Goose

Social behaviour between exotic species
Ana Sampaio,
Portugal



The **Muscovy Duck** was the tenth most recorded species with 31 observations from 8 countries made predominantly in wetlands (71%). The species is native to Americas and established in Spain since 1990s. It may become established in Austria, Belgium, Croatia, France, Greece, Italy, Netherlands, Norway, Poland, Portugal, Slovenia, and United Kingdom. The main introduction vectors in Europe are accidental escaping from captivity and deliberate introduction in urban parks. It feeds on many types of plants and small animals, and nests on the ground or in a tree hole, between February and August. The European population was estimated between 100 – 999 breeding pairs with an unknown trend (2021).

Interactions

The observations made by participants in IBISurvey allowed to identify 1166 interactions between exotic bird species and the environment. Two types of interactions were dominant over all others: socialization events with native species without showing any aggressiveness represented 37% of all interactions, while feeding on ornamental or wild plants represented 28%.

The most frequently reported associations were African Sacred Ibis feeding or nesting close to European native species (mainly herons) and Egyptian Goose feeding or resting together with other ducks and geese (including wild species and domestic varieties). The remaining reported interactions were the use of garden feeders (8%), attacking a native species (8%), feeding on animals (7%), feeding on crops (7%), and being attacked by a native species (2%). Unfrequently reported interactions were placed together in the class “other interactions” including social or aggressive events between different exotic bird species, aggressive behaviour towards people, and nesting behaviours such as the use of holes in trees, nest-boxes, or artificial platforms.

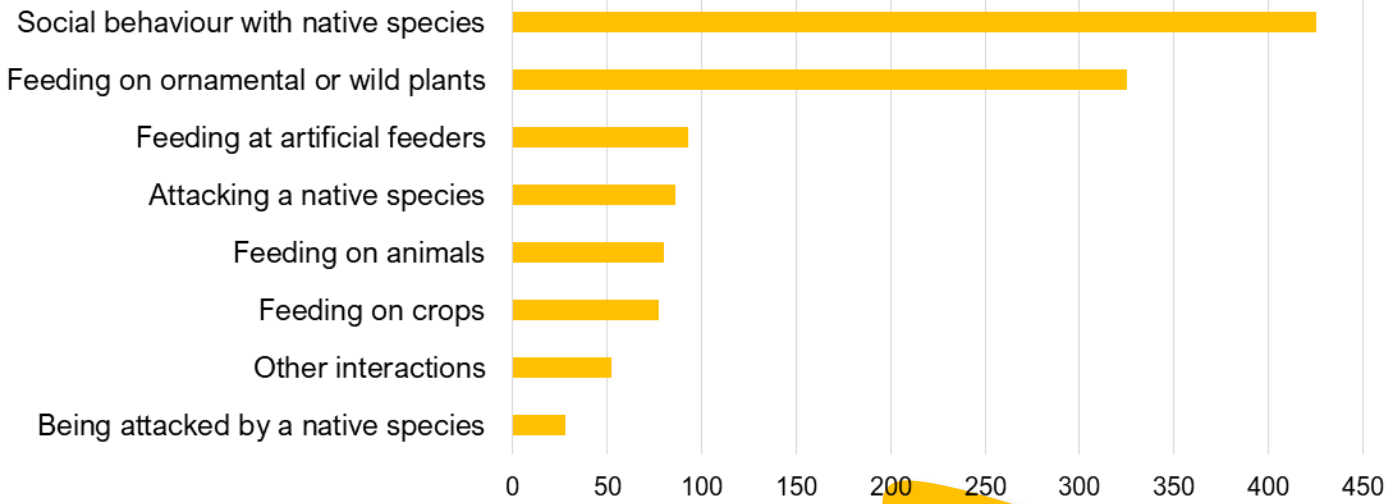
Regarding the aggressive interactions of exotic bird species towards another animal it was possible to identify the victim in 79 cases (90%). Some records included more than one victim species. Mallard (*Anas platyrhynchos*), including its domestic varieties, was the most frequent target of the exotic bird's aggressive interactions with 21 observations. The number of interactions with wild and domestic ducks was constrained by difficulties in distinguishing them on some occasions. The same happened with geese varieties. Participants identified six species interacting aggressively towards mallards, two species towards Great Tit (*Parus major*), and three species towards Graylag Goose (*Anser anser*) as well as towards Sparrows (*Passer* spp.).

Aggressive interactions towards exotic birds were less frequently observed, having been possible to identify the victim in all 28 cases. The most frequently reported aggressive native species were the Magpie (*Pica pica*) and the Blackbird (*Turdus merula*), with only three observations each.



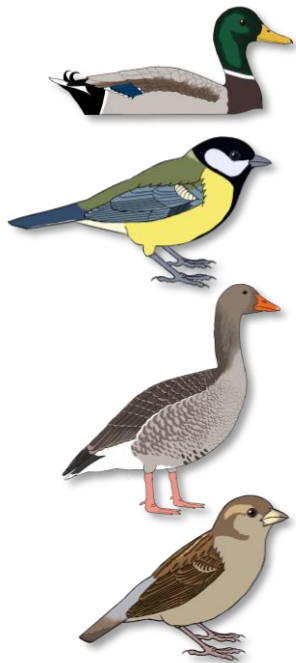
Ring-necked Parakeet
Feeding at artificial feeders
Lou Leconte,
France

Number of interactions between exotic birds and the environment reported at IBISurvey Platform



Aggression target (native)

Aggressor (exotic)



Mallard / Domestic Duck
(*Anas platyrhynchos*)
21 observations



Great Tit
(*Parus major*)
6 observations



Greylag Goose / Domestic Goose
(*Anser anser*)
5 observations



Sparrow
(*Passer sp.*)
5 observations



Aggressor (native)

Aggression target (exotic)



Magpie
(*Pica pica*)
3 observations



Blackbird
(*Turdus merula*)
3 observations



Legend:

- aae. Egyptian Goose (*Alopochen aegyptiaca*)
- acr. Crested Myna (*Acridotheres cristatellus*)
- aga. Mandarin Duck (*Aix galericulata*)
- ain. Bar-headed Goose (*Anser indicus*)
- bca. Canada Goose (*Branta canadensis*)
- cle. Ringed Teal (*Callonetta leucophrys*)

- llu. Red-billed Leiothrix (*Leiothrix lutea*)
- mmo. Monk Parakeet (*Myiopsitta monachus*)
- nho. Cockatiel (*Nymphicus hollandicus*)
- pkr. Ring-necked Parakeet (*Psittacula krameri*)
- pme. Black-headed Weaver (*Ploceus melanocephalus*)
- tfe. Ruddy Shelduck (*Tadorna ferruginea*)
- vma. Pin-tailed Whydah (*Vidua macroura*)

Interactions

It was possible to identify the plant genus or species in 268 cases of reported consumption by exotic bird species (67%). Some of these records mentioned to feeding on more than one plant species. Birds were reported feeding on many different plant parts, including flowers, seeds fruits and leaves.



Blue-crowned Parakeet

Feeding on crops (loquat)

Camila Rodrigues,
Portugal

Considering the plants identified as the most frequently recorded as being part of exotic bird's diet, these were all trees, and it was mostly their fruits that were consumed:

China berry (*Melia azedarach*) is a deciduous tree native to Asia and Oceania, which is cultivated as ornamental or naturalized in Southern Europe. This species was identified as composing the diet of five exotic bird species in Portugal, Italy, and Spain.

IBISurvey participants frequently recorded exotic birds feeding on three types of crops typically grown in southern Europe: loquat (*Eriobotrya japonica*), orange and allies (*Citrus* spp.) and fig (*Ficus carica*). Five exotic bird species

were recorded feeding on loquats in Portugal, Italy, and Spain. While orange and allies were identified as composing the diet of two exotic bird species in Portugal and four species were observed feeding on figs in Portugal, France, and Spain.

Nettle Trees (*Celtis* spp.) belong to a genus of deciduous trees which is native to Southern Europe. Some species of this genus are also cultivated as ornamental in urban areas. This genus was identified as composing the diet of four exotic bird species in Portugal, Italy, and Spain.

Cypresses (*Cupressus* spp.) are evergreen trees, native to or cultivated as ornamental in the British Isles, Central and Southern Europe. IBISurvey participants reported four exotic bird species feeding on cypresses in Portugal, Italy, Spain, Greece, and Turkey.

Cherry, almond, peach, etc. (*Prunus* spp.) and Apples (*Malus* spp.) are deciduous trees which are native to or cultivated (as crop or as ornamental) in most European regions. *Prunus* trees were identified as composing the diet of six exotic bird species in Portugal, Italy, Spain, France, Germany, and Greece. While apples were identified as composing the diet of three exotic bird species in Portugal, France, Germany, United Kingdom, and Turkey.









































Monk Parakeet

Feeding on ornamental plants

(fig – *Ficus carica*)

Daniel Macias Gómez,
Spain

Main plant species/genus identified as food of exotic bird species

| | | | | | | |
|---|---|---|---|---|---|---|
|  | China Berry (<i>Melia azedarach</i>) 24 observations |  |  |  |  |  |
|  | Loquat (<i>Eriobotrya japonica</i>) 18 observations |  |  |  |  |  |
|  | Nettle Tree (<i>Celtis</i> spp.) 17 observations |  |  |  |  | |
|  | Cypress (<i>Cupressus</i> spp.) 17 observations |  |  |  |  | |
|  | Cherry, almond, peach, etc (<i>Prunus</i> spp.) 17 observations |  |  |  |  |  |
|  | Orange and allies (<i>Citrus</i> spp.) 13 observations |  |  | | | |
|  | Fig (<i>Ficus carica</i>) 10 observations |  |  |  |  | |
|  | Apple (<i>Malus</i> spp.) 9 observations |  |  |  | | |

Legend:

aro. Rosy-faced Lovebird (*Agapornis roseicollis*)
hme. House Finch (*Haemorhous mexicanus*)
llu. Red-billed Leiothrix (*Leiothrix lutea*)
mmo. Monk Parakeet (*Myiopsitta monachus*)
mun. Budgerigar (*Melopsittacus undulatus*)

per. Red-masked Parakeet (*Psittacara erythrogenys*)
peu. Alexandrine Parakeet (*Psittacula eupatria*)
pk. Ring-necked Parakeet (*Psittacula krameri*)
pma. Scaly-headed Parrot (*Pionus maximiliani*)
pse. Senegal Parrot (*Poicephalus senegalus*)
tcu. Blue-crowned Parakeet (*Thectocercus acuticaudatus*)

Invasive species

Participants found five out of six bird species present in the list of Invasive Alien Species (IAS) of Union concern (Commission Implementing Regulation 2022/1203 of 12 July 2022). The only species not detected was the House Crow, an Asian species that has been target of eradication in Netherlands.

The **Egyptian Goose** was the most recorded IAS. Participants contributed with 185 observations, which corresponded to 133 interactions between this African species and the environment. The most frequent interactions were socialization events with native species without showing any aggressiveness (44%), aggressive interactions towards native species (20%), and feeding on wild or ornamental plants (11%). In addition to being present in many European countries, this species was introduced in the United States of America, Colombia, Qatar, United Arab Emirates, Israel, and Mauritius islands. According to the literature, this species has been reported to be a dominant competitor over native bird species, namely competing for nesting sites, including nest usurpation. It may also be responsible for causing crop damage, water eutrophication and for increasing the risk of bird-aircraft collisions (Downs & Hart 2020*).

The **African Sacred Ibis** was the second most recorded IAS. Participants contributed with 115 observations which corresponded to 125 interactions between this African species and the environment. The most frequent interactions were socialization events with native species without showing any aggressiveness (51%) and feeding on animals, such as aquatic invertebrates and fish (42%). In addition to being present in some European countries, there are introduced populations in United Arab Emirates, Israel, Thailand, and Taiwan. According to the literature, this species has been reported as a predator of bird eggs and nestlings and as potential disease carrier because it regularly feeds on rubbish and near farm animals (Downs & Hart 2020*).

Participants have obtained two observations of **Ruddy Duck**. This North American species was observed in France and Netherlands. One observation corresponded to a socialization event with a native species without showing any aggressiveness. According to the literature, the main impact of this species is the risk of hybridization with the threatened European White-headed Duck (*Oxyura leucocephala*) (Downs & Hart 2020*).

*Downs, C. T., & Hart, L. A. (Eds.). (2020): Invasive birds: Global trends and impacts. CABI

Egyptian Goose

Feeding on wild plants (meadow grass)
Karl-Ludwig Abken,
Germany

(pp. 28 – 29)



The **Red-vented Bulbul** was observed twice in Fuerteventura (Canary Islands). Nevertheless, participants have not reported any interaction involving this South Asian species and the environment. This species has been introduced also in Saudi Arabia, Qatar, United Arab Emirates, United States of America, Australia, and several islands in the Pacific Ocean. According to literature, it has been reported as a dominant competitor over native species during feeding events, also causing crop damage, and promoting seed dispersal of invasive plant species (Downs & Hart 2020*).

The **Common Myna** was observed once in Turkey. The report corresponded to a bird being killed by a feral cat. This south Asian bird has been introduced in many countries around the world, including Italy, United States of America, South Africa, Australia, New Zealand, and many Oceanic islands. The impacts caused by this species are identical to those reported for the Red-vented Bulbul, and it is also referred to as a dominant competitor in the search for nesting sites (cavities in trees or buildings) (Downs & Hart 2020*).

Ruddy Duck

Social behaviour with native species (common pochard – *Aythya ferina*, the bird on the right side)

Jeffrey Leguit,
Netherlands



*Downs, C. T., & Hart, L. A. (Eds.). (2020): Invasive birds: Global trends and impacts. CABI



Conclusions

The observations sent by the participants to the IBISurvey platform allowed us to analyse a set of unique data with valuable importance for ecosystem conservation.

The current database of IBISurvey gives a reasonable picture of the situation of exotic bird species in Portugal, Italy, Spain, France, and Germany, considering the number of reported observations and identified species. Belgium, Netherlands, United Kingdom, and Greece are countries with important numbers of exotic bird species (Keller et al. 2020*) that would need to be better surveyed in the future by IBISurvey participants. The remaining countries have a lower number of exotic bird species and participants as well. It is important to increase data collection for all exotic birds, as the same species can have different impacts in different countries.

The high proportion of observations in urban areas (51%) was an expected result considering that this is the environment where most observers live and work, and a relatively high number of exotic species occur there. We expect an increase in the proportion of observations in other environments, as the most severe impacts to ecosystems and economy are likely to occur outside urban areas. For instance, the impacts of exotic birds in agriculture will be overlooked if observations from urban areas remain prevalent. There is a bias in the bird groups that were reported. Parrots and parakeets were observed more often than expected considering the number introduced species, which was probably related to the easiness to observe them in urban areas. On the

other hand, partridges, pheasants and other gallinaceous birds were less observed than expected, considering their abundance and widespread distribution across Europe. Less abundant or secretive species are more likely to be unreported, especially when embedded in mixed flocks with common species.

The longer the interaction, the more likely it is to be detected and reported. When it comes to mixed flocks between exotic and native species, the species are more likely to spend more time ignoring each other, consuming the same foods, or resting in the same places, than to behave aggressively while competing for food or space. Therefore, it is expected that aggressive events are rarely reported. However, this does not mean that existing aggressive interactions cannot result in differences in dominance between competing species. A longer period of observation, or closer observation of more discreet agonistic behaviours (e.g., pointing the bill at the opponent or opening the bill or wings, inflating the plumage) could allow for better documentation of other aggressive interactions beyond attacks, which are the most evident but also the rarest agonistic interaction.

Red-billed Leiothrix

Social behaviour with native species
(greenfinch – *Chloris chloris*)

Alain Fourcade,
France

(pp. 30 – 31)



Most observations of exotic birds interacting with plants refer to parrots and parakeets feeding in trees. This may be related to greater difficulty in photographing other types of feeding birds, namely small birds feeding on grasses.

Despite this, participants found exotic birds feeding in many trees of agricultural interest (for example, loquats, cherries, almonds, oranges, figs, and apples) which may indicate a lower yield in fruit production in regions with a high abundance of exotic birds.



Participants contributed with data on five invasive alien species (IAS). According to these data, the two most abundant IAS (African Sacred Ibis and Egyptian Goose) often socialize with other bird species during feeding, nesting, or resting events. It will be important to identify signs of IAS dominance over native species: when an IAS feeds or rests, it has the first access to food or a resting place and are not disturbed by a native species; or if an IAS uses a nest built by a native species. Beyond that, observations of interactions involving other IAS are needed to clarify their impacts in European ecosystems and human activities. Old observations are also eligible to submit to IBISurvey.

The current proportion of observations supported by photos or videos (35%) should increase to allow us to validate the reported species and their behaviours. Photos or videos are fundamental to help us distinguish between very similar species (e.g., Common Waxbill and Black-rumped Waxbill or Ring-necked Parakeet and Alexandrine Parakeet), to identify hints of aggressiveness between individuals (e.g., discreet agonistic behaviours), to identify plant species, particularly grasses or other herbaceous plants, and to validate old observations.

The IBISurvey team is very grateful to all the participants who contributed observations and helped us to better understand the role that exotic bird species have in European environments!

THANK
YOU
VERY
MUCH

INTRODUCED
BIRD
INTERACTION
SURVEY