Concerns regarding impact risk assessment and positive social effect of introduced birds species

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Impact risk assessment

Invasive species can be a major threat to biodiversity conservation and economy

An assessment of the potential impacts of these species is important for prioritizing management practices

Often, general scoring systems are applied using certain criteria to assess and compare impacts of troublesome introduced species

? Lack of empirical data on impact

? Information from native range or other invaded areas

? Focus on negative impacts only

Holt 2006; Goodenough 2010

Kumschick & Nentwig: Alien Birds vs. Mammals

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Some alien birds have as severe an impact as the most effectual alien mammals in Europe

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- K&N modified an existing impact scoring system for invasive mammals (Nentwig et al. 2009) for birds and compared the two
- Invasive birds selected based on DAISIE database
- Quantitative assessment of environmental and economic risks

Kumschick & Nentwig: Alien Birds vs. Mammals

Impact category
Competition
Predation
Hybridisation
Transmission of diseases
Herbivory
Impact on ecosystem
Potential environmental
Agriculture
Livestock
Forestry
Human health
Infrastructure
Human social life
Potential economic

1.2 Competition

0 No impact known or detectable.

1 Very low level of competition with at least one native species, exploitation competition.

2 Competition with several native species by exploitation competition, without large impact on affected species or decline of their populations.

3 Competition with several species for food and/or space, interference competition, at least one native species declining.

4 Competition with many native species, several declining in population size, competition for food and/or space, behavioural changes in out-competed species.

5 Competes with species listed as vulnerable, endangered or critically endangered by IUCN, decline of these species, replacement or even extinction of species.

Kumschick & Nentwig: Alien Birds vs. Mammals

"Birds are mostly excluded from eradication programmes so far. This is scientifically not justified at all"

Aix sponsa
Anser cygnoides
Anser caerulescens
Cairina moschata
Oxyura jamaicensis
Callipepla californica
Alectoris barbara
Coturnix japonica
Perdix dauurica
Amandava amandava
Estrilda troglodytes
Acridotheres tristis
Phoenicopterus chilensis
Myiopsitta monachus
Psittacula krameri

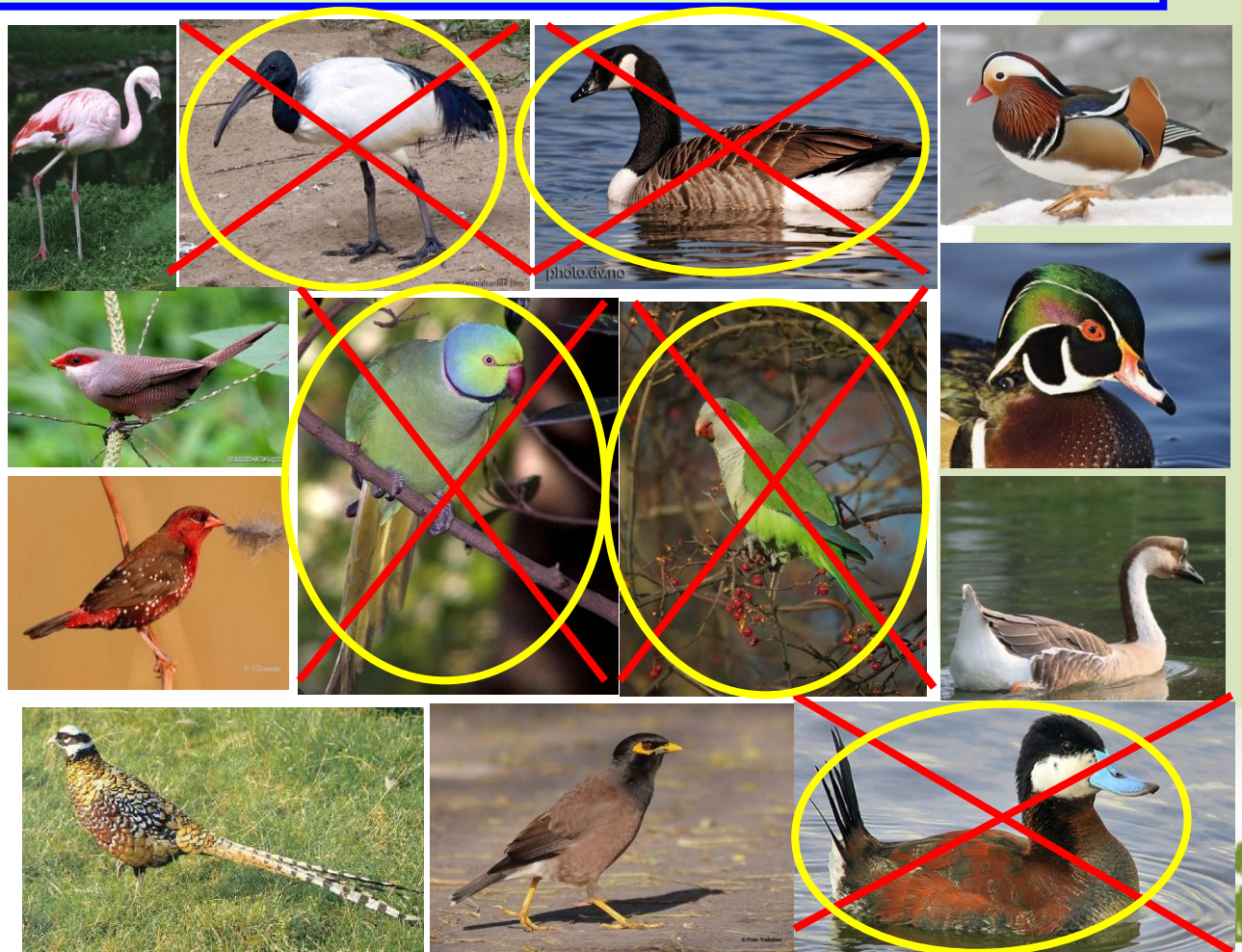
Rose-ringed parakeet (*Psittacula krameri*)

Canada goose (*Branta canadensis*)

Sacred Ibis (*Threskiornis aethiopicus*)

Monk Parakeet (*Myiopsitta monachus*)

Ruddy duck (*Oxyura jamaicensis*)



Re-assessing the impact assessment

Strubbe et al., Biological Conservation 144 (2011)

Surprising results! (Blackburn et al. 2009)

Very strong conclusions → risks providing scientific justification for some bird eradications

Method: Re-assessment of impacts of the five worst avian invaders, using the methodology and literature cited in K&N 2011

Results: We find lower environmental impacts and also lower economic impacts for these species

	Environmental impact		Economic impact	
	K&N	**SSC**	**K&N**	**SSC**
Canada goose	15	10	21	13.3
Ruddy duck	8	7	0	0
Sacred ibis	9	5.7	5	2.7
Rose-ringed parakeet	4	2	11	5.7
Monk parakeet	1	0	6	3.3

Why? Differences in using observational, anecdotal data and hypotheses

Sacred Ibis

Quote for Sacred Ibis in predation category

Yesou and Clergeau (2005/2006) wrote "The sacred ibis is an opportunistic feeder, which favors invertebrates… but also takes larger prey when available, including fish, amphibians, eggs and young birds" and "Apart from birds, there is **concern** that the observed predation of Sacred Ibises on newts may have detrimental effects on discrete population of these endangered amphibians"

1.3 Predation

0 No impact known or detectable.

1 Predation known but negligible, no decline of native species.

2 Predation on several abundant species, without large impact on affected species or decline of their populations.

3 Decline of one to several native species recognized, no changes in food web structure repor

4 Decline of many species, indirect impact by mesopredator release, changes in the food web.

5 Preys also on endemic or species listed as vulnerable, endangered or critically endangered by IUCN, local extinction.

Why? Differences in using observational, anecdotal data and hypotheses

Quotes for Canada goose in competition category

Canada goose

"Canada geese **may** compete with native waterfowl for nest site, feeding and roosting areas… Anecdotal reports suggest that Canada geese **may drive** away ducks Anas spp. and mute swans (Giles 1992)..."

"In a study of one mixed population of waterfowl in England direct aggressive interaction between Canada goose and other waterfowl during winter was **rare** (CSL unpubl). Further research is needed…

"There is **anecdotal evidence** for interspecific aggression between naturalized Canada goose populations and native waterfowl during the breeding season, although the intensity and outcome of such encounters have **seldom been analyzed**

"A study of North America suggested that the mallard productivity can be negatively affected by increasing nesting densities of Canada goose (Master & Oplinger 1984), while another study suggests that the nesting success of mallard, gadwall and lesser scaup can increase due to the protection from predators afforded by neighboring Canada geese (Giroux 1981)"

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The “generic scoring system”

- Economic and environmental criteria are fine.
- Interpretation of anecdotal empirical observations is problematic
  - Data laundry
  - Propagates throughout the scientific literature
- Literature review: should be based on hypotheses (“systematic review”)
  - What about positive effects?

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ELSEVIER

The need for evidence-based conservation

William J. Sutherland[1], Andrew S. Pullin[2], Paul M. Dolman[3] and Teri M. Knight[4]

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[2]Centre for Evidence-Based Conservation, School of Biosciences, The University of Birmingham, Edgbaston, Birmingham, UK B15 2TT
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Much of current conservation practice is based upon anecdote and myth rather than upon the systematic appraisal of the evidence, including experience of others who have tackled the same problem. We suggest that this is a major problem for conservationists and requires a rethinking of the manner in which conservation operates. There is an urgent need for mechanisms that review available information and make recommendations to practitioners. We suggest a format for web-based databases that could provide the required

Is there a problem?

Current conservation practice faces the same problems as did old-fashioned medical practice. For example, most decisions are not based upon evidence, but upon anecdotal sources (Box 1). Furthermore, very little evidence is collected on the consequences of current practice so that future decisions cannot be based upon the experience of what does or does not work. Much accumulated experience is solely in the memory of individual practitioners, and the collection of information in a form that could be used by

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  - What about positive effects?
- Impact assessment alone not enough to call for eradication! (public perception)

The social role of introduced birds in the daily life of dwellers?

Aim:

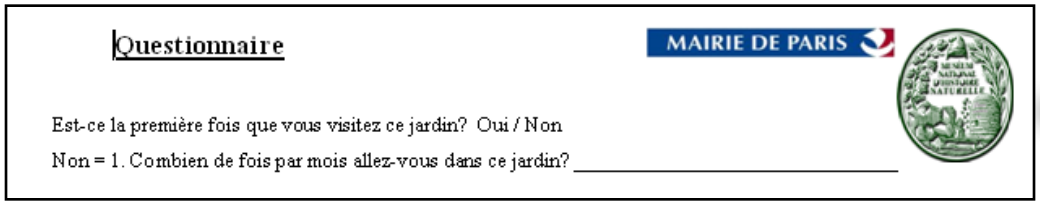
Learn which birds people would like to see in urban gardens and which characteristics (e.g., size, colorfulness…) influence this choice

Method:

During autumn 2010 we passed 457 short questionnaires in small gardens in Paris, France

(1) asking people about their bird's characteristics preference

E.g. 1-not colorful → 4-very colorful (0-don't care)


Questionnaire

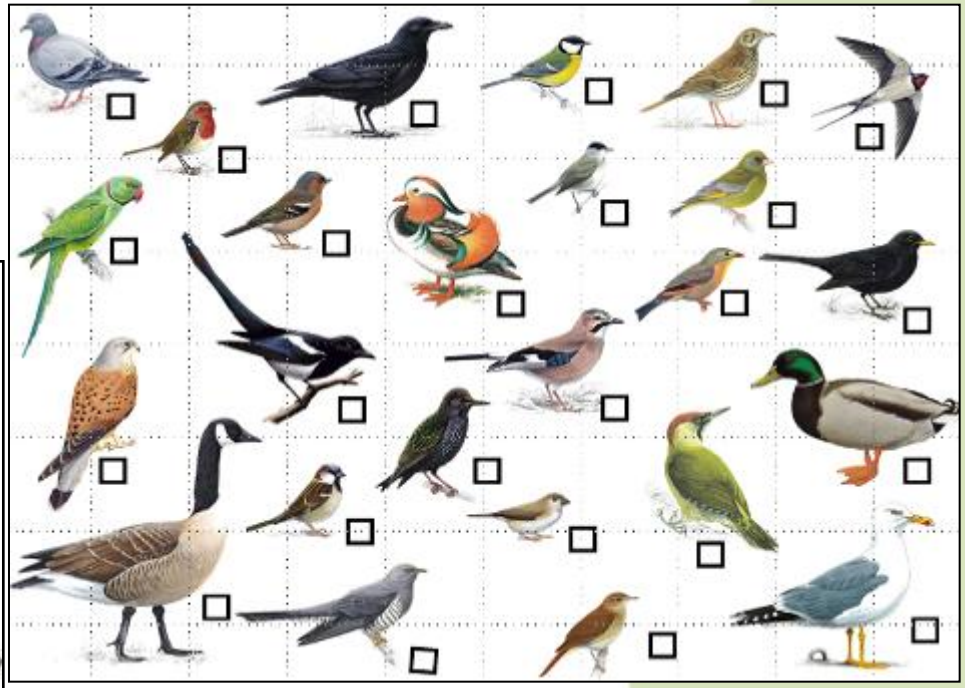
MAIRIE DE PARIS

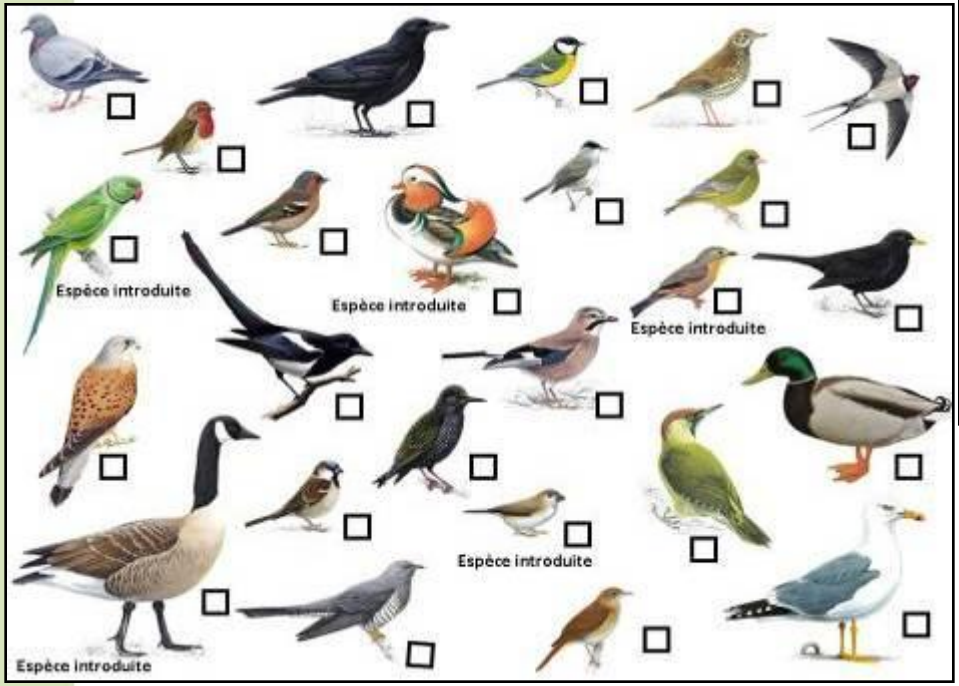
Est-ce la première fois que vous visitez ce jardin? Oui / Non

Non = 1. Combien de fois par mois allez-vous dans ce jardin? _____

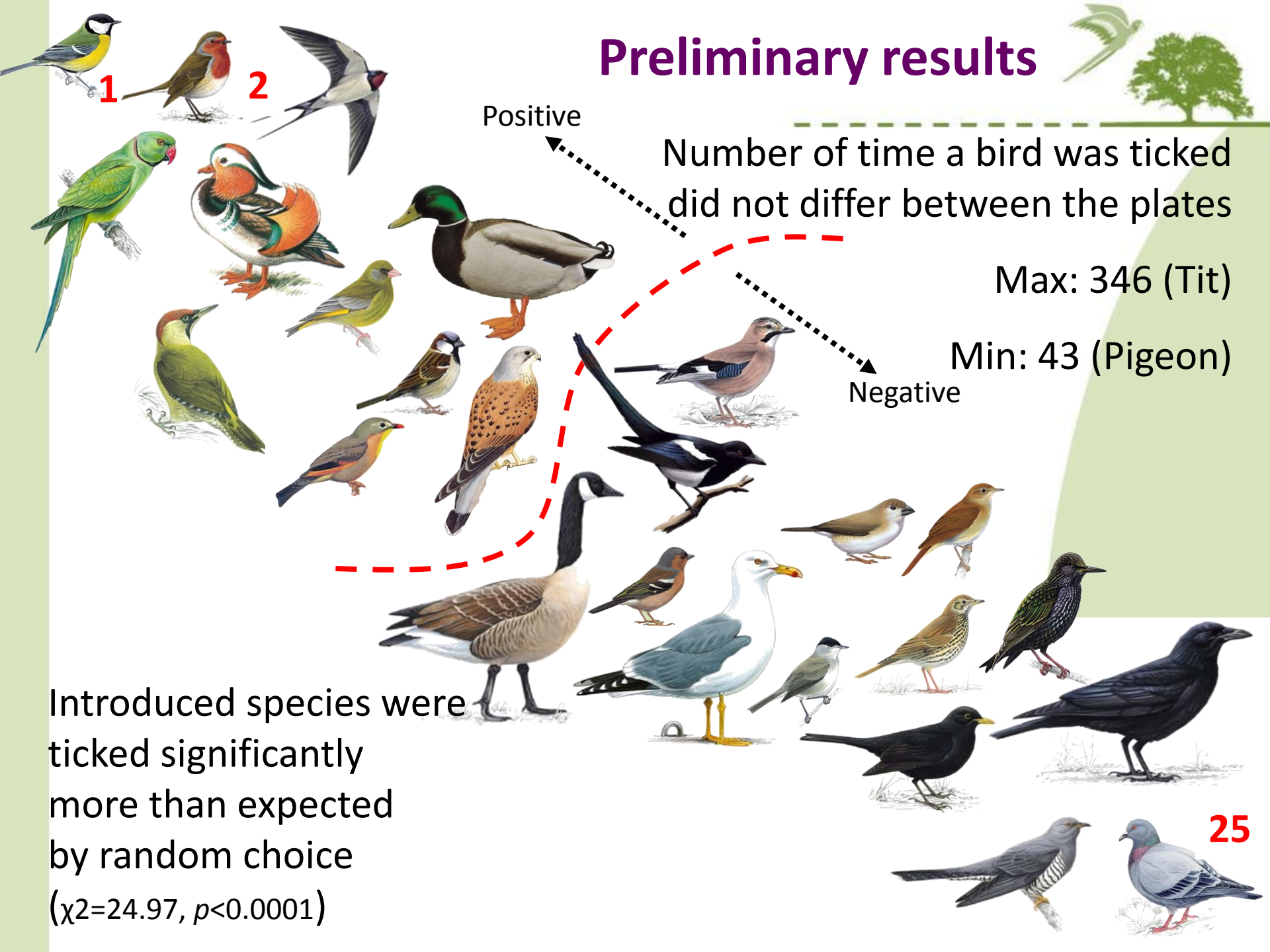
The social role of introduced birds in the daily life of dwellers?

(2) asking people to chose 10 species out of 20 common native urban birds and 5 introduced species in France





Preliminary results



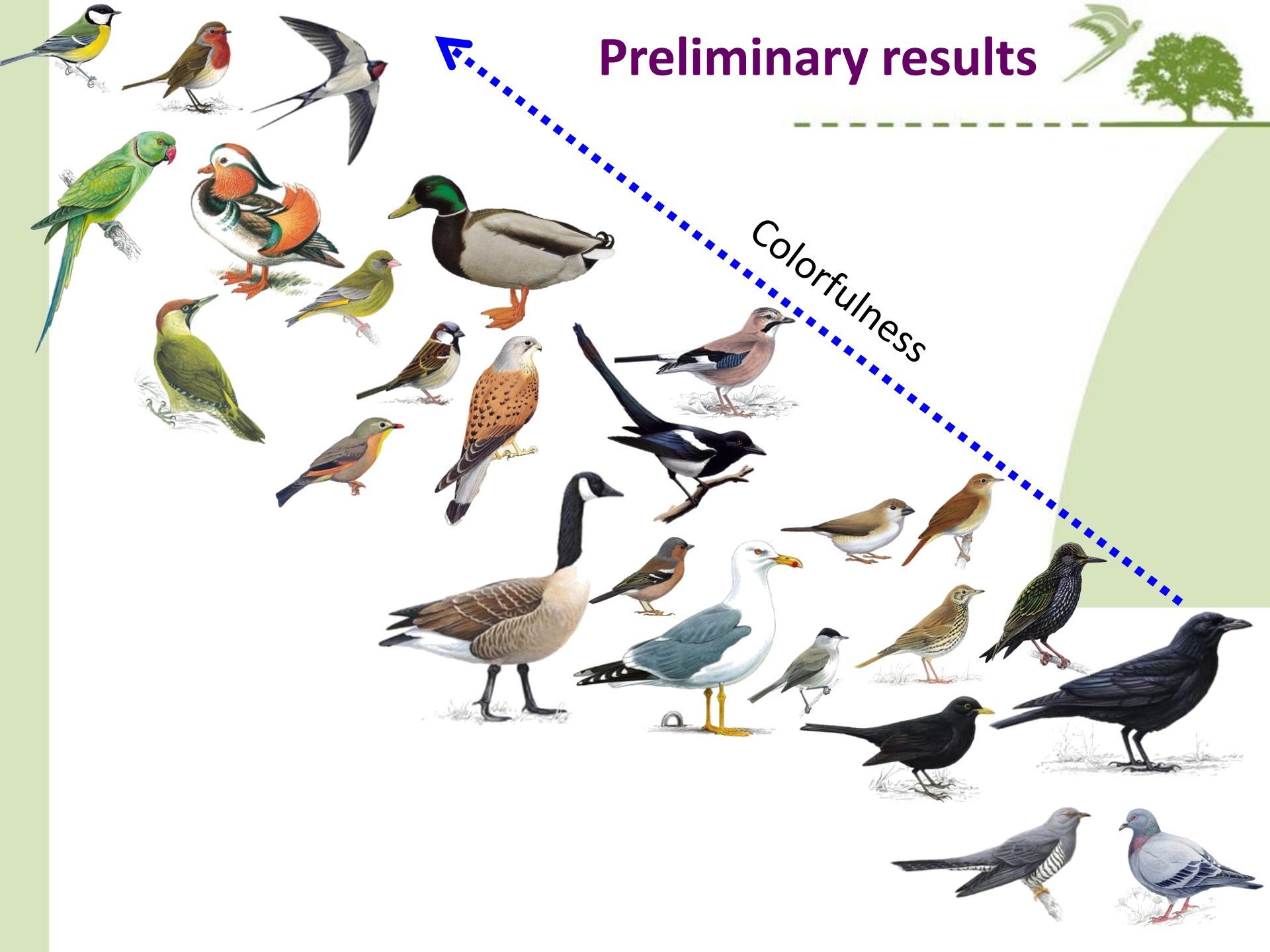
Number of time a bird was ticked did not differ between the plates

Max: 346 (Tit)

Min: 43 (Pigeon)

Introduced species were ticked significantly more than expected by random choice ($\chi 2=24.97$, $p<0.0001$)

Preliminary results



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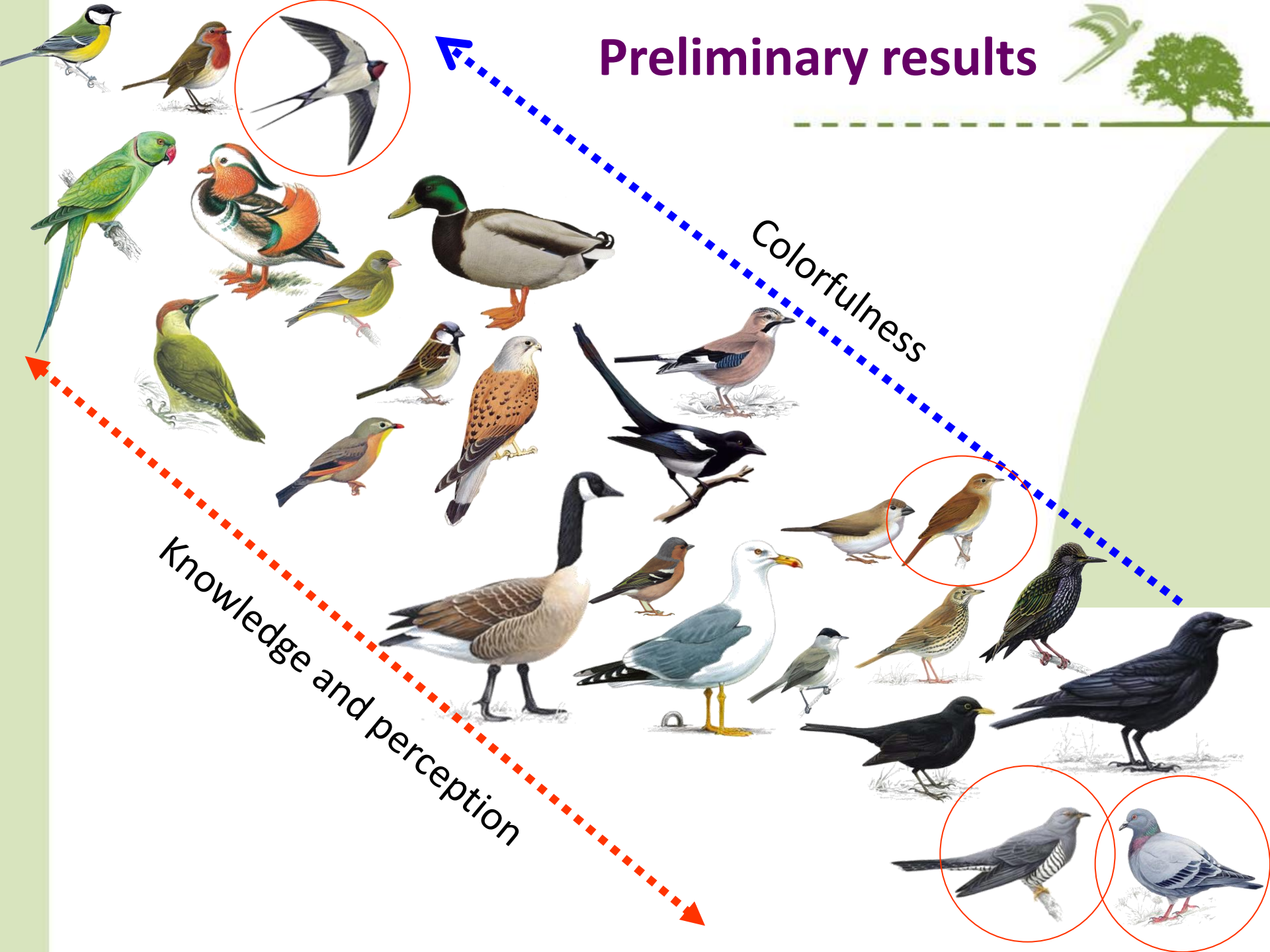

Conclusion

- Anecdotal observations can be used when only poor data is available. But this should be discussed and conclusions should be drown accordingly
- Ill-convincing calls for eradications, based on poor data and without accounting for positive effects, may have a backlash effect that could adversely affect conservation efforts
- Impact risk assessment should based on a cost-benefit approach and primarily consider the ecological functions of introduced species in relation to those of the native community
- Introduced birds are sometimes attractive and colorful → positive social effects → help in reconnecting city-dwellers to nature
- Accounting for all type of positive and negative effects is of great value for understanding the full impact of invasive birds

Thanks for Listening,

Don’t first judge those species by their origin,

judge them first for their ecological or economical

functions in the context of their ecosystem

Davis et al. 2011