Potential uses of bird survey data to facilitate planning decisions

Gavin Siriwardena
(with thanks to Kate Plummer, Daria Dadam & Simon Gillings)
BRITISH TRUST FOR ORNITHOLOGY

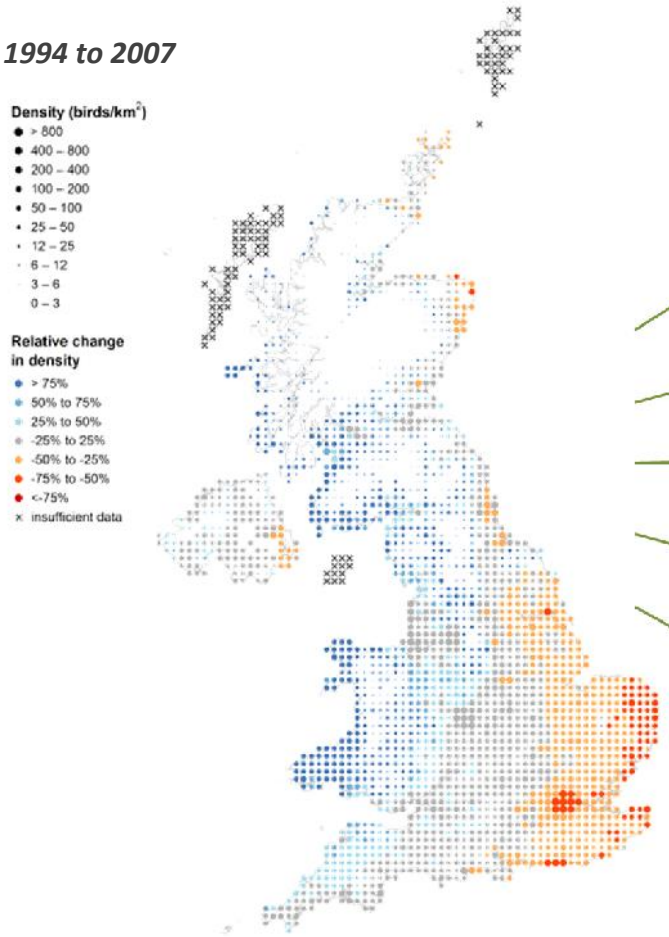

gavin.siriwardena@bto.org

www.bto.org

BTO
Looking out for birds

- Combine professional and citizen science
- Examining wildlife population changes
- 40,000 volunteers
- Collect/ manage/ analyse BIG ecological datasets

House Sparrow population change 1994 to 2007



Conservation bodies

Government

Environmental policy

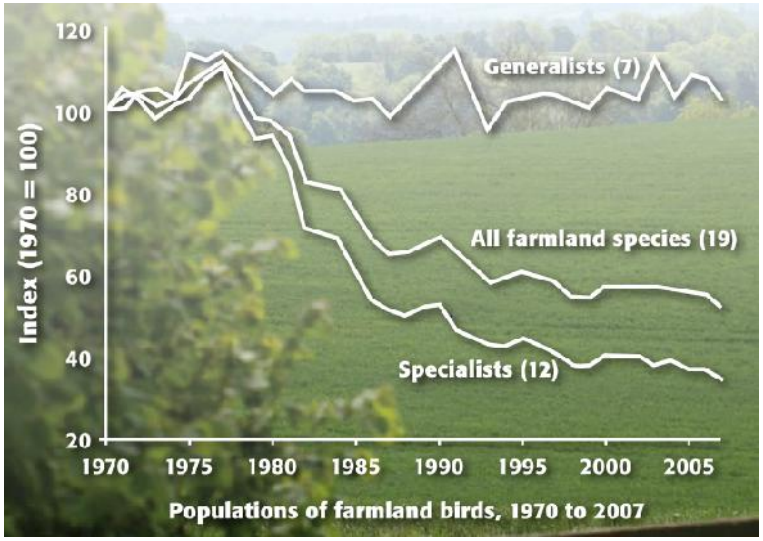
General public

Peer-review

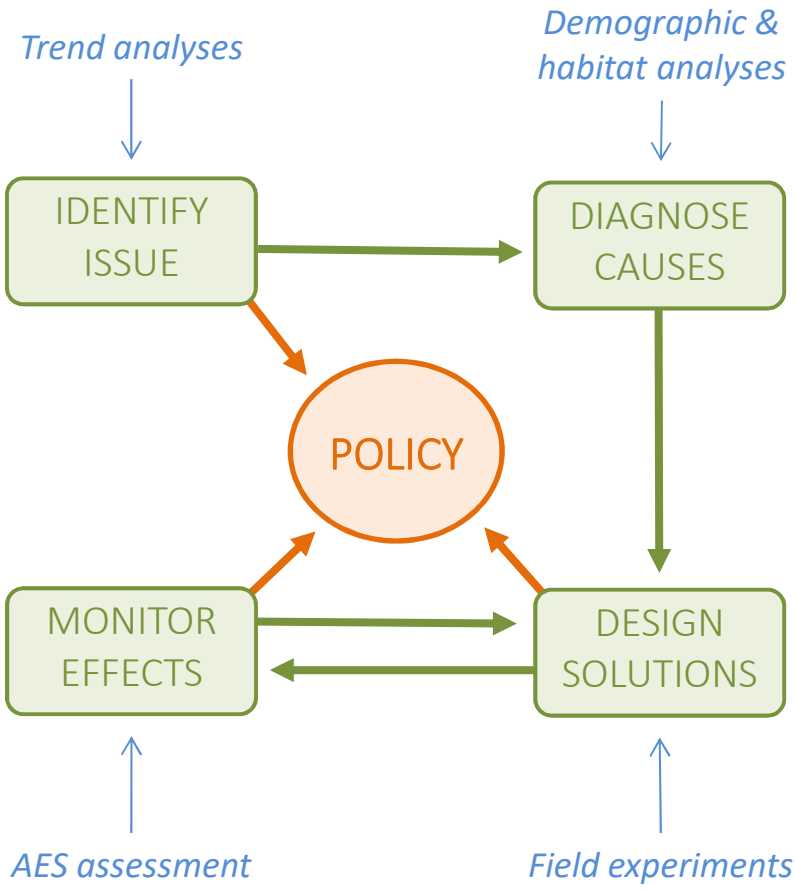
BTO
Looking out for birds

- Combine professional and citizen science
- Examining wildlife population changes
- 40,000 volunteers
- Collect/manage/analyse BIG ecological datasets

Farmland bird declines



NOW ADDING THE URBAN CONTEXT…

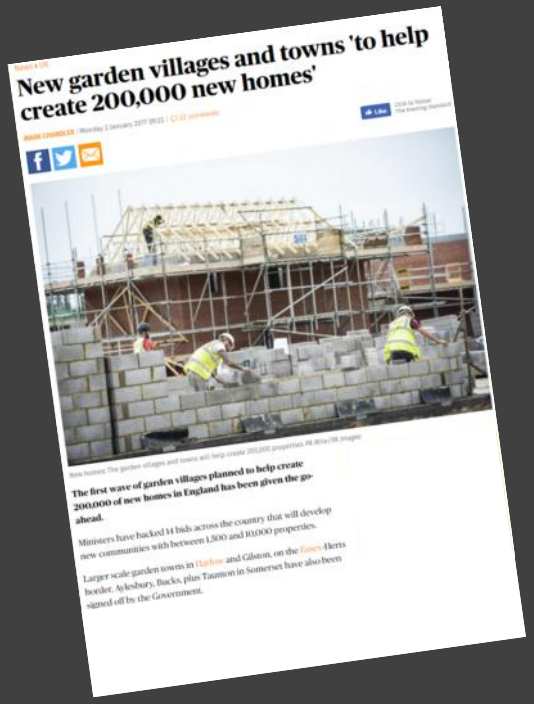


Birds in the built environment

BTO monitoring schemes provide relevant data from the garden scale to the national scale

BTO
Looking out for birds

Rapid urban expansion is a major threat to bird diversity



New garden villages and towns 'to help create 200,000 new homes'

The first wave of garden villages planned to help create 200,000 of new homes in England has been given the go-ahead.

Ministers have backed 14 bids across the country that will develop new communities with between 1,500 and 10,000 properties.

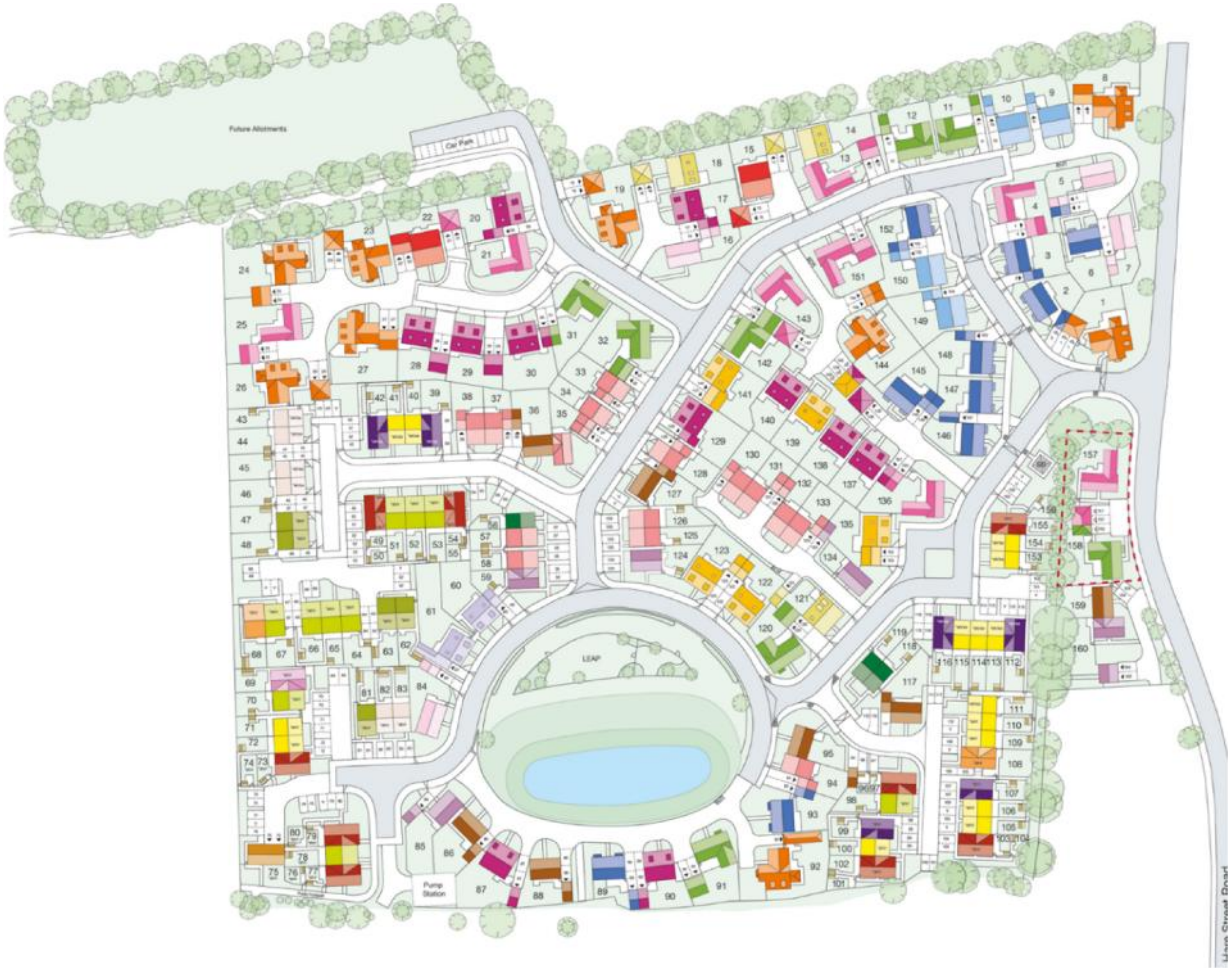
Larger scale garden towns in Harlow and Gilston, on the Essex-Herts border, Aylesbury, Bucks, plus Taunton in Somerset have also been signed off by the Government.

BUT…

also an opportunity for biodiversity-sensitive urban design

BIODIVERSITY-SENSITIVE URBAN DESIGN

How to do it??... 1. Use anecdotal principles and species ecologies, retro-fitting/greenwashing?

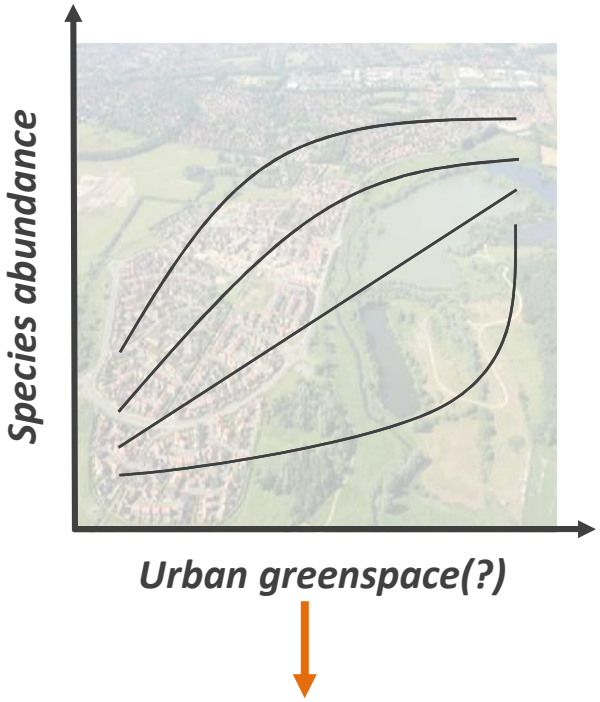


BTO
Looking out for birds

BIODIVERSITY-SENSITIVE URBAN DESIGN

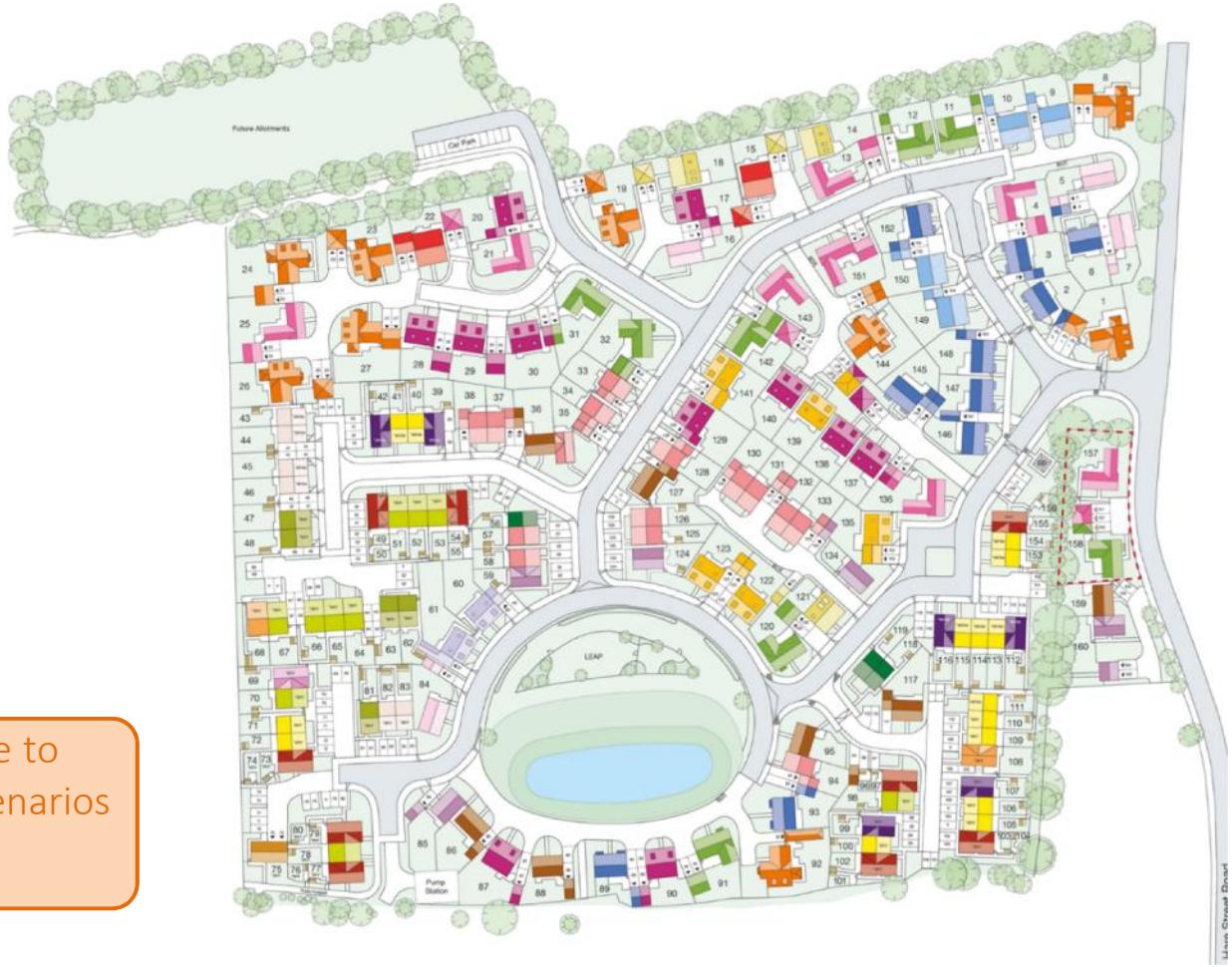
How to do it??... 1. Use anecdotal principles and species ecologies, retro-fitting/greenwashing?

Better to... 2. Incorporate quantitative knowledge about birds into decision-making



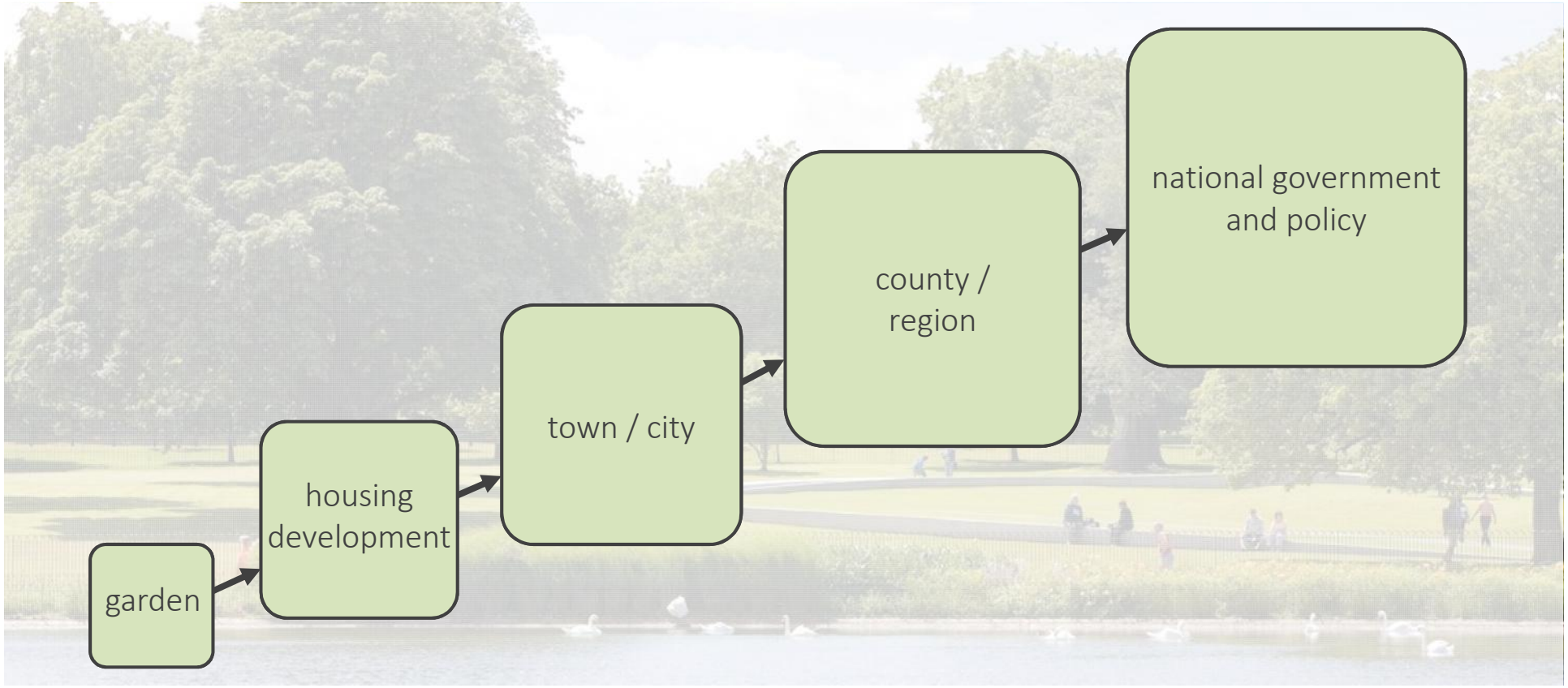
Predict bird response to future development scenarios

→ Simulations



BIODIVERSITY-SENSITIVE URBAN DESIGN

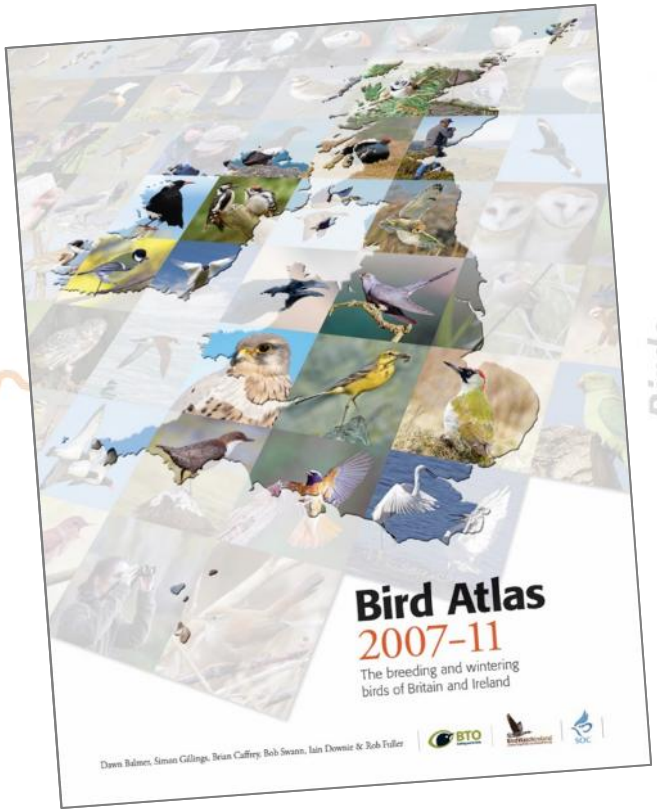
Decisions are made at multiple scales…



Where to position new developments?

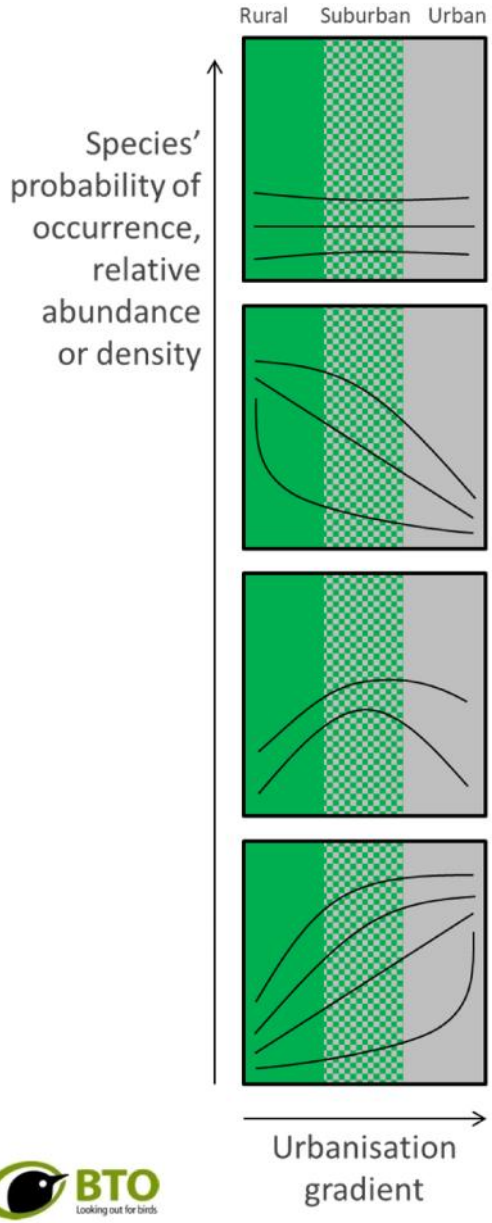
POSITIONING OF NEW DEVELOPMENTS

1. Where do different species occur?
2. How are they affected by patterns of urbanisation?



BTO
Looking out for birds

POSITIONING OF NEW DEVELOPMENTS



Tolerant
Status is invariant to the state of urbanisation. Often rare everywhere.

→ **4 species (3%)**

Urban avoider
Status declines with increasing urbanisation. Decline can be rapid for highly sensitive species.

→ **79 species (57%)**

Suburban adapter
Status peaks at intermediate levels of development.

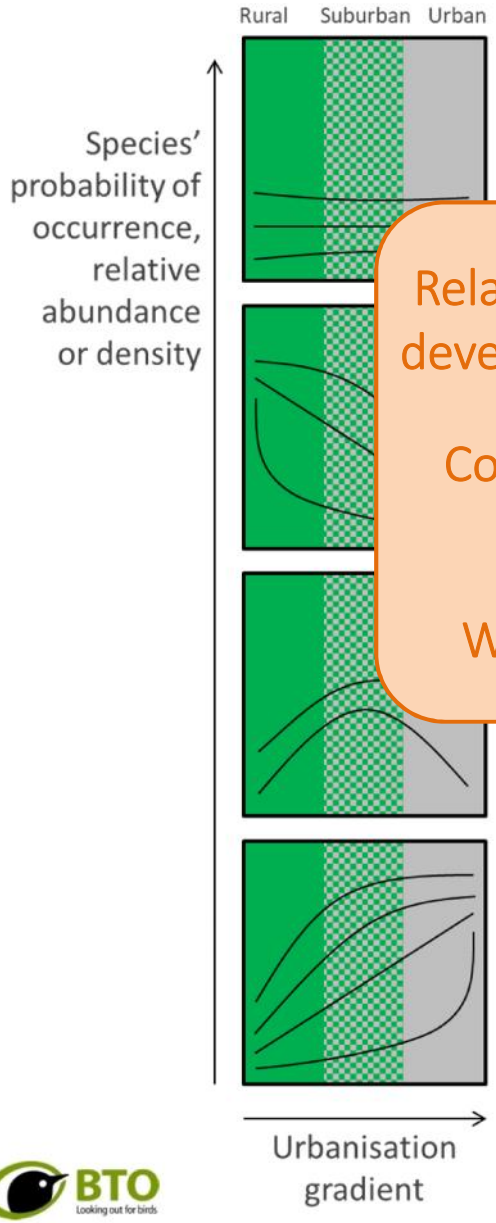
→ **21 species (15%)**

Urban adapter
Status increases with urbanisation; may be stable across intermediate to high levels of development.

→ **35 species (25%)**

Data = Bird Atlas 2007-11

POSITIONING OF NEW DEVELOPMENTS



Tolerant
Status is invariant to the state of urbanisation. Often rare everywhere.

→ **4 species (3%)**

Relationships predict birds likely to be found with developments of different types in different places

Communities will feature tolerant and adapter species

Which species may be the planners' choice…

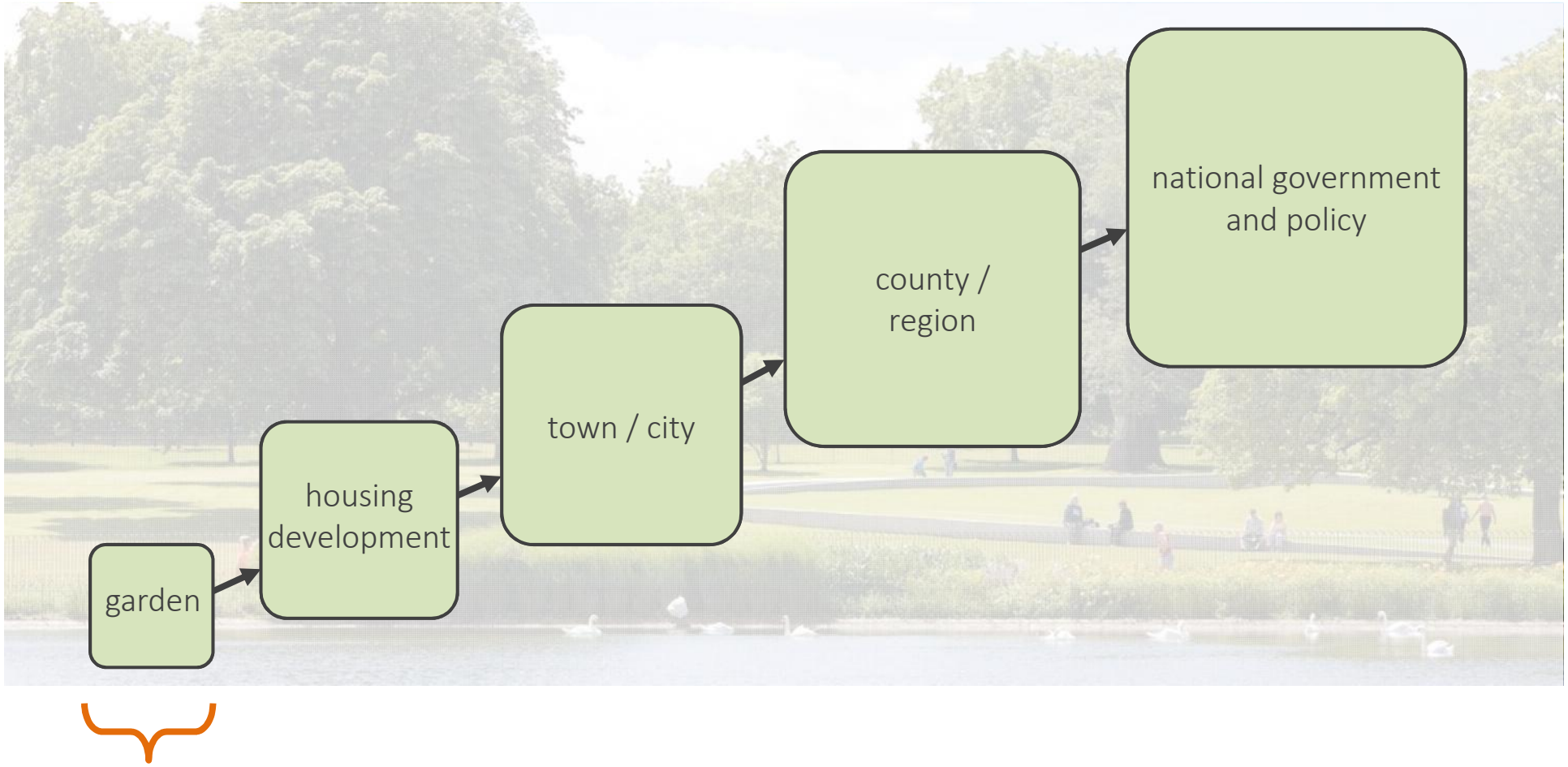
Urban adapter
Status increases with urbanisation; may be stable across intermediate to high levels of development.

→ **35 species (25%)**

Data = Bird Atlas 2007-11

BIODIVERSITY-SENSITIVE URBAN DESIGN

Decisions are made at multiple scales…



How do people's decisions affect wildlife?
Effects of garden structure and location?

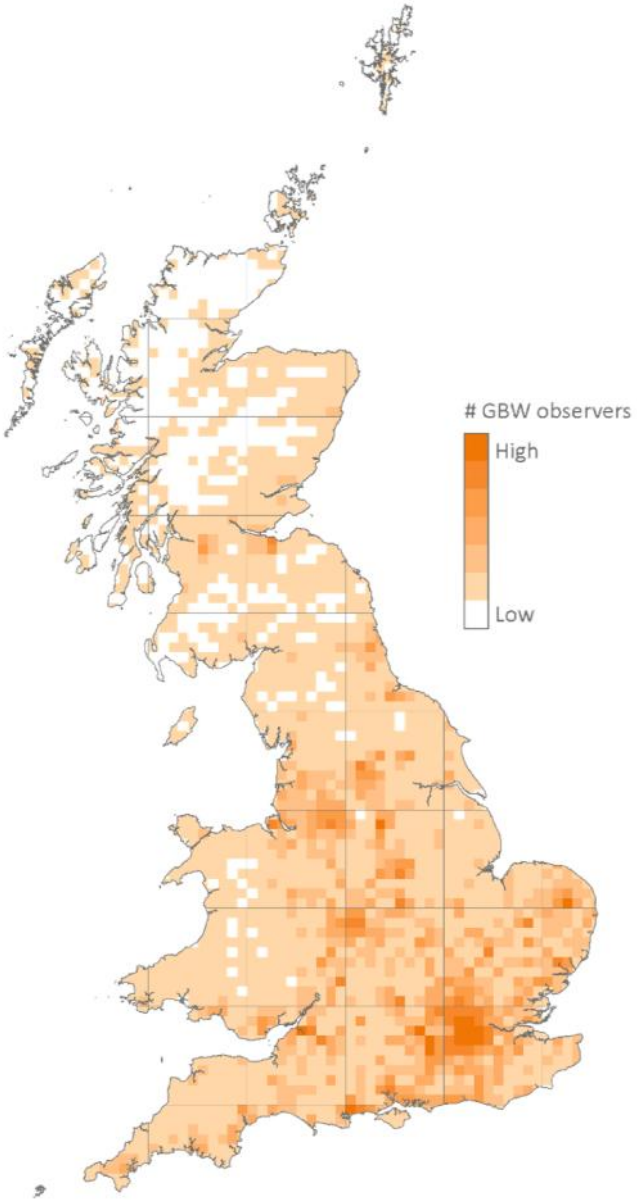
BTO
Looking out for birds

MANAGEMENT IN GARDENS

BTO Garden BirdWatch

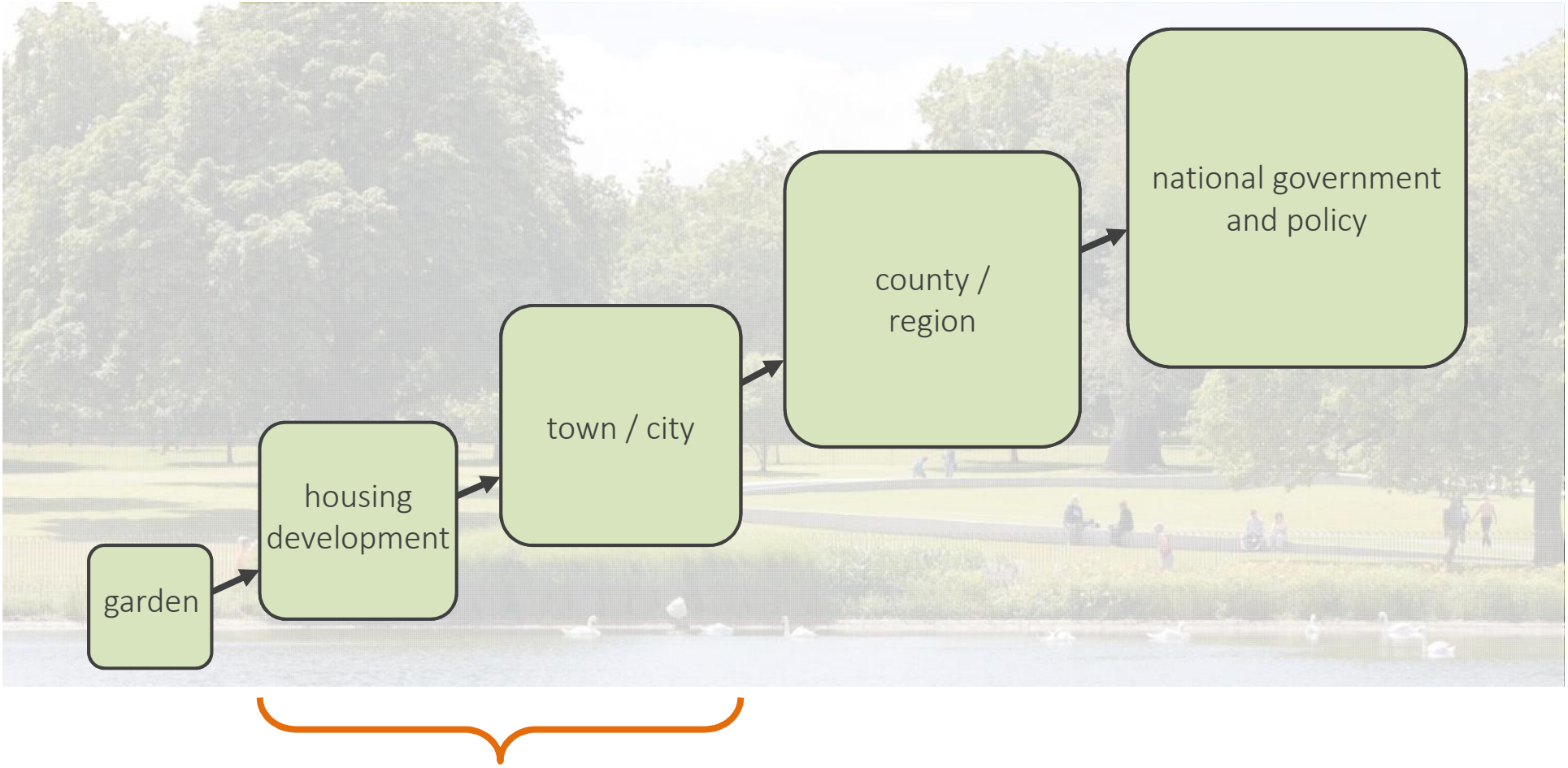
- Focus on gardens
- Long-running (since 1995) (*7.3 million records!*)
- Observers throughout the UK
- Record of garden features & feeding

Annual and seasonal population trends
Effects of habitat type, weather, human feeding activity
Potential for future studies of garden structure and urban design



BIODIVERSITY-SENSITIVE URBAN DESIGN

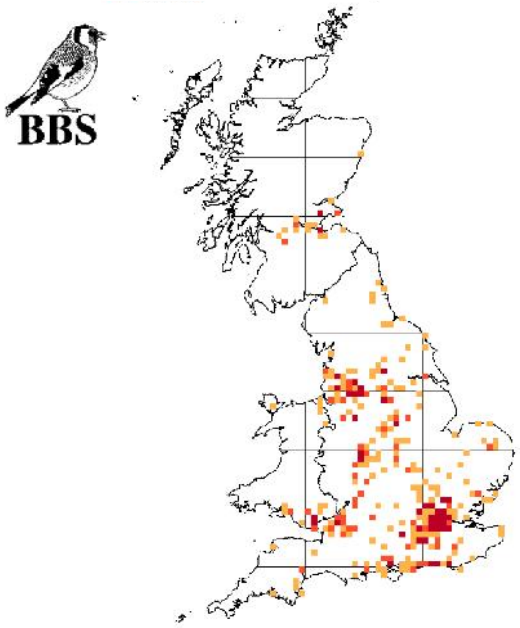
Decisions are made at multiple scales…



How to design urban landscapes for birds?

URBAN DESIGN FOR BIRDS

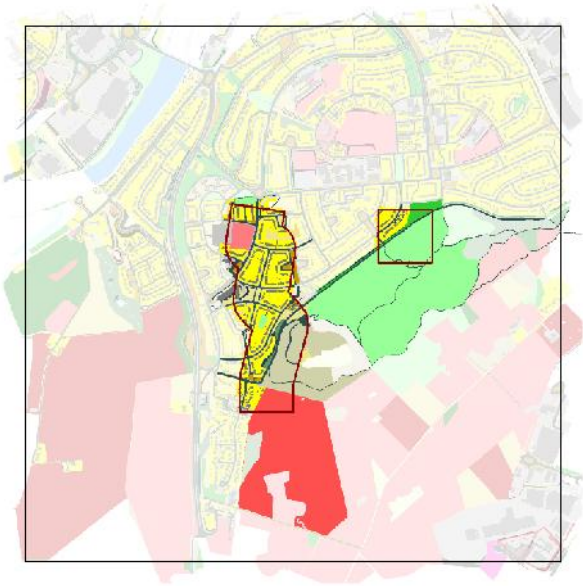
Bird abundance – using Breeding Bird Survey



- National monitoring scheme
- 482 ‘urban sites’ in 1km squares
- 58 common bird species
- Analogous analyses of data for Luton/Bedford/Milton Keynes

~

Urban landscape pattern – using OS MasterMap



- 38 urban form metrics
- Habitat cover, patch densities, patch sizes, connectivity…

(1) Important factors for each species
(2) Best models to predict each species

RESULTS

Patterns of response by species

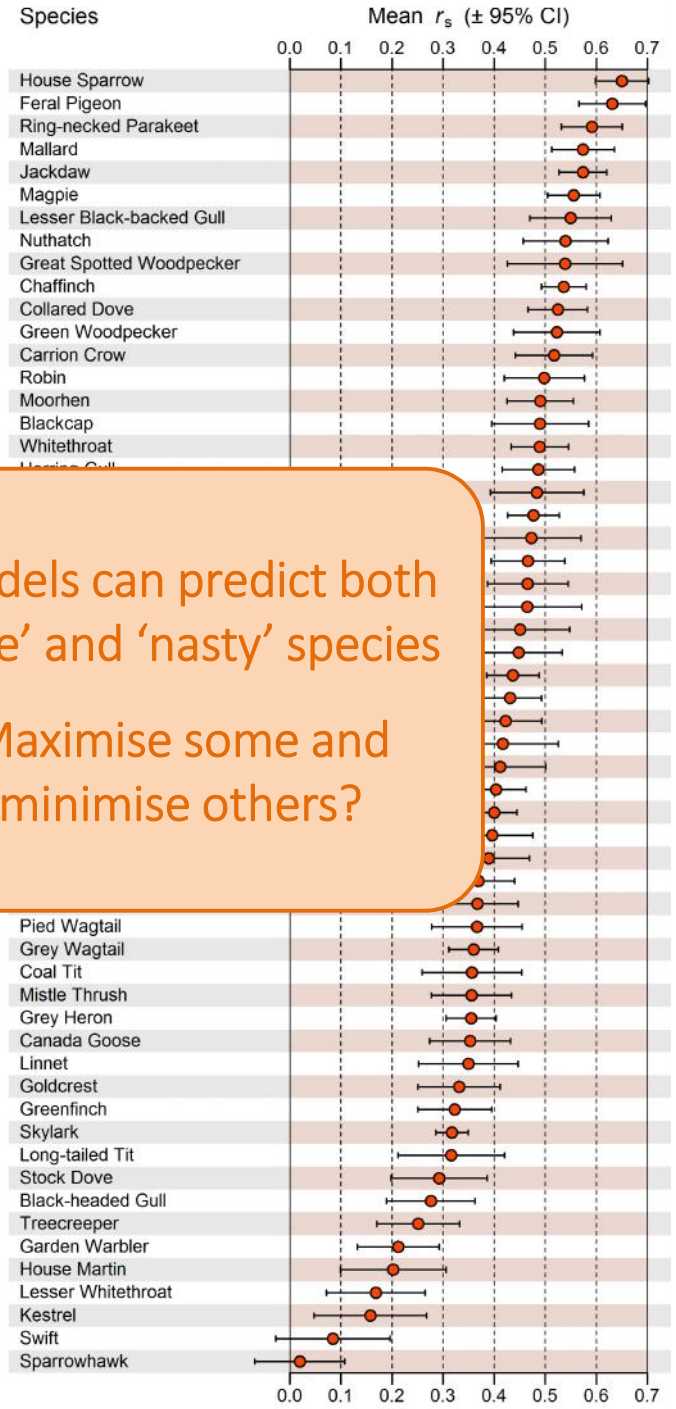
Variable predictive power

Strongest for:

- House Sparrow
- Feral Pigeon
- Ring-necked Parakeet
- Mallard
- Jackdaw
- Magpie

Poorest for:

- Sparrowhawk
- Swift
- Kestrel
- Lesser Whitethroat
- House Martin
- Garden Warbler



Models can predict both ‘nice’ and ‘nasty’ species

Maximise some and minimise others?

RESULTS

Patterns of response across species

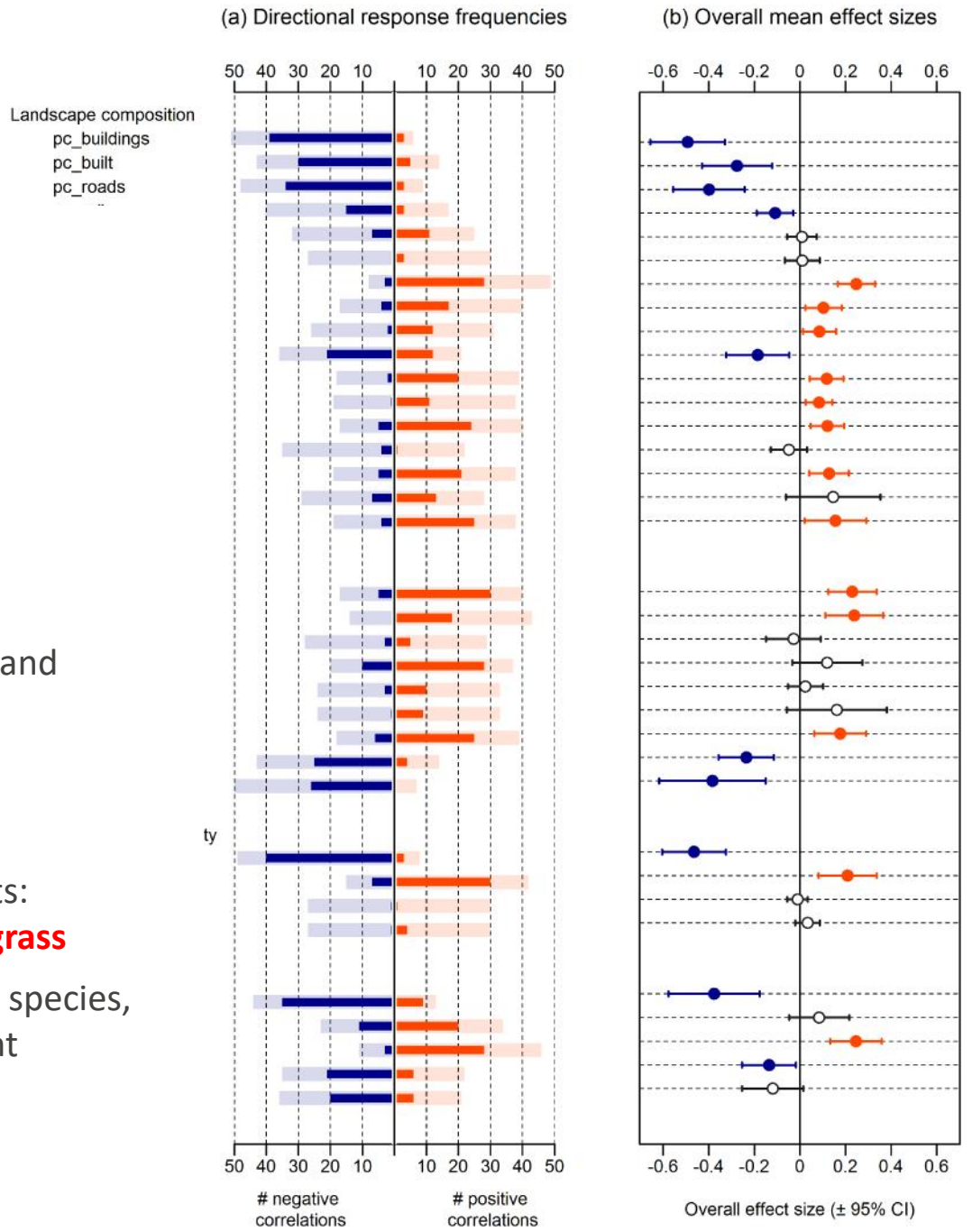
Most **positive** responses =

- Greenspace size
- Woodland density
- Garden size

Most **negative** responses =

- % Building, built and road cover
- Distance between waterbodies and woodlands
- Greenspace density

- Also significant landscape effects: surrounding **urban**, **wood** and **grass**
- All metrics affected at least two species, but patterns were not consistent



URBAN DESIGN FOR BIRDS

Key findings

- Habitat composition, configuration and greenspace heterogeneity all important
- Individual species respond differently

↓

Consider sum of individual species (not total community) to predict biodiversity responses

- Predictive models are strong for common, terrestrial species

↓

Suitable to predict responses to development scenarios

BTO
Looking out for birds

BBS

Data = Breeding Bird Survey (BBS)

IN CONCLUSION

- Useful to incorporate quantitative predictions for birds into planning
- Lots of possibilities using BTO datasets
- Analyses (a) inform about factors driving bird counts (b) allow modelling of count responses at different scales
- **So far =** quantifying relationships between UK birds and urbanisation
- **Future =** predictive models to support decision-making
- Wildlife in new developments is up to us – we can design them as we wish…

BTO
Looking out for birds

THANK YOU TO:

BTO: Kate Plummer, Simon Gillings, Daria Dadam

Data providers: OS, CEH, Met Office

Funders: JNCC, NERC BESS, BTO *Beyond the Maps* appeal

BTO volunteers: The thousands of people who contribute data, making our work possible

Getting in touch…

gavin.siriwardena@bto.org

BTO Looking out for birds

JNCC Joint Nature Conservation Committee

Bird Atlas Beyond the maps

bess biodiversity & ecosystem service sustainability