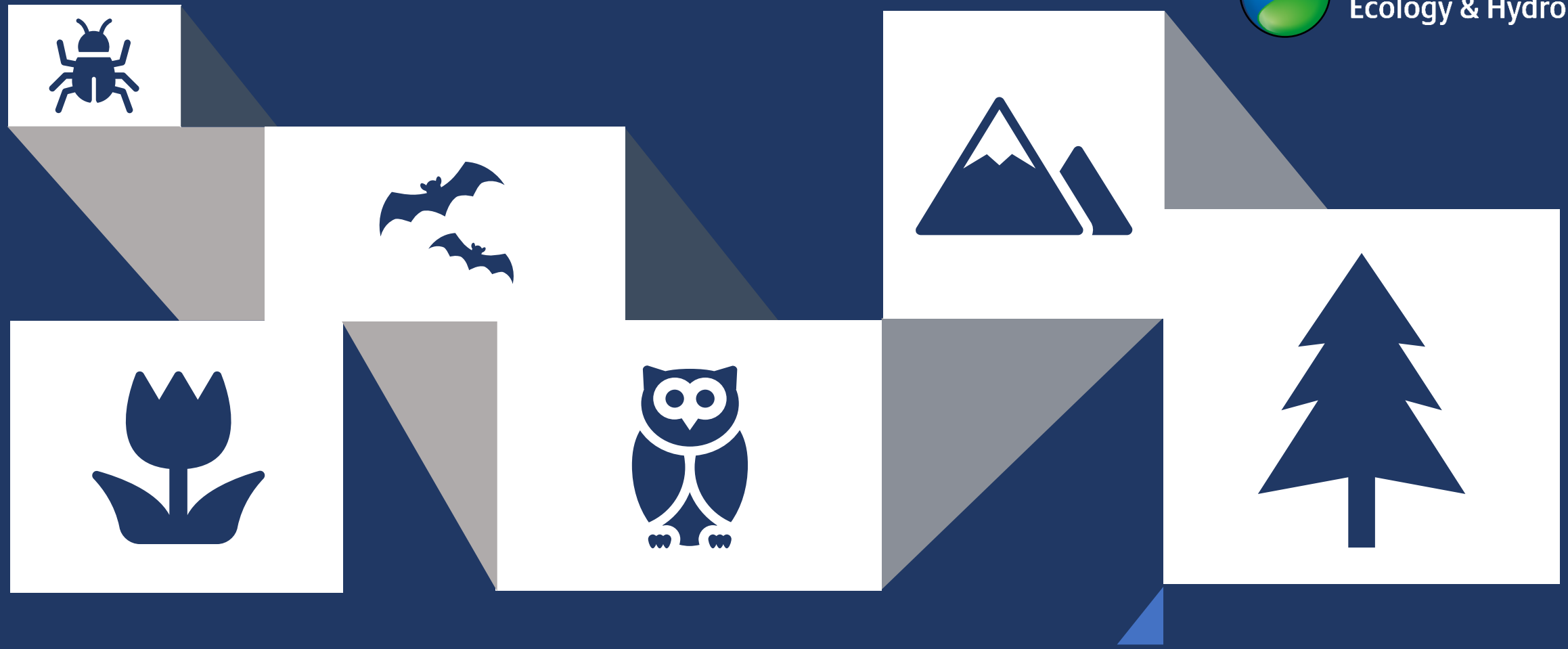


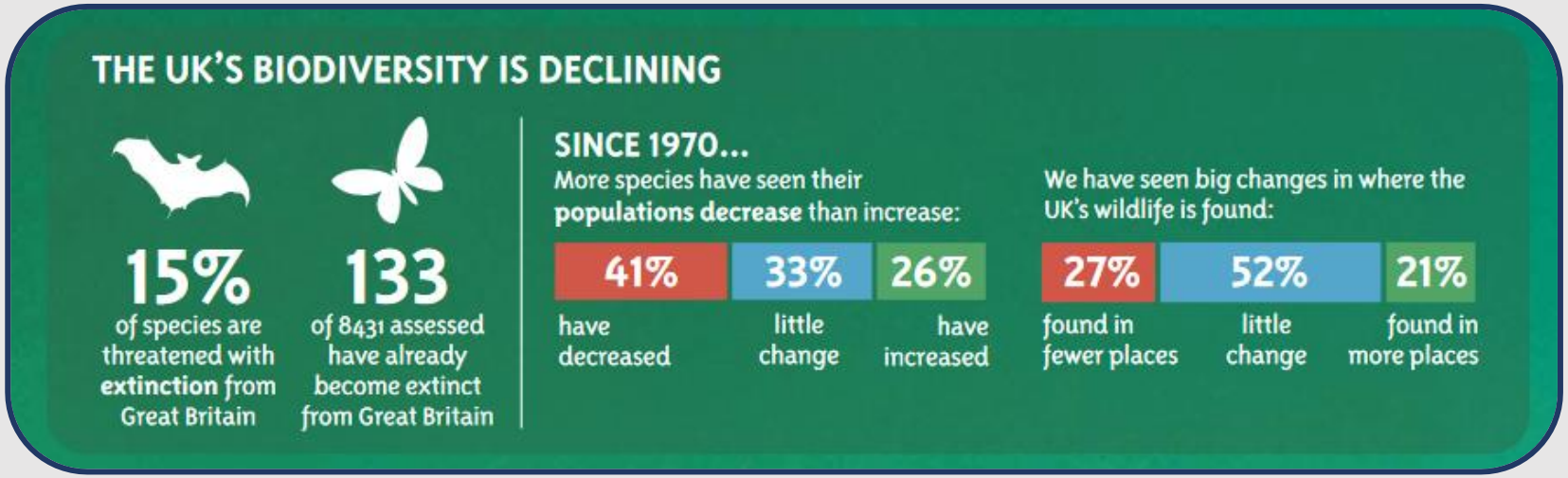
UK Centre for Ecology & Hydrology

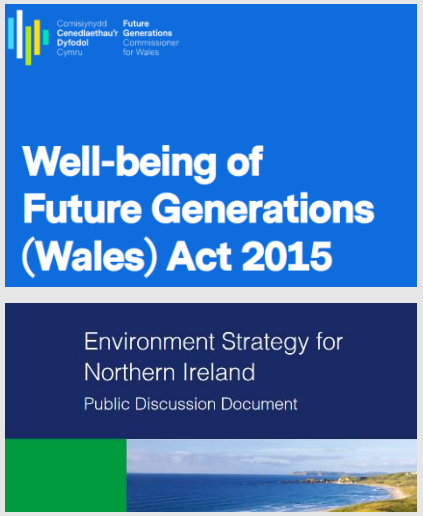
Bringing the data revolution to nature recovery

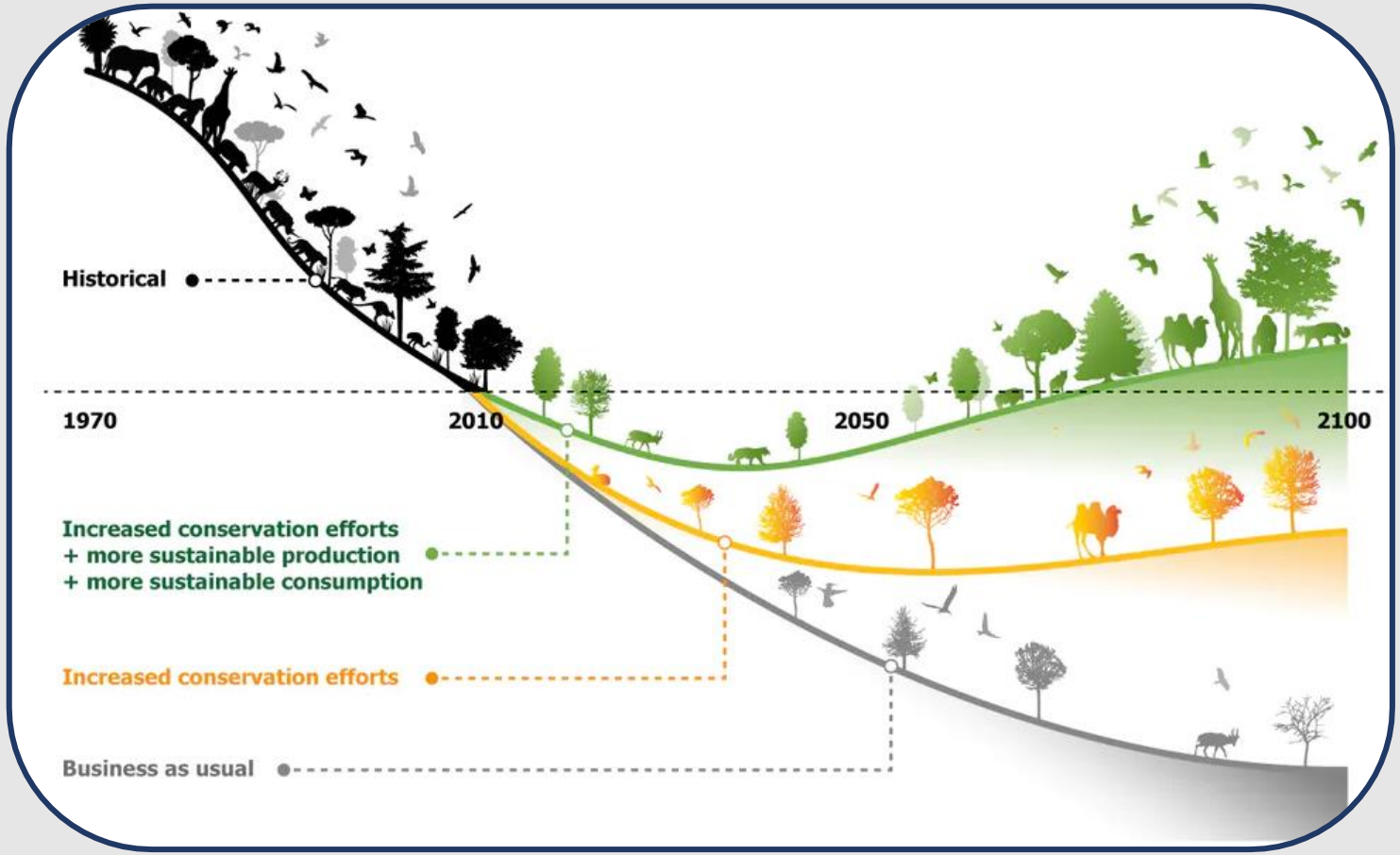
Francesca Mancini

framan@ceh.ac.uk
@Frances_Mancini

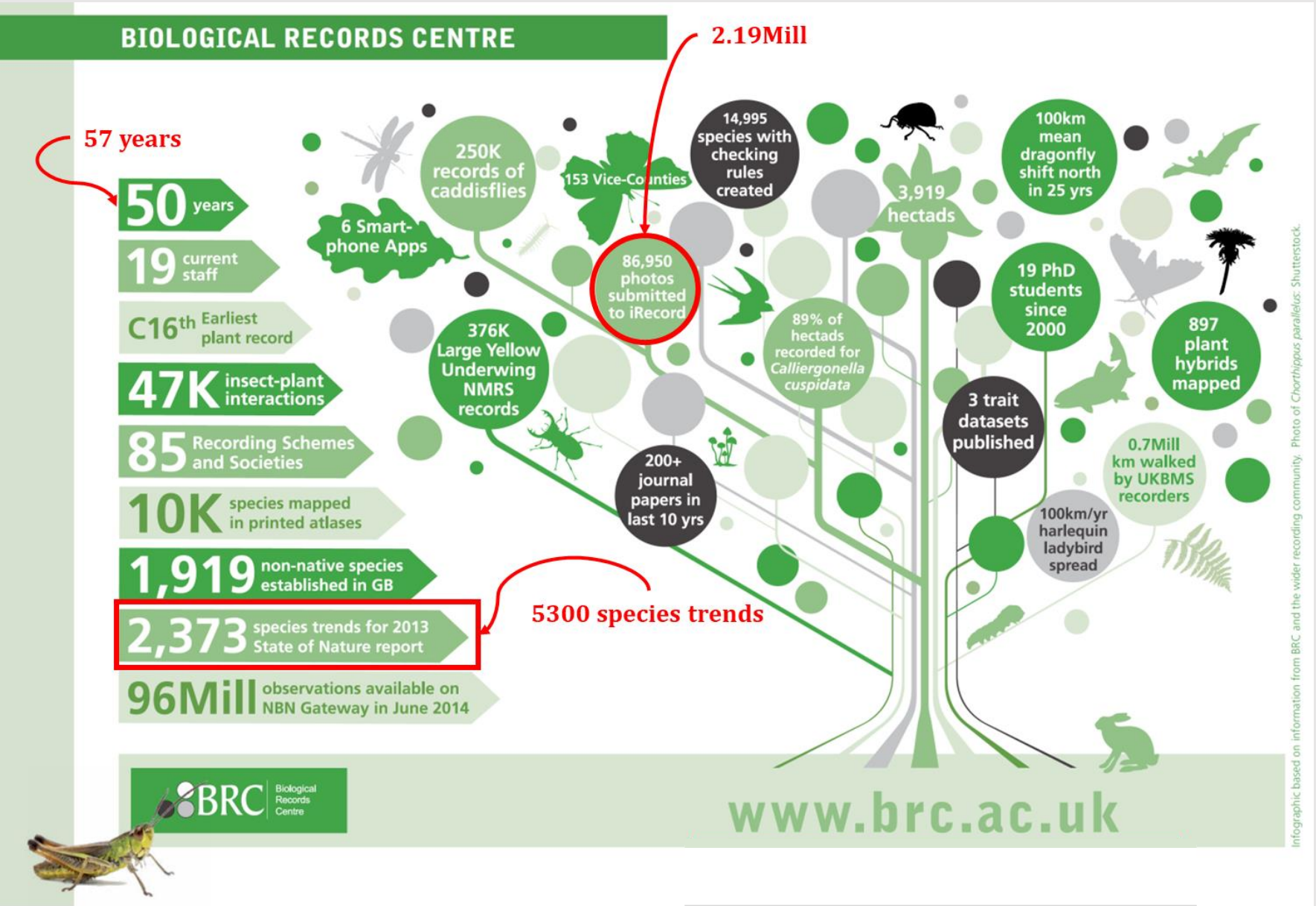
The biodiversity crisis







Monitoring biodiversity



- 85 national recording schemes/societies, mostly volunteer-led
  - Collate species records from multiple sources
- 8 structured monitoring schemes
  - Collect species records as part of defined monitoring protocols
- c. 120 distribution atlases published, covering over 10,000 species

Methodological advances

Methods in Ecology and Evolution

British Ecological Society

Methods in Ecology and Evolution 2014

doi: 10.1111/2041-210X.12254

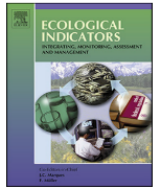
Statistics for citizen science: extracting signals of change from noisy ecological data

Nick J. B. Isaac[1]*, Arco J. van Strien[2], Tom A. August[1], Marnix P. de Zeeuw[2] and David B. Roy[1]

Contents lists available at ScienceDirect

Ecological Indicators

journal homepage: www.elsevier.com/locate/ecolind

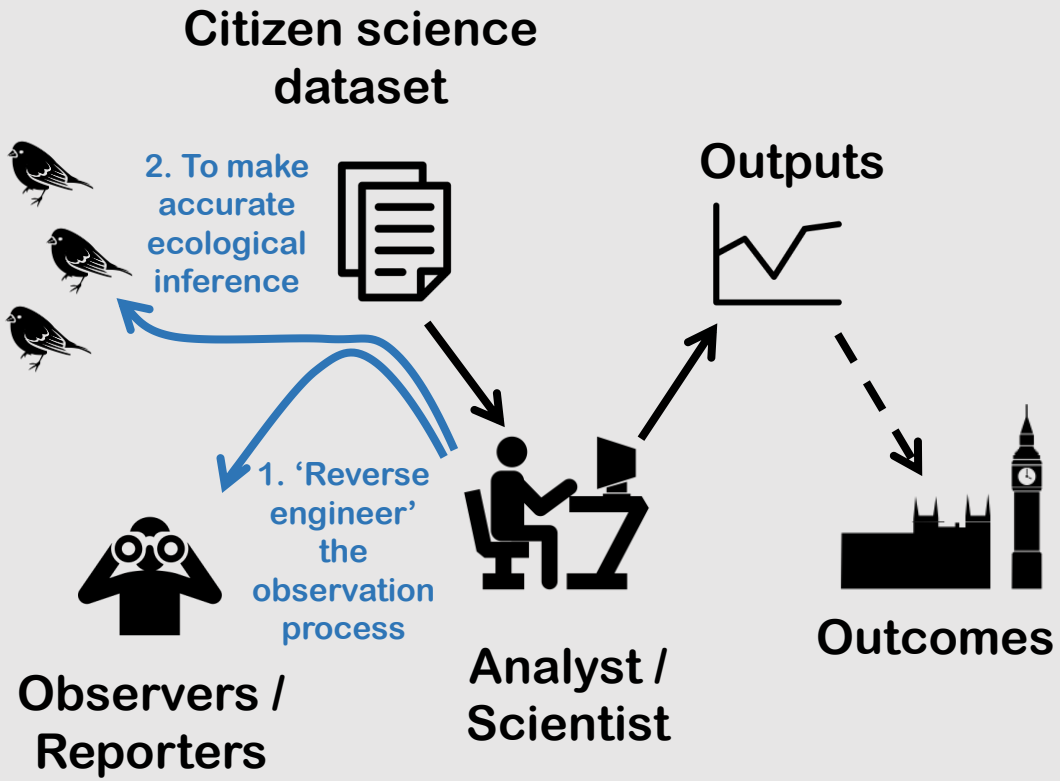


Original Articles

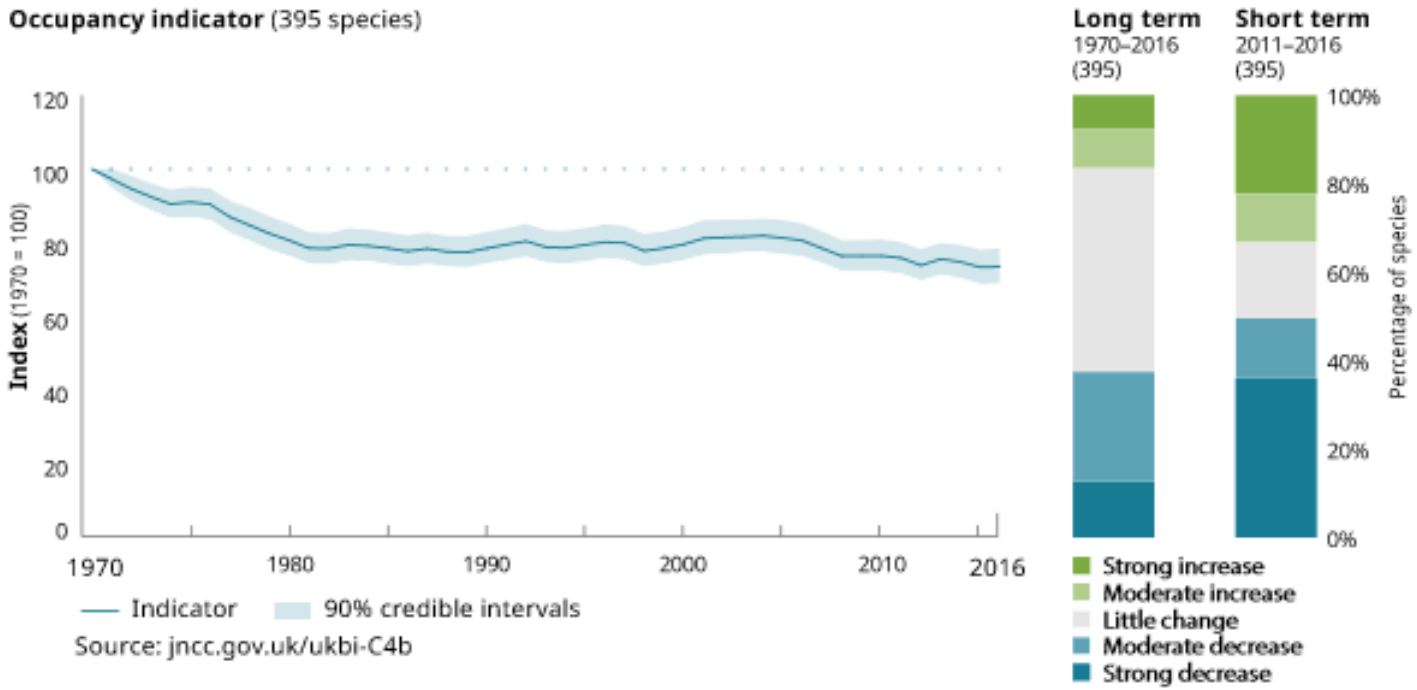
Prior specification in Bayesian occupancy modelling improves analysis of species occurrence data

Charlotte L. Outhwaite[a,b,c,*], Richard E. Chandler[d], Gary D. Powney[a], Ben Collen[b], Richard D. Gregory[b,c], Nick J.B. Isaac[a,b]

[a] *Centre for Ecology & Hydrology, Maclean Building, Benson Lane, Wallingford, Oxfordshire OX10 8BB, UK*
[b] *Centre for Biodiversity and Environment Research, University College London, Gower Street, London WC1E 6BT, UK*
[c] *RSPB Centre for Conservation Science, RSPB, The Lodge, Sandy, Bedfordshire SG19 2DL, UK*
[d] *Department of Statistical Science, University College London, Gower Street, London WC1E 6BT, UK*

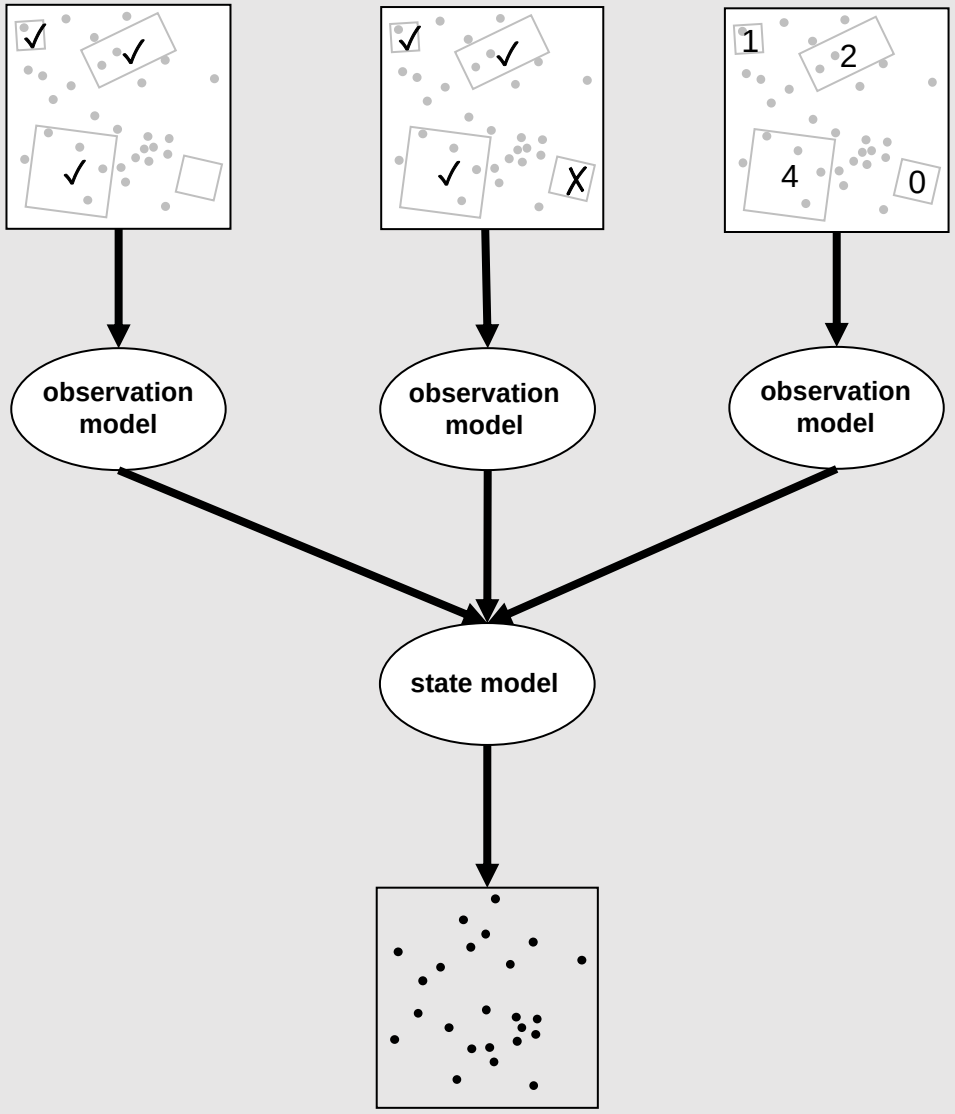


UK Biodiversity Indicator: Change in the distribution of UK priority species, 1970 to 2016



Source: jncc.gov.uk/ukbi-C4b

Methodological advances



Trends in Ecology & Evolution

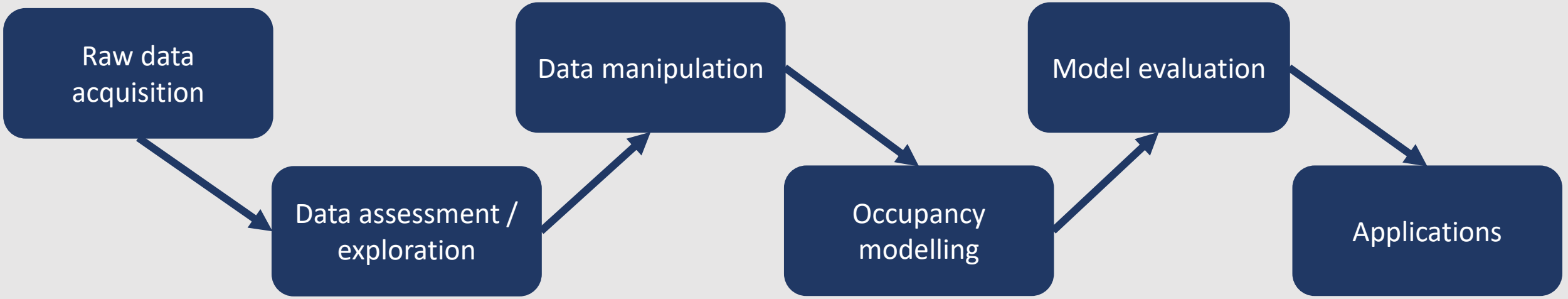
CellPress REVIEWS

Review

Data Integration for Large-Scale Models of Species Distributions

Nick J.B. Isaac,[1,2,*] Marta A. Jarzyna,[3] Petr Keil,[4,5] Lea I. Dambly,[1,2] Philipp H. Boersch-Supan,[6,7] Ella Browning,[2,8] Stephen N. Freeman,[1] Nick Golding,[9] Gurutzeta Guillera-Arroita,[9] Peter A. Henrys,[10] Susan Jarvis,[10] José Lahoz-Monfort,[9] Jörn Pagel,[11] Oliver L. Pescott,[1] Reto Schmucki,[1] Emily G. Simmonds,[12] and Robert B. O'Hara[12]

Outputs – Workflow, Software and Products



Software

SPARTA

OccAssess

BRCindicators

wrappeR

Products

SCIENTIFIC DATA

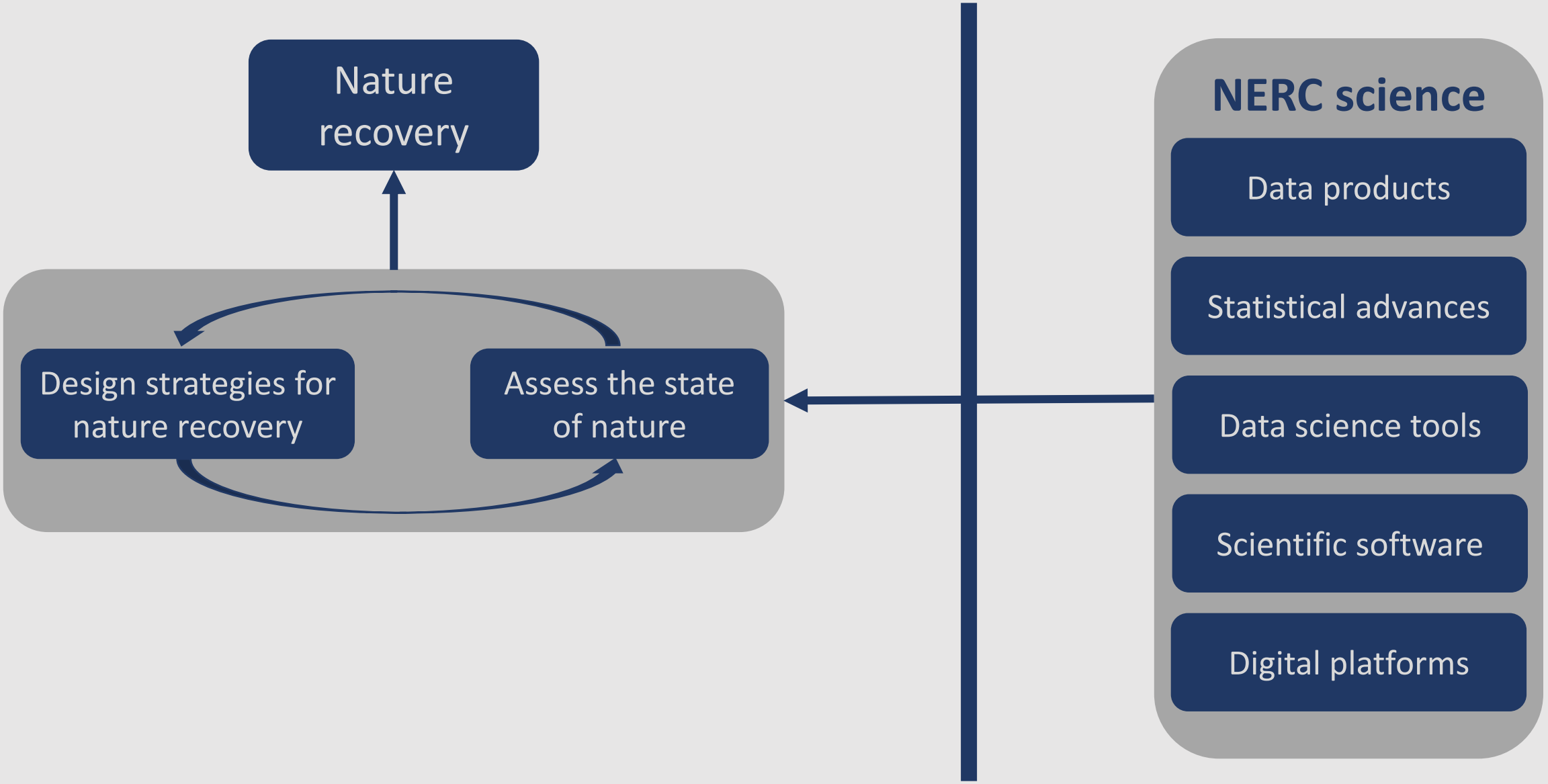
OPEN

DATA DESCRIPTOR

Annual estimates of occupancy for bryophytes, lichens and invertebrates in the UK, 1970–2015

Charlotte L. Outhwaite *et al.*#

The need for Knowledge Exchange




data
species
local
monitoring
different
people
nature
recording
biodiversity
national
might
useful
trends
something
quite
public
challenges
facilitator
definitely
organisation
audience
inaudible
records
time
use
able
structured
outputs
important
reporting
produce
indicators
particular
report
recorded
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lnrs
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terms
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datasets
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trend
good
summary
habitat
evidence
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recovery
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countryside
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perspective
analysis
mapping
interventions
classifications
environmental
understanding
managers
calculations
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digital
across
priority
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databases
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review
maybe
helpful
state
ecosystem
variability
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interested
obviously
everything
indicator
structure
quality
uncertainty
verified
future
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including
target
inform
expertise
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maps
decision
understood
using
difficult
support
strategies
nonacademics
thoughts
particularly
functionality
specific
within
bng
bad
issue
errors
limited
general
conservation
backlog
regional
engagement
around
bearing
trying
checks
saying
regard
analyse
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metrics
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name
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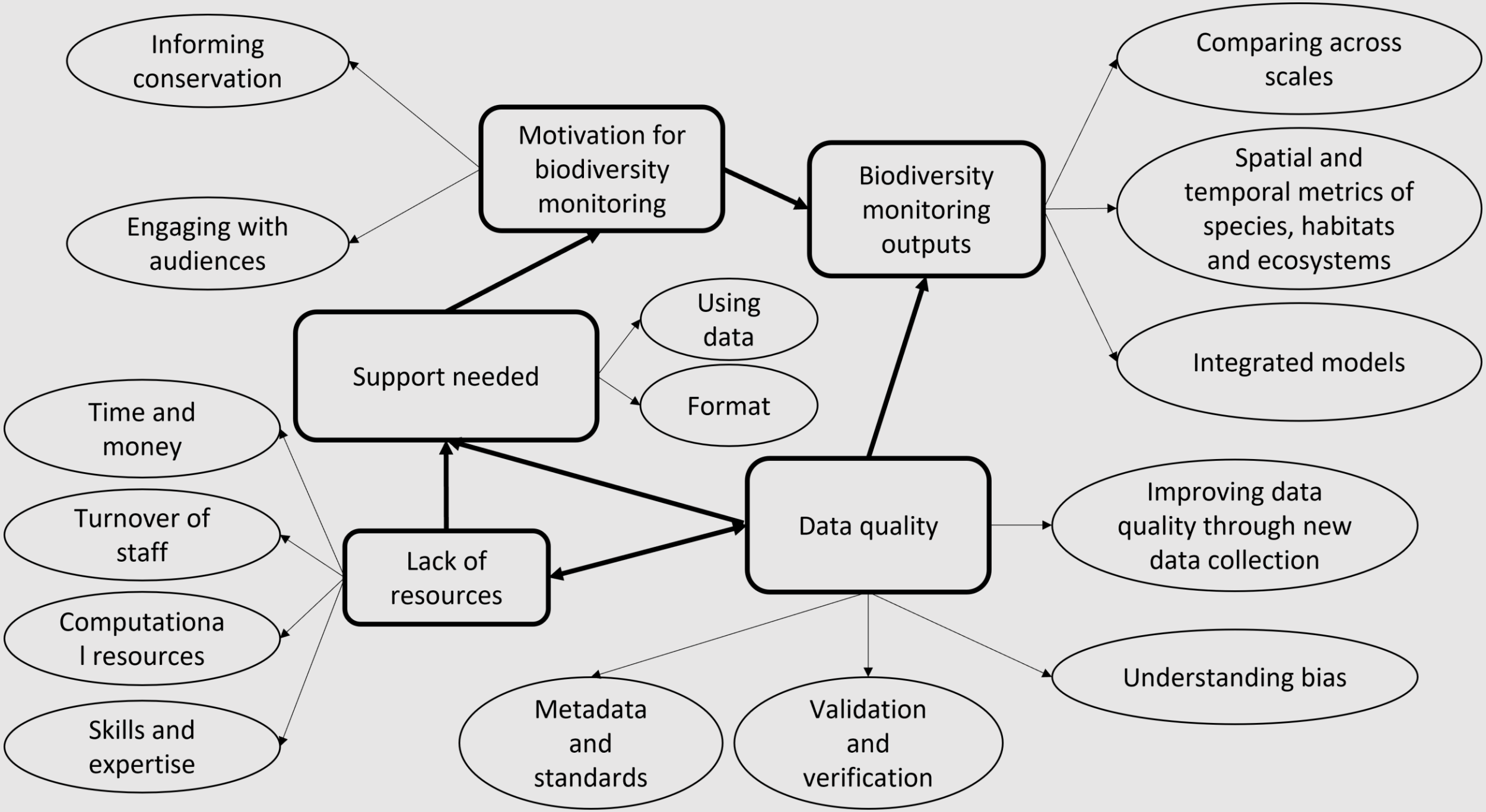
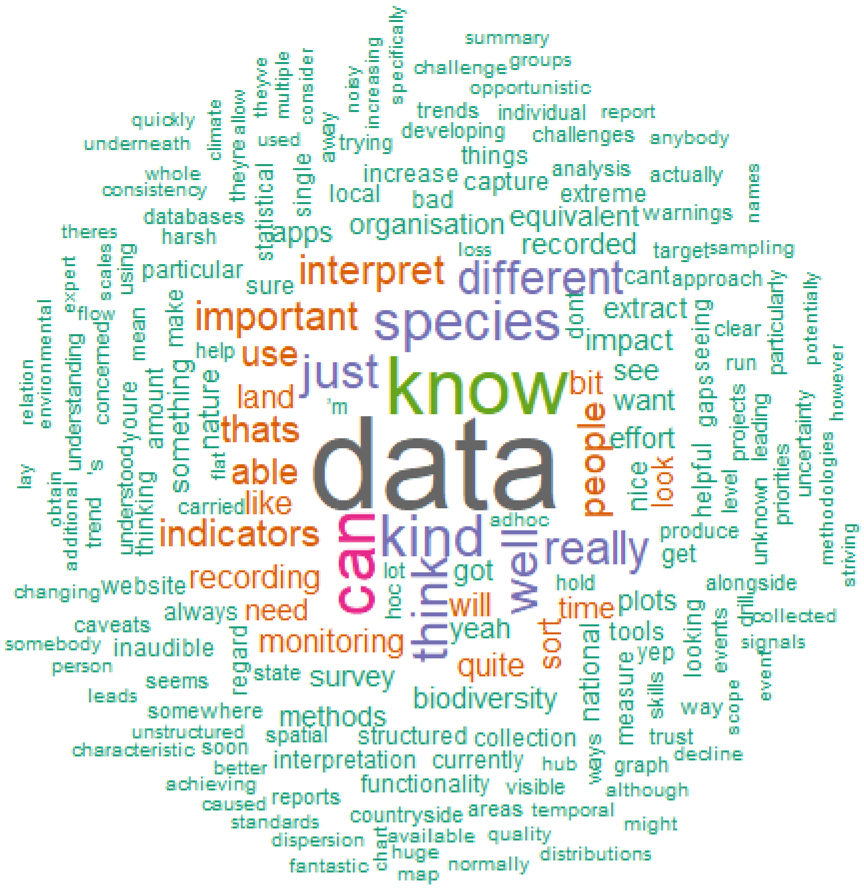
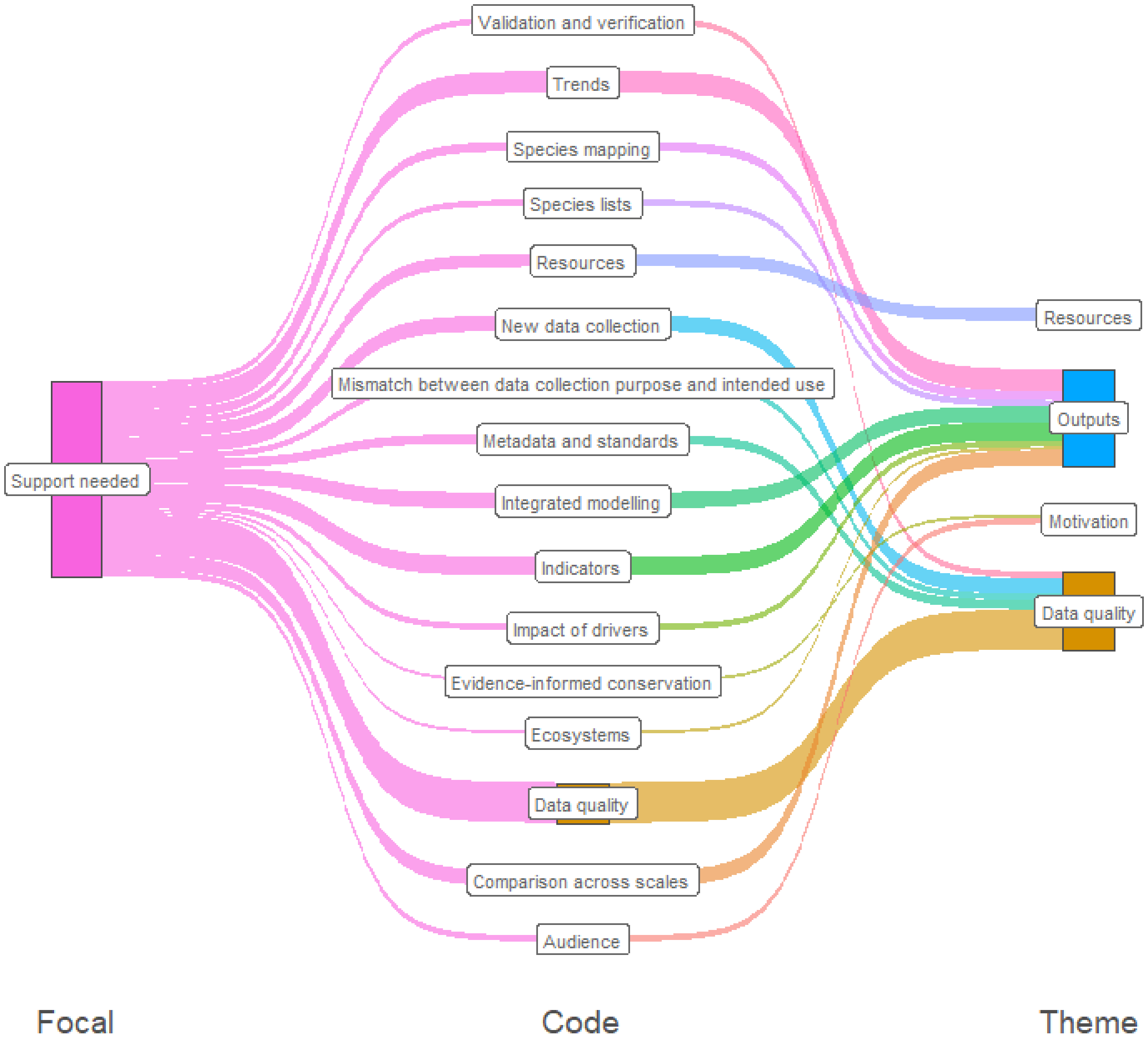
reliable
form
place
lerc
add
trust
present
needed
worked
counties
accuracy
organizations
equivalent
proposed
taxon
large
purpose
consistency
interpretation
ecology
graphs
starting
similar
plants
producing
thought
however
habitats
theres
although
feedback
alongside
record
easier
keep
discussion
difference
ideally
taxa
nice
country
obvious
previously
boundaries
threatened
increasing
basically
development
upload
partnerships
priorities
tweaked
unknown
aspiration
volunteers
achieving
website
locations
comparison
contact
organisations
statistical
graph
follow
collection
resources
reports
partners
freshwater
understand
output
currently
interest
grid
facing
unverified
importance
together
temporal
plots
mentioned
comparing
context
compare
challenge
quantity
internal
collected
based
verification
sources
hoc
run
gain
loss
small
case
put
link
show
least
part
even
action
still
flow
stuff
type
youre

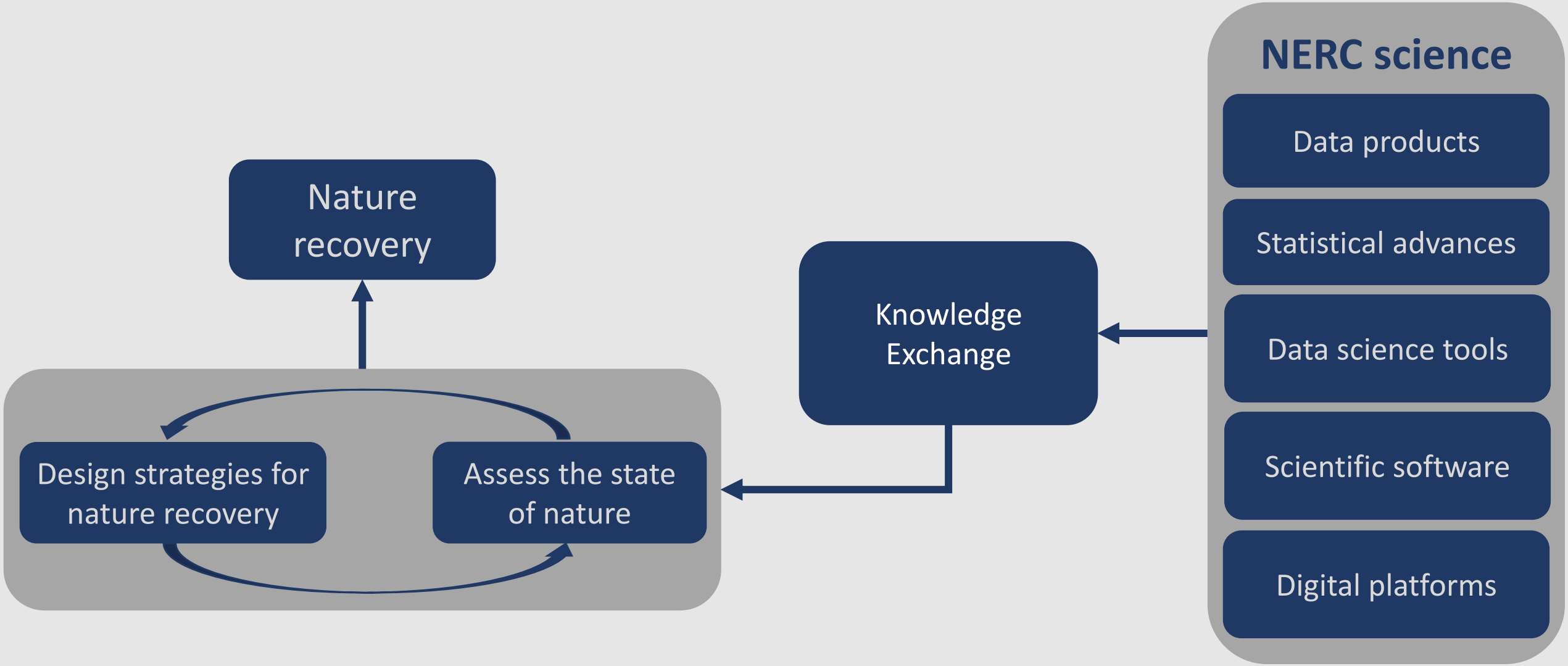

Informing conservation
Engaging with audiences
Motivation for biodiversity monitoring
Biodiversity monitoring outputs
Comparing across scales
Spatial and temporal metrics of species, habitats and ecosystems
Integrated models
Support needed
Using data
Format
Time and money
Turnover of staff
Computational resources
Skills and expertise
Lack of resources
Data quality
Improving data quality through new data collection
Understanding bias
Metadata and standards
Validation and verification

Support needed

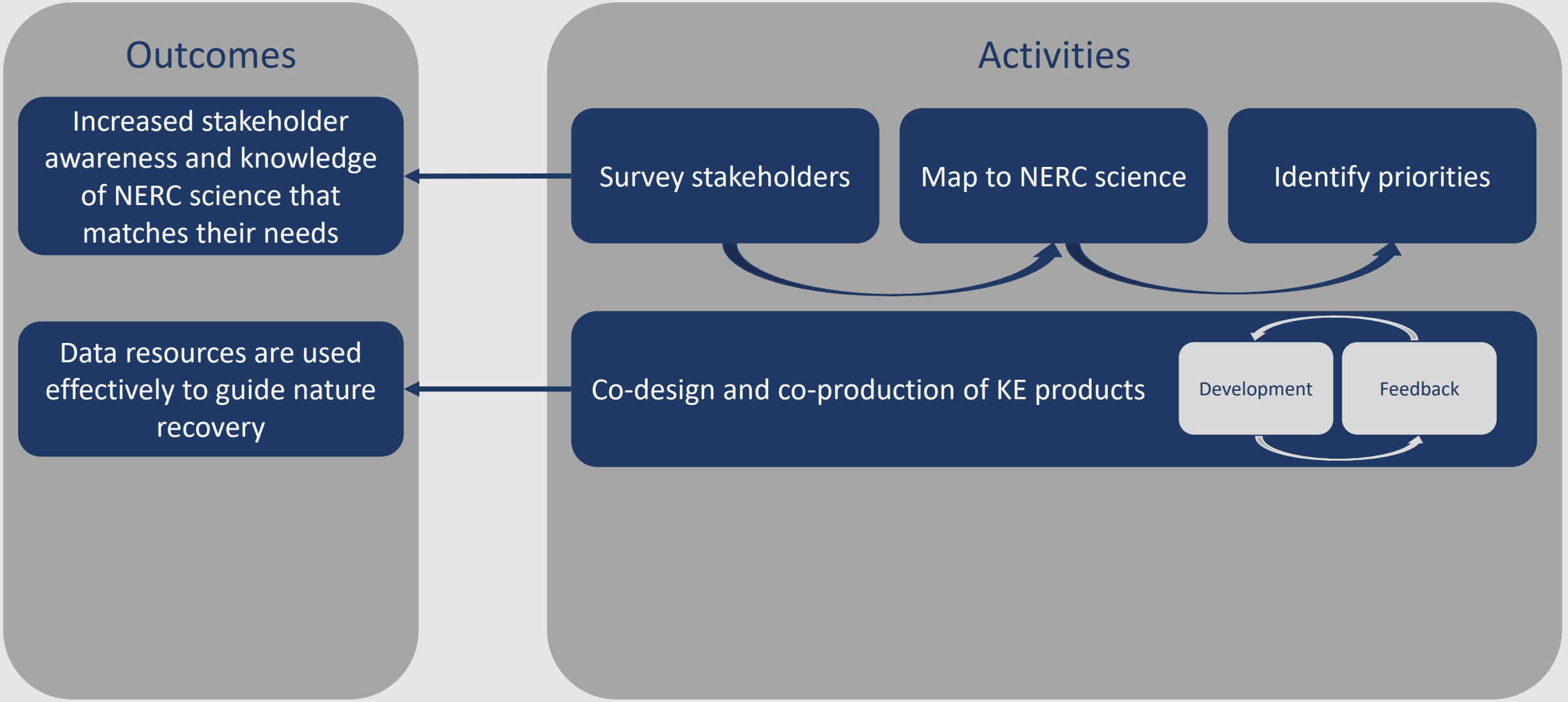




Closing the gap



Co-designing the fellowship



Co-designing the fellowship

sparta.ipynb

Status and trend summary

Broad taxonomic group

Bee

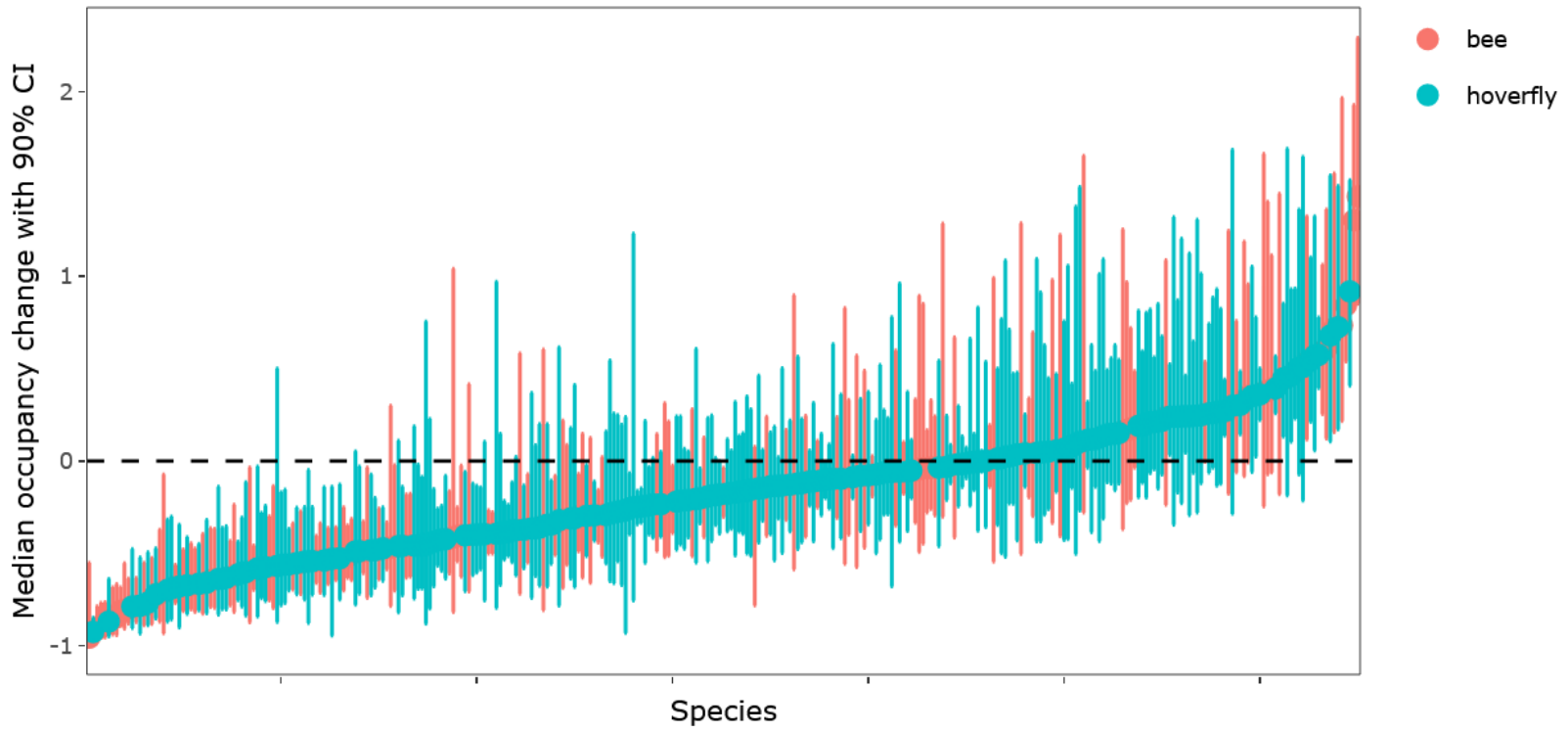
Species

BOMBUS pascuorum

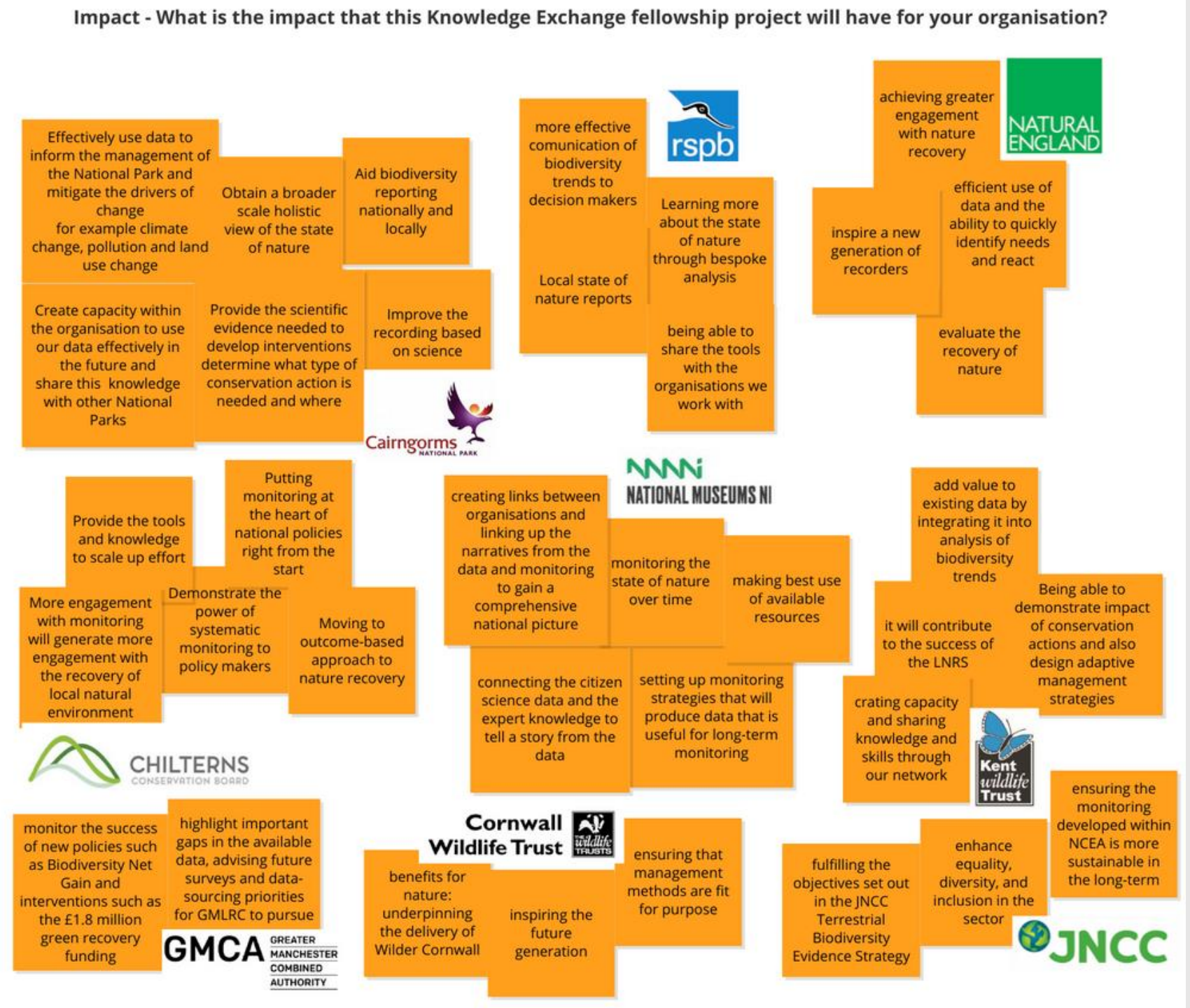
Currently under development, SDM tab will not display for hoverflies.

PLOT | TREND | SDM

Interactive plot showing proportional change in occupancy between 1980 and 2014.
Uncertainty represented as the upper and lower 90% CI.



4	z	A28	1959-01-16



The impact

Effectively use data to inform the management of the National Park and mitigate the drivers of change for example climate change, pollution and land use change

Cairngorms NATIONAL PARK

crating capacity and sharing knowledge and skills through our network

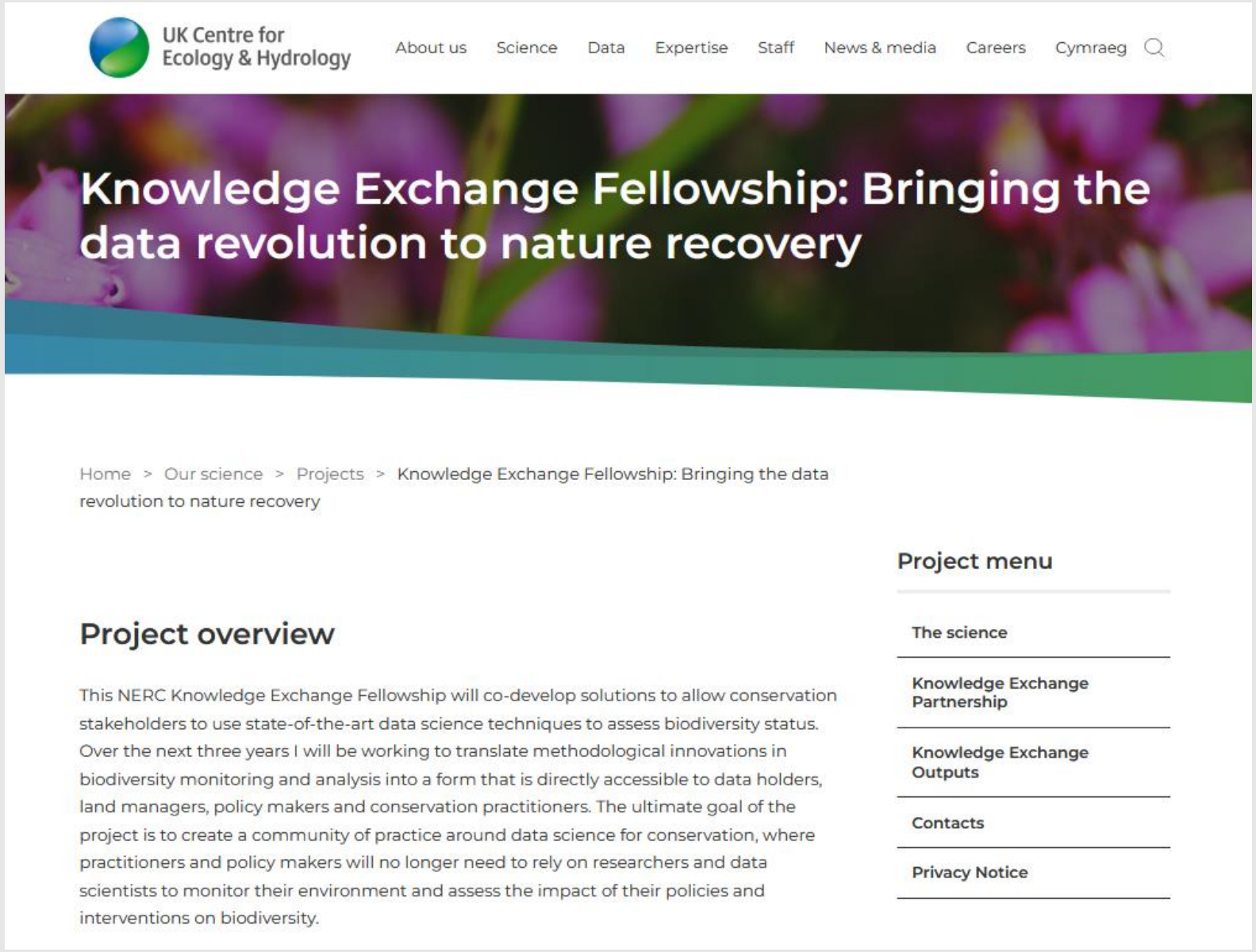
Kent wildlife Trust

more effective comunication of biodiversity trends to decision makers

rspb

inspiring the future generation

Cornwall Wildlife Trust



https://www.ceh.ac.uk/our-science/projects/knowledge-exchange

Acknowledgements

NERC

All recording societies and volunteer recorders

All the partner organisations in the Knowledge Exchange Fellowship

All of you for listening

framan@ceh.ac.uk
@Frances_Mancini

UK Centre for Ecology & Hydrology

BRC Biological Records Centre

UKRI Natural Environment Research Council