

The RSPB's vision for offshore wind –

Challenges and opportunities

Aedán Smith

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“This group of self-serving and ill-informed individuals fought us harder than any other group.”



★ ★ ★ ★ ★
TRUMP





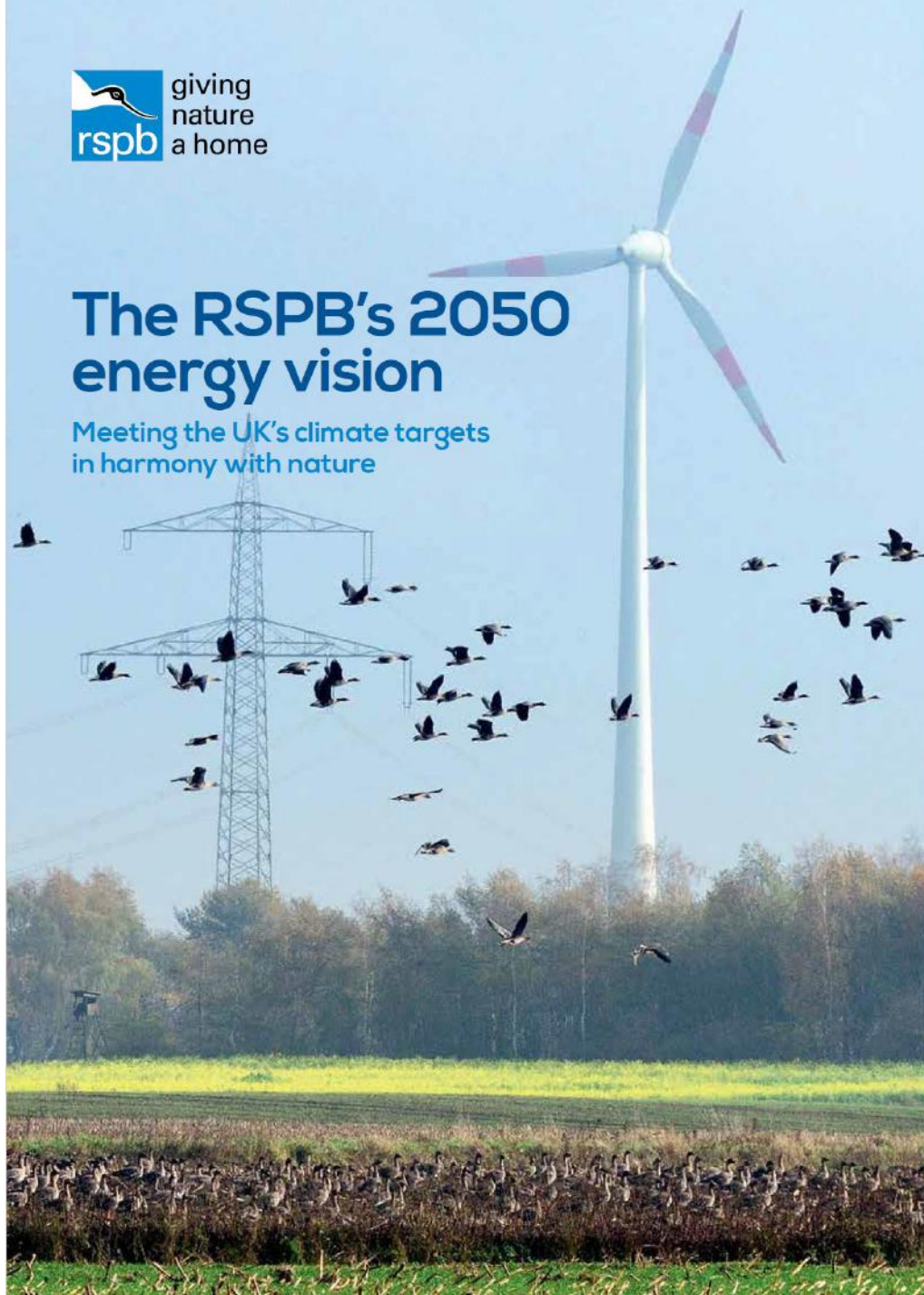






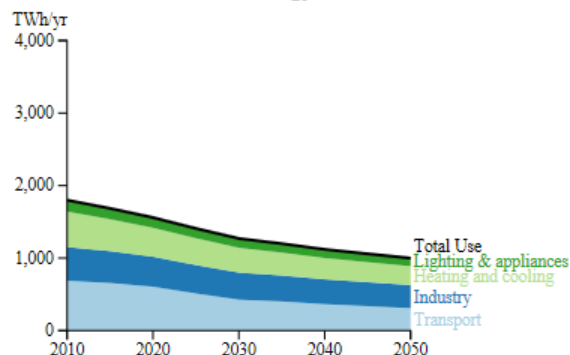
The RSPB's 2050 energy vision

Meeting the UK's climate targets
in harmony with nature



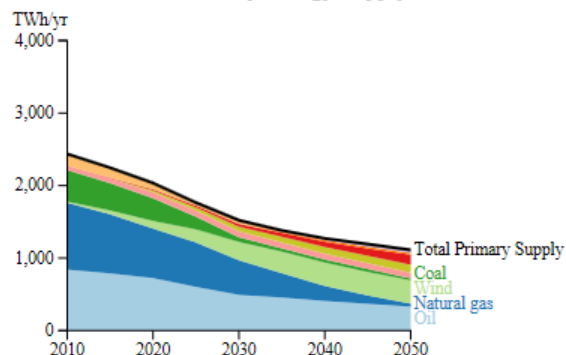
DECC 2050 Pathways Calculator

Final Energy Demand



Domestic transport behaviour	i	1	2	3	4
Shift to zero emission transport	i	1	2	3	4
Choice of fuel cells or batteries	i	1	2	3	4
Domestic freight	i	1	2	3	4
International aviation	i	1	2	3	4
International shipping	i	1	2	3	4
Average temperature of homes	i	1	2	3	4
Home insulation	i	1	2	3	4
Home heating electrification	i	A	B	C	D
Home heating that isn't electric	i	A	B	C	D
Home lighting & appliances	i	1	2	3	4
Electrification of home cooking	i	A	B		
Growth in industry	i	A	B	C	
Energy intensity of industry	i	1	2	3	
Commercial demand for heating and cooling	i	1	2	3	4
Commercial heating electrification	i	A	B	C	D
Commercial heating that isn't electric	i	A	B	C	D
Commercial lighting & appliances	i	1	2	3	4
Electrification of commercial cooking	i	A	B		

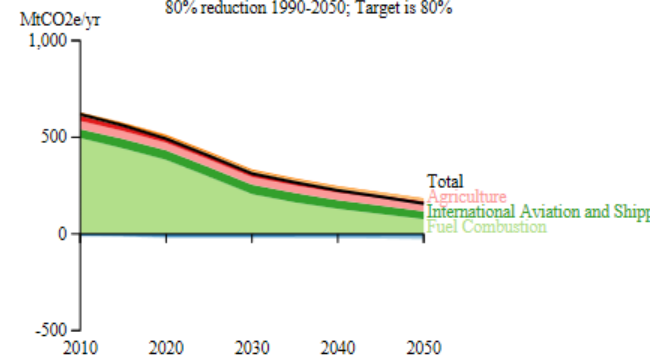
Primary Energy Supply



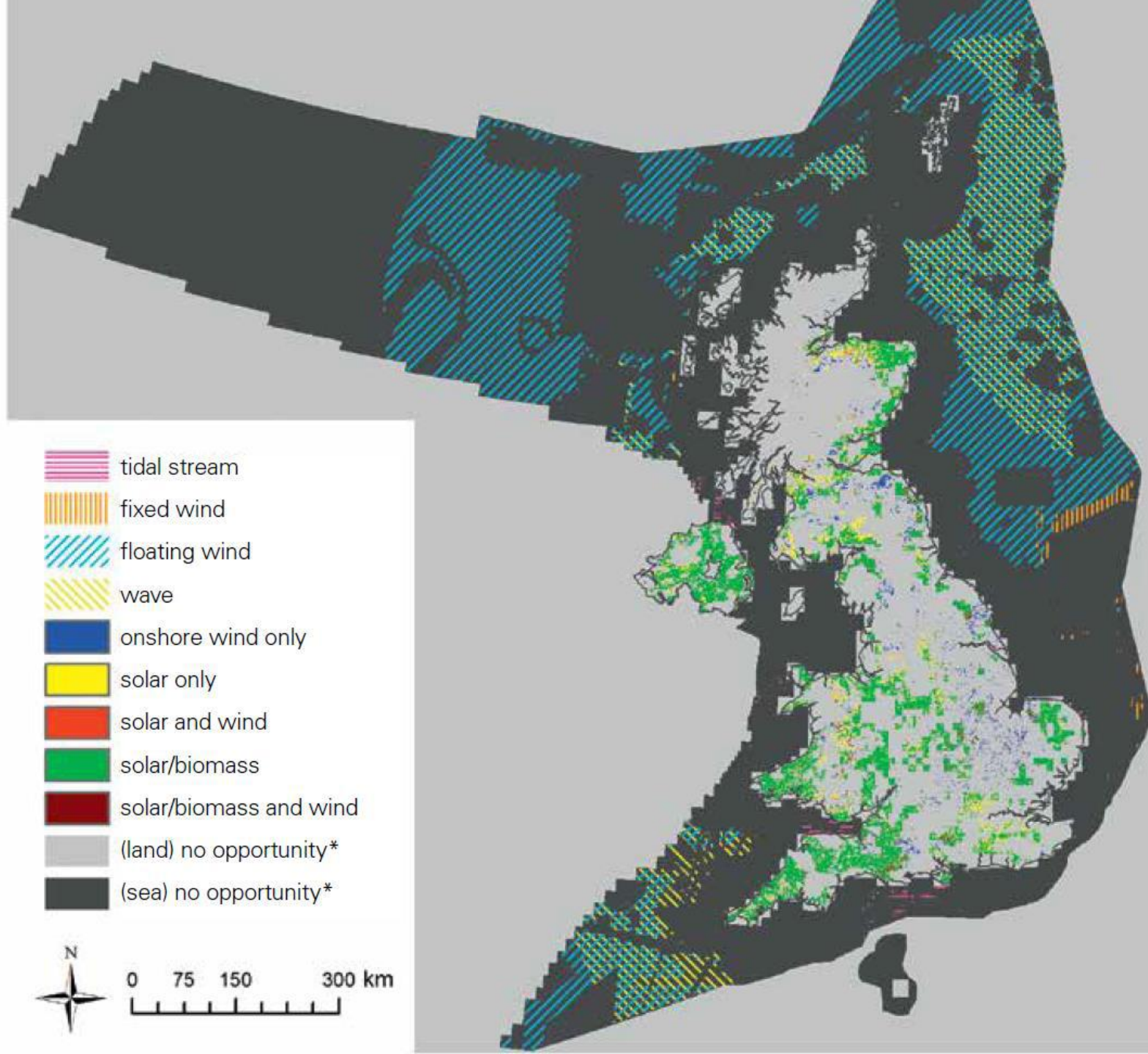
Nuclear power stations	i	1	2	3	4
CCS power stations	i	1	2	3	4
CCS power station fuel mix	i	A	B	C	D
Offshore wind	i	1	2	3	4
Onshore wind	i	1	2	3	4
Wave	i	1	2	2.3	4
Tidal Stream	i	1	1.3	3	4
Tidal Range	i	1	1.6	3	4
Biomass power stations	i	1	2	3	4
Solar panels for electricity	i	1	2	3	4
Solar panels for hot water	i	1	2	3	4
Geothermal electricity	i	1	2	3	4
Hydroelectric power stations	i	1	2	3	4
Small-scale wind	i	1	1.5	3	4
Electricity imports	i	1	2	3	4
Land dedicated to bioenergy	i	1	2	3	4
Livestock and their management	i	1	2	3	4
Volume of waste and recycling	i	A	B	C	D
Marine algae	i	1	2	3	4
Type of fuels from biomass	i	A	B	C	D
Bioenergy imports	i	1	2	3	4

Greenhouse Gas Emissions

80% reduction 1990-2050; Target is 80%



Geosequestration	i	1	2	3	4
Storage, demand shifting & interconnection	i	1	2	3	4



Spatial analysis for offshore technologies

- Fixed wind turbines
- Floating wind turbines
- Wave energy
- Tidal stream



- Crown Estate Marine Resources System (MaRS)

Offshore opportunity mapping

Fixed Wind

Water depth (<60 m)

Wind speed
(>8 m/s annual
average)

Distance to ports and
substations (m)

Distance to coastline

Wave height (yearly
average)

Floating Wind

Water depth (>60 m
minimum)

Wind speed
(>8 m/s annual
average)

Distance to ports and
substations (m)

Distance to coastline

Wave height (yearly
average)

Tidal Stream

Water depth (>5 m
minimum)

Tidal power
(>1.5 m/s mean spring
peak current)

Distance to ports and
substations (m)

Seabed slope

Wave height (yearly
average)

Wave Power

Water depth (10 - 200
m)

Wave power density
(>20 kW/m mean
annual power)

Distance to ports and
substations (m)

Seabed habitat score

Wave height (yearly
average)

These criteria are used by The Crown Estate in their resource assessment procedures.

Offshore opportunity mapping

- **Prime opportunity:** deployment likely to deliver lower/optimal cost of energy
- **Good opportunity:** deployment likely to be commercially viable in line with predicted market conditions
- **Technical opportunity:** appropriate physical conditions exist to support the deployment of devices

Offshore physical constraints:

Constraint	Buffer	Technology type	Data Provider
Active Cables ¹	500m	All	Kingfisher Information Service
Pipelines ¹	500m	All	The Crown Estate, UK DEAL
Anchorage Areas ¹	None	All	SeaZone
Disposal sites ¹	None	All	CEFAS
Dredging Applications and licences ¹	None	All	The Crown Estate
Gas Storage Leases ¹	None	All	The Crown Estate
Offshore helicopter platform safety zones ¹	3 NM ²	All	The Crown Estate
IMO shipping routes	None	All	Anatec
Meteorological Equipment ¹	500m	All	The Crown Estate, UK Hydrographic Office
Munition dumps	None	All	Royal Haskoning
Munitions disposal sites	None	All	Marine Management Organisation (MMO)

Offshore policy constraints:

Constraint	Level 1 (Low)	Level 2 (Medium)	Level 3 (High)	Technology Type	Data Source
AONBs	Y	Y	Y	All	CCW, Natural England, NIEA
Bivalve Harvest areas	N	N	Y	All	CEFAS
Fishery Orders	N	N	Y	All	The Crown Estate
Helicopter safety zones ¹	3-4nm	3-5nm	3-6nm	All	The Crown Estate
Heritage Coast	Y	Y	Y	All	CCW, Natural England
Inshore shipping zones	N	N	Inshore	All	SeaZone
MoD Practice and Exercise Areas (PEXA)	N	N	Y	All	SeaZone
National Parks	Y	Y	Y	All	CCW, Natural England, Scottish Natural Heritage

Offshore Sensitivity mapping methods - Sites

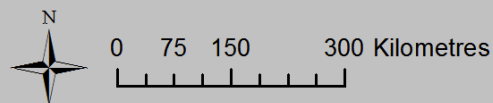
Site Type	Sensitivity
SPAs	high
SACs (including draft, possible and candidate)	high
Ramsar sites	high
IBAs	high
Marine Conservation Zones	high
Proposed Marine Protected Areas	high
Marine Nature Reserves	high
Possible marine SPAs for seabirds	high
SSSIs	medium
NNRs	medium

Offshore Sensitivity mapping methods - Seabirds

- Colony data from seabird 2000 census
- Buffered each colony by mean max foraging range
- Calculated area of sea within each buffer
- Calculated average density of birds assuming uniform distribution of birds within buffer
- Supplemented this approach with wintering seabird and marine megafauna data

Results: fixed offshore wind

4-21 GW at low
ecological risk



Floating wind

730 – 1236
GW at low
ecological risk

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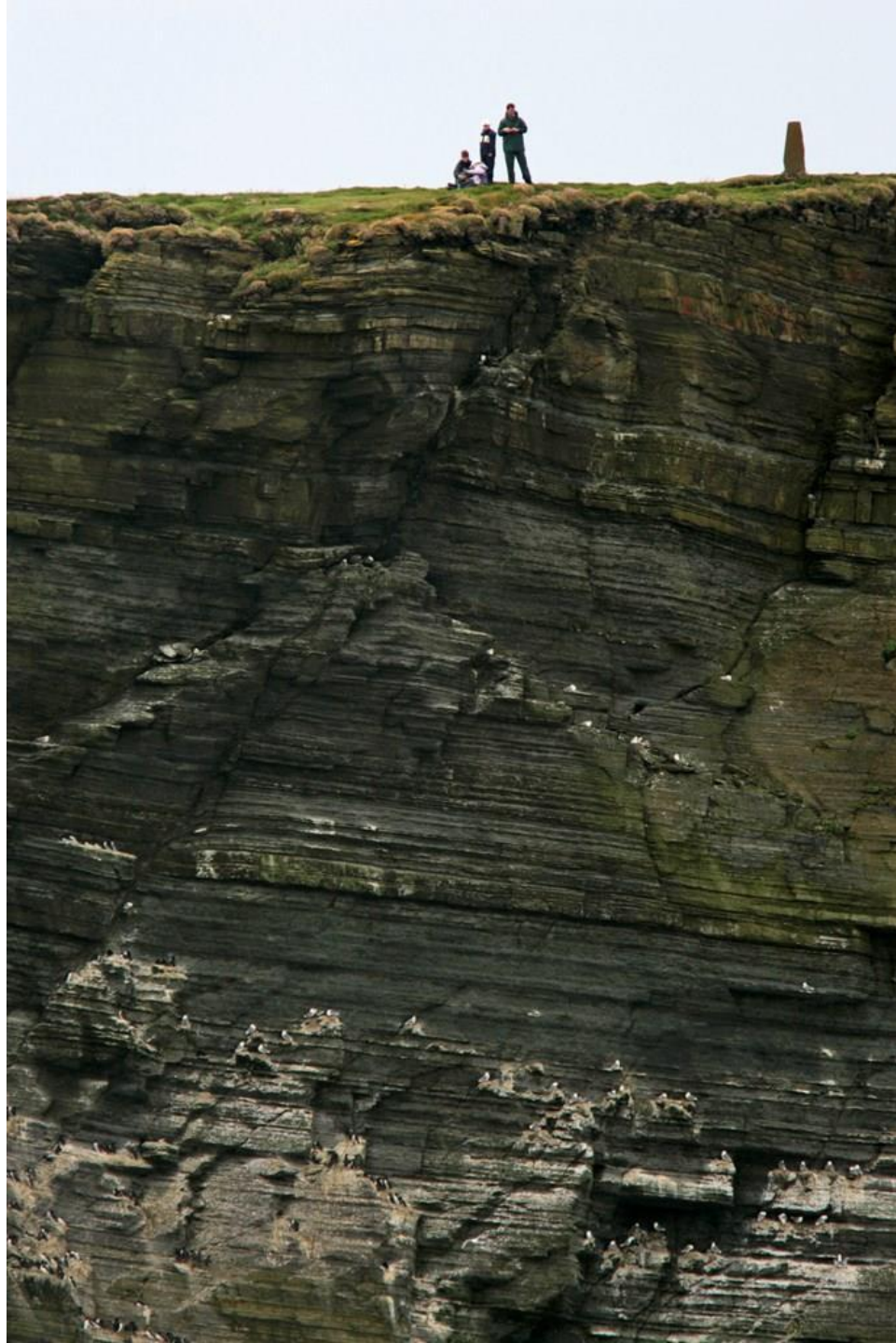
53 GW in prime
opp



0 75 150 300 Kilometres



Floating offshore wind turbines (pictured) could unlock significant renewable energy capacity in the UK with low ecological risk, but research is needed to better understand impacts and identify appropriate sites.





giving
nature
a home

The RSPB is the country's largest nature conservation charity, inspiring everyone to give nature a home. Together with our partners, we protect threatened birds and wildlife so our towns and countryside will teem with life once more.

The RSPB is part of BirdLife International,
a partnership of nature conservation
organisations working to give nature a
home around the world.

