Rapid Response and Long-Term Monitoring for Marine Birds – The Role of Science

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JNCC

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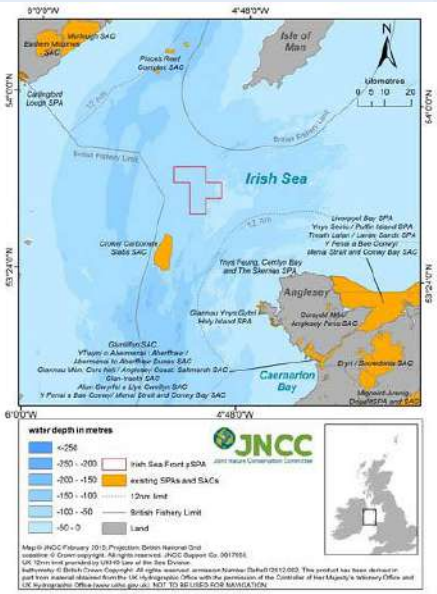
JNCC role in event of incident

- JNCC advises the UK Government on nature conservation
- JNCC Duty Officers, on-call 24/7
- Core members of the Environment Group
- Support from range of specialists: benthic, mammal, bird
- Core members of SERG and PREMIAM

What JNCC do



Marine Monitoring

Marine Mammal Advice

GIS Mapping

SOSI

Environment Group

MPA Advice

Bird Advice

Ongoing Experience

Benthic Advice

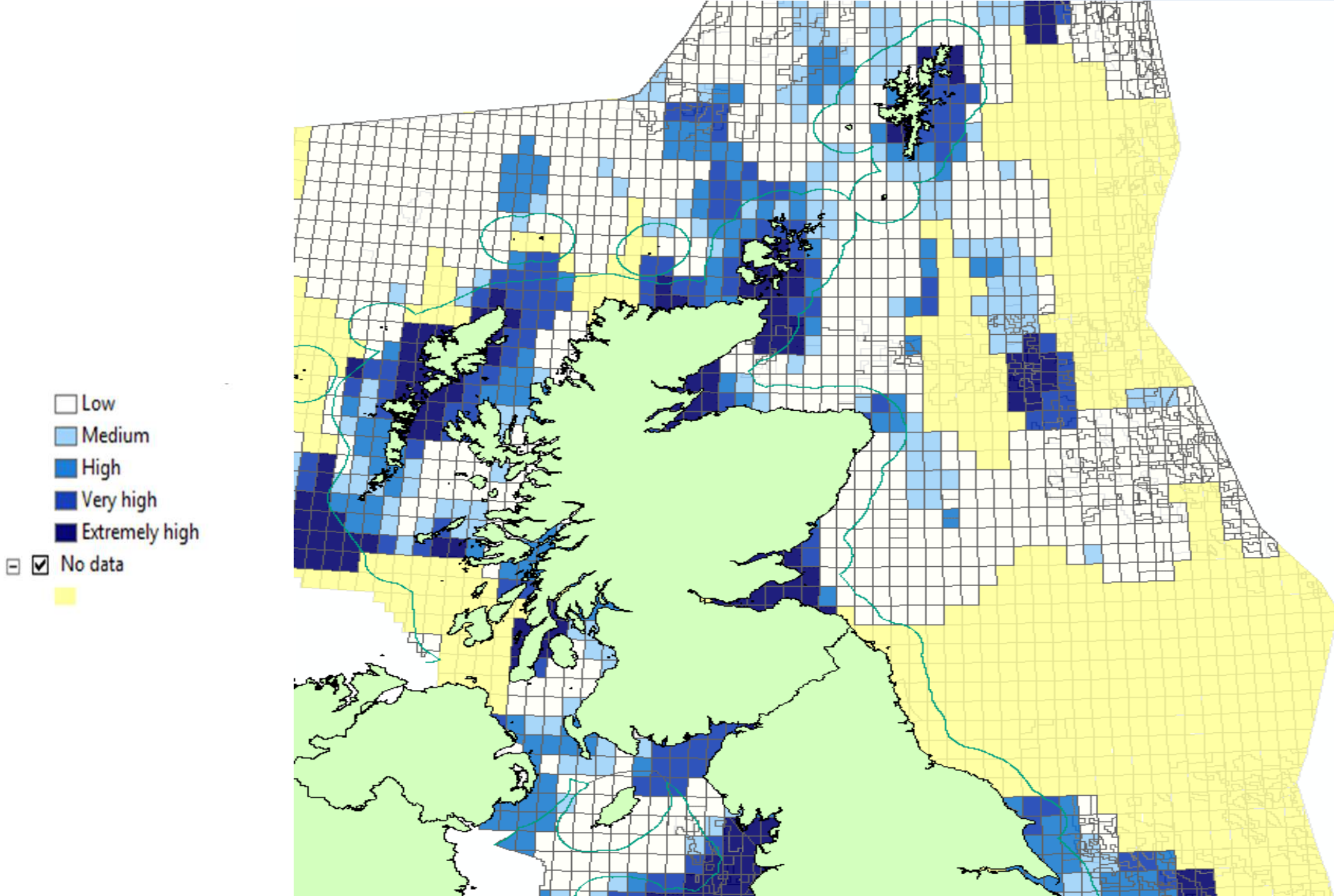
JNCC

Effects of oil on environment

- The impacts to wildlife from an oil spill are caused by:
  - The physical nature of the oil
  - The chemical components
- Different oils behave differently in the environment
- Seabirds are particularly vulnerable to contamination and related impacts

Effects of oil on marine birds

- Loss of buoyancy
- Unable to fly/swim
- Dehydration and starvation
- Loss of body weight and general condition
- Toxicology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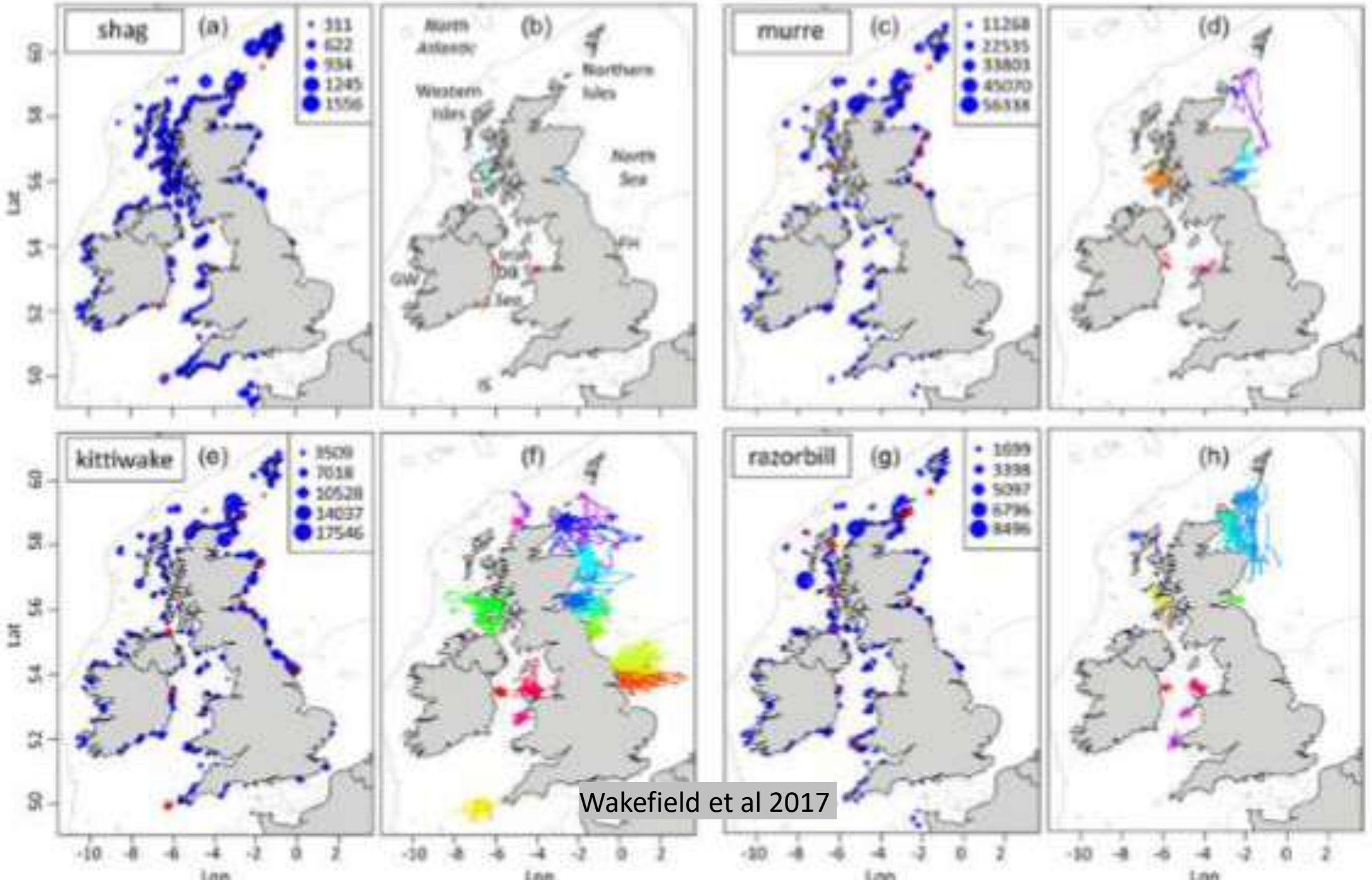

Wakefield et al 2017

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Post-spill Monitoring

What is the objective of monitoring?

- to assess the impact on species/habitats of nature conservation importance
- to provide evidence to support subsequent compensation or insurance claims
- assess the impact of the pollution events on Good Environmental Status (GES)

Difficult to prove causal link

Layers of evidence; build up a story?

Short-term monitoring

Immediate effects

- beached birds surveys
- toxicology
- outward signs of contamination
- chemical composition analysis (identify source of contamination)
- at-sea survey recording evidence of oiling

Limitations

- direct effects only
- what proportion of affected individuals are washed ashore, and where?
- does not imply longer term (population) impacts

Medium/long-term monitoring

Long term effects

- direct and indirect
- demographics trends
- population trends
- toxicology analyses of breeders (failed and successful)
- tracking (identify which colonies/individuals use affected area)

Limitations

- control populations
- confounding factors
- time lag, may need many years (10 +)

Species	Population change (%) 1969-70 to 1985-88	Population change (%) 1985-88 to 1998-2002	Population change (%) 1998-2002 to 2015
northern fulmar	+77	-3	-31
Manx shearwater	n/a	n/a	n/a
European storm-petrel	n/a	n/a	n/a
Leach's storm-petrel	n/a	n/a	n/a
northern gannet	+39	+39*	+34**
great cormorant	+9	+10	-8
European shag	+21	-27	-34
Arctic skua	+226	-37	-64
great skua	+148	+26	+18
black-legged kittiwake	+24	-25	-44
black-headed gull	+5	0	+38
Mediterranean gull	n/a	+10,900	+374
common gull	+25	+36	n/a
lesser black-backed gull	+29	+40	n/a
herring gull	-48	-13	n/a
great black-backed gull	-7	-4	-11
little tern	+58	-23	-18
Sandwich tern	+33	-15	+13
common tern	+9	-9	-10
roseate tern	-66	-83	+229
Arctic tern	+50	-31	+17
guillemot	+77	+31	+5
razorbill	+16	+21	+32
black guillemot	n/a	+3***	n/a
Atlantic puffin	+15	+19	n/a

* change between censuses in 1984-85 and 2004-05.
** change between census in 2003-04 and colonies surveyed in 2013-14 and 2015.
*** change between censuses in 1982-91 and 1998-2002

Evidence from past incidents

DEMOGRAPHIC effects:

- Decreased over-winter survival
- Decreased breeding productivity

PHYSIOLOGICAL effects:

- Acute (ingestion)
- Chronic sub-lethal

BUFFER effects:

- Large pool of non-breeders.

LACK OF RECOVERY:

- Persistent pollution?

Beyond Science

- Need clear objective
- How good does the evidence need to be?
- Individual vs population effects
- Reliant on available resources and capacity
- Engagement, agreement, buy-in and coordination across multiple organisations.

Thank you for listening

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JNCC
Joint Nature Conservation Committee