



Environmental impacts of marine renewable energies

Focus on Birds



Puffin des Baléares

Photo : Thomas Perrier



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Programme national

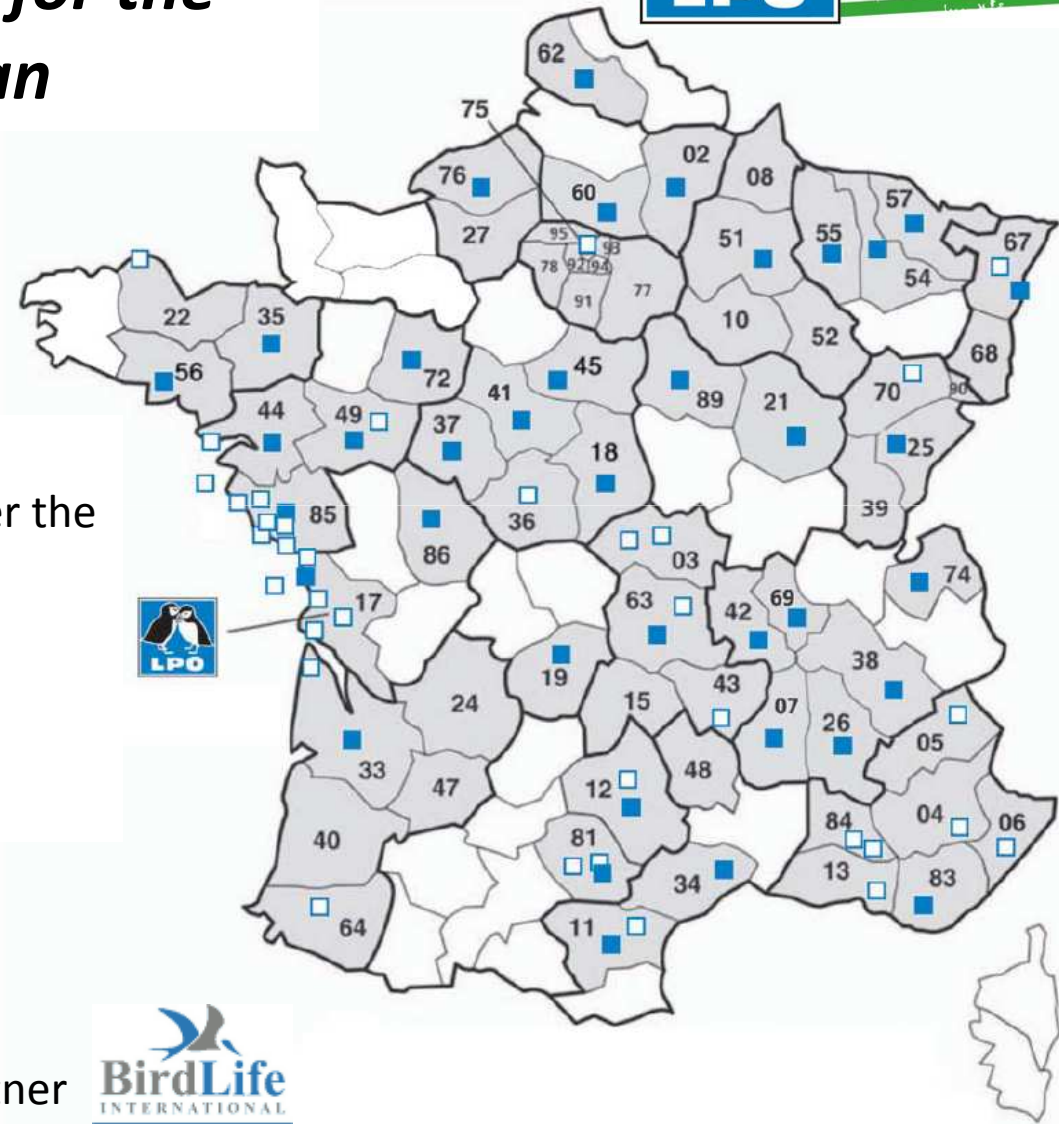
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ADEME - MEDDLT - SER/FEE - LPO

Yann ANDRE
Environmentalist
Sustainable development manager
LPO



Protect birds, species and natural habitats for the well-being of man



- 45 000 members
- 5 000 birdwatchers all over the national territory
- ...
- More info on www.lpo.fr

LPO is the French BirdLife Partner





The sea : a space with Multi activities already existing

- Shipping
- Oil and gas
- Cables
- Pipes
- Beamtrawlers
- Military
- Marine aggregate extraction
- ...



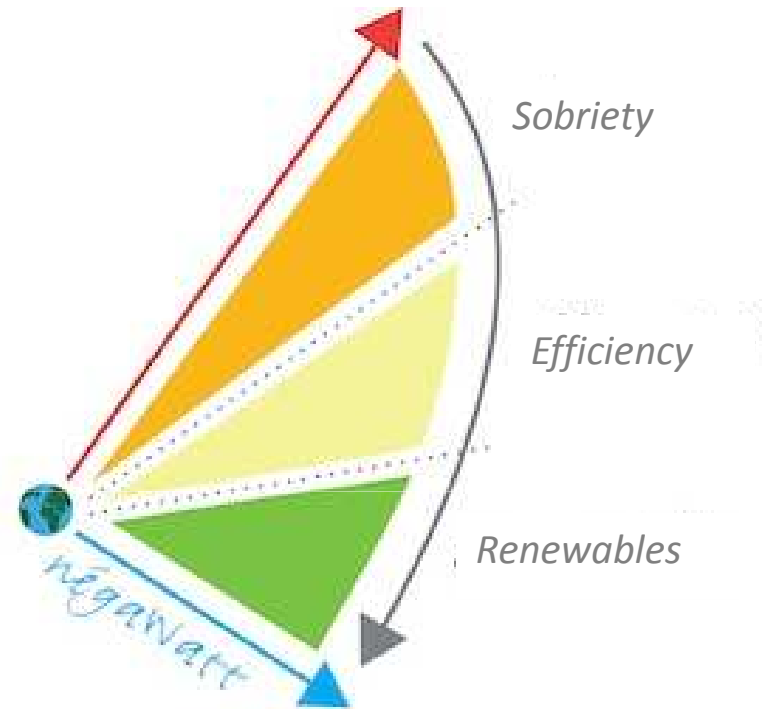
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With a general lack of data on the environmental impacts...



Renewables at sea : a new deal for energy or a headlong ?



New infrastructures in the (marine) natural environment need to make sense with a general energy strategy on a local, regional and national scale

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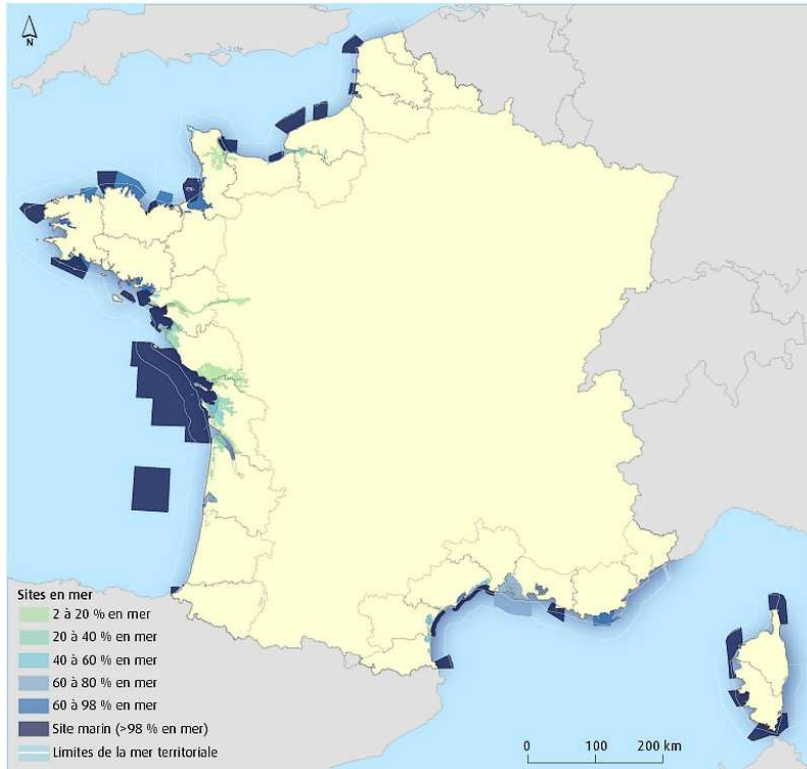
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Strategic Planning : a place for nature ? - 1 -

Birds area N2000 at sea



Sources: Directive « oiseaux », MEEDDM – MNHN, juillet 2009, Shom, 2008 – SOeS (Observatoire du littoral).

Wind park areas / call for tender step 1



Source : MEDDTL, juillet 2011

An appropriate SEA is a strong tool for the success of an ambitious industrial program. Nature protection is one important issue of this exercise. It emphasises the need for fundamental knowledge and accurate environmental data.

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Strategic Planning : a place for nature ? - 1 -

An industrial plan/program has to make an appropriate environmental assessment.
Directive 2001/42/CE

This means for the natural environment :

- A clear definition of the program (How many ? Which technology ?...)
 - A real knowledge of the ecosystems (operation, resiliency, vulnerability)
 - An approach on the overall environmental impacts
 - A real strategy to eliminate or reduce potential impacts
 - If necessary, be imaginative to find appropriate offset measures to achieve the environmental neutrality of the program...
- ...

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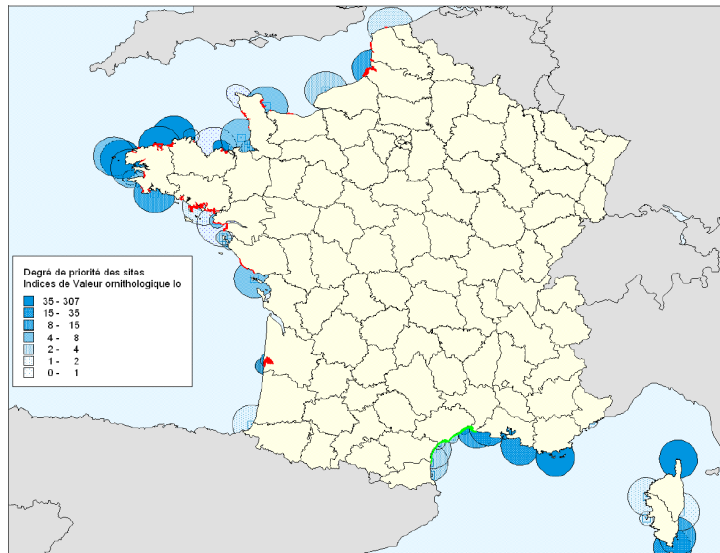


Birds at sea : an urgent need for data



Photos : Gilles Bentz

Carte n°10 : Périmètres justifiant la création ou l'extension de ZPS à partir de données sur certaines populations d'oiseaux marins nicheurs prioritaires (juin 2007)



Source : LPO France

Even if various programs are ongoing, marine natural data is scarce and under analysed.

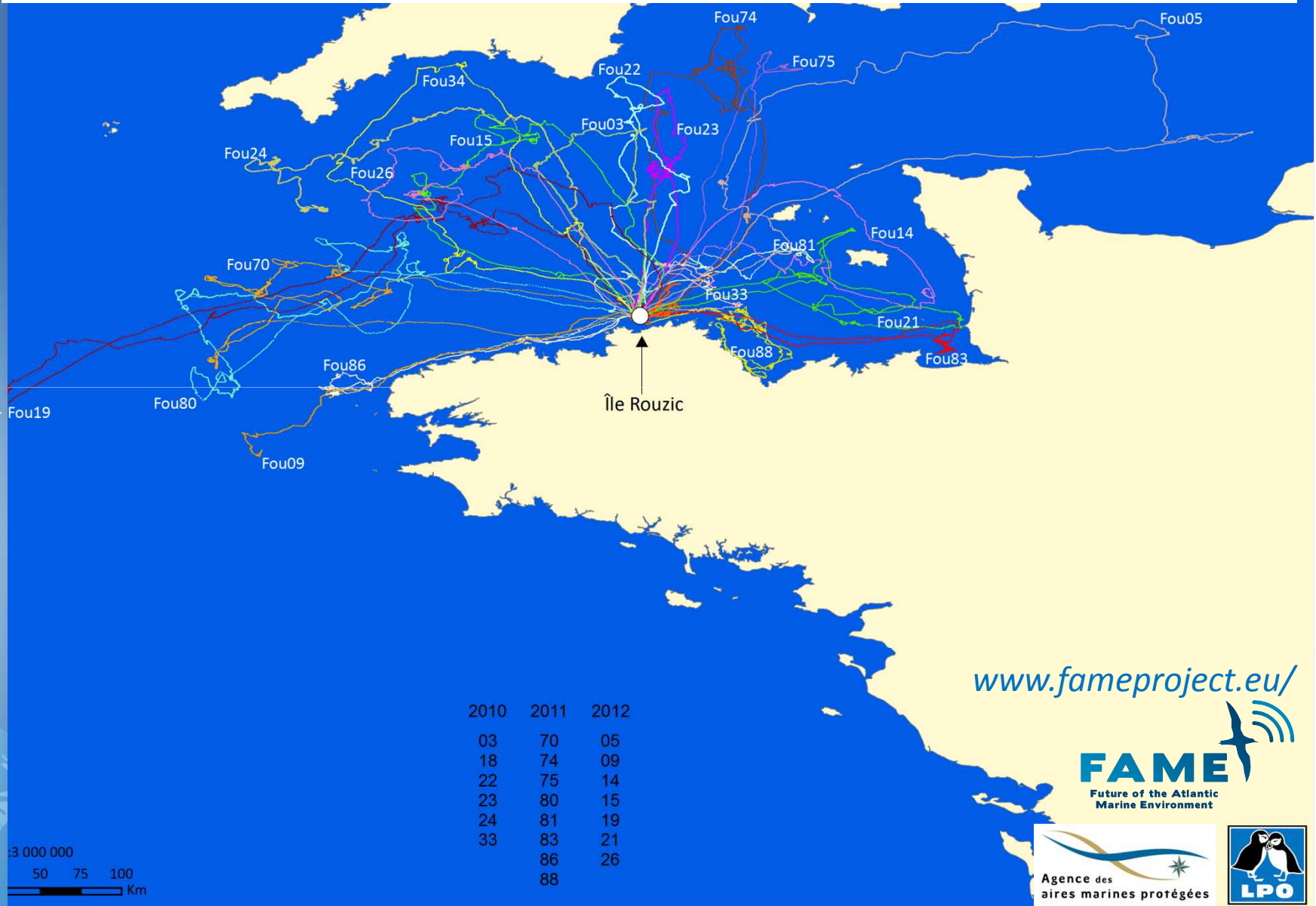
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Exemple of ongoing action : *Looking for the Feeding area of the Northern Gannet by GPS tracking*



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www.fameproject.eu/





Environmental Impact Assessment...



...Looking for « no net loss » of biodiversity



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Focus on Birds and Wind Energy : *Documented impacts*

Barriers effect :

Clear effect but difficult to quantify the impact (energy expenditure) resulting in habitat loss till 4km for some bird species

Collision:

-Most sea birds fly between 0 to 50m (i.e safe from blades) but many passerines are also using the sea (an mainly at night), usually flying higher

- Poor weather conditions may lead to large number of collisions (some days a year)

-Lighting attract birds which may cause strong fatalities in particular weather condition (storms, cloudy weather...)

Attractiveness:

- Artificial Lighting attract birds,

- Roosting availability and Potential increase of preys (artificial reef effect) may attract some bird species

Noise : mostly unknown



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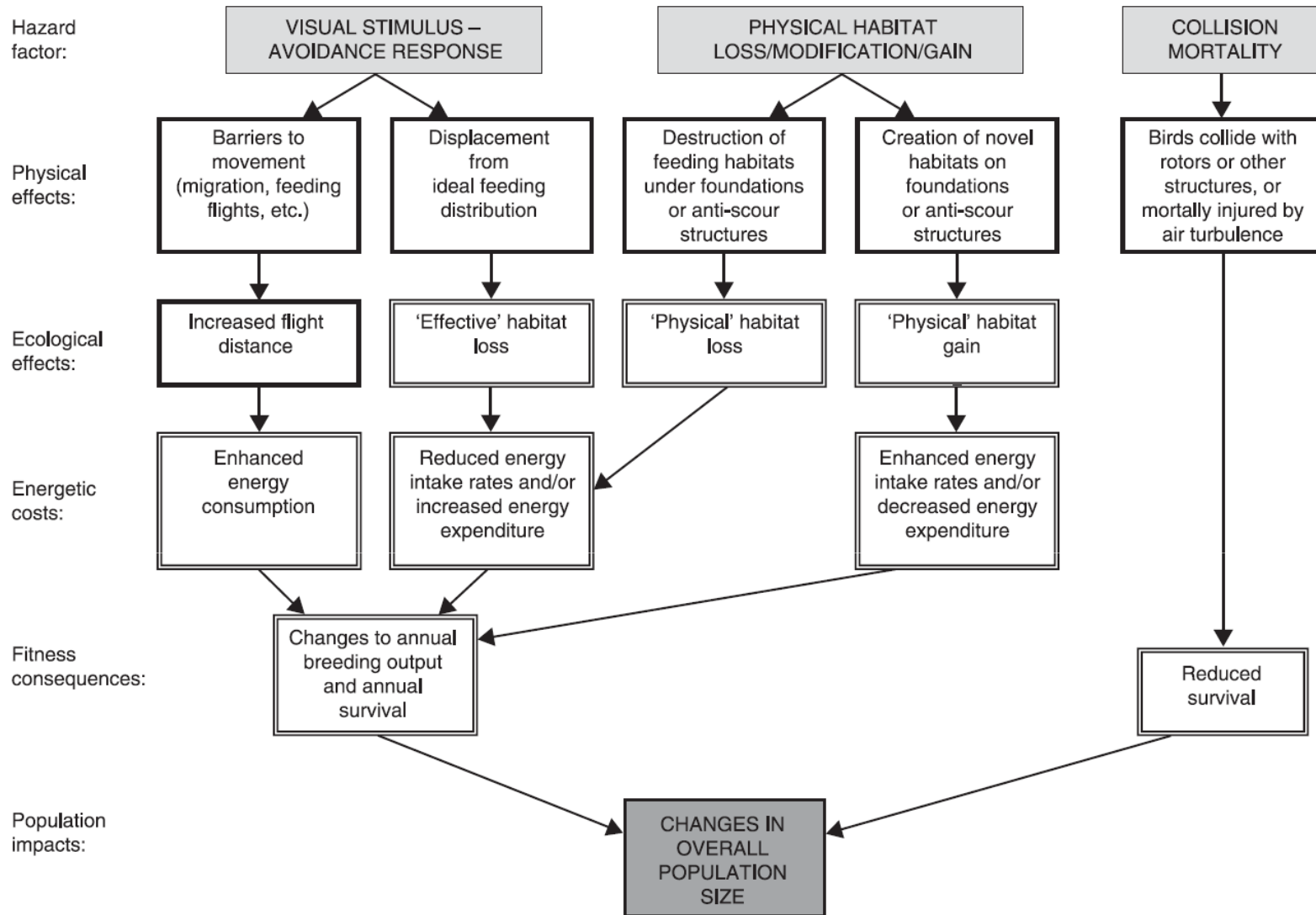


Figure 1. Flow chart describing the three major hazard factors (light shaded boxes) presented to birds by the construction of offshore wind farms, showing their physical and ecological effects on birds, the energetic costs and fitness consequences of these effects, and their ultimate impacts on the population level (dark shaded box). The boxes with a heavy solid frame indicate potentially measurable effects, the double framed boxes indicate processes that need to be modelled (see text for details).

From: Information needs to support environmental impact assessment of the effects of European marine offshore wind farms on birds
A.D. FOX*, MARK DESHOLM, JOHNNY KAHLERT, THOMAS KJAER CHRISTENSEN & IB KRAG PETERSEN, *Ibis* 2006



Early indications attractiveness / habitat loss: large differences between species

Avoidance: Guillemot, Razorbill, Gannet, Divers

Attraction: Cormorants

Indifference: Gulls

Unknowns: Grebes, Terns, Seaduck (nearshore),
Fulmar, Puffin, Shearwaters...

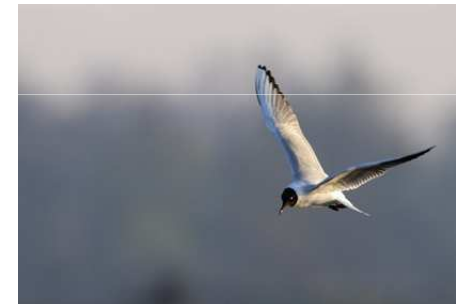


Photo: Cory's shearwaters @ Pedro Geraldès



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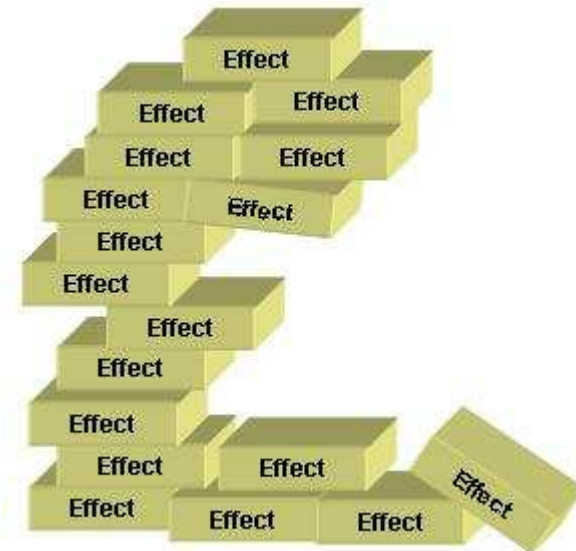
Cumulative effects, cumulative impacts... ...a mandatory step, with poor methodologies :

Of various activities at sea :

- Disturbance
- Mortality
- Habitat change
- Populations
- ...

Of various marine energy projects :

- Disturbance
- Mortality
- Habitat change
- Populations
- ...



<http://www.fs.fed.us/>

EIAs database at sea ??? , Offsets at sea ???



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Some tools for a good measure:

Strategic Planning :

- Macro Data acquisition from boat/plane transects, radar surveys, costal observation
- Telemetric monitoring
- Fundamental ecological knowledge (population dynamics, diets, survival rate...)
- Analysis and biostatistics leading to modelling (cf WSI)
- Scientific publications and mapping
- ...

Environmental assessment

- Collection and analysis of Existing data (including literature review...)
- Air plane transect (HD and traditional)
- Boat transects
- Telemetric monitoring, radar surveys at sea,
- Coastal observations
- Analysis and biostatistics leading to modelling

Surveys :

- Same as above + specific technologies like TADS, WT Bird, RADAR, IDStats...



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At the right time...

The table below shows the periods favorable for field inventories, given the annual cycle.

STATUT	Janv	Févr	Mars	Avril	Mai	Juin	Juil	Août	Sept	Oct	Nov	Déc
Nicheurs												
Hivernants												
Migrateurs												

Tableau n°1 : Périodes favorables aux inventaires de terrain

-  Période favorable
-  Période optimale





Imperious need for collaborative research programs

on :

- Spatial distribution of sea birds, marine mammals and fishes
- Inter relations between fish/birds; fish/mammals
- Migration patterns
- Macro analysis on populations trends
- Data collection and analysis...
- ...



Photo : Michel Brosselin

There are still key information gaps for understanding potential impacts of marine energy development.

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Thank you !



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