



# Offshore Wind Farms and Marine Biodiversity



## CoCoNet to Protect and Connect

**Offshore Wind Farms (OWF)** have a larger potential for generating electricity than land-based wind farms. This is due to:

- Greater wind speeds in the sea
- Uniform wind field because of the absence of obstacles
- No noise pollution issues
- No visual pollution issues
- No competition for use of the area

**OWFs act as Natural Sea parks:** as no human activity (fishery, sea transportation) takes place in the area

**Disadvantages:**

- Increased installation and operation cost
- Environmental disturbance to flora, fauna, sea bed structure and morphology is not fully understood



©London Array

Northern Europe holds the densest network of OWFs:

- UK and Denmark are the leaders in development
- First OWF installed in Denmark in 1991
- Largest OWF is London Array (5 July 2013) sited at Thames outer estuary, potential for 1000 MW



Middelgrunden OWF in Denmark



[http://www.earthtimes.org/newsimage/smaller-fish-more-vulnerable-overfishing\\_25.jpg](http://www.earthtimes.org/newsimage/smaller-fish-more-vulnerable-overfishing_25.jpg)

**Most vulnerable species:**

- Seabirds and migratory birds
- Marine mammals:
- Sea turtles
- Fish population
- Benthic communities



Damien du Toit/Flickr.com

**Impacts during operation:**

- Noise, vibration and shadowing
- Electromagnetic radiation emission from cables carrying electric currents
- Alteration of habitats
- Effects on the water circulation

**Impacts during construction and installation:**

- Temporary loss of habitats
- Increased suspended sediment
- Total depopulation of species living on seabed
- Increased noise levels



Chris Johnson



Stockphoto



**Sea mammals** are affected by construction noise and increased traffic (ships and helicopters) during construction. Sound interference causes disorientation, and can force sea mammals to abandon the area. Sound does not affect their auricular system.



Some species are susceptible to **electromagnetic emissions** from wind farms. These species use Earth's electromagnetic field for their navigation. This includes migratory fish, sea mammals, sharks, sea turtles and marine crustaceans.



M. A. Pancucci, HCMR

**Effects to avifauna:**

- Bird collide with turbines
- Turbines act as obstacles on flyways or disrupt connectivity among groups of the same species



**Benthic communities** are affected by the alteration of geomorphological and geochemical status of the sea floor:

- New habitats and new benthic colonies
- More food in the area attracts fish and mammals
- New flora and fauna is established
- Possible invasion of alien species will disturb the ecological equilibrium

For more information, please visit: <http://coconet-fp7.eu/children/>