

Supplementary Materials: Expected Effects of Offshore Wind Farms on Mediterranean Marine Life

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Table S1. Effects of OWF in marine benthos during construction phase. In “result”: Red = Detected changes/major effects; Grey = no change or effect; Green = decrease of the effect; White = not concluding data. In “area”: L, Basement/foundation/scour protection, I, turbines area; E, area outside OWF.

Biological Group	Effect	Species/Group	OWF	Result	Area	Citation
NOISE						
Infauna	Stress				I	[1]
	Behavior changes according to the decibels		Egmond aan Zee		E	[2]
Macrobenthos	Temporal dispersion		Scroby Sands		I	[3]
SUBSTRATE ADDITION						
Macrobenthos	Suspended sediment	<i>Mytilus edulis</i>	Nysted		I	[4]
	Socavon (Adit)	<i>Ostrea sp</i>	Kentish Flats		L	[3]
	Recruitment	<i>Mytilus edulis</i>	Nysted		I	[4]
			Kentish Flats		L	[3]
			Scroby Sands		L	[3]
	Abundance	<i>Hydrobia mudsnail</i>	Nysted		L	[4]
			Nysted		L	[4]
			Kentish Flats		L	[3]
			Scroby Sands		L	[3]
		Changes in the community		Egmond aan Zee		I

Table S2. Effects of OWF in marine benthos during operation phase. In “result”: Red = Detected changes/major effects; Grey = no change or effect; Green = decrease of the effect; White = not concluding data. In “area”: L, Basement/foundation/scour protection, I, turbines area; E, area outside OWF.

Biological Group	Effect	Species/Group	OWF	Result	Area	OWP years	Citation
NOISE							
Infauna	Stress				I,L		[1]
Macrobenthos	Colonization				L		[6]
	Effect on larvae/metamorphosis	<i>Austrohelice crassa</i> <i>Hemigrapsus crenulatus</i>			L		[7]
	Recruitment	<i>Mytilus edulis</i>	Egmond aan Zee		I	4	[5]
SUBSTRATE ADDITION							
Infauna		<i>Abra alba</i>	Egmond aan Zee		I	3	[2]
		<i>Donax vittatus</i>	Egmond aan Zee		I	3	[2]
	Recruitment	<i>Ensis spp</i>	Egmond aan Zee		I	3	[2]
		<i>Mysella bidentata</i>	Egmond aan Zee		I	3	[2]
			Egmond aan Zee		I	3	[2]
			Thornton bank		L	3	[8]
	Diversity		Benthic assemblages	N/A		L	1
					I		[9]

		Horns Rev I		I	3	[4]
	Benthic assemblages	N/A		I		[9]
		Horns Rev I		L	4	[10]
		Nysted		L	3	[10]
Abundance		Horns Rev I		I	3	[4]
	<i>Abra alba</i>	Horns Rev I		I	2	[11]
	<i>Spisula solida</i>	Horns Rev I		I	2	[11]
		Bligh Bank I		I	0	[12]
		Thornton bank		I	3	[8]
		Bligh Bank I		I	1	[8]
Changes in the community		Horns Rev I		L	4	[10]
		Nysted		L	3	[10]
		Burbo Bank		I	2	[3]
Changes in the sediment		North Hoyle		I	6	[3]
		Kentish Flats		I	4	[3]
Suspended sediment		Nysted		I	2	[4]
Aggregation (temporary FAD)		Egmond aan Zee		I	4	[5]
		Round 2		L		[13]
		North Hoyle		L	2	[14]
		Utgrunden		L	10	[15]
		Utgrunden		L	10	[16]
		Lillgrund		L	4	[16]
	<i>Cancer pagurus</i>	Egmond aan Zee		L	2	[17]
	<i>Venerupis senegalensis</i>	Egmond aan Zee		L	2	[17]
		Egmond aan Zee		L	2	[17]
				L		[18]
		Bligh Bank		L	0	[19]
				L		[20]
		Horns Rev I		L	4	[8]
		Nysted		L	3	[8]
		Thornton bank		L	2	[21]
Macrobenthos	<i>Asterias rubens</i>	Egmond aan Zee		L	4	[5]
	<i>Balanus balanoides</i>	Egmond aan Zee		L	4	[5]
	<i>Balanus crenatus</i>	Egmond aan Zee		L	4	[5]
Permanent settlement (artificial reef)	<i>Diadumene cincta</i>	Egmond aan Zee		L	4	[5]
	<i>Jassa sp</i>	Egmond aan Zee		L	4	[5]
	<i>Mytilus edulis</i>	Egmond aan Zee		L	4	[5]
	<i>Sargartia spp</i>	Egmond aan Zee		L	4	[5]
	<i>Senil metridium</i>	Egmond aan Zee		L	4	[5]
		Egmond aan Zee		L	4	[5]
				L		[22]
				L		[6]
		Bligh Bank I		L	0	[23]
				I		[24]
		Lynn		L	1	[3]
	<i>Mytilus edulis</i>	Yttre Stengrund		L	7	[25]
	<i>Mytilus edulis</i>	Utgrunden		L	8	[25]
	<i>Pollicipes pollicipes</i>	Yttre Stengrund		L	7	[25]
	<i>Pollicipes pollicipes</i>	Utgrunden		L	8	[25]
	<i>Pollicipes pollicipes</i>	Utgrunden		L	8	[25]
		Yttre Stengrund		L	7	[25]
		Utgrunden		L	8	[25]

				I		[26]
				I		[27]
				I		[28]
		Egmond aan Zee		L	2	[29]
				L		[30]
		Bligh Bank		L	0	[19]
		Thorntonbank		L	2	[19]
		Horns Rev I		L	4	[8]
		Nysted		L	3	[8]
Biomass	<i>Gammaridae</i>	Nysted		L	2	[4]
	<i>Balanus improvisus</i>	Nysted		L	2	[4]
	<i>Mytilus edulis</i>	Nysted		L	2	[4]
		Horns Rev I		I	3	[4]
		Horns Rev I		L	3	[4]
		Thornton bank		L	2	[21]
		North Hoyle		L	2	[14]
	Alien species of the natural system		North Hoyle	I,L	2	[14]
	Geographical changes in spawning	<i>Cancer pagurus</i>	Horns Rev I	L	3	[4]
Recruitment	<i>Mytilus edulis</i>	Egmond aan Zee		I	4	[5]
		Egmond aan Zee		I	4	[5]
Diversity		Utgrunden		L	10	[15]
		North Hoyle		L	1	[31]
		Thornton bank		L	3	[8]
	<i>Spiophanes bombyx</i>	Thornton bank		L	3	[8]
	<i>Lanice conchilega</i>	Bligh Bank I		L	1	[8]
		Horns Rev I		L	4	[8]
		Nysted		L	3	[8]
		Horns Rev I		L	3	[4]
		Nysted		I	2	[4]
		Thornton bank		L	2	[21]
		Egmond aan Zee		I	4	[5]
		Egmond aan Zee		L	4	[5]
		North Hoyle		L	2	[14]
				L		[32]
		North Hoyle		L	6	[3]
		Utgrunden		L	7	[33]
		Yttre Stengrund		L	6	[33]
		Utgrunden		L	7	[33]
		Yttre Stengrund		L	6	[33]
		Egmond aan Zee		L	2	[29]
Abundance	<i>Mytilus edulis</i>	Utgrunden		L	10	[15]
		Utgrunden		L	10	[15]
		Utgrunden		L	10	[16]
		Lillgrund		L	4	[16]
		Thorntonbank		L	2	[19]
	<i>Spiophanes bombyx</i>	Thornton bank		L	3	[19]
	<i>Lanice conchilega</i>	Thornton bank		L	3	[19]
		Bligh Bank I		L	1	[19]
		Horns Rev I		L	4	[8]
		Nysted		L	3	[8]
	<i>Gammaridae</i>	Nysted		L	2	[4]
	<i>Balanus improvisus</i>	Nysted		L	2	[4]
	<i>Balanus improvisus</i>	Nysted		L	2	[4]
	<i>Goniadella bobretzkii</i>	Horns Rev I		I	3	[4]
	<i>Goodallia triangularis</i>	Horns Rev I		L	3	[4]
	<i>Hydrobia mudsnail</i>	Nysted		L	2	[4]
	<i>Mytilus edulis</i>	Nysted		L	2	[4]
	<i>Mytilus edulis</i>	Nysted		L	2	[4]
	<i>Pisone remota</i>	Horns Rev I		I	3	[4]
		Horns Rev I		I	3	[4]
	Horns Rev I		L	3	[4]	

		Nysted	I	2	[4]
		Nysted	L	2	[4]
	<i>Crangon crangon</i>	Horns Rev I	L	2	[11]
		Thornton bank	L	2	[21]
	<i>Goniadella bobretzkii</i>	Horns Rev I	I	2	[1]
	<i>Goodallia triangularis</i>	Horns Rev I	I	2	[1]
	<i>Mytilus edulis</i>	Horns Rev I	L	2	[1]
	<i>Pisone Remota</i>	Horns Rev I	I	2	[1]
		Egmond aan Zee	I	4	[5]
		Egmond aan Zee	L	4	[5]
	<i>Mytilus edulis</i>	Nysted	L	6	[34]
	<i>Jassa sp</i>	North Hoyle	L	2	[14]
	<i>Jassa falcata</i>	North Hoyle	L	2	[14]
	<i>Ophiura brittlestar</i>	North Hoyle	I	2	[14]
	<i>Pollicipes pollicipes</i>	North Hoyle	L	2	[14]
		North Hoyle	I	2	[14]
	<i>Crangon crangon</i>	Lynn	I,L	1	[3]
	<i>Decapoda</i>	Lynn	I,L	1	[3]
	<i>Ostrea sp</i>	Kentish Flats	L	4	[3]
	<i>Palinurus elephas</i>	Lynn	I,L	1	[3]
		North Hoyle	L	6	[3]
		Utgrunden	L	7	[33]
		Yttre Stengrund	L	6	[33]
		Egmond aan Zee	L	2	[29]
Changes in trophic structure		Kentish Flats	L	4	[3]
Changes in the community		Egmond aan Zee	L	2	[17]
		Horns Rev I	L	4	[8]
		Nysted	L	3	[8]
		Horns Rev I	L	3	[4]
		Nysted	L	2	[4]
		Thornton bank	L	2	[21]
		Horns Rev I	I	2	[1]
		Egmond aan Zee	I	4	[5]
		North Hoyle	L	2	[14]
		Bligh Bank I	L	0	[23]
	Burbo Bank	L	2	[25]	
	Kentish Flats	I	4	[25]	
ELECTROMAGNETISM					
Infauna	Stress		I,L		[1]
Changes in the quality of eggs	<i>Echinoidea</i>		I		[35]
	<i>Pollicipes pollicipes</i>				[35]
Effect on larvae	<i>Echinoidea</i>		I		[35]
	<i>Pollicipes pollicipes</i>				[35]
Temporal dispersion	<i>Crangon crangon</i>				[35]
	<i>Mytilus edulis</i>		I		[35]
	<i>Rhithropanopeus harrisii</i>		I		[35]
	<i>Saduria entomon</i>		I		[35]
Dispersion permanent	<i>Crangon crangon</i>		I		[35]
	<i>Mytilus edulis</i>		I		[35]
	<i>Rhithropanopeus harrisii</i>		I		[35]
	<i>Saduria entomon</i>		I		[35]
Settlement (permanent)	<i>Crangon crangon</i>		I		[35]
	<i>Mytilus edulis</i>		I		[35]
	<i>Rhithropanopeus harrisii</i>		I		[35]
	<i>Saduria entomon</i>		I		[35]
Aggregation (temporary)	<i>Crangon crangon</i>		I		[35]
	<i>Mytilus edulis</i>		I		[35]
	<i>Rhithropanopeus harrisii</i>		I		[35]

	<i>Saduria entomon</i>		I		[35]
			I		[6]
Migration barrier			I		[6]
Recruitment	<i>Mytilus edulis</i>	Egmond aan Zee	I	4	[5]
Abundance		Barrow	I	3	[3]

Table S3. Effects of OWF in marine fishes and elasmobranchs during construction phase. In “OWF” names correspond to each wind park. In “result”: **red**: Detected changes/major effects; **grey**: no change or effect; **green**: decrease of the effect; **uncolored**: not concluding data. In “area”: L, Basement/foundation/scour protection, I, turbines area; E, area outside OWF.

































Biological Group	Effect	Species/Group	OWF	Result	Area	Citation
NOISE						
Fish	Habituation				I,L	[36]
	Behavior changes according to the decibels		Alpha Ventus		I,E	[37]
		Fish assemblages	Alpha Ventus		I,E	[38]
	Diversity	Fish assemblages	Alpha Ventus		I,L	[36]
			Utgrunden		I	[16]
		Abundance	Lillgrund		I	[16]
			Utgrunden		I	[16]
	Demersal Fish	Damage sonic pulses	Lillgrund		I	[16]
			<i>Solea solea</i>	Utgrunden		I,E
		Effect on larvae	<i>Solea solea</i>	Lillgrund		I
<i>Solea solea</i>					I,E	[39]
<i>Solea solea</i>					I,E	[40]
Temporal dispersion		<i>Limanda limanda</i>			E	[40]
		<i>Sciaena umbra</i>	North Hoyle		I	[3]
		<i>Sciaena umbra</i>	Barrow		I	[3]
		<i>Sciaena umbra</i>	Kentish Flats		I	[3]
		<i>Sciaena umbra</i>	Scroby Sands		I	[3]
	<i>Solea sp</i>	North Hoyle		I	[3]	
	<i>Solea sp</i>	Barrow		I	[3]	
	<i>Solea sp</i>	Kentish Flats		I	[3]	
	<i>Solea sp</i>	Scroby Sands		I	[3]	
	Behavior changes according to the decibels the decibels	<i>Limanda limanda</i>	North Hoyle		I,E	[41]
<i>Limanda limanda</i>				E	[40]	
<i>Solea solea</i>				E	[40]	
Benthopelagic Fish	Effect on larvae	<i>Gadus morhua</i>	Utgrunden		I	[16]
		<i>Gadus morhua</i>	Lillgrund		I	[16]
	Temporal dispersion	<i>Gadus morhua</i>			I,E	[40]
		<i>Salmo salar</i>			I,E	[40]
		<i>Clupea arengus</i>	North Hoyle		I	[3]
		<i>Clupea arengus</i>	Barrow		I	[3]
		<i>Clupea arengus</i>	Kentish Flats		I	[3]
		<i>Clupea arengus</i>	Scroby Sands		I	[3]
		<i>Gadus morhua</i>	North Hoyle		I	[3]
		<i>Gadus morhua</i>	Barrow		I	[3]
		<i>Gadus morhua</i>	Kentish Flats		I	[3]
		<i>Gadus morhua</i>	Gunfleet Sands		I	[3]
		<i>Salmo sp</i>	North Hoyle		I	[3]
		<i>Salmo sp</i>	Barrow		I	[3]
		<i>Salmo sp</i>	Kentish Flats		I	[3]
<i>Salmo sp</i>	Scroby Sands		I	[3]		
	<i>Gadus morhua</i>	North Hoyle		I,E	[41]	

		<i>Salmo salar</i>	North Hoyle		I,E	41
		<i>Gadus morhua</i>			E	[40]
		<i>Salmo salar</i>			E	[40]
SUBSTRATE ADDITION						
	Temporal dispersion		Nysted		I	[4]
Fish	Geographical changes in spawning		Kentish Flats		I	[3]
Benthopelagic Fish	Geographical changes in spawning	<i>Clupea arengus</i>	Kentish Flats		I	[3]
	Suspended sediment	<i>Scophthalmus maximus</i>	Nysted		I	[4]
Demersal Fish	Recruitment	<i>Scophthalmus maximus</i>	Nysted		I	[4]

Table S4. Effects of OWF in marine fishes and elasmobranchs during operation phase. In “OWF” names correspond to each wind park. In “result”: **red**: Detected changes/major effects; **grey**: no change or effect; **green**: decrease of the effect; **uncolored**: not concluding data. In “area”: **L**, Basement/foundation/scour protection, **I**, turbines area; **E**, area outside OWF.

Biological group	Effect	Species/Group	OWF	Result	OWF years	Citation	
NOISE							
Fish	Temporal dispersion	Fish assemblage				[24]	
	Permanent dispersion	Fish assemblage				[24]	
	Settlement (permanent)	Fish assemblage					[24]
		Fish assemblage					[36]
		Fish assemblage		Lynn		1	[3]
	Behavioral changes as the decibels /distance to the turbine	Fish assemblage		Alpha Ventus		3	[37]
		Fish assemblage					[36,43]
		Fish assemblage		Utgrunden		10	[42]
		Fish assemblage		Lynn		1	[3]
	Changes in spawning	<i>Dicentrarchus labrax, Microstomus kitt, Solea sp</i>	Gunfleet Sands			0	[3]
Temporal dispersion	<i>Scophthalmus maximus</i>	Vindeby			11	[44]	
Permanent dispersion	<i>Scophthalmus maximus</i>	Vindeby			11	[44]	
Aggregation (temporary)	<i>Scophthalmus maximus</i>	Vindeby			11	[44]	
Migration barrier /displacement	<i>Scophthalmus maximus</i>	Vindeby			11	[44]	
Demersal Fish	Habituation	<i>Scophthalmus maximus</i>	Vindeby		11	[44]	
		<i>Limanda limanda</i>	North Hoyle		0	[41]	
		<i>Limanda limanda, Solea solea</i>					[40]
	Abundance	<i>Ammodytes tobianus, Aplochiton marinus, Hyperoplus lanceolatus</i>	Horns Rev I			10	[45]
		<i>Ammodytes tobianus, Aplochiton marinus, Hyperoplus lanceolatus</i>	Horns Rev I			2	[11]
		Fish assemblage	Bligh Bank I			0	[46]
Benthopelagic Fish	Changes in spawning	<i>Clupea arengus</i>	Gunfleet Sands		0	[3]	
	Migration barrier /displacement	<i>Gadus morhua</i>	Thornton bank		2	[47]	
	Habituation	<i>Gadus morhua, Salmo salar</i>	North Hoyle			0	[41]
		<i>Gadus morhua, Salmo salar</i>					[40]
	Abundance	Fish assemblage	Bligh Bank I			0	[46]
		Fish assemblage	Thornton bank			2	[46]
Pelagic Fish	Changes in spawning	<i>Sprattus sprattus</i>	Gunfleet Sands		0	[3]	
		Fish assemblage	Thornton bank		2		

SUBSTRATE ADDITION					
Demersal fish	Changes in the sediment	<i>Hyperoplus lanceolatus</i>	Horns Rev I	3	[4]
	Aggregation (temporary FAD)	<i>Hyperoplus lanceolatus</i>	Horns Rev I	3	[4]
		Fish assemblage	Round 2		[13]
		<i>Hyperoplus lanceolatus</i>	Egmond aan Zee	2	[29]
	Settlement (permanent A.Artif.)	Fish assemblage	Utgrunden	10	[16]
		Fish assemblage	Horns Rev I, Lillgrund	4	[10,16]
		Fish assemblage	Nysted	3	[6,43]
		Fish assemblage	Bligh Bank I	0	[23]
		Fish assemblage	Horns Rev I	9	[48]
		Fish assemblage	Yttre Stengrund	7	[25]
		Fish assemblage	Utgrunden	8	[25]
		Fish assemblage			[26,27]
	Biomass	Fish assemblage	Bligh Bank I	0	[46]
		Fish assemblage	Thornton bank	2	[46]
		Fish assemblage	Horns Rev I	9	[48]
		<i>Hyperoplus lanceolatus</i>	Egmond aan Zee	2	[29]
	Change in migration	<i>Ammodytes tobianus, Aplochiton marinus, Hyperoplus lanceolatus</i>	Horns Rev I	2	[11]
	Changes in spawning (other)	<i>Dicentrarchus labrax, Microstomus kitt, Solea sp</i>	Gunfleet Sands	0	[3]
	Diversity	Fish assemblage	Horns Rev I	2	[49]
		Fish assemblage			[32]
		Fish assemblage	Horns Rev I	9	[48]
		Fish assemblage	Yttre Stengrund	7	[25]
		Fish assemblage	Yttre Stengrund	7	[25]
Fish assemblage		Utgrunden	8	[25]	
Fish assemblage		Utgrunden	8	[25]	
Abundance	<i>Gobius niger, Gobiussculus flavescens</i>	Utgrunden	10	[15]	
	Fish assemblage	Utgrunden	10	[16]	
	Fish assemblage	Lillgrund	4	[16]	
	<i>Taurulus bubalis</i>	Egmond aan Zee	2	[17]	
	Fish assemblage	Bligh Bank I	0	[45]	
	Fish assemblages, demersal fish	Thornton bank	2	[45]	
	<i>Ammodytes tobianus, Aplochiton marinus, Hyperoplus lanceolatus</i>	Horns Rev I	10	[45]	
	Fish assemblage	Horns Rev I	4	[10]	
Fish assemblage	Nysted	3	[10]		

	<i>Ammodytes tobianus, Aplochiton marinus, Hyperoplus lanceolatus</i>	Horns Rev I		2	[11]
	<i>Ammodytes tobianus, Aplochiton marinus, Hyperoplus lanceolatus</i>	Horns Rev I		2	[11]
	<i>Aplochiton marinus, Hyperoplus lanceolatus</i>	Horns Rev I		2	[11]
	Fish assemblage	Horns Rev I		9	[48]
	Fish assemblage	Horns Rev I		9	[48]
	Fish assemblage	Lynn		1	[3]
	Fish assemblage	Yttre Stengrund		7	[33]
	Fish assemblage	Utgrunden		8	[33]
	<i>Hyperoplus lanceolatus</i>	Egmond aan Zee		2	[29]
Changes in trophic structure	Fish assemblage	Horns Rev I		4	[10]
	<i>Ammodytes tobianus, Aplochiton marinus, Hyperoplus lanceolatus</i>	Horns Rev I		2	[11]
Changes in the community	<i>Taurulus bubalis</i>	Egmond aan Zee		2	[17]
	Fish assemblage	Bligh Bank I		0	[23]
	<i>Limanda limanda</i>	Horns Rev I		9	[48]
Aggregation (temporary FAD)	<i>Sardina pilchardus, Sprattus sprattus</i>	Egmond aan Zee		2	[29]
	Fish assemblage	Egmond aan Zee		2	[29]
Settlement (permanent A.Artif)	Fish assemblage	Utgrunden		10	[16]
	Fish assemblage	Lillgrund		4	[16]
	Fish assemblage	Horns Rev I		9	[48]
Dispersion (permanent)	Fish assemblage	Horns Rev I		3	[48]
Biomass	Fish assemblage	Horns Rev I		3	[48]
	Fish assemblage	Bligh Bank I		0	[46]
	Fish assemblage	Thornton bank		2	[46]
	Fish assemblage	Horns Rev I		9	[48]
Pelagic Fish	Changes in spawning (other)	<i>Sprattus sprattus</i>	Gunfleet Sands	0	[3]
	Diversity	Fish assemblage	Egmond aan Zee	2	[29]
Abundance	Fish assemblage	Horns Rev I		3	[48]
	Fish assemblage	Bligh Bank I		0	[45]
	Fish assemblage	Thornton bank		2	[45]
	Fish assemblage	Horns Rev I		9	[48]
	<i>Sardina pilchardus, Sprattus sprattus</i>	Egmond aan Zee		2	[29]
	Fish assemblage	Egmond aan Zee		2	[29]
Changes in trophic structure	Fish assemblage	Egmond aan Zee		2	[29]
Changes in the community	Fish assemblage	Horns Rev I		3	[48,50]
Elasmobranchs	Changes in spawning (other)	<i>Raja clavata</i>	Gunfleet Sands	0	[3]
	Abundance	Elasmobranchs	Burbo Bank	2	[3]

ELECTROMAGNETISM							
Fish	Changes in spawning	Fish assemblage	Barrow		3	[3]	
	Changes in the quality of eggs	Fish assemblage	Barrow		3	[3]	
		Fish assemblage					[24]
	Dispersion permanent	Fish assemblage					[24]
		Fish assemblage					[24]
		Fish assemblage	North Hoyle			6	[3]
	Behavior changes according to the intensity of the EC	Fish assemblage					[43]
		Fish assemblage	Burbo Bank			2	[3]
	Abundance	Fish assemblage	Barrow			3	[3]
	Change in the male / female	<i>Solea sp, Pleuronectes platessa, Pleuronectidae</i>	Barrow			3	[3]
Demersal fish	Changes in spawning	<i>Dicentrarchus labrax, Microstomus kitt, Solea sp</i>	Gunfleet Sands		0	[3]	
		<i>Solea sp, Pleuronectes platessa</i>	Barrow		3	[3]	
	Temporal dispersion	<i>Scophthalmus maximus</i>	Vindeby			11	[44]
		<i>Plathichthys flesus</i>					[51]
	Dispersion permanent	<i>Scophthalmus maximus</i>	Vindeby			11	[44]
		<i>Plathichthys flesus</i>					[51]
	Settlement (permanent)	<i>Plathichthys flesus</i>					[51]
	Aggregation (temporary)	<i>Scophthalmus maximus</i>	Vindeby			11	[44]
		<i>Plathichthys flesus</i>					[51]
	Barrier in migration	<i>Anguilla anguilla</i>	Nysted			2	[4]
<i>Scophthalmus maximus</i>		Vindeby			11	[44]	
Habituation	Fish assemblage					[6]	
Habituation	<i>Scophthalmus maximus</i>	Vindeby			11	[44]	
Behavior changes according to the intensity of the EC	Fish assemblage					[43]	
Benthopelagic fish	Change in the male / female	<i>Merlangius merlangus</i>	Barrow		3	[3]	
	Changes in spawning	<i>Clupea arengus</i>	Gunfleet Sands		0	[3]	
		<i>Merlangius merlangus</i>	Barrow			3	[3]
	Barrier in migration	<i>Gadus morhua</i>	Nysted			2	[4]
Pelagic fish	Change in the male / female	<i>Micromesistius poutassou</i>	Barrow		3	[3]	
	Changes in spawning	<i>Micromesistius poutassou</i>	Barrow		3	[3]	
		<i>Sprattus sprattus</i>	Gunfleet Sands			0	[3]
Elasmobranchs	Changes in spawning	<i>Raja clavata</i>	Gunfleet Sands		0	[3]	
		Elasmobranchs	Barrow		3	[3]	
	Temporal dispersion	Elasmobranchs	Nysted			3	[10]
		<i>Scyliorhinus canicula</i>					[20,51]
	Dispersion permanent	<i>Scyliorhinus canicula</i>					[20]
	Aggregation (temporary)	Elasmobranchs	Barrow			3	[3]
Habituation	Elasmobranchs	Nysted			3	[10]	

	Elasmobranchs			[51]
	<i>Carcharhinus plumbeus, Sphyrna lewini</i>			[51]
Behavior changes according to the intensity of the EC	<i>Raja clavata, Scyliorhinus canicula</i>			[52]
	Elasmobranchs	North Hoyle	6	[3]
	Elasmobranchs	Lynn	1	[3]
	Elasmobranchs	Burbo Bank	2	[3]
	Elasmobranchs	Nysted	3	[10]
Abundance	Elasmobranchs	Kentish Flats	4	[3]
	Elasmobranchs	Burbo Bank	2	[3]
Changes in the community	<i>Scyliorhinus canicula</i>	Barrow	3	[3]

Table S5. Effects of OWF in marine mammals during construction phase. In “OWF” names correspond to each wind park. In “result”: **red**: Detected changes/major effects; **grey**: no change or effect; **green**: decrease of the effect; **uncolored**: not concluding data. In “area”: **L**, Basement/foundation/scour protection, **I**, turbines area; **E**, area outside OWF.

Biological Group	Effect	Species/Group	OWF	Result	Area	Citation
NOISE						
Marine Mammals	Behavior changes according to the decibels				I,E	[38]
		<i>Phocoena phocoena</i>	Nysted		I	[53]
		<i>Phocoena phocoena</i>	Nysted		I	[4]
		<i>Tursiops truncatus</i>	Nysted		I	[4]
		<i>Phocoena phocoena</i>			I,E	[54]
		<i>Tursiops truncatus</i>			I,E	[54]
		<i>Phocoena phocoena</i>			I,E	[40]
		<i>Tursiops truncatus</i>			I,E	[40]
			Bligh Bank I		I,E	[55]
Odontocetes	Temporal dispersion	<i>Phocoena phocoena</i>	Nysted		I	[56]
		<i>Phocoena phocoena</i>	HornsRev I		I	[57]
		<i>Phocoena phocoena</i>	North Hoyle		I	[3]
		<i>Phocoena phocoena</i>	Barrow		I	[3]
		<i>Phocoena phocoena</i>	KentishFlats		I	[3]
		<i>Phocoena phocoena</i>	ScrobySands		I	[3]
		<i>Tursiops truncatus</i>	North Hoyle		I	[3]
		<i>Tursiops truncatus</i>	Barrow		I	[3]
		<i>Tursiops truncatus</i>	KentishFlats		I	[3]
		<i>Tursiops truncatus</i>	ScrobySands		I	[3]

		<i>Tursiops truncatus</i>		L	[58]
		<i>Phocoena phocoena</i>	HornsRev I	I,E	[59]
		<i>Phocoena phocoena</i>	Utgrunden	I,E	[59]
		<i>Phocoena phocoena</i>	HornsRev II	I	[60]
		Odontocetes	N/A	I	[20]
		Odontocetes	N/A	E	[61]
		<i>Phocoena phocoena</i>	North Hoyle	I,E	[41]
		<i>Tursiops truncatus</i>	North Hoyle	I,E	[41]
		<i>Phocoena phocoena</i>		I,E	[54]
	Behavior changes according to the decibels	<i>Tursiops truncatus</i>		I,E	[54]
		<i>Phocoena phocoena</i>		E	[40]
		<i>Tursiops truncatus</i>		E	[40]
			Bligh Bank I	I,E	[55]
		<i>Grampus griseus</i>		I	[62]
		<i>Orcinus orca</i>		I	[62]
		<i>Orcinus orca</i>		I	[62]
		<i>Phocoena phocoena</i>		I	[62]
		<i>Stenella coeruleoalba</i>		I	[62]
		<i>Tursiops truncatus</i>		I	[62]
	Recruitment	<i>Phocoena phocoena</i>		I	[63]
		<i>Phocoena phocoena</i>		E	[63]
		<i>Phocoena phocoena</i>	HornsRev II	I	[60]
	Abundance	<i>Phocoena phocoena</i>	HornsRev II	E	[60]
		<i>Tursiops truncatus</i>	Nysted	I	[10]
		<i>Phocoena phocoena</i>	Nysted	I	[4]
		<i>Tursiops truncatus</i>	Nysted	I	[4]
		<i>Halichoerus grypus</i>	Nysted	I	[64]
		<i>Phoca vitulina</i>	Nysted	E	[64]
		<i>Halichoerus grypus</i>	Nysted	I,E	[65]
		<i>Phoca vitulina</i>	Nysted	I,E	[65]
		<i>Halichoerus grypus</i>	Nysted	I	[4]
		<i>Phoca vitulina</i>	Nysted	I	[4]
		<i>Phoca vitulina</i>		I,E	[54]
		<i>Phoca vitulina</i>		I,E	[40]
			Scroby Sands	I,E	[66]
		<i>Phoca vitulina</i>	Horns Rev I	I	[67]
Pinnipeds	Temporal dispersion				

		<i>Phoca vitulina</i>	Horns Rev I	Red	I	[57]	
		<i>Phoca vitulina</i>	North Hoyle	Grey	I	[3]	
		<i>Phoca vitulina</i>	Barrow	Grey	I	[3]	
		<i>Phoca vitulina</i>	Kentish Flats	Grey	I	[3]	
		<i>Phoca vitulina</i>	Scroby Sands	Grey	I	[3]	
	Behavior changes according to the decibels	<i>Phoca vitulina</i>	Nysted	Red	I	[10]	
		<i>Phoca vitulina</i>	North Hoyle	Red	I,E	[41]	
		<i>Phoca vitulina</i>		Red	I,E	[54]	
		<i>Phoca vitulina</i>		Red	E	[40]	
				ScrobySands	Red	E	[66]
				ScrobySands	Red	I	[66]
		<i>Halichoerus grypus</i>	Rødsand	Red	I	[68]	
	Recruitment	<i>Halichoerus grypus</i>	Nysted	Red	I	[64]	
		<i>Phoca vitulina</i>	Nysted	Red	E	[64]	
	Abundance	<i>Halichoerus grypus</i>	Nysted	Green	I	[4]	
		<i>Phoca vitulina</i>	Nysted	Green	I	[4]	
SUBSTRATE ADDITION							
Odontocetes	Changes in the community	<i>Phocoena phocoena</i>	Barrow		I	[3]	

Table S6. Effects of OWF in marine mammals during operation phase. In “OWF” names correspond to each wind park. In “result”: **red**: Detected changes/major effects; **grey**: no change or effect; **green**: decrease of the effect; **uncolored**: not concluding data. In “area”: L, Basement/foundation/scour protection, I, turbines area; E, area outside OWF.

Biological group	Effect	Species/Group	OWF	Result	OWF years	Citation
NOISE						
		Odontocetes				[24]
	Aggregation (temporary)	<i>Phocoena phocoena</i>	Vindeby	Red	12	[20]
	Migration barrier /displacement	<i>Phocoena phocoena</i>		Grey		[69]
Odontocetes	Habituation	<i>Phocoena phocoena</i>		Red		[63]
		<i>Phocoena phocoena, Tursiops truncatus</i>	North Hoyle	Red	0	[41]
		<i>Phocoenaphocoena, Tursiops truncatus</i>		Red		[40,54]
		<i>Phocoena phocoena</i>	Nysted	Red	2	[56]
		<i>Phocoena phocoena</i>	HornsRev I	Red	4	[57]

	<i>Phocoena phocoena</i>	HornsRev I		4	[59]
	<i>Phocoena phocoena</i>	Utgrunden		5	[59]
	<i>Phocoena phocoena</i>	Rødsand		-3	[20]
Behavioral changes as the decibels /distance to the turbine	Odontocetes				[20]
	<i>Phocoena phocoena</i>				[69]
	<i>Phocoena phocoena, Tursiops truncatus</i>	North Hoyle		0	[41]
	<i>Delphinus delphis, Tursiops truncatus</i>	Beatriz		3	[70]
	<i>Grampus griseus, Orcinus orca, Phocoena phocoena, Stenella coeruleoalba, Tursiops truncatus</i>				[62]
Abundance	<i>Tursiops truncatus</i>	Nysted		3	[10]
	<i>Phocoena phocoena, Tursiops truncatus</i>	Nysted		2	[4]
Behavioral changes as the decibels /distance to the turbine	<i>Balaenoptera acutorostrata</i>	Beatriz		3	[70]
	<i>Phoca vitulina</i>	Nysted		6	
Aggregation (temporary)	<i>Halichoerus grypus</i>	Vindeby		12	[20]
	<i>Phoca vitulina</i>	Vindeby		12	[20]
	<i>Halichoerus grypu, Phoca vitulina</i>	Nysted		2	[4]
Migration barrier/displacementHabituation	<i>Halichoerus grypus, Phoca vitulina</i>				[69]
	<i>Halichoerus grypus, Phoca vitulina</i>	Nysted		7	[65]
	<i>Halichoerus grypus</i>	Rødsand		-2	[71]
	<i>Phoca vitulina</i>	Nysted		-2	[71]
	<i>Phoca vitulina</i>	Nysted		3	[10]
	Pinnipeds	HornsRev I		3	[4]
	<i>Phoca vitulina</i>	North Hoyle		0	[41]
	<i>Phoca vitulina</i>				[40,54]
	pinnipeds	ScrobySands		8	[66]
Mysticeti	<i>Phoca vitulina</i>	HornsRev I		4	[57]
Pinnipeds	<i>Phoca vitulina</i>	Rødsand		-3	[20]
	<i>Halichoerus grypus, Phoca vitulina</i>				[69]
	<i>Phoca vitulina</i>	North Hoyle		0	[41]
Abundance	<i>Halichoerus grypus, Phoca vitulina</i>	Rødsand, Nysted		-2	[71]
	<i>Halichoerus grypus, Phoca vitulina</i>	Nysted		2	[4]
SUBSTRATE ADDITION					
Odontocetes	Aggregation (temporary FAD)	<i>Phocoena phocoena</i>	HornsRev I	3	[4]
		Odontocetes	EgmondZee	4	[5,72]
	Abundance	<i>Phocoena phocoena</i>	North Hoyle	2	[14]
Pinnipeds		Odontocetes	North Hoyle	2	[14]
	Aggregation (temporary FAD)	<i>Phoca vitulina</i>	HornsRev I	3	[4]
		<i>Halichoerus grypus</i>	North Hoyle	2	[14]
Abundance	<i>Halichoerus grypus</i>	North Hoyle	2	[14]	
ELECTROMAGNETISM					

Odontocetes	Temporal dispersion	Odontocetes				[20]
		Odontocetes				[24]
	Dispersion permanent	Odontocetes				[24]
	Aggregation (temporary)	Odontocetes				[20]
		Odontocetes				[24]
	Habituation	Odontocetes				[20]
	Behavior changes according to the intensity of the EC	<i>Phocoena phocoena</i>	Rødsand		-3	[20]
Pinnipeds		<i>Phoca vitulina</i>	Rødsand		-3	[20]

References

1. Bech, M.; Leonhars, S.B.; Pedersen, J. *Infauna Monitoring Horns Rev offshore Wind Farm. Annual Status Report 2003*; Bio Consult SH and ELSAM Engineering: Husum, Germany, 2004; pp. 61.
2. Bergman, M.; Duineveld, G.; Van'T Hof, P.; Wielsma, E. *Impact of Owez Wind Farm on Bivalve Recruitment*; NIOZ: IJmuiden, The Netherlands, 2010.
3. Walker, R.; Judd, A.; Warr, K.; Doria, L.; Pacitto, S.; Vince, S.; Howe, L. *Strategic Review of Offshore Wind Farm Monitoring Data Associated with FEPA Licence Conditions: Fish*. Centre for Environment Fisheries and Aquaculture Science (CEFAS): Bangor, Wales, 2010; pp. 328.
4. Authority, D.E. *Offshore Wind Farms and The Environment: Danish Experiences from Horns Rev and Nysted*; Bluewater Wind LLC: Copenhagen, Denmark, 2006.
5. Lindeboom, H.J.; Kouwenhoven, H.J.; Bergman, M.J.N.; Bouma, S.; Brasseur, S.; Daan, R.; Fijn, R.C.; de Haan, D.; Dirksen, S.; van Hal, R.; *et al.* Short-term ecological effects of an offshore wind farm in the Dutch coastal zone; a compilation. *Environ. Res. Lett.* **2011**, *6*, doi:10.1088/1748-9326/6/3/035101.
6. Meißner, K.; Sordyl, H. Literature review of offshore wind farms with regard to benthic communities and habitats. In *Ecological Research on Offshore Wind Farms: International Exchange of Experiences*; Bundesamt für Naturschutz (BfN): Bonn, Germany, 2006.
7. Pine, M.K.; Jeffs, A.G.; Radford, C.A. Turbine sound may influence the metamorphosis behaviour of estuarine crab megalopae. *PLoS One* **2012**, *7*, e51790, doi:10.1371/journal.pone.0051790.
8. Coates, D.; Vanaverbeke, J.; Rabaut, M.; Vincx, M. Soft-sediment macrobenthos around offshore wind turbines in the Belgian part of the North Sea reveals a clear shift in species composition. In *Offshore Wind Farms in the Belgian Part of the North Sea: Selected Findings from the Baseline and Targeted Monitoring*; Royal Belgian Institute of Natural Sciences, Marine Ecosystem Management Unit: Brussels, Belgium, 2011; pp. 47–63.
9. Defew, E.; Wood, C.; Bates, R.; Wilson, L.; Wilson, J. *An Assessment of the Potential Impact of No-take Zones upon Benthic Habitats: A Case Study from SE Scotland*; Crown Estate: London, UK, 2012.
10. Energy, D. *Danish Offshore Wind: Key Environmental Issues*; DONG Energy, Vattenfall, the Danish Energy Authority and the Danish Forest and Nature Agency: Copenhagen, Denmark, 2006.
11. Jensen, H.; Kristensen, P.S.; Hoffmann, E. *Sandeels and Clams (Spisula sp.) in the wind turbine park at Horns Reef—Final report*. Techwise: Colorado Springs, CO, USA, 2004; pp. 45.
12. Van den Eynde, D.; Brabant, R.; Fettweis, M.; Francken, F.; Melotte, J.; Sas, M.; van Lancker, V. *Monitoring of Hydrodynamic and Morphological Changes at the C-Power and the Belwind Offshore Wind Farm Sites: A Synthesis*. Royal Belgian Institute of Natural Sciences, Marine Ecosystem Management Unit: Brussels, Belgium, 2010.
13. Linley, E.A.S.; Wilding, T.A.; Black, K.; Hawkins, A.J.S.; Mangi, S. Review of the reef effects of offshore wind farm structures and their potential for enhancement and mitigation. PML Applications Ltd. and the Scottish Association for Marine Science to the Department for Business, Enterprise and Regulatory Reform (BERR): Plymouth, UK, 2007.
14. May, J. Post-construction results from the North Hoyle offshore wind farm. In Proceedings of the 2005 Copenhagen Offshore Wind International Conference and Exhibition, Copenhagen, Denmark, 26–28 October 2005.
15. Andersson, M.H.; Öhman, M.C. Fish and sessile assemblages associated with wind-turbine constructions in the Baltic Sea. *Mar. Freshw. Res.* **2010**, *61*, 642–650.
16. Andersson, M.H. *Offshore Wind Farms—Ecological Effects of Noise and Habitat Alteration on Fish*. Doctoral Thesis. Stockholm University, Stockholm, Sweden, 2011.
17. Bouma, S.; Lengkeek, W. *Development of Underwater Flora-and Fauna Communities on Hard Substrates of the Offshore Wind Farm Egmond aan Zee (OWEZ)*, Final report 2008; Bureau Waardenburg Bv: IJmuiden, The Netherlands, 2009.
18. Burkhard, B.; Opitz, S.; Lenhart, H.; Ahrendt, K.; Garthe, S.; Mendel, B.; Windhorst, W. Ecosystem based modeling and indication of ecological integrity in the German North Sea—Case study offshore wind parks. *Ecol. Indic.* **2011**, *11*, 168–174.

19. Coates, D.; Vincx, M. Monitoring the effects of offshore wind farms on the soft substratum macrobenthos: Year-1 Bligh Bank and Year-2 Thorntonbank. In *Offshore Wind Farms in the Belgian Part of the North Sea: Early Environmental Impact Assessment and Spatio-Temporal Variability*, Royal Belgian Institute of Natural Sciences, Marine Ecosystem Management Unit: Brussels, Belgium, 2010; pp. 83–103.
20. Dolman, S.J.; Simmonds, M.P.; Keith, S. *Marine Wind Farms and Cetaceans*; Whale and Dolphin Conservation Society, International Whaling Commission: Cambridge, UK, 2003; p. 18
21. Kerckhof, F.; Rumes, B.; Norro, A.; Jacques, T.G.; Degraer, S. Seasonal variation and vertical zonation of the marine biofouling on a concrete offshore windmill foundation on the Thornton Bank (southern North Sea). In *Offshore Wind Farms in the Belgian Part of the North Sea: Early Environmental Impact Assessment and Spatio-Temporal Variability*, Royal Belgian Institute of Natural Sciences, Marine Ecosystem Management Unit: Brussels, Belgium, 2010.
22. Punt, M.J.; Groeneveld, R.A.; van Ierland, E.C.; Stel, J.H. Spatial planning of offshore wind farms: A windfall to marine environmental protection? *Ecol. Econ.* **2009**, *69*, 93–103.
23. Brabant, R.; Jacques, T.G. Introduction: Offshore wind energy development in the Belgian part of the North Sea & Anticipated impacts. In *Offshore Wind Farms in the Belgian Part of the North Sea: Early Environmental Impact Assessment and Spatio-Temporal Variability*, Royal Belgian Institute of Natural Sciences, Marine Ecosystem Management Unit: Brussels, Belgium, 2010; pp. 9–18.
24. Vella, G.; Rushforth, I.; Mason, E.; Hough, A.; England, R.; Styles, P.; Holt, T.; Thorne, P. *Assessment of the Effects of Noise and Vibration from Offshore Wind Farms on Marine Wildlife: Appendix D.*; Harwell Laboratory, Energy Technology Support Unit: Liverpool, UK, 2001; p. 51
25. Wilhelmsson, D.; Yahya, S.A.S.; Öhman, M.C. Effects of high-relief structures on cold temperate fish assemblages: A field experiment. *Mar. Biol. Res.* **2006**, *2*, 136–147.
26. Wilson, J.C.; Elliott, M. The habitat-creation potential of offshore wind farms. *Wind Energy* **2009**, *12*, 203–212.
27. Wilson, J.C. Offshore Wind Farms: Their Impacts, and Potential Habitat Gains as Artificial Reefs, in Particular for Fish. Maser Thesis, University of Hull, Scarborough, UK, September 2007.
28. Wilson, J.C.; Elliott, M.; Cutts, N.D.; Mander, L.; Mendão, V.; Perez-Dominguez, R.; Phelps, A. Coastal and offshore wind energy generation: Is it environmentally benign? *Energies* **2010**, *3*, 1383–1422.
29. Ybema, M.S.; Gloe, D.; Lambers, R.H.L. *OWEZ Pelagic Fish, Progress Report and Progression after T1*; IMARES: Wageningen, The Netherlands, 2009.
30. Krone, R.; Gutow, L.; Joschko, T.J.; Schröder, A. Epifauna dynamics at an offshore foundation—Implications of future wind power farming in the North Sea. *Mar. Environ. Res.* **2013**, *85*, 1–12.
31. Bunker, F. *Biology & Video Surveys of North Hoyle Wind Turbines 11th–13th August 2004*; Centre for Marine and Coastal Studies Ltd (CMACS): Hundleton, UK, 2004.
32. Inger, R.; Attrill, M.J.; Bearhop, S.; Broderick, A.C.; James Grecian, W.; Hodgson, D.J.; Mills, C.; Sheehan, E.; Votier, S.C.; Witt, M.J. Marine renewable energy: Potential benefits to biodiversity? An urgent call for research. *J. Appl. Ecol.* **2009**, *46*, 1145–1153.
33. Wilhelmsson, D.; Malm, T. Fouling assemblages on offshore wind power plants and adjacent substrata. *Estuar. Coast. Shelf Sci.* **2008**, *79*, 459–466.
34. Maar, M.; Bolding, K.; Petersen, J.K.; Hansen, J.L.S.; Timmermann, K. Local effects of blue mussels around turbine foundations in an ecosystem model of Nysted off-shore wind farm, Denmark. *J. Sea Res.* **2009**, *62*, 159–174.
35. Gill, A.B.; Kimber, J.A. The potential for cooperative management of elasmobranchs and offshore renewable energy development in UK waters. *J. Mar. Biol. Assoc. U. K.* **2005**, *85*, 1075–1081.
36. Mueller-Blenkle, C.; McGregor, P.K.; Gill, A.B.; Andersson, M.H.; Metcalfe, J.; Bendall, V.; Sigra, P.; Wood, D.T.; Thomsen, F. *Effects of Pile-Driving Noise on the Behaviour of Marine Fish*; CEFAS: Bangor, UK, 2010; pp. 62.
37. Betke, K.; Matuschek, M. Messungen von Unterwasserschall beim Betrieb der Windenergieanlagen im Offshore-Windpark alpha ventus. In Proceedings of the Research at Alpha Ventus (RAVE) International Conference, Oldenburg, Germany, 8–12 May 2012.
38. Betke, K.; Schultz-von Glahn, M.; Matuschek, R. Underwater noise emissions from offshore wind turbines. Presented at CFA/DAGA, Strasbourg, France, 22–23 March 2004.
39. Bolle, L.J.; De Jong, C.A.; Bierman, S.M.; van Beek, P.J.; van Keeken, O.A.; Wessels, P.W.; van Damme, C.J.; Winter, H.V.; de Haan, D.; Dekeling, R.P. Common sole larvae survive high levels of pile-driving sound in controlled exposure experiments. *PLoS One* **2012**, *7*, e33052, doi:10.1371/journal.pone.0033052.

40. Nedwell, J.R.; Parvin, S.J.; Edwards, B.; Workman, R.; Brooker, A.G.; Kynoch, J.E. *Measurement and Interpretation of Underwater Noise during Construction and Operation of Offshore Windfarms in UK Waters*; COWRIE: Newbury, UK, 2007; pp. 85.
41. Nedwell, J.; Langworthy, J.; Howell, D. *Assessment of Sub-Sea Acoustic Noise and Vibration from Offshore Wind Turbines and Its Impact on Marine Wildlife; Initial Measurements of Underwater Noise during Construction of Offshore Windfarms, and Comparison with Background Noise*; COWRIE: Newbury, UK, 2003.
42. Sigray, P.; Andersson, M.H. Particle motion measured at an operational wind turbine in relation to hearing sensitivity in fish. *J. Acoust. Soc. Am.* **2011**, *130*, 200–207.
43. Keller, O.; Lüdemann, K.; Kafemann, R. Literature review of offshore wind farms with regard to fish fauna. In *Ecological Research on Offshore Wind Farms: International Exchange of Experiences*; Bundesamt für Naturschutz (BfN): Bonn, Germany, 2006.
44. Engell-Sorensen, K. *Possible Effects of the Offshore Windfarm at Vindeby on the Outcome of Fishing*; Bio/consult as: Åbyhøj, Denmark, 2002.
45. Van Deurs, M.; Grome, T.M.; Kaspersen, M.; Jensen, H.; Stenberg, C.; Srensen, T.K.; Stttrup, J.; Warnar, T.; Mosegaard, H. Short- and long-term effects of an offshore wind farm on three species of sandeel and their sand habitat. *Mar. Ecol. Prog. Ser.* **2012**, *458*, 169–180.
46. Degraer, S.; Brabant, R.; Rumes, B. *Offshore Wind Farms in the Belgian Part of the North Sea*; Royal Belgian Institute of Natural Sciences, Marine Ecosystem Management Unit: Brussels, Belgium, 2011.
47. Reubens, J.; Degraer, S.; Vincx, M. The importance of marine wind farms, as artificial hard substrata, for the ecology of the ichthyofauna. In *Offshore Wind Farms in the Belgian Part of the North Sea: Early Environmental Impact Assessment and Spatio-Temporal Variability*, Royal Belgian Institute of Natural Sciences, Marine Ecosystem Management Unit: Brussels, Belgium, 2010.
48. Stenberg, C.; Christoffersen, M.O.; Krog, C.; Patrizio, M.; Dolmer, P. Offshore wind farms and their potential for shellfish aquaculture and restocking. Presented at ICES Council Meeting 2010, Nantes, France, 15–18 June 2010.
49. Leonhard, S.B.; Stenberg, C.; Støttrup, J.G. *Effect of the Horns Rev 1 Offshore Wind Farm on Fish Communities: Follow-Up Seven Years after Construction*; DTU Aqua (National Institute of Aquatic Resources): Lyngby, Denmark, 2011.
50. Brünnner, L.; Knudsen, F.R.; Nygaard, K.; Hvidt, C.B.; Christensen, J.; Leonhard, S.B.; Moeslund, B.; Spanggaard, G.; Cochran, M. Hydroacoustic monitoring of fish communities in offshore wind farms. In *Proceedings of Final Results: The Danish Monitoring Programme Offshore Wind Farms and the Environment*, Copenhagen, Denmark, 27–29 November 2006.
51. Gill, A.B.; Taylor, H. The potential effects of electromagnetic fields generated by cabling between offshore wind turbines upon elasmobranch fishes. *Countryside Council for Wales*; Countryside Council for Wales and University of Liverpool: Banor, Wales, 2001.
52. Gill, A.B.; Huang, Y.; Gloyne-Phillips, I.; Metcalfe, J.; Quayle, V.; Specner, J.; Wearmouth, V. *COWRIE 2.0 Electromagnetic Fields (EMF) Phase 2: EMF-Sensitive Fish Response to EM Emissions from Sub-Sea Electricity Cables of the Type Used by the Offshore Renewable Energy Industry*; COWRIE Ltd.: London, UK, 2009.
53. Carstensen, J.; Henriksen, O.D.; Teilmann, J. Impacts of offshore wind farm construction on harbour porpoises: acoustic monitoring of echo-location activity using porpoise detectors (T-PODs). *Mar. Ecol. Prog. Ser.* **2006**, *321*, 295–308.
54. Nedwell, J.; Howell, D. *A Review of Offshore Windfarm Related Underwater Noise Sources*; COWRIE Ltd.: London, UK, 2004.
55. Norro, A.; Haelters, J.; Rumes, B.; Degraer, S. Underwater noise produced by the piling activities during the construction of the Belwind offshore wind farm (Bligh Bank, Belgian marine waters). In *Offshore Wind Farms in the Belgian Part of the North Sea: Early Environmental Impact Assessment and Spatio-Temporal Variability*, Royal Belgian Institute of Natural Sciences, Marine Ecosystem Management Unit: Brussels, Belgium, 2010.
56. Tougaard, J.; Carstensen, J.; Teilmann, J.; Bech, N.I.; Skov, H.; Henriksen, O.D. *Effects of the Nysted Offshore Wind Farm on Harbour Porpoises*; Ministry of the Environment: Roskilde, Denmark, 2005.
57. Tougaard, J.; Tougaard, S.; Jensen, R.C.; Jensen, T.; Teilmann, J.; Adelung, D.; Liebsch, N.; Müller, G. *Harbour seals on Horns Reef before, during and after Construction of Horns Rev Offshore Wind Farm*; Fisheries and Maritime Museum: Esbjerg, Denmark, 2006.

58. Bailey, H.; Clay, G.; Coates, E.A.; Lusseau, D.; Senior, B.; Thompson, P.M. Using T-PODs to assess variations in the occurrence of coastal bottlenose dolphins and harbour porpoises. *Aquat. Conserv. Mar. Freshw. Ecosyst.* **2010**, *20*, 150–158.
59. Betke, K. *Measurement of Underwater Noise Emitted by an Offshore Wind Turbine at Horns Rev*. Institut für technische und angewandte Physik GmbH: Oldenburg, Germany 2006.
60. Brandt, M.J.; Diederichs, A.; Betke, K.; Nehls, G. Responses of harbour porpoises to pile driving at the Horns Rev II offshore wind farm in the Danish North Sea. *Mar. Ecol. Prog. Ser.* **2011**, *421*, 205–216.
61. Madsen, P.; Wahlberg, M.; Tougaard, J.; Lucke, K.; Tyack, P. Wind turbine underwater noise and marine mammals: Implications of current knowledge and data needs. *Mar. Ecol. Prog. Ser.* **2006**, *309*, 279–295.
62. Thomsen, F.; Lüdemann, K.; Kafemann, R.; Piper, W. *Effects of Offshore Wind Farm Noise on Marine Mammals and Fish*; COWRIE Ltd.: London, UK, 2006.
63. Gilles, A.; Scheidat, M.; Siebert, U. Seasonal distribution of harbour porpoises and possible interference of offshore wind farms in the German North Sea. *Mar. Ecol. Prog. Ser.* **2009**, *383*, 295–307.
64. Edrén, S.M.C.; Teilmann, J.; Dietz, R.; Carstensen, J. *Effect from the Construction of Nysted Offshore Wind Farm on Seals in Rødsand Seal Sanctuary based on Remote Video Monitoring*; Ministry of the Environment: Copenhagen, Denmark, 2004.
65. Edrén, S.; Andersen, S.M.; Teilmann, J.; Carstensen, J.; Harders, P.B.; Dietz, R.; Miller, L.A. The effect of a large Danish offshore wind farm on harbor and gray seal haul-out behavior. *Mar. Mammal Sci.* **2010**, *26*, 614–634.
66. Skeate, E.R.; Perrow, M.R.; Gilroy, J.J. Likely effects of construction of Scroby Sands offshore wind farm on a mixed population of harbour Phoca vitulina and grey Halichoerus grypus seals. *Mar. Pollut. Bull.* **2012**, *64*, 872–881.
67. Tougaard, J.; Ebbesen, I.; Tougaard, S.; Jensen, T.; Teilmann, J. *Satellite Tracking of Harbour Seals on Horns Reef*; Fisheries and Maritime Museum: Esbjerg, Denmark, 2003.
68. Teilmann, J.; Dietz, R.; Larsen, F.; Desportes, G.; Geertsen, B.M.; Andersen, L.W.; Aastrup, P.J.; Hansen, J.R.; Buholzer, L. *Satellite Tracking of Harbour Porpoises in Danish and Adjacent Waters*; NERI Tech. Rep.: Copenhagen, Denmark, 2004.
69. Koschinski, S.; Culik, B.M.; Henriksen, O.D.; Tregenza, N.; Ellis, G.; Jansen, C.; Kathe, G. Behavioural reactions of free-ranging porpoises and seals to the noise of a simulated 2 MW windpower generator. *Mar. Ecol. Prog. Ser.* **2003**, *265*, 263–273.
70. Thompson, P.M.; Lusseau, D.; Barton, T.; Simmons, D.; Rusin, J.; Bailey, H. Assessing the responses of coastal cetaceans to the construction of offshore wind turbines. *Mar. Pollut. Bull.* **2010**, *60*, 1200–1208.
71. Dietz, R.; Teilmann, J.; Henriksen, O.D.; Laidre, K. Satellite tracking as a tool to study potential effects of offshore wind farm on seals at Rødsand; NERI Tech. Rep.: Copenhagen, Denmark, 2001.
72. Scheidat, M.; Tougaard, J.; Brasseur, S.; Carstensen, J.; van Polanen Petel, P.; Teilmann, J.; Reijnders, P. Harbour porpoises (*Phocoena phocoena*) and wind farms: a case study in the Dutch North Sea. *Environ. Res. Lett.* **2011**, *6*, doi:10.1088/1748-9326/6/2/025102.