

Resource and Constraints
Assessment for Offshore Wind

Characterisation Area Report
North Wales

16

Characterisation Area Report: 16 - North Wales

38255-TCE-REP-021 Characterisation Area Report: 16 – North Wales		
Version	Status	Issue date
1.1	Draft	July 2018
1.2	Draft	November 2018
1.3	Final	September 2019

The information included in this report should be read in conjunction with the *Resource and Constraints Assessment for Offshore Wind: Methodology Report* and the *Summary Stakeholder Feedback Report*. The trigger distance for constraints to be included in the constraints analysis section of this report is 1 nautical mile (NM).

The Crown Estate has undertaken the analysis in this report using the evidence available to it, internal expertise and support from external advisers where appropriate. The analysis does not obviate any potential need for any Habitat Regulations Assessment (HRA) or any project level consideration of the potential impact of development. The analysis does not supersede any statutory policies or marine plans. The analysis, including the data and information contained in this document, presents a point in time assessment with changes likely to both the presence and nature of constraints.

This report is provided for information purposes only and no party may rely on the accuracy, completeness or fitness of its content for any particular purpose. The Crown Estate makes no representation, assurance, undertaking or warranty in respect of the analysis in the report including all data and information contained in it.

Receptor rating	Area rating
Receptor assessed but no interaction noted	Receptor assessed but no interaction noted
Interaction acceptable with best practice/accepted mitigation	The constraint will present the need to implement best practice/accepted mitigation measures to enable acceptable development within the whole area
Interaction acceptable with moderate mitigation	The constraint will present the need to implement moderate mitigation measures to enable acceptable development within the whole area
Interaction acceptable with significant mitigation	The constraint will present the need to implement significant and/or strategic level mitigation measures to enable acceptable development within the whole area
Significant/insurmountable issue that would be challenging to mitigate within the area of influence of a receptor	Significant/insurmountable issue that would be challenging to mitigate for any development within the whole area
No data coverage across the area	No data coverage across the area

Constraints analysis

Note that in addition to The Crown Estate leases/licences within this table, The Crown Estate has also identified key resource areas (KRAs) which may be suitable for the future development of different marine sectors. Information about overlapping KRAs that overlap this characterisation area is described in a latter section of this document.

Exclusions model — Hard constraints			Receptor rating	Area rating
	Present	Commentary		
The Crown Estate agreements	Telecoms cables and interconnectors: there are a few active and inactive telecoms cables intersecting the north and centre of the characterisation area, and one interconnector the south. The cables all land into Liverpool and North Wales.	The cables have been removed from the characterisation area and should be avoided where possible by using best practice/accepted mitigation. However, the number of cables present is relatively low, so they are not considered to be a significant concern for future offshore wind development. Since cable crossings require cable protection (which may have adverse environmental effects), crossings should be minimised where practicable.		
	Pipelines: there are a few pipelines adjacent to the eastern boundary of the site with landfall in North Wales.	It is not anticipated that these pipelines would have a significant effect on future offshore wind development.		
	Gwynt y Môr Wind Farm: adjacent to the south-east boundary of the characterisation area.	There may be concerns around wind resource and proximity to existing site. There will need to be a 5 km buffer around existing offshore wind projects – any new wind developments within 5 km will need the permission of the incumbent party. Cumulative pressures around landing locations for export cables may also cause concern.		
	The Crown Estate has completed a plan-level Habitats Regulations Assessment for 2017 Offshore Wind Extensions and intends to grant right for: <ul style="list-style-type: none"> Gwynt y Môr Wind Farm (extension of up to 576 MW). This extension is situated along the southern section of the characterisation area.	As with other offshore wind farms (OWF), a 5 km buffer will be in place around the final area under lease for this extension project. Any new wind developments within 5 km will need the permission of the incumbent party. Proposals for projects coming forwards through new leasing should be cognisant of this extension and potential cumulative impacts on all receptors. There is potentially a significant increase to deployed capacity through this project in an area which already has significant levels of deployment of offshore wind. This has potential to add more constraint to the area.		
Other energy infrastructure	There are two platforms within 1.3 km of the area. These are situated on the easterly edge of the area.	Oil and gas activity is minimal in this area. The 0-3 and 3-6 NM helicopter consultation zones around platforms overlap with less than 9% of this characterisation area in total.		
Navigation	There are three traffic separation schemes in the area that manages access around Liverpool Bay and around Anglesey.	The schemes meant that traffic is concentrated into defined routes due to volume of vessels and safety reasons. Any impact on the traffic separation scheme should be avoided where possible, although there is significant potential elsewhere in the area for this not to be an issue.		
Social	None within the trigger distance.			
Restrictions model — Soft constraints			Receptor rating	Area rating
Economic Tier				
Navigation	Significant traffic exiting Liverpool and traversing through the southern edge of the area or heading north-west to Northern Ireland or the Straits of Moyle.	Significant volume of traffic may restrict the ability to develop in large swaths of the area.		
Subsurface	None within the trigger distance.			
Fishing	<i>See fisheries commentary below.</i>		N/A	

Environmental tier						
The assessment of the sensitivity of Marine Protected Areas (MPAs) to pressures caused by offshore wind development and operation is assessed in a separate spreadsheet which will be made available as part of the Round 4 evidence base. Commentary has been noted in the relevant characterisation document where MPAs either overlap or are within 1 NM of the characterisation area and have been assessed as a yellow rating or above. For more information on the methodology for this assessment, please refer to the methodology report.						
Assessments of Annex II species have not been made as part of the characterisation process. Such assessments will need to be undertaken at project level for individual developments within the characterisation area.						
Type of designation	Name of designation	Designated features/species	Conservation objectives	Commentary	Receptor rating	Area rating
European marine designations	Special Areas of Conservation (SACs)	Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay (20 m)				
	Harbour porpoise SAC	North Anglesey Marine	Harbour porpoise	<p>To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters</p> <p>In the context of natural change, this will be achieved by ensuring that:</p> <ol style="list-style-type: none"> 1. Harbour porpoise is a viable component of the site; 2. There is no significant disturbance of the species; and 3. The condition of supporting habitats and processes, and the availability of prey is maintained. <p>This is similar to the protection afforded to harbour porpoise throughout their range by the European Protected Species (EPS) regulations in the UK. However, the Natura 2000 principles and HRA tests set the bar higher than EPS protection for impacts on the site as the protection is no longer solely considering effects on the population as a whole but making sure that the site is contributing positively to the species' Favourable Conservation Status.</p>	<p>This site was fully designated in February 2019. Harbour porpoise could be affected by offshore wind development in the area, mainly through acoustic impacts (disturbance and hearing damage) from pile driving, UXO clearance and possibly some geotechnical surveys. Disturbance and barrier effects arising from vessel movements and presence of turbines may also occur.</p> <p>The noise disturbance during wind farm construction is likely to be significant if using pile-driving to install the turbine foundations, and there is also a risk from UXO clearance. There will be a need to consider population level effects of disturbance (mainly during construction), and there may be some additional requirements to investigate potential impacts on prey species.</p> <p>The designation of harbour porpoise SACs will undoubtedly have consequences as to how some activities operate, and measures may need to be put in place to reduce disturbance. Implementation of any disturbance management is likely to be challenging given the complexity of marine activities, regulatory arrangements and scientific uncertainty surrounding the significance of noise impacts on harbour porpoise. The approach recommended by SNCBs is that developers should ensure that there is sufficient time between the assessment and the start of construction for them to effectively implement mitigation/management, which could include:</p> <ol style="list-style-type: none"> 1. Careful spatial planning and phasing of noisy activities. 2. Use of alternative foundations that do not require pile driving (e.g. suction buckets, gravity bases), noting that these may have other impacts. 3. Use of alternative methods of installation (e.g. vibropiling) to reduce the noise footprint. 4. Use of technology to reduce the sound levels at source or to minimise sound propagation and reduce the noise footprint. <p>Harbour porpoise occur in elevated densities in some parts of the site compared to others during summer and winter. This may make mitigation slightly easier since summer is likely to be the most important construction season.</p> <p>The SNCBs and The Wildlife Trusts have concerns over the potential cumulative impacts on harbour porpoise within this SAC, and note that currently there is no mechanism to ensure that a strategic</p>	

					<p>approach to the management of impacts is taken. They consider that this could be a significant consenting risk for offshore wind development in the North Sea characterisation areas.</p> <p>In parallel to new offshore wind leasing, The Crown Estate has committed to fund a collaborative programme of strategic enabling actions to increase the evidence base and support sustainable and coordinated expansion of offshore wind. Underwater noise and its management, assessment of impacts on sensitive receptors, and approaches to modelling and assessment, are all likely to form a key priority area for further work, and we anticipate collaborating with stakeholders on new work streams under the programme to help address outstanding evidence gaps.</p> <p>The overlap with this MPA is limited to the western side of the characterisation area although impacts on the site will still occur even where overlaps do not. For this reason the area rating is yellow.</p>		
Sites of Community Importance (SCIs)	None within the trigger distance						
Ramsar	None within the trigger distance						
Special Protection Areas (SPAs)	Anglesey Terns / Morwenoliaid Ynys Môn	Roseate tern (breeding) Common tern (breeding) Arctic tern (breeding) Sandwich tern (breeding)	In 2008 the populations were all assessed as favourable with the exception of roseate tern which was unfavourable. Conservation objectives are to maintain/enhance populations and their supporting habitat.		<p>Tern species forage offshore and are likely to be impacted by offshore wind turbines (vis. Docking Shoal/Race Bank). Population sizes at this site are significant for Wales and the UK, making the site potentially the second largest sandwich tern colony in the UK. The SPA extends and replaces the Ynys Feurig, Cemlyn Bay and The Skerries SPA and has been designated to support offshore habitats used by terns as well as their breeding areas. The majority of the SPA has been excluded from the characterisation area, and consequently the potential impact on terns is likely to be greatly reduced. Potential impacts from cabling on onshore habitats are likely to be mitigable/avoidable.</p> <p>Royal Society for the Protection of Birds (RSPB) considers that there could be significant cumulative impacts on sandwich tern from this site arising from existing wind farms (Gwynt y Môr), possible extension sites and development within the Anglesey and North Wales characterisation areas. They also note the connectivity of this site with the Dee Estuary SPA.</p>		
SPA	Liverpool Bay / Bae Lerpwl	Common scoter (wintering) Red-throated diver (wintering) Little gull Waterfowl assemblage (including in particular Red-Breasted Merganser and Cormorant) Little tern (breeding)	Draft revised Conservation Objectives (July 2016) indicate that populations should be stable or increasing and that the supporting habitat should be maintained (this includes areas which are of importance for little gull, and to protect important foraging areas for little tern and common tern).		<p>Common scoter and red-throated diver are sensitive to displacement from offshore wind projects, and gulls and terns are sensitive to collision risk. The exclusion of the majority of the SPA area from the characterisation area will go a long way to mitigating impacts on these species. However, it should be noted that displacement may occur for up to 12 km away for red-throated diver and they are also sensitive to displacement by increases in boat traffic. This will need to be taken into account for impact assessments.</p> <p>This site crosses the border between England and Wales. Advice should be sought from both Natural England and Natural Resources Wales.</p>		

			Common tern		<p>RSPB note that whilst common and little tern from this site tend to be associated with shallow inshore waters, offshore wind development in the North Wales, Irish Sea or Anglesey characterisation areas could have an impact on them.</p> <p>RSPB have concerns about the in-combination displacement of scoter and red-throated diver within this site.</p> <p>RSPB note that there are significant numbers of cormorant within this site (as well as the overlapping Puffin Island/Ynys Seiriol SPA) and that these should be considered as part of any impact assessment.</p>		
	Potential Special Protection Area (pSPA)	None within the trigger distance					
Marine Conservation Zones (MCZs)		None within the trigger distance					
Sites of Special Scientific Interest (SSSIs)		None within the trigger distance					
Spawning and nursery grounds		There are a number of overlaps in the area (up to nine) with the data showing this area to be important for spawning and nursery for juvenile fish.			Noise disturbance has the potential to be an issue with the potential for restrictions on piling during breeding seasons. It will depend if the spawning grounds are still active and their precise locations (which may need to be determined by surveys). Cod are particularly sensitive to noise impacts.		
Social tier							
Royal Yachting Association (RYA) Automatic Identification System (AIS) intensity		Some traffic exits Liverpool and heads along the boundary of the area. The characterisation area is within a high-intensity cod spawning ground, while the north of the area is close to a high-intensity herring spawning habitat.			Not the level of density that would be a concern and easily mitigatable.		
Marinas		None within the trigger distance.					
Bathing beaches		None within the trigger distance.					
Visibility from sensitive receptors		See visual analysis below.					

Review layers

Visibility from landscape designations and from the coast

The bands of significant visual impact are taken from the OSEA3¹ environmental report. It should be noted that these bands were challenged through the statutory stakeholder engagement by the Statutory Nature Conservation Bodies (SNCBs) so further analysis and engagement should be conducted to understand the visual constraint in potential development areas more fully.

The visibility from landscape designations analysis has been conducted using designations which include protections for landscapes and settings namely: National Parks, Areas of Outstanding Natural Beauty (AONBs), Heritage Coasts and World Heritage sites. For more information on these, please consult the methodology report. The analysis draws on visibility from these designations but not the sensitivity of them to offshore wind developments. Proposals should draw on the relevant management plans or local policies to fully understand the level of constraint that exists in the vicinity of these landscape designations. As such, more analysis is required to fully understand the potential constraint.

	Band of significant visual impact	% of overlap with the characterisation area	Commentary	Area rating
Medium sensitivity receptors	0-13 km (3.6 MW turbines)	16%	Some of this area is within 30 km of the coast. There is still a significant area available in the 20-30 km range and outside of 30 km that will mean impacts can be mitigated through appropriate siting. Note that the north-western boundary of the area is visible from the Isle of Man. Also, feedback from the Natural Resources Wales is that anything west of Great Orme will be particularly sensitive.	
	13-20 km (4-8 MW turbines)	14%		
	20-30 km (10-15 MW turbines)	28%		
High sensitivity receptors	0-30 km	57%		

Visibility of sea surface from landscape designations		Receptor rating	Area rating
The southern edge of the area is visible from: <ul style="list-style-type: none"> Anglesey AONB North Anglesey and Great Orme Heritage Coasts Snowdonia National Park 	Development in the south of this area may be an issue due to the impact on potential sensitive visual receptors.		

Ornithology outside of Special Protection Areas (SPAs) for high-risk species

Joint Nature Conservation Committee (JNCC), Natural England and Royal Society for the Protection of Birds (RSPB) advise that there are a number of information sources which should be taken into consideration in the assessment of potential impacts from offshore wind development in this characterisation area. These are:

- Site Information Centres on the JNCC website (<http://jncc.defra.gov.uk/page-6895>) which provide up-to-date information on protected areas, their features and status.
- Marine Ecosystems Research Programme (MERP) seabird distribution maps (https://marine-ecosystems.org.uk/Research_outcomes/Top_predators)
- Future of the Atlantic Marine Environment (FAME) and Seabird Tracking and Research (STAR) tracking data from the RSPB (<https://rspb.maps.arcgis.com/apps/Cascade/index.html?appid=d6c3aa1ec7184a2895a01cebf451c7b3>)
- Wakefield, E., Owen, E., Baer, J., Carroll, M., Daunt, F., Dodd, S., Green, J., Guilford, T., Mavor, R., Miller, P., Newell, M., Newton, S., Robertson, G., Shoji, A., Soanes, L., Votier, S., Wanless, S. & Bolton, M. (2017) Breeding density, fine-scale tracking, and large-scale modeling reveal the regional distribution of four seabird species. *Ecological Applications* <https://doi.org/10.1002/eap.1591>
- Cleasby, I.R., Owen, E., Wilson, L.J., Bolton, M. (2018) Combining habitat modelling and hotspot analysis to reveal the location of high density seabird areas across the UK: Technical Report. RSPB Research Report no. 63
- Kober, K., Webb, A., Win, I., Lewis, M., O'Brien, S., Wilson, L.J., Reid, J.B. (2010) An analysis of the numbers and distribution of seabirds within the British Fishery Limit aimed at identifying areas that qualify as possible marine SPAs. JNCC Report 431 (and the distribution maps therein) (<http://jncc.defra.gov.uk/page-5622>)
- Sansom, A., Wilson, L.J., Caldow, R.W.G. & Bolton, M. 2018. Comparing marine distributions maps for seabirds during the breeding season derived from different survey and analysis methods. *PLOS ONE* <https://doi.org/10.1371/journal.pone.0201797>
- Bradbury, G., Trinder, M., Furness, B., Banks, A.N., Caldow, R.W.G. & Hume, D. 2014. Mapping Seabird Sensitivity to Offshore Wind Farms. *PLoS ONE* 9(9): e106366. doi:10.1371/journal.pone.0106366

¹ BEIS (2016), OSEA3 Environmental Report. Crown copyright 2016, p 291. URN 16D/033.

- Thaxter, C.B., Ross-Smith, V., Bouten, W., Clark, N., Conway, G., Rehfish, M. & Burton, N. (2015) Seabird–wind farm interactions during the breeding season vary within and between years: A case study of lesser black-backed gull *Larus fuscus* in the UK. *Biological Conservation* 186: 347-358

Species	Site	Commentary on coverage	Area rating
Gannet	Grassholm SPA	<p>The gannet mean maximum seaward foraging range extends 229 km from the source colony at Grassholm SPA. This range overlaps six other characterisation areas in addition to overlapping the southern edge of the North Wales area, which lies in the north of the foraging radius. Cumulative collision risk effects should be considered if development is taken forward in more than one of these characterisation areas. Given the limited existing offshore wind development in the Grassholm foraging range, cumulative impacts will most likely focus on the cumulative effects of new development in the characterisation areas.</p> <p>Summer density of gannet in the North Wales characterisation area is not uniformly distributed, with patches of higher gannet closer to the coastline of Anglesey, and in the north and east of the characterisation area. Some of this increased density could be due to overlap with the foraging range of gannet from the Ailsa Craig colony in Scotland (not assessed). Given the relatively small spatial overlap between the characterisation area and the Grassholm foraging range, any contribution of development in the North Wales area towards cumulative impacts on the Grassholm SPA are likely to be considered <i>de minimis</i>.</p>	
Lesser black-backed gull	Ribble and Alt Estuaries SPA	<p>The lesser black-backed gull mean maximum seaward foraging range extends 141 km from the Ribble and Alt Estuaries SPA, encompassing the North Wales characterisation area. Two other characterisation areas lie within this foraging range, as well as a high level of existing offshore wind development; cumulative collision risk effects are therefore likely to be a key consent consideration for any development in this characterisation area.</p> <p>Summer density of the lesser black-backed gull is concentrated closer to shore around the SPA colony, and in the central part of the Liverpool Bay region. Lesser black-backed gull density is relatively low in the southern part of the North Wales characterisation area; locating any development in the south of the area would help minimise any impacts on this SPA colony.</p> <p>RSPB advise the use of the British Trust of Ornithology's (BTO) tracking data for lesser black-backed gull from colonies in the north-west of England to assist with impact assessments.</p>	
Lesser black-backed gull	Morecambe Bay and Duddon Estuary SPA	<p>The lesser black-backed gull mean maximum seaward foraging range extends 141 km from the Morecambe Bay and Duddon Estuary SPA, encompassing the North Wales characterisation area. Two other characterisation areas lie within this foraging range, as well as a high level of existing offshore wind development; cumulative collision risk effects are therefore likely to be a key consent consideration for any development in this characterisation area.</p> <p>Summer density of the lesser black-backed gull is concentrated closer to shore around the SPA colony, and in the central part of the Liverpool Bay region. Lesser black-backed gull density is relatively low in the southern part of the North Wales characterisation area; locating any development in the south of the area would help minimise any impacts on this SPA colony.</p> <p>RSPB advise the use of BTO's tracking data for lesser black-backed gull from colonies in the north-west of England to assist with impact assessments.</p>	
Lesser black-backed gull	Bowland Fells SPA	<p>The Bowland Fells SPA is situated inland of the Morecambe Bay and Duddon Estuary SPA. The lesser black-backed gull mean maximum seaward foraging range extends 141 km from the SPA, encompassing the North Wales characterisation area. The Irish Sea characterisation area also lies within this foraging range, as well as a high level of existing offshore wind development; cumulative collision risk effects are therefore likely to be a key consent consideration for any development in this characterisation area.</p> <p>Summer density of the lesser black-backed gull is concentrated closer to shore between Morecambe Bay and the Ribble and Alt Estuaries, and in the central part of the Liverpool Bay region. Lesser black-backed gull density is relatively low in the southern part of the North Wales characterisation area; therefore, locating any development in the south of the area would help minimise any impacts on this SPA colony.</p> <p>RSPB advise the use of BTO's tracking data for lesser black-backed gull from colonies in the north-west of England to assist with impact assessments.</p>	
Sandwich tern	Dee Estuary SPA	<p>The sandwich tern mean maximum seaward foraging range extends 49 km from the Dee Estuary SPA, overlapping the south-eastern edge of the North Wales characterisation area. Cumulative impacts of development within the North Wales area with other offshore wind development are likely to be a key consent consideration. Given most of the North Wales area lies outside the sandwich tern foraging range, mitigation is possible so that any contribution to cumulative impacts on sandwich tern could be considered <i>de minimis</i>.</p>	

Summer density of sandwich tern is highest at the mouth of the Dee Estuary, with a band of slightly increased density extending approximately 20 km from the coastline. Locating any development in the north and west of the North Wales characterisation area, and beyond the mean maximum sandwich tern foraging range (i.e. > 49 km) would help minimise any impacts on the Dee Estuary SPA colony.

Ministry of Defence (MoD) activity

Issues when using 250 m tip heights		Issues when using 350 m tip heights	Receptor rating
Air traffic control (ATC)	Royal Air Force (RAF) Valley Primary Surveillance Radar (PSR) and Precision Approach Radar (PAR) concerns with turbines over a small part of the area to the south-west. Warton Aerodrome ATC radar concerns. Great Dunfell radar concerns.	RAF Valley PSR and PAR concerns with turbines over a small part of the area to the south-west. Warton Aerodrome ATC radar concerns. Great Dunfell radar concerns.	
Air defence radar (ADR)	No ADR concerns.	No ADR concerns.	
Threat radar	No threat radar concerns.	No threat radar concerns.	
Low flying	No low flying concerns, however, there will be a lighting requirement.	No low flying concerns, however, there will be a lighting requirement.	
Ranges, danger and exercise areas	UXO should be taken into account. The MoD would need to review routes to ensure highly surveyed routes are not obstructed by either cables or turbines. Routing cables through and coming ashore at the Altcar ranges would be a concern.	UXO should be taken into account. The MoD would need to review routes to ensure highly surveyed routes are not obstructed by either cables or turbines. Routing cables through and coming ashore at the Altcar ranges would be a concern.	
Area commentary			Area rating
ATC concerns are the primary issue in this area which have mitigation solutions that can be implemented.			
There will be a lighting requirement and consideration of UXO as per standard industry practice.			

Fishing activity

Gear type	Location and comments	Area rating
Mobile gear	<ul style="list-style-type: none"> Broadly similar to the Northern Irish Sea in terms of species (<i>Nephrops</i> and scallops with potential for cod). There are some Belgian vessel operating in and around the Liverpool Bay area targeting Dover sole using beam trawlers and these can fish up to 6 NM from shore. 	
Other	<ul style="list-style-type: none"> There are mussel beds against the Welsh coast. Primary <i>Nephrops</i> muddy habitat is off the Cumbrian Coast and south of the Isle of Man. 	
Area commentary		Area rating
While there is lots of activity, there is also lots of opportunity. There is information from existing wind farms. There may be data available from Succorfish iVMS units which would be of use in the area. This is available on request from Natural Resources Wales.		

Future oil and gas

Licensing round	Commentary	Receptor rating	Area rating
28 th and 29 th rounds- to the east of the area	One new block (110/12b) licenced via 28 th round. Overlaps with existing helicopter consultation buffers so low additional constraint.		
31 st round	In the 31 st offshore licensing round there are 8 licences that have been awarded that intersect the North Wales characterisation area. They are located in the northern part of the characterisation area and may present a significant additional constraint.		

Marine plans

Please note there is one marine plan area in Wales, encompassing Welsh inshore and offshore waters. The Welsh Government is responsible for preparing a Marine Plan for Wales. The Welsh National Marine Plan was consulted on, between December 2017 and March 2018. Welsh Government have been working with stakeholders to address issues raised through the consultation and it is now being finalised. The Welsh Government are aiming for adoption of the plan in Autumn 2019, subject to seeking approval of the plan from the UK Government. The analysis below is based on the published draft Welsh National Marine Plan.

Welsh National Marine Plan (Draft)	Spatially explicit policies	Issues	Area rating
Aggregates	<p>AGG04: proposals potentially affecting Strategic Resource Areas for aggregate extraction should demonstrate how, in order of preference, they:</p> <ul style="list-style-type: none"> a) avoid adverse impacts on future potential aggregate extraction in those areas; b) minimise impacts where they cannot be avoided; c) mitigate impacts where they cannot be minimised; and, d) should present the case for proceeding where (a-c) are not possible. 	<p>The characterisation area overlaps with the aggregate strategic resource area identified in the draft Welsh National Marine Plan. Any new offshore wind development would need to consider impacts to the aggregates industry and negotiation with the aggregates sector would be required.</p> <p>Whilst The Crown Estate leases/licences seabed for offshore wind and aggregate extraction it should be noted that aggregates tendering rounds currently run every two years, and so the requirement for liaison between industries will be ongoing.</p>	
Aquaculture	<p>AQU03: proposals potentially affecting Strategic Resource Areas for aquaculture should demonstrate how, in order of preference, they:</p> <ul style="list-style-type: none"> a) avoid adverse impacts on future potential aquaculture activity in those areas; b) minimise impacts where they cannot be avoided; c) mitigate impacts where they cannot be minimised; and, d) should present the case for proceeding where (a-c) are not possible. 	<p>The characterisation area overlaps with the seabed strategic resource area and water column strategic resource area for aquaculture identified in the draft Welsh National Marine Plan. Any new offshore wind development would need to consider impacts to the aquaculture industry and negotiation with the aquaculture sector would be required.</p>	
Ports and shipping	<p>P&S03: proposals potentially affecting strategic resource area for:</p> <ul style="list-style-type: none"> a) established commercial navigation routes; b) pilot boarding areas and commercial anchorages; or c) existing port, harbour and marina activities and their potential for future expansion. <p>Including where a consent or authorisation has been granted or formally applied for, should not be authorised except where compatibility with the existing, authorised or proposed activity can be satisfactorily demonstrated or there are exceptional circumstances. Compatibility should be achieved, in order of preference, through:</p> <ul style="list-style-type: none"> a) avoiding adverse impacts on those activities; b) minimising impacts where they cannot be avoided; or, 	<p>The characterisation area intersects with the strategic resource area for shipping as identified in the draft Welsh National Marine Plan. Any new offshore wind development would need to account for navigation routes when locating the project area.</p>	

	<p>c) mitigating impacts where they cannot be minimised.</p> <p>If adequate compatibility cannot be achieved, proposals should present the case for proceeding.</p>		
Tidal range energy	<p>ELC04: proposals potentially affecting strategic resource areas for renewable energy (including those within the UK Offshore Energy SEA process) should demonstrate how, in order of preference, they:</p> <p>a) avoid adverse impacts on future potential renewable energy activities in those areas; b) minimise impacts where they cannot be avoided; c) mitigate impacts where they cannot be minimised; and, d) should present the case for proceeding where (a-c) are not possible.</p>	<p>There is some overlap in the southern part of the characterisation area with the tidal range energy strategic resource area identified in the draft Welsh National Marine Plan. Any new offshore wind development would need to consider impacts to the tidal range industry and negotiations with the tidal stream sector would be required.</p>	
Tidal stream energy		<p>There is no overlap of the characterisation area with the tidal stream energy strategic resource area identified in the draft Welsh National Marine Plan.</p>	
Wave energy		<p>There is no overlap of the characterisation area with the wave energy strategic resource area identified in the draft Welsh National Marine Plan.</p>	

The Crown Estate key resource areas (KRAs) for other sectors

KRA category	Where?	Commentary	Receptor rating	Area rating
Cables	Intersects the proportion of the area within 12 NM.	This KRA is significant in size and does not give a strong enough signal to be seen as a significant constraint development in this area.		
Carbon Capture Storage (CCS) stores	Overlaps with an aquifer which is rated as moderate.	These sites are not the most favourable in terms of development potential so present little constraint.		
CCS infrastructure	Wide coverage across the area.	This KRA is significant in size and does not give a strong enough signal to be a significant constraint development in this area.		
Minerals	Covering the inshore waters around Mersey Bay.	Small market currently but this will increase in future (maybe 5-10 years). There is an area of good potential resource between the Gwynt y Môr and Burbo Bank wind farms that should be avoided if possible. In addition, the Welsh Marine Plan strategic resource areas gives extra policy context for the management of this and other aggregate resources in the area.		
Pipelines	Only slightly covering the south-western part of the area within 12 NM.	This KRA is significant in size and does not give a strong enough signal to be a significant constraint development in this area.		
Sandscaping	Covers all the area inside 12 NM.	This KRA is significant in size and does not give a strong enough signal to be a significant constraint development in this area.		
Tidal Range	No interaction.			
Tidal Stream	Slight overlap to the south.	There is some interest in this tidal stream resource but there is significant opportunity elsewhere in the area.		
Wave	No interaction.			

National Air Traffic Services (NATs) radar overlap

% Overlap with Primary Surveillance Radar (PSR) assessment buffer (200 m turbines)	Commentary	Area rating
100.00%	Intersect throughout the area so a further risk assessment will be required with site specific mitigation options only available rather than siting.	

Water Framework Directive (WFD)

% of the area covered	Spatial overlap with the area	Commentary	Area rating
No intersect			

Marine Cultural Heritage

Heritage asset type	Where?	Commentary on sensitivity from offshore wind development	Receptor rating
Maritime archaeology and wrecks	Significant potential throughout the characterisation area, but particularly in proximity to the north Anglesey coast and along shipping routes on the approaches into the Port of Liverpool e.g. south parts and north-east area edges.	<p>There is potential for maritime archaeological material from the Palaeolithic to the present day to be present and to be affected by OWF development in the North Wales characterisation area.</p> <p>The area contains a number of wrecks, obstructions and historic losses, with concentrations off the North Anglesey coast, along shipping routes and on the approaches into the Port of Liverpool. Liverpool played a major role in the expansion of trade in England and with the New World in the 18th Century, and a number of ships attempting to access the Port have been lost in the characterisation area. The waters to the north of Anglesey contain a number of wrecks, owing to the dangers to navigation presented by the coastal topography and notoriously treacherous sea conditions. There is a dominance of steel and metal vessels from the 19th and 20th Centuries in the known records, but with significant potential for recovery of wrecks associated with local fishing, and trade from the 18th Century onwards at Liverpool.</p> <p>The area also played a significant role in 20th Century military conflict with a number of important shipping and supply routes from Liverpool, Ireland and the northwest of England to the Atlantic. In addition to military and trade vessels, early forms of watercraft are likely to have been used to cross the coastal waters of the characterisation area in the late Palaeolithic and early Mesolithic.</p> <p>Established procedures exist to ensure that any historic wrecks and associated remains, both known and unknown, are identified as part of any proposed OWF development and impacts are mitigated and minimised.</p>	
Aviation archaeology	Potential for recovery of aviation archaeological remains throughout characterisation area.	<p>Despite there not being a concentration of crashed aircraft remains, there is potential in North Wales for the recovery of crashed aircraft and associated material from airborne military conflict in the second World War. The skies above the area saw conflict, with aircraft being involved in the protection of merchant shipping and passenger vessels in the Irish sea and to the north-west of England, and in defence of important centres and strategic locations along the coast, including the Merseyside area. The RAF base at Woodvale on Merseyside was constructed in late 1941, shortly after the height of the Liverpool Blitz. There are few known aircraft wrecks which have been identified in the area due to the difficulties associated with detecting these sites on the seabed. However, the potential for sites to be discovered is indicated by historic records attest to there being a high number of losses in the area. Any remains that are present may be identified or impacted on by wind farm development.</p> <p>While existing standard mitigation measures may be utilised for specific projects in the area, site-specific mitigation including excavation and recovery of significant remains that are encountered and where impacts are unavoidable may be required. It should, however, be noted that this is an extreme example and would only be undertaken following discussion with advisors and, in rare cases, where preservation <i>in situ</i> was not a feasible option.</p>	
Submerged prehistoric landscapes	Potential across the characterisation area with enhanced potential in areas close to the coast and geomorphological features such as the palaeochannels	During periods of lower sea level caused by three major glaciations (the Anglian, Wolstonian and Devensian) the North Wales characterisation area would have been covered by ice, resulting in there being limited potential for recovery of prehistoric archaeological material from these periods. Any remains there are would be expected to be associated with geomorphological features such as palaeochannels and valleys, and the geological deposits from these periods. Surviving <i>in situ</i> archaeological material may be preserved but it is likely buried under glacial sediments, with potential for derived archaeological material from the period. There is some potential for the survival of sediments and secondary context artefactual material in areas where glacial activity has not eroded earlier sedimentary deposits.	

	<p>being worked by the marine aggregate industry to the east.</p>	<p>There is potential for recovery of material associated with the late upper Palaeolithic and the Mesolithic in the North Wales characterisation area - much of which would have been exposed and potentially habitable during the Late Palaeolithic and Early Mesolithic period following the retreat of the Devensian ice sheet (c. 13,000 BP).</p> <p>This area contained geomorphological and landscape features (such as those identified in the West Coast Palaeolandscapes project) that may have been used as favourable locations by human ancestors during the Mesolithic. Significant deposits and possible finds should be anticipated in association with the early Mesolithic channel systems and other geomorphological features that were present and exposed prior to marine transgression. There is potential for remains from this period to be present and impacted by OWF development in the characterisation area.</p> <p>Established procedures exist to ensure that any submerged prehistoric landscapes, associated geographical and geomorphological features, and associated deposits, features and finds are identified as part of any proposed OWF development, so impacts can be mitigated and minimised.</p>	
<p>Area commentary</p>			<p>Area rating</p>
<p>There are a range of known heritage assets and potential for recovery of further remains across the characterisation area, with particular potential for recovery of significant historic wreck associated with trade and military functions, and prehistoric archaeological remains from the late Palaeolithic and Mesolithic. The application of standard mitigation measures on a strategic and project-specific basis will minimise the risk to underwater cultural heritage in this area.</p>			

Glossary of acronyms and abbreviations

ADR	Air Defence Radar
AONB	Area of Outstanding Natural Beauty
ATC	Air Traffic Control
BTO	British Trust of Ornithology
CCS	Carbon Capture Storage
EPS	European Protected Species
FAME	Future of the Atlantic Marine Environment
HRA	Habitat Regulations Assessment
JNCC	Joint Nature Conservation Committee
km	Kilometre
KRA	Key Resource Area
m	Metre
MCZ	Marine Conservation Zone
MERP	Marine Ecosystems Research Programme
MoD	Ministry of Defence
MPA	Marine Protected Area
MW	Mega watt
NATS	National Air Traffic Services
NM	Nautical Mile
OESEA3	Offshore Energy Strategic Environmental Assessment 3
OFTO	Offshore Transmission Owners
OWF	Offshore Wind Farm
PAR	Precision Approach Radar
pSPA	Potential Special Protection Area
PSR	Primary Surveillance Radar
Ramsar	Ramsar Convention on wetlands of international Importance especially as waterfowl habitat, also known as the 'Convention on Wetlands'.
RAF	Royal Air Force
RSPB	Royal Society for the Protection of Birds
RYA AIS	Royal Yachting Association (RYA) Automatic Identification System (AIS)
SAC	Special Area of Conservation
SCI	Site of Community Importance
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
STAR	Seabird Tracking and Research
Succorfish	Under 12m vessel tracking equipment
UXO	Unexploded Ordnance
WFD	Water Framework Directive