17 Marine Ecology

Introduction

17.1 This section of the Screening and Scoping Report describes the baseline marine ecology of the Dwyryd Estuary and the surrounding area and identifies potential impacts of the Proposed Marine Works which includes the following:

- Removal and dismantling of two pylons and their foundations (4ZC030R and 4ZC031 and the associated temporary access tracks to these locations),
- Removal of the foundations of the previously dismantled pylon 4ZC030,
- The temporary access to enable the dismantling of pylon 4ZC032 (although the pylon itself is within the terrestrial environment).

17.2 The rationale for excluding certain pressures is provided where the level of impact is considered to be minimal and therefore not significant.

Data and information

17.3 Baseline conditions have been established using data collected from site specific ecological surveys and publicly available data. Data sources have included:

- Saltmarsh Botanical Survey Visual Impact Provision (VIP) Snowdonia Project[1];
- Ecological Baseline Report (Animal) Visual Impact Provision (VIP) Snowdonia Project[2]; and
- Citation data from JNCC[3] and Natural Resources Wales (NRW)[4] websites.

Legislation Policy

17.4 Legislation and planning policy relevant to marine ecology includes:

- European Council Directive 92/43/EC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) (as amended);
- European Council Directive 2009/147/EC on the conservation of wild birds (Birds Directive);
- The Conservation of Habitats and Species Regulations 2010 (as amended) transpose the Habitats Directive into law on land and in territorial waters (up to 12nm limit) of England and Wales;
- Marine and Coastal Access Act 2009;
- The Wildlife and Countryside Act 1981 (as amended);
- The Countryside and Rights of Way Act 2000;

[1] RSK 2016 '*Saltmarsh Botanical Survey. Visual Impact Protection (VIP) Snowdonia Scheme*' Report No: 660952

[2] RSK 2016 '*Ecological Baseline Report (Animal) Visual Impact Scheme (VIP) Snowdonia Scheme*' Report No.660952.

[3] Joint Nature Conservation Committee Website for Designated Site Citations: http://jncc.defra.gov.uk/protectedsites/sacselection

[4] Natural Resources Wales Website for Designated Sites Citations: https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/find-protected-areas-of-land-and-seas/designated-sites/?lang=en

- Natural Environment and Rural Communities Act (NERC) 2006; and
- Draft Welsh National Marine Plan.[5.]

Baseline Environment

17.5 Sites of nature conservation importance have initially been highlighted by identifying designated sites with marine components within 10km of the proposed Marine Works. Sites reviewed included the designations: Special Area of Conservation (SAC); Special Protection Area (SPA); Marine Conservation Zone (MCZ); National Nature Reserves (NNR); and Site of Special Scientific Interest (SSSI). Sites which have not been formally designated but are in the process of adoption e.g. potential SPAs, candidate SACs, have also been reviewed.

17.6 In recognition that some species are highly mobile (e.g. marine mammals, fish and birds) and may travel into the Marine Works Area, protected sites up to 40km away have been reviewed where marine birds, fish or marine mammals are qualifying features of the site. Sites greater than 40km have not been considered because whilst it is acknowledged that animals may forage or migrate distances greater than 40km, it is recognised that species from protected sites further away are less likely to travel to the Proposed Marine Works Area in high enough numbers for the population of qualifying species to be significantly affected.

17.7 The protected sites short-listed for further consideration have been described and relevant marine receptors identified in Table 17.1. The protected habitats and species of these sites have been further characterised in the proceeding sections to determine their sensitivity and whether there is a pathway for the Proposed Marine Works to interact with the receptors.

[5] Welsh Government 2017. Draft Welsh National Marine Plan. [online] Available at: https://beta.gov.wales/sites/default/files/consultations/2018-02/draft-plan-en.pdf (Accessed August 2018)

Table 17.1: Protected Sites for Nature Conservation

Site	Protection	Reason for Designation	Distance from Proposed Marine Works				Marine receptors
			4ZCO30	4ZCO30R	4ZCO31	Access tracks to 4ZCO32	
Pen Llyn a 'r Sarnau / Lleyn Peninsula and the Sarnau	SAC	**Annex I habitats that are a primary reason for selection of this site:** Sandbanks which are slightly covered by seawater all the time; Estuaries; Coastal Lagoons; Large Shallow inlets and bays; Reefs **Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:** Mudflats and sandflats not covered by sea water at low tide; Salicornia and other annuals colonizing mud and sand; Atlantic Salt meadows (*Glauco-Puccinellietalia maritimae*); Submerged or partially submerged sea caves **Annex II species present as a qualifying feature, but not a primary reason for site selection:** Bottlenose dolphin (*Tursiops truncates*); Otter (*Lutra lutra*); Grey seal (*Halichoerus grypus*)	Within	Within	Within	Within	Protected habitat: Estuaries Mudflats and sandflats Saltmarsh Protected species: Bottlenose dolphin Grey seal Otter
Afon Eden - Cors Goch Trawsfynydd	SAC	**Annex I habitats that are present as a qualifying feature, but not a primary reason for selection of this site:** Active raised bogs **Annex II species that are a primary reason for selection of this site:** Freshwater pearl mussel; Floating water-plantain **Annex II species present as a qualifying feature, but not a primary reason for selection of this site:** Atlantic Salmon (*Salmo salar*); Otter (*Lutra lutra*)	8.7km	8.7km	9.1km	9.4km	Protected species: Atlantic salmon Otter

Site	Protection	Reason for Designation	Distance from Proposed Marine Works				Marine receptors
			4ZCO30	4ZCO30R	4ZCO31	Access tracks to 4ZCO32	
West Wales Marine / Gorllewin Cymru Forol	cSAC	**Annex II species**: Harbour porpoise (*Phocoena phocoena*)	>34.8km	>34.8km	>34.5km	>34.2km	Protected species: Harbour porpoise
Northern Cardigan Bay / Gogledd Bae Ceredigion	Potential SPA	Non-breeding population of Red-throated diver (*Gavia stellata*)	8.4km	8.4km	8.1km	7.9km	Protected species: Wintering red-throated diver
Liverpool Bay	SPA	**Article 4.1 of the Directive (79/409/EEC) for supporting populations of European importance of the following Annex I species during the breeding season and overwinter:** Red-throated diver (*Gavia stellata*) **Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species over winter:** Common Scoter (*Melanitta nigra*) Waterfowl	38.3km	38.3km	38.1km	38.1km	Protected species: Wintering red-throated diver, common scoter and waterfowl
Anglesey Terns / Morwenoliaid Ynys Môn potential SPA	Potential SPA	Proposed for marine area used by foraging terns during the breeding season: Arctic tern (*Sterna paradisae),* Common tern (*Sterna hirundo*); Roseate tern (*Sterna dougallii*); Sandwich tern (*Sterna sandvicensis*)	35.2km	35.2km	34.8km	34.5km	Protected species: Foraging tern species in breeding season

Site	Protection	Reason for Designation	Distance from Proposed Marine Works				Marine receptors
			4ZCO30	4ZCO30R	4ZCO31	Access tracks to 4ZCO32	
Traeth Lafan / Lavan Sands, Conway Bay	SPA	**Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species over winter:** Oystercatcher (*Haematopus ostralegus*).	34.1km	34.1km	33.9km	33.8km	Protected species: Wintering oyster catcher
Morfa Harlech	SSSI	Terrestrial and marine habitats including: Sand dunes; Salt marsh; Breeding bird assemblages; Wintering pintail (*Anas acuta*); Sand lizard (*Lacerta agilis*); Otter; Water vole (*Arvicola amphibious*); the nationally rare mining bee (*Colletes cunicularius*); and Invertebrate assemblage of sand dune specialists.	Within	Within	Within	Within	Protected habitats: Saltmarsh Protected species: Breeding birds Wintering pintail Otter Water vole
Morfa Harlech	NNR	Sand dune; Salt marsh; wintering waders; the nationally rare mining bee (*Colletes cunicularius*); and Invertebrate assemblage of sand dune specialists	1.5km	1.5km	1.3km	1.05km	Protected habitats: Saltmarsh Protected species: Wintering birds
Glaslyn	SSSI	Estuarine in nature but reclaimed for agriculture. The Arfon Glaslyn is part of the present-day floodplain. The area is important for overwintering wildfowl and waders: Widgeon (*Anas penelope*); Teal (*Anas crecca*); Pintail	1.7km	1.7km	1.3km	1.1km	Protected species: Overwintering wildfowl and waders

Site	Protection	Reason for Designation	Distance from Proposed Marine Works				Marine receptors
			4ZCO30	4ZCO30R	4ZCO31	Access tracks to 4ZCO32	
		(*Anas acuta*); Curlew (*Numenius arquata*); Redshank (*Tringa totanus*); and Snipe (*Gallinago gallinago*). Otters are also known to occur, and Atlantic Salmon use the river as a migration route.					Otter Atlantic salmon
Afon Eden - Cors Goch Trawsfynydd	SSSI	The site supports the freshwater pearl mussel (*Margaritifera margaritifera*), floating water-plantain (*Luronium natans*), Atlantic salmon (*Salmo salar*), otter (*Lutra lutra*) and a lichen assemblage.	8.7km	8.7km	9.1km	9.4km	Protected species: Atlantic salmon Otter
Morfa Dyffryn	SSSI	Morfa Dyffryn, a coastal site south of Harlech, is of special interest for biological (terrestrial and marine intertidal) and geomorphological features. The area is of local importance for breeding, wintering and passage birds.	9.5km	9.5km	9.6km	9.5km	Protected species: Breeding birds Wintering and passage birds
Tiroedd A Glannau Rhwng Cricieth Ac Afon Glaslyn	SSSI	The shore is of special interest for the presence of diverse rockpool and seagrass communities, extensive sandy-shore community zonation patterns and for the presence of two communities of restricted distribution nationally. The shore is the most extensive stretch of moderately exposed sand within Cardigan Bay, at almost 5 km long.	6.1km	6.1km	5.8km	5.6km	Protected habitats: Rockpool and seagrass communities

Protected Habitats

17.8 Details on the designated sites for protected habitats identified as potential key receptors in Table 17.1 have been described below to determine whether they are likely to interact with the Proposed Marine Works and determine their importance.

Pen Llyn a 'r Sarnau / Lleyn Peninsula and the Sarnau SAC, Morfa Harlech SSSI, Morfa Harlech NNR

17.9 The Pen Llyn a 'r Sarnau / Lleyn Peninsula and the Sarnau SAC supports multiple marine features that are distributed throughout the site, encompassing areas of sea, coast and estuary[6]. Those present in the Proposed Marine Works Area are the Habitats Directive Annex I listed habitats:

- Estuaries;
- Mudflats and sandflats not covered by seawater at low tide; and,
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*).

17.10 The estuary feature of the SAC comprises the three main bar-built estuaries situated along the Meirionnydd and Ceredigion coasts; the Glaslyn/Dwyryd estuary, the Mawddach estuary and the Dyfi estuary. The Proposed Marine Works are located within the Glaslyn/Dwyryd estuary[19].

17.11 The morphology and sediments of the Dwyryd estuary are described in Section 16, but in summary the subtidal and intertidal sediments grade from clean sands near the entrance of the estuary to mud or muddy sands upstream and in association with saltmarsh communities.

17.12 Mobile animal species that form part of the Glaslyn/Dwyryd estuary feature include crustaceans, such as crabs and shrimps. The intertidal sandflats support communities of burrowing invertebrates, including dense populations of polychaete worms, crustaceans, bivalve molluscs and gastropod molluscs[19].

17.13 The saltmarsh comprises the upper, vegetated portions of intertidal mudflats, which usually lie approximately between MHWN tides and MHWS tides and above (JNCC 2016). Atlantic salt meadows develop in the middle and upper reaches of saltmarsh and comprise a variety of community types. The lower saltmarsh within the intertidal area consists of pioneer colonising species such as Salicornia and other annuals colonising mud and sand[19.]

17.14 Saltmarsh (including salt pastures and salt steppes) of the entire Llyn Peninsula and Sarnau SAC cover approximately 17.52km^2 (1.2% of the entire SAC).

17.15 A saltmarsh survey undertaken by RSK[14] within the Proposed Marine Works Area, identified communities typical of the west coast of Wales. The main vegetation present is low grade sheep-grazed saltmarsh referable to the National Vegetation Classification (NVC) type SM16d *Festuca rubra* salt-marsh community, *Festuca rubra-Glaux maritima* sub-community and SM18b *Juncus maritimus* salt-marsh community, *Oenanthe lachenalii* sub-community. These habitats both correspond to the Habitats Direction Annex I listed habitat Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*).

17.16 Pylon 4ZCO30R is located on the northern edge of the saltmarsh within an area classified as SM18. Vegetation disturbed in 2013-2014 by the emergency pylon replacement works (i.e.

[6] Natural Resources Wales 2018: Pen Llŷn a'r Sarnau / Lleyn Peninsula and the Sarnau Special Area of Conservation. Advice provided by Natural Resources Wales in fulfilment of Regulation 37 of the Conservation of Habitats and Species Regulations 2017.

installation of 4ZCO30R) was re-surveyed in September 2016 and showed positive signs of recovery.

17.17 The sharp rush (*Juncus acutus*) was identified as the only rare species present in the area. This plant was found in five locations within the saltmarsh survey area, including one location with three plants which were translocated during the 2013-2014 emergency works at 4ZCO30R. One location is already beyond the eroding edge of the saltmarsh and two more are within 10m and at risk of being lost through natural processes[14].

17.18 Pylon 4ZCO31 is within an area classified as SM16d. Pylon 4ZCO32 is outside the boundary of the SAC however, access to the pylon for the removal works runs along the boundary of the SAC[14.]

Tiroedd A Glannau Rhwng Cricieth Ac Afon Glaslyn SSSI

17.19 This site supports the marine habitat: rockpool and seagrass communities, however, it is located more than 6km from the Proposed Marine Works and is unlikely to interact with the activities of the Proposed Marine Works[17].

Protected Species

17.20 Details on the protected species identified as potential key receptors in Table 17.1 have been described below to characterise their importance and determine whether they are likely to be present within, or travel into, the region of the Proposed Marine Works

Fish

17.21 Although no fish species are listed as qualifying features of the **Pen Llyn a 'r Sarnau / Lleyn Peninsula and the Sarnau SAC**, the Afon Dwyryd provides an important habitat for five species of migratory fish: Atlantic salmon, sea lamprey (*Petromyzon marinus*), twaite shad (*Alosa fallax*), sea trout (*Salmo trutta*) and European eel (*Anguilla anguilla*). The estuary acts as an essential migratory route for these species as they make their transitions between fresh and salt water conditions. Atlantic salmon, sea lamprey and twaite shad are Habitats Directive Annex II listed species and the latter two are listed on the Natura 2000 data form, although they are not present in sufficient numbers to represent qualifying features of the SAC[19]. All the species are Priority Species in the UK Biodiversity Action Plan and are listed in relation to Section 42 of the NERC Act 2006. Species action plans have also been produced for salmonids and lampreys as part of the Gwynedd Local Biodiversity Action Plan[7] (Gwynedd Consultancy 2011).

17.22 The **Glaslyn/ Dwyryd** estuary, also forms important nursery areas for different fish species, in particular within the saltmarsh creeks. The estuary has been designated as a nursery area for bass (*Dicentrarchus labrax*)[19].

17.23 Atlantic salmon is a qualifying feature of the **Afon Eden - Cors Goch Trawsfynydd SAC/SSSI**, however, there is no fluvial connectivity between this river and the Afon Dwyryd. Therefore, there will be no interaction between this receptor and the Proposed Marine Works[16, 17].

[7] Gwynedd Consultancy 2011: Pont Briwet Tranxsportation Improvement Scheme. Volume 1: Environmental Statement (80406 GC 644 ED 01) May 2011.

Breeding Birds

17.24 The saltmarsh within the **Morfa Harlech SSSI** at Glan-y-mor is of regional importance for breeding waders, particularly redshank (*Tringa tetanus*) and lapwing (*Vanellus vanellus*). Curlew (*Numenius arquata*), ringed plover (*Charadrius hiaticula*) and oystercatcher (*Haematopus ostralegus*) also regularly breed. Black-headed gulls (*Larus ridibundus*) nest in low numbers at Llyn y Warin, a pool within the dunes. Other breeding marine birds typical of the sand dunes include shelduck (*Tadorna tadorna*). During September to March nationally important numbers of pintail (*Anas acuta*) feed and roost on the extensive areas of mud and saltmarsh in the Dwyryd estuary[17.]

17.25 The quality of the saltmarsh within the saltmarsh survey area for breeding birds is considered by RSK (2016a and b) to be of low quality and breeding activities in this area are noted as infrequent or absent.

17.26 **Morfa Dyffryn SSSI** is of local importance for breeding birds including Redshank (*Tringa tetanus*) and lapwing (*Vanellus vanellus*) which breed on the upper saltmarsh. Given this site is greater than 9km from the Proposed Marine Works and these species are waders important locally, they are unlikely to be present in the area of the Proposed Marine Works.

17.27 The proposed extended SPA **Anglesey Terns** / **Morwenoliaid Ynys Môn potential SPA** will encompass the three breeding sites already within the existing SPA, Ynys Feurig, Cemlyn Bay and The Skerries SPA, together with a marine foraging area used by the terns and will be renamed as the Anglesey Terns / Morwenoliaid Ynys Môn SPA[16]. Given the site identifies the marine area most important to the foraging terns and it is a minimum of 33km from the location of the Proposed Marine Works, it is unlikely that the tern species from this site would be present in significant numbers in the Proposed Marine Works Area.

Wintering Birds

17.28 Over winter (September to March) the **Morfa Harlech SSSI** and **NNR** supports nationally important numbers of pintail (*Anas acuta*) which feed and roost on the extensive areas of mud and saltmarsh in the Glaslyn/Dwyryd estuary[17].

17.29 The marshes within the **Glaslyn SSSI** attract overwintering wildfowl and waders as well as a variety of birds on passage including wintering whooper swans (*Cygnus cygnus*) which use some of the unimproved fields for feeding and the river and Cob for roosting. The overwintering wildfowl are part of the population using the nearby Dwyryd Estuary and depending on tidal and flood conditions, a significant proportion of the estuary close to the Cob supports wigeon (*Anas Penelope*) and teal (*Anas crecca*) whilst smaller numbers of pintail (*Anas acuta*) and shoveler (*Anas clypeata*) use the adjacent marshes[17].

17.30 **Morfa Dyffryn SSSI** is of local importance for wintering and passage birds. The beach and estuary is used on passage by waders, including ringed plover (*Charadrius hiaticula*), turnstone (*Arenaria interpres*), and sanderling (*Calidria alba*)[17]. Given this site is greater than 9km from the Proposed Marine Works and these species are waders important locally, they are unlikely to be present in the Proposed Marine Works Area.

17.31 **Northern Cardigan Bay** / **Gogledd Bae potential SPA** is being proposed for non-breeding red-throated diver (*Gavia stellata*). Wintering red-throated divers start to arrive in UK coastal waters from September, with numbers peaking during the winter and declining in Welsh waters from late February. The proposed designation site boundary, which as the name suggests is within northern Cardigan Bay, encompasses the Marine Area where the greatest numbers of red-throated divers have been recorded during aerial surveys[16]. The designated site is at its closest point 7.9km from the location of the Proposed Marine Works. It is possible

that red-throated diver could forage as far as the Proposed Marine Works, but as the proposed designated site boundary represents the area most important to the red-throated diver, it is unlikely that they would be present in significant numbers.

17.32 **Liverpool Bay SPA** supports wintering red-throated diver, common scoter and waterfowl[16]. Given the minimum distance from this site to the Proposed Marine Works is 38km it is unlikely that any of the qualifying species would be present in significant numbers.

17.33 **Traeth Lafan / Lavan Sands, Conway Bay SPA** is designated for over wintering oystercatcher (*Haematopus ostralegus*)[16]. Since this species is a wader normally found along the coast during winter and the site is a minimum of 33km from the location of the Proposed Marine Works, they are unlikely to be present in significant numbers in the area of the Proposed Marine Works.

Marine Mammals

17.34 **Pen Llyn a 'r Sarnau / Lleyn Peninsula and the Sarnau SAC & Morfa Harlech SSSI:** The Habitats Directive Annex II listed species bottlenose dolphin, otter and grey seal are present in the SAC as a qualifying feature, but not a primary reason for site designation[16]. Bottlenose dolphin are present in coastal waters in greatest numbers between May and September and sightings data indicates that bottlenose dolphin are recorded throughout Tremadog Bay. Site specific surveys undertaken during summer 2016 have confirmed that no otters are currently resident or noted as present within the area of the Proposed Marine Works[15]. Seawatch sightings data and the Marine Mammal Atlas[8] found that grey seal has been recorded near the mouth of the Dwyryd Estuary in low numbers; however, no sightings of cetacean have been recorded within the Dwyryd Estuary.

17.35 **Morfa Harlech SSSI:** The Dwyryd Estuary is an important breeding and feeding habitat for otter (*Lutra lutra*). The ditches associated with the embankments and adjacent farmland also provide suitable bankside habitat for the water vole (*Arvicola amphibious*)[17]. Site specific surveys undertaken during summer 2016 have confirmed that no otter or water vole are currently resident or noted as present within the area of the Proposed Marine Works[15].

17.36 **Afon Eden - Cors Goch Trawsfynydd SAC/SSSI:** The Afon Eden supports the Habitats Directive Annex II listed species otter[16,17]. However, there is no fluvial connection between Afon Eden and Afon Dwyryd and the topography suggests that animals from these protected sites are unlikely to be in the area of the Proposed Marine Works.

17.37 **West Wales Marine / Gorllewin Cymru Forol candidate SAC:** This site off the coast of Wales from the Llyn peninsula has been identified as an area of importance for harbour porpoise. The site covers 7,376km^2 [17]. As the site is greater than 30km from the location of the Proposed Marine Works and no sightings of cetacean have been recorded within the Dwyryd Estuary, harbour porpoise from this site are unlikely to be present in significant numbers, if at all, within the area of the Proposed Marine Works.

Proposed Impacts

17.38 This section identifies and assesses the significance of potential pressures on the marine receptors identified in Table 17.1, as a result of the Proposed Marine Works.

[8] Baines, M.E. and Evans, P.G.H. 2012: Atlas of the Marine Mammals of Wales. CCW Monitoring Report No. 68. 2nd edition.

Hydrological changes - Water flow (tidal current) changes – local

17.39 As discussed in Section 16 - Marine Physical Environment, the foundations and coffer dam at pylon 4ZCO30R, currently act as an artificial barrier preventing erosion of the saltmarsh. Removal of these structures will allow the re-instatement of natural channel migration processes within the estuary, with the indirect affect that erosion of the designated habitat feature, Atlantic salt meadows, within the Pen Llyn a 'r Sarnau / Lleyn Peninsula and the Sarnau SAC is likely to occur.

17.40 Previous studies discussed within the Environmental Statement (National Grid, June 2015) have shown that this area of saltmarsh is currently undergoing a period of erosion, after reaching its maximum extent in 1977. Recent shoreline monitoring data indicates that this saltmarsh is continuing to erode with losses of between 5m and 15m since October 2014. It is likely that the habitats within the southwestern half of the cofferdam would have been lost by now if the cofferdam had not been installed. On removal of the cofferdam and foundations at 4ZC030R, it is likely that this northerly erosion of the saltmarsh will continue. TEP (2017) state that "*Given that erosion is taking place on this area of saltmarsh it is likely that saltmarsh accretion will be occurring elsewhere in the estuary as part of the natural estuarine process. This would ensure that the overall area of saltmarsh within the system remains relatively constant*."

17.41 Although it is acknowledged that it is likely that the removal of the foundations and coffer dam at pylons 4ZC030R and 4ZC030 will result in erosion of the saltmarsh habitat, the Proposed Marie Works will return the estuary to a natural state where in time equilibrium in natural processes can be achieved. This may mean that the natural erosion of this area of saltmarsh continues with accretion taking place elsewhere in the estuary.

17.42 The complete removal of structures related to pylons 4ZC030R and 4ZC030 is being undertaken at the request of Natural Resources Wales; the primary objective being to return the estuary to a natural state. It is therefore accepted that a localised significant impact is expected, but that over time, the conservation objectives of the site can still be met as it reaches a natural equilibrium with erosion and accretion of habitat.

17.43 It is therefore proposed that assessment of the effect of erosion on this habitat will be scoped out of the Environmental Assessment Report.

Physical damage (reversible change) - Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion:

17.44 Pylon 4ZCO32 is located outside the SAC and excavation at this site is proposed to be scoped out from further consideration of this pressure.

17.45 Pylons 4ZC031 and 4ZC030R are located on saltmarsh within the Pen Llyn a 'r Sarnau / Lleyn Peninsula and the Sarnau SAC. The proposed works at these pylons will result in the direct disturbance of the habitat, through temporary substratum loss and displacement of sediment during removal and excavation of the foundations. This habitat is particularly sensitive to disturbance due to its slow recoverability, although as noted above, vegetation disturbed in 2013-2014 at pylon 4ZCO30R showed positive signs of recovery during re-survey in September 2016. However, it should also be noted that as discussed above (Section 17.40) the northern area of the saltmarsh is actively eroding, and vegetation is being continually lost. Therefore, it is possible that, in the long-term and without future intervention, the saltmarsh that this pylon is located on will eventually be lost to natural erosion.

17.46 Vehicle access routes to the marine pylons and working/pylon dismantling areas also have the potential to damage / disturb habitats through abrasion and crushing. Access to 4ZCO32 will use a narrow existing stone track which follows the boundary of the SAC and will not impact the saltmarsh. Access to 4ZCO31 is partly along the same stone track and partly along a narrow stone track across a small area of saltmarsh within the SAC.

17.47 Access to 4ZCO30R and 4ZCO30 will be across the saltmarsh within the SAC along a temporary constructed plastic track designed to protect the saltmarsh. Additionally, crane pads or piling mat pads will be constructed close to the pylons for pylon dismantling. For 4ZCO31 and 4ZCO30R the dismantling areas will be located within the SAC saltmarsh.

17.48 Potential effects of the access tracks to pylons 4ZC030, 4ZC030R and 4ZC031 across the saltmarsh habitat; the placement of dismantling mats for 4ZC031 and 4ZC030R; and the removal of pylons 4CZ031 and 4ZC030R will be assessed within the Environmental Assessment Report.

17.49 The foundations for pylon 4ZC030 are currently located within the estuary channel and the construction of a temporary working platform is proposed to access the foundations. The construction of a platform has the potential to damage / disturb benthic species present directly within the footprint of the platform through smothering, crushing or abrasion. The excavation of the foundations also has the potential to damage / disturb benthic species present within the footprint of these activities through direct displacement, substratum loss or smothering.

17.50 Intertidal sandflats are characterised by communities of burrowing invertebrates including populations of polychaete worms, crustaceans, bivalve molluscs and gastropod molluscs[9]. Such species are not very sensitive to smothering. Based on this low sensitivity, National Grid were advised by Natural Resources Wales that a benthic survey was not required to inform the Marine License application for the geotechnical investigations. Given the short-term and localised impacts of the Proposed Marine Works the habitat is likely to recover rapidly from any disturbance. As such, no significant effects on benthic species are anticipated and this will not be assessed further in the Environmental Assessment Report.

17.51 For the aspects of the Proposed Marine Works where scoping has identified that further assessment is required, the Environmental Assessment Report will, where possible, quantify the percentage of temporary habitat damage and predict recoverability. It is likely that there will be the potential for a localised but temporary significant effect on the saltmarsh habitat and National Grid expect that the Habitats Regulation Assessment Screening will identify that Appropriate Assessment will be required.

Physical damage (reversible change) – Changes in suspended solids (water clarity)

17.52 The suspension of sediments within the water column from pylon excavation works may cause small, localised and temporary turbidity before being re-deposited on the estuary bed. A temporary reduction in the feeding capability of fish species relying on sight to locate their prey may occur.

17.53 As discussed in Chapter 16 Marine Physical Environment, the excavation works at pylon 4ZCO31 are unlikely to result in the release of suspended sediments to the marine environment because the site is effectively land based and any inundation during the excavation works would be insufficient to transport suspended sediments. Small amounts of

[9] JNCC (2017), Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC Site details. Available at: http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUcode=UK0013117

water may be pumped out from within the cofferdam at 4ZCO30R but are unlikely to create a sediment plume that would affect water clarity.

17.54 At 4CZ030 although sediment in the channel is likely to be disturbed, it is unlikely to be noticeable against background levels of disturbance experienced during periods when the estuary sandflats are mobilised.

17.55 It is therefore proposed that potential indirect effects on migratory fish and juvenile fish within the Pen Llyn a 'r Sarnau / Lleyn Peninsula and the Sarnau SAC, as a result of increased levels of suspended sediments in the water column are scoped out from further assessment within the Environmental Assessment Report.

Physical damage (reversible change) - Siltation rate changes, including smothering (depth of vertical sediment overburden)

17.56 The re-deposition of suspended sediments has the potential to smother fish species during the excavation works. The impact would depend on the quantities of excavated material released into the estuary. However, as with the changes in suspended solids, suspended sediments are not predicted to be above background levels therefore this pressure is proposed to be scoped out from further assessment in the Environmental Assessment Report.

Pollution and other chemical changes - Deoxygenation

17.57 During excavation of the pylon foundations sediments could be brought up from depths where they are anoxic and high in organic content. If these sediments get released into the estuary this may result in local deoxygenation within the river. In a confined channel this could present a problem for fish as the deoxygenated water may act as a plug in the channel which the fish cannot circumnavigate. As discussed in Chapter 16 Marine Physical Environment, the available evidence from site investigations supporting the construction of Pont Briwet (Norwest Holst, 2009) show that sediments at depth have a very low organic content (<0.1%) and are not expected to be anoxic. Therefore, it is proposed that this pressure is scoped out from further assessment in the Environmental Assessment Report.

Visual disturbance

17.58 During the pylon and foundation removal operations (including the potential use of a helicopter), the presence of vehicles and equipment (e.g. cranes, derricks, excavators) have the potential to temporarily disturb marine birds and marine mammals in the vicinity of the Proposed Marine Works. Noise is the primary cause of disturbance although the physical presence of equipment can also cause a disturbance effect due to physical and visual intrusion. Disturbance may result in displacement of marine mammals or birds from an area of use (for feeding, breeding, resting, passage etc.).

17.59 Given the localised and temporary nature of disturbance, this impact is unlikely to be significant for disturbance of feeding and foraging birds as they are likely to be able to find alternative feeding grounds. This impact would be of most concern where disturbance could have implications for breeding success for example disturbance of nesting birds during the breeding season. However, the quality of the saltmarsh within the Marine Area for breeding birds has been assessed as low quality and breeding activities in this area are noted as infrequent or absent (RSK 2016a and b), therefore disturbance to breeding birds is unlikely to be significant.

17.60 The Dwyryd Estuary also provides important overwintering and migratory feeding habitat for bird species. However, as the Proposed Marine Works are planned to take place outside the winter months minimal disturbance to overwintering birds will take place. Therefore, no significant impacts on overwintering birds are likely to occur.

17.61 Marine mammals present in the vicinity of the works could potentially be disturbed by the operations however they are likely to be in very low numbers or altogether absent from the area of works. Bottlenose dolphin are recorded throughout Tremadog Bay but not within the estuary; grey seal has been recorded near the mouth of the Dwyryd Estuary in low numbers, but no sightings of cetacean have been recorded within the Dwyryd Estuary; and no evidence of otter or water vole activity has been identified within the Proposed Marine Works Area (RSK 2016b).

17.62 Therefore, no significant impacts on either birds or marine mammals are predicted and it is proposed to scope this potential pressure out from further assessment in the Environmental Assessment Report.

Underwater noise changes

17.63 Excavation of 4ZC030 foundations has the potential to disturb marine mammals through the generation of underwater noise in the estuary.

17.64 Although a number of marine mammals are listed as designating features of the sites within which the Proposed Marine Works are planned (i.e. otter, water vole, bottlenose dolphin and grey seal) they are likely to be present in very low numbers or altogether absent from the area.

17.65 The noise assessment undertaken as part of the Habitat Regulation Assessment (HRA) Screening for the Geotechnical Investigation Borehole Survey (Intertek 2017) within the Dwyryd Estuary concluded that rotary and percussive drilling would not injure or disturb marine mammals.

17.66 Taking the above into consideration and given the excavation works will emit less noise than rotary or percussive drilling this potential pressure has been assessed as not significant and it is proposed to be scoped out from further assessment within the Environmental Assessment Report.

Proposed Assessment Methodology

17.67 The Environmental Assessment Report will consider the pressures from the Proposed Marine Works on the ecological receptors scoped in for further assessment. The protected sites which are proposed to be scoped in for further assessment are:

- Pen Llyn a ‘r Sarnau / Lleyn Peninsula and the Sarnau SAC; and
- Morfa Harlech SSSI.

17.68 The pressures and relevant marine receptors to be scoped in for further assessment are presented in Table 17.2.

Table 17.2: Pressure descriptions to scope into the assessment

Pressure description	Receptors				
	Protected habitats: Saltmarsh	Fish	Breeding birds	Wintering birds	Marine mammals
Physical damage (reversible change) - Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion.	✓				

17.69 The environmental assessment will draw upon numerous guidance documents and regulations, including:

- The Institute of Environmental Management and Assessment (IEMA) Environmental Impact Assessment Guide to: Delivering Quality Development, 2016
- IEMA Guidelines for Environmental Impact Assessment, 2004.
- The Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in Britain and Ireland: Marine and Coastal, 2010.
- Scottish Natural Heritage (SNH), A handbook on environmental impact assessment: Guidance for Competent Authorities, Consultees and others involved in the Environmental Impact Assessment (EIA) Process in Scotland, 2013. [This guidance is also relevant to EA in other parts of the UK].

Characterisation of the existing baseline

17.70 A good understanding of the baseline conditions for the environmental receptor scoped into the assessment will be achieved through:

- A review of the baseline saltmarsh surveys;
- A detailed review of all secondary sources (i.e. existing documentation and literature).
- Stakeholder consultation.

17.71 The key data sources used to establish the baseline will be described in the Marine Ecology Chapter.

Establish Potential Pressures and Study Areas

17.72 As outlined above it is proposed that one pressure be taken forward for further assessment in the Environmental Assessment Report. For this pressure, the Study Area (or zone of influence- the spatial extent over which the activities are predicted to have an effect on the receiving environment) will be established. This will be undertaken quantitatively where possible but also qualitatively where necessary based on the project description, project experience and literature reviews.

Characterisation of the Receptor

17.73 The criteria to be used to characterise the sensitivity of the receptor is presented below.

Table 17.3: Criteria for characterising the sensitivity of marine ecology receptors

Receptor Value	Criteria
High	**Receptor has little or no ability to absorb change without fundamentally altering its character. For example:** One or more combinations of: • Receptor has low tolerance to change e.g. the species population is likely to be killed or destroyed by the project activity[10]. • Recovery to baseline conditions over a very long period i.e. > 10 years or not at all[11]. • The receptor is a designating feature of an International protected site e.g. European Natura 2000 or RAMSAR site. • Receptor is very rare / unique / or ecologically important.
Medium	**Receptor has moderate capacity to absorb change without significantly altering its character; however, some damage to the receptor will occur. For example:** One or more combinations of: • Receptor has intermediate tolerance to change e.g. some individuals of the species may be killed/destroyed by the project activity and the viability of a species population may be reduced[23]. • Recovery to baseline conditions over a long period i.e. > 5 or up to 10 years[24] • The receptor is a designating feature of a national site e.g. SSSI • Uncommon or moderately valuable economically or ecologically but not rare or unique.
Low	**The receptor is tolerant to change without significant detriment to its character. Some minor damage to the receptor may occur. For example:** One or more combinations of: • Localised or short-term damage / disturbance to portion of the population / habitat • Recovery to baseline conditions within 1 year • The receptor is neither rare, unique or of significance in terms of economic or ecological value.
Very Low	**The receptor is tolerant to change with no effect on its character.** The project activity does not have a detectable effect on survival or viability of a species[23]. The habitat or species is expected to recover rapidly i.e. within a week[24].

[10] MarLin 2018: Species intolerance. [Online] Available at: http://www.marlin.ac.uk/glossarydefinition/intoleranceranking. Accessed August 2018

[11] MarLin 1999-2010: Sensitivity assessment methodology. [Online] Available at: https://www.marlin.ac.uk/sensitivity/MarLIN-sensitivity-methods

Characterisation of the Magnitude of Effect

17.74 To fully characterise an effect or level of change from baseline conditions the scale of change, spatial extent and duration / frequency of the change will be considered. These parameters are used to define the magnitude of change based on the definitions provided in Table 17.4.

Table 17.4: Criteria for characterising the magnitude of the impact

Magnitude Value	Criteria
High	Long term (> 5 years) and/or regional level loss or major alteration to key elements /features of the baseline condition such that post development character/composition of baseline will be fundamentally changed.
Medium	Medium term (1- 5 years) loss and/or local level change (greater than the project footprint) or alteration to one or more key elements/features of the baseline conditions such that post development character/composition of the baseline condition will be materially changed.
Low	Short term (<1 year), site specific and/or minor shift away from baseline conditions. Changes arising from the alteration will be detectable but not material; the underlying character /composition of the baseline condition will be similar to the pre-development situation.
Very Low	Very little change from baseline conditions. Change is barely distinguishable, approximating to a “no change” situation.

Assessment of Significance of Effect

17.75 The significance of the effect will be assessed using the significance matrix provided in Section 3 of this report.

17.76 Where a significant effect is predicted, appropriate mitigation measures will be proposed.

17.77 The significance assessment is repeated taking into consideration the application of any mitigation to ascertain the residual effect.

Cumulative Effects

17.78 Inter and intra project effects will be considered as part of the Environmental Assessment Report.

Habitat Regulation Assessment

17.79 A Habitats Regulation Assessment (HRA) will be required to support the Marine License application for the Proposed Marine Works. This will be appended to the Environmental Assessment Report. This will follow the guidance set out in Scottish National Heritage (SNH’s) HRA guidance document (Tydesley 2012) and on the Natural Resources Wales (NRW) website and will take into consideration relevant rulings from the Court of Justice of the European Union e.g. judgement of 12 April 2018 in case, C-323/17 - People Over Wind and Sweetman, preliminary ruling High Court (Irlande) – Ireland.

17.80 The Habitats Directive requires project-related activities within Natura 2000 sites to be assessed with regard to their implications for the site conservation objectives. Under regulation 63(2) of the Conservation of Habitats and Species Regulations 2017, a person applying for consent, permission or other authorisation must provide such information as the

competent authority may reasonably require for the purposes of assessment or to enable them to determine whether an Appropriate Assessment is required.

17.81 The three tests set out to determine if a proposal will affect a Natura site are:

- Is the proposal directly connected with/ necessary for site management for nature conservation?
- Is the proposal likely to have a significant effect on the site either alone or in-combination with other plans or projects? (this is the Screening Stage);
- Can it be ascertained that the proposal will not adversely affect the integrity of the site? (this is the Appropriate Assessment stage).

17.82 Wherever a project that is not directly connected to, or necessary to, the management of a Natura 2000 site has the potential to have a significant effect on the conservation objectives of the site (directly, indirectly, alone or in-combination with other plans or projects) then an Appropriate Assessment (AA) must be undertaken by the competent authority.

Proposed Mitigation Measures

17.83 National Grid has committed to undertake the Proposed Marine Works outside of the winter bird season. No mitigation specific to reducing effects on salt marsh habitat, is currently proposed beyond best practice.

Issues to be Scoped Out

17.84 Table 17.5 summaries the pressures which are proposed to be scoped out of the Environmental Assessment Report. The rationale for their exclusion is provided above.

Table 17.5: Pressure descriptions to scope out

Pressure description	Receptors				
	Benthic Communities	Fish	Breeding birds	Wintering birds	Marine mammals
Hydrological changes - Water flow (tidal current) – local	✓				
Physical damage (reversible change) - Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion.	✓				
Physical damage (reversible change) – Changes in suspended solids (water clarity).		✓			
Physical damage (reversible change) Siltation rate changes, including smothering (depth of vertical sediment overburden).		✓			
Pollution and other chemical changes - Deoxygenation		✓			
Visual disturbance			✓	✓	✓
Underwater noise changes					✓

Overview of the Likely Significance of Effect

17.85 Although it is acknowledged that it is likely that the removal of the foundations and coffer dam at pylons 4ZC030R and 4ZC030 will result in erosion of the saltmarsh habitat, the Proposed Marine Works will return the estuary to a natural state where in time equilibrium in natural processes can be achieved. This may mean that the natural erosion of this area of saltmarsh continues with accretion taking place elsewhere in the estuary.

17.86 The complete removal of structures related to pylons 4ZC030R and 4ZC030 is being undertaken at the request of Natural Resources Wales; the primary objective being to return the estuary to a natural state. It is therefore accepted that a localised significant impact is expected, but that over time, the conservation objectives of the site can still be met as it reaches a natural equilibrium with erosion and accretion of habitat.