

**Appendix 1: Table of targets for feature/sub-features by attribute.** Information taken from Natural England Designated Sites View – Supplementary Advice page (Natural England, 2017).

Blue shaded boxes highlight maintain objectives and yellow shaded boxes highlight recover objectives.

Attribute	<b>Distribution: presence and spatial distribution of biological communities</b>
Feature / Sub-feature	Target
Intertidal coarse sediment	Maintain the presence and spatial distribution of intertidal coarse sediment communities.
Intertidal mud	Maintain the presence and spatial distribution of intertidal mud communities.
Intertidal sand and muddy sand	Maintain the presence and spatial distribution of intertidal sand and muddy sand communities.
Large shallow inlets and bays	Maintain the presence and spatial distribution of large shallow inlet and bay communities.
Mudflats and sandflats not covered by seawater at low tide	Maintain the presence and spatial distribution of mudflat and sandflat communities.
Sandbanks which are slightly covered by sea water all the time	Maintain the presence and spatial distribution of subtidal sandbank communities.
Subtidal coarse sediment	Maintain the presence and spatial distribution of subtidal coarse sediment communities according to the map.
Subtidal sand	Maintain the presence and spatial distribution of subtidal sand communities according to the map.
Subtidal mixed sediments	Recover the presence and spatial distribution of subtidal mixed sediment communities according to the map.
Subtidal mud	Recover the presence and spatial distribution of subtidal mud communities.

Attribute	Extent and distribution	
Feature / Sub-feature	Target	
Intertidal coarse sediment	Maintain the total extent and spatial distribution of intertidal coarse sediment.	
Intertidal mud	Maintain the total extent and spatial distribution of intertidal mud.	
Intertidal sand and muddy sand	Maintain the total extent and spatial distribution of intertidal sand and muddy sand.	
Subtidal coarse sediment	Maintain the total extent and spatial distribution of subtidal coarse sediment.	
Subtidal mixed sediments	Maintain the total extent and spatial distribution of subtidal mixed sediment.	
Subtidal mud	Maintain the total extent and spatial distribution of subtidal mud.	
Subtidal sand	Maintain the total extent and spatial distribution of subtidal sand.	
Sandbanks which are slightly covered by sea water all the time	Maintain the total extent and spatial distribution of subtidal sandbanks to ensure no loss of integrity, while allowing for natural change and succession.	
Large shallow inlets and bays	Maintain the total extent and spatial distribution of large shallow inlets and bays to ensure no loss of integrity, while allowing for natural change and succession.	
Mudflats and sandflats not covered by seawater at low tide	Maintain the total extent, spatial distribution and types of mudflats and sandflats.	
Intertidal biogenic reef: mussel beds	Restore the total extent of mussel beds to 649 ha, and spatial distribution as defined on the map. <sup>1</sup>	

<sup>1</sup>Please note while online advice in January 2018 stated that the conservation objective for the extent of mussel beds was to recover to 649 ha, advice from Natural England has stated that this is an error (February 2018). The conservation objective target should be 500 ha (Georgina Roberts, *Pers. comm.*)

Attribute	<b>Extent of subtidal biogenic reef</b>	
Feature / Sub-feature	Target	
Subtidal biogenic reefs: mussel beds	When mussel beds develops within the site, their extent and persistence should not be compromised by human activities, accepting that, due to the naturally dynamic nature of the feature their extent change over time.	

Attribute	<b>Extent of supporting habitat</b>	
Feature / Sub-feature	Target	
Intertidal biogenic reef: mussel beds	Restore the area of habitat that is likely to support the feature, allowing for natural change and the dynamic nature of the habitat.	

Attribute	<b>Structure: age / size frequency</b>	
Feature / Sub-feature	Target	
Intertidal biogenic reef: mussel beds	Restore a balanced age / size frequency and distribution within the population across the extent of the sub-feature, to increase resilience and encourage a healthy productive population.	
Subtidal biogenic reefs: mussel beds	Maintain a balanced age / size frequency and distribution within the population across the extent of the sub-feature, to increase resilience and encourage a healthy productive population.	

Attribute	<b>Structure: population density</b>	
Feature / Sub-feature	Target	
Intertidal biogenic reef: mussel beds	Restore the density of mussels to 25 tonnes / ha across the sub-feature.	
Subtidal biogenic reefs: mussel beds	Maintain the existing density of mussels across the sub-feature	

Attribute	<b>Structure: species composition of the community</b>	
Feature / Sub-feature	Target	
Intertidal biogenic reef: mussel beds	Restore the species composition of the mussel bed community.	
Subtidal biogenic reefs: mussel beds	Maintain the species composition of the mussel bed community.	

Attribute	<b>Structure: energy / exposure</b>	
Feature / Sub-feature	Target	
Large shallow inlets and bays	Maintain the natural physical energy resulting from waves, tides and other water flows, so that the exposure [High / Medium / Low] does not cause alteration to the biotopes, natural disturbance levels and stability, across the feature / sub-feature.	

Attribute	<b>Structure: habitat zonation</b>	
Feature / Sub-feature	Target	
Large shallow inlets and bays	Maintain habitat zonation, which is affected by both salinity gradient and tides in the feature, from fresh water sources to the sea (horizontally) and with shore height (vertically) from terrestrial to subtidal.	

Attribute	<b>Structure: morphology</b>	
Feature / Sub-feature	Target	
Large shallow inlets and bays	Maintain the characteristic morphology of the large shallow inlet and bay.	

Attribute	<b>Structure: tidal regime</b>	
Feature / Sub-feature	Target	
Large shallow inlets and bays	Maintain the tidal range, currents and circulation patterns across the feature (and each of its sub-features).	

Attribute	<b>Structure: sediment movement, sources and sinks</b>	
Feature / Sub-feature	Target	
Large shallow inlets and bays	Maintain sediment regime and budget within large shallow inlets and bays, including sediment sources, sinks, and movement.	

Attribute	<b>Structure: non-native species and pathogens</b>	
Feature / Sub-feature	Target	
Sandbanks which are slightly covered by sea water all the time	Reduce the introduction and spread of non-native species and pathogens and their impacts.	
Intertidal biogenic reef: mussel beds		
Intertidal mud		
Intertidal sand and muddy sand		
Subtidal biogenic reefs: mussel beds		
Large shallow inlets and bays		
Mudflats and sandflats not covered by seawater at low tide		
Subtidal coarse sediment		
Subtidal mixed sediments		
Subtidal mud		
Subtidal sand		
Harbour (common) seal ( <i>Phoca vitulina</i> )	Restrict the introduction and impacts of non-native species and pathogens.	
Intertidal coarse sediment	Restrict the introduction and spread of non-native species and pathogens, and their impacts.	

Attribute	<b>Structure: water density</b>	
Feature / Sub-feature	Target	
Large shallow inlets and bays	Maintain the natural water density or gradient across the feature (and each of its sub-features).	

Attribute	<b>Structure: sediment composition and distribution</b>	
Feature / Sub-feature	Target	
Sandbanks which are slightly covered by sea water all the time	<p>The Targets for these attributes were variously listed as – “Maintain the distribution of sediment composition across the feature (and each of its sub-features).” / “Maintain the distribution of sediment composition across the feature.” / “Maintain the distribution of sediment composition types across the feature.” / “Maintain the existing distribution of sediment composition types across the feature.”</p> <p>As all of these mean the same, the targets have been grouped together.</p>	
Mudflats and sandflats not covered by seawater at low tide		
Intertidal coarse sediment		
Intertidal sand and muddy sand		
Subtidal coarse sediment		
Subtidal mixed sediments		
Subtidal mud		
Intertidal mud		
Subtidal sand		

Attribute	<b>Structure: sediment total organic carbon content</b>	
Feature / Sub-feature	Target	
Intertidal mud	Maintain total organic carbon (TOC) content in the sediment at existing levels. Notes – <ul style="list-style-type: none"> <li>• “Targets” for these sub-features for this Attribute are the same.</li> </ul>	
Intertidal coarse sediment		
Intertidal mud		
Intertidal sand and muddy sand		
Mudflats and sandflats not covered by seawater at low tide		

Attribute	<b>Structure: species composition of component communities</b>	
Feature / Sub-feature	Target	
Intertidal coarse sediment	Maintain the species composition of component communities.  Notes – <ul style="list-style-type: none"> <li>• “Targets” for these sub-features for this Attribute are the same.</li> </ul>	
Intertidal mud		
Large shallow inlets and bays		
Mudflats and sandflats not covered by seawater at low tide		
Sandbanks which are slightly covered by sea water all the time		
Subtidal coarse sediment		
Subtidal sand		



Attribute	<b>Structure: species composition of component communities</b>	
Feature / Sub-feature	Target	
Subtidal mixed sediments	Recover the species composition of component communities.	
Subtidal mud		
Intertidal sand and muddy sand	Restore the species composition of component communities.	

Attribute	<b>Structure: topography</b>	
Feature / Sub-feature	Target	
Intertidal sand and muddy sand	Maintain the presence of topographic features, while allowing for natural responses to hydrodynamic regime, by preventing erosion or deposition through human-induced activity  Notes – <ul style="list-style-type: none"> <li>• “Targets” for these sub-features for this Attribute are the same.</li> </ul>	
Intertidal coarse sediment		
Intertidal mud		
Intertidal sand and muddy sand		
Mudflats and sandflats not covered by seawater at low tide		
Large shallow inlets and bays	Maintain the characteristic physical form and topographic features of large shallow inlet and bays, and the overall topography on which morphological regime relies.	
Sandbanks which are slightly covered by sea water all the time	Maintain the presence of topographic characteristics of the feature, while allowing for natural responses to hydrodynamic regime, by preventing erosion or deposition through human induced activity.	

Attribute	<b>Structure: volume</b>	
Feature / Sub-feature	Target	
Sandbanks which are slightly covered by sea water all the time	Maintain the existing volume of sediment in the sandbank, allowing for natural change.	

Attribute	<b>Structure and function: biological connectivity</b>	
Feature / Sub-feature	Target	
Harbour (common) seal ( <i>Phoca vitulina</i> )	Maintain connectivity of the habitat within sites and the wider environment to allow movement of migratory species.	

Attribute	Structure and function: presence and abundance of key structural and influential species	
Feature / Sub-feature	Target	
Intertidal coarse sediment	<p>[Maintain OR Recover OR Restore] the abundance of listed species*, to enable each of them to be a viable component of the habitat</p> <p>Notes –</p> <ul style="list-style-type: none"> <li>• “Targets” for all Sub-features for this Attribute are the same.</li> <li>• Advice from Natural England June 2017 – there is no need to consider this Attribute at present, as the information relating to it has not yet been finalised on a national level</li> <li>• Presence and abundance of key species are considered in <b>Section 5.3</b> as far as we are able to with the available information</li> </ul>	
Intertidal biogenic reef: mussel beds		
Intertidal coarse sediment		
Intertidal mud		
Intertidal sand and muddy sand		
Large shallow inlets and bays		
Subtidal biogenic reefs: mussel beds		
Mudflats and sandflats not covered by seawater at low tide		
Sandbanks which are slightly covered by sea water all the time		
Subtidal coarse sediment		
Subtidal mixed sediments		
Subtidal mud		
Subtidal sand		

Attribute	<b>Function: connectivity</b>	
Feature / Sub-feature	Target	
Large shallow inlets and bays	Maintain the connectivity of large shallow inlets and bays to surrounding estuaries, rivers, freshwater, marine and coastal habitats, to ensure larval dispersal and recruitment, maintain nursery grounds for mobile species, and to allow movement of migratory species.	

Attribute	<b>Supporting processes: sedimentation rate</b>	
Feature / Sub-feature	Target	
Intertidal biogenic reef: mussel beds	Maintain the natural rate of sediment deposition to avoid smothering the sub-feature.	
Subtidal biogenic reefs: mussel beds	Maintain the natural rate of sediment deposition to avoid smothering the sub-feature.	

Attribute	<b>Supporting processes: water movement and energy</b>	
Feature / Sub-feature	Target	
Intertidal biogenic reef: mussel beds	Maintain the natural water flow velocity to the subtidal mussel beds, to provide high levels of oxygen and food and prevent 'mussel mud' forming	
Subtidal biogenic reefs: mussel beds	Maintain the natural water flow velocity to the subtidal mussel beds, to provide high levels of oxygen and food and prevent 'mussel mud' forming.	

Attribute	<b>Supporting processes: areas with conditions suitable for reef formation</b>	
Feature / Sub-feature	Target	
Subtidal biogenic reefs: mussel beds	Maintain the environmental conditions in those locations that are known, or which become known, to be important for mussel bed formation.	

Attribute	<b>Supporting processes: energy / exposure</b>	
Feature / Sub-feature	Target	
Intertidal coarse sediment	Maintain the natural physical energy resulting from waves, tides and other water flows, so that the exposure does not cause alteration to the biotopes, and stability, across the habitat.  Notes – <ul style="list-style-type: none"> <li>• “Targets” for these sub-features for this Attribute are the same.</li> </ul>	
Intertidal mud		
Intertidal sand and muddy sand		
Mudflats and sandflats not covered by seawater at low tide		
Sandbanks which are slightly covered by sea water all the time		
Subtidal coarse sediment		
Subtidal mixed sediments		
Subtidal mud		
Subtidal sand		

Attribute	Supporting processes: physico-chemical properties	
Feature / Sub-feature	Target	
Harbour (common) seal ( <i>Phoca vitulina</i> )	Maintain the natural physico-chemical properties of the water.  Notes – <ul style="list-style-type: none"> <li>• “Targets” for these sub-features for this Attribute are the same.</li> </ul>	
Intertidal biogenic reef: mussel beds		
Intertidal coarse sediment		
Intertidal mud		
Intertidal sand and muddy sand		
Subtidal biogenic reefs: mussel beds		
Mudflats and sandflats not covered by seawater at low tide		
Sandbanks which are slightly covered by sea water all the time		
Subtidal coarse sediment		
Subtidal mixed sediments		
Subtidal mud		
Subtidal sand		

Attribute	<b>Supporting processes: sediment contaminants</b>	
Feature / Sub-feature	Target	
Intertidal coarse sediment	Restrict surface sediment contaminants (<1cm from the surface) to below the OSPAR Environment Assessment Criteria (EAC) or Effects Range Low (ERL) threshold. For example, mean cadmium levels should be maintained below the ERL of 1.2 mg per kg.  Notes – <ul style="list-style-type: none"> <li>• “Targets” for these sub-features for this Attribute are the same.</li> </ul>	
Intertidal mud		
Intertidal sand and muddy sand		
Large shallow inlets and bays		
Mudflats and sandflats not covered by seawater at low tide		
Sandbanks which are slightly covered by sea water all the time		
Subtidal coarse sediment		
Subtidal mixed sediments		
Subtidal mud		
Subtidal sand		

Attribute	<b>Supporting processes: sediment movement and hydrodynamic regime</b>	
Feature / Sub-feature	Target	
Subtidal coarse sediment	Maintain all hydrodynamic and physical conditions such that natural water flow and sediment movement are not significantly altered or prevented from responding to changes in environmental conditions  Notes –  • “Targets” for these sub-features for this Attribute are the same. (with minor typographical variations)	
Sandbanks which are slightly covered by sea water all the time		
Subtidal coarse sediment		
Subtidal mixed sediments		
Subtidal mud		
Subtidal sand		
Intertidal coarse sediment		
Intertidal mud		
Intertidal sand and muddy sand		
Mudflats and sandflats not covered by seawater at low tide	Maintain sediment transport pathways to and from the feature to ensure replenishment of the feature, and / or replenishment of habitats that rely on the sediment supply from the feature.	
Harbour (common) seal ( <i>Phoca vitulina</i> )	Maintain all hydrodynamic and physical conditions such that natural water flow and sediment movement is not significantly altered or constrained.	



Attribute	<b>Supporting processes: water quality - contaminants</b>	
Feature / Sub-feature	Target	
Sandbanks which are slightly covered by sea water all the time	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing level	
Intertidal biogenic reef: mussel beds		
Harbour (common) seal ( <i>Phoca vitulina</i> )		
Intertidal coarse sediment		
Intertidal mud		
Intertidal sand and muddy sand		
Supporting processes: water quality - contaminants		
Large shallow inlets and bays		
Mudflats and sandflats not covered by seawater at low tide		
Subtidal coarse sediment		
Subtidal mixed sediments		
Subtidal mud		
Subtidal sand		

Attribute	<b>Supporting processes: water quality - dissolved oxygen</b>	
Feature / Sub-feature	Target	
Intertidal coarse sediment	<p>Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically <math>\geq 5.7</math> mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.</p> <p>Notes –</p> <ul style="list-style-type: none"> <li>• “Targets” for these sub-features for this Attribute are the same. (with minor typographical variations) (and in one case the substitution of “...5./litre...”, which is assumed to be an error</li> </ul>	
Intertidal mud		
Intertidal sand and muddy sand		
Mudflats and sandflats not covered by seawater at low tide		
Intertidal biogenic reef: mussel beds		
Subtidal biogenic reefs: mussel beds		
Large shallow inlets and bays		
Sandbanks which are slightly covered by sea water all the time		
Subtidal mixed sediments		
Subtidal mud		
Subtidal sand		
Subtidal coarse sediment		

Attribute	<b>Supporting processes: water quality - nutrients</b>	
Feature / Sub-feature	Target	
Intertidal biogenic reef: mussel beds	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels.	
Intertidal coarse sediment		
Intertidal mud		
Intertidal sand and muddy sand		
Subtidal biogenic reefs: mussel beds		
Large shallow inlets and bays		
Mudflats and sandflats not covered by seawater at low tide		
Sandbanks which are slightly covered by sea water all the time		
Subtidal coarse sediment		
Subtidal mixed sediments		
Subtidal mud		
Subtidal sand		
Harbour (common) seal ( <i>Phoca vitulina</i> )		

Attribute	<b>Supporting processes: water quality - turbidity</b>	
Feature / Sub-feature	Target	
Intertidal sand and muddy sand	Maintain natural levels of turbidity (e.g. suspended concentrations of sediment, plankton and other material) across the habitat.	
Intertidal mud		
Intertidal biogenic reef: mussel beds		
Intertidal coarse sediment		
Intertidal mud		
Mudflats and sandflats not covered by seawater at low tide		
Sandbanks which are slightly covered by sea water all the time		
Subtidal coarse sediment		
Subtidal mixed sediments		
Subtidal mud		
Subtidal sand		
Subtidal biogenic reefs: mussel beds		
Large shallow inlets and bays	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, particulates, plankton and other material) across the habitat.	
Harbour (common) seal ( <i>Phoca vitulina</i> )	Maintain natural levels of turbidity (e.g. suspended concentrations of sediment, plankton and other material) in areas where this species is, or could be present.	

Attribute	<b>Supporting habitat: extent and distribution</b>	
Feature / Sub-feature	Target	
Harbour (common) seal ( <i>Phoca vitulina</i> )	Maintain the extent and spatial distribution of the following supporting habitats: foraging and haulout sites.	

Attribute	<b>Supporting habitat: food availability</b>	
Feature / Sub-feature	Target	
Harbour (common) seal ( <i>Phoca vitulina</i> )	Maintain the abundance of preferred food items required by the species.	

Attribute	<b>Presence and spatial distribution of the species</b>	
Feature / Sub-feature	Target	
Harbour (common) seal ( <i>Phoca vitulina</i> )	Maintain the presence and spatial distribution of the species and their ability to undertake key life cycle stages and behaviours.	

Attribute	<b>Population: recruitment and reproductive capability</b>	
Feature / Sub-feature	Target	
Harbour (common) seal ( <i>Phoca vitulina</i> )	Maintain the reproductive and recruitment capability of the species.	

**References:**

Natural England, 2017. Natural England Conservation Advice for Marine Protected Areas. The Wash and North Norfolk Coast Special Area of Conservation. Designated Sites View. Available at: <<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0017075&SiteName=the+wash+and+north+norfolk+coast+sac&SiteNameDisplay=The+Wash+and+North+Norfolk+Coast+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>> [Accessed on 24<sup>th</sup> July 2017].