

# Liverpool Bay / Bae Lerpwl pSPA Draft Conservation Objectives and Advice on Operations



## Natural England & the Countryside Council for Wales September 2009

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from the Countryside Council for Wales



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## SUMMARY

This document contains Natural England and the Countryside Council for Wales' (CCW) advice issued under Conservation (Natural Habitats, &c.) Regulations 1994, for the *Liverpool Bay / Bae Lerpwl Special Protection Area* (SPA), namely conservation objectives and advice on operations.

**Section 1** provides the legal basis and practical requirements for setting conservation objectives for Natura 2000 sites, as understood by Natural England and CCW. It also briefly explains the legal and practical basis of the operations advice.

**Section 2** details the qualifying features for the Liverpool Bay / Bae Lerpwl SPA site

**Section 3** contains Natural England and CCW's advice as to the conservation objectives for the SPA site.

**Section 4** contains the Favourable Condition Tables which detail information on the measures and targets that may be used to determine condition and monitoring of the site.

**Section 5** contains Natural England and CCW's advice on operations which may cause deterioration or disturbance of the habitats and species for which the SPA site has been selected (Regulation 33(2)(b)). This is provided to assist the relevant authorities and others in understanding the implications of the designation of the site.

**Section 6** contains the references.

**Section 7** contains a glossary of terms.

**Appendix 1** provides the proposed boundary map for Liverpool Bay / Bae Lerpwl SPA

## **1. Introduction**

This document provides advice for the Liverpool Bay / Bae Lerpwl Potential Special Protection Area (pSPA) and is jointly prepared by Natural England and CCW. Liverpool Bay / Bae Lerpwl pSPA lies across both English and Welsh territorial waters.

### **1.1 The role of Natural England and the Countryside Council for Wales**

Regulation 33 of the Habitats Regulations requires Natural England and CCW to advise the relevant authorities for each European Marine Site in, or partly in, England and Wales as to:

- (a) the conservation objectives for that site, and
- (b) any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated.

This document contains Natural England and CCW's draft advice in relation to the designated sites which comprise the Liverpool Bay / Bae Lerpwl pSPA.

The Conservation (Natural Habitats &c.) Regulations 1994, as amended, transpose the Habitats Directive into law in Great Britain. They give Natural England and CCW a statutory responsibility to advise relevant authorities as to the conservation objectives for European Marine Sites and Ramsar Sites in England and Wales and to any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species for which the sites have been designated. This information will be a key component of any management scheme that may be developed for this site. It will also aid competent authorities in defining the scope and nature of 'appropriate assessment' which the Habitats Directive requires to be undertaken for 'plans and projects' having a significant effect on the European site (Habitats Regulations 20, 48, 50, 60-62 and 85B). Note that Natural England and CCW will also advise competent authorities on individual plans and projects as they arise. Natural England and CCW are also competent and relevant authorities under the Habitats Regulations.

### **1.2 The precautionary principle**

The advice on operations contained within this package has been made based on the precautionary principle and any actions which may need to be taken in response to concerns identified as a result of monitoring undertaken by Natural England and the CCW will also be made on this basis. All forms of environmental risk should be tested against the precautionary principle which means that where there are real risks to the site, lack of full scientific certainty should not be used as a reason for postponing measures that are likely to be cost effective in preventing such damage. It does not however imply that the suggested cause of such damage must be eradicated unless proved to be harmless and it cannot be used as a licence to invent hypothetical consequences. Moreover, it is important, when considering whether the information available is sufficient, to take account of the associated balance of likely costs, including environmental costs, and benefits (DETR & the Welsh Office, 1998).

### **1.3 The role of other competent and relevant authorities**

The Conservation (Natural Habitats &c.) Regulations 1994 require competent authorities to exercise their functions so as to secure compliance with the requirements of the Habitats and Birds Directives. The term “competent authority” includes all public bodies and statutory undertakers. The Regulations identify a number of competent authorities as “relevant authorities”, with particular functions in relation to European Marine Sites. In addition to their duties as competent authorities, under Regulation 34 the relevant authorities may establish a management scheme for a European Marine Site under which they shall exercise their relevant functions. Such a management scheme should be guided by the information contained in this document. Relevant authorities must, within their areas of jurisdiction, have regard to both direct and indirect effects on an interest feature of the site. This may include consideration of issues outside the boundary of the European Marine Site.

Relevant authorities also need to have regard to changing circumstances of the European Marine Site and may therefore need to modify the management scheme and/or the way in which they exercise their functions so as to maintain the favourable condition of interest features concerned in the long term. There is no requirement for relevant authorities to take any actions outside their statutory functions. For the purposes of this document the term ‘interest feature’ refers to any of the habitat types or species for which the European Marine Sites have been designated.

Under certain circumstances, where another relevant authority is unable to act for legal reasons, or where there is no other relevant authority, Natural England and CCW are empowered to use their bylaw-making powers under Regulation 36 of the Habitats Regulations 1994. It is anticipated that this power will be transferred to the Marine Management Organisation / Welsh Ministers subject to the Marine and Coastal Access Bill becoming law.

None of the information contained in this document legally binds any organisation (including Natural England and CCW) to any particular course of action. However, in exercising their functions in accordance with the requirements of the Habitats Directive, as required by the Habitats Regulations, and in accordance with government policy on Ramsar sites, the relevant authorities should be guided by the advice contained in this document. This applies amongst other things to the establishment of a “management scheme”<sup>1</sup>, if such a scheme is established.

### **1.4 Condition**

Natural England and CCW use the term “favourable condition” for the condition represented by the achievement of the conservation objectives, in other words the desired condition for a designated habitat or a species on an individual site.

On many terrestrial European sites, we know sufficient about the required condition of qualifying habitats and species to be able to define favourable condition with confidence. In contrast understanding the functioning of large, varied, dynamic marine sites, which experience a variety of pressures resulting from historic and current activities, is much more difficult. Consequently it is much harder to precisely define favourable condition of the features of Liverpool Bay. In general the conservation objectives provided are based on a

working assumption that the current condition of the features is favourable for most attributes. Where it becomes clear that certain attributes may indicate a cause for concern, and if further investigation indicates this is justified then restorative management actions will need to be undertaken to return the interest feature to favourable condition. In future revisions of our advice Natural England and CCW will keep our assumption under review in light of ongoing and future monitoring and our developing understanding of the features and the factors affecting them.

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<sup>1</sup>Regulation 34 of the Habitats Regulations.

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## 1.5 Favourable Condition Tables

The detailed information regarding the measures and targets that may be used during site monitoring to determine whether favourable condition is being achieved in practice is presented within the Favourable Condition Tables in section 4.

The favourable condition table identifies the following attributes for the SPA features:

- Supporting habitat
- Population size
- Proportion of biogeographical population
- Disturbance impacts
- Mortality impacts
- Food availability

The favourable condition table is intended to supplement the conservation objectives, including with respect to the management of established and ongoing activities, future requirements of monitoring and reporting on the condition of the features of the site and, together with the conservation objectives, informs the scope and nature of any appropriate assessment that may be needed. The table **does not by itself** provide a comprehensive basis on which to assess plans and projects as required under the Habitats Regulations. It should be noted that appropriate assessments are a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects. Natural England and CCW will provide more detailed advice to competent and relevant authorities to assess the implications of any given plan or project under the Regulations, where appropriate, at the time a plan or project is being considered.

The favourable condition table specifies the main types of information that Natural England and CCW may use to assess the condition of interest features. On many terrestrial European sites, we know sufficient about the preferred or target condition of qualifying species and habitats to be able to define measures and associated targets for all attributes. In European Marine Sites favourable condition is generally harder to define precisely since our knowledge of features is still developing. Accordingly, in the absence of such information, condition of interest features in European Marine Sites will, in the first instance, be assessed against targets based on their condition at the time the sites were selected, which may need to be established through baseline surveys in many cases.

The information contained within the favourable condition table is not necessarily what will be monitored but provides a basis for discussions with management and advisory groups. The attributes and associated measures and targets may be modified over time. The selection of attributes is based on the current understanding of the habitats and species and the available measuring techniques.

The appropriateness of individual attributes as indicators of condition will be reviewed as more knowledge of the condition of interest features is obtained and/or survey and monitoring techniques develop. Monitoring of the attributes may be of fairly coarse methodology, underpinned by more rigorous methods on specific areas within the site.

The favourable condition table will be an important, but not the only, driver of the site monitoring programme. Other data, such as results from compliance monitoring and appropriate assessments, will also have an important role in assessing condition of interest features. The monitoring programme will be developed as part of the management scheme process through discussion with the relevant authorities and other interested parties. Natural England and the Countryside Council for Wales will be responsible for collating the information required to assess condition, some of which may be collected by other organisations, and for judging the condition of each feature within the site, taking into account all available information and using the favourable condition table as a guide.

The conservation objectives and associated Favourable Condition Tables in this document are intended to guide relevant and competent authorities in the exercise of their functions to comply with the requirements of the Directives outlined above.

## 1.6 Advice on operations

The advice on operations set out in Section 5 provides the basis for discussion about the nature and extent of the operations taking place within or close to the site and which may have an impact on its interest features. The advice should also be used to identify the extent to which existing measures of control, management and forms of use are, or can be made, consistent with the conservation objectives, and thereby focus the attention of competent authorities and surveillance to areas that may need management measures.

This operations advice may need to be supplemented through further discussions with the competent authority and any advisory groups formed for the pSPA.

## 2. Qualifying features of the Liverpool Bay / Bae Lerpwl pSPA

Under Stage 1 of the SPA selection guidelines (JNCC, 1999), sites eligible for selection as a potential SPA must demonstrate one or more of the following:

1. an area used regularly by 1% or more of the Great Britain population of a species listed in Annex I of the Birds Directive (79/409/EEC) in any season;
2. an area used regularly by 1% or more of the biogeographical population of a regularly occurring migratory species (other than those listed in Annex I) in any season;
3. an area used regularly by over 20,000 waterfowl (waterfowl as defined by the Ramsar Convention) or 20,000 seabirds in any season.

Liverpool Bay has been identified by Natural England and CCW as qualifying for SPA status under the following Stage 1 guidelines:

Stage 1(1). Liverpool Bay regularly supports over 1% of the GB population of one species listed on Annex I of the EC Directive on the Conservation of Wild Birds (79/409/EEC): red-throated diver (*Gavia stellata*). The mean peak count of overwintering red-throated divers within the pSPA boundary over the period 2001/02 – 2005/06 was 922 individuals: or 5.4% of GB's total estimated overwintering population.

Stage 1(2). Liverpool Bay regularly supports more than 1% of the biogeographical population of one regularly occurring migratory species: common scoter (*Melanitta nigra*). The mean

peak overwintering common scoter population of 54,675 individuals between 2001/02 – 2005/06 is an estimated 58% of the GB population.

Stage 1(3). The site also supports more than 20,000 waterbirds in the non-breeding season with a mean peak average over 2001/02 – 2005/06 of at least 55,597, with at least 80,346 in winter 2001/02.

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### 3. Conservation Objectives for Liverpool Bay / Bae Lerpwl pSPA

The protection and management of the SPA in accordance with Article 6 of the Habitats Directive, including in particular the consideration of plans and projects under Article 6(3) and 6(4), should be carried out in view of the conservation objectives in this section.

#### 3.1 Interest feature 1: Internationally important population of regularly occurring Annex 1 species: red-throated diver (*Gavia stellata*)

The draft conservation objective is to maintain the red-throated diver population and its supporting habitats in favourable condition.

The interest feature red-throated diver will be considered to be in favourable condition only when all of the following conditions are met:

- (i) The 5 year peak mean population size for the red-throated diver population is no less than 922 individuals (ie the five-year peak mean between 2001/02 – 2006/07);
- (ii) The overall presence and abundance of prey species within the site is maintained;
- (iii) Red-throated divers are not exposed to significant human-induced mortality, and areas where they congregate in higher densities are not subject to significant disturbance.

##### 3.1.1 Explanatory information for the red-throated diver conservation objectives

###### Key supporting habitats and distribution

Red-throated divers tend to winter in inshore waters that are 0-20m deep, and in areas with extensively sandy seabeds. There is some evidence that they may also be associated with areas where there is a change in the salinity of water - ie in areas where low and high waters meet such as estuaries.

The greatest densities of red-throated divers in Liverpool Bay are off the Ribble Estuary, North Wales, and the North Wirral Foreshore (Webb *et al.*, 2006).

As an active fish-feeder, the distribution and concentrations of red-throated divers will at least partly be determined by the presence, abundance, and availability of their prey species.

###### Key food

The sandbanks of Liverpool Bay support the nursery and feeding grounds for many fish species, including the small fish that red-throated divers feed on.

Evidence suggests that red-throated divers are associated with shoals of sprats. They also eat herring, gobies, sand eels, and various flatfish such as plaice and sole.

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Webb, A., McSorley, C.A., Dean, B.J. & Reid, J.B. (2006) Recommendations for the selection of, and boundary options for, an SPA in Liverpool Bay. JNCC Report 388.

## **Behaviour and Impacts**

Red-throated divers are vulnerable to increased adult mortality as they are a long-lived species with low breeding productivity.

There is evidence that red-throated divers are displaced from the footprint and surrounding areas of offshore windfarms by the presence of the turbines and the activities of maintenance vessels. Petersen *et al.* (2004) showed a displacement of 80-100% of red-throated divers for up to 2-4 km from offshore windfarms.

Entanglement in static fishing nets is an important cause of death for red-throated divers in the UK waters (Wernham *et al.*, 2002). The extent of this impact in Liverpool Bay is not known however.

Commercial extraction of the red-throated diver's main fish prey, as either target and/or bycatch species, could impact the birds, but again the extent of this in Liverpool Bay is not well understood.

### **3.2 Interest feature 2: Internationally important population of regularly occurring migratory species: common scoter (*Melanitta nigra*).**

The draft conservation objective is to maintain the common scoter population and its supporting habitats in favourable condition.

The interest feature common scoter will be considered to be in favourable condition only when all of the following conditions are met:

- (i) The 5 year peak mean population size for the common scoter population is no less than 54,675 individuals (ie the five-year peak mean between 2001/02 – 2006/07);
- (ii) The overall presence and abundance of benthic prey species within the site is maintained, along with its associated features;
- (iii) Common scoters are not exposed to significant human-induced mortality, and their aggregations are not subject to significant disturbance;
- (iv) The movement of common scoters between feeding and resting areas is not significantly impeded.

#### **3.2.1 Explanatory information for the wintering European common scoter objectives**

##### **Key supporting habitat and distribution**

The over-wintering common scoter of Liverpool Bay tend to aggregate on water depth range of 2-20m and a mean depth of 10-12m (Kaiser *et al.*, 2005). The most important area of Liverpool Bay for the common scoter is Shell Flat to Formby (off Blackpool), Colwyn Bay, and Conwy Bay (CCW, 2006).

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Petersen, I.K., Clausager, I. & Christensen, T.J. (2004) *Bird numbers and distribution on the Horns Rev offshore wind farm area. Annual Status Report 2003*. Report commissioned by Elsam Engineering A/S 2003. NERI report, National Environmental Research Institute, Ministry of the Environment, Denmark. [www.dmu.dk](http://www.dmu.dk).  
Wernham, C.V., Toms, M.P., Marchant, J.H., Clark J.A., Siriwardena, G.M., & Baillie, S.R. (eds) (2002) *The Migration Atlas*

Kaiser, M., Elliot, A., Galanidi, M., Rees, E.I.S., Caldow, R., Stillman, R., Sutherland, W. & Showler, D. (2005) *Predicting the displacement of Common Scoter Melanitta nigra from benthic feeding areas due to offshore windfarms*. Report COWRIE-BEN-03-2002. University of Wales, Bangor.  
Countryside Council for Wales, 2006. CCW Phase 1 intertidal survey dataset (unpublished).

Common scoters are present in Liverpool Bay from August to May, with the most significant numbers present during August to March.

The observed distribution of common scoter is strongly associated with the distribution of its benthic prey species (Kaiser *et al.*, 2005).

### **Key food**

Common scoters feed by diving, usually synchronously in flocks, and feed on mainly cockles, clams, other bivalves, and a variety of other molluscs, crustaceans, and worms.

### **Behaviour and Impacts**

Male and female common scoter appear to arrive in Liverpool Bay at different times, with females arriving later in the winter.

Common scoter are sensitive to disturbance by moving vessels. Large flocks of the birds were observed being put to flight at a distance of 2km from a 35m vessel, though smaller flocks were less sensitive and put to flight at a distance of 1km (Kaiser *et al.*, 2005). Larger vessels would be expected to have an even greater disturbance distance (Kaiser *et al.*, 2005).

Dredging for bivalves has been shown to have significant negative effects on their benthic habitat and could directly affect both the food source and feeding grounds used by common scoters.

### **3.3 Interest feature 3: Area being used by over 20,000 waterfowl or 20,000 seabirds in any season**

The conservation objective is to maintain the waterfowl assemblage and its supporting habitat in favourable condition:

The interest feature waterfowl assemblage will be considered to be in favourable condition when all of the following conditions are met:

- (i) The peak mean population size for the waterfowl assemblage is no less than 55,597 (ie the five-year peak mean between 2001/02 – 2006/07);
- (ii) Aggregations of waterfowl and seabirds at feeding and resting sites are not subject to significant disturbance.

#### **3.3.1 Explanatory information for the waterfowl/seabird objectives**

The peak mean waterfowl population of 55,597 was a combination of the red-throated diver and common scoter counts in the surveys 2001/02 – 2006/07

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Kaiser, M., Elliot, A., Galanidi, M., Rees, E.I.S., Caldow, R., Stillman, R., Sutherland, W. & Showler, D. (2005)  
Predicting the displacement of Common Scoter *Melanitta nigra* from benthic feeding areas due to offshore  
windfarms. Report COWRIE-BEN-03-2002. University of Wales, Bangor.

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## 4. Favourable Condition Table

Background information on the role of favourable condition tables and the information provided in each column is provided in section 1.5 of this document, and a concise glossary of terms used is provided in Section 7.

The favourable condition tables (Tables 1-3) are intended to supplement the conservation objectives, including with respect to the management of established and ongoing activities, future requirements of monitoring and reporting on the condition of the features of the site and, together with the conservation objectives, informs the scope and nature of any appropriate assessment that may be needed. The table does not by itself provide a comprehensive basis on which to assess plans and projects as required under the Habitats Regulations. It should be noted that appropriate assessments are a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects.

These tables set out all the attributes that *may* be used to monitor the condition of the features of the SPA. Where possible we will seek available information from others which can inform our assessment process.

It will be possible to monitor many of the attributes at the same time or during the same survey. The frequency of sampling for many attributes may need to be greater during the initial monitoring events in order to characterise the site and establish the baselines. Extreme events (such as storms reducing or increasing salinities, exceptionally cold winters or warm summers) also need to be recorded as they may be critical in influencing ecological issues in Liverpool Bay and may well be missed by routine monitoring.

**Table 1 – Favourable Condition Table for the Annex I interest feature: red-throated diver**

SPA Interest Feature	Attribute	Measure	Target	Comments
Red-throated Diver	Supporting habitat	Maintain the area of sandbanks in the site within acceptable limits	No decrease in the extent of undisturbed sublittoral, shallow (<20m) sandbank habitat available for red-throated diver feeding	Changes in extent will need to take account of the dynamic nature of the sandbank, but a trend of reduction in extent may indicate long-term changes in the physical conditions influencing the feature, whether it be natural processes or anthropogenically driven.
	Population size	Five-year mean peak number of	Mean overwintering population	Natural fluctuations in numbers should be taken in to account. Areas of

		individuals	does not fall below 922 individuals. (ie the five-year peak mean between 2001/02 – 2006/07)	highest red-throated diver density were Ribble Estuary, North Wales, and North Wirral foreshore.
	Proportion of biogeographical population	% of UK overwintering population	Maintain over 1% of British non-breeding population of red-throated diver	Liverpool Bay is currently estimated to have supported 5.4% (922 individuals) of the British non-breeding population over period 2001/02 – 2006/07.
	Disturbance impacts	Disturbance or displacement of wintering red-throated divers	No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline	Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging. Disturbance impacts could potentially come from shipping, fishing, and offshore development and servicing activity.
	Mortality impacts	Red-throated diver mortality as a direct result of human impact	No significant red-throated diver mortality impacts from human activity	Wind turbine strike and entrapment in fixed fishing nets would be the most likely cause of mortality for red-throated diver, though the likelihood or extent of this impact is not currently well understood within

				Liverpool Bay
	Food availability	Amount and availability of small fish prey	Maintain the abundance and distribution of red-throated diver prey species subject to natural fluctuations	Red-throated divers could be strongly affected by a decline in the amount and/or availability of the small fish on which they feed.

**Table 2 – Favourable Condition Table for the Annex II interest feature: common scoter**

SPA Interest Feature	Attribute	Measure	Target	Comments
<b>Common Scoter</b>	Supporting habitat	Maintain the area of sandbanks in the site within acceptable limits	No decrease in the extent of undisturbed sublittoral, shallow (<20m) sandbank habitat available for common scoter feeding	Changes in extent will need to take account of the dynamic nature of the sandbank, but a trend of reduction in extent may indicate long-term changes in the physical conditions influencing the feature, whether it be natural processes or anthropogenically driven.
	Population size	Five-year mean peak number of individuals	Mean overwintering population does not fall below 54,675 individuals. (ie the five-year peak mean between 2001/02 – 2006/07)	Natural fluctuations in numbers should be taken in to account. Areas of highest common scoter congregations are Red Wharf Bay (Anglesey), Conwy Bay, Great Orme's Head to the North Wirral foreshore, and Formby Point to Shell Flat.

	Proportion of biogeographical population	% of UK overwintering population	Maintain over 1% of British non-breeding population of CSs	The mean number of 54,675 common scoter individuals found in Liverpool Bay over the period 2001/02 – 2006/07 is currently estimated to be around 58% of the GB population. However, the surveying revealed far higher than previously expected numbers of CS and it is possible that other areas of GB have as-yet unidentified CS populations, potentially reducing the percentage in Liverpool Bay.
	Disturbance impacts	Disturbance or displacement of wintering common scoter	No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline	Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging. Disturbance impacts could potentially come from shipping, fishing, and offshore developments and associated activities, and also from having their routes between feeding, roosting, and sheltering areas impeded.
	Mortality impacts	Common scoter mortality as a direct result of human impact	No significant common scoter mortality impacts from human activity	Wind turbine strike and entrapment in fixed fishing nets would be the most likely cause of mortality for common scoter, though the likelihood or extent of this impact is not currently well understood within

				Liverpool Bay
	Food availability	Amount and availability of sublittoral prey	Maintain the abundance and distribution of common scoter prey species subject to natural fluctuations	Common scoter could be strongly affected by a decline in the amount and/or availability of the bivalve and other sublittoral species on which they feed.

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**Table 3 – Favourable Condition Table for the interest feature: Area used by over 20,000 waterfowl or seabirds in any one season**

SPA Interest Feature	Attribute	Measure	Target	Comments
<b>Area used by &gt;20,000 waterfowl or seabirds in any one season</b>	Supporting habitat	Maintain the areas of habitat associated with the bird assemblages	No decrease in the extent of appropriate habitat	Changes in extent will need to take account of natural , but a trend of reduction in extent may indicate long-term changes in the physical conditions influencing the feature, whether it be natural processes or anthropogenically driven.
	Population size	Five-year mean peak number of individuals	Mean overwintering population does not fall below 55,597 individuals. (ie the five-year peak mean between 2001/02 – 2006/07)	This number is taken from the combined red-throated diver and common scoter counts and is subject to the same variables described above
	Disturbance impacts	Disturbance or displacement of wintering bird assemblages	No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline	Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging. Disturbance impacts could potentially come from shipping, fishing, and offshore

				development and associated activities, and also from having their routes between feeding, roosting, and sheltering areas impeded
	Mortality impacts	Waterfowl/seabird mortality as a direct result of human impact	No significant overwintering waterfowl/seabird mortality impacts from human activity	Wind turbine strike and entrapment in fixed fishing nets would be the most likely cause of mortality for overwintering birds, though the likelihood or extent of this impact is not currently well understood within Liverpool Bay
	Food availability	Amount and availability of fish/sublittoral prey	Maintain the abundance and distribution of prey species subject to natural fluctuations	The food sources of red-throated diver and common scoter are important for their overwintering populations

## 5. Advice on Operations

Natural England and CCW have a duty under Regulation 33(2)(b) of The Conservation (Natural Habitats &c.) Regulations 1994 to advise other relevant authorities as to any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated. Information on how Natural England and CCW have developed this advice is given in section 5.2, and on how it may be reviewed and updated in the future in section 5.3.

The specific Advice on Operations concerning the SPA is provided in Tables 4-6 and section 5.5. These include recommendations regarding specific interest features and their supporting habitats.

### 5.1. Purpose of advice

The aim of this advice is to provide Natural England and CCW's Advice on Operations as required by Regulation 33 (2)(b) for the Liverpool Bay / Bae Lerpwl pSPA and thereby enable all relevant authorities to direct and prioritise their work on the management of activities that pose the greatest potential threat to the favourable condition of interest

features on Liverpool Bay / Bae Lerpwl European Marine Site. The advice should be read in conjunction with the Conservation Objectives for the SPA interest features given in section 3 and it is established to provide the basis for detailed discussions to formulate and agree a management scheme for the European Marine Sites.

General advice on sensitivity, exposure (and together vulnerability) contained within this document is presented against broad categories of operation which may cause the deterioration of natural habitats or the habitats of species, or the disturbance of species. It reflects activities and plans and projects. Generic examples of some of the types of operation that are covered under the broad category headings are given for illustration.

The advice is based on best available information at the time of preparation of the Conservation Objective document for the Liverpool Bay / Bae Lerpwl pSPA, in 2009.

## 5.2 Methods for assessment

The advice provided here is within six broad categories of operation which may cause the deterioration of natural habitats or the habitats of species, or the disturbance of species. These categories are:

- Physical loss
- Physical damage
- Non-physical disturbance
- Toxic contamination
- Non-toxic contamination
- Biological disturbance

Given current knowledge of the nature and extent of activities taking place within Liverpool Bay / Bae Lerpwl pSPA, this approach therefore:

- enables links to be made between human activities and the ecological requirements of the habitats or species, as required under Article 6 of the Habitats Directive;
- provides a consistent framework to enable relevant authorities in England and Wales to assess the effects of activities and identify priorities for management within their areas of responsibility; and
- is appropriately robust to take into account the development of novel activities or operations which may cause deterioration or disturbance to the interest features of the site and should have sufficient stability to need only infrequent review and updating by the CCW and Natural England.

These broad categories provide a clear framework against which relevant authorities can assess activities or operations under their responsibility. The more detailed information in Tables 4-6 provides competent authorities with a context against which to consider an assessment of 'significant effect' of any plans or projects which may affect the site and a basis to inform on the scope and nature of appropriate assessments required in relation to plans and projects. It is important to note that this advice is only a starting point for assessing impacts. It does not remove the need for the relevant or competent authorities to

consult Natural England or CCW formally over individual plans and projects where required to do so under the Regulations.

This Advice on Operations for the site is based on a three-step process involving:

- an assessment of the **sensitivity** of the interest features or their component supporting habitats to operations;
- an assessment of the current **exposure** of each interest feature or their component supporting habitats to operations; and
- a final assessment of current **vulnerability** of interest features or their component supporting habitats to operations.

This three-step process builds up a level of information necessary to manage activities in and around the European Marine Site in an effective manner and to identify to competent and relevant authorities those operations which pose the most immediate threats to the favourable condition of the interest features of the European Marine Site.

The assessment of relative sensitivity, exposure and vulnerability is derived using best available scientific information and informed scientific interpretation and judgement. The process uses sufficiently coarse categorisation to minimise uncertainty in information, reflecting the current state of knowledge and understanding of the marine environment. Where possible, the sensitivity, exposure and vulnerability are assessed on a three-point scale of 'Low', 'Moderate' or 'High'. To assist with interpretation, these levels have been colour-coded in Tables 4-6

### 5.2.1 Sensitivity assessment

The sensitivity assessment used is an assessment of the relative sensitivity of the interest features or the component supporting habitats of Liverpool Bay / Bae Lerpwl pSPA to the effects of six broad categories of human activities. In relation to this assessment, **sensitivity** has been defined as **'the intolerance of a habitat, community or individual (or individual colony) of a species to damage, or death, from an external factor and the time taken for its subsequent recovery'** (MarLIN, 2003). For example, a very sensitive species or habitat is one that is very adversely affected by an external factor arising from human activities or natural events (killed/destroyed, 'high' intolerance) and is expected to recover only over a very long period of time, i.e. >10 or up to 25 years ('low' recoverability).

The sensitivity assessments are based on current information but may develop with improvements in scientific knowledge and understanding. The sensitivity of interest features (and scientific understanding of sensitivity) may change over time; hence an operation which is not currently considered to have a negative effect, may do so in the future.

### 5.2.2 Exposure assessment

Exposure assessment has been undertaken for Liverpool Bay / Bae Lerpwl pSPA by assessing the relative exposure of the interest features or their component supporting habitats to the effects of broad categories of operations, resulting from human activities currently occurring on the site.

In assigning a three-point score (High, Moderate or Low) to the exposure, each activity is considered for:

- Spatial extent of the pressure
- Frequency of the pressure and
- Intensity of the pressure

### 5.2.3 Vulnerability assessment

The third step in the process is to determine the vulnerability of interest features or their component supporting habitats to operations. This sensitivity and exposure are integrated to determine vulnerability. Only if a feature is both sensitive and exposed to a human activity will it be considered vulnerable. In this context therefore, 'vulnerability' has been defined as 'the exposure of a habitat,

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MarLIN, 2003. *Species sensitivity assessment rationale summary*. [on-line]. Plymouth: Marine Biological Association of the United Kingdom. Available from: [http://www.marlin.ac.uk/glossaries/SpeciesSensRationale\\_Summ.htm](http://www.marlin.ac.uk/glossaries/SpeciesSensRationale_Summ.htm) [Accessed August 2008].

community or individual (or individual colony) of a species to an external factor to which it is sensitive' (Hiscock, 1996).

Tables 4-6 show the vulnerability assessments for the SPA features.

## 5.3 Update and review of advice

The information provided in this advice on the sensitivity of interest features or their supporting habitats (Tables 4-6) will change as a result of an improvement in our scientific knowledge, which will be a relatively long term process. It is suggested that advice for sites be kept under review and is periodically updated through discussion with relevant authorities and others to reflect significant changes in our understanding of sensitivity together with the potential effects of plans and projects on the marine environment.

## 5.4 Plans and Projects

Under Regulation 48(1), an appropriate assessment must be undertaken by competent authorities in respect of any plan or project which:

- a. either alone or in combination with other plans or projects is likely to have a **significant effect** on a European site; and
- b. is not directly connected with or necessary to the management of the site for nature conservation.

This legal requirement applies to all European sites (SACs and SPAs). Regulation 48 is also applied, as a matter of Government policy, to proposed SPAs.

Tables 4-6 provides competent authorities with a guide against which to initiate an assessment of the 'significance' of any plans or projects (and on-going operations or activities) proposed for the site, although this will only be a starting point for assessing

impacts and does not remove the need for competent authorities to consult Natural England or CCW formally over individual plans and projects where required under the Regulations.

## 5.5 Specific Advice on Operations for the Liverpool Bay / Bae Lerpwl pSPA

This section provides information to help relate general advice to each of the specific interest features of the Liverpool Bay / Bae Lerpwl pSPA. Where specific examples are given they are provided to aid understanding of possible impacts and are not intended to be a comprehensive list of all relevant operations

This draft advice relates to the vulnerability of the interest features and supporting habitats of the Liverpool Bay / Bae Lerpwl pSPA as set out in Tables 4-6. An explanation of the sensitivity of the interest features or supporting habitats follows with an explanation of their exposure and therefore their vulnerability to damage or disturbance from the listed categories of operations. This enables

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Hiscock, K., ed. 1996. *Marine Nature Conservation Review: rationale and methods*. Peterborough: Joint Nature Conservation Committee.

links between the categories of operation and the ecological requirements of the SPA's interest features to be made. It should be noted that sensitivity scorings are a combination of whether the habitat itself is likely to be affected by a particular operation in combination with an assessment as to whether the outcome is likely to affect the bird's use of that habitat.

### 5.5.1. Physical loss of supporting habitat

#### ***Red-throated divers***

Removal of the shallow (<20m) sandbank features associated with red-throated diver feeding in Liverpool Bay could be detrimental to the favourable condition of the interest feature. As such the overwintering population is considered to be highly sensitive to physical loss of habitat.

As red-throated divers are not benthic feeders, and feed on fish over the sandbanks, they are considered less sensitive to smothering than common scoter.

Offshore development construction, marine aggregates extraction, and dredging all undertake physical removal of sandbanks from within the pSPA boundary.

Based on the extent of supporting sandbank habitat and the distribution and extent of activities, the overall exposure to physical loss can be considered to be low as it represents a small area of the pSPA.

Overall the vulnerability of the Annex I species within the Liverpool Bay / Bae Lerpwl pSPA and associated habitats to physical loss is considered to be moderate for habitat removal and low for habitat smothering.

#### ***Common scoter***

As benthic feeders, common scoter are closely associated with the availability and condition of their shallow sandbank habitat. As such they are considered highly sensitive to its physical loss and smothering.

Based on the extent of supporting sandbank habitat and the distribution and extent of activities, the overall exposure to physical loss can be considered to be low as it represents a small area of the pSPA.

Overall the vulnerability of the Annex II species within the Liverpool Bay / Bae Lerpwl pSPA and associated habitats to physical loss is considered to be moderate for habitat removal and habitat smothering.

### **5.5.2. Physical damage to their supporting habitat**

#### ***Red-throated diver***

Red-throated diver are known to be associated with sandbank features, and though the link between the birds and benthic habitats is not well understood it probably reflects the association between some of their prey species (small fish such as sprat, herring and sandeel between c. 25 and 55g)

and sandbanks (Madsen 1957, Durinck et al. 1994; Reimchen and Douglas 1984).

Sandbanks may have a functional role (as nursery, spawning, feeding or in providing shelter) in supporting these fish species. Physical damage to any of the habitats on which red-throated diver are associated may therefore affect the feeding overwintering population. Repeated or permanent damage (through changes in suspended sediment or physical disturbance such as anchoring or selective extraction) could adversely affect the ability of the habitats to recover and may ultimately lead to loss of prey species

Sensitivity of the red-throated divers to damage to their habitat is considered to be moderate for siltation, abrasion and for selective extraction.

Few ships anchor in Liverpool Bay, and marine aggregate extraction activities are typically very small: only 0.39 km<sup>2</sup> of seabed in Liverpool Bay in 2007 and further offshore than the known areas of red-throated diver concentrations. As such, exposure to all physical habitat damage is considered low.

Overall the vulnerability of the Annex 1 species within the Liverpool Bay / Bae Lerpwl pSPA and associated habitats to physical damage is considered to be low for siltation and abrasion and moderate for selective extraction.

#### ***Common scoter***

Damage to the sandbank features associated with the common scoter's sublittoral prey species could strongly affect their populations. The birds are considered to have moderate sensitivity to siltation and abrasion impacts, but high sensitivity to selective extraction impacts.

Within Liverpool Bay the current exposure to all physical habitat damage impacts are low as there are few ships anchoring and marine aggregate extraction is low and occurs away from the known common scoter congregation areas

Overall the vulnerability of the Annex II species within the Liverpool Bay / Bae Lerpwl pSPA and associated habitats to physical damage is considered to be low for siltation and abrasion and moderate for selective extraction.

### **5.5.3. Non physical disturbance**

#### ***Red-throated diver and common scoter***

Both red-throated diver and common scoter are highly sensitive to noise and visual disturbance and can be disturbed by wind turbine rotors, boat movements, and general activity. Disturbance can cause birds to cease feeding or fly away and in response they could a) increase their energy requirements at their present (disturbed) feeding sites, or b) move to an alternative less favoured feeding or roosting site. Such a response affects energy budgets and food intake rates, and possibly survival. Overwintering birds, which are frequently subject to harsh weather conditions and must lay down fat

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Madsen, F. J. 1957. On the food habits of some fish-eating birds in Denmark. Danish Review of Game Biology, 3: 19-83.

Durinck J, Skov H, Jensen FP, Pihl S (1994) Important marine areas for wintering birds in the Baltic Sea. EU DG XI research contract no. 2242/90-09-01. Ornis Consult report Madsen, F. J. 1957. On the food habits of some fish-eating birds in Denmark. Danish Review of Game Biology, 3: 19-83.

Reimchen, T.E. & Douglas, S, 1984. Feeding schedule and daily food consumption in red-throated loons (*Gavia stellata*) over the pre fledging period. The Auk 101: 593-599.

resulting from disturbance. Sensitivity is therefore considered high.

Exposure to the boat activity (including passenger, recreational, maintenance, and fishing vessels) and existing and proposed windfarms for red-throated divers and common scoter in Liverpool Bay is considered to be moderate.

Overall the vulnerability of the Annex I and Annex II species within the Liverpool Bay / Bae Lerpwl pSPA to non-physical disturbance is considered to be high.

### **5.5.4 Toxic contamination**

#### ***Red-throated diver and common scoter***

Red-throated diver and common scoter sensitivity to synthetic chemicals, such as PCBs, is considered moderate.

PCBs can bioaccumulate in the sublittoral prey species of the common scoter and bioaccumulate/biomagnify in the fish species of the red-throated diver. If marine pollution were to occur there is the potential for exposure to PCBs to change. Hotspots of PCBs include industrial estuaries and sandy environments offshore, but as PCB's are currently banned, exposure can be considered low.

Large oil and chemical spills affecting shallow sandbank habitats can have a detrimental effect on bird populations as it can affect their food sources and also the birds directly,

especially during their moulting times when they are far less mobile. Sensitivity to non-synthetic compounds is therefore considered to be high.

The possibility of a pollution event has been considered and the overall assessment of exposure is considered to be low. This is a combination of 'normal' toxic contamination in the pSPA plus the low risk of catastrophic event. Although exposure is low, the possibility of a catastrophic event due to vessel traffic (oil tankers, ships with toxic contaminants etc) exists.

Overall the vulnerability of red-throated diver and common scoter within the Liverpool Bay / Bae Lerpwl pSPA to toxic contamination is considered to be moderate.

### **5.5.5 Non-toxic contamination**

#### ***Red-throated diver and common scoter***

Non-toxic contamination through nutrient loading, organic loading and changes to the thermal regime could impact on prey species and distribution. The sensitivity of the prey species of both red-throated diver and common scoter to non-toxic contamination is considered moderate.

Non-toxic contamination through the impact from an oil spill could be significant. Oil on the feathers of birds could lead to loss of insulation, reduced buoyancy and possible drowning. Consequently both species may suffer the inability to feed, resulting in starvation and death. The risk of an oil spill occurring is discussed above in section 5.5.4.

The dilution effect for this form of contamination (which could also include increased turbidity and changes to the salinity) may reduce the exposure, which is considered low.

The overall vulnerability of the prey species to non-toxic contamination is considered low.

### **5.5.6. Biological disturbance**

#### ***Red-throated diver and Common scoter***

Sensitivity to the introduction of microbial pathogens and non-native species is considered to be low for both red-throated diver and common scoter, as is their exposure to them in Liverpool Bay. Vulnerability is therefore low.

Their sensitivity to selective extraction of their prey species is high. Fishing activities within Liverpool Bay includes trawling, potting, dredging, netting, long-lining, and angling. The exposure to fishing (ie the amount of their prey species taken by fishing vessels as target or bycatch) is not clearly understood but is considered moderate, making vulnerability moderate/high.

The main possible causes of non-selective extraction would be through entanglement with static fishing gear or through wind turbine strike. The sensitivity to entanglement is considered high to the populations of both species as they dive for their prey and getting caught in the nets would certainly lead to mortality. The exposure to this is not well understood but is considered to be low at present. Vulnerability is therefore moderate.

Impacts with wind turbines could occur if the red-throated divers or common scoter fly above 20m from the sea surface – ie the minimum distance of the turbine rotors from the sea

surface. The sensitivity to strike for the populations of both species is considered to be moderate as common scoter are believed to exclusively fly underneath the blade height and red-throated diver mostly so, and it is believed that both species avoid windfarm areas. Vulnerability is therefore low for both species

### 5.5.7. Vulnerability Tables for Liverpool Bay / Bae Lerpwl pSPA

Vulnerability is derived from assessing an interest feature or sub-feature's sensitivity towards an operation against its exposure to it. In this case, it means assessing aspects of the birds in question (red-throated diver, common scoter, and their combined numbers) to their specific exposures to operations in Liverpool Bay. Both sensitivity and exposure are graded None (0), Low (1), Moderate (2), and High (3), and multiplied against each other to determine the relative vulnerability, as detailed in the tables below.

#### Methods deriving vulnerability

Sensitivity		Exposure		Vulnerability	
None	-	None	-	None detectable	
Low	•	Low	+	Low	
Moderate	••	Medium	++	Moderate	
High	•••	High	+++	High	

#### Additional Category for insufficient information = DD (Data Deficient)

		Relative sensitivity of the interest feature			
		High (3)	Moderate (2)	Low (1)	None detectable (0)
Relative exposure of the interest feature	High (3)	9	6	3	0
	Medium (2)	6	4	2	0
	Low (1)	3	2	1	0
	None (0)	0	0	0	0

Categories of relative vulnerability	
High	6-9
Moderate	3-5
Low	1-2
None detectable	0

**Table 4 - Assessment of the relative vulnerability of interest feature 1: Red-throated diver and its supporting habitat for the Liverpool Bay / Bae Lerpwl pSPA**

Operations which may cause deterioration or disturbance	Internationally important populations of the Annex I species and its supporting habitat and prey species		
	Red-throated diver ( <i>Gavia stellata</i> )		
	Sensitivity	Exposure	Vulnerability
<b>Physical loss of supporting habitat</b>			
Removal (e.g. harvesting, offshore development)	•••	+	Moderate
Smothering (e.g. by artificial structures, disposal of dredge spoil)	•	+	Low
<b>Physical damage to habitat</b>			
Siltation (e.g. run-off, channel dredging, outfalls)	••	+	Low
Abrasion (e.g. boating, anchoring)	••	+	Low
Selective extraction (e.g. aggregate dredging)	••	+	Low
<b>Non-physical disturbance</b>			
Noise (e.g. boat activity)	•••	++	High
Visual (e.g. recreational activity)	•••	++	High
<b>Toxic contamination</b>			
Introduction of synthetic compounds (e.g. pesticides, TBT, PCBs)	••	+	Low
Introduction of non-synthetic compounds (e.g. heavy metals, hydrocarbons)	•••	+	Moderate
Introduction of radionuclides	DD	DD	DD
<b>Non-toxic contamination</b>			
Changes in nutrient loading (e.g. agricultural run-off, outfalls)	••	+	Low
Changes in organic loading (e.g. mariculture, outfalls)	••	+	Low
Changes in thermal regime (e.g. power stations)	••	+	Low
Changes in turbidity (e.g. run-off, dredging)	••	+	Low
Changes in salinity (e.g. water abstraction, outfalls)	••	+	Low
<b>Biological disturbance</b>			
Introduction of microbial pathogens	•	+	Low
Introduction of non-native species and translocations	•	+	Low

Operations which may cause deterioration or disturbance	Internationally important populations of the Annex I species and its supporting habitat and prey species		
Selective extraction of prey species (e.g. commercial & recreational fishing)	•••	+	Moderate
Non-selective extraction (through entanglement with static gear)	•••	+	Moderate
Non-selective extraction (through wind-turbine strike)	••	+	Low

**Table 5 - Assessment of the relative vulnerability of interest feature 2: Common scoter and its supporting habitat for the Liverpool Bay / Bae Lerpwl pSPA**

Operations which may cause deterioration or disturbance	Internationally important populations of the Annex 2 species and its supporting habitat and prey species		
	Common scoter ( <i>Melanitta nigra</i> )		
	Sensitivity	Exposure	Vulnerability
<b>Physical loss of supporting habitat</b>			
Removal (e.g. harvesting, offshore development)	•••	+	Moderate
Smothering (e.g. by artificial structures, disposal of dredge spoil)	•••	+	Moderate
<b>Physical damage to habitat</b>			
Siltation (e.g. run-off, channel dredging, outfalls)	••	+	Low
Abrasion (e.g. boating, anchoring,)	••	+	Low
Selective extraction (e.g. aggregate dredging)	•••	+	Moderate
<b>Non-physical disturbance</b>			
Noise (e.g. boat activity)	•••	++	High
Visual (e.g. recreational activity)	•••	++	High
<b>Toxic contamination</b>			
Introduction of synthetic compounds (e.g. pesticides, TBT, PCBs)	••	+	Low
Introduction of non-synthetic compounds (e.g. heavy metals, hydrocarbons)	•••	+	Moderate
Introduction of radionuclides	DD	DD	DD
<b>Non-toxic contamination</b>			
Changes in nutrient loading (e.g. agricultural run-off, outfalls)	••	+	Low

Operations which may cause deterioration or disturbance	Internationally important populations of the Annex 2 species and its supporting habitat and prey species		
Changes in organic loading (e.g. mariculture, outfalls)	••	+	Low
Changes in thermal regime (e.g. power stations)	••	+	Low
Changes in turbidity (e.g. run-off, dredging)	••	+	Low
Changes in salinity (e.g. water abstraction, outfalls)	••	+	Low
<b>Biological disturbance</b>			
Introduction of microbial pathogens	•	+	Low
Introduction of non-native species and translocations	•	+	Low
Selective extraction of prey species (e.g. commercial & recreational fishing)	•••	++	Moderate/High
Non-selective extraction (through entanglement with static gear)	•••	+	Moderate
Non-selective extraction (through wind-turbine strike)	••	+	Low

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**Table 6 - Assessment of the relative vulnerability of interest feature 3: Area being used by over 20,000 waterfowl or 20,000 seabirds in any season in Liverpool Bay / Bae Lerpwl pSPA**

Operations which may cause deterioration or disturbance	Area being used by over 20,000 waterfowl or 20,000 seabirds in any season		
	Numbers from combined red-throated diver ( <i>Gavia stellata</i> ) and common scoter ( <i>Melanitta nigra</i> ) counts		
	Sensitivity	Exposure	Vulnerability
<b>Physical loss of supporting habitat</b>			
Removal (e.g. harvesting, offshore development)	•••	+	Moderate
Smothering (e.g. by artificial structures, disposal of dredge spoil)	•••	+	Moderate
<b>Physical damage to habitat</b>			
Siltation (e.g. run-off, channel dredging, outfalls)	••	+	Low
Abrasion (e.g. boating, anchoring,)	••	+	Low
Selective extraction (e.g. aggregate dredging)	••	+	Low
<b>Non-physical disturbance</b>			
Noise (e.g. boat activity)	•••	++	High
Visual (e.g. recreational activity)	•••	++	High
<b>Toxic contamination</b>			
Introduction of synthetic compounds (e.g. pesticides, TBT, PCBs)	••	+	Low
Introduction of non-synthetic compounds (e.g. heavy metals, hydrocarbons)	•••	+	Moderate
Introduction of radionuclides	DD	DD	DD
<b>Non-toxic contamination</b>			
Changes in nutrient loading (e.g. agricultural run-off, outfalls)	••	+	Low
Changes in organic loading (e.g. mariculture, outfalls)	••	+	Low
Changes in thermal regime (e.g. power stations)	••	+	Low
Changes in turbidity (e.g. run-off, dredging)	••	+	Low
Changes in salinity (e.g. water abstraction, outfalls)	••	+	Low

Operations which may cause deterioration or disturbance	Area being used by over 20,000 waterfowl or 20,000 seabirds in any season		
<b>Biological disturbance</b>			
Introduction of microbial pathogens	•	+	Low
Introduction of non-native species and translocations	•	+	Low
Selective extraction of prey species (e.g. commercial & recreational fishing)	•••	++	Moderate/High
Non-selective extraction (through entanglement with static gear)	•••	+	Moderate
Non-selective extraction (through wind-turbine strike)	••	+	Low

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## 6. References

Countryside Council for Wales, 2006. CCW Phase 1 intertidal survey dataset (unpublished).

Durinck J, Skov H, Jensen FP, Pihl S (1994) Important marine areas for wintering birds in the Baltic Sea. EU DG XI research contract no. 2242/90-09-01. Ornis Consult report.

Hiscock, K., ed. 1996. *Marine Nature Conservation Review: rationale and methods*. Peterborough: Joint Nature Conservation Committee.

Kaiser, M., Elliot, A., Galanidi, M., Rees, E.I.S., Caldow, R., Stillman, R., Sutherland, W. & Showler, D. (2005) *Predicting the displacement of Common Scoter Melanitta nigra from benthic feeding areas due to offshore windfarms*. Report COWRIE-BEN-03-2002. University of Wales, Bangor.

Madsen, F. J. 1957. On the food habits of some fish-eating birds in Denmark. *Danish Review of Game Biology*, 3: 19-83.

MarLIN, 2003. *Species sensitivity assessment rationale summary*. [on-line]. Plymouth: Marine Biological Association of the United Kingdom. Available from: [http://www.marlin.ac.uk/glossaries/SpeciesSensRationale\\_Summ.htm](http://www.marlin.ac.uk/glossaries/SpeciesSensRationale_Summ.htm) [Accessed August 2008].

Petersen, I.K., Clausager, I. & Christensen, T.J. (2004) *Bird numbers and distribution on the Horns Rev offshore wind farm area. Annual Status Report 2003*. Report commissioned by Elsam Engineering A/S 2003. NERI report, National Environmental Research Institute, Ministry of the Environment, Denmark. [www.dmu.dk](http://www.dmu.dk).

Reimchen, T.E. & Douglas, S, 1984. Feeding schedule and daily food consumption in red-throated loons (*Gavia stellata*) over the pre fledging period. *The Auk* 101: 593-599.

Wernham, C.V., Toms, M.P., Marchant, J.H., Clark J.A., Siriwardena, G.M., & Baillie, S.R. (eds) (2002) *The Migration Atlas*

Webb, A., McSorley, C.A., Dean, B.J. & Reid, J.B. (2006) *Recommendations for the selection of, and boundary options for, an SPA in Liverpool Bay*. JNCC Report 388.

## 7. Glossary

<b>Annex 1 Bird species</b>	The species listed in Annex 1 of the Birds Directive are the subject of special conservation measures concerning their habitat. These measures ensure the survival and reproduction of the birds in their area of distribution. Species listed on Annex 1 are in danger of extinction, rare or vulnerable
<b>Annex II species</b>	A species listed in Annex II of the Habitats Directive for which Special Areas of Conservation can be selected.
<b>Assemblage</b>	A collection of plants and/or animals characteristically associated with a particular environment.
<b>Attribute</b>	Characteristic of an interest feature or supporting habitat which provides an indication of the condition of the feature or supporting habitat to which it applies.
<b>Benthos</b>	Those organisms attached to, or living on, in or near, the seabed, including that part which is exposed by tides.
<b>Birds Directive</b>	The abbreviated term of <i>Council Directive 79/409/EEC of 1979 on the conservation of wild birds.</i>
<b>CCW</b>	Countryside Council for Wales
<b>Competent authority</b>	Any Minister, government department, public or statutory undertaker, public body or person holding a public office that exercises legislative powers.
<b>Conservation objective</b>	A statement of the nature conservation aspirations for a site, expressed in terms of the favourable condition that we wish to see the species and/or habitats for which the site has been selected to attain. Conservation objectives for European Marine Sites relate to the aims of the Habitats Directive.
<b>European Marine Site</b>	A European site which consists of, or in so far as it consists of, areas covered intermittently or continuously by seawater.
<b>Favourable condition</b>	The condition represented by the achievement of the conservation objectives, in other words the desired condition for a designated habitat or a species on an individual site.
<b>Habitat</b>	The place in which a plant or animal lives.
<b>Interest feature</b>	A natural or semi-natural feature for which a European site has been selected. This includes any Habitats Directive Annex I habitat, or any Annex II species and any population of a bird species for which an SPA has been designated under the Birds Directive.
<b>Maintain</b>	The action required for an interest feature when it is considered to be in favourable condition.
<b>SPA</b>	Special Protection Area for birds.

**Supporting Habitats** The key habitats within the European Marine Site necessary to support the interest feature.

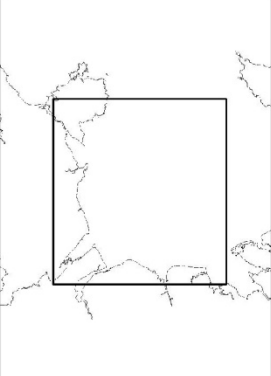
**TBT** Tri-butyl tin

**Vulnerability** The exposure of a habitat, community or individual of a species to an external factor to which it is sensitive.

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# Appendices

## Appendix 1 – Map of Liverpool Bay / Bae Lerpwl pSPA Boundary



**Cyngor Cwm Cwlad Cymru**  
Countywide Council for Wales

**Liverpool Bay / Bae Lerpwl**

Map 1 of 1  
OS Site Code UK9020294  
EC Site Code UK9020294

**Arwynebedd o'r fan** 170,225.55 ha  
**Total area**

**Hydref** 03° 12' 33" Gogleddol  
**Longitude** 53° 35' 56" Gogleddol  
**Latitude**

N.S. Mwrfigur Lloerdddhydrefl yst iweid ddefinio - System Geodeiddig Yrd Sa (WGS 84)  
N.S. All Lloerdddclatitudo figures have been derived from World Geodeiddic System 84 (WGS 84)  
Taldudol map: Y Gwlad Cwladlloerdddclatitudo  
Projection: British National Grid

Riflir ddiweddardf 4 20/05/2009  
**Version number**

Gweddle / Scale 1:350,000

Noder: Cwladlir y data o'r cwyrd ar raddfa 1:2500 o'r hirt ffa y'r Arwydd Odeiddig, no'r pwydd ar cwyrd y'r raddfa 1:250,000 ar raddfa 1:350,000. The data is derived from the Ordnance Survey map at a scale of 1:250,000. The map is reduced to a scale of 1:350,000. The map is derived from the Ordnance Survey map at a scale of 1:250,000. The map is reduced to a scale of 1:350,000. The map is derived from the Ordnance Survey map at a scale of 1:250,000. The map is reduced to a scale of 1:350,000.

