



**Appropriate Assessment Summary Report of Aquaculture  
in the;**

- **Slaney River Valley SAC (Site Code: 000781),**
  - **Raven Point Nature Reserve SAC (Site Code: 000710)**
  - **Wexford Harbour and Slobbs SPA (site code 004076)**
- and**
- **Raven SPA (site code 004019)**

**Marine Institute**

**Version: August 2016**

**Table of Contents**

**Preface ..... 3**

**Summary SAC Considerations, Conclusions and Recommendations ..... 4**

**Summary SPA Considerations, Conclusions and Recommendations ..... 7**

  

**Annex I:        Report supporting Appropriate Assessment of Aquaculture in Slaney River Valley  
                     SAC (Site Code: 000781) and Raven Point Nature Reserve SAC (Site Code: 000710)**

**Annex II:       Marine Institute Bird Studies: Wexford Harbour, the Raven and Rosslare Bay:  
                     Appropriate Assessment of Aquaculture**

---

## Preface

---

In Ireland, the implementation of the Habitats Directive in relation to aquaculture and certain fisheries activities that occur within designated sites is achieved through Article 6(3) of the Directive whereby such activities, which are licenced by the Department of Agriculture, Food and the Marine (DAFM) or Department of Communications, Energy and Natural Resources (DCENR), are viewed as plans and projects and are therefore subject to Appropriate Assessment (AA). The Habitats Directive is transposed in Ireland in the European Communities (Birds and Natural Habitats) Regulations 2011. Appropriate assessments are currently carried out against the conservation objectives (COs), and more specifically on the version of the COs that are available at the time of the Assessment, for designated ecological features, within the site, as defined by the National Parks and Wildlife Service (NPWS). NPWS are the competent authority for the management of Natura 2000 sites in Ireland. Obviously, aquaculture and fishing operations existed in coastal areas prior to the designation of such areas under the Directives. Ireland is thereby assessing both existing and proposed aquaculture and fishing activities in such sites. This is an incremental process, as agreed with the EU Commission in 2009, and will eventually cover all fishing and aquaculture activities in all Natura 2000 sites.

The process of identifying existing and proposed activities and submitting these for assessment is, in the case of fisheries, outlined in SI 346/2009. Here, the industry or the Minister may bring forward fishing proposals or plans which become subject to assessment. These so called Fishery Natura Plans (FNPs) may simply be descriptions of existing activities or may also include modifications to activities that mitigate, prior to the assessment, perceived effects to the ecology of a designated feature in the site. In the case of aquaculture DAMF receives applications to undertake such activity and submits a set of applications, at a defined point in time, for assessment. The FNPs and aquaculture applications are then subject to AA. If the AA finds that significant effects of such activities cannot be discounted the plans or projects will need to be mitigated further if such activities are to continue. The AA is not explicit on how this mitigation should be achieved but rather the degree of mitigation required. In effect, therefore, the AA is a 'point in time' assessment of aquaculture and fishing activities to determine if they are consistent with COs for designated features within a Natura site and thereby compliant with the Directives.

This report is structured such that the summary, conclusions and recommendations from the assessments of fisheries and aquaculture activities in Natura 2000 features for the Slaney River Valley SAC (Site Code: 000781), the Raven Point Nature Reserve SAC (Site Code: 000710), the Wexford Harbour and Slobbs SPA (site code 004076) and the Raven SPA (site code 004019) are provided in the first part of this report while the full assessments on the SAC and the SPA are provided in Annex 1 and 2.

---

## Summary SAC Considerations, Conclusions and Recommendations

---

### The SAC

Slaney River Valley and Raven Point Nature Reserve SACs are designated as Special Areas of Conservation (SAC) under the Habitats Directive. The marine areas are designated for Estuaries [1130] and for Intertidal mud and sand flats not covered by seawater at low tide [1140]. The area supports a variety of sub-tidal and intertidal sedimentary community types including those that are sensitive to aquaculture related pressures (e.g. dredging in bottom shellfish culture). The area is also designated for and supports significant numbers of Harbour Seal and Otter while Salmon and Sea Lamprey and Twaite Shad, migrate through the harbour as smolts and as mature animals returning from sea. Conservation Objectives for these habitats and species (within the Slaney River Valley SAC and Raven Point Nature Reserve SAC) were identified by NPWS (2011a,c) and relate to the requirement to maintain habitat distribution, structure and function, as defined by characterizing (dominant) species in these habitats. For designated species the objective is to maintain various attributes of the populations including population size, cohort structure and the distribution of the species in the Bay. Guidance on the conservation objectives is provided by NPWS (2011b, d).

### Aquaculture activities

The main aquaculture activities within the SACs (and vicinity) are bottom culture of mussels (*Mytilus edulis*) as well as applications to carry out intertidal oyster culture and subtidal suspended mussel culture. The Pacific oyster (*Crassostrea gigas*) is cultured on trestles in intertidal areas. The profile of the aquaculture industry in the Bay, used in this assessment, was prepared by BIM and is derived from the list of licence applications received by DAFM and provided to the MI for assessment in March 2015.

### The appropriate assessment process

The function of this appropriate assessment report is to determine if the ongoing and proposed aquaculture and fisheries activities are consistent with the Conservation Objectives for the Natura site or if such activities will lead to deterioration in the attributes of the habitats and species over time and in relation to the scale, frequency and intensity of the activities. NPWS (2011b, d) provide guidance on interpretation of the Conservation Objectives which are, in effect, management targets for habitats and species in the Bay. This guidance is scaled relative to the anticipated sensitivity of habitats and species to disturbance by the proposed activities. Some activities are deemed to be wholly inconsistent with long term maintenance of certain sensitive habitats while other habitats can tolerate a range of activities. For the practical purpose of management of sedimentary habitats a 15% threshold of overlap between a disturbing activity and a habitat is given in the NPWS guidance. Below this threshold disturbance is deemed to be non-significant. Disturbance is defined as that which leads to a change in the characterizing species of the habitat (which may also indicate change in structure and function). Such disturbance may be temporary or persistent in the sense that change in characterizing species may recover to pre-disturbed state or may persist and accumulate over time.

The appropriate assessment process is divided into a number of stages consisting of a preliminary risk identification, and subsequent assessment (allied with mitigation measures if necessary) which are covered in this report. The first stage of the AA process is an initial screening wherein activities which cannot have, because they do not spatially overlap with a given habitat or have a clear pathway for interaction, any impact on the conservation features and are therefore excluded from further consideration. The next phase is the Natura Impact Statement (NIS) where interactions (or risk of) are identified. Further to this, an assessment on the significance of the likely interactions between activities and conservation features is conducted. Mitigation measures (if necessary) may be identified in situations where the risk of significant disturbance is identified. In situations where there is no obvious mitigation to reduce the risk of significant impact, it is advised that caution should be applied in licencing decisions. Overall, the Appropriate Assessment is both the process and the assessment undertaken by the competent authority to effectively validate this Report and/or

NIS. It is important to note that the screening process is considered conservative, in that other activities which may overlap with habitats but which may have very benign effects are retained for full assessment unless otherwise indicated. In the case of risk assessments consequence and likelihood of the consequence occurring are scored categorically as separate components of risk. Risk scores are used to indicate the requirement for mitigation.

### **Data supports**

Distribution of habitats and species population data are provided by NPWS . Information on Aquaculture licences and applications are provided by DAFM . Scientific reports on the potential effects of various activities on habitats and species have been compiled by the MI and provide the evidence base for any findings. It should be noted that data supporting the assessment of individual activities vary and provides for varying degrees of confidence in the findings.

### **Findings**

In Slaney River Valley SAC and the Raven Point Nature Reserve SAC and environs there are a range of aquaculture activities currently being carried out and proposed. Based upon this and the information provided in the aquaculture profiling, the likely interaction between aquaculture methodology and conservation features (habitats and species) of the site was considered.

### **Annex I Habitats**

In relation to habitats an initial screening exercise resulted in a number of habitat features being excluded from further consideration by virtue of the fact that no spatial overlap of the culture activities was expected to occur and no likely interactions were identified.

The habitats and species excluded from further consideration were:

1. 1029 Freshwater Pearl Mussel *Margaritifera margaritifera*
2. 1096 Brook Lamprey *Lampetra planeri*
3. 1099 River Lamprey *Lampetra fluviatilis*
4. 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation (Floating river vegetation)
5. 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
6. 91E0 \* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)

Given the nature of the activities proposed for aquaculture in Slaney River Valley, it is unlikely that aquaculture activities will impact on the conservation attributes for Salmon, Sea Lamprey and Twaite Shad. On that basis, Salmon (*Salmo salar*), Sea lamprey (*Petromyzon marinus*) and the Twaite shad (*Alosa fallax*) were excluded from further analysis.

Applications for subtidal suspended mussel cultivation were also screened out of full assessment on the basis that;

- 1) there was no spatial overlap with the two SACs considered in the assessment report,
- 2) any impacts are likely to be localised on the seabed beneath the footprint of the proposed licences or given the high degree of flushing experienced at the sites, will result rapid dispersion of dissolved nutrients, and
- 3) based upon published accounts, the structures are unlikely to disturb resident species in the SAC, i.e. Harbour seal and Otter.

A full assessment was carried out on the likely interactions between aquaculture operations (as proposed) and the features Annex 1 habitats Mudflats and sandflats not covered by seawater at low tide (1140), Estuaries (1160) in both Slaney River Valley SAC (0781) and Mudflats and sandflats not covered by seawater at low tide (1140) in Raven Point Nature Reserve SAC (0710). The likely effects of the aquaculture activities were considered in light of the sensitivity of the constituent

communities of these Annex 1 habitats. A number of issues were highlighted in Section 8.3 and relate to certain aquaculture and habitat interactions the conclusions of which are presented below.

**Conclusion 1:** The culture/collection of wild mussel seed on longlines and rafts that might occur outside of the boundaries but are proximate to the two SACs are deemed to be non-disturbing to the conservation features of the SAC.

**Conclusion 2:** By virtue of extensive spatial cover the levels of existing and proposed culture of bottom mussel culture activities are considered disturbing to habitat feature Estuaries (1130) and Mudflats and Sandflats not Covered by Seawater at Low Tide (1140) in the Slaney River Valley SAC.

**Conclusion 3:** By virtue of extensive spatial cover the levels of existing and proposed culture of bottom mussel culture activities are considered disturbing to the community type - Estuarine muds dominated by polychaetes and crustaceans community complex within the habitat feature Mudflats and Sandflats not Covered by Seawater at Low Tide (1140) in the Raven Point Nature Reserve SAC.

**Conclusion 4:** The proposal to culture oysters (intertidally on trestles) is not considered disturbing to habitat feature Estuaries (1130) and Mudflats and Sandflats not Covered by Seawater at Low Tide (1140) in the Slaney River Valley SAC.

**Conclusion 5:** Removal of seed resources from intertidal habitat will also result in disturbance to 1140 habitat features by destabilising the reef structure formed by mussels and reducing habitat complexity and associated biodiversity.

## Annex II Species

The likely interactions between the proposed aquaculture activities and the Annex II Species Harbour Seal (*Phoca vitulina*) and Otter (*Lutra lutra*) were also assessed.

It is acknowledged in this assessment that the favourable conservation status of the Harbour seal (*Phoca vitulina*) has been achieved given current levels of aquaculture production within the SAC. The aspect of the culture activities that could potentially disturb the Harbour seal status relates to movement of people and vessels within the sites as well as accessing the sites over intertidal areas and via water.

**Conclusion 7:** The current levels of aquaculture production are considered non-disturbing to harbour seal conservation features in all areas of the SAC. It is important to note that area covered by the (subtidal) bottom mussel culture activities would appear to be considerably smaller than those represented by licenced areas, which extend into the intertidal areas. If actual production were to occur over or close to the seal haul-out areas then a risk of disturbance to seal cannot be discounted.

**Conclusion 8:** In relation to new licence applications, similar to licenced areas, there is considerable overlap with seal haul out locations and a number of new applications. If actual culture activities were to extend to intertidal/shallower areas proximate to the seal sites then this would present a risk to seals. On the basis of distance from the seal haul out locations, the proposed oyster trestle culture sites are considered non-disturbing to seal conservation features.

It is recommended that a range of potential mitigation factors are carefully considered when proposing management responses to the conclusions above. These features relate specifically to the fact that mussels appear to have been a historical constituent in the waterbody, that the filtration capacity of the mussels may have a beneficial impact on the eutrophication status of the bay and that the habitat provision by mussels can be beneficial to the ecological function of the system. In summary, it is our view that based upon the information presented that bottom mussel culture, at current levels, does have an overall positive role in ecosystem. The addition of more mussels to the system (with new applications) may have additional benefit in terms of reducing effects of eutrophication, and may further improve status in the outer parts of Wexford Harbour relative to the Lower Slaney waterbody; however, this remains to be determined/confirmed and is subject to availability of additional seed. Other mitigating/qualifying factors that are important to clarify are;

- 1) mussel culture only occurs in deeper subtidal areas of the SAC and with one exception, it is anticipated that no culture (and disturbance from same) will occur in intertidal and shallow subtidal areas;
- 2) given the patchy nature of shellfish distribution on the seafloor, the areas where mussel culture will occur will not result in 100% cover of the seabed; however, it is expected that disturbance (dredging relating to harvest and/or maintenance) will occur over the entire area where mussels are placed, and;
- 3) The input of mussels into the system is limited by seed availability which, if consistent with previous inputs (of seed stock), will result in greater dilution of stock within larger surface areas licenced.

---

## **Summary SPA Considerations, Conclusions and Recommendations**

---

### **The SPA**

This report contains an Appropriate Assessment of aquaculture in Wexford Harbour, the Raven and Rosslare Bay. The Wexford Harbour and Slobbs SPA (site code 004076) and the Raven SPA (site code 004019) are the primary focus of this assessment. Four other SPAs are also included in this assessment: Cahore Marshes SPA (site code 004143), Lady's Island Lake SPA (site code 004009), the Saltee Islands SPA (site code 004002) and Tacumshin Lake SPA (site code 004092).

This assessment is based on a desktop review of existing information. This included published reports and papers and unpublished data from waterbird surveys. Where relevant, the report identifies information gaps that may affect the reliability of the conclusions of this assessment.

The research carried out for this assessment also included a preliminary study of the disturbance impacts of marine traffic on Red-breasted Merganser and other subtidal species and a review of potential disturbance impacts from dredger activity to Greenland White-fronted Goose.

### **Methodology**

The spatial extents of the aquaculture sites have been derived from shapefiles supplied by the Marine Institute (dated 06/08/2014), based upon site lists supplied to the Marine Institute by the Department of Agriculture, Food and the Marine. Details of existing and proposed aquaculture activities have been taken from the Aquaculture profile prepared by BIM.

Most of the analyses of the likely impacts of activities covered in this assessment are based on calculations of spatial overlap between the SCI species distribution and the spatial extent of the activities. These analyses focus on distribution patterns of feeding, or potentially feeding birds, as the main potential impacts will be to the availability and/or quality of feeding habitat, although we have included assessment of potential impacts on roosting and breeding birds, where relevant.

The distribution of waterbirds was analysed using data from the Irish Wetland Bird Survey (I-WeBS) counts (1994/95-2011/12); Non-Estuarine Waterbird Survey (NEWS) counts (1997/98 and 2006/07); National Parks and Wildlife Service (NPWS) Baseline Waterbird Survey (BWS) low tide counts (carried out in 2009/10); Little Tern monitoring reports for 2013, 2014 & 2015; Marine Institute Common Scoter survey from March & December 2014; Red-breasted Merganser disturbance study (Appendix C) and a review of potential disturbance impacts from dredger activity to Greenland White-fronted Goose (Appendix D).

The methodology used to identify potentially significant impacts is focussed on the Conservation Objectives, and their attributes, that have been defined and described for the Wexford Harbour (004076) and the Raven (004019) SPAs. Impacts that will cause displacement of 5% or more of the total Wexford Harbour (004076) and the Raven (004019) SPAs population of a non-breeding SCI species have been assessed as potentially having a significant negative impact.

The distribution of biotopes within the Wexford Harbour and Slob SPA, and the Raven SPA, is based upon the NPWS biotope map, as shown in Figure 3 of the marine supporting document for the Slaney River Valley SAC (NPWS, 2011f) and Figure 2 of the marine supporting document for the Raven Point Nature Reserve SAC (NPWS, 2011e).

Information on tidal zones, and the depths of subtidal habitats, was derived from a variety of sources including Admiralty Chart data, the Wexford Harbour chartlets, and bathymetry data provided by the Geological Survey of Ireland.

## **Findings**

The following are potential impacts where the available evidence indicates a high likelihood of significant impacts occurring.

### **Bottom mussel culture impact on Red-breasted Merganser**

Disturbance from bottom mussel-related boat activity may cause significant displacement impacts to Red-breasted Merganser. The mean area potentially disturbed could amount to around 19-27% of the total area of available habitat. High levels of impact could occur on around 80% of days in the October-December period, for periods of up to 55-66% of daylight hours. The population-level consequences of the displacement impact will depend upon whether the displaced birds can find suitable alternative habitat to feed in while they are displaced, or, if this is not the case, whether the undisturbed portion of the day provides sufficient feeding time for the birds to meet their daily energetic requirements. There is no site-specific data available that can be used to address these questions, and we are not aware of any comparable studies in the literature that can be used.

### **Bottom mussel culture impact on Little Tern**

There is potential for significant disturbance impacts to the Little Tern breeding colony. However, these can be avoided through an appropriate adaptive management strategy (see below).

### **Other potential impacts**

The following are potential impacts where the available evidence is not sufficient to rule out significant impacts beyond reasonable scientific doubt. However, this does not mean that all these impacts are considered to be very likely to occur.

### **Bottom mussel culture impact on Greenland White-fronted Goose**

NPWS have raised concerns about the potential for dredger activity close to the North Slob to cause disturbance to Greenland White-fronted Geese feeding on the North Slob. As noted, review of potential disturbance impacts from dredger activity to Greenland White-fronted Goose (Appendix D). The closest vessel activity by the Branding and Laura Anne to the North Slob will be around 400 m from the sea wall, or around 350 m while the Branding is travelling to/from its site. It is not known whether Greenland White-fronted Geese are susceptible to disturbance from dredgers at these distances from the sea wall. Given the current low frequency of dredger activity in sites 46A, 49B and 52A, any disturbance of Greenland White-fronted Geese by dredger activity in these sites is likely to be a rare event and on a comparable scale to disturbance by licensed wildfowling (which occurs on around 5% of days during the October- March period). However, the patterns of site usage, and the locations of dredger access routes, may change in the future as a result of changes in sedimentation patterns in the harbour, and (in the case of site usage) increases in seed supply. It should be noted also that there is an additional site close to the sea-wall (site 57F). This site is licensed to an operator who is currently not active, and has not been active since around 2008. Further information on the distance from the sea wall at which dredging activity causes disturbance to geese on the North Slob would be required to fully assess this potential impact.

### **Bottom mussel culture impacts on Scaup, Goldeneye, Red-breasted Merganser and Great Crested Grebe**

There is potential for night-time dredging to cause disturbance to nocturnal roosts of these species. Further information about the location and seasonal patterns of usage of these nocturnal roosts is



required, as well as information about the sensitivity of nocturnally roosting birds to disturbance from marine traffic, is required to fully assess this potential impact.

#### **Bottom mussel culture impact on intertidal mussel beds**

In the long term, it is possible that the seed collection method could prevent the regeneration of existing intertidal mussel beds and reduce the quality of the habitat for Oystercatcher, Knot, Curlew and Redshank. Information on the existing extent of intertidal mussel beds, their usage by these wader species, and the impact of seed collection on the mussel bed dynamics would be required to fully assess this potential impact.

#### **Bottom mussel culture impact on high tide roosts**

Mussel-related boat activity could cause disturbance to high tide wader and tern roosts on sandbanks in the mouth of Wexford Harbour. Further information on the distribution and usage of wader and tern roost sites under various tidal conditions, and the sensitivity of sandbank roosting waders and terns to disturbance from dredging activity, in Wexford Harbour would be required to fully assess this potential impact.

#### **Intertidal oyster culture impact on Golden Plover, Grey Plover, Knot, Sanderling and Bar-tailed Godwit**

Taking all the relevant factors into consideration, it is probable that the displacement impacts for these species will be substantially less than 5%. However, there is a significant uncertainty attached to this assessment due to the very limited low tide count data. Further data on the low tide distribution of these species across the whole of Wexford Harbour (not just the I-WeBS/BWS subsites) would be required to complete the assessment for these species.

#### **Intertidal oyster culture impact on Little Tern**

We consider that the distance of site T03/092A from the Bird Island colony site is probably sufficient to prevent disturbance to the colony (providing no dogs are brought out). However, there is some uncertainty about this assessment, given the lack of site-specific data on the response of Little Tern to disturbance in Wexford Harbour, and the perceived high sensitivity of Little Tern breeding colonies to disturbance in remote locations. This uncertainty can be addressed by an adaptive management strategy (see paragraph 6.215).

There is a significant likelihood that oyster cultivation in site T03/092A will increase the activity of gulls and corvids in this area. It is not possible to predict to what extent, if any, this would cause an increased predation risk to the Bird Island tern colony (in the event that it was reoccupied).

#### **Assessment of impacts of suspended mussel cultivation**

There are no sites currently licensed for suspended mussel cultivation in Wexford Harbour and the Raven. There are 10 sites (covering a total area of 128 ha) with applications for suspended mussel cultivation in the Raven SPA). There are also another six sites (covering a total area of 68 ha) in Rosslare Bay. The individual sites range in size from 7-15 ha, with a mean size of 12 ha. While the Rosslare Bay sites are outside the Wexford Harbour & Slobbs and the Raven SPAs, they are considered in this assessment as they occur in an area that is likely to be used by some SCI populations from these SPAs. Our assessment has not identified any potentially significant impacts from the proposed suspended mussel culture in the Raven and Rosslare Bay. However, the reliability of this assessment for Common Scoter and Red-throated Diver is only moderate due to the high potential sensitivity of these species to disturbance impacts, and the limited quantitative data available on the nature of their disturbance responses. Site-specific data on the disturbance responses of Common Scoter and Red-throated Diver in the Raven and Rosslare Bay would improve the reliability of this assessment.

#### **Management Responses / Measures**

The following management measures, research and information compilation is required to complete this assessment: -

- Record comprehensive information on all bottom mussel-related boat activity. At a minimum, this should include daily logs of all vessel activity, including information on the time, duration and location of the activity. This information would be required over a period of years to allow characterisation of typical patterns of activity, and the level of variation around these patterns. Information on mussel relay activity (including the location and sizes of the plots, the dates of the relay and the tonnages relaid) would also be required to relate vessel activity to the scale of production, and, thereby, allow prediction of impacts from any expansion of the activity. As noted this information would further inform the assessment of impacts on Greenland White-fronted geese, Red-breasted Merganser and other diving species.
- Research into the impact of the bottom mussel culture seed collection method on the long-term dynamics of intertidal mussel beds is required to fully assess the impact of this method on habitat quality for Oystercatcher, Knot, Curlew and Redshank in Wexford Harbour.
- In parallel to the recording of patterns of vessel activity, further Red-breasted Merganser disturbance studies are required to determine if there is any seasonal, spatial, or other, variation in the nature of the response, and to refine the prediction of the scale of the displacement impact. Placement of observers on the dredgers would allow more accurate estimation of distances. These studies could also record the disturbance responses of the other potentially sensitive species (Scaup, Goldeneye and Great Crested Grebe).
- Research into the ecology of Red-breasted Merganser in Wexford Harbour. This research is required to allow assessment of the population-level consequences of the displacement of mergansers by boat activity. The scope of the research should include mapping the spatial distribution of mergansers throughout the Harbour Zone, determining their activity budget and how this varies seasonally and with the intensity of vessel activity, and recording their diet.
- Should night-time dredging be permitted, surveys of night-time roosting behaviour by Scaup, Goldeneye, Red-breasted Merganser and Great Crested Grebe would be required.
- Surveys of high-tide wader and tern roosts. This research is required to allow assessment of the potential disturbance impact from bottom mussel-related boat activity. The scope of the research should include recording the distribution of the roosts, and their sensitivity to disturbance by boat activity, and how these vary seasonally, and with the neap-spring tidal cycle.
- Surveys of the use of mussel beds by Oystercatcher, Knot, Curlew and Redshank. This research would be required to allow assessment of the impact of the intertidal seed collection on these species.
- Surveys of the low tide distribution of Golden Plover, Grey Plover, Knot, Sanderling and Bar-tailed Godwit. This research would be required to allow assessment of the potential impact of displacement by intertidal oyster cultivation in site T03/092A.
- Little Tern research. This research would form part of an adaptive management strategy for the Little Tern population (see paragraph 9.14).

It should be noted that a lot of the above bird survey requirements will be logistically challenging (e.g., surveying sandbank areas in the middle of the harbour). Therefore, if the research is to be carried out, adequate lead-in time should be allowed to trial methodologies, etc.

### **Mitigation recommendations**

An adaptive management strategy to protect the Little Tern breeding colony, and the post-breeding flocks of juveniles in the Hopeland area, should be prepared. This would specify: the buffer zones required to protect the colonies/flocks from disturbance (e.g., 340 m around the Fort Bank colony); additional measures (such as prohibiting dogs from accompanying workers in the seed collection site); and monitoring requirements. The strategy would have to allow for the possibility of the terns moving their colony locations: e.g., an assessment could be carried out in April of the suitability of the existing colony sites and, if the existing colony sites were considered to now be unsuitable (due to winter storm damage) buffer zones could be put in place around additional potential sites until it became clear which site(s) are going to be occupied that year. The monitoring carried out as part of this strategy would help to improve knowledge about the sensitivity of Little Terns in Wexford Harbour to disturbance, and may allow relaxation of some of the prescriptions (e.g., reduce the size of the buffer zones required).

### **Cumulative impacts**

This report does not include assessment of the potential cumulative impacts of the aquaculture activities in combination with other activities. The cumulative impact assessment can only be prepared when there is a reasonable level of certainty about the likely impacts arising directly from the activities being assessed, which is not the case for the present assessment. There are likely to be significant impacts arising from the cumulative impact of hunting pressures in combination with impacts from aquaculture activities. Detailed information on the scale of hunting activities in Wexford Harbour and environs were not available to the authors for consideration at the time of writing.