



AQUAFAC

**Proposed Compensatory Measures Associated with the
Galway Harbour Extension,
Renmore and Townparks Townlands, Galway**

Prepared by

AQUAFAC International Services Ltd

On behalf of

Galway Harbour Company

November 2015

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1. Introduction

1.1 Background

This report puts forward proposed compensatory measures for habitat loss arising from the Galway Harbour Extension (GHE) project and is in response to the request from An Bord Pleanála (ABP) dated 29th September 2015. The approach to the identification of compensatory measures involved firstly identifying potential replacement habitats for those lost, followed by the identification of measures which, together with the replacement designated habitats, are considered to constitute compensatory measures.

The overall approach to the identification of compensatory measures is to firstly consider the further information request from ABP together with the Board's Statement of Appropriate Assessment and the report of the Board's specialist marine ecological consultant, Dr. Bastreri of Thompson Unicomarine. The identification of compensatory measures is informed by the EU Guidance on Article 6(4) and a summary of the relevant provisions/criteria from this guidance document is set out in Section 2 of this document.

Section 3 of this report describes the habitat types that will be lost if the GHE project is given planning permission.

The approach is to identify potential replacement habitats similar to those lost and a number of options for the provision of such replacement habitats is outlined in Section 4. These include the engineering of replacement habitats and alternatively, the identification of similar existing habitats to those lost for subsequent designation. Locations both within and outside Galway Bay cSAC are assessed in this same section.

The identification of compensatory measures follows the criteria set out in the EU document on Article 6 (4) and these criteria are applied respectively to the 3 relevant habitat types in Section 4 also. The recommended compensatory measures are outlined in Section 5 and are put forward on the basis that they are the closest like-for-like replacement without the potential negative impacts which would arise from engineered solutions.

Having followed the approach outlined above, the recommended compensatory measures were determined and these include compensatory measures together with replacement designated habitats. These are listed and described in Section 5.

1.2 An Bord Pleanála Further Information Request

The further information request from the Board confirms that it has completed an appropriate assessment of the proposed GHE project in accordance with Article 6(3) of the Habitats Directive and has concluded that approval of the proposed development could not be considered under Article 6(3), given that a significant adverse impact on the integrity of the Galway Bay cSAC would occur.

The Board has identified the impacts on the integrity of the European Site as follows:

- The direct and permanent loss of furoid-dominated reef habitat [1170] and mud and sand flat habitat [1140] in Galway Bay Complex cSAC will result in the conservation objectives for these features not being met. The direct and permanent loss of a habitat, which is part of the conservation objectives of the site, is in general a significant adverse effect on the integrity of the site.
- The loss of perennial vegetation of stony banks [1220] due to the sheltering effect of the harbour extension will also have significant adverse effect on the integrity of the cSAC.

The Board invited Galway Harbour Company to confirm that it wishes to have the project considered for approval under Article 6(4) of the Directive, and this confirmation has been issued to ABP on 1st October 2015.

The Board also advised that it is necessary for Galway Harbour Company to submit proposals for compensatory measures to address the impacts on the integrity of the Galway Bay Complex cSAC identified above. These compensatory measures are to offset the negative effects of the project such that the overall coherence of the Natura 2000 network is maintained.

The letter of 29th September 2015 states that the Board proposes that the development of compensation measures be addressed in two phases:

Phase 1 – the proposals for compensatory measures should be set out by Galway Harbour Company for initial consideration. Galway Harbour Company is advised to liaise with the National Parks and Wildlife Service of the Department of Arts, Heritage and the Gaeltacht in this regard. It is envisaged that once proposals are received, the Board will also seek the views of the National Parks and Wildlife Service with respect to the acceptability in principle of the emerging proposals. The Board will advise in due course whether the compensatory measures should be developed in more detail, or otherwise.

Phase 2 – pending the outcome of Phase 1, the applicant will be afforded further time to develop the compensatory measures in more detail leading to submission of a completed proposal for consideration by the Board.

This document addresses the requirements of Phase 1 as stipulated by An Bord Pleanála in commencing the liaison with the National Parks and Wildlife Service of the Department of the Arts Heritage and the Gaeltacht and to enable close co-operation between the Galway Harbour Company and the National Parks and Wildlife Service as encouraged in the “Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC”, published by the European Commission (DG Environment).

1.3 Statement of Appropriate Assessment

In its Statement of Appropriate Assessment, An Bord Pleanála notes that it had regard to the documentation submitted by the applicant which included a comprehensive list of Natura 2000 sites potentially coming within the influence of the proposed port extension. The Board has also advised that it has agreed with the screening assessment and conclusion reached in the report of the specialist ecological consultant (Dr Bastreri of Thomson Unicomarine) appointed to assist the Board’s Inspector) that the following sites:

- Galway Bay Complex cSAC (site code 000268),
- Inner Galway Bay SPA (site code 004031) and
- Lough Corrib cSAC (Site code 000297)

are the relevant European sites for which there is a likelihood of significant effects, requiring a ‘Stage II’ assessment¹ and that other sites can be discounted from further consideration, owing to the separation distances involved and lack any likelihood of significant effects arising.

A copy of the Board’s appropriate assessment is presented in Appendix 2 of this report and its conclusions are that approval of the proposed development could not be considered under Article 6(3) of the Habitats Directive given that a significant adverse impact on the integrity of the Galway Bay cSAC would occur with the loss of 5.93 ha of intertidal habitat of fucoid-reef and mud and sand flat not covered by sea water at low tide and 0.35 ha of perennial vegetation of stony bank habitat of which approximately 0.2 ha lies within the boundary of the cSAC

1.4 Professional competency of author

The report has been prepared by Dr. Brendan O’Connor of AQUAFAC. Dr. O’Connor has been working in Galway Bay since 1972 as a researcher in NUI Galway and following that since the

¹ Stage II requirement was covered by NIS and accepted by ABP

foundation of AQUAFAC in 1986. He is therefore very familiar with the different types of habitats that occur throughout inner Galway Bay. Dr. O'Connor and AQUAFAC has been a member of the project team on the proposed Galway Harbour Extension since the inception of the project and has contributed to the project EIS, NIS and other application documents.

Dr. Michelene Sheehy-Skeffington who is Ireland's leading expert in perennial vegetation of stony banks was consulted with regard to possible compensatory measures for the loss of this habitat type.

2. EU Guidance on Compensatory Measures

- 2.1.1. The Board in its request for Further Information of the 29th September, 2015 has referred the applicant to the guidance in relation to compensatory measures set out in the European Commission (DG Environment) Guidance Document entitled: "Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC" (2007/2012), as may be updated.
- 2.1.2. This EU guidance notes on page 10, bullet 2, that *"compensation measures sensu stricto are independent of the project (including any associated mitigation measures). They are intended to offset the negative effects of the plan or project so that the overall ecological coherence of the Natura 2000 network is maintained"*.
- 2.1.3. It also states (page 11, line 2) that compensatory measures *"should be considered only after having ascertained a negative impact on the integrity of a Natura 2000 site"*. Compensation measures are aimed at offsetting the negative impact of a project and to provide compensation corresponding precisely to the negative effects on the species or habitats concerned (page 11, text box).
- 2.1.4. The EU document states (page 13, text box, para. 1) that *"in order to ensure the overall coherence of Natura 2000, the compensatory measures proposed for a project should therefore*
- a) address, in comparable proportions, the habitats and species negatively affected;*
 - b) provide functions comparable to those which had justified the selection criteria of the original site, particularly regarding the adequate geographic distribution."*
- 2.1.5. It also notes (page 13, text box, para. 2) that *"the distance between the original site and the place of the compensatory measures is not necessarily an obstacle as long as it does not affect the functionality of the site, its role in geographical distribution and the reasons for its initial selection."*
- 2.1.6. On page 14, para. 2 of the document, it states that compensation *"could, similarly, consist of the recreation of a comparable habitat or the biological improvement of substandard habitat within an existing designated site, or even the addition to the Natura 2000 network of a new site of comparable quality to the original site"* and this is reiterated on the same page, para.3, final bullet, where the Guidance Document notes that measures ... can consist of *"...proposing a new site under the Habitats and Birds Directive"*.
- 2.1.7. Further on in the document (p.18, para. 3), it notes that *"...locating compensation within or nearby the Natura 2000 site concerned in a location showing suitable conditions for the measures to be successful seems the most preferred option"*.

The criteria used to identify compensation measures for the GHE project follow the principles set out in the Commission's Guidance on Article 6(4) (see pages 15 – 20), which are:

2.2.1. Targeted Compensation

Having identified the habitats and extent of the damage that the project or plan will cause, the compensation measures must specifically address such effects so that the elements of integrity contributing to the overall coherence of the Natura 2000 network are preserved in the long term. Measures must clearly refer to the structural and functional aspects of the site integrity and the related types of habitat and species populations that are affected.

2.2.2. Effective Compensation

Compensation measures must be feasible and operational in reinstating the ecological conditions needed to ensure the overall coherence of the Natura 2000 network.

2.2.3. Technical Feasibility of the proposed compensation

To overcome intrinsic difficulties associated with reinstatement of ecological conditions, compensatory measures must be designed following scientific criteria and evaluation in accordance with best scientific knowledge and taking into account specific requirements of the ecological features to be reinstated.

2.2.4. Extent of Compensation

Compensation ratios are set on a case-by-case basis and take account of the areas that will be lost by the plan or project. At minimum, compensation should be based on the areas lost by the project. The Galway Harbour Company has addressed the issue in light of the guidance that the result of compensatory measures should be effective by the time the damage occurs as a general rule and that "*where this cannot be fully achieved, overcompensation would be required for the interim losses.*"²

2.2.5. Location of Compensatory Measures

This will be as required in paragraphs 2.1.3 – 2.1.7 above which are extracts of the EU Guidance Document on 6 (4). It is further noted that, as per the Commission Guidance document³, where compensation takes place on a non-designated location, the area must be designated as Natura 2000 site itself and be subject to all the requirements of the 'nature' directives.

2.2.6. Timing of Compensation

The EU Guidance on 6(4) notes that a site must not be irreversibly affected *i.e. commencement of development works* before compensation is in place⁴ and that the results of the compensation should be effective at the time damage occurs. If this cannot be achieved, then overcompensation would be required for the interim losses. Time lags might only be admissible when it is ascertained that they would not compromise the objective of "no net losses" to the overall coherence of the Natura 2000

² See section 1.5.5. of the Guidance Document

³ See section 1.5.5. of the Guidance Document

⁴ See section 1.5.6 of the Guidance Document

network. Time lags are not permitted if they lead to population losses for any species protected in the site under Annex II of Directive 92/43/EEC or Annex I of Directive 79/409/EEC requiring particularly attention when it entails priority species.

The purpose and timing of the compensatory measures proposed is to ensure that all necessary provisions, technical, legal or financial, necessary to implement the compensatory measures must be completed before the plan or project implementation starts, so as to prevent any unforeseen delays that may hinder the effectiveness of the measures⁵.

2.2.7. Long-term Implementation

Compensatory measures being proposed take into account a number of different aspects of what the Commission regards as long term implementation and these include:

- devising binding enforcement methods at the National level aimed to ensure the full implementation and effectiveness of compensation
- devising the necessary legal means in case land or rights purchase is deemed essential for the effective implementation of the compensation and
- establishing monitoring programmes for the life of the project, including objectives, responsible bodies and requirements on reporting to the Commission.

⁵ As required under Section 1.5.6 of the Guidance Document.

3. Intertidal and Stony Bank Habitats

As set out in Section 1.2 above in the Board's Statement of Appropriate Assessment (included as Appendix 2 to this document), three habitat types have been identified as requiring compensation as follows:

- Intertidal Habitats
 - Fucoid-dominated reef habitat [1170]
 - Mud and sand flat habitat [1140] and
- Stony Bank
 - Perennial vegetation of stony banks [1220].

Sections 3.1 and 3.2 provide a description of these habitat types.

3.1 Intertidal habitats

Intertidal habitats are those marine areas along the shore line that are found between normal High water and Low water levels. The difference in Galway Bay between normal High water and normal Low water is *ca* 3.00m. There are some tides during the year that can rise significantly higher than the "normal" High tides and these are caused by specific astronomic conditions or prolonged periods of extremely strong winds. In the accompanying Figures 1 and 2 of this report which are portions of the Admiralty chart of Galway Bay, the intertidal area of this part of the bay is coloured olive green while the subtidal is coloured blue, pale blue or white depending on the water depth.

In terms of the different types of sediments that may be present, intertidal habitats vary from muddy sediments as are found in Oranmore Bay, to sandy sediments as are found in Silver Strand to bedrock as can be seen around Black Head, Co. Clare. This variation depends to a large extent on the level of exposure experienced at any site – at sites with low exposure levels *e.g.* Oranmore Bay, fine muddy particles can build up on the shore as there is not enough energy to wash them out of the location. The area in the vicinity of the proposed Galway Harbour Extension experiences some exposure to southerly winds but also is sheltered from southwesterly/westerly winds by the Mutton Island causeway. This variability in the level of exposure gives rise to some rocky out crops on which algae grow (in this case, a brown seaweed called a fucoid which are a very characteristic type of alga found all around the Irish coast line) and on which can also be found limpets, periwinkles and mussels. Patches of sand and muddy sand are interspersed between these rocky areas. Characterising floral and faunal species of these habitat types are presented in Appendix 3.

3.1.1. Areas of intertidal habitat impacted

The Board has determined that compensatory measures are required for the loss of 5.93 hectares of intertidal habitats shown enclosed by a red line in Figure 1. This figure also shows the intertidal habitat types (and percentages of each) present within the footprint of the GHE site. Fucoid-dominated reef (1170) was the most frequently occurring habitat with 76.62% of the area comprising this type. 22.25% was made up of a shelly gravel substrate dominated by dead mussel shells. This latter habitat type is not listed as a Qualifying Interest by National Parks and Wildlife Services in the site synopsis for Galway Bay cSAC. One small patch of mud/sand flat was recorded and made up 1.13% of the total area.

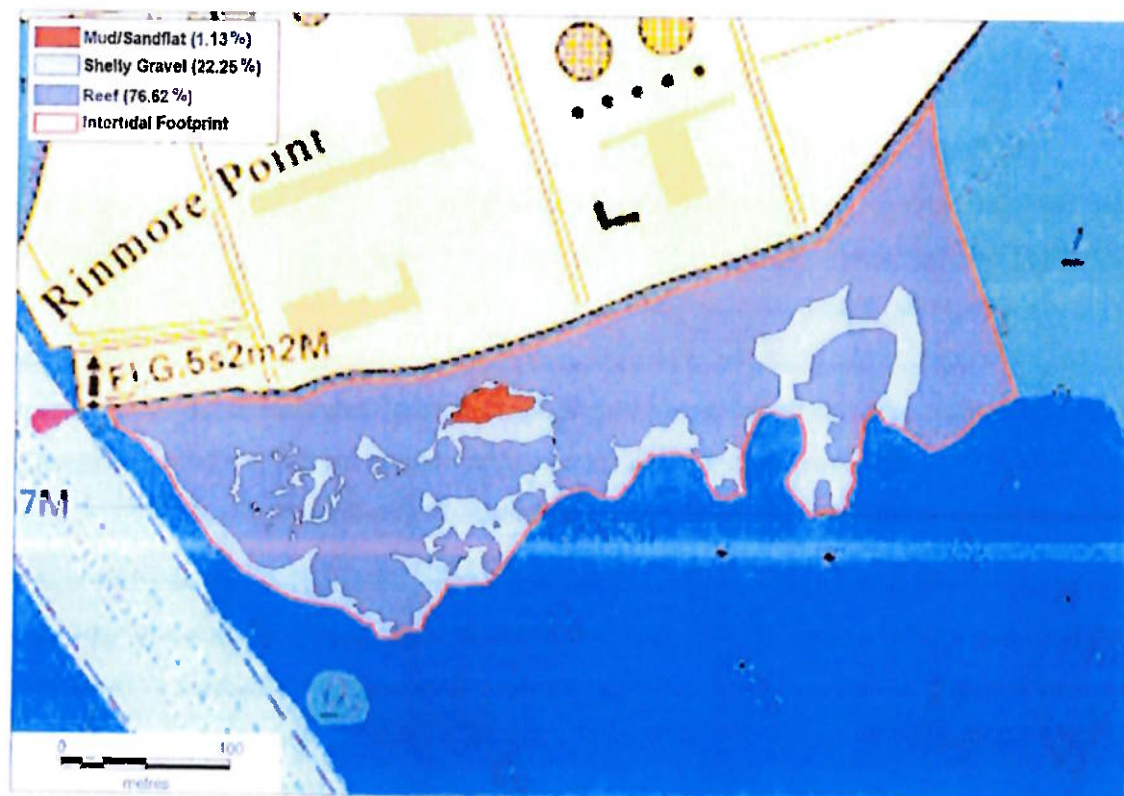


Figure 1. Intertidal habitat types present within the foot print of the proposed Galway Harbour Extension site. (Red line outlines intertidal area affected).

3.2 Perennial vegetation of stony banks

This habitat type is found in semi- to exposed areas of the coastline where shingle (cobbles and pebbles) have accumulated to form elevated banks or ridges above the normal High water mark. This habitat type cannot form if the level of shelter is too high e.g. parts of Oranmore Bay. The cobble size is defined as less than 256 mm in diameter and these beaches (also known as storm beaches) are subject to aperiodic disturbance during storms when rocks and stones are thrown up or disturbed on

the shore by combined high winds and storm surge. Typically, vegetation is sparse on the seaward side whereas behind the ridge or bank, growth of the typical plants is more vigorous and more dense. Given the exposed nature of much of the north shore of Galway Bay, there is almost a continuous strip of stony bank habitat present from Silver Strand west to the entrance to Rossaveal Harbour. Characterising plant species of this habitat type are presented in Appendix 4.

3.2.1 Areas of stony bank habitat impacted

The Board has determined that compensatory measures are required for the loss of 0.35 hectares of stony bank habitat of which approximately 0.2 ha lies within the boundary of the cSAC.

4. Compensatory Measures Considered

The overall approach taken to the provision of compensatory measures involved firstly the identification of potential replacement for both intertidal and stony bank habitats. The first step in this process is the consideration of a number of options for the provision of replacement habitats as discussed in this section.

Potential compensatory habitat locations were identified both within and outside the Galway Bay cSAC, and for outlines of possible methods as to how these might be achieved see Sections 4.1 and 4.2 below. This section also addresses the design criteria listed in the EU Guidance document on Article 6(4) in relation to each proposed compensatory measure.

Having identified such replacement habitat types, further compensatory measures are then proposed which will require landowner agreement, the carrying out of works and finally designation as appropriate.

A number of options for the provision of replacement habitats were considered and these are set out below.

The compensation options considered for the loss of intertidal habitats were:

1. Inundation by the sea of either reclaimed land or non-marine/agricultural fields (see Section 4.1.1.1)
2. Infilling of shallow, subtidal parts of Galway Bay to turn them into intertidal habitat (see Section 4.1.1.2)
3. Identifying similar intertidal habitats outside, but in close proximity to, the boundary of the Galway Bay Complex cSAC, for measures which could be undertaken or habitats which could be considered for designation (see Section 4.2.1).

The compensation options considered for the loss of stony bank habitats were:

1. Developing of stony bank habitat in areas of non-qualifying interest habitat (see Section 4.1.2.1)
2. Rehabilitation of areas where stony bank habitat has been damaged/removed (see Section 4.1.2.2)
3. Identifying similar stony bank habitats outside, but in close proximity to, the boundary of the Galway Bay Complex cSAC, for measures which could be undertaken or habitats which could be considered for designation (see Section 4.2.2).

4.1 Potential Compensatory Replacement Habitats within Galway Bay cSAC

Potential compensatory habitats for both intertidal and stony bank habitats within Galway Bay cSAC are outlined in the following sub-sections.

4.1.1 Intertidal Habitats

In the case of the intertidal habitat, there are 2 possible methods to compensate within the cSAC for the loss of intertidal habitat that will arise due to the construction of the GHE. These are:

1. Inundation by the sea of either reclaimed land or non-marine/agricultural fields or
2. Infilling of shallow, subtidal parts of Galway Bay cSAC to turn them into intertidal habitat.

Each of these methods is described below and tested against the 7 criteria for designing compensatory measures outlined in Section 2 above.

4.1.1.1 INUNDATION

There are various lands which were reclaimed in the past in parts of Galway City. Examples are to the north of Grattan Road at Beach Court and at South Park. The likelihood of these or other more developed land options being seen as having any real potential for clearance and inundation as part of the solution is considered as extremely low due to their well-established use as recreation areas as well as residents' concerns vis-à-vis flooding. Regarding freshwater/non-marine areas, there are some parts of the cSAC to the east of the GHE site such as locations in Oramore Bay *e.g.* Murrough, Roscam, Millplot and Rinvilla but these are designated for other habitat types *e.g.* lagoons and wet lands and are therefore not available for inundation.

EU DESIGN CRITERIA.

With regard to the first two criteria *i.e.* targeted compensation and effective compensation, as inundation of land to convert same to intertidal area has been assessed as likely to entail a significant level of uncertainty regarding re-establishing or establishing such an ecosystem including its structural and functional assets. There are also concerns about the level of effectiveness of this compensation method and although inundation is technically feasible, the potential for negative impacts on the cSAC/SPA exists during the construction/excavation phase and potentially thereafter due to possible changes in currents and tidal patterns *etc.*

Given the level of uncertainty of this method, the spatial extent of areas to be inundated would have to have a ratio of at least 2:1 relative to the areas of habitat lost, thereby increasing the risk of adverse effects of such compensatory measures.

In relation to possible locations, as noted above, there are reclaimed lands in the city and in other areas of the cSAC but these are not considered to be realistically open to consideration.

With regard to timing, the work would have to be completed and the ecosystem shown to function fully before any works begin on the GHE project. This latter element *i.e.* proof that the ecosystem is functioning properly, would form part of the long-term implementation criterion of the EU Guidance on 6 (4).

Given the above concerns, inundation of lands within the cSAC was considered as not comprising a viable method to compensate for the loss of intertidal habitat within the cSAC.

4.1.1.2 INFILLING

Parts of the shallow subtidal area of the northern part of the cSAC east of Mutton Island were examined for potential for infilling. This area was focused on as it is classified by the EPA (2015, Water Quality in Ireland 2010- 2012) as "Transitional" waters or "Estuarine" as defined in the Habitats Directive. This habitat type is not a Qualifying Interest for the Galway Bay cSAC. (It should be noted that this is not the only part of the cSAC that is defined as "Transitional" waters – the inner area of Oranmore Bay, Kilcolgan Bay and most of Kinvarra Bay are also "Transitional" waters. However, in order to be as spatially close to the area that will be lost, the north eastern part of the cSAC was focused on).

The extent of replacement habitats required are 4.54 ha of fucoid-dominated reef and 0.067 ha of sand and mud flat.

Figure 2 shows three potential locations of this area of Galway Bay where shallow subtidal areas of "Transitional" waters occur (defined as the area inside the red line). A location to the west of the Mutton Island causeway (marked as **No. 1** on Figure 2) covers an area of *ca* 25ha where maximum water depths are *ca* 5m at low water to the west of Mutton Island. The next area (marked **No. 2** on Figure 2) is located between Hare and Rabbit Island southeast of Ballyloughan and covers an area of *ca* 19 ha. Maximum water depths at low water are *ca* 2m to the southwest of the site. The third area is located east of Rabbit Island (marked **No. 3** on Figure 2) and covers an area of *ca* 20 ha. Maximum water depths at low water are *ca* 2.5m at the southwestern part of the site.

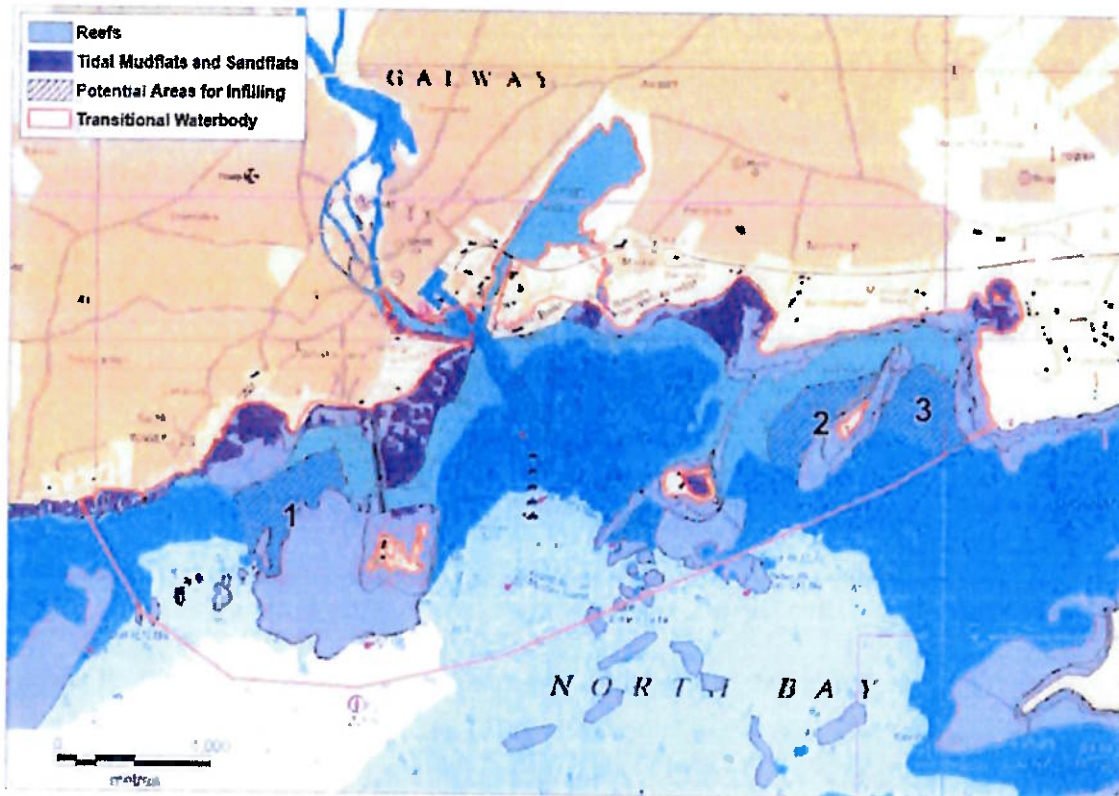


Figure 2: Potential areas for infilling of subtidal to intertidal level.

These areas (No. 1, 2 and 3 as above) can provide intertidal habitat similar to those that will be lost.

The construction of such new intertidal areas would generate impacts arising from their creation.

Detailed studies as envisaged by ABP would be required in advance of confirming, in the Phase 2 stage of the compensatory report, such works to be proposed as a compensatory measure. These include site investigation works to determine depth to bedrock, magnetometer and side scan surveys to record any potential archaeology at the site and subsequent follow-up dive surveys if anything is recorded. A mathematical model study (and calibration/validation data collection programme) and if deemed necessary, a physical model study may also be required.

Experience and knowledge of the three possible sites would indicate that areas 2 and 3 would be preferable to area 1, as they are less exposed and have lower current velocities. Subsoil investigation of the three sites would be required and modelling of the impact on flow regimes to assess the accretion/scouring impacts which would arise. An outline of a proposed method of construction is set out below.

Rock fill material would be placed to the required extent of subtidal area to be raised. These areas would be raised to the same level as the areas lost. The rock/boulders would be placed so that natural

accretion/building up of displaced mud/sand by the sinking in of the placed boulders would generate elements of mud and sandflats which would stabilise in the lee of the reefs constructed, thus providing such types of areas equivalent or greater than those lost. The large boulders /rock fill would be placed at low tide using a temporary haul road across the intertidal area as far as the subtidal area to be raised to intertidal level. The rock would be dropped at the end of the haul road and then placed by excavator in the pattern required to form the area of reefs and sheltered patches of mud and sandflats. The temporary haul road would then be removed.

EU DESIGN CRITERIA

With regard to the first two criteria *i.e.* targeted compensation and effective compensation, as this method attempts to recreate lost marine habitat by infilling parts of Galway Bay below low water, there is a level of uncertainty regarding re-establishing the ecosystem including its structural and functional assets. Similarly, there are concerns about the level of effectiveness of this compensation method and although technically feasible, this proposed compensation method of infilling was assessed as likely to give rise to considerable negative impacts on the cSAC/SPA during the construction phase, as well as ongoing and permanent loss of subtidal habitat on which the works were carried out. Given the level of uncertainty of this method, the spatial extent of areas to be infilled might have to be at a ratio to the areas lost up to 2:1. In relation to possible locations, as noted above, there are a number of possible locations where infilling could be considered. With regard to timing, the work would have to be completed and the ecosystem been shown to function before any works begin on the GHE project. This latter element *i.e.* proof that the ecosystem is functioning properly would form part of the long-term implementation criterion of the EU Guidance on 6 (4). Other issues under this last criterion relate to legal matters such as obtaining a foreshore licence and dumping at sea licence.

Given the above concerns, infilling is not seen as a viable method to compensate for the loss of intertidal habitat within the cSAC.

4.1.2 Stony Bank Habitat

Regarding perennial vegetation of stony banks, in order to compensate for the loss of stony bank habitat within the cSAC, two potential methods have been considered and these are:

1. The development of stony bank habitat in areas of non-qualifying interest habitat,
2. The rehabilitation of areas where stony bank habitat has been removed or damaged.

4.1.2.1 DEVELOPMENT OF STONY BANK HABITAT

This option may prove difficult to achieve due to the highly dynamic, though aperiodic nature of the physical characteristics of these habitats. In order to create this sort of habitat, an area of land above high water that does not already have stony bank substrate would have to be found. It would also have to have sufficiently high exposure to storm surge and wave action. Stones and cobbles of the correct size would have to be imported to the site.

EU DESIGN CRITERIA

With regard to the first two criteria *i.e.* targeted compensation and effective compensation, as this method attempts to recreate lost stony bank by constructing it at some location within the Galway Bay cSAC, there is a level of uncertainty regarding re-establishing this ecosystem including its structural and functional assets. Similarly, there are concerns about the level of effectiveness of this compensation method and although technically feasible, this proposed compensation method of stony bank construction would give rise to some negative impacts on the cSAC/SPA during the construction phase as well as ongoing loss of the habitat on which the measures were carried out. Given the level of uncertainty of this method, the spatial extent of areas to be constructed may have to be up to 2:1. In relation to possible locations, no sites where this method could be implemented are known within the cSAC.

With regard to timing, the work would have to be completed and the ecosystem been shown to function before any works begin on the GHE project. This latter element *i.e.* proof that the ecosystem is functioning properly would form part of the long-term implementation criterion of the EU Guidance on 6 (4). Other issues under this last criterion relate to legal matters such as purchase of land.

Given the above concerns, construction of new stony bank is not seen as a viable method to compensate for the loss of this habitat within the cSAC.

4.1.2.2 REHABILITATION OF DEGRADED STONY BANK HABITAT

Discussions were held with Dr. Michelene Sheehy-Skeffington who is Ireland's leading expert on stony banks regarding this method. She advises that the likelihood of this being successful is very low given the high dynamic nature of such habitats.

Both from AQUAFAC's studies and those of Dr. Michelene Sheehy-Skeffington, degraded stony bank habitat does not occur within the cSAC.

EU DESIGN CRITERIA

With regard to the first two criteria *i.e.* targeted compensation and effective compensation, as this method attempts to rehabilitate degraded stony bank which is not known to exist within the Galway Bay cSAC, neither can be satisfied. Similarly, as no areas of degraded stony bank habitat are known within the cSAC, there can be no level of effectiveness of this compensation method. Additionally, there are concerns about the technical feasibility of this approach given the required physical environmental characteristics. Regarding the remaining criteria that relate to spatial extent, possible location, timing and long-term implementation, none of these can be satisfied as no such sites are present within the cSAC.

Because of the issues noted above, this option was not considered to provide effective compensation.

4.2 Potential Compensatory Replacement Habitats outside the Galway Bay cSAC

4.2.1 Intertidal Habitats

This compensatory option is to replace lost intertidal habitat in an area outside the existing cSAC boundary. Works to recreate lost reef habitat (1170) and mud and sandflat habitat (1140) were considered. As previously discussed the options are to raise the subtidal or add reef to existing intertidal. The area considered is the stretch of coastline from the cSAC boundary at Silverstrand west to Barna. Both of these options would have negative implications on the hydrodynamics and sediment transfer in the area which would impact Silverstrand designated sandflats. As these options would negatively impact a cSAC qualifying interest they cannot be considered further.

The remaining option was to identify similar intertidal habitats outside, but in close proximity to, the boundary of the Galway Bay Complex cSAC. The area shown in Figure 3 is considered suitable. An initial examination of this area comprising of a walk over of the site, examination of aerial photographs and previous experience in the same area showed that it contains areas of mud and sand flat and furoid-dominated reef habitats. Based on the existing data, it has been determined that there are 21.15 ha of furoid-dominated reef habitat and 7.47 ha of mud/sand habitat at this location.

It is the considered opinion of the author based on examination of these data, that adequate replacement habitats of the extent and characteristics lost can be found within this envelope of coastline between Silverstrand and Barna. These habitats are similar to what is present at the GHE site. This proposal would require the designation of a new area of coastline within the envelope shown in in Figure 3.

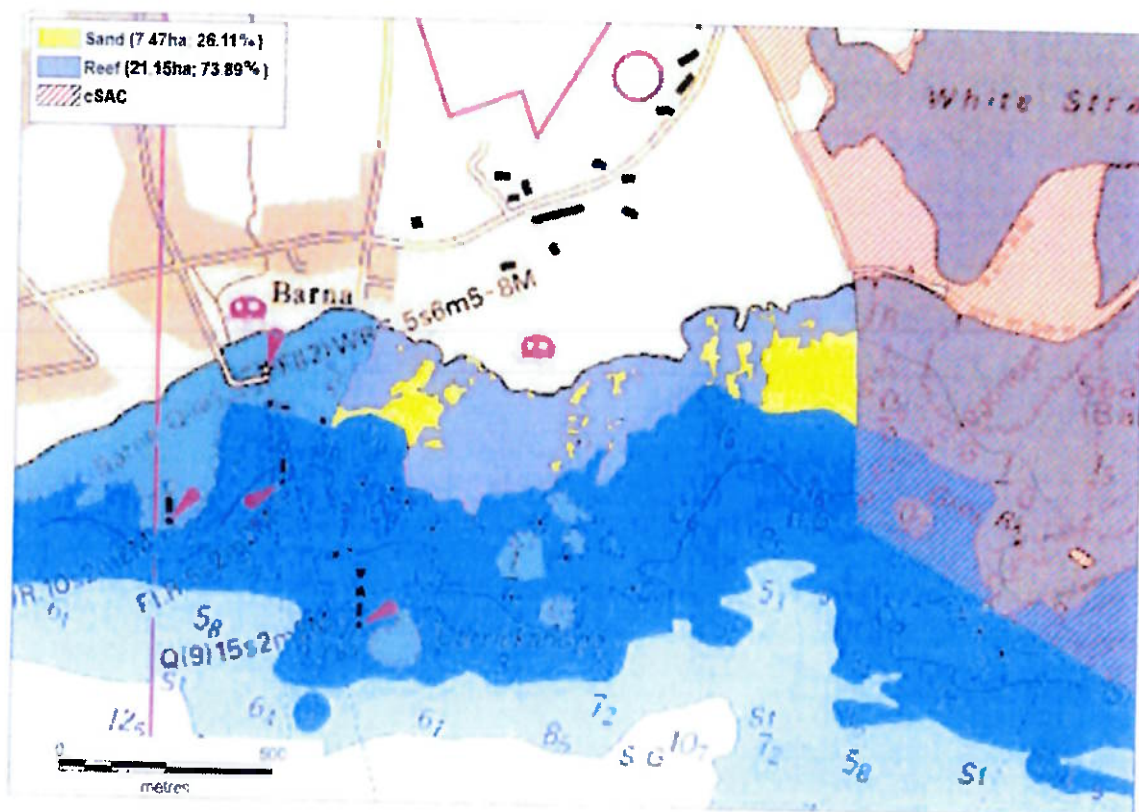


Figure 3. Area outside Galway Bay cSAC between Silverstrand and Barna where furoid-dominated reef (1170) and mud and sand flat not covered by water at low tide (1140) habitats occur.

EU DESIGN CRITERIA

With regard to targeted compensation, the proposed compensatory plan for the loss of each habitat type is to designate a new area that is contiguous with the existing cSAC and that includes each of these habitats which are similar in structure to what will be lost and are also fully functional.

The proposal to designate an area to the west of the existing boundary of the cSAC will be effective as it is immediate and feasible and the ecosystem is already fully functional. There are no technical reasons why this proposed compensatory plan is not feasible.

The designation of a new area outside the cSAC has no level of uncertainty of being unsuccessful associated with it.

Regarding the criterion of extent of compensation, this issue needs to be discussed with NPWS prior to making a decision on what the ratio of compensated to lost habitat is required within this envelope. However, as it is known that both habitat types are present at the site and are fully functional in the proposed extension area, it is possible to see why a 1:1 ratio is appropriate. The location of this compensatory habitat is shown in Figure 3 above.

Concerning timing, the proposed compensatory measure of the designation of a new area of coastline will be completed before the Galway Harbour Extension project starts. In order to ensure the full implementation of this proposed compensation method, binding enforcement methods at the National level are required.

An annual monitoring programme of key species of these habitats is recommended in order that National Parks and Wildlife can comply with Article 17 of the Habitats Directive. As the planned compensation for loss on intertidal habitat is adjacent to the boundary of the cSAC/SPA, an appropriate assessment will be required.

4.2.2 Stony Bank Habitat

It is proposed to identify, acquire rights to and designate stony bank habitat within the envelope of coastline as marked on Figure 4. This section of Galway Bay is known to contain areas of both natural and degraded stony bank habitat.

During consultation with Dr. Michelene Sheehy who is Ireland’s leading expert on stony bank ecology, she was strongly of the opinion that designating a new area to the west of the existing cSAC boundary is the best solution (in the sense of level of success) and will not therefore impact on the Galway Bay cSAC.

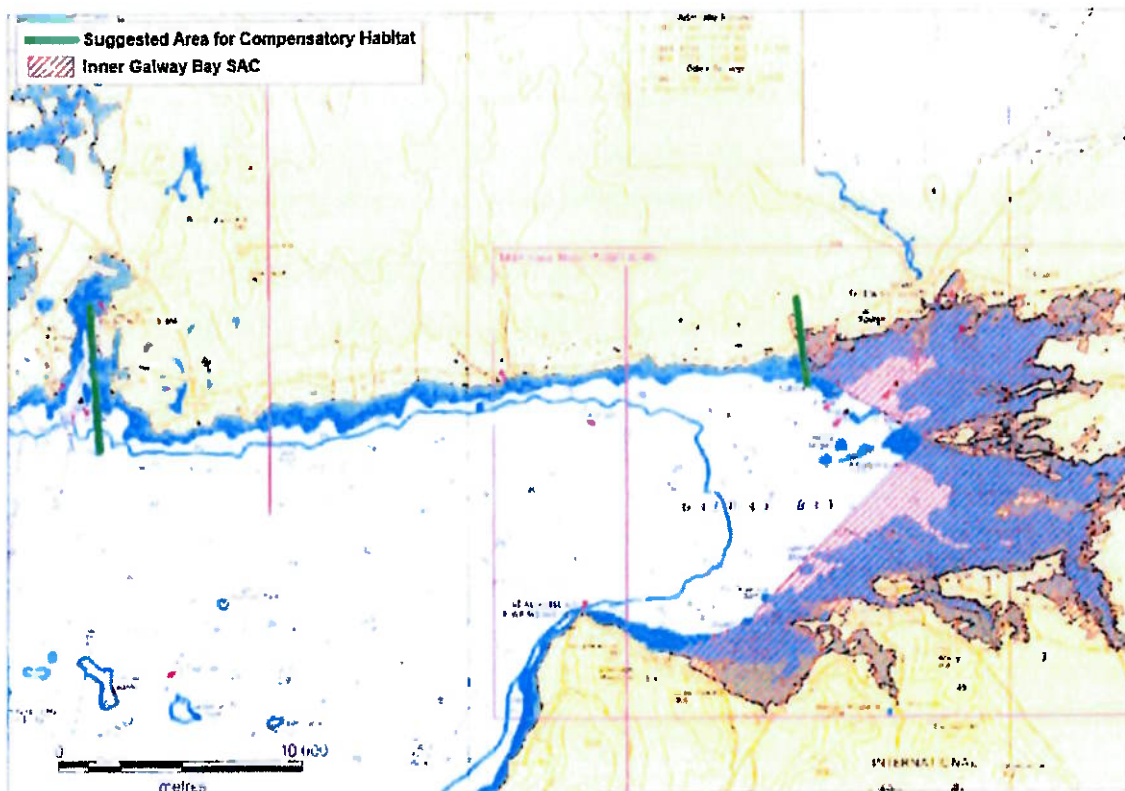


Figure 4. Area west of Galway Bay cSAC where perennial vegetation of stony banks (1120) compensatory habitat occurs.

EU DESIGN CRITERIA

With regard to targeted compensation, the proposed compensatory plan for the loss of stony bank habitat type is to designate new areas that are adjacent to the existing cSAC and that include this habitat which is similar in structure to what will be lost and is also fully functional. The proposal to designate areas to the west of the existing boundary of the cSAC will be effective as it is immediate and feasible and the stony bank habitat is fully functional. There are no technical reasons why this proposed compensatory plan is not feasible.

The designation of a new area outside the cSAC has no level of uncertainty of being unsuccessful associated with it. Regarding the criterion of extent of compensation, this issue needs to be discussed with NPWS prior to making a decision on what the ratio of compensated to lost habitat is required. However, as it is known that this habitat type is present within the area marked on Figure 4 and is fully functional in the proposed extension area, it is possible to see why a 1:1 ratio is appropriate. The location of this compensatory habitat is shown in Figure 4 above and is already fully functional.

Concerning timing, the proposed compensatory measures will be secured before the Galway Harbour Extension project starts. In order to ensure the full implementation of this proposed compensation method, binding enforcement methods at the National level are required. Also, as these lands are owned by private individuals, purchase or access rights are foreseen. An annual monitoring programme of key species of this habitat is recommended in order that National Parks and Wildlife can comply with Article 17 of the Habitats Directive. As the planned compensation for loss on intertidal habitat is adjacent to the boundary of the cSAC/SPA, an appropriate assessment will be required.

5. Compensatory Measures

The recommended compensatory measures are set out below, initially in summary format in Section 5.1 and in more detail in Section 5.2 – 5.7.

5.1 Summary of Measures

5.1.1 Intertidal and Stony Bank Habitats

- Intertidal and stony bank habitats have been identified along the coastline outside and immediately to the west of the Galway Bay cSAC. This area, located west of Silverstrand, has

the potential to provide suitable replacement habitat for both intertidal and perennial vegetation of stony bank habitat.

- Reverse manmade constraints to the landward migration of the stony banks with removal of storm defenses.
- Allow nature to restore these elements of this stony bank to its natural dynamic habitat.

5.1.2 Creation of Wetland Habitat / Inundation

- Creation of brackish wetland habitats to the rear of the stony banks through inundation by seawater/freshwater resulting from the removal of storm defenses and blocking of land drains

5.1.3 Renmore Salt Marsh

- The Galway Harbour Company has lands at Renmore which are within the SPA but not designated as cSAC.
- Galway Harbour Company will request that these lands are afforded protection under the Habitats Directive for the benefit of the saltmarsh habitat.
- This will also afford protection to the nearby Renmore and Lough Atalia priority habitat lagoons
- GHC will manage this habitat in accordance with the management plan to be agreed with NPWS

5.1.4 Tern Nesting Platform

- Provision of a tern platform in transitional waters in the CSAC and the SPA
- This platform will be located in a natural tern roosting area between Hare Island and Rabbit Island
- The platform will be 20 x 20m, constructed from the seabed to above the highest astronomical tide. This will provide shelter for roosting purposes and will provide an additional tern nesting site

5.1.5 Removal of Loose Rock at Lough Atalia Entrance

- Enhance the intertidal habitat at the entrance to Lough Atalia through the removal of old construction rubble which impedes the tidal flow regime in the channel

5.1.6 Habitat Benefit / Improvement

- An envelope of intertidal area has been identified which will be proposed for designation as a shoreline extension of Galway Bay Complex cSAC. These habitats will benefit from this protection
- An envelope of stony bank habitat has been identified west of Silverstand within which elements will be proposed for designation as cSAC
- These habitats will benefit from this protection

5.2 The Proposed Measures

The actual measures are outlined below:-

5.2.1 Stony Bank Habitat

There are elements of stony bank habitat west of Silverstrand that have been constrained in their landward migration by man-made structures. In some cases, this defence comprises large boulders placed above high water on the stony bank to act as a defence against storm surge. In other cases, it comprises of a field wall which constrains the stony bank to its seaward side. Agricultural elements of this land will be sought to allow the removal of such sea defence works. This will allow stony bank habitat that occurs along this length of coastline to be periodically inundated by storm surge and again allow the landward migration of the stony bank. Interaction with the landowners will be required to reach agreement as to which areas could be put forward for this compensation. Subject to such land owner agreement, these areas will be formally proposed as a compensation measure. Subject to acceptance of this as a compensatory measure and the success of the planning proposal, these areas will be put forward for designation to forming part of the Galway Bay cSAC prior to the commencement of the GHE development works.

EU DESIGN CRITERIA

The fact that this envelope of stony bank is bordered by Galway Bay cSAC, renders it suitable to be made part of this Natura 2000 sites and as such satisfied the “targeted compensation” criterion. As it contains areas of stony bank habitat, it will be an immediate and effective additional compensation measure and it is also technically highly feasible as the removal of boulders will facilitate re-instatement of the habitat and the re-establishment of the species within same. The envelope is ca 30 km in length and its location is shown above in Figure 4. An element or elements of the required extent will be sought and rights acquired to facilitate this part of the compensatory proposal. It will be designated before any work commences on the GHE project. Long term implementation issues associated with this measure include agreement with land owners to carry out the required works, planning permission to do the work and monitoring requirements for the NPWS under Article 17 of the Habitats Directive.

5.2.2 Inundation

In the same area of the north shore of Galway Bay as shown above in Figure 4, there are low lying lands *i.e.* approximately at mean high water level that are subject to inundation at extreme tidal/weather events. These lands have been agriculturally enhanced by drainage works. It is

proposed that those drainage works would be reversed thereby allowing some of these areas to become wetlands for use by waders and other aquatic wildfowl species.

EU DESIGN CRITERIA

Although replacement of wetlands is not a requirement by An Bord Pleanála, this provision of additional wetland habitat is seen as a positive addition to the environmental status of Galway Bay. The fact that this area is bordered by Galway Bay cSAC and SPA renders it suitable to be part of an extension of these Natura 2000 sites and as such, satisfies the “targeted compensation” criterion. As per Section 5.2.1 above, an element or elements of the required extent will be sought and rights acquired to facilitate this part of the compensatory proposal. This may correspond in location with the elements of Section 5.2.1 above and be the ground on the landward side of the stony bank element proposed. The envelope is *ca* 30 km in length within which suitable areas will be found. Its location is shown above in Figure 4. It will be operational before any work commences on the GHE project. Long term implementation issues associated with this measure include agreement with land owners to carry out the required works and planning permission to do the work. These new areas of wetland will then be designated under the Habitats and Birds Directive.

5.2.3 Galway Harbour Company lands (Renmore Salt Marsh)

Galway Harbour Company proposes to make available 3 ha of its Renmore lands to the east of the GHEP, presently designated as SPA only, for designation also as cSAC. From the EIS for the GHE project, it was found that this area supports salt marsh and wetland freshwater marsh habitats both of which are Qualifying Interests of the cSAC and the SPA. This offer of designation will ensure that the site will be afforded the appropriate protection into the future for the benefit of the listed habitats and species that are known to occur there. The fact that this area borders Renmore Lagoon, which under the EU Habitats Directive is a priority habitat requiring special protection, will ensure that the lagoon and its downstream waterbody, Lough Atalia which is also a lagoon and a priority habitat, has additional protection. This location therefore, merits designation under both EU Directives *i.e.* Birds and Habitats.

EU DESIGN CRITERIA

The fact that this area is bordered by Galway Bay cSAC makes its designation entirely suitable as it would then form part of this Natura 2000 site and as such, would satisfy the “targeted compensation” criterion.

As it is a functioning complex of habitats including salt marsh, freshwater marsh and scrub, it will be an immediate and effective additional compensation measure and it is also technically feasible. The area is ca 3ha in extent and its location is shown above in Figure 5. It will be designated before any work commences on the GHE project. There are no long term implementation issues associated with this measure other than monitoring requirements for the NPWS under Article 17 of the Habitats Directive.

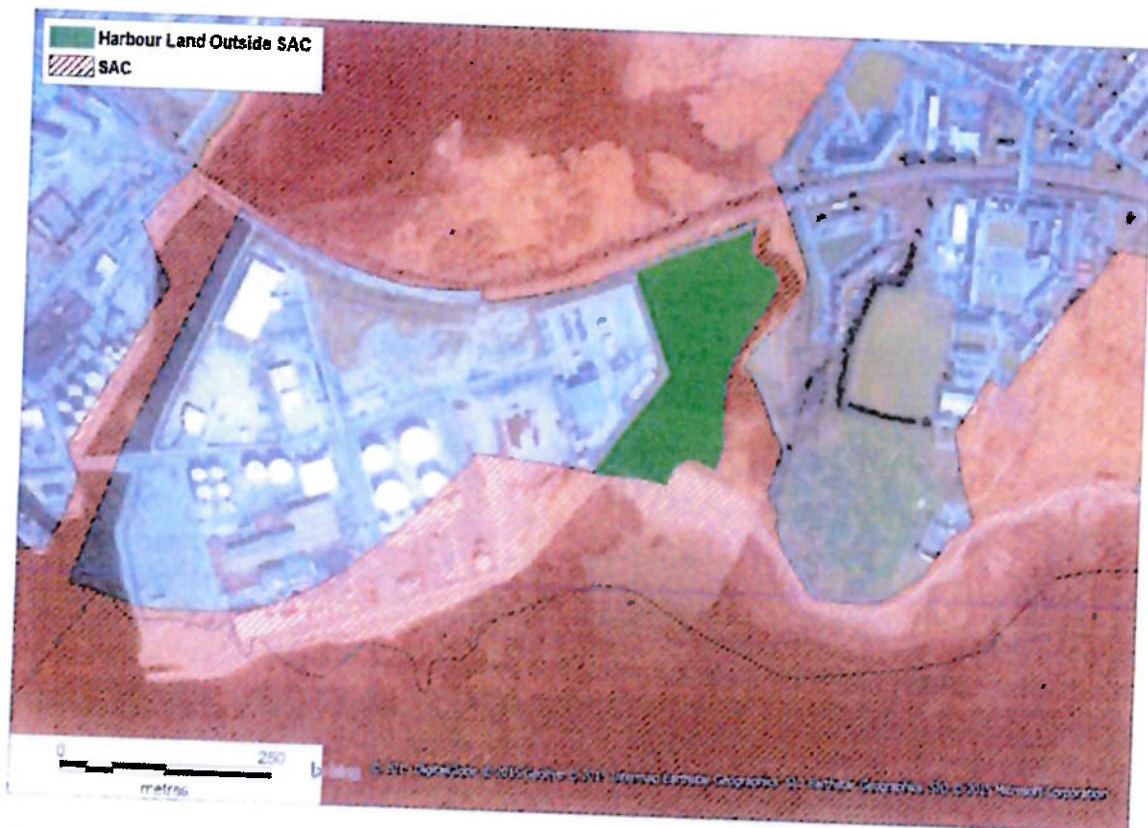


Figure 5. Area of Galway Harbour Enterprise Park (shown in green) that is not part of the Galway Bay cSAC.

5.2.4 Tern nesting platform

A tern nesting platform is proposed to be placed between Hare and Rabbit Islands as this area is within the Galway Bay SPA. The tern colony in this part of Galway Bay has moved between Mutton Island to Rabbit Island and back to Mutton Island and this compensatory measure is seen as giving the terns a more permanent nesting facility. The structure is envisaged as a 20 x 20m concrete floored platform elevated above extreme high water and maximum wave heights. As this will be raised on piles it will have minimum interference with wave and current patterns. The platform will overhang the piles to protect terns from terrestrial predators. The platform deck will be cambered to facilitate

drainage. The deck will be laden with cobbles/stones of the size that terns like to nest on, and, as in other tern platform studies, roof ridges tiles will be randomly placed on the cobbles to provide shelter to adults, eggs and chicks from avian predators. The platform will be edged to avoid cobble-loss. This will afford terns further protection from predation which would not be available on existing breeding sites and will enhance the breeding success of these birds.

EU DESIGN CRITERIA

Although An Bord Pleanála did not make any requirement regarding compensation measures for additional tern nesting habitat, this compensatory measure is being proposed as it lies within the Galway Bay SPA. It is entirely suitable that it forms part of this Natura 2000 site and as such satisfies the “targeted compensation” criterion. Rafts/dolphins have been placed in either the sea or freshwater in a number of European countries and terns have been shown to successfully breed on them. The area being considered is in the northern, inner part of Galway Bay close to Rabbit Island. It will be put in place before any work commences on the GHE project. Long term implementation issues associated with this measure include foreshore licence for foundation/anchorage, discussions with fishermen and NPWS and permissions from the Departments of Environment and Agriculture and Fisheries. A monitoring programme would include annual counts of tern numbers, nest numbers, egg numbers and chick numbers.

5.2.5 Removal of Loose Rock at Lough Atalia Entrance

Construction rubble was abandoned in the channel adjacent to the sea wall as part of the works realigning the access channel into Lough Atalia in ca 1972. The tidal flow in and out of Lough Atalia lagoon which is a priority habitat is regulated by a sill on which the railway bridge was founded and built. This pile of rock is an intrusion in the channel and removal would facilitate flows on the southwestern seaward side of the sill and restore the channel and tidal flows to their natural conditions.

EU DESIGN CRITERIA

This pile of rock is located directly in front of the western most arch of the Galway – Dublin railway line. As the area lies within the cSAC/SPA, it is entirely suitable that it forms part of these Natura 2000 sites and as such satisfies the “targeted compensation” criterion. It will be an immediate and effective additional compensation measure and it is also technically highly feasible as all it requires is the removal of boulders. It is proposed that this will be done by grab machine from the western bank of the approach channel and therefore, there will be no works within the channel. The area is ca 10 m²

and its location is on the southern side of the railway bridge into Galway Station. The removal of the rocks will be completed before any work commences on the GHE project. Long term implementation issues associated with this measure include the obtaining of permissions from the Departments of Environment and Agriculture and Fisheries for the removal of same. Suggested monitoring requirements include pre-, during and post- construction monitoring of salinity and turbidity at 6 locations - one on the seaward side of the pile of rocks, one at the railway bridge, three within Lough Atalia and the final sixth in Renmore Lough. If monitoring results immediately post construction are the same as preconstruction levels, monitoring can cease.

5.2.6 Habitat Benefit / Improvement and Designation

The recommended compensatory measure for both intertidal habitats of furoid-dominate reef 1170 and mud and sand flat not covered by sea water at low water 1140 is to replace the lost intertidal habitat by designating an area outside the existing cSAC boundary. This envelope is identified on Figure 3 and is located between Silverstrand and Barna to the west. As noted above, based on existing data, it has been determined that adequate replacement habitats of the extent and characteristics lost can be found within the envelope of coastline between Silverstrand and Barna. This would require the designation of a new area of coast line, in that direction.

EU DESIGN CRITERIA

This measure will more than compensate for the loss of these habitats within the cSAC and can be achieved without any damage to the cSAC/SPA. Furthermore, there is certainty that such an approach will be effective and will also be risk-free in terms of environmental damage. This compensatory measure will offset the negative effects of the project such that the overall coherence of the Natura 2000 network is maintained in line with the requirements of Article 6 (4).

6. Summary

In conclusion, the envelopes of intertidal and stony habitats outlined in Figures 3 and 4 and described in the compensatory measures 5.1 and 5.2.6 above, have the potential to provide replacement habitat far in excess of that required by An Bord Pleanála. This is a matter for further discussion with NPWS with a view to determining the precise location and extent of Compensatory Habitat/Measures within the identified envelopes. A detailed proposal for the agreed Compensatory Measures will then be submitted to An Bord Pleanála (*i.e.* Phase 2).

Appendix 1

An Bord Pleanála: Further Information Request

Our Ref: 81 PA0033
PA1 Ref:

Your Ref: JPK2139

An Bord Pleanála

TOBIN CONSULTING ENGINEERS		
PROJECT NO		
FILE REF		
DATE RECEIVED	30 SEP 2015	
PASS TO	ACT ON BY	DATE
JPK		

John P Kelly
Tobin Consulting Engineers
Fairgreen House
Fairgreen Road
Galway

29th September 2015

Re: Galway Harbour Extension
Renmore and Townparks Townlands, Galway

Dear Sir

I have been asked by An Bord Pleanála to refer further to the above mentioned proposed development and in particular to compensatory measures as required under Article 6(4) of the Habitats Directive

The Board has completed an appropriate assessment of the proposed Galway Harbour Extension in accordance with Article 6(3) of the Habitats Directive and has concluded that approval of the proposed development could not be considered under Article 6(3) of the Habitats Directive, given that a significant adverse impact on the integrity of the Galway Bay SAC would occur

The impacts on the integrity of the European Site are as follows

- The direct and permanent loss of fucoid-dominated reef habitat [1170] and mud and sand flat habitat [1140] in Galway Bay Complex eSAC will result in the conservation objective for these features not being met. The direct and permanent loss of a habitat, which is part of the conservation objective of the site, is in general a significant adverse effect on the integrity of the site
- The loss of perennial vegetation of stony banks [1220] due to the sheltering effect of the harbour extension will also have a significant adverse effect on the integrity of the eSAC

Therefore, without prejudice to the final outcome of the application which is before the Board, and in accordance with section 37(F)(1) of the Planning and Development Act, 2000, as amended, you are **invited to confirm** that you wish the project to be considered for approval under Article 6(4) of the Directive, in which case it is necessary for you to submit **proposals for compensatory measures to address the impacts on the integrity of the Galway Bay Complex SAC identified above. The compensatory measures should offset the negative effects of the project such that the overall coherence of the Natura 2000 network is maintained.**

This information is required by the Board in order to continue to consider the case and to decide whether to apply a derogation under Article 6(4) of the Habitats Directive

In order to comply with the Board's request, you are referred to the guidance in relation to compensatory measures set out in the European Commission (DG Environment) Guidance Document entitled "Guidance document on Article 6(4) of the Habitats Directive" (2007-2012) (2007-2012) as may be updated

It is noted that within this guidance, 'tight co operation' between the applicant, the Natura 2000 authorities, and the assessment authority is encouraged with respect to the programme of conservation measures

The Board proposes that the development of proposed compensation measures be addressed in two phases:

Phase 1 - the proposals for compensatory measures should be set out by Galway Harbour Company for initial consideration. You are advised to liaise with the National Parks and Wildlife Service of the Department of Arts, Heritage and the Gaeltacht in this regard. It is envisaged that once proposals are received, the Board will also seek the views of the National Parks and Wildlife Service with respect to the acceptability in principle of the emerging proposals. The Board will advise in due course whether the compensatory measures should be developed in more detail, or otherwise

Phase 2 - pending the outcome of Phase 1, the applicant will be afforded further time to develop the compensatory measures in more detail leading to submission of a completed proposal for consideration by the Board

The further information referred to above should be received by the Board within eight weeks from the date of this notice (i.e. no later than 5.30 p.m. on the 24th November 2015).

Prior to any decision on the acceptability or otherwise of any compensatory measures, the Board will consider what public involvement is appropriate and may invite further submissions from parties to the case or seek further public notices

Should you require clarification of any matter a written request can be submitted and the Board will endeavour to clarify any technical or procedural queries arising. It is not the Board's role to suggest or influence what form the compensatory measures should take.

The following documents are attached for information purposes:

- An Bord Pleanála findings of the Appropriate Assessment of the project
- Galway Harbour Extension Project: Assessment of Ecological Impacts on the Marine Environment for An Bord Pleanála. Author Mr. Daniel Bastren of Thomson Unicomarine, February 2015.

If you have any queries in relation to the matter please contact the undersigned officer of the Board. Please quote the above mentioned An Bord Pleanála reference number in any correspondence or telephone contact with the Board

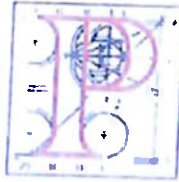
Yours faithfully,


Kieran Doherty
Executive Officer
Direct Line. 01-8737248

ADHOC PA0033 38

Appendix 2

An Bord Pleanála: Statement of Appropriate Assessment



STATEMENT OF APPROPRIATE ASSESSMENT (ARTICLE 6(3))

An Bord Pleanála had regard to the documentation submitted by the applicant which included a comprehensive list of Natura 2000 sites potentially coming within the influence of the proposed port extension. The Board agreed with the screening assessment and conclusion reached in the report of the specialist ecological consultant (Mr. Bastreri of Thomson Unicomarine, appointed to assist the Board's inspector) that the following sites.

- Galway Bay Complex SAC (site code 000268),
- Inner Galway Bay SPA (site code 004031) and
- Lough Corrib SAC (Site code 000297)

are the relevant European sites for which there is a likelihood of significant effects, requiring a 'stage II' assessment, and that other sites can be discounted from further consideration owing to the separation distances involved and lack of likelihood of significant effects arising.

The Board considered the Natura impact statement and all other relevant submissions – including further information submitted by the applicant in response to a request by An Bord Pleanála, and further submissions made in the course of the oral hearing – and carried out an appropriate assessment of the implications of the proposed development for European sites listed above in view of the sites' conservation objectives. The Board considered that the information before it was adequate to allow the carrying out of an appropriate assessment.

In completing the assessment the Board considered, in particular, the

- i) likely direct and indirect impacts arising from the proposed development both individually or in combination with other plans or projects, including the reclamation of land in this area carried out by the Galway Harbour Company in the mid-1990s to create the Galway Harbour Enterprise Park (planning permission reference 95/68),
- ii) mitigation measures which are included as part of the current proposal,
- iii) conservation objectives for these European sites, and
- iv) submissions of the National Parks and Wildlife Service (NPWS) of the Department of Arts, Heritage and the Gaeltacht and of the other participants in the case including at the oral hearing.

In completing the AA, the Board accepted and adopted the appropriate assessment carried out in the report of the specialist ecological consultant appointed by the Board in respect of the potential effects of the proposed development on the aforementioned European sites, having regard to the sites' conservation objectives

The conclusions of the specialist ecological consultant in relation to impacts on the integrity of the European sites can be summarised as follows (Table, and text below):

Table – Summary of impacts on the Integrity of Natura 2000 sites.

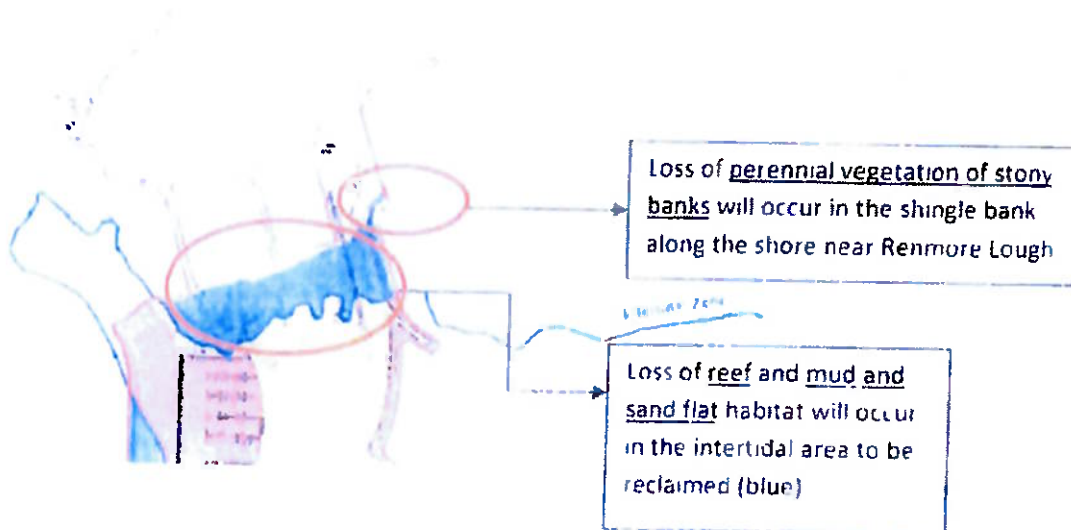
Natura 2000 site	Conclusion
Galway Bay Complex SAC Site code 000268	<p>The integrity of the European site will be affected by the proposed development, specifically:</p> <ul style="list-style-type: none"> • The direct and permanent loss of furoid-dominated reef habitat [1170] and mud and sand flat habitat [1140] in Galway Bay Complex cSAC will result in the conservation objective for these features not being met. The direct and permanent loss of a habitat, which is part of the conservation objective of the site, is in general a significant adverse effect on the integrity of the site. • The loss of perennial vegetation of stony banks [1220] due to the sheltering effect of the harbour extension will also have a significant adverse effect on the integrity of the cSAC.
Inner Galway Bay SPA Site code 004031	While some adverse impacts are likely, a significant adverse effect on the integrity of the SPA will not arise in view of the site's conservation objectives.
Lough Corrib SAC Site code 000297	While some adverse impacts are likely, a significant adverse effect on the integrity of the SAC will not arise in view of the site's conservation objectives.

Impacts arising on the integrity of the Galway Bay Complex SAC

The 'fucoid dominated reef' habitat (Annex 1 habitat) and the 'mud and sand flat not covered by sea-water at low tide' habitat that will be permanently removed by the proposed land reclamation are located in the inter-tidal zone directly adjacent to the existing Galway Harbour Enterprise Park. The 5.93 hectares involved is clearly marked on the application drawings. There is a combination of reef habitat and mud and sand flat habitat occurring in this zone. The total area of reef habitat occurring in the SAC is 1227 hectares. Therefore in a 'worst case' scenario, the loss of 5.93 hectares would represent approximately 0.5% of the total area of the reef habitat that occurs within the European site.

The habitat supporting **perennial vegetation of stony banks** is found adjacent to the Galway Harbour Enterprise Park, beside Renmore Lough, and comprises a low shingle bank running along the shore. The shingle bank has been affected by recent storms but may be expected to recover. The proposed development will lead to changes in the hydrological regime at local level, sheltering the stony bank that forms the south boundary of Renmore Lough, which in turn will prevent storm and wave surges from accessing the stony banks, leading to increased colonisation by terrestrial vegetation. Therefore the proposed harbour expansion is expected to lead to a loss of the habitat. The total area of this habitat affected is approximately 0.35 hectares of which approximately 0.2 hectares lies within the boundary of the SAC.

Figure – indicative location of habitats where adverse impacts on integrity of the SAC will arise.



The assessment carried out by Mr Bastreri concluded that although there are certain **priority habitats** present within the Galway Bay SAC - including Lough Atalia and Renmore Lough which comprise coastal lagoon habitat - the proposed harbour extension project will not lead to negative implications arising for the conservation objectives relating to these priority habitats. The Board adopted this conclusion.

Impacts on the Inner Galway Bay SPA

Significant consideration has been given in the course of the application (including at the oral hearing) to potential impacts on the conservation interests (bird species) of the Inner Galway Bay SPA. Having analysed the issues involved, the Board's specialist ecological consultant Mr. Bastreri concluded as follows:

- Loss of intertidal and subtidal habitat, underwater noise and vibration and disturbance during construction are likely to have a moderate adverse impact on many of the bird species that are qualifying features of the SPA.
- Disturbance caused by an increase in shipping traffic during operation are likely to have a moderate adverse impact on some of the bird species that are qualifying features of the SPA.

He does not include the SPA in those sites whose integrity will be adversely affected by the proposed development.

The Board also gave consideration to the impacts arising, in particular the potential impacts on bird species owing to increased shipping movements associated with the proposed harbour extension once operational. Notwithstanding the extensive written and oral submissions made in relation to this matter, there remain conflicting views taken by the specialist ecologists representing the applicant and the NPWS in the course of the case. The Board took the view that some disagreement in relation to this aspect of the appropriate assessment was understandable given the nature, scope and duration of the project and the availability of information on the receiving environment. The matter has already been the subject of a 'further information request' and extensive exchanges at the oral hearing, and the Board considered that further surveying or analysis was unlikely to resolve this lack of agreement in view of the current understanding of the behaviour of marine birds.

Having examined the matter, the Board considered that Mr Bastreri's report represents the best scientific advice available, and that it takes a conservative approach in concluding a 'likely moderate adverse' impact owing to disturbance. The Board agreed with Mr Bastreri that such an impact, if it were to arise, would not comprise a significant adverse effect on the integrity of the SPA in view of the site's conservation objectives.

Appropriate Assessment Conclusion

The Board concluded that approval of the proposed development could not be considered under article 6(3) of the Habitats Directive, given that a significant adverse impact on the integrity of the Galway Bay SAC would occur.

The Board then proceeded to examine whether it should consider applying article 6(4) of the Directive to this project.

September 2015

Appendix 3

Characterising species of fucoid reefs and muds and sand flats

Fucoid Reef area

The species associated with this community include lichens *Verrucaria mucosa*, the algae *Peletia canaliculata*, *Fucus vesiculosus*, *F. spiralis*, *Ascophyllum nodosum*, *Polysiphonia lanosa*, *Enteromorpha* and *Chondrus crispus*. Molluscan fauna includes the gastropods *Patella vulgata*, *Littorina littorea*, *L. obtusata*, *Nucella lapillus* and the bivalve *Mytilus edulis*. Crustaceans include numerous gammarid amphipods, barnacles including *Semibalanus balanoides* and *Austrominius modestus*, and shore crabs *Carcinus maenas*. Much of the fucoid growth is encrusted with epizoic fauna such as bryozoa and spirorbid polychaetes. Many of the mussel shell debris in this area are encrusted with *Spirobranchus* spp. and spirorbid polychaetes also.

Muddy sands with mixed sediment.

The fauna here includes the bivalves *Mytilus edulis*, *Ostrea edulis*, *Cerastoderme edule*, *Tapes* spp., *Tellina fibula*, *Thyasira flexuosa*, *Corbula gibba*, *Kurtiella bidentata* and *Nucula nitidosa*. Specimens of the Pacific oyster *Crassostrea gigas* have also been observed. The polychaetes fauna includes *Arenicola marina*, *Lanice conchilega*, *Owenia fusiformis*, *Galathowenia oculata*, *Chaetozone setosa*, *Chaetozone christiei*, *Mediomastus fragilis*, *Notomastus latericeus*, *Lagis koreni*, *Amphictene auricoma*, *Spiophanes bombyx*, *Diplocirrus glaucus*, *Lumbrineris cingulata/aniara* and *Nephtys* spp. as well as *Phoronis* spp. Crustaceans include the amphipods *Ampelisca* spp., Cumaceans *Diastylis* spp. and swimming crabs *Liocarcinus* spp. Echinoderm fauna includes *Echinocardium cordatum*, *Amphiura filiformis*, *Ophiura albida*, and *Ophiura ophiura*.

Appendix 4

Characterising species of stony banks

Perennial Vegetation of Stony Banks

This habitat occurs along the coast where shingle (cobbles and pebbles) and gravel have accumulated to form elevated ridges or banks above the high tide mark. The vegetation tends to be dominated by perennial species, typically including sea sandwort (*Honckenia peploides*), curled dock (*Rumex crispus*), sea beet (*Beta vulgaris* spp. *maritima*), rock samphire (*Crithmum maritimum*) and sea mayweed (*Tripleurospermum maritimum*). Species diversity is determined by the degree of exposure and by substrate stability, coarseness and size. The presence of lichens indicates long term stability.