Galway Harbour Company

Galway Harbour Extension

Addendum to Natura Impact Statement to include Consideration of the Compensatory Measures (4)

An Bord Pleanála (Ref: 61.PA 0033)

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TOBIN
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BACKGROUND

This section outlines the series of NIS documents presented to date.

NIS 1

A planning application, including an Environmental Impact Statement (EIS) (1) and Natura Impact Statement (NIS) (1), for a proposed Extension to Galway Harbour, was submitted to An Bord Pleanála (ABP) for consideration on the 10th January 2014.

NIS 2

Subsequently, a Response to a Request for Further Information was submitted in 16th October 2014. The Response included documents outlining Errata and Addenda to the NIS (2) and EIS (these documents were dated October 2014).

NIS 3

Following review of submissions on the Response to Further Information, some additional information was prepared in further Addendum/Errata documents to the NIS and EIS. That document presented the additional Addenda/Errata to the NIS, namely NIS Addendum/Errata Document (3), January 2015. Generally, the information presented in that NIS Addendum / Errata Document (3), was new information additional to that included in the NIS and NIS Addendum/Errata Documents, January and October 2014, respectively.

STATEMENT OF APPROPRIATE ASSESMENT

Having completed an Appropriate Assessment of the NIS, An Bord Pleanála (see in Appendix I, Statement of Appropriate Assessment pages 2 and 3), based on the findings of its specialist ecological consultant 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 Complex cSAC would occur:

i) The direct and permanent loss of 5.93 ha of Intertidal habitat [1170] Fucoid Dominated Reef habitat and [1140] Mud and Sand Flat habitat in Galway Bay 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

ii) The loss of perennial vegetation of 0.35 ha of Stony Bank [1220] due to the sheltering effect of the harbour extension will also have a significant adverse effect on the integrity of the cSAC.

(Although these two habitats are listed as Qualifying Interests for Galway Bay cSAC, they are not listed as Priority habitats in the EU Habitats Directive).

Regarding the Inner Galway Bay SPA (4031), ABP's Appropriate Assessment concluded that 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.

NIS ADDENDUM DOCUMENT (4) - APRIL, 2019

This addendum to the NIS has arisen given the decision by ABP, following Appropriate Assessment, that the Galway Harbour Extension could not be considered under Article 6(3) of the EU Habitats Directive but, if it is to proceed, the application for same should proceed in accordance with the provisions of Article 6(4) of the same Directive. The requirements of Article 6(4) include a requirement to provide compensatory measures to ensure the overall coherence of Natura 2000 is protected.

This Addendum to the NIS considers the overall project including the Compensatory Measures proposed as detailed in the Report on Compensatory Measures of April 2019 and includes the assessment of those measures in combination with the overall project along with the impacts of the historic development of the Galway Harbour Enterprise Park (GHEP) and any other relevant developments previously carried out in the area around the Northern part of Inner Galway Bay, approved or which have been the subject of applications for development consent.

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1 INTRODUCTION

1.1 ARTICLE 6(4) AND DEVELOPMENT OF COMPENSATORY MEASURES

A Natura Impact Statement (NIS) (as previously supplemented) was prepared for the GHE project and was submitted to An Bord Pleanála (ABP) which carried out an assessment of the project at that time (without any consideration of any Compensatory Measures). The conclusions of ABP's Appropriate Assessment (AA) (see in Appendix I, Statement of Appropriate Assessment pages 2 and 3), were 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 Complex cSAC would occur *i.e.*

i) the direct and permanent loss of 5.93 ha of Intertidal habitat [1170] Fucoid Dominated Reef habitat and [1140] Mud and Sand Flat habitat in Galway Bay 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

ii) the loss of perennial vegetation of 0.35 ha of Stony Bank [1220] due to the sheltering effect of the harbour extension will also have a significant adverse effect on the integrity of the cSAC.

(Although these two habitats are listed as Qualifying Interests for Galway Bay SAC, they are not listed as Priority habitats in the EU Habitats Directive).

Regarding the Inner Galway Bay SPA (4031) and the nearby Lough Corrib SAC (000297), ABP's Appropriate Assessment concluded that while some adverse impacts are likely, a significant adverse effect on the integrity of these Natura sites will not arise in view of the site's conservation objectives.

ABP invited Galway Harbour Company (GHC) to confirm if it wished the project to be considered for approval under Article 6(4) of the Directive. GHC confirmed it wished to proceed on that basis and commenced the preparation of proposals for Compensatory Measures to address the impacts on the integrity of the Galway Bay Complex cSAC.

The EU Guidance Document on Article 6 of the Habitats Directive (EU, 2018) was followed in the identification of and proposed implementation of Compensatory Measures particularly with regard to the concept of "the biological improvement of substandard habitat within an existing designated site…". Precedence for this approach was approved at EU level in the New Port Granadilla (Tenerife), Nied TGV and Mainport Rotterdam projects and other projects as documented in the Compensatory Measure Report (CMR).

Tight coordination and cooperation with the Natura Authorities was exercised in the search for the appropriate form of compensation and in the preparation of the proposed Compensatory Measures as presented in the CMR.

Following an extensive review of published literature / aerial photography, terrestrial / marine surveys, interaction with landowners and oyster farmers and consultation with the National Parks and Wildlife Services (NPWS) and ABP, an area of land and shoreline at Mweeloon, Tawin, containing Intertidal and Stony Bank habitats that lies within Galway Bay cSAC, was identified as an area for the development of Compensatory Measures.

The proposed GHE has been mitigated by design so that the alternative put forward for approval is the least damaging for habitats, for species and for the integrity of the Natura 2000 sites both during its construction and from its future existence and use. All possible alternatives were considered to avoid impact on the designated sites without dictation by economic cost constraint. The development proposed herein is the least damaging for habitats, for species and for the integrity of the Natura 2000 site, regardless of economic considerations, and no other feasible alternative exists that would not adversely affect the integrity of the site. There are Imperative Reasons of Overriding Public Interest (IROPI) including "those of a social or economic nature". The CMR proposes that all the compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected will be taken, as stated in the CMR.

1.2 GHE COMPENSATORY MEASURES PROPOSAL

The Compensatory Measures are fully described in the CMR; what follows is a summary.

Intertidal Management Plan
An Intertidal Management Plan to implement the compensatory measures for this habitat has been devised. This management plan will benefit from the adjacent Land Management Plan which will curtail terrestrial run off issues. It entails the ceasing of some aquaculture and the control of a marine invasive non-native tunicate species, *Didemnum vexillum*. A central part of this Intertidal Management Plan is that GHC has contracted, subject to satisfactory planning permission, to acquire control of 3.27 ha of aquaculture licences and related foreshore licences so that these can be fallowed and be preserved free from aquaculture and its related tractor access impacts.

All of the Intertidal reserve area will be either cleared of or preserved free of aquaculture. Sampling / monitoring of the cleared aquaculture areas and virgin areas will track and reference relative recovery between those areas. Separate reference areas for the different elements of the compensatory Intertidal habitat will not therefore be required.

Stony Bank / Terrestrial Management Plans
A Land Management Plan to implement the Stony Bank Compensatory Measures comprising aspects such as managing grazing to curtail overgrazing / poaching, ceasing use of fertilizers and herbicides, controlling anthelmintic use, limiting tractor access, ceasing all construction / reclamation works and control of litter has been devised. Animals to be brought onto the lands will be treated in advance so that they will be outside of the recommended anthelmintic withdrawal periods which are generally 7 or 30 days. A central part of the terrestrial management plan is the agreement by GHC to purchase two separate landholdings totalling 26.079 ha adjacent to and surrounding Mweeloon Lagoon which will ensure that all the measures can be fully implemented for the habitats on the lands. The Land Management Plans will also benefit the Salt Marsh lands and the Intertidal habitats directly adjacent.

Terrestrial Reference Areas
Small parts of the terrestrial areas will be used as a reference areas, where the management plans will be implemented in all respects other than the restrictions of grazing and supplementary feeding. As a result slurry, fertilizer and herbicides will not be used on the reference lands. No reclamation of these lands will be undertaken. Use of anthelmintic and litter will be controlled. The difference will only be the stocking of the lands.

This will allow comparative assessment of the relative merit of the shorter Spring to Autumn grazing season and feeding controls on the management area against the longer grazing season in the Salt Marsh reference area, see Section 1.4 below. Some supplementary feeding will be permitted, only in the reference area, while there is some grass available there. Winter feeding in this area, when animals are entirely dependent on supplementary feed brought onto the lands, will not be permitted.

The Stony Bank reference area is presently ungrazed and rank. The Stony Bank managed area will have the benefit of the Spring to Autumn grazing management and feeding controls. The relative merit of the grazing management will be measurable by the comparative assessment between these Stony Bank areas.

The lighter grazing will allow species which can be choked by rank grasses on Stony Bank and the over grazed species in Salt Marsh to grow better so the species in each habitat can flower and come to seed.

1.3 GHE COMPENSATORY MEASURES IMPLEMENTATION

Habitats corresponding with those that require compensation have been discovered which are in sub-standard condition. These areas have potential for enhancement which will be local, generous in extent and feasible. Control of the properties containing the areas to be enhanced have been legally contracted subject to planning *i.e.* Final Grant of Satisfactory Planning Permission (F.G.S.P.).

A range of annual monitoring surveys, and their independent auditing, has been devised to objectively document the recovery / improvement of the Intertidal and Stony Bank habitats and also to record additional benefits to other habitats, as further outlined below, which exist within the proposed compensatory area all of which is designated cSAC.

The area proposed for Compensatory Measures contains:
i) 27.239 ha of Intertidal habitat and
ii) 3.053 ha of Stony Bank (see Appendix 3).
Parts of those areas are to be allocated to implement the GHE compensatory measures for the 5.93 ha of Intertidal and 0.35 ha Stony Bank requiring compensation.

The GHE areas are described in Sections 1 to 14 in Part 1 of the CMR.

1.4 PREVIOUS DEVELOPMENT AT GALWAY HARBOUR

Previous development at Galway Harbour in the 1990's which developed the Galway Harbour Enterprise Park (GHEP) impacted three qualifying interests of the Galway Bay cSAC causing the loss of:
i) 8.58 ha of Intertidal habitat, [1170] and [1140]
ii) 0.28 ha of Stony Bank [1220] and
iii) 7.39 ha of Salt Marsh [1330] and [1410].
The compensatory lands agreed to be purchased and/or of which control is being obtained by the GHC contain Intertidal and Stony Bank areas well in excess of those required to compensate for the losses arising solely from the GHE proposal and indeed the combined losses from the GHE proposal and GHEP legacy losses and impacts.

The compensatory lands contain 11.715 ha of Salt Marsh. Some of these Salt Marsh habitats in the Tawin area have been described as being of *"unfavourable/inadequate"* status (in a NPWS Salt Marsh Monitoring Programme Project, 2006, Tawin Island) and as observed during recent qualitative and quantitative surveys of these lands.

To address the combined and historic losses of the GHE and GHEP, the Compensatory Measures proposed will in total provide:

i) 27.239 ha for 14.51 ha of Intertidal habitat losses,
ii) 3.053 ha for 0.63 ha of Stony Bank losses and impacts and
iii) 11.715 ha for 7.39 ha of Salt Marsh loss (see Appendix 3).

All three habitats have potential for enhanced management. The sum of these Intertidal marine and terrestrial Qualifying Interest habitats found at Tawin and proposed to be managed will comprise 42.007 ha as compensation for the 22.530 ha of Qualifying Interest habitat losses both proposed and historic at Renmore, as described in Part 2 of the CMR.

1.5 ADDITIONAL ENVIRONMENTAL BENEFITS / NATURE RESERVE

In addition to the areas of Stony Bank and Salt Marsh to be managed, the lands proposed as the area for compensatory measures also include a further area of some 11.381 ha. This contains other important habitats and species including Limestone Pavement. The total 26.079 ha of terrestrial lands to be purchased surrounds the Mweeloon Lagoon and partly fronts onto the Lackanaloy Lagoon. The important additional habitats and species are as follows:

- The Limestone Pavement is a Priority habitat. Some of it is in mosaic with Salt Marsh which is a rare occurrence. It also transitions to areas of calcareous grassland with sparser pavement outcrops, all of which will now be preserved.
- The site also includes *Salicornia* (Salt Marsh plant) and a rare plant species, the Yellow Horned Poppy (Stony Bank).
- The very notable additional benefit of the selection of the site at Mweeloon is that it surrounds an extensive area 19.480 ha of the Mweeloon Lagoon. This too is a Priority habitat.

Neither of these two Priority habitats had been previously documented for the Mweeloon site and are further described in Part 3 of the CMR. These priority habitats and their associated species make all of the lands which GHC has contracted to acquire and/or control most worthy of conservation.

1.6 NATURE RESERVE, PROTECTION OF GALWAY BAY cSAC AND INNER GALWAY BAY SPA (GALWAY BAY cSAC/SPA) INTEGRITY, COHERENCE AND CONSERVATION OBJECTIVES

In all therefore, a total of 73.233 ha containing Intertidal, Stony Bank and Salt Marsh habitats, priority Lagoon habitat, priority Limestone Pavement habitat, *Salicornia* muds and ground containing rare plant species will be available for management and consequent biological improvement as part of the Compensatory Measures package now being proposed and to be managed as a nature reserve.

The Compensatory Measures for these habitats have been designed to bring about a significant improvement over time of each habitat and thereby improve the overall functioning of the cSAC

and SPA as ecosystems. The biological diversity proposed to be lost to the GHE and that has been lost by the previous GHEP development within the Galway Bay cSAC and SPA site will both be addressed by these measures.

The proposed Compensatory Measures based on EU Guidance (EU, 2018) and IROPI precedents will bring about biological restoration of substandard areas of Intertidal, Stony Bank, Salt Marsh and other habitat areas at Mweeloon Lagoon in Inner Galway Bay, within the boundary of the cSAC, through the development of targeted management plans for the Intertidal and terrestrial areas.

The integrity, coherence and conservation objectives of the Galway Bay cSAC and SPA sites will be protected by these compensatory measures now proposed for the GHE.

1.7 CUMULATIVE IMPACTS OF THE COMPENSATORY MEASURES

The cumulative impacts of the Compensatory Measures for the habitats in Tawin have been designed to bring about a significant improvement over time of each habitat and thereby improve the overall functioning of the cSAC and SPA as ecosystems. This is a positive, long term impact.

Some negative impacts *e.g.* repairing stone walls, replacing gates, removing aquaculture structures, have been identified but as they are short term *i.e.* weeks, they are not considered as being significant. The positive impacts of these repairs will facilitate the implementation of organic farming principals, reduced grazing levels/stocking densities and control of *Didemnum* all of which will have a long term positive impact on the cSAC. The biological diversity proposed to be lost to the GHE and that has been lost by the previous GHEP development within the Galway Bay cSAC site will both be addressed by the measures as described in the CMR and this Addendum to the NIS.

The removal of oyster trestles from parts of Mweeloon Bay will provide additional feeding space for intertidal waders and water fowl, while the control of *Didemnum* at the same area will help to return the ecosystem to its previous form and function. These effects are seen as having a minor, positive impact on the SPA.

Due to the lack of connectivity between the compensatory site at Mweeloon and the GHE / GHEP projects and other projects in Galway City and its environs, no cumulative impacts between these measures and those projects are predicted. Furthermore, as the GHC will own the lands at Tawin, no development on them will occur, thereby ensuring the protection of these elements of the Natura site into the future.

1.8 SUMMARY

The GHE development will cause permanent loss and impacts including direct and indirect to Intertidal and Stony Bank habitats within the Galway Bay cSAC designated site. Regarding the Inner Galway Bay SPA (4031), ABP's Appropriate Assessment concluded that while some adverse impacts are likely, a significant adverse effect on the integrity of the SPA will not arise.

The GHE development proposed is the least damaging design alternative. No other feasible alternative exists that would not adversely affect the integrity of the designated site. There are

Imperative Reasons of Overriding Public Interest including 'those of a social and economic nature' which require this development to proceed.

To provide all the necessary compensatory measures to ensure that the overall coherence of Natura 2000 is protected with regard to this proposed development, GHC has contracted the purchase of lands and the control of aquaculture licences at Mweeloon, Tawin, Co. Galway. Mweeloon lies within the Galway Bay cSAC. The GHC site and the compensatory site are inter-visible across the Inner Galway Bay cSAC at *ca* 4.7 km (*ca* 2.5 nautical miles) due south, south east of the GHE site, 19 km by road.

The properties contracted for purchase contain areas of substandard habitats which GHC will manage on a long term basis as part of the GHE development, to enhance and preserve the areas of habitats to be acquired as the compensatory measures for that development.

The targeted enhancement measures proposed are technically feasible and will be effective. They will provide a compensatory ratio of 3 : 1 for the GHE development and implementation of same will be commenced prior to the commencement of the development as follows:-

- Purchases of lands and of the control of aquaculture licences will be completed within 3 months of grant of a satisfactory permission, when the entire planning process will be deemed to be complete and final *i.e.* Final Grant of Satisfactory Planning Permission (F.G.S.P.).
- Implementation of the management plans will commence within a further 3 months or as the growing / grazing seasons allow for all of the habitats.
- Significant enhancement of Intertidal, Stony Bank and Salt Marsh will be achieved within the first 6 months of management that is within 12 to 18 months of final grant of planning permission.
- The second management season of 12 months will see the bulk of the enhancement achieved.
- Thereafter it will be a matter of maintaining and fine tuning that enhancement given the vagaries of different annual weather and storm conditions.

The Compensatory Measures site, contracted to be acquired or of which control will be acquired by the GHC (in relation to the intertidal and marine areas), contains the habitats for which compensation is required. These habitats in that area require enhancement and lend themselves to enhancement. The contracts to purchase the lands and control of the licences, subject to the grant of this planning permission provide a temporary level of preservation from further development / reclamation to the habitats for the 3 years of the options agreed.

Part 1 of the CMR confirms that compensatory area will be provided at a rate of 3: 1 for the loss / impact proposed by the GHE to Intertidal and Stony Bank habitat.

Part 2 confirms that losses, which previously arose due to the GHEP in the 1990's, will be compensated for at the following rates: Intertidal 1.101: 1, Stony Bank 7.154: 1 and Salt Marsh 1.585: 1.

Part 3 confirms that the compensatory area contracted contains other habitats some of which are priority habitats. These will allow a multi habitat nature reserve of 73.233 ha to be generated. GHC will maintain, monitor, audit and publish a public annual report on the condition and maintenance of these habitats. The total reserve area will represent a ratio of 3.25: 1 of preservation area for the sum of the GHE and GHEP area of losses / impacts.

The proposed Compensatory Management plans have been the subject of a Natura Impact Statement and is presented in this document. This NIS confirms that there are only minor short term (1 growing season) negative impacts of the proposed compensatory management plans on the Natura site. However, and of greater ecological and conservation significance, the report confirms that there are significant positive, long term impacts arising from the proposed compensatory measures. These include the making fallow of parts of the Intertidal habitat that are currently being used to farm oysters and therefore, the removal of pressures associated with operating the farms *e.g.* tractor access and the control of a non-native, invasive species, *Didemnum vexillum* that has infested the farms.

Recovery of Stony Bank and Salt Marsh vegetation will come about by controlling grazing and by the introduction of organic farming principals *e.g.* no use of herbicides within the lands containing the Stony Bank and Salt Marsh habitats. An essential aspect of the control of grazing is the repair of stone walls and damaged gates. This will contribute to the improvement of both habitats in terms of species composition and function.

There are other ecologically significant positive aspects to the targeting of the site at Mweeloon and these are that:

- 2 priority habitats, Limestone Pavement and Lagoon that had previously not been known for that part of Galway Bay cSAC were recorded during biological survey work,
- The area of lagoon at Tawin represents an additional *ca* 10% of this habitat on a National scale.

Areas of another Qualifying Interest habitat,

- *Salicornia* muds were recorded at Tawin and
- The rare Horned Poppy (*Glaucium flavum*) was recorded at the site.

Additionally, the measures also include for purchase of lands at Mweeloon and Tawin East in the areas which will ensure that all aspects of the management plan can be successfully implemented. The purchase of these lands is considered to be a vitally important element of the management plan as it ensures the capacity to allow the successful restoration of habitat quality

A soil nutrient survey of both the area to be managed and the reference site will be carried out to determine the levels of Nitrogen and Phosphorous, prior to the initiation of any element of the compensation plan. This will be used as the base line for future soil nutrient surveys and hydrochemical modelling studies to track changes in soil chemistry given the adoption of organic farming principles.

Livestock using the lands are to be outside of the withdrawal period for medicines and anthelmintics. This action will remove any potential for impact on coprophillic or coprophaegous species.

The prevention of removal of cobbles is an essential element for the protection of Stony Bank habitat.

By controlling access by tractors to the 2 habitats is question, the damaged areas of habitat will recover and improve. This will also be the result of the elimination of supplementary Winer feeding.

The regular removal of flotsam and jetsam and other litter will help to improve the condition of the habitats and their visual appearance.

The effects of these compensatory measures will be monitored by carrying out annual biological surveys of the habitats (including the control sites) to document any changes in their extent and their characterising species. These report will undergo a third party audit to ensure that the annual surveys and management proposals can be independently reviewed and validated.

It is important that immediately following significant storm events, surveys need to be carried out to assess possible damage to habitats. Such extreme events can give rise to sudden and extensive changes to the physical, chemical and biological characteristics of Intertidal, Stony bank and Salt Marsh habitats and it is important to document such changes directly after the event. This will also contribute to the recording of the natural recovery processes. In the light of the possible changes due to storm events and results of the independent audit, the compensation management plan may need to be adjusted or modified.

It is concluded that, beyond reasonable scientific doubt, the impacts from the proposed compensation measures, both alone and in combination with other activities, will avoid any significant, negative effects on the Galway Bay cSAC Natura 2000 site, its qualifying interests/special conservation interests or conservation objectives.

Finally, as GHC will own the lands, the long term protection of this part of Galway Bay cSAC into the future is assured and will compensate generously for the losses proposed to arise from the GHE and which formerly arose from the GHEP.

2 ASSESSMENT

2.1 REQUIREMENT FOR AN ARTICLE 6 ASSESSMENT

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network of sites of highest biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises candidate Special Areas of Conservation (cSACs, including candidate SACs) and Special Protection Areas (SPAs, including proposed SPAs). cSACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites and from these the conservation objectives of the site are derived.

The Birds and Habitats Directives set out various procedures and obligations in relation to nature conservation management in Member States in general, and of the Natura 2000 sites and their habitats and species in particular. A key protection mechanism is the requirement to consider the possible nature conservation implications of any plan or project on the Natura 2000 site network before any decision is made to allow that plan or project to proceed. Not only is every new plan or project captured by this requirement but each plan or project, when being considered for approval at any stage, must take into consideration the possible effects it may have in combination with other plans and projects when going through the process known as Appropriate Assessment (AA).

The obligation to undertake Appropriate Assessment (AA) derives from Article 6(3) and 6(4) of the Habitats Directive, and both involve a number of steps and tests that need to be applied in sequential order. Article 6(4) contains the procedure for allowing derogation from the protection provided by Article 6(3) in certain restricted circumstances. Each step in the assessment process precedes and provides a basis for other steps. The results at each step must be documented and recorded carefully so there is full traceability and transparency of the decisions made.

The project herein comprises the extension of Galway Harbour by extending it southwards into Galway Bay which is both a cSAC (Galway Bay Complex cSAC) and an SPA (Inner Galway Bay SPA) (the development is set out at Figure 1 below) and Figure 2 shows the Natura sites in the compensatory measures area.

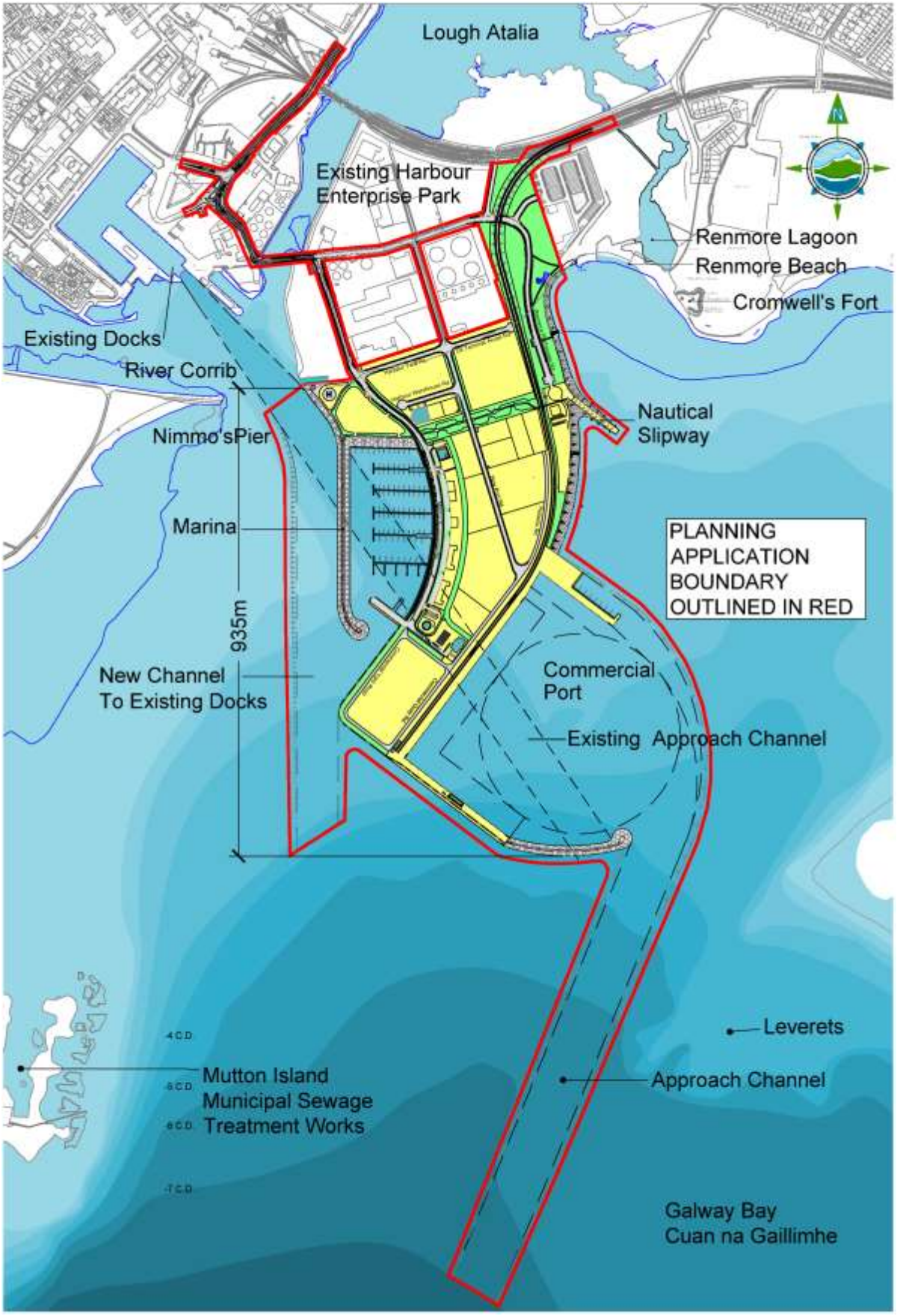

Figure 1: Proposed expansion of Galway Harbour.

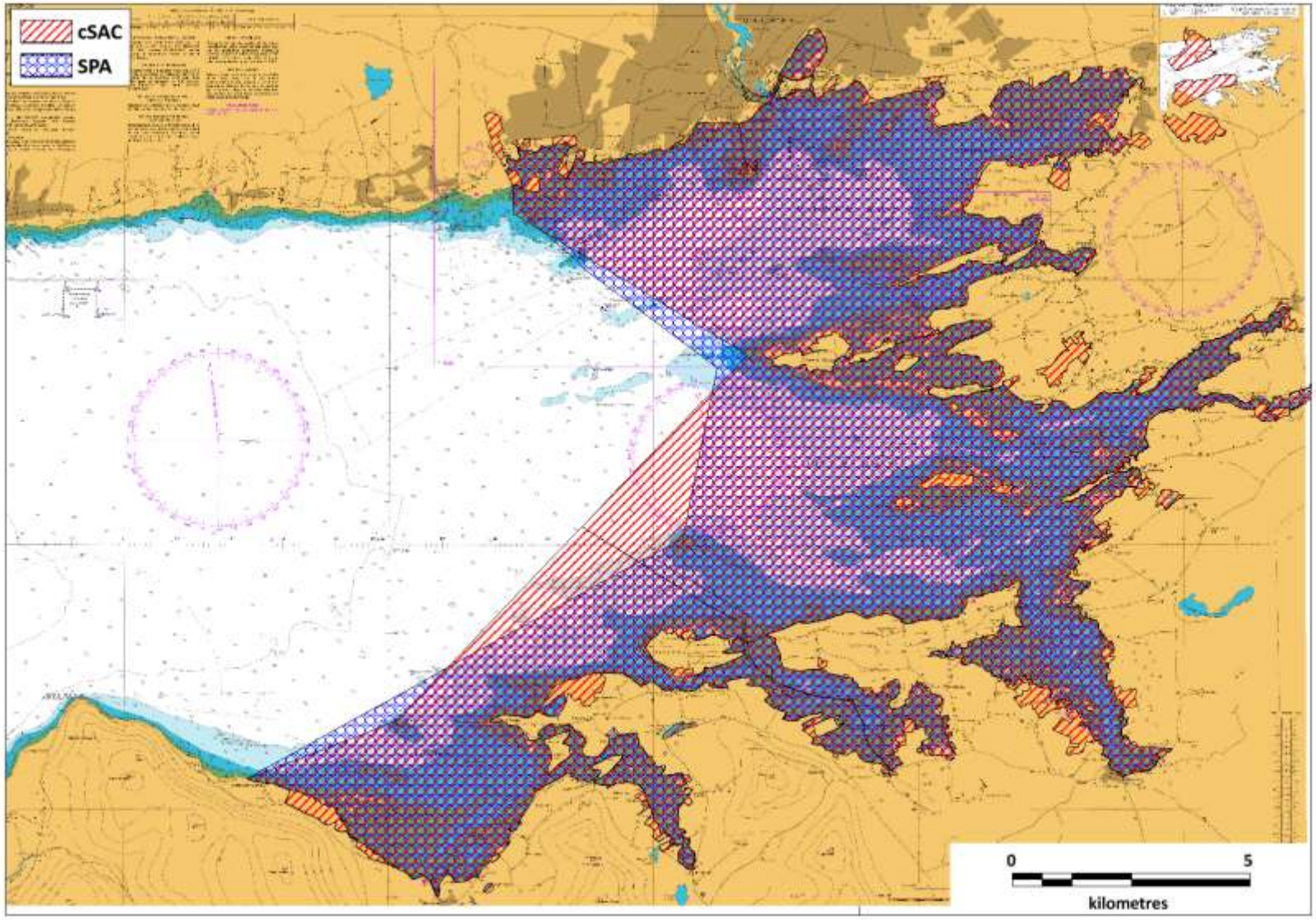

Figure 2: Galway Bay Complex cSAC and Galway Bay SPA.

Because no mitigation measures could be found for the loss of the 2 Qualifying Interests (QIs) of the cSAC, the project was deemed by An Bord Pleanála to require, if it was to proceed, to qualify in accordance with the provisions of Article 6 (4) of the EU Habitats Directive (1992), which, *inter alia*, requires that ecological compensation is provided for the loss of the relevant habitats to protect the overall coherence of the Natura 2000 network.

A part of Tawin Island, Mweeloon, Co. Galway (see Figure 3 below) is the location where the proposed suite of compensatory measures is to take place and it lies within 2 Natura 2000 sites, 1) the Galway Bay cSAC (IE000268) and 2) the Inner Galway Bay SPA (IE004031) (see Figure 2 above and Appendix 2). For these reasons, it is considered necessary that the compensatory measures should be subject to the NIS process. This assessment can be found in Section 4 of this report.

Figure 3: Location of the Compensatory Area outlined in red at Mweeloon, Tawin in Inner Galway Bay.

2.2 THE AIM OF THIS REPORT

The purpose of this report is to inform the Appropriate Assessment (AA) process as required under the Habitats Directive (92/43/EEC), in instances where a plan or project may give rise to significant impacts on a Natura 2000 site. This report aims to inform the process in determining whether the proposed Compensatory Management Plans, whether alone or in combination with other plans or projects, are likely to have a significant impact on the Natura 2000 sites in the study area in the context of their conservation objectives and specifically on the habitats and species for which the sites have been designated.

The GHE project has triggered the need for an NIS. Since the Compensatory Measures proposed herein, [while excluded from the consideration of the project when considered under Article 6(3) in accordance with the European Commission Guidance document on Article 6 of November 2018 (revising the contents of the 2007 Guidance Document on Article 6(4)], are associated with the development of the GHE, this Addendum to the NIS to include consideration of the Compensatory Measures has been prepared to inform the AA process (Stage 2) and is required under the requirements of Article 6 of the Habitats Directive.

This report has been prepared in accordance with the current guidance:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG 2009, Revised February 2010),
- Marine Natura Impact Statements in Irish Special Areas of Conservation – A Working Document. April 2012 (Department of Arts Heritage and the Gaeltacht) (DAHG), 2012),
- EU Guidance document on Article 6 of the 'Habitats Directive' 92/43/EEC (EC, 2007),
- Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2002) and
- EU (2018). Managing Natura 2000 site. The provisions of Article 6 of the Habitats Directive 92/43/EEC. C(2018) 7621 final. 85 pps.

This report is laid out as follows:

Section 2, outlines the Appropriate Assessment procedure.
Section 4 covers the NIS phase which provides a description of the receiving environment, identification of the relevant Natura 2000 sites and their Qualifying Interests (QIs) / species of Conservation Interests (SCIs), an Assessment and a Conclusion.

3 APPROPRIATE ASSESSMENT PROCESS

3.1 LEGISLATIVE CONTEXT

The requirements for AA derive directly from Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC) (DEHLG, 2009). AA is an impact assessment process that fits within the decision-making framework and tests of Articles 6(3) and 6(4). The AA process encompasses all of the processes covered by Article 6(3) of the Habitats Directive *i.e.* the screening process, the NIS, the AA by the competent authority and the record of decisions made by the competent authority at each stage of the process, up to the point at which Article 6(4) may come into play following a determination that a plan or project may adversely affect the integrity of a Natura 2000 site.

Article 6(3) states:

'Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans

or projects, shall be subject to Appropriate Assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.'

Article 6 (4) states that:

'If, in spite of a negative assessment of the implications for the [Natura 2000] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted'.

'Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest'.

In addition, the European Court of Justice (Waddenzee Ruling – Case C-127/02) has made a ruling in relation to AA:

'*Any plan or project not directly connected with or necessary to the management of the site is to be subject to an Appropriate Assessment of its implications for the site in view of the sites conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans of projects and that the plan or project may only be authorised where no reasonable scientific doubt remains as to the absence of such effects'*

3.2 STAGES OF AA

The Commission's methodological guidance (EC, 2002) promotes a four-stage process to complete the AA, and outlines the issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

The four stages are summarised diagrammatically in Figure 3 below.

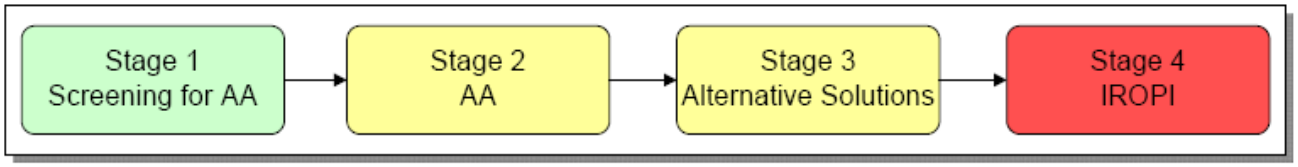

Figure 4: Stages in the AA process (Source: DEHLG, 2009).

3.2.1 Stage 1. Screening for Appropriate Assessment

Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3):

i. Whether a plan or project is directly connected to or necessary for the management of the site, and

ii. Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives.

If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 *i.e.* the preparation of an NIS. Screening should be undertaken without the inclusion of mitigation, unless potential impacts clearly can be avoided through the modification or redesign of the plan or project, in which case the screening process is repeated on the altered plan. The greatest level of evidence and justification is needed in circumstances where the process ends at the screening stage on grounds of no impact.

According to DAHG (2012) Marine NIS Guidelines, AA Screening should include:

1. Description of the plan or project and local site or plan area characteristics;
2. Identification of relevant SAC, compilation of information on their qualifying interests and conservation objectives;
3. Assessment of the likely effects – direct, indirect, cumulative – undertaken on the basis of available information (desk study, field survey and/or primary research), which will result in a screening assessment and screening statement.

3.2.2 Stage 2. Natura Impact Statement (NIS),

This stage considers whether the plan or project, alone or in combination with other projects or plans, will have an adverse effect on the integrity of a Natura 2000 site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects. The proponent of the plan or project is required where Stage 2 applies to submit a **Natura Impact Statement (NIS)**, *i.e.* the report of a targeted professional scientific examination of the plan or project and the relevant Natura 2000 sites, to identify and characterise any possible implications for the site in view of the site's conservation objectives, taking account of in combination effects. This should provide information to enable the competent authority to carry out the Appropriate Assessment. If the assessment is negative, *i.e.* adverse effects on the integrity of a site cannot be excluded, then the process must proceed to Stage 4, or the plan or project should be abandoned. The AA is carried out by the competent authority and is supported by this document.

3.2.3 Stage 3. Alternative Solutions

This stage examines any alternative solutions or options that could enable the plan or project to proceed without adverse effects on the integrity of a Natura 2000 site. The process must return to Stage 2 as alternatives will require Appropriate Assessment in order to proceed, demonstrating that all reasonable alternatives have been considered and assessed, and that the least damaging option has been selected, is necessary to progress to Stage 4. In the NIS for the GHE project, the alternative solutions process was examined and no solution could be found that did not adversely affect the 2 Natura sites in question and on foot of the ABP AA, it was determined that the GHE project could not be considered under Article 6(3) and hence this Stage 4 process was commenced.

3.2.4 Stage 4. Imperative Reasons of Overriding Public Interest (IROPI)/Derogation

Stage 4 is the main derogation process of Article 6(4) which examines whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project that will have adverse effects on the integrity of a Natura 2000 site to proceed in cases where it has been established that no less damaging alternative solution exists. The extra protection measures for Annex I priority habitats come into effect when making the IROPI case[1]. Compensatory measures must be proposed and assessed and this is the main purpose of the current Addendum to the NIS and assesses same in combination with the main development of the GHE and other relevant plans and projects including the historic development of the GHEP. The Commission must be informed

[1] IROPI reasons that may be raised for sites hosting priority habitats are those relating to human health, public safety or beneficial consequences of primary importance to the environment. In the case of other IROPI, the opinion of the Commission is necessary and should be included in the AA

of the compensatory measures. Compensatory measures must be practical, implementable, likely to succeed, proportionate and enforceable, and they must be approved by the Minister.

4 STAGE 1: NIS

4.1 SITE CHARACTERISTICS AND DESCRIPTION OF PROPOSED CMR PLANS

4.1.1 Galway Bay cSAC

The Galway Bay cSAC QI habitats where the proposed CMR works will be carried out include:

1. A complex of two marine habitats – Fucoid-dominated reef [1170] and mud/sand flats that are not covered by sea water at low tide [1140] (see Appendix 3),
2. 3 terrestrial habitats: Stony Bank [1220], Atlantic Salt Marsh [1330] and Semi Natural dry grasslands [6210],
3. *Salicornia muds* [1310], and
4. Priority habitats Coastal Lagoon [1150].

In addition to these habitats another priority habitat Limestone Pavement [8240] which is not listed as QI for the Galway Bay cSAC, it was however recorded within the proposed compensatory measures area.

4.1.1.1 Marine Habitats

The survey findings for the Intertidal habitat are included in Appendix No. 8 of the CMR. The 66 shoreline transects (see Figure 1, Appendix 8) of the area of Mweeloon surveyed as part of this quantitative survey fall into two main groups *i*.e. those that are outside the lagoon and those that are inside it.

The first group includes the sixteen shore line transects that face north into Galway Bay (T 1 – T16 on Figure 1, Appendix 8). The coast here experiences full daily symmetrical tidal variation including the longer lunar variations of the Spring and Neap cycles. These shores show the full range of zonation associated with such tidal conditions. At low water Spring tide, the length of the exposed shore is up to *ca* 200m particularly at the eastern end of Lurgan Island. The supratidal habitat along the entire length of this northern shore is comprised of limestone boulders and cobbles interspersed with gravel. The profile of this habitat is very steep but shallows rapidly as it continues into the upper shore habitat. The shore profile continues to level out with distance from the shore and by mid tide, it has flattened out considerably. Lower shore substrates at these sites are a sandy shell substrate with bivalves such as oysters (*Ostrea edulis*) and clams (*Tapes* and *Dosinia*). Small amounts of live maerl (*Lithothamnion* sp.) can also be found at low water. Although some intravariation in lichen and algal species was recorded in these sixteen transects *e.g.* some lacked *Pelvetia* or *Ascophyllum*, overall, the typical zonation pattern was recorded on these shores with lichen species occurring in the supratidal and high shore levels followed by *Pelvetia, Fucus spiralis, F. vesiculosus, Ascophyllum* and finally, *F. serratus.* Band width of these algae can be tens of meters in extent. These algal species are also all found at the Renmore site where the proposed harbour extension is planned. At the western end of Lurgan Island where the outflow from Mweeloon Lagoon via Oileanbeag Stream fans out to a width of *ca* 100m, this zonation pattern is far less clear as there is always some level of water that covers the substrate.

With regard to invertebrate taxa, they too show the classic zonation with isopods (*Ligia*) occurring under stones above high water and talitrid amphipods present in rotting weed at the High Water mark, littorinid gastropods and amphipods in the *Pelvetia* zone, other littorinid species, limpets and dog whelks and barnacle species at mid shore levels and echinoderms and bivalves at low water.

The second group are the 56 that are located inside Mweeloon Lagoon. As the marine habitat within Tawin is a lagoon, tidal conditions are very different that those described above and as

noted in Section 3.2 above. Even under low water Spring tide conditions, water levels only fall to *ca* -1.5m below high water at most. Also, in this inner area, Salt Marsh (with typical floral species such as *Limonium, Salicornia, Aster, Suede* and *Beta* being present) predominates in the supratidal and high water shore levels. Of special note is the presence of extensive stands of *Artemisia absinthium* which is present throughout the headland. Due to the restricted tidal conditions described above, the full suite and spatial extent of zonation present in the outer open sea shoreline does not occur inside the lagoon *e.g. F. serratus* is not exposed and in some locations, neither *F. spiralis* nor *F. vesiculosus* are exposed. Furthermore, algal band width is never more than a few meters in extent. The lagoonal specialists, *Ruppia cirrhosa* and *Idotea chelipes,* were recorded at one location. The inner lagoonal shores can be differentiated by their substrates *i.e.* mud, gravel/sand, stones, exposed bed rock.

At the two locations to the east and west of Lurgan Island where sea water enters and leaves Mweeloon Lagoon at Lurgan Stream and Oileanbeg Stream dense populations of mussels (*Mytilus edulis*) were observed. A sea defence wall is present on the northwestern shoreline of Lurgan Island.

There is some aquaculture *(Magallana (Crassostrea)* production of oyster being carried out off the north shore of Mweeloon and access to the production and/or spat collection site is via tractor along the shore from the east. The trestles on which the oysters are grown have localised impacts on the sea bed ecology by shading the sea bed from direct sunlight and thereby reducing algal growth, causing minor alteration in oceanography and therefore affecting intertidal ecology and faeces from the oysters falling on the sea bed and causing changes in sedimentary conditions. The passage of tractors along the sea shore crushes sea weeds. Animals that live on stones or in the sediment also can be crushed.

Given that fact that intertidal communities are exposed to a wide range of physical and chemical variability *i.e.* large variations in Winter and Summer temperatures and salinities and high levels of perturbation due to wind and wave action and violent storm surges during exceptional hurricane events, their sensitivity to impacts is low and their recoverability is high.

The extent of Intertidal habitat both on the perimeter of Mweeloon and Lackanaloy Lagoons and on the foreshore to the north extending out to the LAT datum is 27.239 ha.

4.1.1.2 Terrestrial Habitats

The main species of the vegetated stony bank areas is the tall grass species *Arrhenatherum elatius* with *Festuca rubra*, *Galium verum, Plantago lanceolata* and *Trifolium repens* also locally common. On a small area of a high shingle ridge, where a skeletal calcareous soil occurs, there is development of species-rich calcareous grassland vegetation characterised by the occurrence of rarer, base-demanding plant species such as *Thymus polytrichus, Carlina vulgaris, Sesleria caerulea, Campanula rotundifolia, Koeleria macrantha* and *Linum catharticum*. The occurrence of calcareous grassland vegetation on vegetated shingle is very rare.

Along the northern shore of the island there is a wide shingle beach with a narrow band of pioneer shingle vegetation. This species-poor shingle vegetation is generally dominated by large shingle and is typically dominated by *Raphanus raphanistrum* subsp. *maritimus* with frequent *Festuca rubra* and *Arrhenatherum elatius.* During the survey the attractive yellow-horned poppy *Glaucium flavum* was noted growing on shingle substrate. Along the Atlantic coast of Ireland, this species is very rare and the shingle beaches of Inner Galway Bay are the most northerly sites known along the west coast (see Appendix 3).

With regard to Salt Marsh [1330], vegetation generally occurs as a relatively narrow fringe which lies between dry meadow (GS2) vegetation on shallow soil and intertidal. This dry meadow vegetation is typically dominated by coarse grass species such as *Holcus lanatus, Dactylis glomerata* and *Anthoxanthum odoratum*. Although the fringe of Salt Marsh vegetation

present is generally relatively narrow (typically 10 to 20 metres wide) there is good zonation of vegetation evident throughout ranging from pioneer Salt Marsh on stony soils characterised by *Salicornia* sp*. and Suaeda maritima* to mid-upper marsh characterised by species such as *Artemisia maritima*, *Festuca rubra, Juncus gerardii* and *Armeria maritima.* The main type of vegetation noted during the initial survey of vegetation is a relatively species-poor middle marsh community which tends to be dominated by a low-growing sward of *Plantago maritima* and *Aster tripolium.* Upper Salt Marsh areas which are less frequently inundated by sea water tend to be dominated by *Festuca rubra, Juncus gerardii* with frequent *Agrostis stolonifera*. The majority of the Salt Marsh habitat occurring at Mweeloon is comprised of Atlantic salt meadows [1330].

At Mweeloon, the upper limit of Salt Marsh vegetation is usually indicated by the presence of the tall, silver-grey species Wormwood (*Artemisia maritima)*. In Ireland this species has a restricted distribution which is largely confined to Galway Bay, the Shannon estuary and a few scattered locations on the Irish Sea coast, north of Dublin. The site also contains a small population of the shrubby species *Atriplex portulacoides* which is very rare on the west coast of Ireland.

4.1.2 Galway Bay SPA

This large coastal site is of high ornithological importance, with two wintering species having populations of International importance and a further sixteen species having populations of National importance. The breeding colonies of Sandwich tern, Common tern and Cormorant are also of National importance. Also of note is that seven of the regularly occurring species are listed on Annex I of the E.U. Birds Directive, *i.e.* Red-throated diver, Black-throated diver, Great Northern diver and Greater Northern diver, Golden plover, Bar-tailed godwit, Sandwich tern and Common tern.

4.1.3 Description of the compensatory measures proposed

Mweeloon is part of Tawin Headland in the central, eastern part of Galway Bay (see Figure 2 above). The area has been identified as the site where suites of measures will be carried out to act as compensation for the loss of areas of 3 habitats which are Qualifying Interests (QIs) for Galway Bay cSAC listed above in Section 3.1.1. All aspects of these measures have been designed to improve habitat quality at Mweeloon and not to negatively impact them, or any other habitat/species in the long term.

4.1.3.1 Marine Habitats

The marine Intertidal habitat along the southern shore of Mweeloon Bay is used as an area for the cultivation of Pacific oysters (*Magallana (Crassostrea) pacifica)* (see Figure 4 below). These aquaculture activities all give rise to negative impacts on the Intertidal habitat in the following ways:

- The trestles on which the oysters are grown have localised impacts on the sea bed ecology by shading the sea bed from direct sunlight and thereby reducing algal growth and causing minor alterations in oceanography and therefore affecting intertidal ecology. Faeces from the oysters falling on the sea bed cause changes in sedimentary conditions.
- The passage of tractors along the sea shore crushes sea weeds. Animals that live on stones or in the sediment are also crushed.

The invasive, non-native tunicate species *Didemnum vexillum* occurs at some of the oyster farms (see Figure 6 below).

Figure 5: Oyster trestles northeast off Lurgan, Tawin.

Figure 6: *Didemnum vexillum* at the aquaculture site.

With regard to the Intertidal habitats *e.g.* Fucoid-dominated reef and mud/sand flats that are not covered by sea water at low tide, the proposed management plan includes the following 14 components:

No	**Intertidal Management Plan** **Management proposal and implementation plans for Intertidal Areas**
1	Carry out on an on-going basis a programme to control the colonial non-native tunicate [marine invertebrate] *Didemnum vexillum* at the locations of the oyster farms to be removed and extended area adjacent to Mweeloon Lagoon, in accordance with methodology as briefly described later in Section 10.1.2 and more fully in Appendix 9, see Figures 10 and 14. Implementation: 1st late Spring – early Autumn (May to August) after F.G.S.P.
2	**Cease aquaculture** Finalise the purchase and exchange of control of licences for aquaculture on the foreshore with a view to removing the oyster trestles immediately and on a permanent basis, resulting in a permanent fallowing of aquaculture operations at these particular sites. Remove aquaculture structures in the management areas as they can cause changes in composition of benthic communities around them. They also support the non-native, invasive species, *Didemnum*. Implementation: 6 months after F.G.S.P.
3	**Cease construction of drainage channels** Prevent the construction of and cease the maintenance of any land drainage channels. Maintained drainage channels can give rise to greater volumes of either fresh or salt water being contaminated on the land and then discharging to the intertidal area which in turn may alter the physical, chemical and biological characteristics of the habitat. Implementation: 3 months after F.G.S.P.
4	**Control tractor access** Tractors are used to access the aquaculture installations over intertidal areas and in doing so, they damage algae and both epibenthic and infaunal species. Tractor access will be controlled by:- - The fallowing of aquaculture will reduce tractor use, - Restricting access route to along the highest part of the shore line but below the Stony Bank habitat as per aquaculture licences, - Tractor access will only be required for remaining aquaculture licence area 1, - Apply to change tractor access to licence area 1 to boat access, as agreed with licence holders. Implementation: 3 months after F.G.S.P.
5	**Eliminate Winter and supplementary feeding** Eliminate Winter feeding of livestock and all supplementary feeding and specifically the use of ring feeders on the adjacent purchased lands. This will stop related poaching and rutting of lands at feeding and at gate sites and help to prevent run off to the Intertidal habitat. The addition of nutrient to the Intertidal habitat causes changes in macroalgal species *e.g.* excessive growth of green algae. Implementation: 3 months after F.G.S.P.

6	**Prevent construction of sea defences** Prevent the construction of any further sea defence works or dumping of materials to act as a sea defence save for works or repairs of existing defences as referred to at paragraph 7 below. Such activities may cause physical damage to upper shore habitats. Implementation: 3 months after F.G.S.P.
7	**Sensitive repair of existing sea defence wall** In order to protect the Lagoon Priority habitat, sensitive repair of the existing sea defence wall to prevent erosion/ingress by the sea as may be required. The ecology and oceanography of the lagoon and its Intertidal habitat and species has the potential of being changed if the Stony Bank habitat is breached. Therefore, in order to protect the lagoon, some sensitive repair of the existing sea defence wall, at the north west of Lurgan Island, and as described in Section 17.1 of the CMR will be undertaken if required. Implementation: 3 months after F.G.S.P. Annually and after significant storm events (see Bullet 11 following), GHC will survey the condition of the existing sea defence wall and will sensitively undertake repair, if required.
8	**Control flotsam and jetsam** Regular removal of flotsam and jetsam and other refuse. This is to improve the visual and aesthetic quality of the habitat. Implementation: 3 months after F.G.S.P. (and every 3 months thereafter) and immediately after a Force 9 or greater storm event.
9	**Annual biological surveys** Annual biological surveys of the habitats by GHC ecologists to document any changes in their extent and their characterising species. This is an essential scientific element of the restoration plan. Implementation: Annually during September, to be submitted to Galway Harbour Company by mid October.
10	**Review of plan** In the light of the results of the annual biological surveys, the GHC ecologist will adjust/modify the management plan and submit it to the Galway Harbour Company Board as the annual report. Implementation: Within 4 weeks after the annual surveys has been completed, mid November.
11	**Surveys after storms** Immediately following storm force 11, or greater events, carry out surveys to assess possible damage to this habitat. Such extreme events can give rise to sudden and extensive changes to the physical, chemical and biological characteristics of Intertidal habitats and it is important to document such changes directly after the event. This will also contribute to the recording of the natural recovery processes. Implementation: Within 10 working days after the storm event occurs.

12	**Independent audit of surveys** Commission an annual, independent audit of the progress of the management plan. This is to ensure that the annual surveys and management proposals can be independently reviewed and validated. Implementation: Complete 2 weeks after submission of the annual report to The Galway Harbour Company, 1 December.
13	**Modify plan following audit** In the light of the results of this independent audit and possible changes due to storm events, the GHC ecologist will adjust/modify the management plan. Implementation: After receipt of independent audit, 1 Dec. Submit annual surveys, audit and proposed modifications to co-ordinating Bodies*. This will be done by mid December annually, which process will make the annual report available to the public via the Galway City Council, Planning File.
14	**Signage** Erection of signage including drawings at chosen vantage points demonstrating what the project comprises and what species are contained within each habitat. Implementation: During Year 1 of the compensatory measures.

4.1.3.2 Terrestrial Habitats

The terrestrial habitats are being seasonally damaged by over stocking (trampling, poaching, dunging), supplementary feeding (trampling, poaching, dunging) and rutting by farm machinery. In order to minimise these impacts and control livestock grazing/access in the future, it is necessary to rebuild and maintain the broken stone wall and fence network and form / replace 8 missing gates, 6 damaged gates and repair 5 existing gates (see Figures 7 – 10 below).

Implementation: In the late Spring/Summer after lands have been purchased. These activities might give rise to impacts on some of the QIs of the Galway Bay cSAC.

Figure 7: Poaching, trampling and rutting of Salt Marsh at Mweeloon.

Figure 8: Damage to Salt Marsh due to tracking by farm vehicles and poaching.

Figure 9: Collapsed stone wall that needs to be rebuilt.

Figure 10: Gates in need of repair.

The proposed management plan for the Stony Bank habitat includes the following 21 components:

No	**Stony Bank Management Plan** **Management proposal and implementation plan for Stony Bank**
1	**Purchase lands** Purchase options for land areas 1 and 2 at Mweeloon and Tawin East as shown in Figure 11 of this report have been agreed. This will ensure that all aspects of the management plan can be successfully implemented. The purchase of these lands is considered to be vitally important as it ensures the capacity to manage the lands as required to provide for the successful restoration of habitat quality. This meets the long term implementation criterion stated in the EU (2018) guidance document and as stated on page 25, Bullet 4.1.10 of the CMR. Implementation: Land purchases to be completed within 3 months after F.G.S.P.
2	**Organic farming principles** Manage the Stony Bank habitat that is to be purchased in accordance with organic farming principles. The use of appropriate and extensive organic farming on the lands, will contribute to the improvement of the habitat in terms of species composition and function. The restoration of the terrestrial habitat will then follow a natural progression. This will be monitored on an annual basis [see below]. Implementation: Immediately after lands have been purchased.
3	**Curtail grazing** Curtail grazing levels by horses, cattle, sheep and other grazing stock. This will allow optimal growth and flowering of the vegetation and reduce poaching. Through ownership and set stocking management, the appropriate stocking density of animals on the land can be ensured, thereby maximising the successful management of the habitat. This will limit light grazing to Summer and Autumn

	rather than the previous Winter and Spring use which is more damaging. This will facilitate the elimination of the need for supplementary feeding as per (12) below. To achieve this, the grazing of the lands will be undertaken within the period from 1st May to 31st October, subject to appropriate weather and ground conditions, with a stocking density of 0.5 - 1.0 livestock units / ha. Stock density may be adjusted following observations of grazing effects during the first and subsequent years of implementation. Implementation: Immediately after lands have been purchased.
4	**Repair stone walls, fences and gates** Rebuild and maintain the broken stone wall and fence network and form / replace 8 missing gates, 6 damaged gates and repair 5 existing gates. For locations see Appendix 3 of this report. This action is essential to achieve access and grazing control to and within the lands. Implementation: In the late Spring/Summer after lands have been purchased.
5	**Cease fertilizing** Cease fertilizer and slurry spreading on the lands and curtail dunging in this habitat by repair of animal fencing. By stopping fertilizing and supplementary feeding on the lands, the Stony Bank habitat areas will return to a natural state and nitrogen and phosphorous soil contents will return to natural Stony Bank levels. Implementation: Immediately after lands have been purchased.
6	**Soil nutrient survey** At the commencement of the management plan, carry out a soil nutrient survey of both the area to be managed and the reference site. This will determine the levels of Nitrogen and Phosphorous in the soil prior to the initiation of any other element of the compensation plan. The results will be used as the base line for future soil nutrient surveys and hydrochemical modelling studies to track changes in soil chemistry given the adoption of organic farming principles. Implementation: In the late Spring/Summer after lands have been purchased.
7	**No herbicides** Prevention of the use of herbicides within the lands. This intervention will remove any risk of herbicidal damage to plants. It is planned to control noxious weeds such as ragwort by pulling them by hand and the spreading of briars by cutting them back in late Summer. The reduced levels of poaching by livestock on the lands will also contribute to the reduction of noxious weed infestations. Note that species such as ragwort and briar / scrub are largely confined to areas of dry grassland within the lands. Implementation: Immediately after lands have been purchased.
8	**Animal health** Ensure livestock using the lands will be outside of the withdrawal period for medicines and anthelmintics. This action will remove any potential for impact on coprophillic or coprophaegous species. Implementation: Immediately after lands have been purchased.

9	**Prevent removal of cobbles** Prevent removal of cobbles. This is an essential element for the protection of Stony Bank habitat. Implementation: Immediately after lands have been purchased.
10	**No drainage channels** Prevent the construction of any drainage channels on the lands. Construction activities have the potential to damage the habitat and must therefore not be allowed. Implementation: Immediately after lands have been purchased.
11	**Control tractor access** Control access by tractors to the habitat. By minimizing tractor access and confining unavoidable access to critically required occasions *e.g.* removal of sick or dying livestock, the damaged areas of habitat will recover and improve. Implementation: Immediately after lands have been purchased.
12	**Eliminate Winter feeding** Eliminate Winter feeding and all supplementary feeding. This will stop related poaching and rutting of lands at feeding and at gate sites. These farming activities give rise to significant localised damage to habitats and by eliminating them, the damage cannot occur. This proposed feeding plan will also contribute to the reduction of weed infestation and the transfer of parasites. This will avoid the import of seed and minerals and increased dunging and poaching at feeding locations. Implementation: Immediately after lands have been purchased.
13	**No further sea defences** Prevent the construction of any further sea defence works or dumping of materials to act as a sea defence in order to protect lands. These activities give rise to damage to the habitat because of machinery and personnel tracking/walking over it. Prevention will remove this pressure. Implementation: Immediately after lands have been purchased.
14	**Sensitive repair of existing sea defence wall** In order to protect the Lagoon Priority habitat, sensitive repair of the existing sea defence wall to prevent erosion/ingress by the sea as may be required. The ecology and oceanography of the lagoon and its Intertidal habitat and species has the potential of being changed if the Stony Bank habitat is breached. Therefore, in order to protect the lagoon, some sensitive repair of the existing sea defence wall, at the north west of Lurgan Island, and as described in Section 17.1 of the CMR will be undertaken if required. Implementation: 3 months after F.G.S.P. Annually and after significant storm events (see Bullet 11 following), GHC will survey the condition of the existing sea defence wall and will sensitively undertake repair, if required.

15	**Control flotsam and jetsam** Regular removal of flotsam and jetsam and other litter. This action will help to improve the condition of the habitat and its visual appearance. Implementation: Every 3 months after lands have been purchased and directly after a Force 9 or greater storm event.
16	**Annual biological surveys** Annual biological surveys of this habitat (including the control site) to document any changes in its extent and its characterising species. This is an essential scientific element of the restoration plan. Monitoring of shingle habitat will closely follow the survey approaches which have been developed by NPWS over the past 15 years. Implementation: 1 year after the compensation plan commenced and to be submitted to Galway Harbour Company Board by mid October.
17	**Review of plan** In the light of the results of the annual biological surveys adjust/modify the management plan. Implementation: Within 4 weeks after the annual surveys has been completed, mid November.
18	**Surveys following storms** Immediately following storm force 11 events or greater, carry out surveys to assess possible damage to the habitat. Such extreme events can give rise to sudden and extensive changes to the physical, chemical and biological characteristics of Stony Bank habitat and it is important to document such changes directly after the event. This will also contribute to the recording of the natural recovery processes. Implementation: Within 10 working days after the event occurred.
19	**Independent audit of surveys** Commission an annual, independent audit of the progress of the management plan. This is to ensure that the annual surveys and management proposals can be independently reviewed and validated. Implementation: Complete 2 weeks after the submission of the annual report to the GHC Board, 1 December.
20	**Modify plan following audit** In the light of the results of this independent audit and possible changes due to storm events, adjust/modify the management plan. Implementation: After receipt of the Independent Audit, 1 December, Submit the Annual Surveys, Audit and Proposed Modifications to the Co-ordinating Bodies*, mid December, annually.
21	**Signage** Erection of signage including illustrations and photographs at chosen vantage points demonstrating what the project comprises and what species are typical of the habitat. Implementation: During Year 1 of the compensation plan.

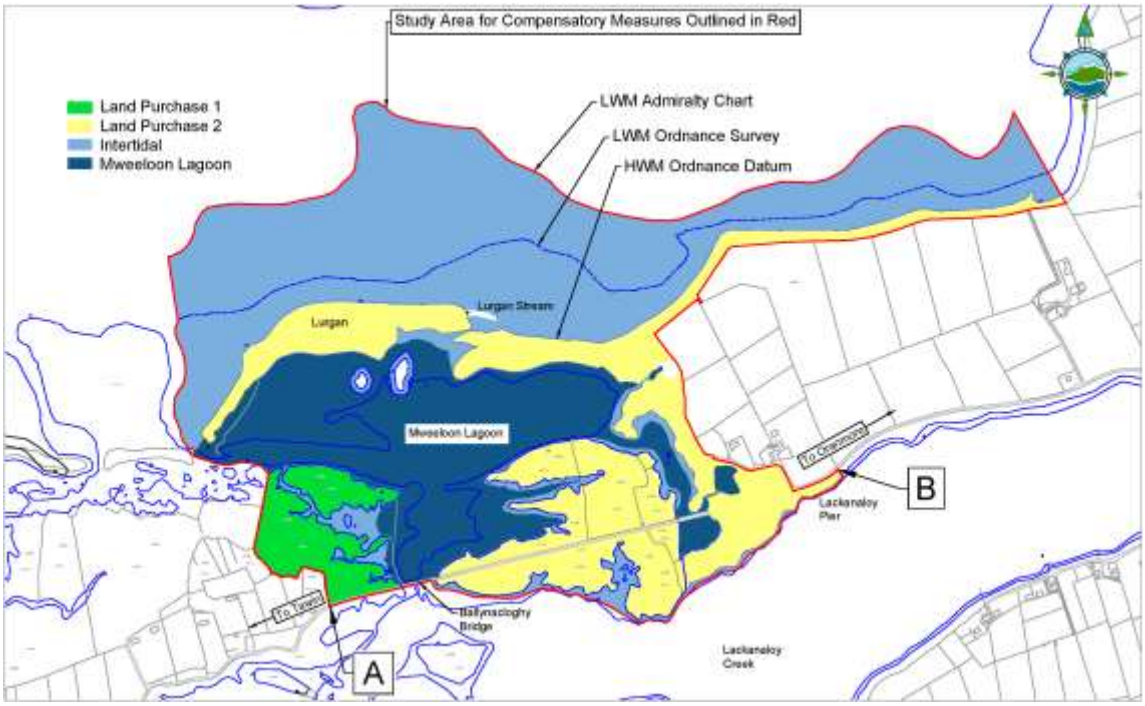

Figure 11: Areas of land at Tawin that have been contracted to be purchased subject to a satisfactory planning permission.

Of the 22 points listed above, Numbers 4, 5 and 14 *i.e.* rebuilding and maintenance of the dry stone wall network, the replacement of damaged gates and fencing in the area and repair to existing sea defence wall have the potential to negatively impact Stony Bank, Calcareous grasslands, *Salicornia* muds and Salt Marsh habitats during the construction phase.

All the required agricultural work will be carried out by Farm Relief Services (FRS). FRS Farm Relief Services offers an array of services to help farmers on their farms.

The rebuilding of stone walls will require two people (one either side of the wall) who will walk along the walls and replace stones or rebuild walls by hand that have significantly collapsed or have been broken down by stock. No mortar will be used and no machinery will be required.

A repair and/or gating of a total of 19 gateway openings are planned. Again, two people will carry out the required work. Materials *e.g.* shovel, gate posts, a dry mix of gravel and cement and water will be brought on site in the transport box of a small quad bike. For the gates posts, they will be erected by digging out a hole of *ca* 50 x 50 x 50 cms either side of where the gate is to be hung, placing the gate post in the hole and filling the hole with quick setting concrete that will be mixed in the transport box. The material that has been dug out to create the hole will be taken away using the same small quad bike for final disposal to a landfill site. Once the concrete has set, the gate will be brought to the site by hand and hung.

The fencing will be erected by two people using a small quad bike to carry materials, equipment and any spoil arising. Wooden posts will be driven by hand into the ground as tested by crowbar. Where not possible to drive the post, a hole will be dug by hand to receive the post and surplus material will be taken away using the quad bike for final disposal to a landfill. Four strands of barbed wire will be fixed to them using u shaped galvanised staples and a hammer. Repair of stone wall will be by hand carried out by two people, one on either side of the wall.

It is estimated that the above works will take 4 weeks and they will be carried out in a period of dry weather in the Summer months.

The lands at the northwestern section of Lurgan have historically undergone coastal defence and in order to protect the lagoon within Mweeloon, repair to this sea defence wall may be required in the future. Such repair will be undertaken by GHC as required.

All of the proposed surveys and repairs to walls, gates and sea defences will require notification to and permission from the National Parks and Wildlife Service.

The proposed management plan for the Salt Marsh habitat includes the following 22 components:

No	**Salt Marsh Management Plan** **Management proposal and implementation plan for Salt Marsh**
1	**Purchase lands** Purchase options for land areas 1 and 2 at Mweeloon and Tawin East as shown in Figure 11 previously have been agreed. This will ensure that all aspects of the management plan can be successfully implemented. The purchase of these lands is considered to be vitally important as it ensures the capacity to manage the lands as required to provide for the successful restoration of habitat quality. This meets the long term implementation criterion stated in the EU (2018) guidance document and as presented on page 25, Bullet 4.1.10 of the CMR. Implementation: Land purchases to be completed within 3 months after F.G.S.P.
2	**Organic farming principles** Manage the Salt Marsh habitat that is to be purchased in accordance with organic farming principles. The use of appropriate and extensive organic farming on the lands, will contribute to the improvement of the habitat in terms of species composition and function. The restoration of the terrestrial habitat will then follow a natural progression. This will be monitored on an annual basis [see below]. Implementation: Immediately after lands have been purchased.
3	**Curtail grazing** Curtail grazing levels by horses, cattle, sheep and other grazing stock. This will allow optimal growth and flowering of the vegetation and reduce poaching. Through ownership and set stocking management, the appropriate stocking density of animals on the land can be ensured, thereby maximising the successful management of the habitat. This will limit light grazing to Summer and Autumn rather than the previous Winter and Spring use which is more damaging. This will facilitate the elimination of the need for supplementary feeding as per (12) below. To achieve this, the grazing of the lands will be undertaken within the period from 1st May to 31st October, subject to appropriate weather and ground conditions, with a stocking density of 0.5 - 1.0 livestock units / ha. Stock density may be adjusted following observations of grazing effects during the first and subsequent years of implementation. Implementation: Immediately after lands have been purchased.

4	**Repair stone walls, fences and gates** Rebuild and maintain the broken stone wall and fence network and form / replace 8 missing gates, 6 damaged gates and repair 5 existing gates. See Appendix 14, Part 1. This action is essential to achieve access and grazing control to and across the lands. Implementation: In the late Spring/Summer after lands have been purchased.
5	**Cease fertilizing** Cease fertilizer and slurry spreading on the lands and curtail dunging in this habitat by repair of animal fencing. By stopping fertilizing and supplementary feeding on the lands, the Salt Marsh habitat areas will return to a natural state and nitrogen and phosphorous soil contents will return to natural Salt Marsh levels. Implementation: Immediately after lands have been purchased.
6	**Soil nutrient survey** At the commencement of the management plan, carry out a soil nutrient survey of both the area to be managed and the reference site. This will determine the levels of Nitrogen and Phosphorous in the soil prior to the initiation of any other element of the compensation plan. The results will be used as the base line for future soil nutrient surveys and hydrochemical modelling studies to track changes in soil chemistry given the adoption of organic farming principles. Implementation: In the late Spring/Summer after lands have been purchased.
7	**No herbicides** Prevention of the use of herbicides within the lands. This intervention will remove any risk of herbicidal damage to plants. It is planned to control noxious weeds such as ragwort by pulling them by hand and the spreading of briars by cutting them back in late Summer. The reduced levels of poaching by livestock on the lands will also contribute to the reduction of noxious weed infestations. Note that species such as ragwort and briar / scrub are largely confined to areas of dry grassland within the lands. Implementation: Immediately after lands have been purchased.
8	**No shooting** The owners and their tenants will not shoot on or over the lands or allow other persons to do so. Implementation: Immediately after lands have been purchased.
9	**Animal health** Ensure livestock using the lands will be outside of the withdrawal period for medicines and anthelmintics. This action will remove any potential for impact on coprophillic or coprophaegous species. Implementation: Immediately after lands have been purchased.

10	**No drainage channels** Prevent the construction of any drainage channels on the lands. Construction activities have the potential to damage the habitat and must therefore not be allowed. Implementation: Immediately after lands have been purchased.
11	**Control tractor access** Control access by tractors to the habitat. By minimizing tractor access and confining unavoidable access to critically required occasions *e.g.* removal of sick or dying livestock, the damaged areas of habitat will recover and improve. Implementation: Immediately after lands have been purchased.
12	**Eliminate Winter feeding** Eliminate Winter feeding and all supplementary feeding. This will stop related poaching and rutting of lands at feeding and at gate sites. These farming activities give rise to significant localised damage to habitats and by eliminating them, the damage cannot occur. This proposed feeding plan will also contribute to the reduction of weed infestation and the transfer of parasites. This will avoid the import of seed and minerals and increased dunging and poaching at feeding locations. Implementation: Immediately after lands have been purchased.
13	**No further sea defences** Prevent the construction of any further sea defence works or dumping of materials to act as a sea defence in order to protect lands. These activities give rise to damage to the habitat because of machinery and personnel tracking/walking over it. Prevention will remove this pressure. Implementation: Immediately after lands have been purchased.
14	**Sensitive repair of existing sea defence wall** In order to protect the Lagoon Priority habitat, sensitive repair of the existing sea defence wall to prevent erosion/ingress by the sea as may be required. The ecology and oceanography of the lagoon and its Intertidal habitat and species has the potential of being changed if the Stony Bank habitat is breached. Therefore, in order to protect the lagoon, some sensitive repair of the existing sea defence wall, at the north west of Lurgan Island, and as described in Section 17.1 of the CMR will be undertaken if required. Implementation: 3 months after F.G.S.P. Annually and after significant storm events (see Bullet 11 following), GHC will survey the condition of the existing sea defence wall and will sensitively undertake repair, if required.
15	**Control flotsam and jetsam** Regular removal of flotsam and jetsam and other litter, blown up / thrown up by storm events. This action will help to improve the condition of the habitat and its visual appearance. Implementation: Every 3 months after lands have been purchased and directly after a Force 9 or greater storm event.

16	**Annual biological surveys** Annual biological surveys of this habitat (including the control site) to document any changes in its extent and its characterising species. This is an essential scientific element of the restoration plan. Monitoring of Salt Marsh habitat will closely follow the survey approaches which have been developed by NPWS over the past 15 years. Implementation: 1 year after the compensation plan commenced and to be submitted to Galway Harbour Company Board by mid October.
17	**Cordgrass** Should Cordgrass, which is an invasive (weed) species (*Spartina maritima*) be recorded in the future, initiate a control programme. Implementation: Immediately after lands have been purchased.
18	**Review of plan** In the light of the results of the annual biological surveys adjust/modify the management plan. Implementation: Within 4 weeks after the annual surveys has been completed, mid November.
19	**Surveys following storms** Immediately following storm force 11 events or greater, carry out surveys to assess possible damage to the habitat. Such extreme events can give rise to sudden and extensive changes to the physical, chemical and biological characteristics of Salt Marsh habitat and it is important to document such changes directly after the storm / flood event. This will also contribute to the recording of the natural recovery processes. Implementation: Within 10 working days after the event occurred.
20	**Independent audit of surveys** Commission an annual, independent audit of the progress of the management plan. This is to ensure that the annual surveys and management proposals can be independently reviewed and validated. Implementation: Complete 2 weeks after the submission of the annual report to the GHC Board, 1 December.
21	**Modify plan following audit** In the light of the results of this independent audit and possible changes due to storm events, adjust/modify the management plan. Implementation: After receipt of the Independent Audit, 1 December, Submit the Annual Surveys, Audit and Proposed Modifications to the Co-ordinating Bodies*, mid December, annually.
22	**Signage** Erection of signage including illustrations and photographs at chosen vantage points demonstrating what the project comprises and what species are typical of the habitat. Implementation: During Year 1 of the compensation plan.

The same methods to put these compensatory measures in place will be as described for the Stony Bank habitat above. However, it should be noted that no post and wire fencing will be erected in the Salt Marsh habitat. The stone wall repair and gating (see Appendix 3) will allow for the enhanced stocking management of the areas that contain Salt Marsh. These aspects of the proposed compensatory measures, along with adherence to organic farming principals will promote the full recovery of Salt Marsh flora and fauna.

4.2 IDENTIFICATION OF RELEVANT NATURA 2000 SITES

Adopting a precautionary principle, the cSACs and the SPAs within 15km of the development site were included in this assessment. The cSACs are listed below in Section 4.2.1 and the SPAs are listed in Section 4.2.2. Their locations are presented in Figure 12.

4.2.1 cSACs within 15 km of Mweeloon.

- Galway Bay Complex cSAC (IE000268)
- Lough Corrib cSAC (IE000297)
- Lough Fingall Complex cSAC (IE000606)
- East Burren Complex cSAC (IE001926)
- Rahasane Turlough cSAC (IE000322)
- Castle Taylor Complex cSAC (IE000242)
- Caherglassaun Turlough cSAC (IE000238)
- Kiltiernan Turlough cSAC (IE001285)
- Ardrahan Grassland cSAC (IE002244)

While the 9 cSACs sites listed above lie within 15km of the Mweeloon site, given the details of each of the management plans outlined above, it is considered that "*no pathway*" exists by which the proposed compensatory measures could impact upon any designated sites, other than the Galway Bay cSAC (IE000268).

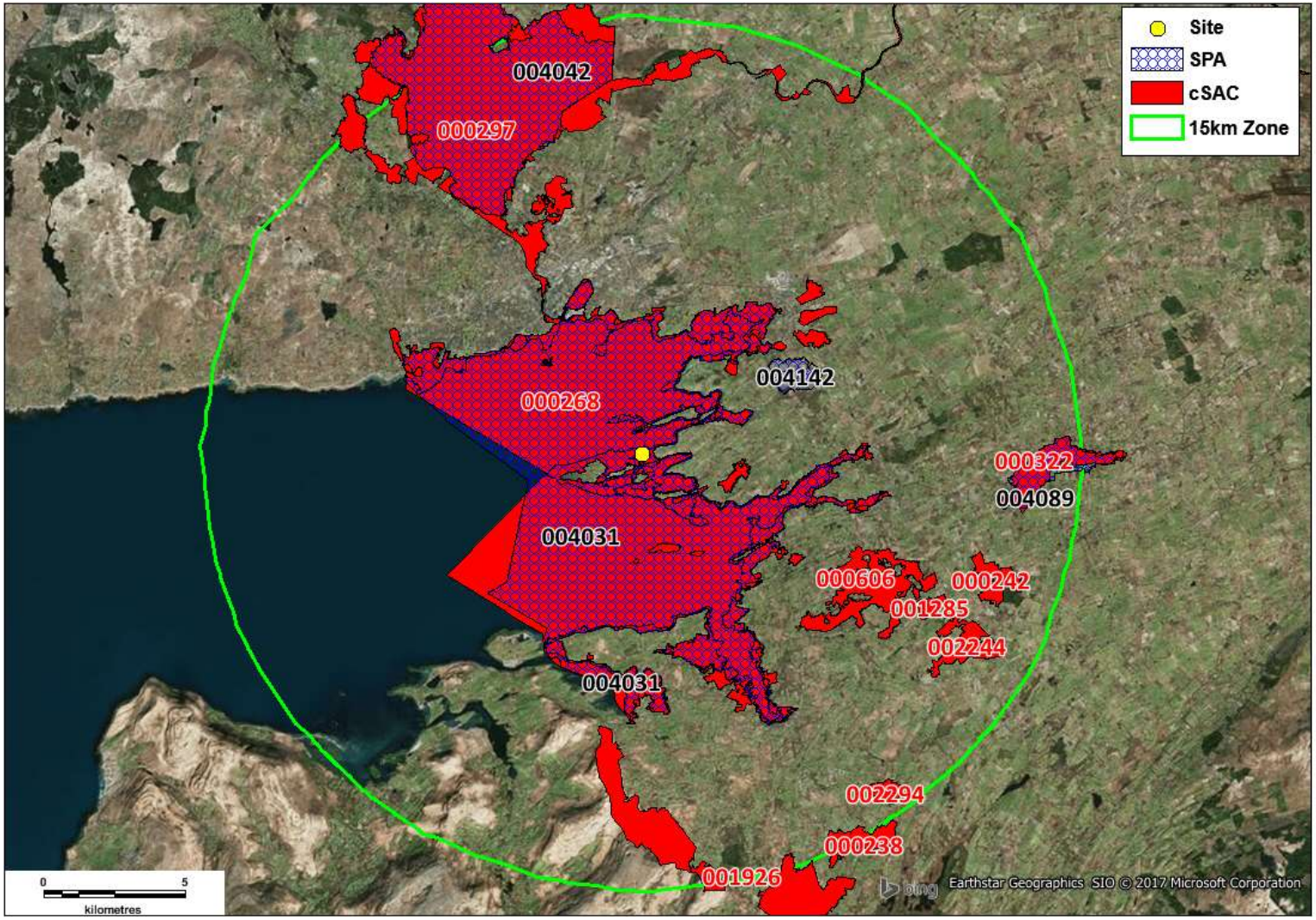

Figure 12: Location of cSACs and SPAs within 15km of the Mweeloon site.

The Qualifying Interests (QIs) for the Galway Bay cSAC (IE000268) are listed below:

- Mudflats and sandflats not covered by seawater at low tide [1140]
- Coastal lagoons [1150] *
- Large shallow inlets and bays [1160]
- Reefs [1170]
- Perennial vegetation of stony banks [1220]
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
- *Salicornia* and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Turloughs [3180] *
- *Juniperus communis* formations on heaths or calcareous grasslands [5130]
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]
- Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]
- Alkaline fens [7230]
- *Lutra lutra* (Otter) [1355]
- *Phoca vitulina* (Harbour Seal) [1365]

* indicates a Priority Habitat

Of these, the following 5 marine QIs occur at the proposed management site:
Mudflats and sandflats not covered by seawater at low tide [1140]
Coastal lagoons [1150]*
Large shallow inlets and bays [1160]
Reefs [1170]
Phoca vitulina (Harbour Seal) [1365] (N.B There are no seal haul out sites at Mweeloon).

The Conservation Objectives for these 5 QIs are presented below.

Mudflats and sandflats not covered by seawater at low tide [1140]

Conservation Objectives for : Galway Bay Complex SAC [000268]

1140 Mudflats and sandflats not covered by seawater at low tide

To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 3	Habitat area was estimated using OSi data as 744ha
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sandy mud community complex; and Intertidal sand community complex. See map 7	Based on intertidal surveys undertaken in 2009 and 2010 (RPS, 2012). See marine supporting document for further information

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Coastal lagoons [1150]

Conservation Objectives for : Galway Bay Complex SAC [000268]

1150 Coastal lagoons

To restore the favourable conservation condition of Coastal lagoons in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable, subject to slight natural variation. Favourable reference area 76.7ha. See map 4	Areas calculated from spatial data derived from Oliver, 2007. Site codes IL037, IL038, IL039, IL046, IL047, IL048, IL049, IL050, IL051, IL052. NB there may be more, as yet unmapped, lagoons within this SAC. See lagoon supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 4 for mapped lagoons	Sites IL037, IL038, IL039, IL046, IL047, IL048, IL049, IL050, IL051, IL052 in Oliver, 2007. NB there may be more, as yet unmapped, lagoons within this SAC. See lagoon supporting document for further details
Salinity regime	Practical salinity units (psu)	Median annual salinity and temporal variation within natural ranges	The lagoons in the site vary from oligohaline to euhaline. See lagoon supporting document for further details
Hydrological regime	Metres	Annual water level fluctuations and minima within natural ranges	Most of the lagoons listed for this site are considered to be shallow; however, Aughinish lagoon and Lough Atalia do have deeper (at least 3m) parts. See lagoon supporting document for further details
Barrier: connectivity between lagoon and sea	Permeability	Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management	The lagoons within this site exhibit a variety of barrier types including cobble/shingle, karst and artificial embankment/causeway. Several are recorded as having sluices. See lagoon supporting document for further details
Water quality: Chlorophyll *a*	µg/L	Annual median chlorophyll *a* within natural ranges and less than 5µg/L	Target based on Roden and Oliver (2010). See lagoon supporting document for further details
Water quality: Molybdate Reactive Phosphorus (MRP)	mg/L	Annual median MRP within natural ranges 0.1mg/L	Target based on Roden and Oliver (2010). See lagoon supporting document for further details
Water quality: Dissolved Inorganic Nitrogen (DIN)	mg/L	Annual median DIN within natural ranges and less than 0.15mg/L	Target based on Roden and Oliver (2010). See lagoon supporting document for further details
Depth of macrophyte colonisation	Metres	Macrophyte colonisation to at least 2m depth	For shallow lagoons, it is expected that macrophytes should extend to their deepest points. See lagoon supporting document for further details
Typical plant species	Number and m^2	Maintain number and extent of listed lagoonal specialists, subject to natural variation	Species listed in Oliver, 2007. See lagoon supporting document for further details
Typical animal species	Number	Maintain listed lagoon specialists, subject to natural variation	Species listed in Oliver, 2007. See lagoon supporting document for further details
Negative indicator species	Number and % cover	Negative indicator species absent or under control	Low salinity, shallow water and elevated nutrient levels increase the threat of accelerated encroachment by reedbeds. See lagoon supporting document for further details

Large shallow inlets and bays [1160]

Conservation Objectives for : Galway Bay Complex SAC [000268]

1160 Large shallow inlets and bays

To maintain the favourable conservation condition of Large shallow inlets and bays in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 5	Habitat area was estimated as 10,825ha using OSi data and the Transitional Water Body area as defined under the Water Framework Directive
Community extent	Hectares	Maintain the extent of the *Zostera*-dominated community complex and the maërl-dominated community, subject to natural processes. See map 7	Based on 2006 diver observation and dropdown camera data (MERC, 2006). See marine supporting document for further details
Community structure: *Zostera* density	Shoots per m^2	Conserve the high quality of *Zostera*-dominated communities, subject to natural processes	2006 diver observation and dropdown camera data (MERC, 2006). See marine supporting document for further details
Community structure	Biological composition	Conserve the high quality of the maërl-dominated community, subject to natural processes	2006 diver observation and dropdown camera data (MERC, 2006). See marine supporting document for further details
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sandy mud community complex; Intertidal sand community complex; Fine to medium sand with bivalves community complex; Sandy mud to mixed sediment community complex; Mixed sediment dominated by Mytilidae community complex; Shingle; Fucoid-dominated community complex; *Laminaria*-dominated community complex; and Shallow sponge-dominated community complex. See map 7	Based on intertidal and subtidal surveys undertaken in 2009 and 2010 (Aquafact, 2010a, b; RPS, 2012). See marine supporting document for further information

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Reefs [1170]

Conservation Objectives for : Galway Bay Complex SAC [000268]

1170 Reefs

To maintain the favourable conservation condition of Reefs in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Occurrence	The distribution of reefs is stable or increasing, subject to natural processes. See map 6 for mapped distribution	Based on information from 2009 and 2010 intertidal survey data and 2009 subtidal survey data (Aquafact, 2010a, b; RPS, 2012). See marine supporting document for further details
Habitat area	Hectares	The permanent habitat area is stable, subject to natural processes. See map 6	Habitat area estimated as 2773ha using 2009 and 2010 intertidal survey data and 2009 subtidal survey data (Aquafact, 2010a, b; RPS, 2012)
Community extent	Hectares	Maintain the extent of the *Mytilus*-dominated reef community, subject to natural processes. See map 7	Area established from 2009 intertidal survey (RPS, 2012)
Community structure: *Mytilus* density	Individuals per m²	Conserve the high quality of the *Mytilus*-dominated reef community, subject to natural processes	Based on intertidal survey 2009 (RPS, 2012) and intertidal walkover 2012
Community structure	Biological composition	Conserve the following community types in a natural condition: Fucoid-dominated community complex; *Laminaria*-dominated community complex; and Shallow sponge-dominated community complex See map 7	Reef mapping based on information from 2009 subtidal reef survey (Aquafact, 2010b) and 2009 and 2010 intertidal surveys (RPS, 2012). See marine supporting document for further details

Phoca vitulina (Harbour Seal) [1365]

Conservation Objectives for : Galway Bay Complex SAC [000268]

1365 Harbour seal *Phoca vitulina*

To maintain the favourable conservation condition of Harbour Seal in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use. See map 12	See marine supporting document for further details
Breeding behaviour	Breeding sites	Conserve breeding sites in a natural condition. See map 12	Attribute and target based on background knowledge of Irish breeding populations, review of data summarised by Summers et al. (1980), Warner (1983), Harrington (1990), Doyle (2002), Lyons (2004), and unpublished NPWS records. See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	Conserve moult haul-out sites in a natural condition. See map 12	Attribute and target based on background knowledge of Irish populations, review of data from Doyle (2002), Lyons (2004), Cronin et al. (2004), NPWS (2010, 2011, 2012) and unpublished NPWS records. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	Conserve resting haul-out sites in a natural condition. See map 12	Attribute and target based on background knowledge of Irish populations, review of data from Doyle (2002), Lyons (2004) and unpublished NPWS records. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site	See marine supporting document for further details

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With regard to the terrestrial QIs, the following 5 QIs occur in the location where it proposed to repair the stone walls, hang the gates and put up the fencing:

- Perennial vegetation of stony bank [1220]
- Atlantic salt meadows (Juncatalia maritimi) [1330]
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]

- *Salicornia* and other annuals colonising mud and sand [1310]
- Otter [1355]

The Conservation Objectives for these 5 QIs are presented below.

Conservation Objectives for : Galway Bay Complex SAC [000268]

1220 Perennial vegetation of stony banks

To maintain the favourable conservation condition of Perennial vegetation of stony banks in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession	Current area unknown. It was recorded from Rinville Point, Tawin Point and coastline from Blackhead to Carrickada during the National Shingle Beach Survey (Moore and Wilson, 1999), but the extent was not mapped. Two areas of vegetated shingle were recorded during the Coastal Monitoring Project (Ryle et al., 2009): Bishopsquarter - 0.18ha and Barna (Whitestrand) - 0.45ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 8 for mapped locations	Full distribution unmapped at present, although the habitat has been recorded at Rinville Point, Tawin Point and coastline from Blackhead to Carrickada (Moore and Wilson, 1999). It has also been recorded from Barna and Bishopquarter by Ryle et al. (2009). See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	The Galway Bay shoreline supports good examples of shingle beaches along the more exposed shores to the south and west of Galway city and to the north-east of Finnavara, County Clare. Shingle features are relatively stable in the longterm (Moore and Wilson, 1999). See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Moore and Wilson (1999). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain the typical vegetated shingle flora including the range of sub-communities within the different zones. Typical species include sea sandwort (*Honckenya peploides*), sea beet (*Beta vulgaris* ssp *maritima*), rock samphire (*Crithmum maritimum*), sea mayweed (*Tripleurospermum maritimum*), yellow-horned poppy (*Glaucium flavum*) and sea campion (*Silene uniflora*)	Based on data from Moore and Wilson (1999). See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Moore and Wilson (1999). Negative indicators include non-native species indicative of changes in nutrient status and species not considered characteristic of the habitat. See coastal habitats supporting document for further details

Conservation Objectives for : Galway Bay Complex SAC [000268]

1410 Mediterranean salt meadows (Juncetalia maritimi)

To restore the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Barna House - 0.282ha, Seaweed Point - 0.931ha, Kilcaimin - 0.005ha, Tawin Island - 1.799ha. Tyrone House- Dunbulcan Bay - 8.184ha, Kileenaran - 0.271ha. See map 9	Based on data from the Saltmarsh Monitoring Project (SMP) (McCorry, 2007; McCorry and Ryle, 2009). Six sub-sites that support Mediterranean salt meadow were mapped (11.472ha) and additional areas of potential saltmarsh (8.415ha) were identified from an examination of aerial photographs, giving a total estimated area of 19.887ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 9 for known distribution	See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Based on data from the SMP (McCorry, 2007; McCorry and Ryle, 2009). [Site-specific info.]. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	Mediterranean salt meadows is found high up in the saltmarsh but requires occasional tidal inundation. [Site-specific info.] See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation in the sward	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from SMP (McCorry, 2007; McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in SMP (McCorry and Ryle, 2009)	Based on data from SMP (McCorry, 2007; McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	There is currently no common cordgrass (*Spartina anglica*) in this SAC. Prevent establishment of cordgrass	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details

Conservation Objectives for : Galway Bay Complex SAC [000268]

6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites)

To maintain the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*) in Galway Bay Complex, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Extent of this habitat in the SAC is currently unknown. Areas are likely to be small and often in mosaic with other habitats such as limestone pavement and scrub (Dwyer et al., 2007; internal NPWS files). Dwyer et al. (2007) surveyed a number of sub-sites in 2006. The Irish semi-natural grasslands survey undertook survey work in Counties Clare and Galway in 2012 and additional information is likely to be available for this SAC following data analysis
Habitat distribution	Occurrence	No decline, subject to natural processes	Full distribution of this habitat in this SAC is currently unknown- see note above
Vegetation composition: broadleaf herb: grass ratio	Percentage	Broadleaf herb component of vegetation between 40 and 90%	Attribute and target based on O'Neill et al. (2010)
Vegetation composition: typical species	Number	At least 7 positive indicator species present, including 2 "high quality" species	List of positive indicator species, including high quality species, identified by O'Neill et al. (2010)
Vegetation composition: negative indicator species	Percentage	Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%. Non-native invasive species, absent or under control	List of negative indicator species identified by O'Neill et al. (2010)
Vegetation structure: sward height	Percentage	30-70% of sward 5-40cm high	Attribute and target based on O'Neill et al. (2010)
Vegetation structure: woody species and bracken (*Pteridium aquilinum*)	Percentage	Cover of bracken (*Pteridium aquilinum*) and woody species (except juniper (*Juniperus communis*)) not more than 5% cover	Attribute and target based on O'Neill et al. (2010)
Physical structure: bare ground	Percentage	Not more than 10% bare ground	Attribute and target based on O'Neill et al. (2010)

Conservation Objectives for : Galway Bay Complex SAC [000268]

1310 Salicornia and other annuals colonising mud and sand

To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Bama House - 0.067ha, Seaweed Point - 0.003ha, Roscam West and South - 0.023ha, Kilcaimin - 0.015, Kileenaran - 0.007ha, Kinvara West - 0.017ha, Scanlan's Island - 0.117ha, Tawin Island - 1.098ha. See map 9	Based on data from Saltmarsh Monitoring Project (SMP) (McCorry and Ryle, 2009). Habitat recorded at eight of the ten sub-sites surveyed and mapped, giving a total estimated area of 1.347ha. N.B. Further unsurveyed areas may be present within this site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 9 for known distribution	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). *Salicornia* is an annual species, so its distribution can vary significantly from year to year. See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore, natural circulation of sediments and organic matter, without any physical obstructions	Sediment supply is particularly important for pioneer saltmarsh community, as the distribution of this habitat depends on accretion rates. See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain, or where necessary restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). Creeks deliver sediment throughout saltmarsh system. Creeks and pan structures well developed at Kileenaran and Tawin Island. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	This pioneer saltmarsh community requires regular tidal inundation. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for details
Vegetation composition: typical species and sub-communities	Percentage cover	Maintain the range of species-poor communities with typical species listed in SMP (McCorry and Ryle, 2009)	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	There is currently no common cordgrass (*Spartina anglica*) in this SAC. Prevent establishment of cordgrass	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details

Conservation Objectives for : Galway Bay Complex SAC [000268]

1355 Otter *Lutra lutra*

To restore the favourable conservation condition of Otter in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. FCS target, based on 1980/81 survey findings, is 88% in SACs. Current range in the west is estimated at 70% (Bailey and Rochford, 2006).
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 262ha above high water mark (HWM); 14ha along river banks/around ponds	No field survey. Areas mapped to include 10m terrestrial buffer along shoreline (above HWM and along river banks) identified as critical for otters (NPWS, 2007)
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 2040ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (HWM) (NPWS, 2007; Kruuk, 2006)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 4km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982)
Extent of freshwater (lake/lagoon) habitat	Hectares	No significant decline. Area mapped and calculated as 21ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk, 2006; Kruuk and Moorhouse, 1991)
Fish biomass available	Kilograms	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford, 2006) and wrasse and rockling in coastal waters (Kingston et al., 1999)
Barriers to connectivity	Number	No significant increase. For guidance, see map 11	Otters will regularly commute across stretches of open water up to 500m e.g. between the mainland and an island; between two islands; across an estuary (De Jongh and O'Neill, 2010). It is important that such commuting routes are not obstructed

Limestone Pavement (8240)

In addition to these habitats, the habitat Limestone Pavement (8240) which is listed as a Priority Habitat in the EU Habitats Directive but that is not listed as occurring in this part of the Galway Bay cSAC nor as a Qualifying Interest for the Galway Bay cSAC, was recorded within the proposed management area. Given the high conservation status of this habitat, this is a significant ecological addition to the Tawin site. The conservation objectives for this habitat (taken from the Conservation Objectives for the nearby Blackhead - Poulsallagh cSAC, site code 000020) are presented below.

8240 Limestone pavements

To maintain the favourable conservation condition of Limestone pavements in Black Head-Poulsallagh Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable, subject to natural processes	Limestone pavements occurs in intimate association with other Annex I habitats in this SAC: Alpine and Boreal heaths (4060); *Juniperus communis* formations on heaths or calcareous grasslands (5130); Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (6210); Petrifying springs with tufa formation (Cratoneurion) (7220). Therefore, these habitats cannot easily be mapped or considered separately. Conservation objectives for all these habitats should be used in conjunction with each other as appropriate. Wilson and Fernandez (2013) mapped the indicative area of limestone pavement, including associated habitats as 5,572ha (map 6). Four sites within the SAC were surveyed in detail as part of the national survey of limestone pavement and associated habitats (Wilson and Fernandez, 2013). This survey should be consulted for further details
Habitat distribution	Occurrence	No decline. Map 6 shows indicative distribution, including associated habitats	See notes for area above. Based on data from Wilson and Fernandez (2013). This habitat is split into exposed pavement and wooded pavement. In this SAC, the area of wooded pavement is relatively small
Vegetation composition: typical species	Number at a representative number of monitoring stops	At least seven positive indicator species present	Positive indicator species for exposed and wooded pavement are listed in Wilson and Fernandez (2013)
Vegetation composition: bryophyte layer	Percentage at a representative number of monitoring stops	Bryophyte cover at least 50% on wooded pavement	Attribute and target based on Wilson and Fernandez (2013)
Vegetation composition: negative indicator species	Percentage at a representative number of monitoring stops	Collective cover of negative indicator species on exposed pavement not more than 1%	Negative indicator species listed in Wilson and Fernandez (2013). Negative indicator species for wooded pavement overlap with non-native species (below)
Vegetation composition: non-native species	Percentage at a representative number of monitoring stops	Cover of non-native species not more than 1% on exposed pavement; on wooded pavement not more than 10% with no regeneration	Attribute and target based on Wilson and Fernandez (2013)
Vegetation composition: scrub	Percentage at a representative number of monitoring stops	Scrub cover no more than 25% of exposed pavement	Attribute and target based on Wilson and Fernandez (2013). This SAC has very little scrub cover compared with areas further inland
Vegetation composition: bracken cover	Percentage at a representative number of monitoring stops	Bracken (*Pteridium aquilinum*) cover no more than 10% on exposed pavement	Attribute and target based on Wilson and Fernandez (2013)
Vegetation structure: woodland canopy	Percentage at a representative number of monitoring stops	Canopy cover on wooded pavement at least 30%	Wooded limestone pavement in this SAC is mostly low-growing hazel (*Corylus avellana*) woodland, some of which can be classified as Atlantic hazel woodland, an internationally rare woodland type. Despite its low stature it is nonetheless an important habitat for woodland species. Attribute and target based on Wilson and Fernandez (2013)
Vegetation structure: dead wood	Occurrence in a representative number of monitoring stops	Sufficient quantity of dead wood on wooded pavement to provide habitat for saproxylic organisms	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem

Physical structure: disturbance	Occurrence in a representative number of monitoring stops	No evidence of grazing pressure on wooded pavement	Attribute and target based on Wilson and Fernandez (2013)
Indicators of local distinctiveness	Occurrence	Indicators of local distinctiveness are maintained	Includes red-data and other rare or localised species as well as archaeological and geological features, which often support distinctive species

4.2.2 SPAs within 15 km of Mweeloon

The SPAs that are within 15 km of Mweeloon are:

- Inner Galway Bay SPA (IE004031)
- Lough Corrib SPA (IE004042)
- Creganna Marsh SPA (IE004142)
- Rahasane Turlough SPA (IE004089)

With regard to these 4 listed SPAs, they are all aquatic habitats and their Species of Conservation Interests (SCIs) are all aquatic species. With regard to Lough Corrib, Creganna Marsh and Rahasane Turlough SPA, due to distances involved, it is considered very likely that only a minor proportion of any SCI population would fly to the area at Mweeloon where compensatory measures will be carried out. For this reason, they were not considered any further.

ABP's AA of the GHE proposal concluded that, with regard to the Inner Galway Bay SPA (004031) while some minor, short term 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. The ABP AA made no comment on any other SPA.

Regarding the Inner Galway Bay SPA (0040231), the SCIs are the following:

- [A003] Great Northern Diver *Gavia immer,* *
- [A017] Cormorant *Phalacrocorax carbo,*
- [A028] Grey Heron *Ardea cinerea,*
- [A046] Brent Goose *Branta bernicla hrota,* *
- [A050] Wigeon *Anas penelope,*
- [A052] Teal *Anas crecca,*
- [A056] Shoveler *Anas clypeata,*
- [A069] Red-breasted Merganser *Mergus serrator,*
- [A137] Ringed Plover *Charadrius hiaticula,*
- [A140] Golden Plover *Pluvialis apricaria,*
- [A142] Lapwing *Vanellus vanellus,* *
- [A149] Dunlin *Calidris alpina alpina,* *
- A157] Bar-tailed Godwit *Limosa lapponica,* *
- [A160] Curlew *Numenius arquata,**
- [A162] Redshank *Tringa totanus,*
- [A169] Turnstone *Arenaria interpres,*
- [A179] Black-headed Gull *Chroicocephalus ridibundus,*
- [A182] Common Gull *Larus canus,*
- [A191] Sandwich Tern *Sterna sandvicensis,*+
- [A193] Common Tern *Sterna hirundo.* +

*: Winter visitor. +: Summer visitor.

One habitat and its component birds is also listed for the Inner Galway Bay SPA:

- [A999] Wetlands & Waterbirds

Most of these species *i.e.* Heron, Brent Goose, Widgeon, Teal, Shoveler, Ringed Plover, Dunlin, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Black-headed Gull and Common Gull forage or roost on the sea shore. Great Northern Diver, Cormorant, Red-breasted Merganser, Sandwich Tern and Common Tern feed exclusively by diving in the sea. Brent Goose, Lapwing and Curlew may also feed on pasture fields. Given the preference for living in/near the sea, these species cannot be impacted by the repairs to gates and stone wall. Additionally as it is planned to carry out such repairs in the Summer, species that migrate to Ireland in the Winter *e.g.* Brent Goose and Widgeon and those that migrate away from the shore in the late Spring to breed, *e.g.* Curlew, Lapwing, Bar-tailed Godwit, cannot be effected by such repairs.

The removal of oyster trestles and control of *Didemnum vexillum* at oyster farms is predicted to have a minor positive effect on Wetlands and Waterbirds [A999].

The conservation objectives for the SCIs of Inner Galway Bay SPA (004031) are:

Conservation Objectives for : Inner Galway Bay SPA [004031]

A003 Great Northern Diver *Gavia immer*

To maintain the favourable conservation condition of Great Northern Diver in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by great northern diver, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A017 Cormorant *Phalacrocorax carbo*

To maintain the favourable conservation condition of Cormorant in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	This attribute applies to breeding cormorant. Measure based on standard survey methods (see Walsh et al., 1995). The Seabird Monitoring Programme (SMP) online database (JNCC, 2013) provides population data for this species. A recent survey of Deer Island (conducted in 2010) estimated 128 AONs at this colony, which represents an approximate decline of 38% since 1985
Productivity rate	Mean number	No significant decline	This attribute applies to breeding cormorant. Measure based on standard survey methods (see Walsh et al., 1995). The Seabird Monitoring Programme (SMP) online database (JNCC, 2013) provides population data for this species
Distribution: breeding colonies	Number; location; area (hectares)	No significant decline	This attribute applies to breeding cormorant. Cormorant colonies are usually sited on flat or rocky islets or sea stack tops, less often on cliffs (Walsh et al., 1995). Deer Island is a traditional breeding colony in this SPA
Prey biomass available	Kilogrammes	No significant decline	This attribute applies to breeding cormorant. Key prey items: fish (mostly benthic), some crustaceans. Key habitats: cormorants use sandy areas as well as rocky and vegetated substrates. Foraging range: max. 50km, mean max. 31.67km, mean 8.46km (BirdLife International Seabird Database (Birdlife International, 2013))
Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	This attribute applies to breeding cormorant. Seabird species make extensive use of the marine waters adjacent to their breeding colonies. Foraging range: max. 50km, mean max. 31.67km, mean 8.46km (BirdLife International Seabird Database (Birdlife International, 2013))
Disturbance at breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding cormorant population	This attribute applies to breeding cormorant. Cormorant colonies are usually sited on flat or rocky islets or sea stack tops, less often on cliffs (Walsh et al., 1995). Deer Island is a traditional breeding site
Population trend	Percentage change	Long term population trend stable or increasing	This attribute applies to non-breeding cormorant. Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by cormorant, other than that occurring from natural patterns of variation	This attribute applies to non-breeding cormorant. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A028 Grey Heron *Ardea cinerea*

To maintain the favourable conservation condition of Grey Heron in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas used by grey heron, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A046 Brent Goose *Branta bernicla hrota*

To maintain the favourable conservation condition of Light-bellied Brent Goose in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A050 Wigeon *Anas penelope*

To maintain the favourable conservation condition of Wigeon in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of areas used by waterbirds	No significant decrease in the range, timing or intensity of use of areas by wigeon, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A052 Teal *Anas crecca*

To maintain the favourable conservation condition of Teal in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing or intensity of use of areas by teal, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A056 Shoveler *Anas clypeata*

To maintain the favourable conservation condition of Shoveler in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing or intensity of use of areas by shoveler, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A069 Red-breasted Merganser *Mergus serrator*

To maintain the favourable conservation condition of Red-breasted Merganser in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by red-breasted merganser, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A137 Ringed Plover *Charadrius hiaticula*

To maintain the favourable conservation condition of Ringed Plover in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing or intensity of use of areas by ringed plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A140 Golden Plover *Pluvialis apricaria*

To maintain the favourable conservation condition of Golden Plover in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of theconservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by golden plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A142 Lapwing *Vanellus vanellus*

To maintain the favourable conservation condition of Lapwing in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lapwing, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives

Conservation Objectives for : Inner Galway Bay SPA [004031]

A149 Dunlin *Calidris alpina alpina*

To maintain the favourable conservation condition of Dunlin in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A157 Bar-tailed Godwit *Limosa lapponica*

To maintain the favourable conservation condition of Bar-tailed Godwit in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A160 Curlew *Numenius arquata*

To maintain the favourable conservation condition of Curlew in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A162 Redshank *Tringa totanus*

To maintain the favourable conservation condition of Redshank in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of area	There should be no significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A169 Turnstone *Arenaria interpres*

To maintain the favourable conservation condition of Turnstone in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the range, timing or intensity of use of areas by turnstone, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A179 Black-headed Gull *Chroicocephalus ridibundus*

To maintain the favourable conservation condition of Black-headed Gull in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the range, timing and intensity of use of areas used by black-headed gull other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A182 Common Gull *Larus canus*

To maintain the favourable conservation condition of Common Gull in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range,timing or intensity of use of areas by the common gull, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Inner Galway Bay SPA [004031]

A191 Sandwich Tern *Sterna sandvicensis*

To maintain the favourable conservation condition of Sandwich Tern in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). Hannon et al. (1997) and Mitchell et al. (2004) provide summary population information. The Seabird Monitoring Programme (SMP) online database (JNCC, 2013) provides population data for this species
Productivity rate: fledged young per breeding pair	Mean number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). The Seabird Monitoring Programme (SMP) online database (JNCC, 2013) provides population data for this species
Distribution: breeding colonies	Number; location; area (Hectares)	No significant decline	Typical sandwich tern breeding sites are located on low-lying offshore islands or islets in bays or brackish lagoons on spits or remote mainland dunes (Cramp, 1985). Wide fluctuations between years in both breeding numbers and colony locations are known to occur for this species (Mitchell et al., 2004)
Prey biomass available	Kilogrammes	No significant decline	Key prey items: Mostly energy-rich fish, some crustaceans and occasionally insects and rag worms. Key habitats: sandwich tern forage in/over shallow marine waters such as bays, inlets and outflows, gullies, shoals, inshore waters, reefs, and sandbanks; also more open waters nearshore and offshore, including open sea. Foraging range: max. 70km, mean max. 42.3km, mean 14.7km (BirdLife International Seabird Database (Birdlife International, 2013))
Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	Seabird species can make extensive use of the marine waters adjacent to their breeding colonies. Foraging range: Max 70km, mean max 42.3km, mean 14.7km (Birdlife International Seabird Database (Birdlife International, 2013))
Disturbance at breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding sandwich tern population	Typical sandwich tern breeding sites are located on low-lying offshore islands or islets in bays or brackish bagoons on spits or remote mainland dunes (Cramp, 1985)

Conservation Objectives for : Inner Galway Bay SPA [004031]

A193 Common Tern *Sterna hirundo*

To maintain the favourable conservation condition of Common Tern in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). Hannon et al. (1997) and Mitchell et al. (2004) provide summary population information. The Seabird Monitoring Programme (SMP) (JNCC, 2013) provides population data for this species
Productivity rate: fledged young per breeding pair	Mean number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). The Seabird Monitoring Programme (SMP) (JNCC, 2013) provides population data for this species
Distribution: breeding colonies	Number; location; area (Hectares)	No significant decline	Common tern breeding colonies can be sited in both coastal and inland areas using a wide variety of habitats including sandy, rocky or well-vegetated islands in estuaries, lakes and rivers. This species can also use man-made subtrates (Del Hoyo et al., 1996)
Prey biomass available	Kilogrammes	No significant decline	Key prey items: Small fish, crustaceans, insects and occasionally squid. Key habitats: common tern forage in/over shallow coastal waters, bays, inlets, shoals, tidal-rips, drift lines, beaches, saltmarsh creeks, lakes, ponds, or rivers. Foraging range: max. 37km, mean max. 33.81km, mean 8.67km (BirdLife International Seabird Database (Birdlife International, 2013))
Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	Seabird species can make extensive use of marine waters adjacent to their breeding colonies. Foraging range: max. 37km, mean max. 33.81km, mean 8.67km (BirdLife International Seabird Database (Birdlife International, 2013))
Disturbance at breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding little tern population	Breeding colonies can be sited in both coastal and inland areas using a wide variety of habitats including sandy, rocky or well vegetated islands in estuaries, lakes and rivers. This species can also use man-made subtrates (Del Hoyo et al., 1996)

Conservation Objectives for : Inner Galway Bay SPA [004031]

A999 Wetlands

To maintain the favourable conservation condition of wetland habitat in Inner Galway Bay SPA as a resource for the regularly occurring migratory waterbirds that utilise it. This is defined by the following attribute and target:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 13,267ha, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 13,267ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document

4.3 ASSESSMENT OF LIKELY EFFECTS

4.3.1 Likely effects of the Compensatory Measures at Mweeloon

All aspects of these compensatory measures have been designed to improve cSAC and SPA habitat quality at Mweeloon and not to negatively impact them, or any other habitat/species and because of this, the likely effects of the proposed compensatory measures will have a positive effect on the receiving environment.

4.3.1.1 cSAC Marine Habitats

Regarding the marine environment, given the fact that the oyster trestles are already accessed on a fortnightly basis, the activity of turning the bags to help control the non-native *Didemnum* will have no additional impact on the conservation status Intertidal habitat. Furthermore, the eradication of *Didemnum*, either by turning the bags or treatment with acetic acid (vinegar) is considered as a positive impact of the conservation objectives for this QI of the Natura site. Following treatment and the return of the rising tide, the acetic acid will be quickly diluted and will not have any impact on surrounding the flora and fauna at the trestle location.

Regarding the repair of the existing sea defence wall should it be required, this will only be undertaken sensitively.

As there are no seal haul out sites at Mweeloon, the compensatory measures will not impact on *Phoca vitulina*, the Harbour Seal [1365].

The removal of oyster trestles will allow the intertidal flora and fauna return to their “pre-aquaculture” status and this habitat will recover its form and function status.

4.3.1.2 cSAC Terrestrial Habitats

In relation to the terrestrial environment, as the rebuilding of the stone walls will only require two people walking along either side of the wall, there will be minimal short term impact on the ecology of the habitat along the edges of the wall.

Regarding the erection of gate posts and placement of gates, soil and stones that have been dug out to create the hole where the post will be fixed will be taken off site to a licenced land fill and cannot therefore have any impact of the local habitat. All materials and tools required to put the gates in place will be brought to site on a small quad bike. This will minimalise the impact of accessing the work site. Concrete will be mixed in the bucket of the quad on site and will therefore have no impact on the habitat.

As the quad bike will also be used to bring fencing posts and barbed wire to site, impact on the habitats will be minimalised.

It is planned to carry out all these works during a dry Summer period. This will further limit the impacts of the quad bike and other construction activities.

Examined in their entirety, the combined effects of the proposed compensatory plans for the Intertidal, Stony Bank and Saltmarsh habitat at Mweeloon will have a positive effect on those and other cSAC QI habitats in the area.

4.3.1.3 Inner Galway Bay SPA

Regarding the repair of walls and gates, carrying out the works in the Summer months means that some wildfowl e.g. Brent Geese, Teal, that migrate to Ireland for the Winter months and some species that move upland/migrate out of Ireland to breed i.e. Curlew, Lapwing and Bar-tailed Godwit, will not be present at the site when such repairs are being carried out.

Regarding the use of acetic acid to control *Didemnum*, following treatment and the return of the rising tide, the acetic acid will be quickly diluted and will not have any impact on SCIs of the SPA.

The removal of oyster trestles from parts of the SPA will provide SCIs of the Inner Galway Bay SPA an additional feeding area.

Examined in their entirety, the combined effects of the proposed compensatory plans on the SCIs for the Inner Galway Bay SPA at Mweeloon will have a minor, positive effect on those species in the area.

4.3.2 Cumulative Impacts of the Compensatory Measures at Mweeloon with Other Plans on Projects

This section considers the potential for cumulative impacts arising from the proposed compensatory measures in association with other plans and projects within a 15km radius of the site of the proposed Compensatory Measures at Mweeloon, including the interaction between potential impacts on different environmental receptors arising from the proposed compensatory measures.

It must be pointed out at the outset that all aspects of the proposed compensatory measures have been designed to improve habitat quality at Mweeloon and not to negatively impact any other habitat/species. Additionally, no aspects of any of these measures have any long term emissions associated with them *e.g.* waste water, surface water loadings, emissions to air or noise. Given the planned reduction in farm animal stocking densities, the proposed compensatory measures will bring about a reduction in green house gas emissions.

The statutory plans which have been considered include the Galway City Development Plan, the Galway County Development Plan, the Bearna Local Area Plan and the Oranmore Local Area Plan.

The settlements that lie within the 15km radius of Mweeloon include Galway City, Bearna, Oranmore, Clarenbridge, Kilcolgan and Kinvara all of which are subject to the statutory Development Plans and LAP's listed above.

It is important to note that in terms of the treatment of wastewater, the most significant settlements within the 15 km radius, which are Galway City, Oranmore and Bearna, all are serviced by the Mutton Island wastewater treatment system.

The **Galway County Development 2015-2021** is accompanied by Strategic Environmental Assessment (SEA) and a Natura Impact Report (NIR). The SEA concludes that:

'In summary the Plan represents a pragmatic recognition and continuation of established patterns and trends of development in County Galway. These have been modified to take account of significant environmental sensitivities that exist over very large portions of the County with a view to stabilising both environmental conditions and the populations of those communities who continue to sustain these communities.

By complying with appropriate mitigation measures – including those which have been integrated into the Plan – potential adverse environmental effects which could arise as a result of implementing this scenario would be likely to be avoided, reduced or offset.'

The NIR concludes the following:

'The risks to the safeguarding and integrity of the qualifying features and conservation objectives of the Natura 2000 network have been addressed by the inclusion of the mitigation measures that will prioritise the avoidance of impacts in the first place and mitigate impacts where these cannot be avoided. In addition, all lower level plans and projects arising through the implementation of the Plan will themselves be subject to Appropriate Assessment when further details of design and location are known. Having incorporated mitigation measures, it is considered that the Plan will not have a significant effect on the integrity of the Natura 2000 Network.'

The **Galway City Development Plan 2017-2023** is accompanied by Strategic Environmental Assessment (SEA) and a Natura Impact Report (NIR). The SEA concludes that:

'The policies and objectives of the Development Plan were assessed in respect of sustainability and specifically against the SEO. A matrix was used to rate the impact of policies and objectives, as having potential positive, indirectly positive, neutral, uncertain, negative, or indirectly negative impacts on the SEO. The results of the assessment demonstrate that the Development Plan will not have a significant negative impact on the environment: Where there is a potential impact, it is predominately positive or neutral. Uncertain potential impacts arise for example with specific projects, which depends on factors such as layout and design. Uncertain potential impacts have also been identified for policies relating to the development of large greenfield sites at Ardaun and Murrough, redevelopment proposals within the city, transportation and green network proposals, coastal protection and flood mitigation measures. Where potential impacts occur, they are mitigated by policies, specific objectives, development management standards and monitoring to ensure there is no deterioration in environmental quality'

The NIR concludes the following:

'An assessment on the potential cumulative and in-combinations effects of the Draft Plan concluded that through the implementation of the overarching policies and objectives of the Plan no negative in-combination effects from other plans and projects to European Sites are expected through the implementation of the Plan. Having incorporated mitigation measures, the NIR concluded that it is considered that the Galway City Development Plan 2017-2023 will not have a significant adverse effect on the integrity of the European sites.'

The **Oranmore Local Area Plan 2012-2018** is accompanied by Strategic Environmental Assessment (SEA) and a Natura Impact Report (NIR). The SEA concludes that:

'Subject to the full and proper implementation of the mitigation measures outlined, including appropriate site level investigations, it is considered that significant adverse impacts on the environment will be avoided'.

The NIR concludes the following:

'It is considered that the adoption of the LAP will not result in likely significant effects to the conservation management or integrity of Natura 2000 sites, either individually or in combination with other plans and projects'.

The relevant development plan for the settlement of Barna is a variation to the Galway County Development 2015-2021 (Variation 2a) and therefore the findings of the SEA and NIR for the County Development Plan are relevant to this Variation also.

Development projects within the 15km radius of Mweeloon which have been considered are those which have been recently carried out; those permitted but not yet carried out and those that are in the planning process. These projects include residential, office, retail and infrastructure developments among which are the GHE and GHEP. The impacts of single houses outside of the settlements have also been considered.

There are a number of one off single house developments in Tawin and wider area, some of which have been completed and some of which are on-going. However, due to the relatively low number in the vicinity of Mweeloon and greater separation distances between others and Mweeloon, the potential for a cumulative effect to occur between these projects and the proposed compensatory measures at Mweeloon is not considered significant.

No other plans or projects are in place for the proposed compensatory measures area at Mweeloon. Also, as the compensatory measures include purchase of the land, the Galway Harbour Authority as owners of the land can ensure that there is no development on these lands in the future.

The implementation of the compensatory Management Plans themselves will not have any significant impacts on any of the qualifying interests of the Galway Bay cSAC or the Inner Galway Bay SPA Natura 2000 sites, and, taking that into account they cannot have any cumulative impact with any other planned proposals in that Natura 2000 site.

Due to the distances involved between where any of the above developments have been carried out or are due to be carried out, including the proposed GHE and the completed GHEP and also the small spatial and temporal extent of the proposed compensatory measures, there are no cumulative impacts arising from the proposed compensation plans at Mweeloon with any other completed or planned development.

4.3.3 Cumulative Impacts Conclusion

The potential for a cumulative effect between any/all of these developments in tandem with the proposed compensatory measures at Mweeloon for both the cSAC and the SPA has been taken into account and as there is:

1. No connectivity between any of these sites and the area at Mweeloon,
2. There are no emissions arising from the proposed compensatory measures that could bring about an in combination effect and
3. Other than short term, temporal effects of the repair aspects of the compensatory measures have been designed to have long term positive impacts on the environment,

it can be concluded that there are no cumulative impacts arising from the full suite of compensatory measures at Mweeloon in combination with GHE and GHEP and any other plans or projects in the Galway, Barna or Oranmore areas.

4.3.4 Assessment

4.3.4.1 Mud flats and sand flats not covered by sea at low water [1140]

Based on the conservation objectives listed above and in light of what construction works entail and methodologies that will be used, it is concluded that the proposed works at Mweeloon, alone or in combination with other activities, will not pose any threat to either the

Intertidal habitat and as a result the conservation objectives and overall integrity of the cSAC will not be impacted by the proposed works.

4.3.4.2 Perennial vegetation of Stony Banks [1220]

Based on the conservation objectives listed above and in light of what construction works entail and methodologies that will be used, it is concluded that the proposed works at Mweeloon, alone or in combination with other activities, will not pose any threat to either the perennial vegetation of Stony Bank habitat and as a result the conservation objectives and overall integrity of the cSAC will not be impacted by the proposed works.

4.3.4.3 Atlantic Salt Marsh (Glauco-Puccinellietalia maritimae) [1330]

Based on the conservation objectives listed above and in light of what the repair works entail and methodologies that will be used, it is concluded that the proposed repair works at Mweeloon, alone or in combination with other activities, will not pose any threat to the Atlantic Salt Marsh habitat and as a result the conservation objectives and overall integrity of the cSAC will not be impacted by the proposed works.

4.3.4.4 Semi-natural dry grasslands and scrubland facies in Calcareous substrates (Festuco-Bromatalia important orchid sites [6210]

Based on the conservation objectives listed above and in light of the repair works entail and methodologies that will be used, it is concluded that the proposed works at Mweeloon, alone or in combination with other activities, will not pose any threat to the semi-dry grassland habitat and as a result the conservation objectives and overall integrity of the cSAC will not be impacted by the proposed works.

4.3.4.5 Salicornia and other annuals colonising muds and sand [1310].

As no works are planned to take place within this habitat type, it is concluded that the proposed works at Mweeloon, alone or in combination with other activities, will not pose any threat to the *Salicornia* habitat and as a result the conservation objectives and overall integrity of the cSAC will not be impacted by the proposed works.

4.3.4.6 Limestone pavement [8240].

It is concluded that as no works are planned to take place within this habitat type, the proposed works at Mweeloon, alone or in combination with other activities, will not pose any threat to the Limestone pavement habitat and as a result the conservation objectives for this habitat. The overall integrity of the cSAC will not be impacted by the proposed works.

4.3.4.7 Lagoon [1150].

It is concluded that as no works are planned to take place within this habitat type, the proposed works at Mweeloon, alone or in combination with other activities, will not pose any threat to the lagoonal habitat and as a result the conservation objectives for this habitat. The overall integrity of the cSAC will not be impacted by the proposed works.

4.3.4.8 Otter [1355]

As the works will only occur in day light hours, the chances of otter passing through the site at those is very low. Disturbance therefore to otter during the construction phase is considered negligible. Post-completion of the proposed works, the re-hanging of gates and erection of barbed wire fencing will not restrict connectivity.

Based on the conservation objectives listed above and in light of what construction works entail and methodologies that will be used, it is concluded that the proposed works at Mweeloon, alone or in combination with other activities, will not pose any threat to otter and as a result the conservation objectives and overall integrity of the cSAC will not be impacted by the proposed works.

4.3.4.9 Harbour Seal [1365]

As there are no seal haul out sites present at Mweeloon Lagoon, it is concluded that the proposed work, alone or in combination with other activities, will pose any threat to seals and as a result, the conservation objectives and overall integrity of the cSAC will not be impacted.

4.3.4.10 Inner Galway Bay SPA (004031)

The removal of oyster trestles and the control of *Didemnum* are seen as having a minor positive impact on the SCIs for this SPA.

4.3.5 Conclusion

The impacts from the proposed works, both alone and in combination with other activities including the GHE and GHEP, housing and office developments, student accommodation, roadworks, local one off housing *etc,* will not have any significant, negative effects on either the Galway Bay cSAC or the Inner Galway Bay SPA Natura 2000 sites, their qualifying interests/special conservation interests or conservation objectives.

Of much more significance is the fact that the proposed works will have significant positive beneficial, long term effects on the area where they will be carried out. These include the making fallow of parts of the Intertidal habitat that are currently being used to farm oysters and therefore, the removal of pressures associated with operating the farm *e.g.* tractor access, the control of a non-native, invasive species, *Didemnum vexillum* that has infested the farms and the recovery of Stony Bank and Salt Marsh vegetation by controlling grazing and the introduction of organic farming principals.

There are other ecologically significant positive aspects to the targeting of the site at Mweeloon and these are that:

- 2 priority habitats, Limestone Pavement and Lagoon that had previously not been known for that part of Galway Bay cSAC were recorded during biological survey work,
- The area of lagoon at Tawin represents an additional ca 10% of this habitat on a National scale.

Areas of another Qualifying Interest habitat,

- *Salicornia* muds were recorded at Tawin and
- The rare Horned Poppy (*Glaucium flavum*) was recorded at the site.

The removal of oyster trestles and the control of *Didemnum* are seen as having a minor positive impact on the SCIs for this SPA.

Finally, as GHC will own the lands, the long term protection of this part of Galway Bay cSAC into the future is assured.

The Compensatory Measures Report and this latest Addendum to the NIS include the full details of the proposed compensation measures for the GHE including the historic impacts associated with the development of the GHEP.

5 REFERENCES

DAHG. 2012. Marine Natura Impact Statements in Irish Special Areas of Conservation – A Working Document. April 2012. Prepared by the National Parks and Wildlife Service of the DAHG.

DEHLG. 2009. Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (Revised February 2010).

European Commission. 2000. Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. Office for Official Publications of the European Communities, Luxembourg.

European Commission. 2002. Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Luxembourg.

European Commission. 2007. EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission.

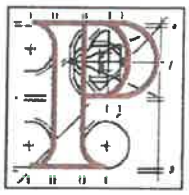
NPWS. 2005. Site Synopsis Inner Galway Bay SPA (004031). 22.2.2005. http://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004031.pdf

NPWS. 2013. Conservation Objectives: Inner Galway Bay SPA 004031. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004031.pdf

APPENDIX No. 1

An Bord Pleanála
Statement of Appropriate Assessment
(Article 6(3))

An Bord Pleanála



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.

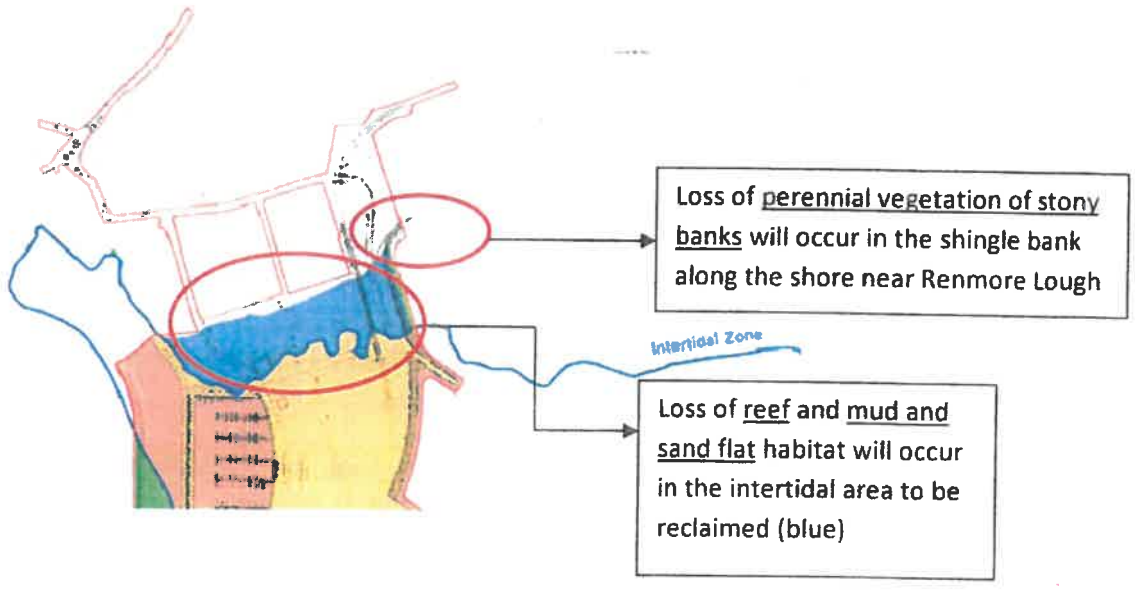
Natura 2000 site	Conclusion
Galway Bay Complex SAC Site code 000268	The integrity of the European site will be affected by the proposed development, specifically: • The direct and permanent loss of fucoid-dominated reef habitat [1170] and mud and sand flat habitat [1140] in Galway Bay Complex cSAC will 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.

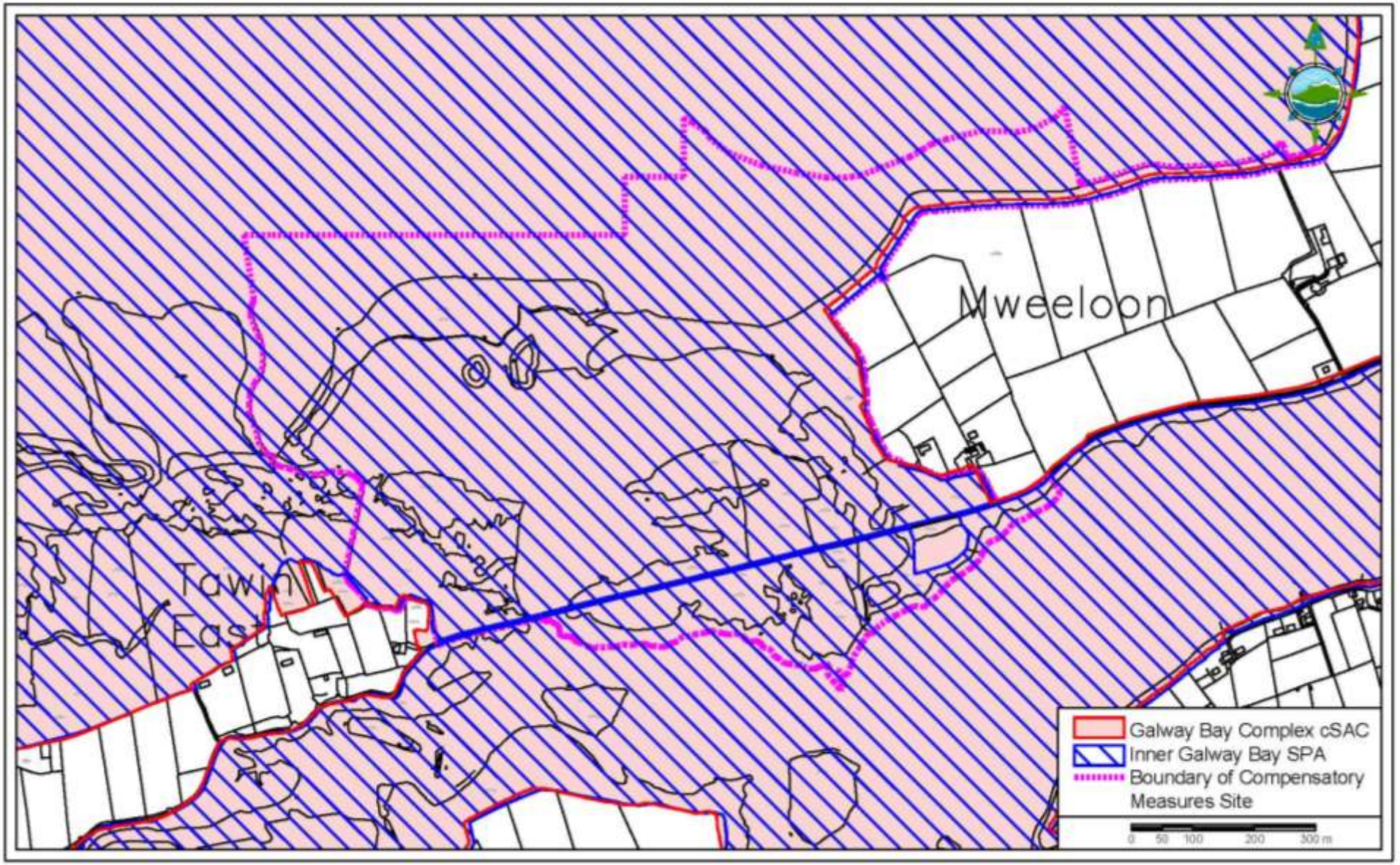
The Board then proceeded to examine whether it should consider applying article 6(4) of the Directive to this project.

September 2015

APPENDIX No. 2

Map of cSAC and SPA

at the proposed Compensatory Measures Site at Mweeloon, Tawin, Co Galway



Galway Bay Complex cSAC 000268 and Inner Galway Bay SPA 004031 Showing the Proposed Compensatory Measures Site at Mweeloon, Tawin, Co Galway

APPENDIX No. 3

Map 1 of Intertidal Management Area

Map 2 of Stony Bank Management Area and Reference Areas

Map 3 of Salt Marsh Management Areas

Map 4 of Photo Locations of Proposed Gate Positions and Wall Repairs

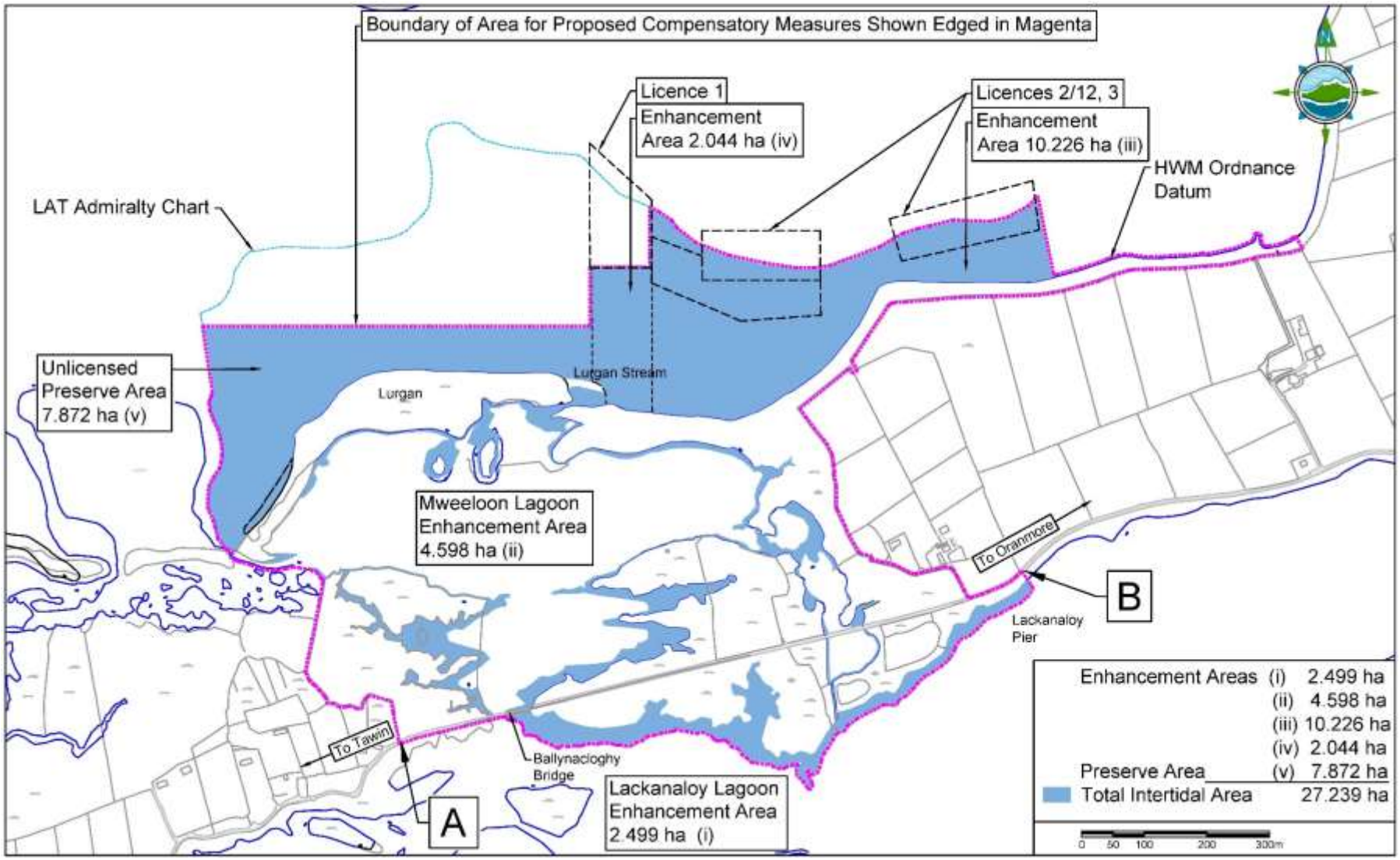


Figure No. 1 – Intertidal Management Area

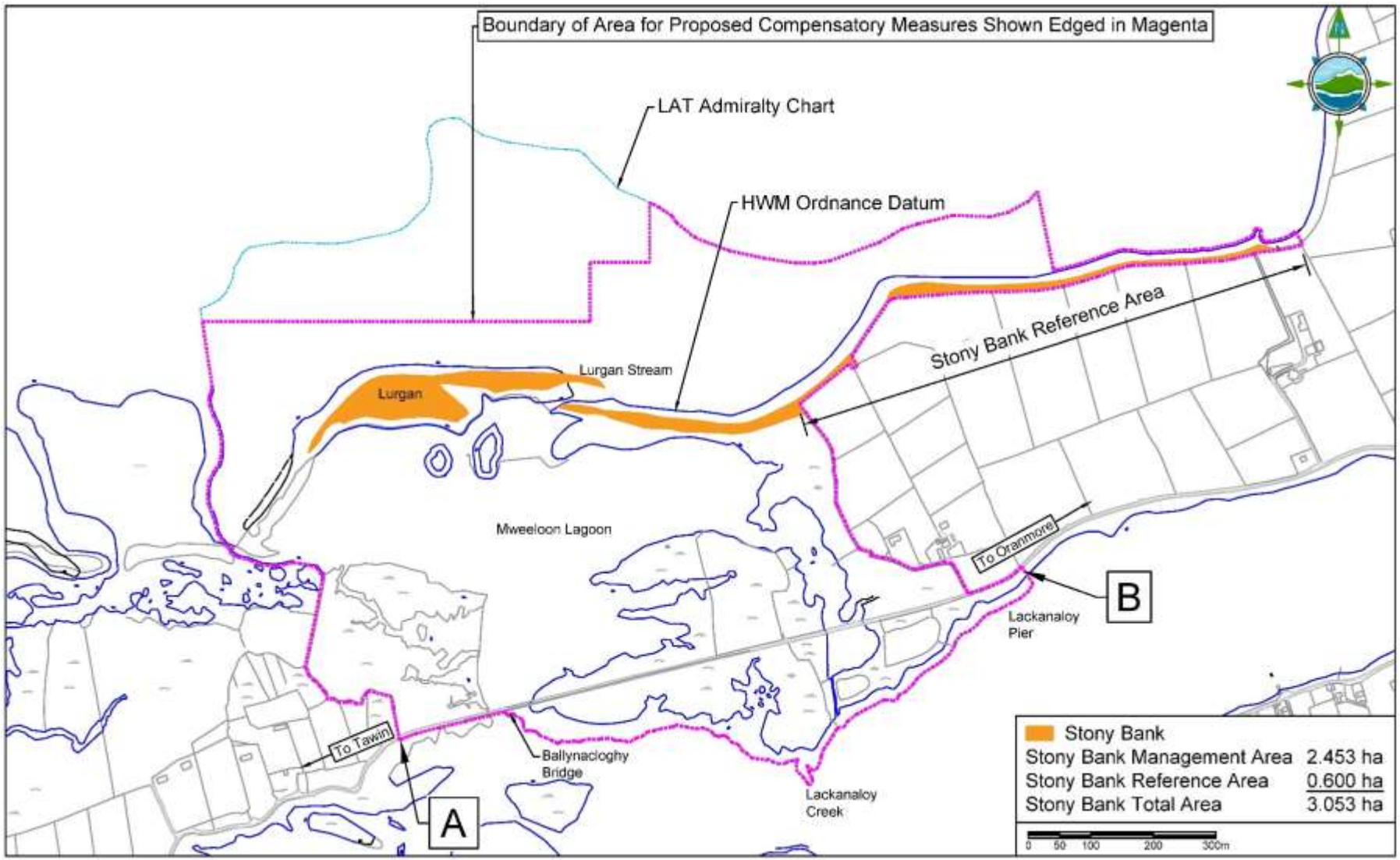


Figure No. 2 – Stony Bank Management and Reference Areas

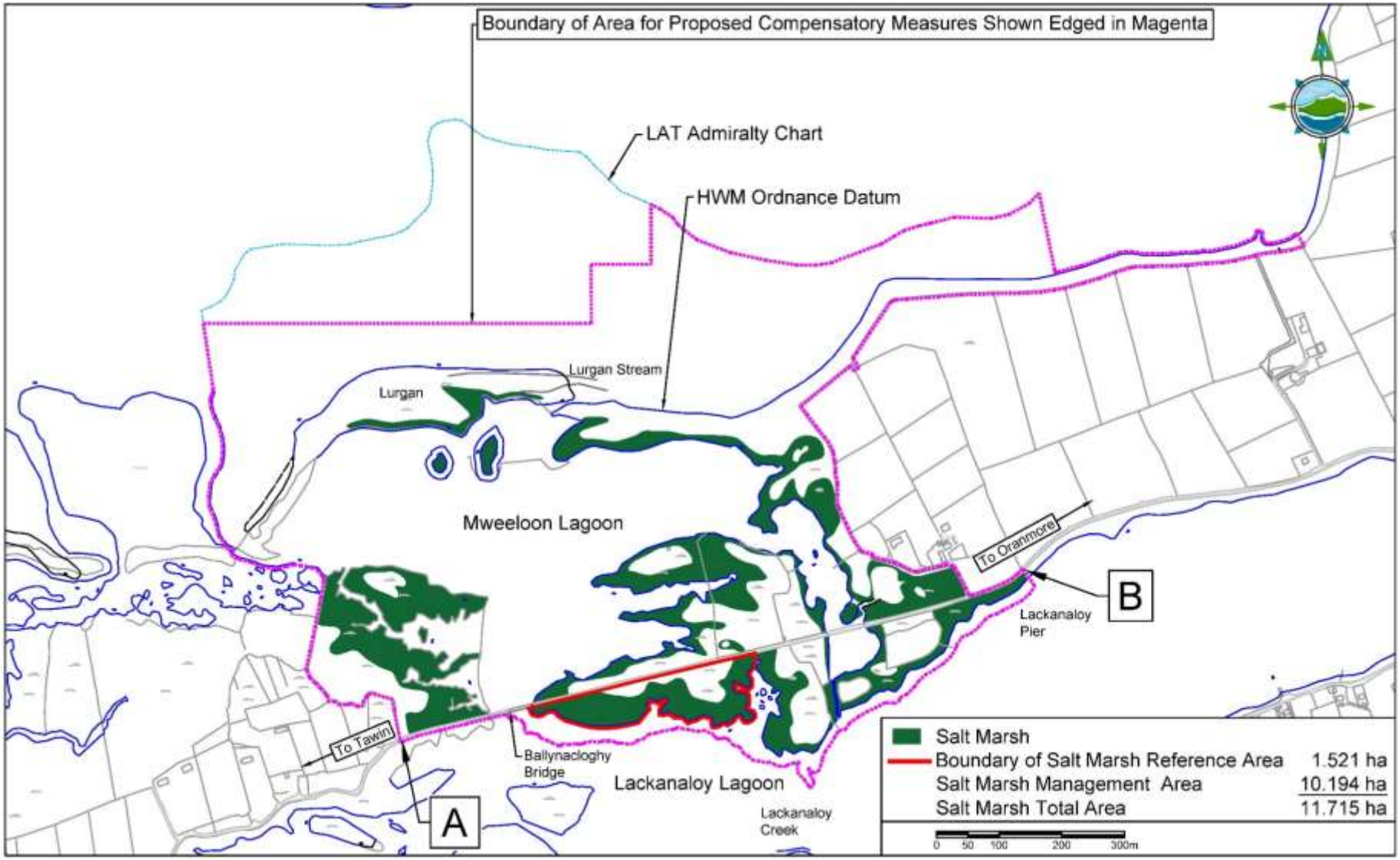


Figure No. 3 – Salt Marsh Management and Reference Areas

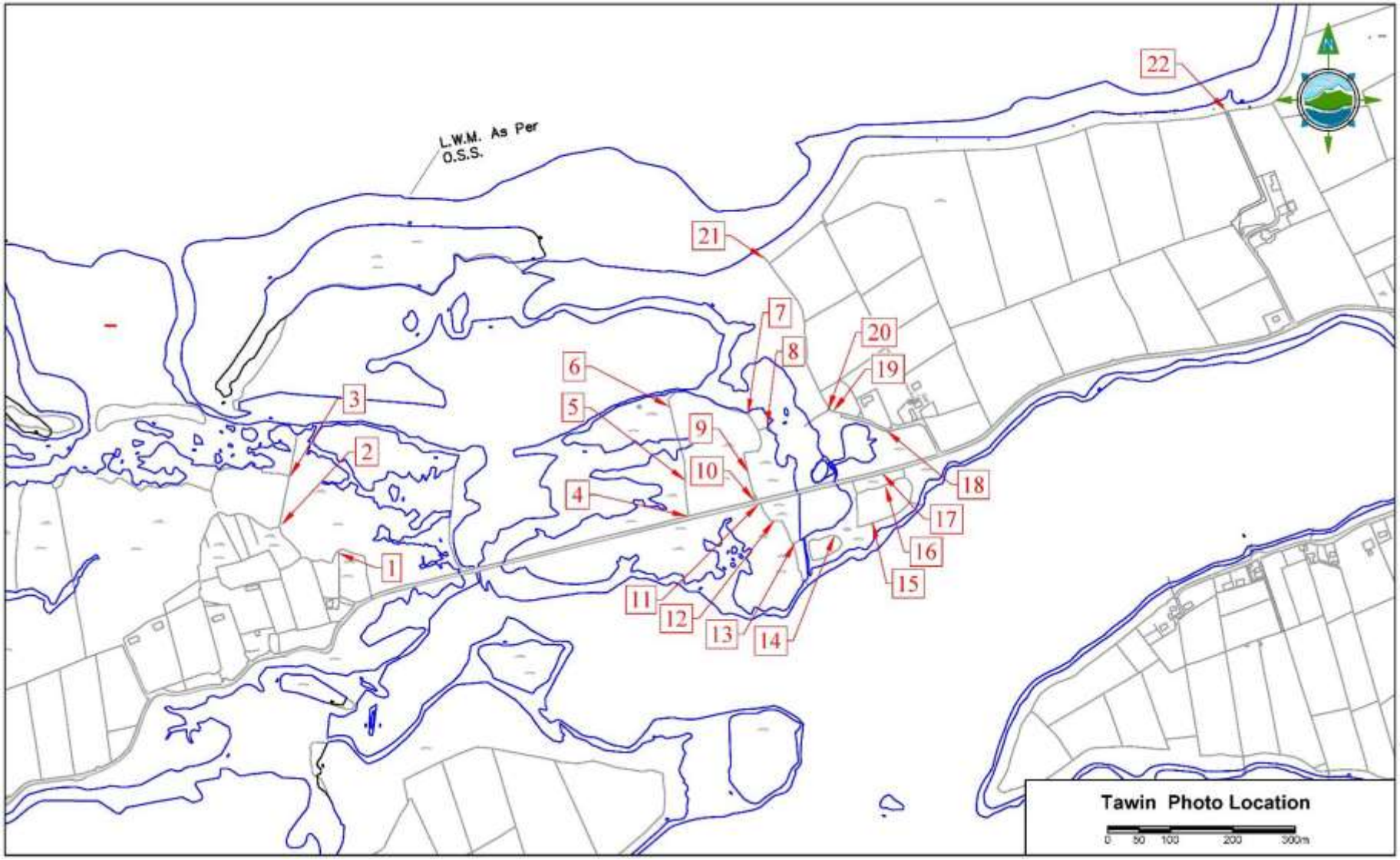


Figure No. 4 – Photo Locations of Proposed Gate Positions and Wall Repairs, see Appendix 14 of the CMR