

**Marine Institute**

**Clonakilty Bay Special Protection Area (004081):  
Appropriate Assessment of Aquaculture**

**April 2021**

**ATKINS**



# Marine Institute

## Clonakilty Bay Special Protection Area: Appropriate Assessment of Aquaculture

April 2021

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# Executive Summary

## Introduction

This document contains the Appropriate Assessment Report for aquaculture in Clonakilty Bay SPA (site code IE004081). The predominant habitats within the SPA are intertidal sand and mud flats.

There is currently no licenced aquaculture within Clonakilty Bay. There is one application to farm oysters (*Crassostrea gigas*) on a site north of Inchydoney Island in the inner harbour - T05/603A. This site is 22.7ha in area and lies at the mouth of Clonakilty Bay and close to Ring Channel.

The aquaculture licence application site occupies 22.57ha; ca. 16.6ha of 0L506 (32.6% of the subsite) and ca. 6ha of 0L507 (15.4% of the subsite). In all the proposed licence occupies ca. 25.2% of the combined area of Outer Clonakilty Bay as defined by the NPWS low tide count sectors 0L506 & 0L507.

Access is proposed from 3 no. locations as shown on Figure 3.1. One is from the public road and along the shoreline from close to the Cul-de-Sac pool. The remaining two access point are by boat from quays in Ring on the eastern side of the Harbour.

## Methodology

Information on the proposed oyster cultivation activities in Clonakilty Bay SPA were obtained from the aquaculture profile document compiled by Bord Iascaigh Mhara. Consultation was also undertaken with the Marine Institute.

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

The distribution of waterbirds was analysed using data from the Irish Wetland Bird Survey (IWeBS) counts of Clonakilty Bay SPA and the National Parks and Wildlife Service (NPWS) Baseline Waterbird Survey (BWS) low tide counts (carried out in 2010/11 at Clonakilty Bay). A number of further low tide counts undertaken by NPWS Regional staff, namely 2011-12; 2012-13 and 2013-14, were also reviewed (from NPWS, 2014a); as were data compiled to inform the *Clonakilty Wastewater Treatment Plant Upgrade. Environmental Impact Statement* prepared by White Young Green (Limosa, 2006). The Clonakilty Bay SPA Conservation Objectives Supporting document also quotes additional data collated by Dr. Lewis from 2000/01 – 2010/11. The age of the NPWS low tide survey work which is relied on heavily in this assessment (2010/11) is of note.

The assessment was further informed by research carried out for a previous Marine Institute project: *The effects of intertidal oyster culture on the spatial distribution of waterbirds* (Gittings and O'Donoghue, 2016) as well as general observations from 2011 and 2016. Maps of flock locations from the NPWS BWS low tide counts and descriptions of waterbird distribution in and NPWS (2014a) have also been used to interpret the patterns derived from these analyses.

Additional sources of data included intertidal and subtidal biotope mapping; NPWS information on marine communities; Admiralty Charts; tidal information; and the MERC 2012 report on intertidal habitats (commissioned by the Marine Institute on behalf of National Parks and Wildlife Service), etc.

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

## Conservation objectives & Screening

The Special Conservation Interest (SCI) of Clonakilty Bay SPA (004081) is the non-breeding population of Shelduck (*Tadorna tadorna*), Dunlin (*Calidris alpina*), Black-tailed Godwit (*Limosa limosa*) and Curlew (*Numenius arquata*). In addition, wetland habitats within Clonakilty Bay SPA are identified to be of conservation importance for non-breeding (wintering) migratory waterbirds. There are no subtidal species for which the SPA has been designated.

There are also several other SPAs in the vicinity: e.g. Courtmacsherry Bay SPA (004219), Seven Heads SPA (004191), Old Head of Kinsale SPA (004021), Galley Head to Duneen Point SPA (004191), Sovereign Islands SPA (004124) and Sheep's Head to Toe Head SPA (004156).

### Status of species in Clonakilty Bay SPA

NPWS in the *Conservation Objective Supporting Document* indicate a long term population trend (up to 25 years) of -51% Highly Unfavourable status for Shelduck. Dunlin and Curlew indicate a long term population trend of Unfavourable (populations that have declined between 25.0 – 49.9% from the baseline reference value). In contrast, Black-tailed Godwit have shown a positive +13% population change.

### Other Species of Note

A very large roost of gulls and terns (>1000) is located on the sandbanks by Ring village; while large numbers of gulls (in the thousands) also congregate in the central portion of Clonakilty estuary at dusk – it is not known if this aggregation persists as a night-time roost. Terns roosting near Ring are predominantly Sandwich Tern (*Thalasseus sandvicensis*) during late summer / autumn. Common tern (*Sterna hirundo*) and Arctic tern (*S. paradisaea*) can also occur. All three tern species are listed on Annex I of the EU Birds Directive. Furthermore, Little Egret (*Egretta garzetta*), breeds at a Grey heron colony adjoining the cul-de-sac pool.

## Conclusions

The extent of intertidal habitat is 40.9ha in 0L506 (80.3% of the subsite) and 27.5ha in 0L507 (71% of the subsite). The total area of intertidal habitat within subsites 0L506 and 0L507 equates to approximately 76.2% of available habitat in these subsites (combined). As noted, within Clonakilty Bay SPA, NPWS (2014a) recorded 325ha of intertidal habitat. The intertidal habitat located within subsites 0L506 and 0L507 therefore equates to ca. 21% of intertidal habitat within Clonakilty Bay SPA as a whole. Its loss would therefore represent a significant loss of this habitat within the SPA; one of whose qualifying interests is Wetland and Waterbirds [A999].

NPWS biotope mapping (from Clonakilty Bay SAC Conservation Objectives supporting documents – marine; NPWS, 2014f ) record a single community type – Sand to sandy mud with *Tubificoides benedii* and *Peringia ulvae* community complex (see Figure 5.6a). This occurs on intertidal and shallow intertidal habitat (<2m within Clonakilty Bay). MERC (2012) found that north of Inchydoney Island is dominated by *Polychaete/bivalve-dominated muddy sand shores* (LS.LSa.MuSa) and *Polychaete/bivalve-dominated mid-estuarine mud shores* (LS.LMu.MEst). (see Figure 5.6b). These sediments are both high in species diversity and biomass (MERC, 2012) and therefore provide good quality habitat for intertidal waders and wildfowl.

The percentage occurrence of the qualifying interest in 0L506 & 0L507 can be summarised as follows: -

- Black-tailed Godwit: 1.06% - 29.64% at low tide; 51.98% at high tide;
- Curlew: 14.00% - 45.33% at low tide; 75.96% at high tide;
- Shelduck: 0% at low tide; 78.57% at high tide; and

- Dunlin: 0.52% - 31.37% at low tide; 51.98% at high tide.

With respect to potential for displacement (based on NPWS low tide data from 2010/11) based on loss of access to intertidal areas within 0L506 & 0L507 within the licence plot: -

- Black-tailed godwit - The peak low tide count was 206 birds; 29.64% of birds in in Clonakilty Bay at this time. Assuming development of T05/603A birds could be displaced from 76.2% of available intertidal habitat at low tide; this would represent ca. 22.6% displacement (average displacement - 8.85%);
- Curlew - The peak low tide count was 135 birds; 45.3% of birds in in Clonakilty Bay at this time. Assuming development of T05/603A birds could be displaced from 76.2% of available intertidal habitat at low tide; this would represent ca. 34.5% displacement (average displacement - 23.4%)
- Shelduck – no birds were recorded at low tide. During the January high tide count 44 birds were recorded in 0L506. While not a large count it did represent 78.6% of Shelduck using Clonakilty Bay at the time.
- Dunlin - The peak low tide count was 101 birds (100 birds in 0L506 in February 2011); 10% of birds in in Clonakilty Bay at this time (1001 birds). Assuming development of T05/603A birds could be displaced from 76.2% of available intertidal habitat at low tide; this would represent ca. 7.62% displacement. However, the LT1 count noted that 31.37% of Dunlin within the bay occurred in these two count sectors (i.e. 48 of 153 birds) – this represented a potential displacement of 23.9% of birds in Clonakilty Bay at this time (average displacement of 9.23%).

Result from the targeted roost counts recorded significant numbers of both Black-tailed Godwit and Dunlin in November 2010; 375 both Black-tailed Godwit in November 2010 (including a flock of 310 godwit recorded along the border of 0L506 and 0L507 roosting intertidally) and a flock of 337 Dunlin in 0L507. These both represent significant numbers.

As noted, a significant tern / gull roost also occurs within Clonakilty Harbour. There is insufficient data available on the numbers, species and location of these roosts to discount the potential for negative impacts. As noted, this includes post-breeding Sandwich Tern, a species listed on Annex I of the EU Habitats Directive.

In conclusion, based on the potential levels of displacement identified above the potential for negative impacts on bird's species for which Clonakilty Bay SPA has been designated cannot be discounted. Given the large risk of displacement there is no obvious mitigation measures that would be helpful.

## Recommendations

While a diverse range of data has been used to ensure a robust assessment is undertaken, the main low tide data was collected in 2010 / 2011. We would recommend that up to date low tide data be collected in order to better understand the current spatial distribution relative to 0L506 & 0L507 as well as within T05/603A.

While, not qualifying interests of Clonakilty Bay SPA, one area of uncertainty relates to the post-breeding / autumn tern roost as well as the areas used by roosting gulls to discount the potential for negative impacts. Note that Sandwich tern roosting at the site most likely originate from the tern colony at Lady's Island Lake SPA (004009).



# 1. Introduction

## Description of the Proposed Development

- 1.1 Atkins (Ecology) was commissioned by the Marine Institute to provide ornithological services in relation to the appropriate assessment of aquaculture and shellfisheries on coastal Special Protection Areas (SPAs).
- 1.2 This report contains the Appropriate Assessment of aquaculture in Clonakilty Bay SPA. The aquaculture sites are within Clonakilty Bay SPA (site code 004081) and this SPA is the primary focus of this assessment. There are also a several other SPAs in the vicinity: - Courtmacsherry Bay SPA (004219); Seven Heads SPA (004191) and Galley Head to Duneen Point SPA (004190). These SPAs are also considered. SPAs in the wider environment are also considered to rule out any usage of Clonakilty Bay SPA by birds from these sites. The boundaries of the SPAs are shown in Figure 1.1.
- 1.3 Clonakilty Bay SPA in west County Cork is a wetland complex which extends from Clonakilty town to the open sea. It comprises two small estuarine bays: Clonakilty Estuary and Inchydoney Estuary (also known as Muckruss Island). These are separated by Inchydoney Island and a section of empoldered land to the west called Island Strand Intake. The main watercourse entering Clonakilty Estuary is the Fealge River, but several small rivers also flow into the site.
- 1.4 There are currently no aquaculture activities in Clonakilty Bay. A crab and lobster pot fishery operate beyond the subtidal boundary of the SPA<sup>1</sup>. There are no Fisheries Natura Declarations (under Regulation 9 of the European Union (Birds and Natural Habitats) (Sea-fisheries) Regulations 2013) in place within Clonakilty Bay.
- 1.5 This assessment is based on a desktop review of existing information, combined with an examination of the results of Irish Wetland Bird Survey data provided by BirdWatch Ireland, the Waterbird Survey Program 2010/11 (NPWS, 2011a), as well as other sources of published data and peer reviewed publications. In the case of trestle cultivation of Pacific oyster, it was also informed by data collected as part of a wider study of the effects of intertidal oyster cultivation on the spatial distribution of waterbirds (Gittings and O'Donoghue, 2012; Gittings and O'Donoghue, 2016). Interpretation of licences and proposed activities was assisted by consultation with Bord Iascaigh Mhara (BIM); the Marine Institute and the Department of Agriculture, Food and the Marine.
- 1.6 Where relevant, it identifies information gaps that may affect the reliability of the conclusions of this assessment.
- 1.7 The data analysis and report writing were done by Paul O'Donoghue.
- 1.8 Scientific names and British Trust for Ornithology (BTO) species codes of bird species mentioned in the text are listed in Appendix A.

## Constraints to this assessment

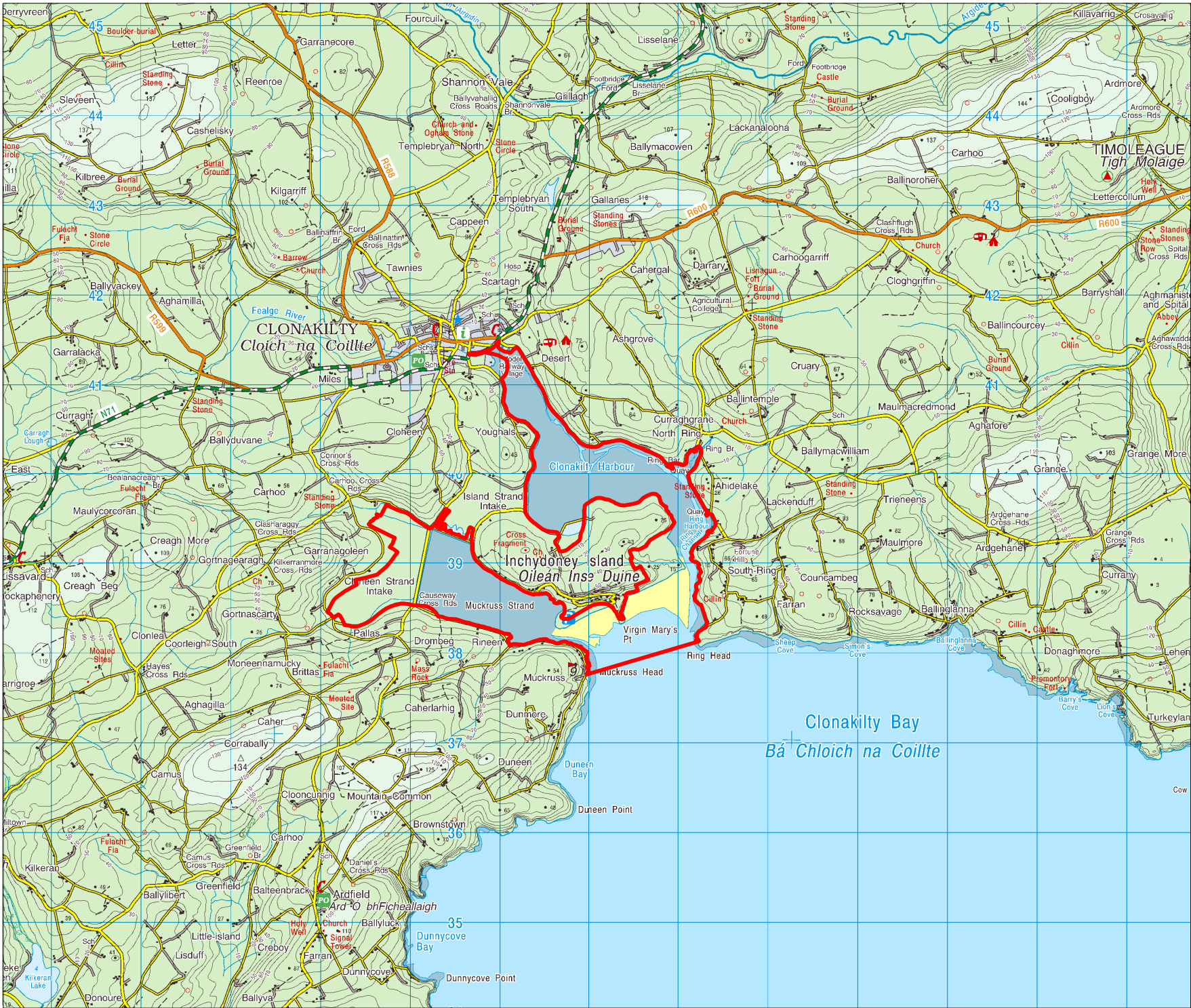
- 1.9 The spatial extents of the aquaculture plots have been derived from shapefiles supplied by the Marine Institute. Detailed information on the aquaculture activities proposed was compiled by BIM

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<sup>1</sup> Ireland's Marine Atlas: [atlas.marine.ie](https://atlas.marine.ie)

through an aquaculture profiling exercise. Details of site specific activities were further clarified through follow-up consultation with BIM, the Marine Institute and the Department of Agriculture, Food and the Marine as appropriate.

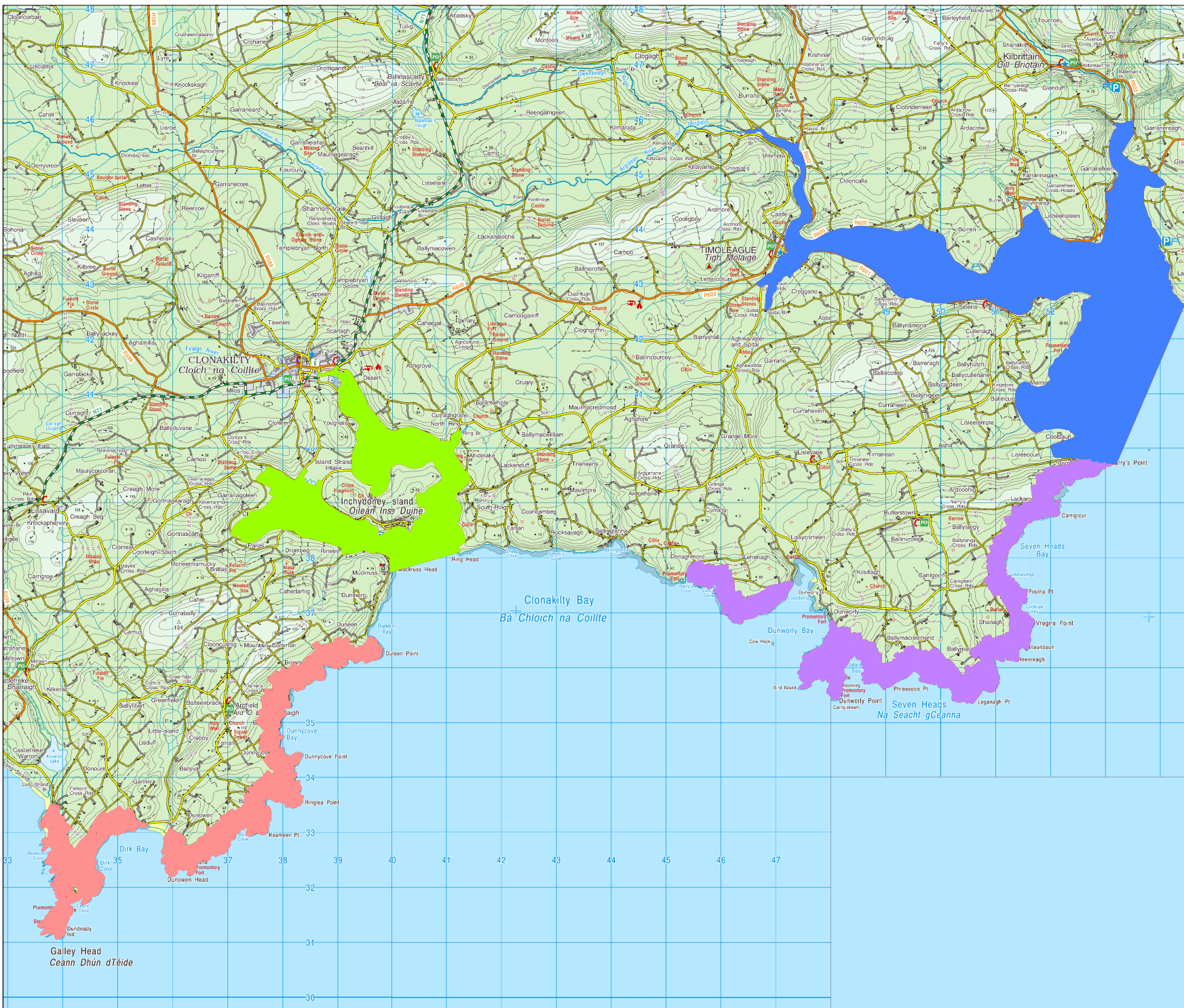
- 1.10 There is little information available on historic patterns and distribution of aquaculture in Clonakilty Bay SPA; where available this is discussed in the relevant chapters assessing specific aquaculture practices.
- 1.11 There is relatively good information available on the low tide distribution of waterbirds in Clonakilty Bay SPA in mid-late winter through the NPWS low tide counts (undertaken in 2009-2010). The I-WeBS dataset generally includes 2-3 good counts per year over the period 2008 – 2014; thus, providing a good dataset for analysis of impacts. The age of the data should, however, be noted.
- 1.12 Good information on general patterns of bird use of Clonakilty Bay SPA was also available through consultation with National Parks & Wildlife Service (2009/2010) and BirdWatch Ireland.
- 1.13 The assessment of cumulative impacts provides a general assessment of issues such as recreational impacts, but without detailed information on other activities it is not possible to precisely quantify these potential impacts. General comments are, however, included as appropriate.



Clonakilty Bay SPA

Client:	Marine Institute		
Project:	Clonakilty Bay SPA - Aquaculture AA		
Title:	Site Location		
Designed/Drawn:	Checked:	Authorised:	
POD	POD	POD	
Date: 17/06/20	Date: 17/06/20	Date: 17/06/20	
Drawing No:	Figure 1.1	Rev: 0.0	

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 Galway - Tel: 353 - 91 786050



**SPAs within 15 km**

- Galley Head to Duneen Point SPA
- Clonakilty Bay SPA
- Courtmacsherry Bay SPA
- Seven Heads SPA

Client:	Marine Institute		
Project:	Clonakilty Bay SPA - Aquaculture AA		
Title:	SPAs within 15km		
Designed/Drawn:	Checked:	Authorised:	
POD	POD	POD	
Date: 17/06/20	Date: 17/06/20	Date: 17/06/20	
Drawing No:	Figure 1.2	Rev: 0.0	



Clonakilty Bay SPA

Client: Marine Institute		
Project: Clonakilty Bay SPA - Aquaculture AA		
Title: Clonakilty Bay SAC		
Designed/Drawn: POD	Checked: POD	Authorised: POD
Date: 17/06/20	Date: 17/06/20	Date: 17/06/20
Drawing No: Figure 1.3		Rev: 0.0

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## 2. Methods

### Data sources

2.1 Clonakilty Bay is counted as part of Irish Wetland Bird Survey<sup>2</sup> co-ordinated by BirdWatch Ireland on behalf of National Parks and Wildlife. The Bay is divided into 5 no. counts zones. Count zones as listed illustrated on Figure 2.1: -

- 0L428 Clogheen Marsh
- 0L430 White's Marsh
- 0L427 Muckruss Strand (western bay)
- 0L431 Clonakilty Harbour (eastern bay & outer bay west of Virgin Mary's Pt.)
- 0L912 Outer bay east of Virgin Mary's Pt.

2.2 There are a number of small differences between the IWEBS count zones and the spatial extent of the SPA. In 0L430 the area counted in IWEBS includes the full lagoon system and is slightly larger than that within the SPA. On Inchydoney Island, the dune system on the eastern end of the island is not counted as part of IWEBS.

2.3 More recently the IWEBS count sectors have been further subdivided from the boundaries shown on the BirdWatch Ireland webpage<sup>3</sup> - see Table 2.1.

**Table 2.1 IWEBS subsites.**

Original Subsite no.'s	Description	Amended Subsite no.'s	Description
0L428	Clogheen Marsh	0L913	Cul-de-sac Pool
0L430	White's Marsh	0L428	Clogheen
0L427	Muckruss Strand (western bay)	0L429	Clogheen Field
0L431	Clonakilty Harbour	0L430	White's Marsh
0L912	Outer bay east of Virgin Mary's Pt.	0L427	Inchydoney
		0L914	Island Strand Intake
		0L608	Deasy's Quay
		0L431	Clonakilty Harbour
		0L912	Inchydoney East

2.4 Clonakilty Bay was counted in 2010 / 2011 as part of the National Parks and Wildlife Service Waterbird Survey Program (as described in NPWS, 2011a). The Waterbird Survey Program was

<sup>2</sup> <https://www.birdwatchireland.ie/?tabid=111>

<sup>3</sup> <https://bwi.maps.arcgis.com/apps/View/index.html?appid=1043ba01fcb74c78bc75e306eda48d3a>

undertaken by BirdWatch Ireland on behalf of NPWS. Unlike IWeBS, which focuses on high tide survey work, the Waterbird Survey Program undertook a series of low tide surveys and considered the spatial distribution of waterbirds within the bay at low tide (4 counts) as well as a single high tide survey in the winter of 2010/2011. The age of this data should be noted. Findings are presented in Cummins and Crowe (2011); *Collection of base line waterbird data for Irish coastal Special Protection Areas 2010/ 2011* as well as in NPWS (2014a); *Clonakilty Bay SPA (Site Code 4081). Conservation Objective Supporting Document*.

2.5 The *Conservation Objective Supporting Document* also includes data from more recent low tide surveys undertaken by NPWS Regional staff; namely 2011-12; 2012-13 and 2013-14 (NPWS, 2014a).

2.6 In the NPWS Waterbird Survey Program the study area was divided into 17 no. subsites. Equivalence between IWEBS and NPWS Waterbird Survey Program is shown below. Count subsite 0L501 Island Strand Intake is largely outside the SPA; apart from the southern end at White's Marsh (the latter is equivalent to IWEBS subsite 0L430 (see Figure 2.2). As noted, a large area of dunes on the eastern end of Inchydoney Island was not counted.

**Table 2.2 Equivalence between IWEBS and NPWS Waterbird Survey Program count subsites.**

NPWS WSP Subsite Code	Subsite Name	Overlap with IWEBS Subsite
0L447	Deasy's Quay	0L431
0L448	Desert North	0L431
0L449	Desert South	0L431
0L450	Youghals House	0L431
0L451	Muckruss Head	0L427
0L462	East Muckruss Strand	0L427
0L465	West Muckruss Strand	0L427
0L500	Causeway	0L427
0L501	Island Strand Intake	Includes White's Marsh – 0L430. Most of Island Strand Intake not counted by IWEBS
0L502	Clogheen Strand Intake	0L428
0L503	Inchydoney Island	0L431
0L504	Inchydoney House	0L431
0L505	Youghals SE	0L431
0L506	Ring Quay	0L431
0L507	Ring Harbour	0L431
0L508	Ring Head	0L912 (slight difference on norther boundary in Ring Channel)
0L509	Desert Church	0L431

2.7 An assessment of previous data collected by Dr. L.J. Lewis (monthly count data for the period January 2000 – February 2002) including low-tide species distribution was included in the Ecology Chapter (7.0; prepared by Limosa) of the *Clonakilty Wastewater Treatment Plant Upgrade. Environmental Impact Statement* prepared by White Young Green (Limosa, 2006). These data have also been reviewed to inform this assessment.

2.8 In the case of trestle cultivation of Pacific oyster the assessment was also informed by data collected as part of a wider study of the effects of intertidal oyster cultivation on the spatial distribution of waterbirds (Gittings and O'Donoghue, 2012; Gittings and O'Donoghue, 2016).

Interpretation of licences and proposed activities was assisted by consultation with Bord Iascaigh Mhara (BIM); the Marine Institute and the Department of Agriculture, Food and the Marine.

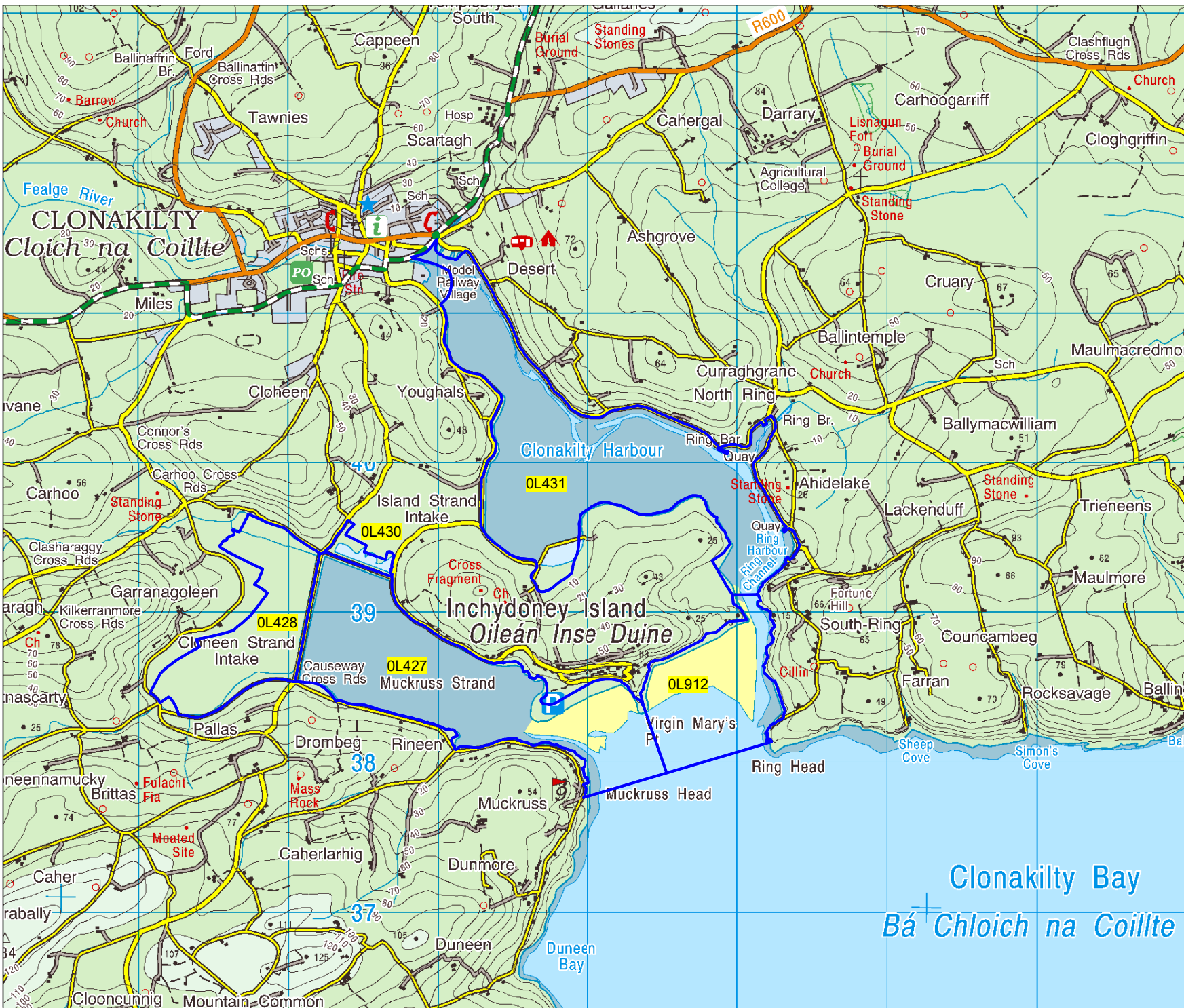
- 2.9 The SPA boundaries are derived from NPWS<sup>4</sup> shapefiles. The spatial extents of the aquaculture plots have been derived from shapefiles supplied by the Marine Institute.
- 2.10 Information on the development and current practices of aquaculture in Clonakilty Bay was obtained from the aquaculture profile document compiled by Bord Iascaigh Mhara as well as consultation with the Marine Institute and the Department of Agriculture, Food and the Marine, as appropriate. The aquaculture profile is included in full in Chapter 2.0 and was used to inform this Appropriate Assessment.
- 2.11 Clonakilty Bay does not currently have a CLAMS plan (i.e. Co-ordinated Local Aquaculture Management Systems). CLAMS is a “*is a nationwide initiative to manage the development of aquaculture in bays and inshore waters throughout Ireland at a local level. In each case, the plan fully integrates aquaculture interests with relevant national policies*” (BIM, n.a.) (see <http://www.bim.ie/clams/>).
- 2.12 Biotopes within Clonakilty Bay were reviewed in *Conservation Objectives: Clonakilty Bay SAC 000091* (NPWS, 2014b). GIS / mapping was downloaded from NPWS online Habitats and Species data portal (<http://www.npws.ie/maps-and-data/habitat-and-species-data>) and also viewed on EMODnet – The European Marine Observation and Data Network<sup>5</sup>.
- 2.13 The extent of intertidal and subtidal habitats in key bays are based on Admiralty Chart data and represent the depth below the lowest astronomical tide; supplemented by available aerial imagery. NPWS (2014a) notes that area of broad habitat types that occur within the SPA are as follows: -
- Subtidal 67ha
  - Intertidal 325ha
  - Supratidal 39ha
  - Lagoons & associated habitats 77ha
- 2.14 Data on the timing and height of low tides were obtained from the United Kingdom Hydrographic Offices Admiralty EasyTide website (<http://easytide.ukho.gov.uk/>).
- 2.15 Information on other activities (such as recreational use and shellfish gathering) was obtained primarily from the data on potentially disturbing activities recorded during the NPWS low tide counts; supplemented by desktop research and consultation.
- 2.16 Desktop research to find other published studies on birds within Clonakilty Bay was also undertaken. These are referenced as appropriate below.

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<sup>4</sup> <http://www.npws.ie/maps-and-data/designated-site-data/download-boundary-data>

<sup>5</sup> <https://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/>





IWEBS Subsites

Clonakilty Bay  
Bá Chloich na Coillte

Client: Marine Institute		
Project: Clonakilty Bay SPA - Aquaculture AA		
Title: IWEBS Subsites		
Designed/Drawn: POD	Checked: POD	Authorised: POD
Date: 17/06/20	Date: 17/06/20	Date: 17/06/20
Drawing No: Figure 2.1		Rev: 0.0

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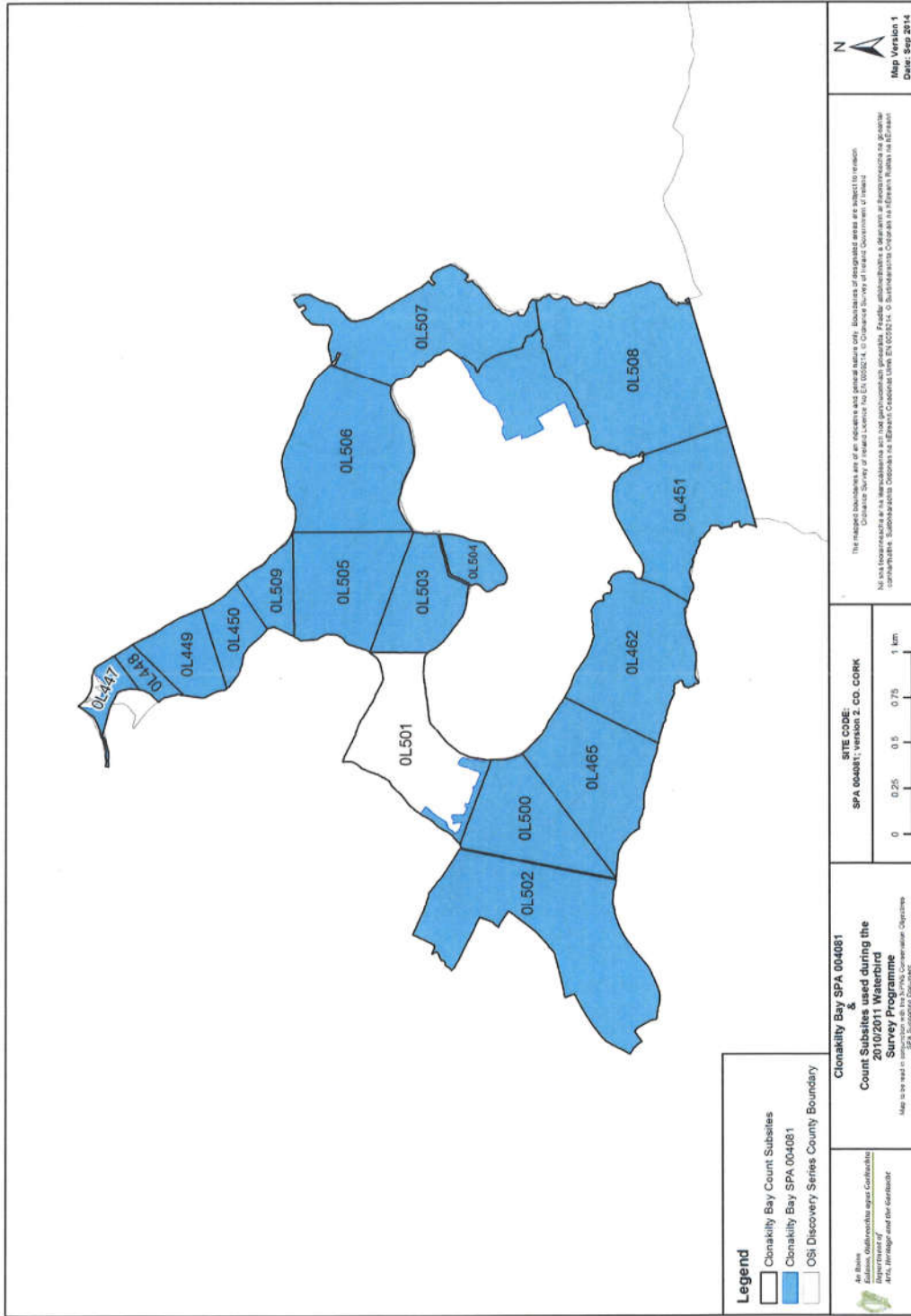


Figure 2.2 NPWS waterbird survey program subsite boundaries (from NPWS, 2014a).

## Assessment Methodology

### Identification of potential impacts

- 2.17 A literature review was carried out to assess the likely main food resources of the SCI species in the Clonakilty Bay SPA. Information on the impact of the proposed aquaculture activities on intertidal and subtidal biotopes from the SAC Appropriate Assessment, and previous published research, has been used to identify potential impacts to prey resources used by the SCI species. Where available, previous research (Caldow *et al.*, 2003; Gittings and O'Donoghue, 2012 / 2016; Roycroft *et al.*, 2004, 2007; Scheiffarth *et al.*, 2007; van der Kam *et al.*, 1999; Wehrmann, 2009) has also been used to identify the likely response (positive, neutral or negative) of the SCI species to the activities being assessed.
- 2.18 Potential negative impacts to SCI species have been identified where the activity may cause negative impacts to prey resources, where there is evidence of a negative response to the activity by the species from previous work, and/or where a negative response is considered possible by analogy to activities that have similar types of impacts on habitat structure and/or by analogy to ecologically similar species.
- 2.19 With respect to cultivation of oysters on trestles, the primary source of information used for the identification of potential impacts is the oyster trestle study (Gittings and O'Donoghue, 2012; 2016). The results of this study were used to identify consistent patterns of positive or negative association with oyster trestles across the sites studied and categorised species into the following groups: neutral/positive association, negative association, exclusion response, and variable response (response may vary between sites). The trestle study was carried out during periods with typical levels of husbandry activity. Therefore, the effects of disturbance due to husbandry activity associated with intertidal oyster cultivation are included in the categorisation of species responses and such disturbance impacts are not analysed separately in this assessment. The trestle study focused on species associated with the intertidal and/or shallow subtidal habitats including Light-bellied Brent Goose.

### Assessment of impact magnitude

- 2.20 In previous Appropriate Assessments, the approach adopted was that where potential impacts from an activity on a SCI species have been identified, the spatial overlap between the distributions of the species and the spatial extent of the activity was calculated, or qualitatively assessed when quantitative data was not available. This overlap is considered to represent the potential magnitude of the impact, as it represents the maximum potential displacement if the species has a negative response to the activity. Where appropriate, information on species habitat usage is also used to refine the assessment of likely impact magnitude.

### Assessment of impact significance

- 2.21 The methodology used for this Appropriate Assessment is focussed on the Conservation Objectives, and their attributes, that have been defined and described for the Clonakilty Bay SPA (NPWS, 2014a).
- 2.22 Conservation Objective 1 defines two types of attributes to assess conservation condition: long term population trends and numbers or range (distribution) of areas used. This assessment focuses on assessing potential impacts on the spatial distribution of qualifying interest within Clonakilty Bay SPA and, in particular, whether the activities will cause displacement of a significant proportion of the Clonakilty Bay SPA population of these species from the affected area(s). If the activities are not predicted to cause significant displacement, then the activities are

not likely to affect the long term population trends. If the activities are predicted to cause significant displacement, then the activities could affect the long term population trends (but see below). In the cases where the activities are predicted to cause significant displacement, the impacts on distribution and population size are assessed separately.

- 2.23 The basis for the assessments is datasets that indicate the distribution of waterbird species between different broad sectors of Clonakilty Bay SPA (e.g. IWeBS, NPWS Waterbird Survey Programme etc.). In general, the approach adopted to examine the potential for negative impacts is to use datasets in order to allow calculation of the proportion of the Clonakilty Bay SPA population that would be affected if aquaculture or fisheries activities cause displacement of birds from areas occupied by the activities. This approach can be considered as a very simple form of habitat association model and represents a conservative form of assessment (see Stillman and Goss-Custard, 2010): the population-level consequences of displacement will depend upon the extent to which the remaining habitat is available (i.e., whether the site is at carrying capacity). In general, this assessment method “*will be pessimistic because some of the displaced birds will be able to settle elsewhere and survive in good condition*” (Stillman and Goss-Custard, 2010).
- 2.24 The assessment of potential disturbance impacts is based mainly on the potential for disturbance to cause displacement of birds from areas they would otherwise occupy. However, where there is limited availability of alternative habitat, or where the energetic costs of moving to alternative habitat is high, disturbance may not cause displacement of birds but may still have population level consequences (e.g., through increased stress, or reduced food intake, leading to reduced fitness) (Gill *et al.*, 2001a/b). However, assessing these types of potential impacts would require detailed population modelling, which would require a major research effort that is beyond the scope of this assessment.

### Assessment of significance

- 2.25 The significance of any potential impacts identified has been assessed with reference to the attributes and targets specified by NPWS (2014a) for this conservation objective. Potential negative impacts are either assessed as significant (if the assessment indicates that they will have a detectable effect on the attributes and targets) or not significant. The significance levels of potential positive impacts have not been assessed.

#### Attribute 1 – Long term population trends

- 2.26 The criteria that we have used in Appropriate Assessments to date for assessing significance with reference to attribute 1 of the conservation objectives are summarised in Table 2.3 and are described below.
- 2.27 If the impact is predicted to cause spatial displacement of >25% of the total Clonakilty Bay SPA population of a SCI species, then the impact could, pessimistically, cause the long term population trend to show a decrease of 25% or more. Therefore, the impact would be potentially significant with reference to attribute 1 of the conservation objective.
- 2.28 If the long-term population trend of the species is a decrease of 25% or more, and the impact is predicted to cause spatial displacement of 5% or more (see criteria under Attribute 2), then the impact could prevent the potential recovery of the population. Therefore, the impact would be potentially significant with reference to Attribute 1 of the conservation objective.
- 2.29 If the long-term population trend of the species is a decrease of less than 25%, but the combination of the long-term population trend and the predicted spatial displacement (where the latter is assessed to be significant; see criteria under Attribute 2) would equal or exceed 25%, then the impact could cause the long term population trend to show a decrease of 25% or more.

Therefore, the impact would be potentially significant with reference to attribute 1 of the conservation objective.

**Table 2.3 Criteria for assessing significance with reference to attribute 1 of the conservation objectives.**

Long-term population decrease (P)	Spatial displacement (S)	Additional criteria	Impact
-	≥ 25%	-	Significant
≥ 25%	≥ 5%	-	Significant
< 25%	≥ 5%	P + S ≥ 25%	Significant

**Attribute 2 – Number or range (distribution) of areas used**

2.30 Assessing significance with reference to attribute 2 is more difficult because the level of decrease in the numbers or range (distribution) of areas that is considered significant has not been specified by NPWS. There are two obvious ways of specifying this threshold: (i) the value above which other studies have shown that habitat loss causes decreases in estuarine waterbird populations; and (ii) the value above which a decrease in the total Clonakilty Bay SPA population would be detectable against background levels of annual variation.

2.31 If a given level of displacement is assumed to cause the same level of population decrease (i.e., all the displaced birds die or leave the site), then displacement will have a negative impact on the conservation condition of the species. However, background levels of annual variation in recorded waterbird numbers are generally high, due to both annual variation in absolute population size and the inherent error rate in counting waterbirds in a large and complex site. Therefore, low levels of population decrease will not be detectable (even with a much higher monitoring intensity than is currently carried out). The minimum error level in large-scale waterbird monitoring is considered to be around 5% (Hale, 1974; Prater, 1979; Rappoldt, 1985). Therefore, any population decrease of less than 5% is unlikely to be detectable and, for the purposes of this assessment, 5% has been taken to be the threshold value below which displacement effects are not considered to be significant. This is a conservative threshold, as error levels combined with natural variation are likely to, in many cases; prevent detectability of higher levels of change. This threshold is also likely to be very conservative in relation to levels that would cause reduced survivorship (see above).

**Summary**

2.32 Impacts have been assessed as potentially having a significant negative impact on attribute 1 of the conservation objectives (the species' long-term population trend), if they are predicted to cause: -

- Displacement of 25% or more of the Clonakilty Bay SPA total; or
- Significant displacement levels (i.e., 5% or greater; see below) that combined with current long-term population trends, could result in a long-term population decline of 25%; or
- Significant displacement levels (i.e., 5% or greater; see below) where the current long-term population trends are already equal to or greater than 25%.

2.33 Impacts that will cause displacement of 5% or more of the total Clonakilty Bay SPA population of a SCI species have been assessed as potentially having a significant negative impact on attribute 2 of the conservation objectives (the species' distribution within Clonakilty Bay SPA). In this

context, displacement may involve birds moving to other areas within the SPA or leaving the site altogether.

- 2.34 The 25% threshold has been derived from the NPWS conservation objectives. The 5% threshold is based on the rationale presented above.

## 3. Aquaculture Profile

### Clonakilty Bay Overview

#### General description

- 3.1 Clonakilty Bay is described by NPWS as “*Clonakilty Bay in west Cork is an inter tidal expanse that stretches from Clonakilty to the open sea, and comprises two small estuaries separated by Inchydoney Island. The site also includes adjacent sand dunes and inland marshes, and therefore is a coastal complex with a good diversity of habitats*” (NPWS, 2013; SAC Site Synopses; 2013 - 000091\_Rev13.Doc).
- 3.2 The town of Clonakilty is located at the head of the more easterly bay; where the River Fealge joins the estuary. The village of Ring, with associated pier, is also located on the eastern side of the bay. A narrow strait known as Ring Channel connects to the sea on the eastern side of Inchydoney Island. A coastal lagoon, separated from the estuary, is located on the northern shore of *Inchydoney Island*. This supports a nesting colony of Grey heron (*Ardea cinerea*) and Little egret (*Egretta garzetta*).
- 3.3 A second large bay, called Muckruss Strand, is located on the western side of Inchydoney Island. The western / northwestern side of this is bound by causeway roads – beyond which are located a number of notable wetlands; Clogheen Marsh and White’s Marsh.
- 3.4 Apart from urban development centred on Clonakilty and the Inchydoney Hotel, the catchment of the bay is mainly agricultural; with dairy farming the dominant land use.
- 3.5 Clonakilty has frequently been flooded and is currently the subject of a Flood Relief Scheme. This “*is designed to protect the town of Clonakilty from fluvial flooding from the Ballyhalwick River, the River Fealge, the Cappeen Stream and the Garage Stream along with tidal flooding from Clonakilty Bay*” (<http://clonakiltyfrs.ie/>).
- 3.6 A new Waste Water Treatment Plant has been constructed by EPS – <https://www.epswater.ie/group/nereda-wwtp-clonakilty>. The discharge consent is as follows: - BOD 25 mg/l, TSS 35 mg/l, MRP 1 mg/l, Total-P 2mg/l, Total-N 15 mg/l, NH3-N 10 mg/l

#### Protected Sites and Species

- 3.7 The Bay is designated as Clonakilty Bay SAC (000091) and Clonakilty Bay SPA (004081). It is also designated as Clonakilty Bay proposed Natural Heritage Area (000091).
- 3.8 Ramsar sites are designated as a result of the Ramsar Convention, held in Iran in 197 (refer to <http://www.ramsar.org/>). The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources; Clonakilty Bay is not listed as a Ramsar site.
- 3.9 The qualifying interests of Clonakilty Bay SAC (000091) are: -
- Mudflats and sandflats not covered by seawater at low tide [1140]
  - Annual vegetation of drift lines [1210]
  - Embryonic shifting dunes [2110]

- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
- Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150]

## Aquaculture Overview

- 3.10 The following profile was prepared by Bord Iascaigh Mhara (BIM) and is reproduced (with minor changes) in full here in order to inform the Appropriate Assessment.
- 3.11 There is currently no licenced aquaculture within Clonakilty Bay. There is one application to farm oysters (*Crassostrea gigas*) on a site north of Inchydoney Island in the inner harbour - T05/603A. This site is 22.7ha in area and lies at the mouth of Clonakilty Bay and close to Ring Channel.

### Oyster production

- 3.12 Oyster production has a life cycle from seed input to harvest for market of 2½ years. Oysters are sold fully grown at a size range from 60-140 grams, or as half grown for ongrowing elsewhere.
- 3.13 The oyster seed will either be bought in from other farms in Ireland; oyster nurseries in Ireland the UK and France; or from wild seed stocks in France.
- 3.14 It is not indicated in the application whether diploid or triploid seed is proposed to be used on site.

### Bag and Trestle Method

- 3.15 It is proposed that cultivation of oysters will be undertaken using trestles and bags. The trestle type to be used in Bay will most likely measure 3m x 1m and stand 0.4 – 1.2m in height, holding 5-6 bags each. Bags are made of a plastic (HDPE) mesh and are fastened to trestles using rubber straps and hooks. Bags vary in mesh size depending on oyster stock grade (6mm, 9mm, and 14mm). Trestle size may vary according to local conditions.
- 3.16 Seed is generally imported in the spring and in the autumn of each year. The intake size ranges, packed in oyster bags at a predetermined density and taken to the inter-tidal zone, where the bags are attached to trestles for the growing process to begin.
- 3.17 Packing densities of seed is individually determined by each producer.
- 3.18 Oysters are thinned out and graded as the oysters grow. As the oysters grow, they are taken to a handling / sorting facility or foreshore area for splitting and re-packing, and returned to the trestles. The seed will be split following a few months once growth starts. Producers generally split the oysters either once or twice over the growth cycle. Again the density following splitting varies from producer to producer.

### Oyster Site Layouts

- 3.19 The trestles are arranged in rows and blocks on site. Again, this is not determined on the application. Rows are often set out in pairs with sufficient gap between pairs for flat-bottomed vessels or tractors to pass, allowing servicing. Other producers will arrange trestles in blocks e.g. block of 40 trestles where there are 4 trestles deep and 8 trestles long. There are generally gaps left between blocks for access and servicing.



- 3.20 The site will either be accessed by boat from a nearby pier or by tractor across the foreshore.



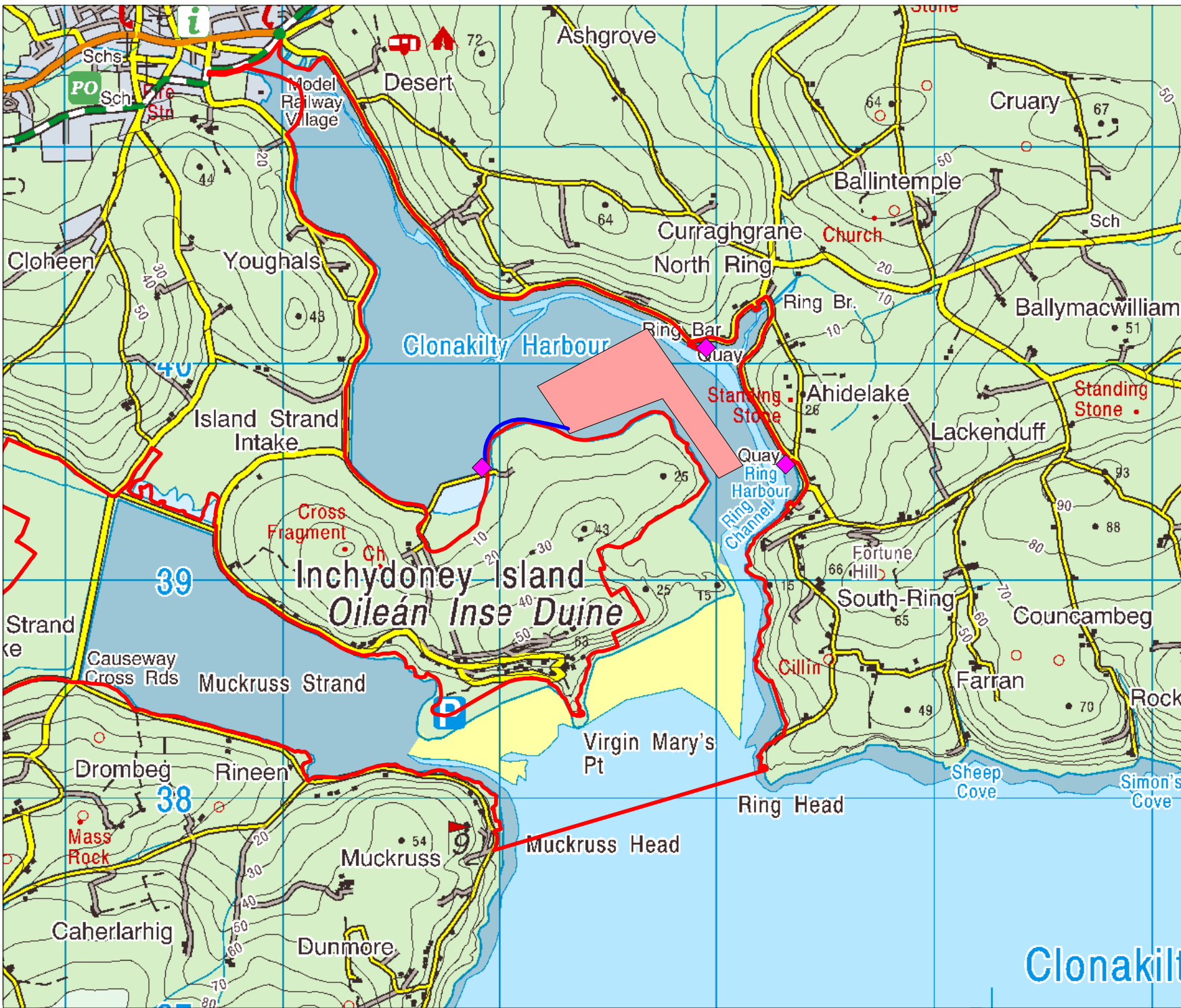
**Plate 3.1 Example of Bag trestle cultivation of pacific oyster.**

### Turning Oyster Bags

- 3.21 Producers generally turn each bag on site once a month. Turning takes place when the oysters are growing. This means turning takes place from March up to Oct/Nov depending on growth. Both spring tides of each month are generally used by producers to get out to their sites.

### Site Access

- 3.22 Access to the site is across the foreshore from the west by tractor and at three point for potential boat access (see Figure 3.1). The potential for negative impacts to Annex I habitats for which Clonakilty Bay SAC has been designated are addressed in the accompanying Appropriate Assessment of impacts to Clonakilty Bay SAC.



- Clonakilty Bay SPA
- Licence Application
- T05/603A - Oysters
- Access
- ◆ Boat Access Points
- Shore Access Route

Client: Marine Institute		
Project: Clonakilty Bay SPA - Aquaculture AA		
Title: Aquaculture Sites		
Designed/Drawn: POD	Checked: POD	Authorised: POD
Date: 17/06/20	Date: 17/06/20	Date: 17/06/20
Drawing No: Figure 3.1		Rev: 0.0

Clonakilty

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## 4. Conservation objectives

### Clonakilty Bay SPA (004081)

#### Qualifying features

- 4.1 The Special Conservation Interests (SCIs) of Clonakilty Bay SPA (004081) include non-breeding populations of Shelduck, Dunlin, Black-tailed Godwit and Curlew.
- 4.2 In addition, wetland habitats within Clonakilty Bay SPA are identified to be of conservation importance for non-breeding (wintering) migratory waterbirds. Therefore, the wetland habitats are considered to be an additional Special Conservation Interest (NPWS, 2014a<sup>6</sup> & c<sup>7</sup>).

#### Conservation objectives

##### SCI species

- 4.3 The conservation objectives for the non-breeding populations of Shelduck, Dunlin, Black-tailed Godwit and Curlew at Clonakilty Bay SPA are to maintain their favourable conservation status (NPWS, 2014a & c).
- 4.4 The favourable conservation conditions of these species at Clonakilty Bay SPA are defined by various attribute and targets, which are shown in Table 4.1.

**Table 4.1 Attributes and targets for the conservation objectives for Shelduck, Dunlin, Black-tailed Godwit and Curlew at Clonakilty Bay SPA.**

Attribute	Measure	Target	Notes
1 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
2 Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing and intensity of use of areas used by the 'SCI species', other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/10 waterbird survey programme is discussed in Part Five of the conservation objectives supporting document

Source: NPWS (2014a). Attributes are not numbered in NPWS (2014a), but are numbered here for convenience.

#### Wetlands and waterbirds

- 4.5 The conservation objective for wetlands and waterbirds at Clonakilty Bay SPA is to to “*maintain the favourable conservation condition of the wetland habitat in Clonakilty Bay SPA as a resource for the regularly occurring migratory waterbirds that utilise it*” (NPWS, 2014a).

<sup>6</sup> [https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO004081.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004081.pdf)

<sup>7</sup>

[https://www.npws.ie/sites/default/files/publications/pdf/Clonakilty%20Bay%20SPA%20\(004081\)%20Conservation%20objectives%20supporting%20document%20-%20\[Version%201\].pdf](https://www.npws.ie/sites/default/files/publications/pdf/Clonakilty%20Bay%20SPA%20(004081)%20Conservation%20objectives%20supporting%20document%20-%20[Version%201].pdf)

- 4.6 The favourable conservation condition of the wetland habitat at Clonakilty Bay SPA is defined by a single attribute and target, which is shown in Table 4.2.

**Table 4.2 Attribute and target for the conservation objective for wetlands and waterbirds at Clonakilty Bay SPA.**

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 508 hectares, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 508ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document

Source: NPWS (2014a)

### Other species of note

- 4.7 Regularly occurring non qualifying interest waterbird species which occur in Clonakilty Bay in numbers of national importance include Ringed Plover (*Charadrius hiaticula*) (115); Golden Plover (*Pluvialis apricaria*) (1,464); Knot (*Calidris canutus*) (448) and Greenshank (*Tringa nebularia*) (26) (Source: Table 5.1 of NPWS, 2014a; counts represent recent IWeBS site averages – 2008/09 – 2012/13).
- 4.8 Significant numbers of Wigeon (*Anas penelope*); Mallard (*A. platyrhynchos*); Oystercatcher (*Haematopus ostralegus*); Lapwing (*Vanellus vanellus*) and Redshank (*Tringa totanus*) also use Clonakilty Bay.
- 4.9 A very large roost of gulls and terns (>1000) is located on the sandbanks by Ring village; while large numbers of gulls (in the thousands) also congregate in the central portion of Clonakilty estuary at dusk – it is not known if this aggregation persists as a night-time roost. Terns roosting near Ring are predominantly Sandwich Tern (*Thalasseus sandvicensis*) during late summer / autumn. Common tern (*Sterna hirundo*) and Arctic tern (*S. paradisaea*) can also occur. All three tern species are listed on Annex I of the EU Birds Directive.
- 4.10 Kingfisher (*Alcedo atthis*), listed on Annex I of the EU Birds Directive, also occurs within the Bay. Clogheen Strand Inlet is a regular wintering site for Short-eared owl (*Asio flammeus*).
- 4.11 Little Egret (*Egretta garzetta*), also listed on Annex I of the EU Birds Directive, is a relatively new breeding species in Ireland (Smiddy and Duffy, 1997) and has bred at a Grey heron colony adjoining the cul-de-sac pool since ca. 2004.

## Other sites

### Courtmacsherry Bay SPA (004219)

#### Qualifying features

- 4.12 The Special Conservation Interests (SCIs) of Courtmacsherry Bay SPA (004219) include non-breeding populations of Great Northern Diver, Shelduck, Wigeon, Red-breasted Merganser, Golden Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Black-headed Gull and Common Gull.
- 4.13 In addition, wetland habitats within Courtmacsherry Bay SPA are identified to be of conservation importance for non-breeding (wintering) migratory waterbirds. Therefore, the wetland habitats are considered to be an additional Special Conservation Interest (NPWS, 2014d & e).

#### Conservation objectives

##### SCI species

- 4.14 The conservation objectives for the non-breeding populations of Great Northern Diver, Shelduck, Wigeon, Red-breasted Merganser, Golden Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Black-headed Gull and Common Gull at Courtmacsherry Bay SPA are to maintain their favourable conservation status (NPWS, 2014d & e).
- 4.15 The favourable conservation conditions of these species at Courtmacsherry Bay SPA are defined by various attribute and targets, which are shown in Table 4.3.

**Table 4.3 Attributes and targets for the conservation objectives for Great Northern Diver, Shelduck, Wigeon, Red-breasted Merganser, Golden Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Black-headed Gull and Common Gull at Courtmacsherry Bay SPA.**

Attribute	Measure	Target	Notes
1 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
2 Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing and intensity of use of areas used by the 'SCI species', other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/11 waterbird survey programme is discussed in Part Five of the conservation objectives supporting document

Source: NPWS (2014d). Attributes are not numbered in NPWS (2014d), but are numbered here for convenience.

#### Wetlands and waterbirds

- 4.16 The conservation objective for wetlands and waterbirds at Courtmacsherry Bay SPA is to “*maintain the favourable conservation condition of the wetland habitat in Clonakilty Bay SPA as a resource for the regularly occurring migratory waterbirds that utilise it*” (NPWS, 2014d).
- 4.17 The favourable conservation condition of the wetland habitat at Courtmacsherry Bay SPA is defined by a single attribute and target, which is shown in Table 4.4.

**Table 4.4 Attribute and target for the conservation objective for wetlands and waterbirds at Courtmacsherry Bay SPA.**

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 1299 hectares, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 1299ha using OSI data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document

Source: NPWS (2014e)

## Seven Heads SPA (004191)

### Qualifying features

- 4.18 The Special Conservation Interest (SCI) of Seven Heads SPA (004191) is the breeding population of Chough.

### Conservation objectives

#### SCI species

- 4.19 The conservation objective for the breeding population of Chough at Seven Heads SPA is to maintain or restore their favourable conservation status (NPWS, 2020a).

[https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO004191.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004191.pdf)

- 4.20 NPWS have only published generic conservation objectives for the Seven Heads SPA. Therefore, there are no site-specific attributes and targets to define the favourable conservation condition of this species.

## Old Head of Kinsale SPA (004021)

### Qualifying features

- 4.21 The Special Conservation Interests (SCIs) of Old Head of Kinsale SPA (004021) are the breeding populations of Kittiwake and Guillemot.

### Conservation objectives

#### SCI species

- 4.22 The conservation objective for the breeding populations of Kittiwake and Guillemot at Old Head of Kinsale SPA is to maintain or restore their favourable conservation status (NPWS, 2020b).

[https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO004021.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004021.pdf)

- 4.23 NPWS have only published generic conservation objectives for the Old Head of Kinsale SPA. Therefore, there are no site-specific attributes and targets to define the favourable conservation condition of these species.

## Galley Head to Duneen Point SPA (004190)

### Qualifying features

- 4.24 The Special Conservation Interest (SCI) of Galley Head to Duneen Point SPA (004191) is the breeding population of Chough.

### Conservation objectives

#### SCI species

- 4.25 The conservation objective for the breeding population of Chough at Galley Head to Duneen Point SPA is to maintain or restore their favourable conservation status (NPWS, 2020c).

[https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO004190.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004190.pdf)

- 4.26 NPWS have only published generic conservation objectives for the Galley Head to Duneen Point SPA. Therefore, there are no site-specific attributes and targets to define the favourable conservation condition of this species.

## Sovereign Islands SPA (004124)

### Qualifying features

- 4.27 The Special Conservation Interest (SCI) of Sovereign Islands SPA (004124) is the breeding population of Cormorant.

### Conservation objectives

#### SCI species

- 4.28 The conservation objective for the breeding population of Cormorant at Sovereign Islands SPA is to maintain or restore their favourable conservation status (NPWS, 2020d).

[https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO004124.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004124.pdf)

- 4.29 NPWS have only published generic conservation objectives for the Sovereign Island SPA. Therefore, there are no site-specific attributes and targets to define the favourable conservation condition of this species.

## Sheep's Head to Toe Head SPA (004156)

### Qualifying features

- 4.30 The Special Conservation Interests (SCIs) of Sheep's Head to Toe Head SPA (004156) are the breeding populations of Peregrine and Chough.

## Conservation objectives

### SCI species

- 4.31 The conservation objective for the breeding populations of Peregrine and Chough at Sheep's Head to Toe Head SPA is to maintain or restore their favourable conservation status (NPWS, 2020e).

[https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO004156.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004156.pdf)

- 4.32 NPWS have only published generic conservation objectives for the Sheep's Head to Toe Head SPA. Therefore, there are no site-specific attributes and targets to define the favourable conservation condition of these species.



## 5. Status, habits and distribution of SCI species

### Clonakilty Bay SPA

- 5.1 As noted, the qualifying interests of Clonakilty Bay SPA are: -
- Shelduck (*Tadorna tadorna*) [A048]
  - Dunlin (*Calidris alpina*) [A149]
  - Black-tailed Godwit (*Limosa limosa*) [A156]
  - Curlew (*Numenius arquata*) [A160]
  - Wetland and Waterbirds [A999]
- 5.2 The conservation condition and trends of the non-breeding waterbird SCI species at Clonakilty Bay Estuary SPA are summarised in Table 5.1 – 5.2. Table 5.2 also shows the relationship between a species' long-term site trend and the current national trend for the 12-year period 1998/99 to 2010/11 (as extracted from the NPWS Conservation Objectives Supporting document; NPWS, 2014a).
- 5.3 There are four categories of conservation condition, as follows: -
- Favourable population = population is stable/increasing.
  - Intermediate (unfavourable) = Population decline in the range 1.0 – 24.9%.
  - Unfavourable population = populations that have declined between 25.0 – 49.9% from the baseline reference value.
  - Highly Unfavourable population = populations that have declined > 50.0% from the baseline reference value.
- 5.4 One species is currently considered as being of highly unfavourable condition (Shelduck); two species are of unfavourable condition (Dunlin and Curlew); and one species is of favourable condition (Black-tailed Godwit) (Table 5.2 & 5.3).

**Table 5.1 Population data of the SCI assessment species at Clonakilty Bay SPA.**

Special Conservation Interests (SCIs)	Baseline Period <sup>1</sup> (1995/96 – 1998/99) (4 year peak)	Recent Site Data <sup>2</sup> 2008/09 – 2012/13 (5 year peak)	Peak Numbers recorded in recent NPWS low tide surveys (from NPWS, 2014a)		
			2011-12	2012-13	2013-14
Shelduck	156 (n)	77	46	85	60
Dunlin	1,172 (n)	882 (n)	1,390	1,030	1,050
Black-tailed Godwit	874 (i)	988 (i)	1,177	1,511	1,065
Curlew	599 (n)	366 (n)	480	235	450

Source: Tables 4.1 in NPWS (2014a)

<sup>1</sup>Baseline data is the 4-year mean peak for the period 1995/96 – 1998/99;

<sup>2</sup>recent site data is the mean peak for the 5-year period 2008/09 – 2012/13 (I-WeBS).

(i) denotes numbers of international importance; (n) denotes numbers of all-Ireland importance. Note that thresholds differ for the baseline and recent time periods used; international thresholds are outlined in Wetlands International (2002) and Wetlands International (2012), while all-Ireland thresholds are presented within Crowe *et al.* (2008) and Crowe & Holt (2013) for the baseline and recent site data respectively.

**Table 5.2 Clonakilty Bay 2010 / 2011 water bird numbers – summary data.**

Special Conservation Interests	Peak Numbers – Low Tide <sup>1</sup>	Peak number – High Tide <sup>2</sup>	Peak Overall
Shelduck	97	56	97
Dunlin	1,006 (n)	1,081 (n)	1,081
Black-tailed Godwit	761 (i)	481 (n)	761
Curlew	399 (n)	545 (n)	545

(ii) Source: Table 5.4 in NPWS (2014a); Cummins and Crowe, 2011.

(iii) (i) denotes numbers of international importance (after Wetlands International, 2010); (n) denotes numbers of all-Ireland importance (after Crowe and Holt, 2013).

(iv) <sup>1</sup> Four low tide counts – 09/10/10; 10/11/10; 09/12/10 & 08/02/11.

(v) <sup>2</sup> One high tide count – 16/01/11.

**Table 5.3 Site population trends for qualifying interests of Clonakilty Bay SPA.**

Special Conservation Interests (SCIs)	Site Conservation Condition	Site population trend	Recent all-Ireland Trend	Current international trend
Shelduck	Highly Unfavourable	-51	Stable	Stable
Dunlin	Unfavourable	-25	Declining	Stable
Black-tailed Godwit	Favourable	+13	Increasing	Increasing
Curlew	Unfavourable	-39	Declining	Declining

Source: Table 4.2 & 4.3 in NPWS (2014a).

Site population trend – based on comparison of a four and five year mean (1995/96 – 1998/99 and 2008/09 – 2012/13).

**Table 5.4 Comparison with national population trends for qualifying interests of Clonakilty Bay SPA.**

Special Conservation Interests (SCIs)	Site population trend (NPWS, 2014a) <sup>1</sup>	5 year All Ireland Trend <sup>2</sup>	12 year All Ireland Trend <sup>3</sup>	22 year All Ireland Trend <sup>4</sup>
Shelduck	-51	-9.9	-17.3	-23.0
Dunlin	-25.0	-23.0	-41.7	-63.0
Black-tailed Godwit	+13	+3.0	+29.8	+77.7
Curlew	-39	-2.4	-21.1	-41.0

Source: Table 4.2 & 4.3 in NPWS (2014a).

<sup>1</sup> Site population trend – based on comparison of a four and five year mean (1995/96 – 1998/99 and 2008/09 – 2012/13).

<sup>2</sup> 5 year: Percentage change between 2011/12 – 2015/16.

<sup>3</sup> 12 year: Percentage change between 2004/05 – 2015/16.

<sup>4</sup> 22 year: Percentage change between 1994/95 – 2015/16.

From Lewis *et al.*, 2019.

**Table 5.5 Recent IWeBS count data; 2013/14 to 2015/16 compared to 2008/09 – 2012/13 5 year peak.**

Special Conservation Interests (SCIs)	2008/09 – 2012/13 (5 year peak)	2013/14	2014/15	2015/16	2016/17	2017/18	2014/15 – 2017/18 (5 year mean)
Shelduck	77	108	86	95	72	133	99
Dunlin	882 (n)	880	552	651	673	808	713
Black-tailed Godwit	988 (i)	871	1551	1080	613	732	969
Curlew	366 (n)	325	430	299	354	400	362

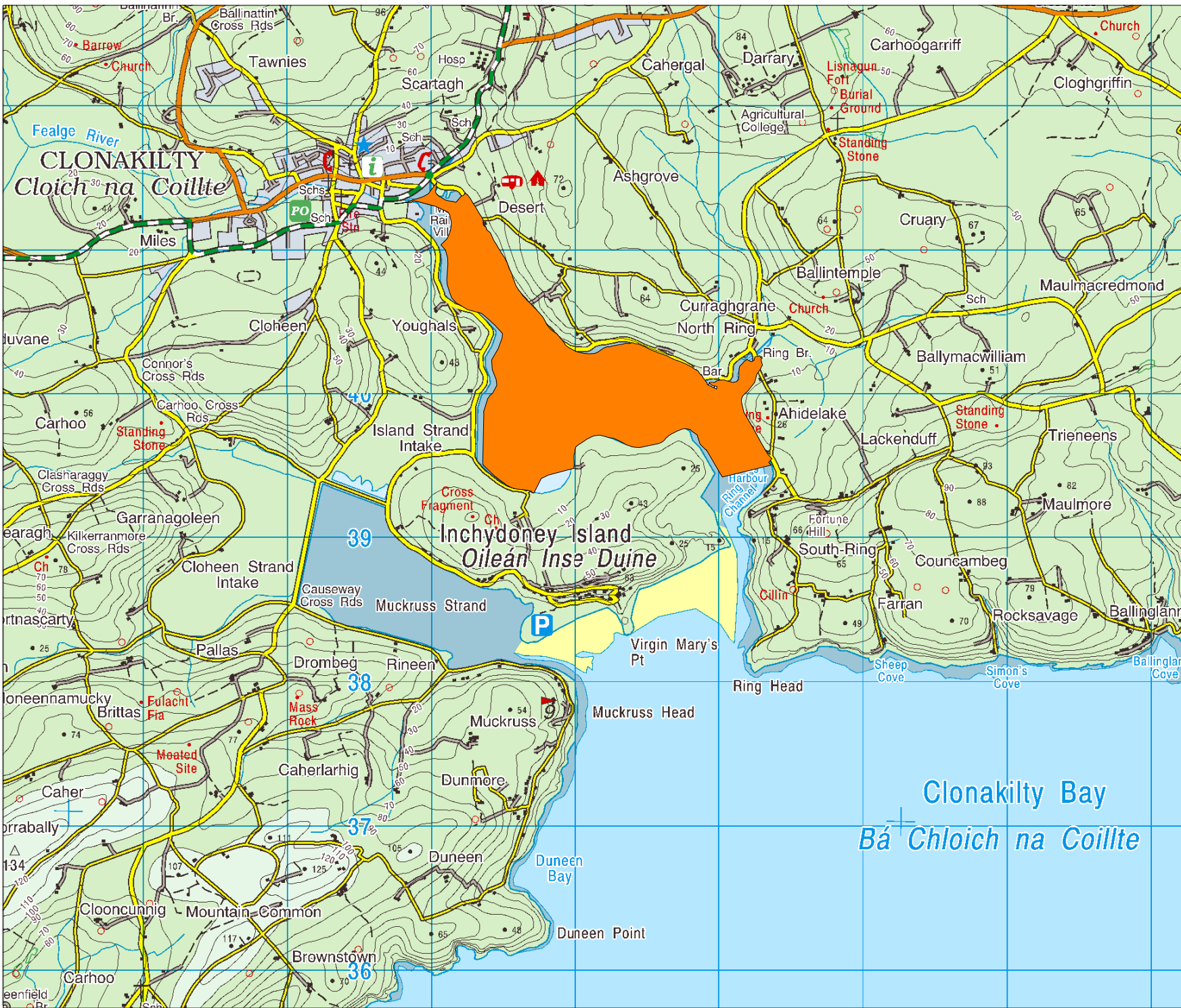
- 5.5 Shelduck numbers seem to have stabilised in recent years; however, their site conservation status is categorised as Highly Unfavourable.
- 5.6 Black-tailed Godwit have a Favourable site status; recent counts shows evidence of continued population growth (see Table 5.5).
- 5.7 IWeBS data (high tide counts) would suggest a decline in Dublin; however, the low tide NPWS surveys during the same time window (see Table 5.1) indicate a greater degree of stability in the period 2011/12 – 2013/14 (peak of 1,050 in 2013/14).
- 5.8 Due to their tendency to field feed Curlew can be missed during coastal IWeBS counts. A total of 430 were recorded in the 2014/15 IWeBS count; while NPWS recorded 450 in a low tide survey undertaken in 2013/14. Both Dunlin and Curlew were, however, noted by NPWS (2014a) to have an Unfavourable site conservation status.

## Waterbird habitats and distribution

### Tidal zones & biotope mapping

- 5.9 Clonakilty Bay is designated for the marine habitat *Mudflats and sandflats not covered by seawater at low tide* (Annex I of EU Habitats Directive).
- 5.10 The site was surveyed in 2011 (MERC, 2012); the results of which informed the identification of benthic habitats with the SAC and overlapping SPA.
- 5.11 As noted, Clonakilty Bay SAC is designated for
- Mudflats and sandflats not covered by seawater at low tide [1140]
  - Annual vegetation of drift lines [1210]
  - Embryonic shifting dunes [2110]
  - Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
  - Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
  - Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150]
- 5.12 The spatial extent of mudflats and sandflats (1140) is shown Figure 5.2; while the extent of Estuary and Shallow Inlets are shown on Figures 5.1 and 5.3, respectively. The site also contains a number of coastal lagoons; shown on Figure 5.4, while sand dune habitats for which the site has been designated are shown on Figure 5.5 (see also NPWS, 2014b).
- 5.13 Within the bay a single community type is recorded – Sand to sandy mud with *Tubificoides benedii* and *Peringia ulvae* community complex (Figure 5.6a / b) (the following descriptions are from NPWS, 2014f). This occurs on intertidal and shallow intertidal habitat (<2m within Clonakilty Bay). The sediment includes a mix of sand to sandy mud; apart from an area of mixed sediment in the nearer bay near Dysert.
- 5.14 The distinguishing species are the oligochaete *Tubificoides benedii*, the gastropod *Peringia ulvae*, the amphipods *Deshayesorchestia dehayesii* and *Talitrus saltator* and the polychaetes *Hediste diversicolor*, *Scoloplos (Scoloplos) armiger* and *Pygospio elegans*. A variant of this community is found along the south of Inchydoney Island (from Ring Harbour to Muckruss Strand); the sediment here is mainly of clean sand.
- 5.15 Significant mats of green algae can occur in the southwest of Clonakilty Bay and southwest of Muckruss Strand; this has been the subject of a number of publications on the potential impact on shorebirds (Lewis and Kelly, 2012; Lewis *et al.*, 2014). As noted, improvements to the Clonakilty WwTP have recently been implemented.
- 5.16 This community type overlaps with the annex I habitat Mudflats and sandflats not covered by seawater at low tide [1140].
- 5.17 The MERC (2012) report provides further resolution on the distribution and type of habitats. The majority of the site is defined as *polychaete / amphipod dominated fine sands shores* (LS.LSa.FiSa); this dominates Muckruss Bay and the outer harbour east to Ring Channel. The inner muddier parts of Muckruss Bay are characterised by *polychaete / oligochaete dominated upper estuarine mud shores* (LS.LMu.UEst). These have a slightly lower species diversity than the muddier shores (see below).

- 5.18 By contrast, north of Inchydoney Island is dominated by *Polychaete/bivalve-dominated muddy sand shores* (LS.LSa.MuSa) along the eastern side of the bay and *Polychaete/bivalve-dominated mid-estuarine mud shores* (LS.LMu.MEst). These sediments are both high in species diversity and biomass (MERC, 2012).
- 5.19 Fringes of shingle habitat are located in places along the shoreline; i.e. *shingle (pebble) and gravel shores* (LS.LCS.Sh). This habitat is located at / close to the proposed access points. Potential for impacts is considered in the accompanying assessment of Clonakilty Bay SAC (see Figure 1.3; 3.1 and 5.6).
- 5.20 MERC (2012) found that *Hydrobia ulvae*, a favoured prey item of Shelduck, “was particularly widespread and abundant at the majority of sheltered sites behind Inchydoney Island”. The oligochaete *Tubificoides benedii* “was particularly abundant in the upper sections of the site, behind Inchydoney Island in muddy and fine sand sediments”.



1130 - Estuaries

Clonakilty Bay  
*Bá Chloich na Coillte*


Client: Marine Institute		
Project: Clonakilty Bay SPA - Aquaculture AA		
Title: 1130 Estuaries - Distribution		
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Date: 17/06/20	Date: 17/06/20	Date: 17/06/20
Drawing No: Figure 5.1		Rev: 0.0

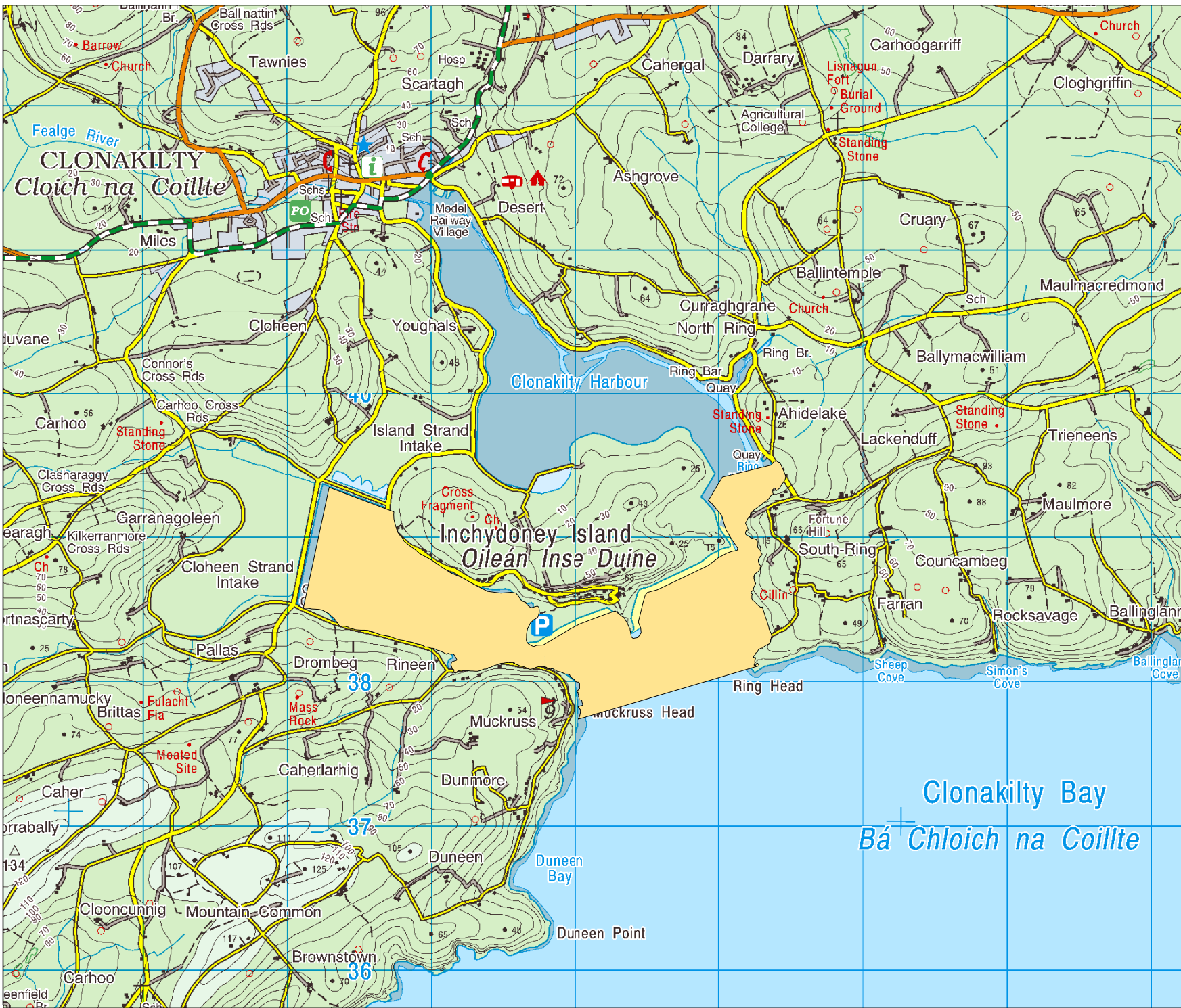
**ATKINS** Dublin - Tel: 353 - 1 - 890 9000  
 Cork - Tel: 353 - 21 - 429 0300  
 Galway - Tel: 353 - 91 786050




1140 - Mudflats & Sandflats

Clonakilty Bay  
*Bá Chloich na Coillte*

Client: Marine Institute		
Project: Clonakilty Bay SPA - Aquaculture AA		
Title: 1140 - Mudflats & Sandflats		
Designed/Drawn: POD	Checked: POD	Authorised: POD
Date: 17/06/20	Date: 17/06/20	Date: 17/06/20
Drawing No: Figure 5.2		Rev: 0.0
 Dublin - Tel: 353 - 1 - 890 9000 Cork - Tel: 353 - 21 - 429 0300 Galway - Tel: 353 - 91 786050		

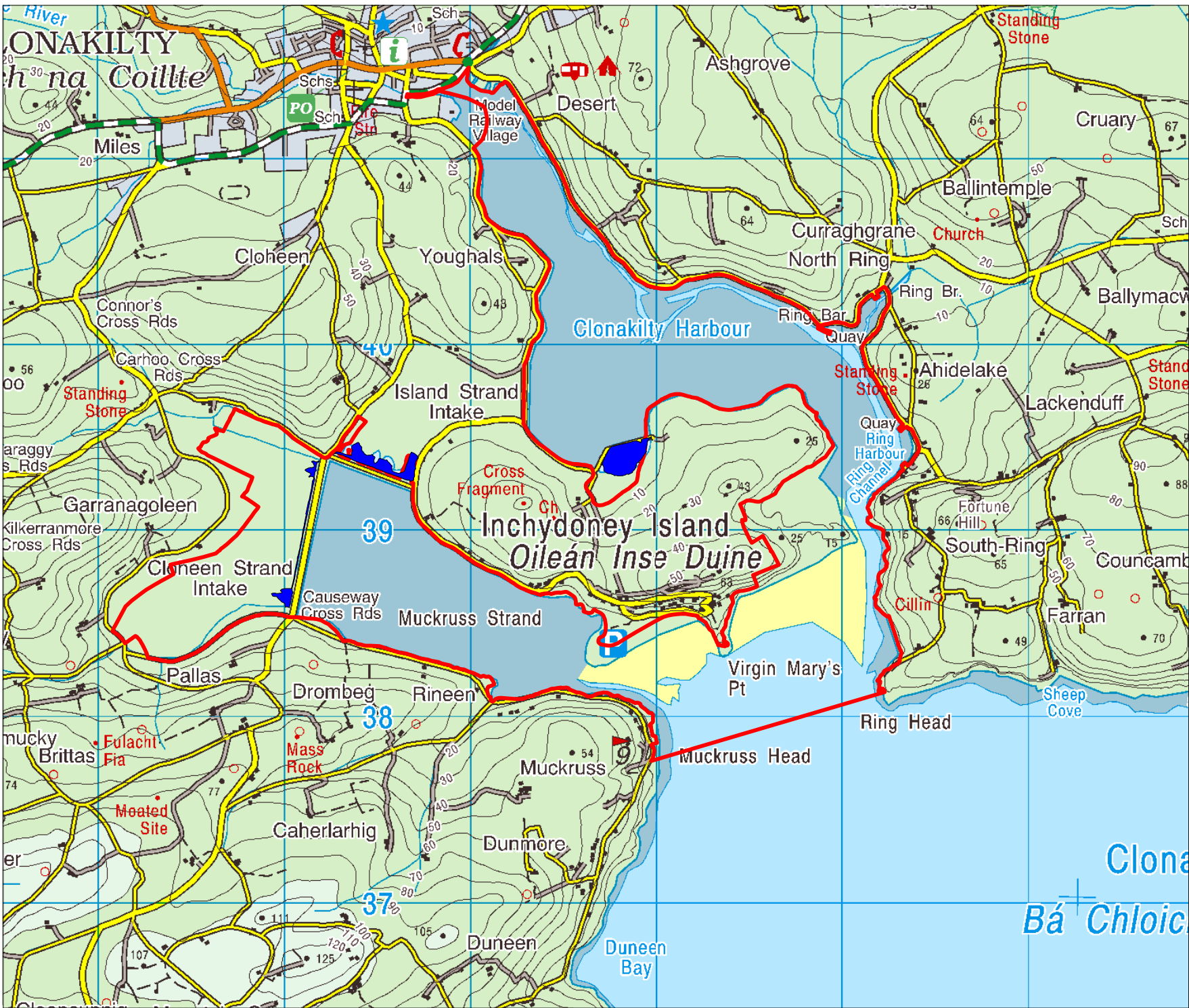


 Large Shallow Inlet

Client: Marine Institute		
Project: Clonakilty Bay SPA - Aquaculture AA		
Title: Large Shallow Inlet		
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Date: 17/06/20	Date: 17/06/20	Date: 17/06/20
Drawing No: Figure 5.3		Rev: 0.0

**ATKINS** Dublin - Tel: 353 - 1 - 890 9000  
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Galway - Tel: 353 - 91 786050

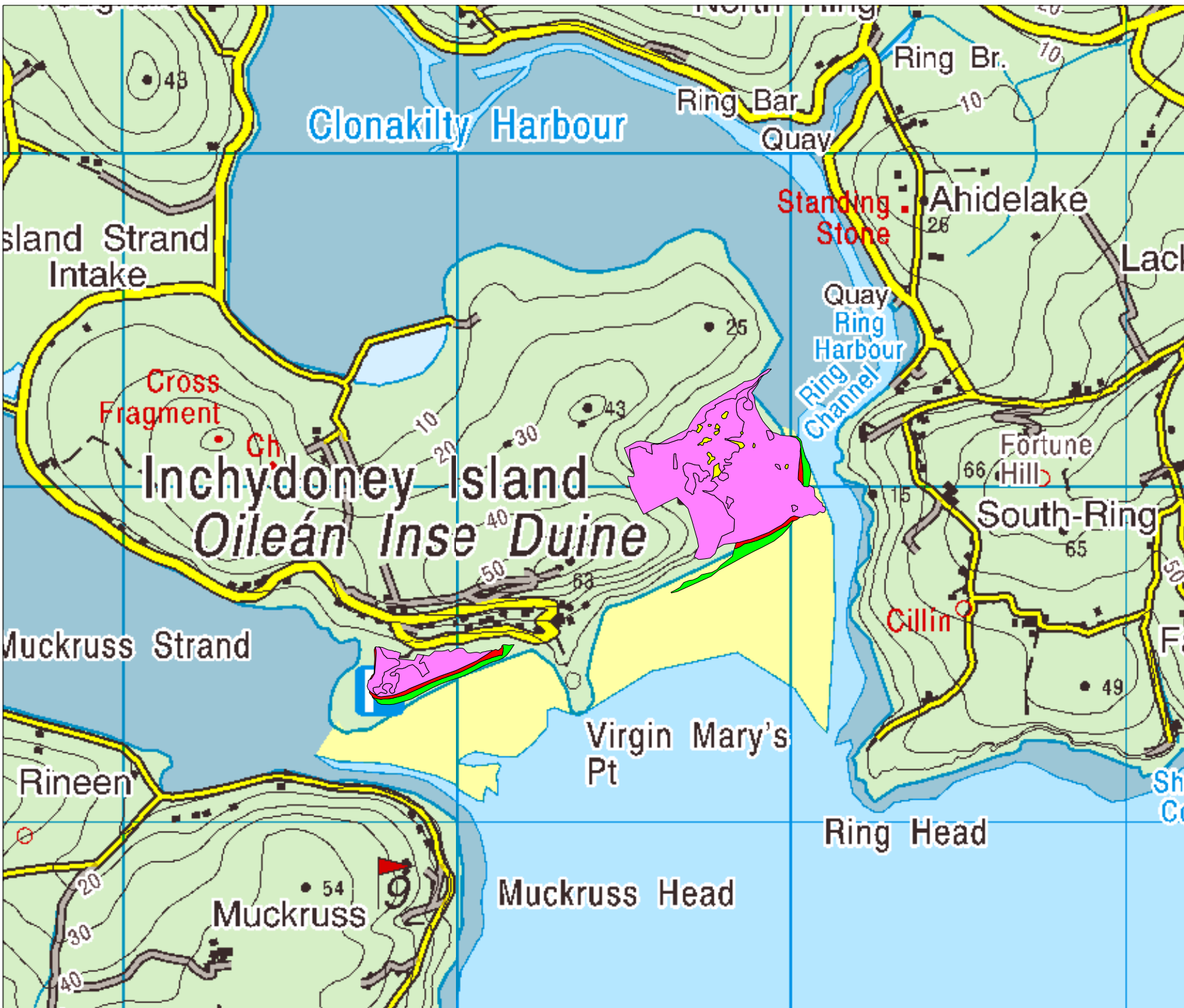




- Clonakilty Bay SPA
- Coastal lagoons

Client: Marine Institute		
Project: Clonakilty Bay SPA - Aquaculture AA		
Title: Coastal Lagoons		
Designed/Drawn: POD	Checked: POD	Authorised: POD
Date: 17/06/20	Date: 17/06/20	Date: 17/06/20
Drawing No: Figure 5.4	Rev: 0.0	

**ATKINS** Dublin - Tel: 353 - 1 - 890 9000  
 Cork - Tel: 353 - 21 - 429 0300  
 Galway - Tel: 353 - 91 786050



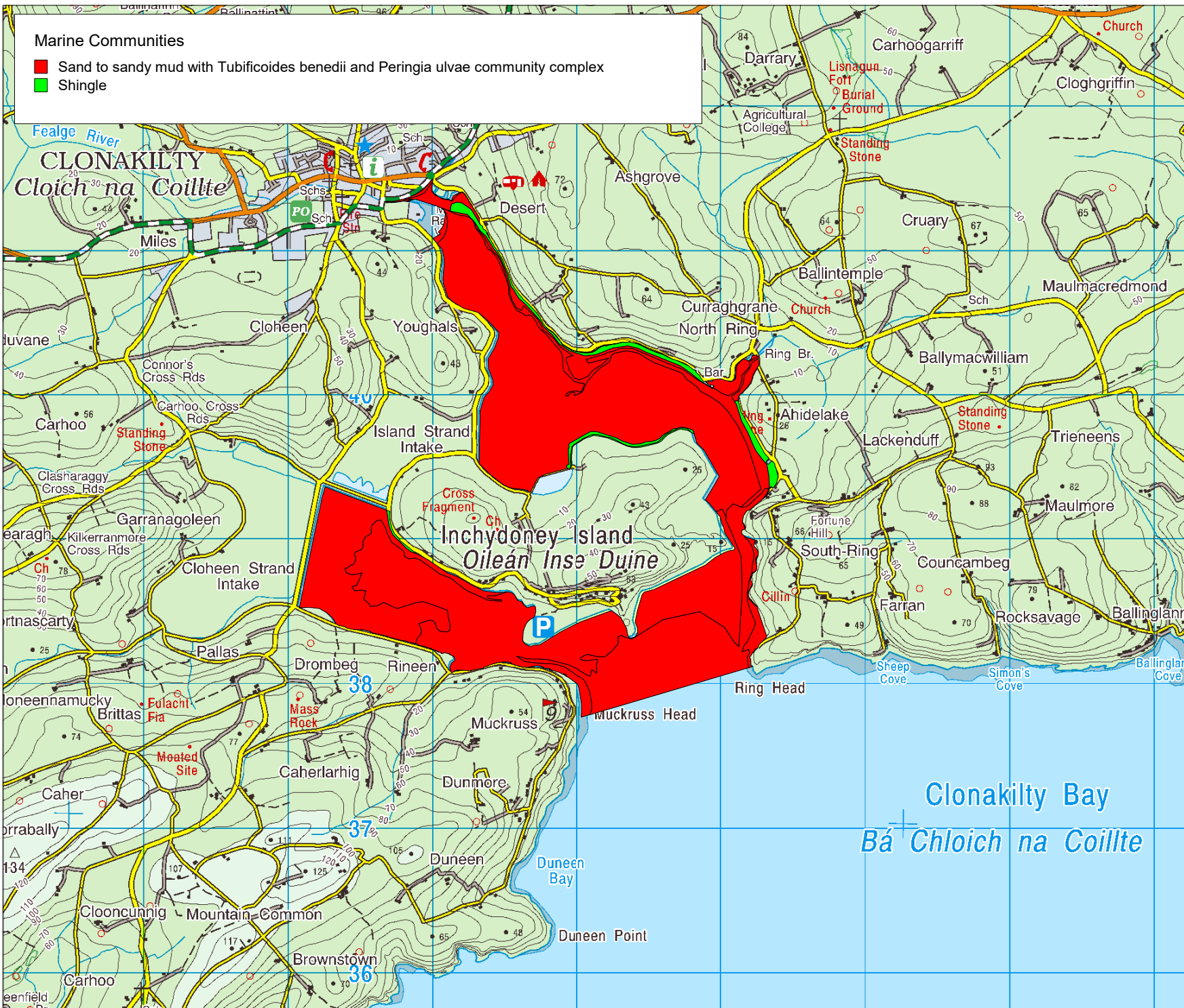
- Sand Dune Habitats**
- 2110 - Embryonic shifting dunes
  - 2120 - Shifting dunes
  - 2130 - \* Fixed coastal dunes
  - 2190- Humid slack dunes

Client: Marine Institute		
Project: Clonakilty Bay SPA - Aquaculture AA		
Title: Sand Dune Habitats		
Designed/Drawn: POD	Checked: POD	Authorised: POD
Date: 17/06/20	Date: 17/06/20	Date: 17/06/20
Drawing No: Figure 5.5		Rev: 0.0


**ATKINS** Dublin - Tel: 353 - 1 - 890 9000  
 Cork - Tel: 353 - 21 - 429 0300  
 Galway - Tel: 353 - 91 786050

**Marine Communities**

- Sand to sandy mud with *Tubificoides benedii* and *Peringia ulvae* community complex
- Shingle



Clonakilty Bay  
Bá Chloich na Coillte

Client: Marine Institute		
Project: Clonakilty Bay SPA - Aquaculture AA		
Title: Marine Communities		
Designed/Drawn: POD	Checked: POD	Authorised: POD
Date: 17/06/20	Date: 17/06/20	Date: 17/06/20
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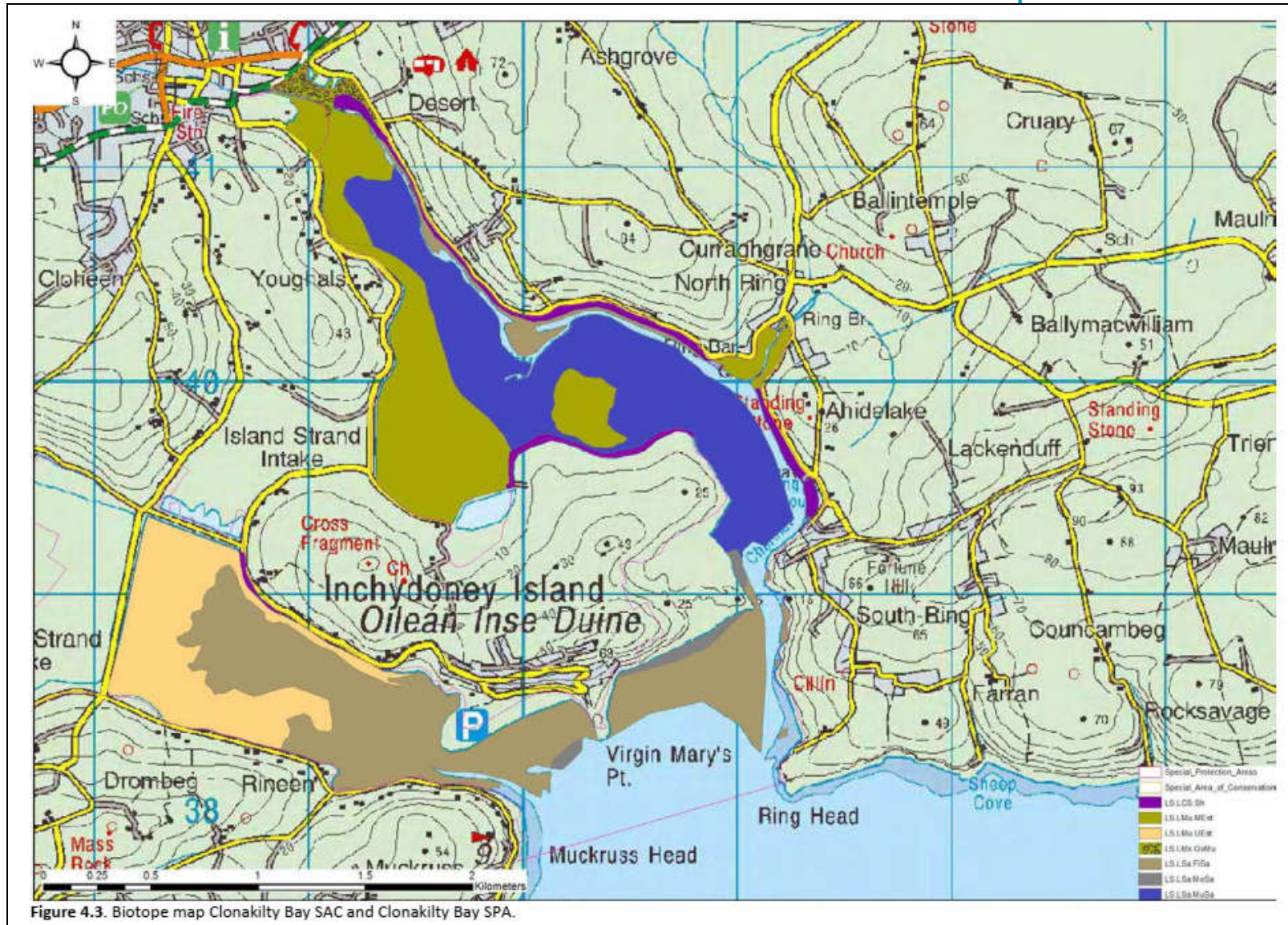


Figure 5.6b Biotope map of Clonakilty Bay (copy of Figure 4.3 from MERC, 2012).

## Waterbird Survey Programme (2010/2011)

### Waterbird habitats and distribution

#### Shelduck

- 5.21 With respect to total numbers the peak Shelduck count was 97 birds (08/02/2011); 56 during the high tide count on the 16/01/11. There were no counts of national or international importance.
- 5.22 Shelduck were recorded across 8 subsites during the waterbird survey programme (2010/11); these were mainly in the north of Clonakilty Bay and in the western reaches of Muckruss Strand; i.e. 0L448, 0L450, 0L465, 0L500, 0L503, 0L505, 0L506 and 0L509 (see Figure 2.2 for subsite boundaries). Peak numbers were recorded in 0L500 (Causeway) on 10/11/10 and 09/02/2011; while 0L503 (Inchydoney Strand) held peak numbers on 09/10/10 and 08/02/11.
- 5.23 0L505 (Youghals SE) was also of note; recording a subsite peak count of 45 on 08/02/11.
- 5.24 The aquaculture site overlaps with 0L506 and 0L507; no Shelduck were recorded during the waterbird survey programme (2010/11) in 0L507.
- 5.25 Shelduck feed mainly on invertebrates; particularly molluscs, insects, and crustaceans and can also take plant materials. They can feed in both the benthic and pelagic zones. However, in north and west Europe, molluscans predominate in the diet, particularly *Hydrobia ulvae*<sup>8</sup> (see also Buxton *et al.*, 1981; Viain *et al.*, 2011); though they do take a variety of small invertebrates. This species was found to be particularly widespread and abundant at the majority of sheltered sites behind Inchydoney Island (MERC, 2012). Much of the western side and inner Clonakilty Bay, behind Inchydoney Island, is dominated by *polychaete / bivalve dominated mid-estuarine shores* (LS.LMu.MEst); this coincides with areas favoured by Shelduck. NPWS (2014a) noted that *P. ulvae* generally occurs in low abundance but is locally abundant in the southwest shores of both Clonakilty Harbour and Muckruss Strand (i.e. subsites 0L500, 0L503 and 0L505).
- 5.26 The boundary between 0L506 and 0L507 represents a transition from an area of *polychaete / bivalve dominated mid-estuarine shores* (LS.LMu.MEst) in 0L506 which supports Shelduck; to *polychaete / bivalve dominated muddy sand shores* (LS.LSa.MuSa) where Shelduck were not recorded. The infauna of LS.LSa.MuSa is characterised by the amphipods *Bathyporeia pilosa*, *Corophium arenarium* and *C. volutator*, and the spire shell *Hydrobia ulvae*. However, MERC (2012) noted the presence of the oligochaete *Tubificoides benedii*, an indicator of stressed habitat (i.e. eutrophic tidal flats and polluted coastal areas often characterised by high levels of hydrogen sulphide. They also recorded abundant algal mats (*Ulva*) in this area.
- 5.27 Foraging Shelduck were recorded from 7 no. subsites (see Figure 2.2): - 0L448, 0L450, 0L465, 0L500, 0L503, 0L505 and 0L509. Thus, foraging Shelduck were not recorded from either 0L506 and 0L507 within which the aquaculture plot is located. Access, however, would be from close to the cul-de-sac pool within 0L503 (see Figure 3.1). 0L500, 0L503 and 0L505 are favoured foraging areas indicating a strong association with *P. ulvae* distribution.
- 5.28 The largest record of roosting birds was of 82 in 0L503 (Inchydoney Island)

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<sup>8</sup> Now *Peringia (Hydrobia) ulvae*.

- 5.29 NPWS undertook further low tide surveys in 2011/12, 2012/13 and 2013/14. Peak numbers of foraging birds were recorded in 0L503 and 0L505 (2011/12); 0L503 (2012/13) and 0L505 (2013/14), showing strong consistency with the waterbird survey programme (2010/11) results.

#### **Dunlin**

- 5.30 Dunlin were recorded in 13 subsites: – 0L447, 0L448, 0L449, 0L450, 0L462, 0L465, 0L500, 0L502, 0L503, 0L505, 0L506, 0L507 and 0L509 (foraging at 12 subsites). Peak numbers during low tide counts were recorded in 0L506 (Ring Quay), 0L465 (West Muckruss Strand) and 0L503 (Inchydoney Island; on two occasions). 0L447, 0L465, 0L503 and 0L507 held Dunlin on all four low tide counts. The aquaculture site overlaps with 0L506 and 0L507.
- 5.31 The peak low tide count was 376 in 0L503 on 08/02/2011; a higher peak high tide count of 605 Dunlin was recorded in 0L465 on 16/01/11.
- 5.32 NPWS undertook further low tide surveys in 2011/12, 2012/13 and 2013/14. Peak numbers of Dunlin recorded were 1,390 (2011/12), 1,030 (2012/13) and 1,050 (2013/14). Peak numbers were recorded within 0L447, 0L500 and 0L506 (2011-12); 0L465, 0L500 and 0L505 (2012-13) and 0L448, 0L465 and 0L505 (2013-14).

#### **Black-tailed Godwit**

- 5.33 While Black-tailed Godwits were recorded across 15 subsites during the NPWS counts, they were recorded at six subsites across all four low tide counts (see Figure 5.2): namely 0L447 Deasy's Quay; 0L449 (Desert South); 0L450 (Youghals House); 0L465 (Muckruss Strand); 0L500 (Causeway) and 0L507 (Ring Harbour). The licence application is located within 0L506 & 0L507. The flock maps included in the Conservation Objective supporting documentation supports this picture of Black-tailed godwits being widely distributed in Clonakilty Harbour; with Ring Harbour notable amongst these.
- 5.34 Sites which held peak numbers were 0L502 (Clogheen Strand Intake) in October; 0L500 (Causeway) in November and December and 0L506 (Ring Quay) in February. 0L506 (Ring Quay) also held the peak subsite count during the high tide count in January 2011 (i.e. 250 birds).
- 5.35 Recent low tide counts carried out by NPWS recorded peak counts of 1,177 (2011/12), 1,511 (2012/13) and 1,065 (2013/14) (see Table 5.1).
- 5.36 When considering foraging birds, while Black-tailed Godwits were recorded across 12 subsites during the NPWS counts (see Figure 5.2) only 0L447 Deasy's Quay and 0L465 (Muckruss Strand) held foraging birds on all four low tide counts. Peak counts of foraging birds were held by 0L509 (Desert Church), 0L500 (Causeway), 0L500 and 0L506 (Ring Quay), respectively – again highlighting the relative importance of the Ring area for Black-tailed Godwit. Terrestrial foraging was also noted at fields adjoining Ring Harbour.
- 5.37 A previous long term study (2000/01 – 2010/11) of Clonakilty Estuary (excluding Inchydoney Estuary) also found Black-tailed Godwit to be widely distributed, with peak counts occurring across a range of subsites; though the importance of the inner bay – from 0L447 to 0L503 was noted.

#### **Curlew**

- 5.38 During the low tide surveys, Curlew were widespread across Clonakilty Harbour, being recorded from 15 subsites overall. Peak numbers were recorded in 0L506 (Ring Quay), 0L500 (Causeway), 0L500 and 0L503 (Inchydoney Island) during the four low tide counts. Of note, 0L507, within which the aquaculture site is located, recorded numbers ranked in the top three on two survey occasions, highlighting its importance to Curlew.

- 5.39 Terrestrial foraging was noted in fields adjoining both 0L506 (Ring Quay) and 0L507 (Ring Harbour). Field feeding outside the SPA boundaries is a regular occurrence at Clonakilty.
- 5.40 Recent low tide surveys undertaken by NPWS Regional staff recorded peak numbers of 480 (2011/12), 235 (2012/13) and 450 (2013/14). Peak numbers were recorded feeding in the following areas: -
- 0L449, 0L465 & 0L507 in 2011/12;
  - 0L449, 0L500 & 0L506 in 2012/13; and
  - 0L503, 0L506 & 0L507 in 2013/14.
- 5.41 The subsites adjoining Ring (0L506 & 0L507) are again identified as important to Curlew, along with adjoining fields.
- 5.42 A previous long term study (2000/01 – 2010/11) of Clonakilty Estuary (excluding Inchydoney Estuary) also found Curlew to be widely distributed, with peak counts occurring across a range of subsites including 0L449, 0L450, 0L503 and most frequently 0L506; though the importance of the inner bay – was noted, with the highest density of Curlew noted from here.

## Roosts

- 5.43 During the course of the NPWS low tide survey work roost locations were mapped during targeted high tide surveys undertaken on the 3<sup>rd</sup> November 2010 and the 16<sup>th</sup> February 2011. These findings are summarised below; though as noted previously care must be taken in interpreting patterns based on a limited number of samples which are now ca. 10 years old.

### Shelduck

- 5.44 No Shelduck were recorded roosting during low tide surveys in 2010/11. Birds were not recorded roosting in 0L506 (Ring Quay) or 0L507 (Ring Harbour) during the roost surveys (see Figure 3.1 for location of aquaculture site).

### Dunlin

- 5.45 Relatively few Dunlin were recorded roosting during low tide surveys. During the November 2010 roost survey birds were recorded roosting in 0L447 (3 groups of 2, 26 and 28 mainly roosting terrestrially) and 0L462; the latter being the largest and holding 281 birds (roosting on a sandbank the remained exposed). During the February 2011 roost survey birds were recorded roosting in four subsite: 0L447, 0L451, 0L507 and 0L508; 15 Dunlin were noted roosting on intertidal sand in 0L507.

### Black-tailed Godwit

- 5.46 During the high tide survey, a total of 294 Black-tailed godwits were roosting intertidally – 85% of these birds were within 0L506 (Ring Quay).
- 5.47 The November 2010 roost survey recorded five roosting flocks in 3 subsites – 0L500, 0L506 and 0L507; with the largest flock of 310 birds on sand in the southeast of 0L506. There were a further 22 birds roosting in 0L507.
- 5.48 The February 2011 roost survey recorded four flocks of roosting birds in 0L501, 0L502 and 0L507. Largest numbers were again recorded in Ring – two flocks of 70 birds on intertidal sands and 145 birds terrestrially on Inchydoney Island.

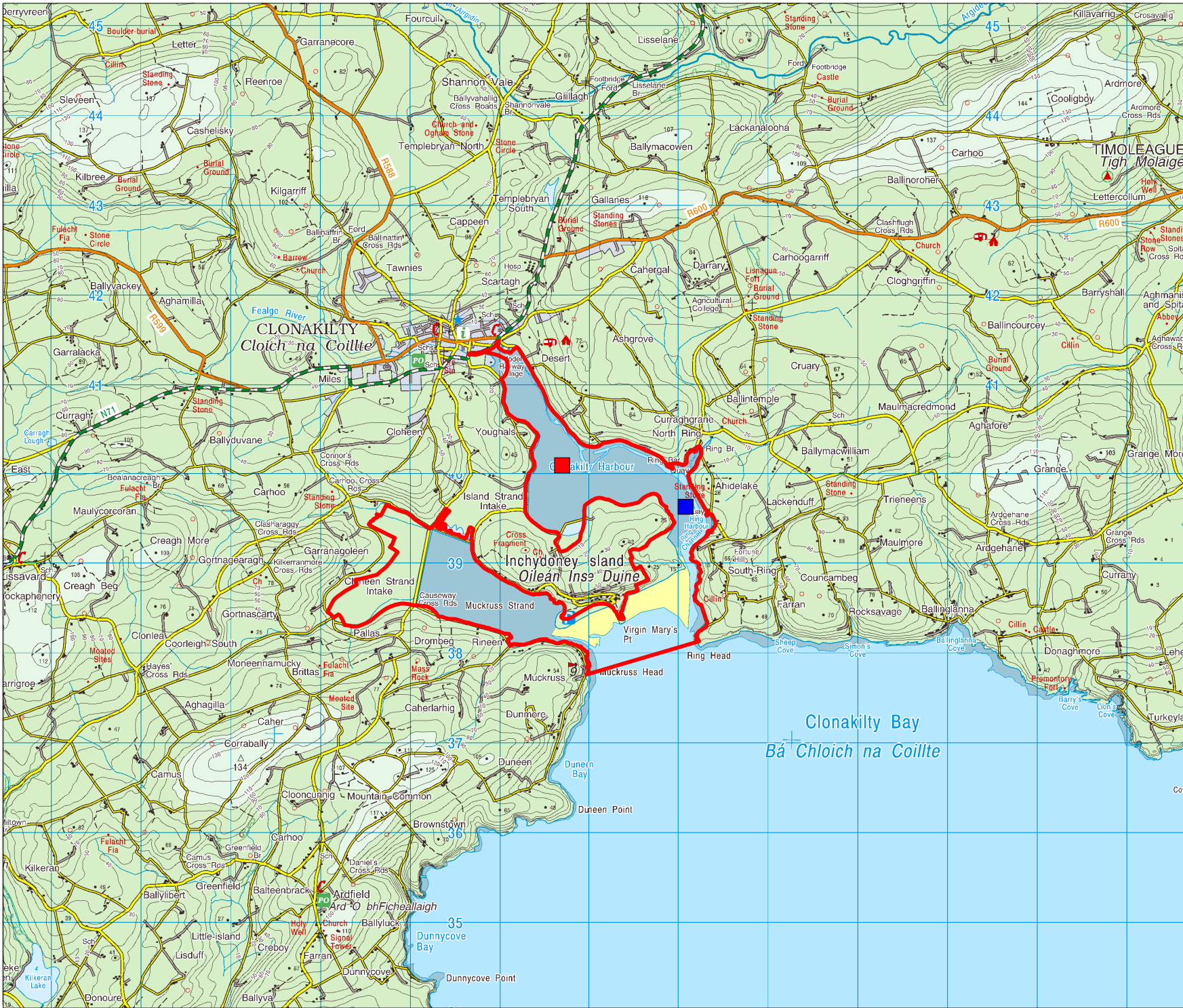
### Curlew

- 5.49 The NPWS low tide survey recorded good numbers of Curlew roosting intertidally – peak numbers were recorded in 0L506 (Ring Quay) and 0L507 (Ring Harbour) (09/10/10 & 10/11/10, respectively); 0L448 held peak numbers in 08/02/11.
- 5.50 During the high tide survey 385 Curlew were recorded to be roosting intertidally; 96% of these were roosting within 0L506 (Ring Quay), with smaller numbers in 0L500 and 0L507 (Ring Harbour). Thus, on this occasion nearly all Curlew counted were within 0L506 (Ring Quay) or 0L507 (Ring Harbour) within which the aquaculture licence site is located (see Figure 3.1).
- 5.51 The November 2010 roost count recorded roosting birds across six subsites: 0L451, 0L462, 0L501, 0L502, 0L506 and 0L507. The largest flock (31 birds) was in 0L502 (Clogheen Strand Intake). Flocks of <12 birds were recorded in 0L506 (Ring Quay) or 0L507 (Ring Harbour).
- 5.52 The February 2011 roost count recorded roosting birds across four subsites: 0L501, 0L502, 0L506 and 0L507. The largest flock (71 birds) was in 0L502 (Clogheen Strand Intake). 17 Curlew roosted in a field adjoining 0L506 (Ring Quay) (outside the SPA boundary).

### Other species

- 5.53 As noted, a very large roost of gulls and terns (>1000) is located on the sandbanks by Ring village; while large numbers of gulls (in the thousands) also congregate in the central portion of Clonakilty estuary at dusk – it is not known if this aggregation persists as a night-time roost (see Figure 5.7 for locations). Terns roosting near Ring are predominantly Sandwich Tern (*Thalasseus sandvicensis*) during late summer / autumn. Common tern (*Sterna hirundo*) and Arctic tern (*S. paradisaea*) can also occur. All three tern species are listed on Annex I of the EU Birds Directive. The nearest nesting colony of Sandwich tern is at Lady's Island SPA (004009); as recently as 2016 Lady's Island supported 1,682 nesting pairs of Sandwich tern.
- 5.54 Burke *et al.* (2020) reported on the first three years of monitoring of post-breeding tern aggregations in Ireland. A peak count of 51 Sandwich tern were recorded in Clonakilty Bay. Burke *et al.* (2020) noted that walker and dogs as a key source of disturbance to roosting terns (a trend noted for waders also; see Lewis *et al.*, 2019). Furthermore, Burke *et al.* (2020) stressed the importance of protected post-breeding / autumnal tern roosting sites when balancing commercial and recreational uses.





Clonakilty Bay SPA

Tern & Gull Roosts

Central gull roost

Ring Gull & tern roost

Client: <b>Marine Institute</b>		
Project: <b>Clonakilty Bay SPA - Aquaculture AA</b>		
Title: <b>Gull &amp; Tern Roost</b>		
Designed/Drawn: POD	Checked: POD	Authorised: POD
Date: 17/06/20	Date: 17/06/20	Date: 17/06/20
Drawing No: <b>Figure 5.7</b>		Rev: <b>0.0</b>

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## 6. Assessment of Potential Impacts

- 6.1 There is a single application to cultivate pacific oyster (*Crassostrea gigas*) at a site close to Ring on the eastern side of Clonakilty Bay SPA, T05/603A.

### Habitats

- 6.2 The site is located within IWEBS count sector 0L431 (see Figure 5.1). This is a large site running from Ring northwards to Deasy's Quay at Clonakilty (equivalent to Clonakilty Harbour). Due to its size it was subsequently further subdivided into a number of IWEBS subsites, with the licence application area remaining within 0L431 Clonakilty Harbour (amended).
- 6.3 T05/603A covers an area of 22.57ha of Clonakilty Harbour; this area is equivalent to IWEBS count subsite 0L431 and covers 197.3ha or 11.44% of Clonakilty Harbour.
- 6.4 With respect to the NPWS low tide surveys (Figure 5.2), licence application T05/603A is located within 0L506 (Ring Quay) and 0L507 (Ring Harbour). As we were unable to source a digital map of the NPWS low-tide boundaries these were drawn up from published maps (NPWS, 2014a). 0L506 (Ring Quay) is approximately 50.97ha in area, while 0L507 (Ring Harbour) is approximately 38.74ha in area; a combined area 89.71ha located in outer Clonakilty Harbour (i.e. 45.5% of Clonakilty Harbour / 17.7% of Clonakilty Bay SPA).
- 6.5 The aquaculture licence application site occupies ca. 16.6ha of 0L506 (32.6% of the subsite) and ca. 6ha of 0L507 (15.4% of the subsite). In all the proposed licence occupies ca. 25.2% of the combined area of Outer Clonakilty Bay (in the environs of Ring) – as represented by NPWS low tide count sectors 0L506 and 0L507. As noted above, both of these areas are repeatedly highlighted as being important for species for which Clonakilty Bay SPA has been designated.
- 6.6 The relative proportion of intertidal to subtidal habitat was also examined – with areas mapped initially from OSi Discovery Series mapping. However, more recent aerial images on GoogleEarth (2013) and Bing Maps (2020) indicated movement in the location and size of subtidal channels. Subtidal channels were therefore remapped from aerial imagery hosted on Bing Maps (dated 2020) (see Figure 6.1 and 6.2).



**Figure 6.1** Aerial image from Bing Maps, 2020 showing tidal channels in OL506 (left) and OL507 (right).

- 6.7 The extent of subtidal / shallow subtidal habitat (channels) is 10.0ha in OL506 (19.7% of the subsite) and 11.25ha in OL507 (29% of the subsite). The area in OL506 represents an increase of over 6ha from that shown in the OSi Discovery Series map; however, many of this is made up of recently formed shallow braided channels. The total area of subtidal channel equates to approximately 23.8% of available habitat within OL506 and OL507. As noted the total area of subtidal habitat in Clonakilty Bay SPA is ca. 67ha (NPWS, 2014a); thus, Outer Clonakilty Bay (OL506 and OL507) represents ca. 31.86% of subtidal habitat within Clonakilty Bay SPA [Note: it should, however, be noted that the increase in subtidal channels noted in Figure 6.1 may be such that the overall area of subtidal habitat within the SPA has also increased; this would reduce the percentage represented by OL506 and OL507 to a small degree].
- 6.8 However, Apart from one area of shallow channel which is most probably available to intertidally feeding waders due to its shallow depth, there is little overlap between the proposed aquaculture plot and the distribution of subtidal / shallow subtidal habitat (see Figure 6.1 & 6.2). Furthermore, no species of diving duck, grebe, diver or Cormorant who require subtidal areas are qualifying interests of Clonakilty Bay SPA.
- 6.9 The extent of intertidal habitat is 40.9ha in OL506 (80.3% of the subsite) and 27.5ha in OL507 (71% of the subsite). The total area of intertidal habitat within subsites OL506 and OL507 equates to approximately 76.2% of available habitat in these subsites (combined). As noted, within Clonakilty Bay SPA, NPWS (2014a) recorded 325ha of intertidal habitat. The intertidal habitat located within subsites OL506 and OL507 therefore equates to ca. 21% of intertidal habitat within Clonakilty Bay SPA as a whole. Its loss would therefore represent a significant loss of this habitat within the SPA; one of whose qualifying interests is Wetland and Waterbirds [A999].
- 6.10 NPWS site specific conservation objectives (NPWS, 2014) for Wetlands and Waterbirds is “*To maintain the favourable conservation condition of the wetland habitat in Clonakilty Bay SPA as a resource for the regularly occurring migratory waterbirds that utilise it*”. This is defined by the following attribute and target: Habitats – with the target being “*The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 508 hectares, other*”.

than that occurring from natural patterns of variation” (NPWS, 2014). While the proposed cultivation of oysters does not represent a permanent loss of habitat, it does nonetheless represent a significant area / percentage of habitat not being available to species, for which the SPA has been designated, for the duration of operation of the licence.

- 6.11 NPWS biotope mapping (from *Clonakilty Bay SAC Conservation Objectives supporting documents – marine*; NPWS, 2014f ) record a single community type – Sand to sandy mud with *Tubificoides benedii* and *Peringia ulvae* community complex (see Figure 5.6a). This occurs on intertidal and shallow intertidal habitat (<2m within Clonakilty Bay). Development of the proposed aquaculture plot would remove access to up to 22.57ha of this habitat type. Habitats were further resolved by MERC (2012); this found that north of Inchydoney Island is dominated by *Polychaete/bivalve-dominated muddy sand shores* (LS.LSa.MuSa) and *Polychaete/bivalve-dominated mid-estuarine mud shores* (LS.LMu.MEst). (see Figure 5.6b). These sediments are both high in species diversity and biomass (MERC, 2012) and therefore provide good quality habitat for intertidal waders and wildfowl (see pg’s. 5.9-5.20). For a detailed review of potential impacts to habitats refer to the accompanying Appropriate Assessment of impacts to Clonakilty Bay SAC (000091).
- 6.12 As noted, field feeding species, such as Curlew, also feed on agricultural grassland outside the SPA, such as in fields east of Ring. Use of such fields will not be negatively impacted by operation of the proposed licence.

### Access

- 6.13 Access is proposed from 3 no. locations as shown on Figure 3.1. One is from the public road and along the shoreline from close to the Cul-de-Sac pool (see Figure 3.1). The egret / grey heron colony is sufficiently distant and screened from this location that negative impacts through disturbance to the Annex I species Little egret are not anticipated.
- 6.14 Access by foot and / or vehicles along the shoreline would, however, increase the level of disturbance to birds foraging in the southwestern corner of Clonakilty Harbour.
- 6.15 The remaining two access point are by boat from quays in Ring on the eastern side of the Harbour. As noted, there are not subtidal species for which the SPA has been designated.

### Roosts

- 6.16 As discussed above the environs of Ring is noted to be of importance to roosting gulls and terns (see paragraphs 5.53 – 5.54). During consultation two areas were noted. One is to the west of 0L506, with the second located within 0L507. Details as to the spatial extent and relative distribution of roosting gulls and terns is not available. The potential for displacement of birds by activities associated with the proposed trestles cannot be discounted at this time. As noted, Sandwich Tern (listed on Annex I of the Birds Directive) is known to use this area as a post breeding / autumnal roost. This behaviour amongst terns in Ireland is currently under investigation by BirdWatch Ireland (Burke *et al.*, 2020).
- 6.17 During the October 2010 NPWS counts Sandwich tern were noted roosting at two locations; 27 birds on Muckruss Strand and 19 within 0L507 northwest of Ring Quay. On a separate count in August 2017 44 birds were recorded at Muckruss Estuary / Inchydoney (Gittings, 2017).
- 6.18 The NPWS low tide survey in 2010/2011 also found evidence to indicate that 0L506 and 0L507 are notable sites for roosting waders. This discussed in detail between 5.43 and 5.52.

- 6.19 Shelduck were not recorded roosting in 0L506 and 0L507 during the NPWS 2010/2011 surveys. Dunlin have been recorded roosting in 0L507, but not in large numbers.
- 6.20 Of particular note was the occurrence 385 Curlew roosting intertidally during a high tide count in the winter of 2010/11, with 96% of these roosting within 0L506 (Ring Quay); suggesting that this area is of significance to Curlew for roosting.
- 6.21 Similarly, during the high tide survey a total of 294 Black-tailed godwits were roosting intertidally – 85% of these birds were again within 0L506 (Ring Quay). During the November 2010 roost survey 310 Black-tailed Godwit were recorded roosting on sand in the southeast of 0L506. In February 2011 the largest numbers of Black-tailed Godwit were again recorded in Ring – two flocks of 70 birds on intertidal sands and 145 birds terrestrially on Inchydoney Island. Note that the estuary in this area is also located close to fields used by field feeding Curlew.

### Intertidal Species

- 6.22 Count data for qualifying interests from low tide and high tide counts undertaken in the winter of 2010/11 for count Clonakilty Bay are shown in Table 6.1. Count data from subsites 0L506 and 0L507 are presented in Table 6.2 and 6.3; with combined data shown in Table 6.4. The count data expressed as a percentage of the same count for the entirety of Clonakilty Bay is shown in Table 6.5.

**Table 6.1 Counts of qualifying interests in Clonakilty Bay SPA during NPWS 2010/11 Counts.**

Species	LT1	LT2	LT3	LT4	HT
Black-tailed Godwit	104	761	662	695	481
Curlew	298	205	100	399	545
Shelduck	12	15	13	97	56
Dunlin	153	572	733	1006	1081

**Note:** -

LT – Low Tide; HT – High Tide.

LT1 – 9/10/11; LT2 – 12/11/10; LT3 – 09/12/10; LT4 – 08/02/11 and HT – 16/01/11.

**Table 6.2 Counts of qualifying interests in 0L506 during NPWS 2010/11 Counts.**

Species	LT1	LT2	LT3	LT4	HT
Black-tailed Godwit	0	13	5	110	250
Curlew	21	67	6	34	381
Shelduck	0	0	0	0	44
Dunlin	45	0	38	100	0

**Note:** -

LT – Low Tide; HT – High Tide.

LT1 – 9/10/11; LT2 – 12/11/10; LT3 – 09/12/10; LT4 – 08/02/11 and HT – 16/01/11.

**Table 6.3** Counts of qualifying interests in 0L507 during NPWS 2010/11 Counts.

Species	LT1	LT2	LT3	LT4	HT
Black-tailed Godwit	2	93	2	96	0
Curlew	114	23	8	44	33
Shelduck	0	0	0	0	0
Dunlin	3	3	10	1	0

**Note:** -

LT – Low Tide; HT – High Tide.

LT1 – 9/10/11; LT2 – 12/11/10; LT3 – 09/12/10; LT4 – 08/02/11 and HT – 16/01/11.

**Table 6.4** Counts of qualifying interests in both 0L506 & 0L507 during NPWS 2010/11 Counts.

Species	LT1	LT2	LT3	LT4	HT
Black-tailed Godwit	2	106	7	206	250
Curlew	135	90	14	78	414
Shelduck	0	0	0	0	44
Dunlin	48	3	48	101	0

**Table 6.5** Birds in 0L506 & 0L507 as a percentage of the Clonakilty Bay counts.

Species	LT1	LT2	LT3	LT4	HT
Black-tailed Godwit	1.92%	13.93%	1.06%	29.64%	51.98%
Curlew	45.30%	43.90%	14.00%	19.55%	75.96%
Shelduck	0	0	0	0	78.57%
Dunlin	31.37%	0.52%	6.55%	10.04%	0.00%

6.23 The percentage occurrence of the qualifying interest in 0L506 & 0L507 can be summarised as follows: -

- Black-tailed Godwit: 1.06% - 29.64% at low tide; 51.98% at high tide;
- Curlew: 14.00% - 45.30% at low tide; 75.96% at high tide;
- Shelduck: 0% at low tide; 78.57% at high tide; and
- Dunlin: 0.52% - 31.37% at low tide; 51.98% at high tide.

6.24 Thus, at low tide, on average, 0L506 and 0L507 combined support 11.6% of Black-tailed Godwit; 30.7% of Curlew and 12.12% of Dunlin that are utilising Clonakilty Bay.

6.25 As noted, the intertidal habitat located within subsites 0L506 and 0L507 represents 21% of intertidal habitat within Clonakilty Bay SPA as a whole. However, the area of intertidal habitat within the licence application area equates to 76.2% of available intertidal habitat within these subsites.

6.26 Table 6.6 presents the results of two targeted roost counts in November 2010 and February 2011. It includes birds roosting in intertidal, supratidal and terrestrial habitats.

**Table 6.6 Results of targets roost counts in November 2010 and February 2011.**

Species	03.11.10		16.02.11	
	0L506	0L507	0L506	0L507
Black-tailed Godwit	310 <sup>1</sup>	65		215
Curlew	2	108	23	74
Shelduck		5		
Dunlin		337		15

Note: -

<sup>1</sup> Same 310 birds were noted in 0L506 and later in 0L507. Birds were roosting intertidally. Recorded under 0L506.

### **Black-tailed Godwit**

- 6.27 The oyster study found that the response of Black-tailed Godwit to trestles was negative (Gittings and O'Donoghue, 2012; 2016a). However, given the limited data available at the time we consider that the overall response of Black-tailed Godwit to oyster trestles should be classified as negative, with a low degree of confidence. For the purposes of this assessment predictions of the impact of oyster trestle blocks should therefore assume complete exclusion of these species from the affected area, although this may be a conservative assumption.
- 6.28 The peak numbers of Black-tailed Godwit recorded was at high tide in January 2011 (250 birds); this represented 52% of birds recorded in Clonakilty Bay at this time. The peak low tide count was 206 birds; 29.64% of birds in in Clonakilty Bay at this time. Assuming development of T05/603A birds could be displaced from 76.2% of available intertidal habitat at low tide; this would represent ca. 22.6% displacement.
- 6.29 As noted, the average number of birds using 0L506 and 0L507 (combined) was 11.64%. A worst case scenario of complete exclusion could result in displacement of up to 8.85% of the Black-tailed Godwit population of Clonakilty Bay.
- 6.30 The peak numbers recorded during a targeted roost count was 375 birds in November, including a flock of 310 godwit recorded along the border of 0L506 and 0L507 roosting intertidally.
- 6.31 The population trend for Black-tailed Godwit at Clonakilty Bay SPA is Favourable (positive).

### **Curlew**

- 6.32 Curlew showed a neutral response in most of the analyses of the impact of oyster trestles on waterbirds; though at Ballymacoda Bay they showed consistently negative responses to trestles. There was no obvious reason for the differences between sites, if these were real. In particular, Curlews do not frequently occur on trestles, so variation between sites in the condition of the trestles should not affect their response. Therefore, given the robust evidence of a neutral response from the intensive study (Gittings and O'Donoghue, 2012; 2016a), we consider that the overall response of Curlews to oyster trestles should be classified as neutral, but with only a moderate degree of confidence.
- 6.33 The peak numbers of Curlew recorded was at high tide was 381 birds in 0L506 in January 2011; 414 birds across both subsites which represented 76% of birds recorded in Clonakilty Bay at this time. The peak low tide count was 135 birds; 45.3% of birds in in Clonakilty Bay at this time. Assuming development of T05/603A birds could be displaced from 76.2% of available intertidal habitat at low tide; this would represent ca. 34.5% displacement.

- 6.34 As noted, the average number of birds using 0L506 and 0L507 (combined) was 30.7%. A worst case scenario of complete exclusion could result in displacement of up to 23.4% of the Curlew population of Clonakilty Bay.
- 6.35 The peak numbers recorded during a targeted roost count was 108 birds in 0L506 in November.
- 6.36 The population trend for Curlew at Clonakilty Bay SPA is Unfavourable. This therefore represents a significant negative impact. The age of the data derived as it is from 2010 / 2011 must however be noted.

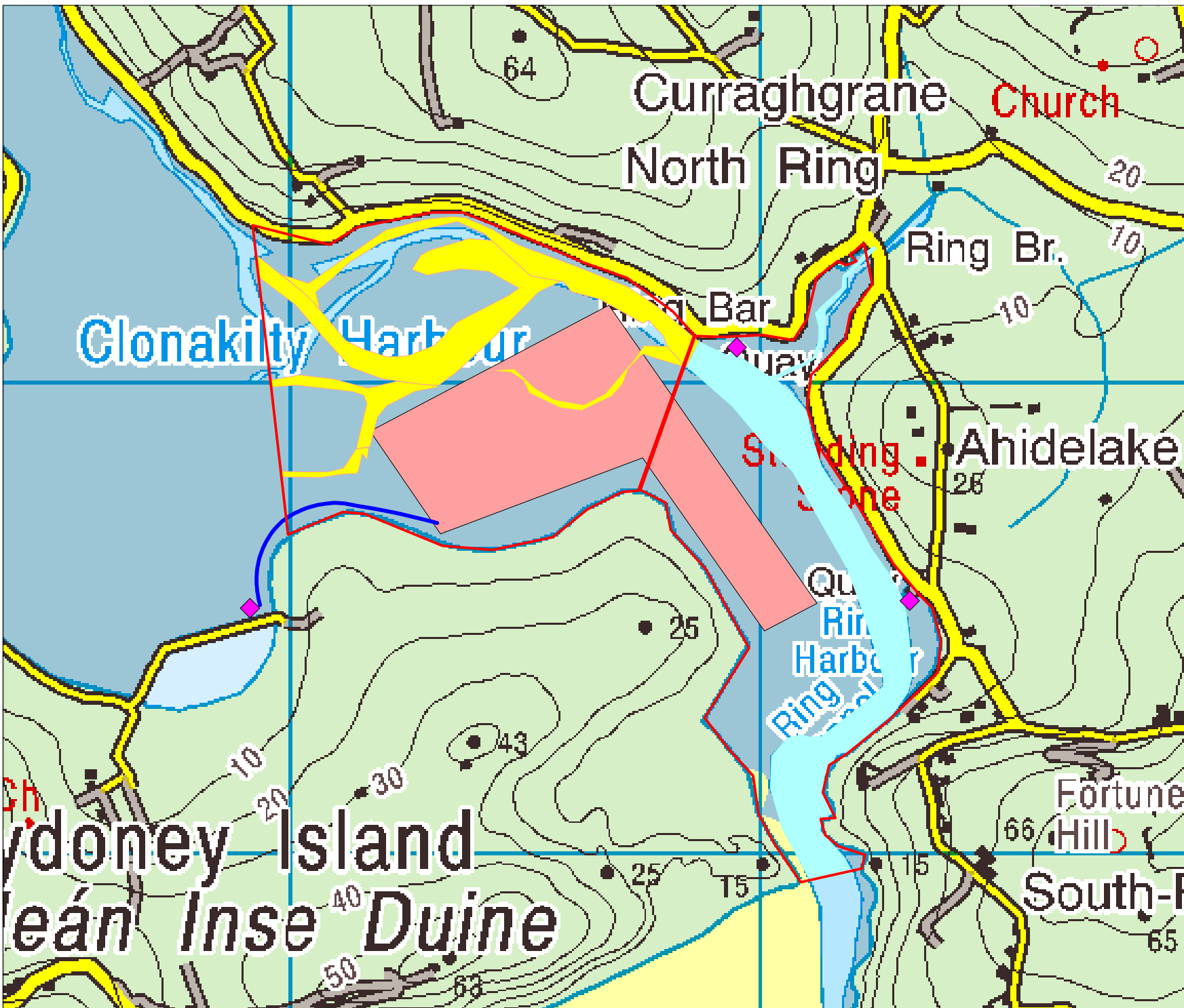
### **Shelduck**

- 6.37 The subsites, 0L506 and 0L507 does not appear to support significant numbers of Shelduck at low tide, with none recorded in 0L506 or 0L507 during any of the low tide counts suggesting they are not actively foraging in this area. As noted, however, this data is from 2010/11, so its age must be borne in mind.
- 6.38 During the January high tide count 44 birds were recorded in 0L506. While not a large count it did represent 78.6% of Shelduck using Clonakilty Bay at the time. Activities at the proposed trestles would largely be around low tide, though access at higher water levels by boat (eastern access points) or along the shore (from the cul-de-sac pool access) may cause disturbance to birds roosting. The conservation status of Shelduck in Clonakilty is Highly Unfavourable; declining numbers of Shelduck are also evident in other sites along the south coast, such as Cork Harbour SPA (004030).

### **Dunlin**

- 6.39 The oyster study found that the response of Dunlin to trestles was negative (Gittings and O'Donoghue, 2012; 2016a).
- 6.40 Dunlin were not recorded in 0L506 or 0L507 during the January 2011 high tide survey. The peak low tide count was 101 birds (100 birds in 0L506 in February 2011); 10% of birds in Clonakilty Bay at this time. Assuming development of T05/603A birds could be displaced from 76.2% of available intertidal habitat at low tide; this would represent ca. 7.62% displacement. However, the LT1 count noted that 31.37% of Dunlin within the bay occurred in these two count sectors (i.e. 48 of 153 birds) – this represented a potential displacement of 23.9% of birds in Clonakilty Bay at this time.
- 6.41 As noted, the average number of birds using 0L506 and 0L507 (combined) was 12.1%. A worst case scenario of complete exclusion could result in displacement of up to 9.22% of the Curlew population of Clonakilty Bay. While a higher percentage of Dunlin occurred in 0L506 & 0L507 (34.4%) in October 2010, this represented 48 birds from a total of 153 – at a time when Dunlin numbers were beginning to build up.
- 6.42 The peak numbers recorded during a targeted roost count was 337 birds in 0L507 in November 2010.
- 6.43 The population trend for Dunlin at Clonakilty Bay SPA is Unfavourable. This therefore represents a significant negative impact. The age of the data derived as it is from 2010 / 2011 must however be noted.





- Low Tide Subsites
- Licence Application
- T05/603A - Oysters
- Access
- ◆ Boat Access Points
- Shore Access Route
- Subtidal Channels
- In 0L506
- In 0L507

Client: Marine Institute		
Project: Clonakilty Bay SPA - Aquaculture AA		
Title: Subtidal Channels		
Designed/Drawn: POD	Checked: POD	Authorised: POD
Date: 17/06/20	Date: 17/06/20	Date: 17/06/20
Drawing No: Figure 6.2		Rev: 0.0

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## 7. Cumulative Impacts

7.1 At site level, the concept of 'favourable status', the overriding objective of the Habitats Directive, is referred to as 'conservation condition'. Conservation condition does not only relate to species numbers, but also to factors that influence species abundance and distribution at a site. Identifying activities and events that occur at a designated site is therefore important, as is the assessment of their potential impact upon the waterbird species and their habitats, thus influencing the achievement of favourable condition. Site-based management and control of factors that impact on species or habitats of conservation concern are fundamental to the achievement of site conservation objectives.

7.2 Information regarding activities, plans and projects across Clonakilty Bay SPA was collated through a desktop review including NPWS site reports (NPWS 2014b), County Development Plans, Local Area Plans and Town Council Plans (Cork County Council 2014, 2017, 2009; town councils were abolished in 2014 but their plans remain in effect until the next County Development Plan is published in 2020).

- [http://corkcocodevplan.com/wp-content/uploads/2017/10/CCDP\\_Volume\\_3.pdf](http://corkcocodevplan.com/wp-content/uploads/2017/10/CCDP_Volume_3.pdf)
- <http://corklocalareaplans.com/wp-content/uploads/2017/08/West-Cork-Environmental-Report-MD-LAP.pdf>
- <https://corkcocoplans.ie/wp-content/uploads/bsk-pdf-manager/2016/07/Clonakilty-T.C-Vol-1-2009-2015.pdf>

### Fishing

7.3 Fishing boats are docked at Ring Pier (subsite 0L507) and some small-scale fishing occurs in the outer estuarine subsites (e.g. 0L507, 0L508) but most boats make their way out through the narrow estuary opening and proceed to fishing areas further offshore (NPWS, 2014a).

7.4 Shore angling is a common activity at the site, at both Clonakilty and Inchydoney estuaries, and at Ring Harbour, Inchydoney beach and Muckruss Head. Some small-scale bait-digging occurs around Ring Estuary targeting lugworm and crabs and at Clonakilty Harbour targeting lugworm and sandeel.

7.5 Hand collection of shellfish is not a common activity in Clonakilty Bay.

### Beach recreation

7.6 A popular hotel is located on Inchydoney Island overlooking two beaches (0L451 and 0L508) which are separated by Virgin Mary's Point. As a popular holiday destination, the beaches are extensively used for recreational purposes throughout the year. Inchydoney beach has held Blue Flag status since 1991.

7.7 With high accessibility due to roads and pavements bounding many parts of the estuarine areas of the site, walking, often with dogs, is a regular occurrence around the site but rarely within the estuary itself due its muddy substrate. A road train brings tourists around the coast on public roads year-round (NPWS, 2014b).

7.8 Horse riding on the western beach at Inchydoney (0L451) is a common occurrence.

## Water-based recreation

- 7.9 Inchydoney beach is often favoured for surfing as water can be unsafe for swimming due to rip-tides (NPWS, 2014b). A surf school is based on the beach, often hosting large groups of children and adults. Other watersports in the vicinity are mainly carried either in Courtmacsherry Bay or Rosscarbery. There are no sailing or boating clubs within the bay.

## Hunting and shooting

- 7.10 Wildfowling has been recorded previously at the site, such as shooting for Snipe in Island Strand Intake, although this is not a regular occurrence. This activity was not observed during the 2010/11 Waterbird Survey Programme (NPWS, 2014b).

## Livestock

- 7.11 Goats and ponies are often grazed along the shoreline of West Muckruss Strand (0L465) and partly graze saltmarsh habitat. As part of a habitat management programme managed by the NPWS, horses graze clogheen Marsh and White's Marsh (NPWS, 2014b).

## Water treatment

- 7.12 For many years Clonakilty WWTP was operating above capacity, failing to meet minimum quality standards. In 2015, a new WWTP was made operational, employing new technology to achieve a more environmentally sustainable treatment solution. The new treatment plant has a population equivalent of >10,000 and operates a secondary treatment process. There is a primary treatment sewage treatment plant in Ring, which discharges untreated effluent into the bay.
- 7.13 EPA Transitional Water Quality monitoring recorded Clonakilty harbour as eutrophic in the 2010-2012 reporting, while it was classed as moderate in the 2010-2015 Water Framework Directive reporting. Coastal Water Quality monitoring (2010 – 2012) recorded Clonakilty Bay as of intermediate quality, while 2010 – 2015 WFD monitoring recorded it as moderate.
- 7.14 Algal mats are present at this site annually (see below) and in years where excessive growth occurs, macroalgal material washes up onto the beaches at Inchydoney (subsites 0L451 and 0L508) where it causes considerable nuisance and odour pollution. Cork County Council has obtained permission to remove the mass of macroalgae (which otherwise remains piled up, and rots down gradually) (NPWS, 2014a).
- 7.15 A reduction in organic and nutrient loading to an estuary may have various consequences for the ecology of the estuarine system. For example, there could be a reduction in the abundance of benthic invertebrate prey species (e.g. Burton *et al.* 2002) particularly those invertebrates that thrive (proliferate) in organically-enriched sediments. This could therefore have subsequent knock-on effects upon waterbird foraging distribution, prey intake rates, and ultimately upon survival and fitness. (NPWS, 2014b ; <https://www.bto.org/sites/default/files/publications/rr696.pdf>).

## 8. Conclusion & Recommendations

### Conclusions

- 8.1 The extent of intertidal habitat is 40.9ha in 0L506 (80.3% of the subsite) and 27.5ha in 0L507 (71% of the subsite). The total area of intertidal habitat within subsites 0L506 and 0L507 equates to approximately 76.2% of available habitat in these subsites (combined). As noted, within Clonakilty Bay SPA, NPWS (2014a) recorded 325ha of intertidal habitat. The intertidal habitat located within subsites 0L506 and 0L507 therefore equates to ca. 21% of intertidal habitat within Clonakilty Bay SPA as a whole. Its loss would therefore represent a significant loss of this habitat within the SPA; one of whose qualifying interests is Wetland and Waterbirds [A999].
- 8.2 NPWS biotope mapping (from Clonakilty Bay SAC Conservation Objectives supporting documents – marine; NPWS, 2014f ) record a single community type – Sand to sandy mud with *Tubificoides benedii* and *Peringia ulvae* community complex (see Figure 5.6a). This occurs on intertidal and shallow intertidal habitat (<2m within Clonakilty Bay). MERC (2012) found that north of Inchydoney Island is dominated by *Polychaete/bivalve-dominated muddy sand shores* (LS.LSa.MuSa) and *Polychaete/bivalve-dominated mid-estuarine mud shores* (LS.LMu.MEst). (see Figure 5.6b). These sediments are both high in species diversity and biomass (MERC, 2012) and therefore provide good quality habitat for intertidal waders and wildfowl.
- 8.3 The percentage occurrence of the qualifying interest in 0L506 & 0L507 can be summarised as follows: -
- Black-tailed Godwit: 1.06% - 29.64% at low tide; 51.98% at high tide;
  - Curlew: 14.00% - 45.3%% at low tide; 75.96% at high tide;
  - Shelduck: 0% at low tide; 78.57% at high tide; and
  - Dunlin: 0.52% - 31.37% at low tide; 51.98% at high tide.
- 8.4 With respect to potential for displacement (based on NPWS low tide data from 2010/11) based on loss of access to intertidal areas within 0L506 & 0L507 within the licence plot: -
- Black-tailed godwit - The peak low tide count was 206 birds; 29.64% of birds in in Clonakilty Bay at this time. Assuming development of T05/603A birds could be displaced from 76.2% of available intertidal habitat at low tide; this would represent ca. 22.6% displacement (average displacement - 8.85%);
  - Curlew - The peak low tide count was 135 birds; 45.3% of birds in in Clonakilty Bay at this time. Assuming development of T05/603A birds could be displaced from 76.2% of available intertidal habitat at low tide; this would represent ca. 34.5% displacement (average displacement - 23.4%)
  - Shelduck – no birds were recorded at low tide. During the January high tide count 44 birds were recorded in 0L506. While not a large count it did represent 78.6% of Shelduck using Clonakilty Bay at the time.
  - Dunlin - The peak low tide count was 101 birds (100 birds in 0L506 in February 2011); 10% of birds in in Clonakilty Bay at this time (1001 birds). Assuming development of T05/603A

birds could be displaced from 76.2% of available intertidal habitat at low tide; this would represent ca. 7.62% displacement. However, the LT1 count noted that 31.37% of Dunlin within the bay occurred in these two count sectors (i.e. 48 of 153 birds) – this represented a potential displacement of 23.9% of birds in Clonakilty Bay at this time (average displacement of 9.23%).

- 8.5 Result from the targeted roost counts recorded significant numbers of both Black-tailed Godwit and Dunlin in November 2010; 375 both Black-tailed Godwit in November 2010 (including a flock of 310 godwit recorded along the border of 0L506 and 0L507 roosting intertidally) and a flock of 337 Dunlin in 0L507. These both represent significant numbers.
- 8.6 As noted, a significant tern / gull roost also occurs within Clonakilty Harbour. There is insufficient data available on the numbers, species and location of these roosts to discount the potential for negative impacts. As noted, this includes post-breeding Sandwich Tern, a species listed on Annex I of the EU Habitats Directive.
- 8.7 In conclusion, based on the potential levels of displacement identified above the potential for negative impacts on bird species for which Clonakilty Bay SPA has been designated cannot be discounted. In conclusion, based on the potential levels of displacement identified above the potential for negative impacts on bird's species for which Clonakilty Bay SPA has been designated cannot be discounted. Given the large risk of displacement there is no obvious mitigation measures that would be helpful.

## Recommendations

- 8.8 While a diverse range of data has been used to ensure a robust assessment is undertaken, the main low tide data was collected in 2010 / 2011. We would recommend that up to date low tide data be collected in order to better understand the current spatial distribution relative to 0L506 & 0L507 as well as within T05/603A.
- 8.9 While, not qualifying interests of Clonakilty Bay SPA, one area of uncertainty relates to the post-breeding / autumn tern roost as well as the areas used by roosting gulls to discount the potential for negative impacts. Note that Sandwich tern roosting at the site most likely originate from the tern colony at Lady's Island Lake SPA (004009).

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