Donegan, Fergus (Alab)

From: Noel Roche [redacted]
Sent: Friday 19 January 2024 17:31
To: Alab, Info
Subject: Re: Ballyteigue Oysters Ltd - Final Observations

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Fergus,

I haven't received any email from Nextcloud for a link. I have checked Spam folder also and it hasn't come in so I'm not sure what the issue is then.

Any other ideas of how I can access it?

Thanks
Noel

On Fri, Jan 19, 2024 at 5:24 PM Alab, Info <Info@alab.ie> wrote:

> Hi Noel,
>
> The link is sent directly from NextCloud and would be in a separate email.
>
> If you are having issues with this it might be in your junk folder?
>
> I have resent the link to the shared folder and attach a new password below.
>
> Kind regards,
>
> Fergus

Fergus Donegan

An Bord Achomhairc Um Cheadúnais Dobharshaothraithe

Aquaculture Licences Appeals Board

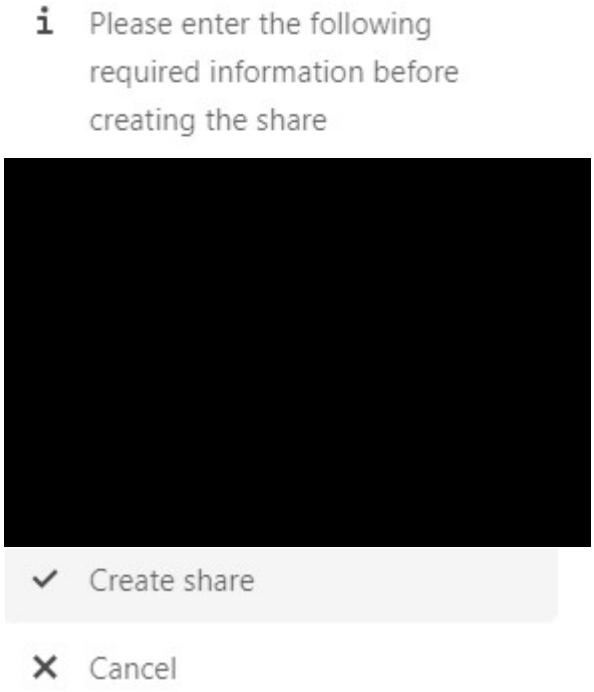
Cúirt Choill Mhinsí, Bóthar Bhaile Átha Cliath, Port Laoise, Contae Laoise, R32 DTW5

Kilminchy Court, Dublin Road, Portlaoise, County Laois, R32 DTW5

T +353 (0) 057 8631912

R-phost/Email: info@alab.ie

Láithreán Gréasáin/Website: www.alab.ie



From: Noel Roche [redacted]
Sent: Friday, January 19, 2024 4:36 PM
To: Alab, Info <Info@alab.ie>
Subject: Re: Ballyteigue Oysters Ltd - Final Observations

Hi Fergus,

I cant seem to find a link, it doesn't to be in the email, but i have received the password. Can you please resend the link to Nextcloud.

Many thanks

Noel

On Fri, Jan 19, 2024 at 4:19 PM Alab, Info <Info@alab.ie> wrote:

> Dear Mr Roche,
>
> We wish to acknowledge receipt of your email and contents received by ALAB on 18/01/2024 in relation to the recent S46 notice.
>
> In relation to the video footage you wish to submit, a link has issued to this email address providing an upload portal by way of NextCloud.
>
> This is a time sensitive upload link so we would advise you to upload this at the earliest possible convenience.
>
> If you require any additional assistance with this issue please let me know.
>
> Kind regards,
>
> Fergus
>
> **Fergus Donegan**

An Bord Achomhairc Um Cheadúnais Dobharshaothraithe

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T +353 (0) 057 8631912

R-phost/Email: info@alab.ie

Láithreán Gréasáin/Website: www.alab.ie

From: Noel Roche [redacted]
Sent: Thursday, January 18, 2024 5:15 PM
To: Alab, Info <Info@alab.ie>
Subject: Ballyteigue Oysters Ltd - Final Observations

To whom it may concern,

Please see attached documents for your attention for submission:

- Ballyteigue Oysters LTD Final Observations on TAR and FRC Report - Word document. A hard copy of the attached document has been posted to you on 17/01/2024.

- Ballyteigue Bay Bird Survey Report PDF. A hard copy had been sent on 17/01/2024

- Video footage will follow and be uploaded to Next Cloud (once link is received from ALAB).

I have spoken to Majella in ALAB on Thursday 18 January in relation to the sending video footage as part of this submission. It has been confirmed by Majella that video footage is accepted through Next Cloud. I am awaiting a link to be sent to me from ALAB for Next Cloud to upload this footage. Within this footage there is no GDPR issue with the short clip showing footage of Brent Geese feeding on oyster trestles.

These are Brent Geese feeding on oyster trestles in Bannow Bay on 4th October 2023. They were feeding within metres of a passing oyster workboat with staff on it and they are unphased by the encounter. Previous reports stated that Brent Geese avoid trestles in Bannow Bay.

This is untrue as every oyster farmer knows. I refer to this in my word file submission.

Once I receive the Next Cloud Link from ALAB I will upload the footage.

Can you please confirm by reply email that you have received this email along with the both attachments named above, with both attachments opening successfully.

Kind Regards,

Noel Roche

[redacted]

[redacted]

Noel Roche

[redacted]

[redacted]

[redacted]

[redacted]

15/01/24

Aquaculture Licence Appeals Board (ALAB)

Kilminchy Court

Dublin Road

Portlaoise

County Laois

R32 DTW5

Re: AP4/1-2/2023, Site Ref. T03/038A

Comments on the Technical Advisors Report (TAR) and the Dungarvan Waterbird Monitoring Report 2019/2020

Dear ALAB, thank you for providing me with an opportunity to comment on the above reports as set out in your letter of 07/12/23. When reading the comments below (my submission on the TAR and the KRC Dungarvan report) they should be read whilst taking on board my original observations that I made on 27/03/23 in response to the appeals made against the DAFM decision to grant me a licence.

Comments of the Technical Advisors Report (TAR).

Information of the dates and duration of site visits is very limited. The TAR states the date of site inspection as 9 September 2023. The TAR also mentions in Section 3.2.2 Angling Activity that

> *-'Anglers were seen within the area during the three site visits in August and September 2023.'*

My concerns are as follows in regard to the TAR site visit information:

- No details of how long the site visits took on each occasion.
- No effort was made to monitor bird activity/take bird count therefore no effort to support or contradict the conclusion statement findings of the Appropriate Assessment for the SPA.
- The dates of the Technical Advisor (TA) site visits are outside the normal overwintering period for Species of Conservation Interest (October to March).
- No attempt to undertake even one overwintering period of bird counts/activity monitoring in Ballyteigue.

- The TAR is essentially a fairly quick and incomplete desk top study into an issue that has already undergone intensive assessment by various bird experts. The reason for this statement is highlighted later in my submission with specific examples.
- The TA hasn't even bothered to use the boundary of my actual application on the google earth images that are include in the report.

I include my own image **(Figure 1)** of my application on the Google earth background image which shows that the trestles are included within the area.

Fig. 1 Actual Location of Ballyteigue Oysters Application as opposed to the erroneous location portrayed in blue outline in the TAR.

Below is a screen grab image of how my application is portrayed (in blue outline) in Figure 4 of the TAR. This isn't correct, and it is indicative of the poor approach the TA has taken to this important appeal. Not only very important from my perspective but also very important from the aquaculture industry viewpoint *viz* as to how they are treated during an appeal process.

Figure 4: Google Earth map (April 2021) showing existing (as per background image) aquaculture activity and the approximate areas for which the two new applications refer. The blue polygon thus approximates to the location of a new application for an existing area of oyster trestle structures (and the subject of this application T/03/38A), whilst the red area approximates to the location of the separate application T/03/095A.

In Section 3.3.5 of the TAR the TA cuts and pastes passages of text from the Wexford County Development Plan 2022-2028 with Wexford County Development Plan Objectives that the TA deems as relevant such as:

-Coastal Zone Management

-Tourism:

-Environmental Management:

-Biodiversity

In addition, in Section 7.3 Statutory Status of the TAR the TA goes on to reiterate the same topics that he deems as relevant to this appeal as per Section 61 c of the appeals process:

> *-Section 61 (c) considers the statutory status of the area under consideration including the provisions of any development plan. There are no specific statutory or development plans for Ballyteigue Bay. The County Wexford Development Plan promotes sustainable economic development, tourism and environmental protection, and reference is made under the headings Coastal Zone Management, Tourism, Environmental Management and Biodiversity which are relevant in this regard*.

I had a look at the Wexford County Development Plan 2022-2028 also and I include the following excerpts of text which in my opinion are equally if not more relevant and which were overlooked by the TA:

12.6.2 Fisheries and Aquaculture

> *-**These sectors are an integral part of our coastal economy** and co-exist in various locations with other marine sectors such as ports, marine leisure and tourism. As outlined in Chapter 6 Economic Development Strategy, the Council supports the **development of sustainable fisheries and aquaculture sectors,** driven by skilled workforces and **promotes sustainable industries that protect and enhance the social and economic fabric of rural coastal communities, which are dependent on these sectors**. The Council will continue to support the development of appropriate landside facilities and other developments that offer value added opportunities for these sectors. The Council will work with these sectors to promote improved marine litter management and the provision of reclamation facilities, as appropriate, in developments in coastal and maritime areas.*

In regard to the Fisheries and Aquaculture Objectives

> *It is the objective of the Council:*
>
> ***Objective CZM47***
>
> *-To **support the development of vibrant fisheries and aquaculture sectors that produce high quality foods, protect and enhance the social and economic fabric of rural coastal communities and conserves biodiversity around our coastline** and ensures good marine litter management, and to support the development of associated landside infrastructure subject to compliance with Objective CZM46 and the proper planning and sustainable development of the area.*

In regard to the The Blue Economy in Section 6.7.4 of the County Development Plan its states:

> *-The planning of the country's marine area is currently undergoing an ambitious programme of reform, with an impending new regime for the management of development and activities in Ireland's Marine Area (See Section 12.3 in Chapter 12 Coastal Zone Management and Marine Spatial Planning).*
>
> *The National Marine Planning Framework (NMPF) promotes the sustainable development of a thriving marine economy and the development of vibrant, accessible and sustainable rural coastal and island communities* ***while realising the potential of marine resources in a fair, balanced and transparent manner****. The Framework focuses on the development of key marine assets including* ***aquaculture*** *and fisheries, energy, marine aggregates and mining, ports, harbours and shipping and tourism.*
>
> *The RSES recognises that as an island we are dependent on our seas for* ***trade****, fishing, energy and tourism, and* ***it supports the development of the marine resources and the Blue economy, while conserving biodiversity and ecosystem health.***
>
> *The sea has, and will continue to be, a very important economic asset for our county. It provides* ***employment to many people in coastal areas making a valuable economic contribution to local communities in the county.*** *Dominant marine economic activities in County Wexford include ports, harbours and shipping,* ***seafood*** *and fisheries and tourism.*
>
> *The Wexford coastline is 275km long and presents significant opportunities in terms of marine related development, continuing in the* ***traditional sectors*** *while exploring opportunities offered by off-shore energy production and marine biotechnology.*

In regard to the Aims of Wexford County Council regarding Aquaculture and Fisheries it states:

> *-The Council aims to maximise the long-term contribution of the sea-fishing sector and inland fisheries to the county's economy and to the* ***maintenance of the social fabric of rural and coastal communities****.* ***Aquaculture activity is carried out in Wexford Harbour and Bannow Bay. Most aquaculture activity in Bannow Bay involves intertidal oyster cultivation, in addition to some mussel cultivation.***
>
> ***Growth opportunity in the seafood sector lies in developing greater processing scale so as to capitalise on the supply of raw material. The sector has significant potential for sustainable growth in terms of value-added product in the areas of food ingredients, health and sport nutrition markets.***

Indeed, Wexford County Council were very supportive of my application and in their response to the application they stated:

> *-The Environment Section* ***have no objections to the proposed development, and in fact welcome it*** *as its presence will be used to highlight the need for good water quality to people upstream in the catchment and the need for them to carry out farming, licensed discharges etc in a sustainable manner.*

Despite the TA not capturing all of the relevant info from the Development Plan in his TAR, The TA states:

*-It is the considered opinion of the Technical Advisor that the proposed plan **does not have a significant impact with regard to the County Development Plan**.*

I would argue that my application has a positive significant impact on the Wexford County Development Plan for the impact of oyster farming in the rural economy, adding scale to shellfish production in the county thus opening up value adding opportunities, for development of a tourist seafood trail in the county, **the positive ecosystem services afforded by bivalve aquaculture (a point completely ignored by the TA)** and for the reasons that Wexford County Council environment section stated in their supportive response to my application in the first instance. The latter point clearly demonstrates that Wexford County would see oyster farms in Ballyteigue as assisting with improving water quality and maintaining compliance with the Water Framework Directive.

All of the additionally relevant passages I have gleaned from reading the Wexford County Development plan and included here highlights a very key point in the approach that the TA has taken in writing up the TAR. **That approach is piecemeal/incomplete at best or wilfully overlooking/omitting to document supportive facts to my application at worst**. It's a theme that I will return to throughout my submission below.

5.0 Screening for Appropriate Assessment.
Section 5 of the TAR goes into Screening for Appropriate Assessment and then gives his views/observations. At this point before I go into the specific views that the TA raises in regard to the SPA AA. I would like to point out an extremely important overarching point which has a bearing on the interpretation of all SPA Appropriate Assessments of aquaculture and which ALAB Board Members should pay particular attention to. I discuss as follows:

The Misinterpretation of the Threshold Displacement value of 5% of an SCI species.
Possibly one of the most misunderstood pieces of information by the appellants and indeed the TA and others is the 5% displacement threshold. Given what is at stake here and the importance of this figure I'll leave nothing to chance and I will spend some time attempting to highlight what this famous figure of 5% or more displacement actually means.

Back in the 2014 the Marine Institute Ornithological Consultants Atkins produced the Appropriate Assessment of aquaculture in Dungarvan Harbour SPA.
Gittings, T. and O'Donoghue, P. undertook an AA on Dungarvan SPA. Dungarvan Harbour Special Protection Area: Appropriate Assessment of Intertidal Oyster Cultivation [including consideration of Helvick Head to Ballyquin SPA and Mid-Waterford Coast SPA].

This report is available at:
https://wayback.archive-it.org/org-1444/20201126171322/https://www.agriculture.gov.ie/media/migration/seafood/aquaculturefores horemanagement/aquaculturelicensing/appropriateassessments/DungarvanHarbourAA240314.pdf

Again, the TA would have known of its existence.

In it sections 2.54 to 2.56 the Authors of the Report discuss the rationale for deriving 5% as the threshold.

The report states:
Attribute 2 – Number or range (distribution) of areas used

2.54 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 Dungarvan Harbour population would be detectable against background levels of annual variation.*

2.55 There have been some studies that have used individual-based models (IBMs; see Stillman and Goss-Custard, 2010) to model the effect of projected intertidal habitat loss on estuarine waterbird populations. West et al. (2007) modelled the effect of percentage of feeding habitat of average quality that could be lost before survivorship was affected. ***The threshold for the most sensitive species (Black-tailed Godwit) was 40%.*** *Durell et al. (2005) found* ***that loss of 20% of mudflat area had significant effects on Oystercatcher and Dunlin mortality and body condition but did not affect Curlew****. Stillman et al. (2005) found that, at mean rates of prey density recorded in the study****, loss of up to 50% of the total estuary area had no influence on survival rates of any species apart from Curlew****. However, under a worst-case scenario (the minimum of the 99% confidence interval of prey density), habitat loss of 2-8% of the total estuary area reduced survival rates of Grey Plover, Black-tailed Godwit, Bar-tailed Godwit, Redshank and Curlew, but not of Oystercatcher, Ringed Plover, Dunlin and Knot.* ***Therefore, the available literature indicates that generally quite high amounts of habitat loss are required to have significant impacts on estuarine waterbird populations, and that very low levels of displacement are unlikely to cause significant impacts.*** *However, it would be difficult to specify a threshold value from the literature as these are likely to be site specific.*

2.56 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). For example, a 1% decrease in the baseline population of Turnstone would be a decrease of two birds.* ***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).***

My Comments

The same explanations are reiterated verbatim in the Appropriate Assessment for Ballyteigue SPA in sections 2.67 to 2.70**.** So, they haven't changed. The TA would have been aware of them and hopefully their meaning too although I'm not so sure of the latter. An Taisce and other appellants automatically assume that a significant negative impact on birds at 5% and above. This is incorrect.

The underling and bolding (above) that I have used on the excerpt above is to highlight the authors own words as to how conservative this 5% figure is. This newly derived threshold is basically the level at which any **potential** impact may be detected as separate from natural variation in the population or the variation created by difficulties monitoring the birds. It is simply a **screening threshold** below which it is pointless continuing to assess as it is indistinguishable from natural variations. **Above 5% does not represent a significant impact**. It just means **there is a potential but that it requires further assessment** to determine if there is an actual negative impact. The author explains this in 2.58 below. Unfortunately for the aquaculture industry this incredibly conservative threshold (a screening threshold in reality) has been misinterpreted by the appellants and the TA and potentially by ALAB members and is used in an even more conservative manner in that it is wrongly assumed

that there is a negative impact above 5% all of the time. This is incorrect and has transcended into a myth which people like the appellants to my licence use to their favour.

> 2.58 Impacts that will cause displacement of 5% or more of the total Dungarvan Harbour 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 Dungarvan Harbour)**. In this context, displacement may involve birds moving to other areas within the SPA or leaving the site altogether.

This has to be borne in mind especially in light of the predicted potential displacement impact of Grey Plover in Ballyteigue was only 4.6-4.9% if all licences were granted and the sites fully occupied being determined. Other adjustments such as using maximum instead of mean bird occupancy at the two count sub-sites. In other words, even with worst case scenario the potential (not actual) displacement was indistinguishable from background natural fluctuations in population or noise created by difficulties in monitoring.

This is borne out in the tabulated information shown below (Table 5.2 from the Ballyteigue SPA AA) of the short-term changes and long-term changes for Ballyteigue as opposed to the national trend for Grey plover. It appears grey plover are during extremely well (possibly one of the best grey plover performing bays in the country going by those very positive figures. Doesn't look like my site is doing them any harm at all.

Table 5.2 –Short-term and long-term percentage changes in the population estimates for the SCI species in the Ballyteige Burrow SPA compared to the national estimates.

Special Conservation Interests (SCIs)	Short-term change		Long-term change	
	Ballyteige Burrow	all-Ireland	Ballyteige Burrow	all-Ireland
Light-bellied Brent Goose	-3%	-15%	+35%	+96%
Shelduck	-2%	-14%	-68%	-30%
Golden Plover	-61%	-24%	-56%	-44%
Grey Plover	+38%	-6%	+59%	-54%
Lapwing	-52%	-16%	-81%	-67%
Black-tailed Godwit	+86%	+4%	-30%	+45%
Bar-tailed Godwit	+14%	+4%	-2%	+6%

Note: The percentage changes are the changes between the mean annual peak counts (Ballyteige Burrow) and the mean annual peak estimates (all-Ireland) between the periods 2006/07-2010/11 and 2011/12-2015/16 (short-term) and 1994/95-1998/99 and 2011/12-2015/16 (long-term). Ballyteige Burrow percentage changes calculated from I-WeBS data. All-Ireland percentage changes from Burke *et al.* (2018).

The TA doesn't opt to use the table above from the SPA AA in his TAR but rather uses the following Table below (Table 3 in the TAR) generated by Birdwatch Ireland which:

> *-undertook an analysis of trends in waterbird populations[5], analysing the trends of those species for which sufficient data was available over the period 1994/95-2019/20 (last updated 17/08/2023). Shown in Table 3 for 15 species (10 waders; 5 other),*

Of note is that Grey plover is still doing remarkably well in Ballyteigue Bay in comparison to the national picture over the last 23 years. During that time, I was present in Ballyteigue Bay oyster farming. There is no hiding that fact.

Table 3. Trends in abundance of selected species at Ballyteigue over short-, medium- and long-time period.

Species	5-year trend (%) 2014/15-2019/20	12-year trend (%) 2007/08-2019/20	23-year trend (%) 1996/97-2019/20	Classification (long-term)[6]	National trend (22 year)[7]
Golden Plover	-33.9	-87.2	-77.0	Large Decline	-43.4
Lapwing	-13.7	-66.8	-76.7	Large Decline	-67.6
Bar-tailed Godwit	-59.6	-21.6	-47.2	Moderate Decline	+31.7
Wigeon	-9.3	-37.1	-43.6	Moderate Decline	-39.2
Black-tailed Godwit	-47.6	-63.5	-43.3	Moderate Decline	+77.7
Curlew	+4.6	+1.5	-43.3	Moderate Decline	-41.0
Shelduck	-9.0	-12.6	-40.0	Moderate Decline	-23.0
Dunlin	+10.0	+27.5	-24.1	Intermediate Decline	-63.0
Light-bellied Brent Goose	-34.1	-41.7	-12.4	Intermediate Decline	+96.1
Grey Plover	-14.9	-3.9	0.0	Stable/Increasing	-61.8
Oystercatcher	+24.4	+2.0	+4.1	Stable/Increasing	+21.5
Ringed Plover	-31.2	+140.9	+35.9	Stable/Increasing	-6.6
Redshank	+38.6	-17.7	+46.3	Stable/Increasing	+11.2
Mallard	+72.6	+409.5	+10.98	Stable/Increasing	-26.1
Teal	+28.6	+230.0	+135.7	Stable/Increasing	+4.1

In addition to the above important point I have to make another very important point regarding the lack of consideration of several highly relevant reports concerning bird monitoring within Ballyteigue and also in Bannow and Dungarvan. These are:

-**Ballyteigue Burrow Waterbird Survey Winter 2018-19, 2019-20 & 2020-21 commissioned by Ballyteigue Oysters Limited (my company) and undertaken by INIS Environmental Consultants Ltd. (INIS**). I will refer to this as the **BTWBS Report 2018-2021** in this submission from here on.

This work was undertaken for the specific purpose of assessing wintering bird populations in Ballyteigue Burrow SPA, Co. Wexford and included four low tide surveys and a single high tide survey for **each** of the three winter seasons and a one-day disturbance study also. This report was submitted by me to ALAB and for technical/procedural reasons it wasn't accepted.

In addition to the report above the Marine Institute (MI) also have undertaken follow up post-licencing bird monitoring studies in Bannow Bay (6 Reports) and Dungarvan Harbour (7 reports) which are publicly available at the following link:

https://emff.marine.ie/marine-biodiversity/measure-effectiveness-mitigation-measures-managed-activities-aquaculture-1

The Bannow Bay reports as follows:
Marine Institute Bird Studies Winter Waterbird Survey Bannow Bay SPA, County Wexford.2017-2018
Marine Institute Bird Studies Winter Waterbird Survey Bannow Bay SPA, County Wexford.2018-2019
Marine Institute Bird Studies Winter Waterbird Survey Bannow Bay SPA, County Wexford.2019-2020
Marine Institute Bird Studies Winter Waterbird Survey Bannow Bay SPA, County Wexford.2020-2021
Marine Institute Bird Studies Winter Waterbird Survey Bannow Bay SPA, County Wexford.2021-2022
Marine Institute Bird Studies Winter Waterbird Survey Bannow Bay SPA, County Wexford.2022-2023
All of the above Bannow Bay Reports were written by Inis Environmental Consultants Ltd; the same Consultancy that I commissioned for the BTWBS Report 2018-2021.

The MI Dungarvan Reports are as follows:
Marine Institute Bird Studies Dungarvan Harbour SPA: Monitoring of waterbird distribution across the tidal cycle.2014-2015 (by Atkins)

Marine Institute Bird Studies Dungarvan Harbour SPA: Monitoring of waterbird distribution across the tidal cycle.2016-2017 (by Atkins)
Marine Institute Bird Studies Dungarvan Harbour SPA: Monitoring of waterbird distribution across the tidal cycle.2017-2018 (by Atkins)
Marine Institute Bird Studies Dungarvan Harbour SPA: Monitoring of waterbird distribution across the tidal cycle.2018-2019 (by Atkins)
Marine Institute Bird Studies Dungarvan Waterbird Monitoring 2019/2020 (**by KRC Ecological Ltd of which the TA that ALAB are using in this appeal is the company Director)**. **This is the only one of these valuable reports sought by ALAB.**
Marine Institute Bird Studies Dungarvan Harbour SPA: Monitoring of waterbird distribution across the tidal cycle.2020-2021 (by Atkins)
Marine Institute Bird Studies Dungarvan Harbour SPA: Monitoring of waterbird. 2021-2022 (By Atkins)

All of these studies Measure the effectiveness of mitigation measures of managed activities (aquaculture) carried out in Natura sites – monitoring and baseline data collection. The project states that the expected benefit of the work was:

> -***Validation of licensing decisions taken at sites to allow adaptive management of aquaculture in Natura sites***
>
> *-This project was designed to measure the effectiveness of management or mitigation measures taken as part of aquaculture licencing decisions to reduce or minimise risk to conservation features. Such measures are likely to be of the form of, 1) licence conditions that place certain constraints on activities in certain areas or, 2) redrawing site boundaries. The response of the conservation features to such measures will have to be considered.*

The question is why was the KRC Report pertaining to Dungarvan Harbour 2019/20 the only one requested from the MI? Surely the TA was aware of the existence of the others relevant reports? There is some very relevant information to be found in the MI Commissioned Bird Studies which I will mention below. On the other hand, ALAB have sought a report written by the TA for a completely different bay (Dungarvan Harbour) which does have some significant differences. Dungarvan Harbour is an open oceanic bay and has a very different bathymetry, sediment types (particularly in the outer intertidal harbour east of the Cunnigar sandspit). Furthermore, it has the largest concentration of oyster farming in any bay in the country which is on the opposite end of the scale to my application of 1.698ha. Bannow Bay would be closer and have more similarities with Ballyteigue bay.
Despite this mystery of cherry picking one MI Report (the one that the TA actually was the author of) the other reports mentioned above (particularly the BTWBS Report 2018-2021) should be used by ALAB in the appeal process hence I include the BTWBS Report 2018-21 in my submission and I include some findings incorporated into this submission.

The MI commissioned bird reports make for some very interesting reading.
In Winter Waterbird Survey Bannow Bay SPA, County Wexford.2022-2023 it states in section **4.8.6. Grey Plover**

> *-Total site numbers of Grey Plover peaked at just 18 individuals during winter 2022/23. This is the lowest total count in the nine-year dataset. The site trend is for decline, which is against the backdrop of a national trend for decline.* ***Reasons for the decline in numbers wintering in Ireland is unknown, but satellite tracking results have shown Ireland to be on***

the extreme western edge of the species' flyway, and therefore short-stopping, i.e. the birds simply not migrating as far west as Ireland, may be a reason (Exo et al., 2019).

In the Marine Institute Bird Studies Dungarvan Harbour SPA: Monitoring of waterbird.2021-2022 Dungarvan report by Atkins they state **in section 4.1. Low tide counts:**

> *-The overall numbers and distribution patterns of most species were broadly in line with expectations based on previous monitoring data and general knowledge of distribution patterns in Dungarvan Harbour. However, two of the target species (Grey Plover and Bar-tailed Godwit) occurred in very low numbers.* ***The low numbers of Grey Plover that we recorded reflects the phenomenon of Grey Plover disappearing at low tide that was apparent from the tidal cycle monitoring, and which we have discussed in previous reports. This may be due to birds roosting at low tide in creeks in the Inner Harbour Main, where they are not visible from shoreline vantage points.***
>
> *The low numbers of Bar-tailed Godwit were more unexpected as the daily maxima during the tidal cycle counts were usually recorded at low tide. During the Bar-tailed Godwit feeding study, around 200-400 Bar-tailed Godwit were recorded on Ballyrandle Sandflats on each of the five survey days, but* ***on some days they were absent for a significant part of the low tide period. Therefore, it seems likely that the low numbers recorded on the low tide counts were caused by birds being missed due to their movement patterns, rather than a real decline in numbers. The above issues with the Grey Plover and Bar-tailed Godwit counts reflect general issues with low tide counts as a method of monitoring population sizes. At low tide birds move around more than at high tide, so birds can be missed, or double-counted, depending on their movement patterns, relative to the sequences in which the sectors are counted. There is also a much larger area to cover at low tide, with more opportunities for birds to be hard to detect due to distance and / or topography.***

To give the TA some credit he used GPS tagging methods In the KRC Dungarvan Report 2019-2020 in Figure 9 they state and show:

> ***-****Use of areas outwith the core Dungarvan site by GPS tagged Grey Plovers during January/February 2020. The use of inland areas at the Gold Coast Golf Course, SW of Dungarvan at Ring and ca. 8km SW of Ring towards Ardmore* ***is unexpected****. Overall* ***43.5% of fixes of the tracked birds came from sites outwith Dungarvan Harbour itself****.*

The above snippets from several reports would indicate that that there are different reasons for birds disappearing at low tide or disappearing temporarily from the SPA and that it could well be that aquaculture has nothing to do with it.

However, despite evidence that Grey Plover 'prefer' certain areas in the inner Harbour/upper Whitehouse Bank and golf courses and land outside the SPA the KRC goes on to describe this as 'actively avoiding' trestles in the following explanation:

> *-To increase sampling effort around all tidal and day/night stages, we tracked the movements of eight Grey Plovers using high resolution GPS in January-February of 2020, acquiring GPS positions continuously at 40-minute intervals. These tracked birds spent ~ 41% of their time outside the main site (above the Dungarvan HWM or outwith the SPA entirely). They primarily utilised the Inner Harbour area but 25% of 'in site' positions were on the upper sections of Whitehouse Bank on ebb of flood tide phases. Resource selection analyses indicated that across all states of the tide, Grey Plovers actively avoided trestle areas and the*

corridor in-between by day and night; just 0.3% of positions (from ~ 4,900 observations) being recorded on trestles or in the corridor.

That's the equivalent of saying that someone who prefers to drive a Skoda car as actively avoiding a Hyundai or someone who swims for a club as actively avoiding GAA. It's absolutely ludicrous. Using this logic, one could say that Brent Geese feeding on top of oyster bags are actively avoiding other areas of green shore or are actively avoiding land. Utter nonsense. The birds are choosing preferential areas not actively avoiding them.

The 21-22 latest MI commissioned report from Dungarvan Harbour states in **Section 4.2. Population trends**

- *The population trends presented in this report include the data from the 2021/22 low tide counts (and also include data from the 2009/10 Waterbird Survey Programme low tide counts, which are part of the I-WeBS dataset). Therefore, some caution should be applied to the interpretation of these trends, due to the issues with using low tide counts to monitor population sizes. In particular,* ***the large declines in the Grey Plover and Bar-tailed Godwit indices in 2021/22 may be spurious*** *for the reasons discussed above* (which I highlighted in 4.1 above). ***The I-WeBS data for the early part of the I-WeBS period is also quite limited, with only one or two counts in many of those winters. This means that the index values for those winters are based on high components of imputed counts****. Despite the above issues****, the overall trends for many species are broadly similar to the national trends, or regional trends. In particular, the trends for the six target species do not appear to be obviously different from the national trends, which <u>may indicate a lack of impact from oyster trestle cultivation</u>.*

At last the ornithologists through successive studies are beginning to come to a realisation. So, there are big external factors at play here along with local difficulties in capturing real reasons for bird movement within a bay or their supposed disappearance.

However, things maybe be better on the Grey Plover front in Ballyteigue Bay as the **BTWBS Report 2018-2021 states that:**

4.9.4 Grey Plover

-Peak counts ***of Grey Plover within the study area have exceeded the threshold for national importance in all three recent winters and during the winter of 2011/12.*** *Numbers across the study area therefore appear to be* ***stable****, and they also appear stable across the entire SPA when comparing recent five-year mean peak numbers with those from the baseline period (mid 1990's).* ***This contrasts to the national trend; nationally, the species has been in decline over the long-term (Lewis et al., 2019) while the flyway trend is also for decline (Wetlands International, 2017).*** *As a consequence, Grey Plover is now red-listed as a wintering species (Gilbert et al., 2021).*

Although peak numbers were recorded in all three subsites, 0OL06 (Blackstone) appeared to be favoured by Grey Plover during low tide. Of the three subsites, 0OL06 is the only one to have been ranked as 'very high' during winter 2011/12 (NPWS, 2014b) ***therefore the observed species distribution is consistent with these earlier results, a decade later.***

Even the KRC Dungarvan Report states that:

-Preliminary analysis of I-WeBS trends at the site showed that the local population of Grey Plover has seen a significant marginal increase over 10 years at the site whilst Dunlin, Knot and Bar-tailed Godwit have remained stable.

This despite the same report stating that:

> *-This is contrary to the overall long-term (1994/95 – 1998/99; -54.3%) and short-term (2006/07 – 2010/11; -5.8%) declines in Grey Plover numbers in Ireland as a whole (Burke et al. 2018).*

So that's two bays in the southeast with aquaculture bucking the negative national trends for Grey Plover.

Huge state resources have funded many man hours of ornithological expertise looking at the effectiveness of mitigation measures used to manage licenced aquaculture. Indeed, the TA knows this as he has undertaken such work for the MI (documented above) and indeed **it is the only report that ALAB have sought** and the only one that I have been asked to make observations on. This is the KRC report.

I ask again why were all of the other reports commissioned by the MI in Dungarvan and particularly Bannow Bay (a lot closer to Ballyteigue) not sought by ALAB? Why hasn't the TA made reference to these in making a 'considered' opinion. I myself have commissioned three winter bird monitoring reports for Ballyteigue Bay which I sent to ALAB but which were refused on a technical/legal basis. The report I commissioned is probably the most relevant to my application although obviously the MI in their more extensive work **are reassured that aquaculture isn't doing anything to exacerbate anything as the declines are mirroring national declines.** So, I will now go down through the comments that the TA makes on some of the specific issues that he raises with the SPA Appropriate Assessment of the aquaculture applications in the in Ballyteigue Bay.

From Section 5 of the TAR:

> *-The SPA Appropriate Assessment identifies that there was very limited information available on the current and proposed aquaculture activities at Ballyteigue Bay in the preparation of their report. Consequently, they have based some of their predictions on potential impacts (e.g. displacement) based on their experience of interactions of waterbirds and trestle structures from other sites. Further, they highlight this is a particular issue for the assessment of potential disturbance impacts which are related to site-specific behaviour stroke husbandry operations.*
>
> ***The absence of site-specific information on aquaculture husbandry activities (e.g., timing, extent, frequency, scale etc.) does limit the ability to understand/predict the potential effects of the proposed developments on the SCI and other species. This is due to the potential additive impact of disturbance (above loss of habitat within the 'footprint' of the trestle structures) which has the potential to cause significant displacement effects.***

My comment:

Did the TA not see any husbandry activity during the site visits? Did he not read the details of my application which detailed the site layout, the proposed maximum number of trestles, the types of trestles etc. Oyster husbandry activity is well known nationally. The SPA AA gives a generic description of the husbandry activity. It even states that husbandry will not happen on every low spring tide due to the size of the proposed aquaculture sites which are very small oyster farms.

We are a small operation and even the SPA AA captures this in Section 6.10.

> *-At Ballyteige Bay, the small size of the aquaculture sites means that husbandry activity is only likely to take place on a proportion of low tides, rather than on every low tide. During*

the 2011/12 WSP survey, aquaculture activity was only recorded on one of the four low tide counts (NPWS, 2014a).

From Section 5 of the TAR:

-The AA identified that there was very limited waterbird data available for the assessment. In particular, there was no-fine scale spatial data available to understand distributional patterns within the site as a whole other than one season of data (from 2011/12).
Understanding the potential effects of potentially-impacting activities at waterbird sites requires fine-scale, within-site, information in order to understand potential effects. For example, repeated counts across multiple months/years, recording abundance and behaviour at sub-site scales within sites, make it possible to identify the most/least important areas for all/most or individual species. It is also often possible to understand the relationship between behaviour and activity patterns in relation to tide levels, weather, and other factors (e.g., disturbance) on distribution.

My Comment:
I sent into ALAB the Ballyteigue Burrow Waterbird Survey for Winters 2018-2019, 2019-20 and 2020-2021 which ALAB didn't accept for procedural reasons yet they have the power to request a report from Dungarvan Harbour in Winter 20-21 for consideration and in the interests of justice. The report which I commissioned by a reputable environmental consultancy with comprehensive ornithological qualifications gathered the detail that the TA is seeking. In the interests of justice, I am submitting the report as part of my submission. I also submit the link to the publicly available reports commissioned by the MI into follow up bird studies at bays with managed aquaculture within.

From Section 5 of the TAR:

-The AA assessment undertook the displacement analysis based on count data from four months in one year. They identify that, in doing so, there is a high degree of uncertainty and the inferences arising.
Given the large number of factors which determine the spatio-temporal variability of waterbird usage within a site (for example, effects of season, tidal conditions, disturbance, temperature, food availability, competition etc), undertaking robust analyses such as was attempted for the AA assessment requires multiple surveys, across multiple months/years/tidal states, and as described above, collecting data on abundance, activity/behaviour for all species at fine spatial scale.

My comment:
The Technical Advisor suggests that reaching conclusions on, for example, potential displacement effects in the absence of such data, is fraught with so much uncertainty as to be questionable. Again, the point that I am making here is that my three years of professionally commissioned impartial winter bird survey work undertaken in recent years is being ignored. Furthermore, even in the absence of taking on board the findings of the BTWBS report 2018-21 one has to remember that the Marine Institute (the competent authority in Appropriate Assessments for the DAFM related aquaculture applications) approached the SPA AA with a **worst-case scenario approach**.

To quote directly from the MI AA Conclusion Statement:

-Any data constraints were adequately dealt with via the adoption of worst-case assumptions in the analysis and prediction of displacement impacts. The worst-case scenario was adopted to account for the potential that SCIs may gather along the channel proximal to

the licence areas. In addition, it is assumed that the aquaculture sites are fully occupied by trestles.

The assessment of potential displacement effect of the proposed aquaculture activities in the SPA AA report followed worst-case principles by adopting the following assumptions:

- *100% trestle occupation within both aquaculture sites;*
- *Assuming the maximum, instead of mean, rate of occupancy in the two bird count subsites; and*
- *Increased the categorical 'Assessment of significance" in Table 7.5 from not significant/ measurable (4.6% – 4.9%) to significant, on the basis that Grey Plover are known to exhibit negative behavioural responses to trestle cultivation.*

Despite such an approach for Grey Plover (a major focus of the TA's report) the AA Conclusion statement states that:

-The positive short and long-term population trends in the Ballyteigue Burrow SPA (38% and 59% respectively) relative to the overall negative trend of the national population of Grey Plover (-54%) are presented. ***These lines of evidence provide a good indication that this SCI will not be significantly affected by the proposed aquaculture activities****.*

From Section 5 of TAR:

-The predicted displacement impacts to Light-bellied Brent Goose and Wigeon were described as significant. However, there was a high level of uncertainty about the prediction, due to the variable nature of the responses of these species to oyster trestle cultivation. ***The view of the Technical Advisor is that the effects on Light-bellied Brent Geese are indeed less clear/variable, with good evidence from many sites that the species exploits green algae on or near trestle structures and do indeed habituate, to some extent, to aquaculture husbandry activities.***

My comment:

In relation to Light Bellied Brent Geese the AA Conclusion Statement states that:

-Recent studies on Carlingford Lough in 2020 on behalf of the Marine Institute, further explored the relationship between Light-bellied Brent geese and oyster trestles, and concluded that:

• Light-bellied Brent Geese using the areas are well habituated to aquaculture activity and generally undisturbed by it;

• They forage and roost amongst and on top of the oyster cultivation structures (trestles and bags) on almost all tides, particularly Light-bellied Brent Goose who exploit the fact that green algae grown on the oysters).

This evidence gives further confidence that Light-bellied Brent Geese will not be negatively affected by the proposed aquaculture activity.

.

However, the TA elaborates further despite overwhelming evidence of Light Bellied Brent Geese foraging on top of trestles:

-However, in the absence of detailed energetic calculations it is impossible to understand whether the net effects of foraging on/near aquaculture structures is neutral, positive or negative for this species.

So despite the MI report from Carlingford, the constant use of these birds on top of my trestles in Autumn (which I referred to in my first submission), the same behaviour of these birds in Bannow Bay on trestles within metres of passing oyster work boats (a video clip of which will be provided by email), the TA attempts to dodge this reality by bringing energetics into it. Logically if the Brent Geese are using the algal resource on top of my oyster bags then it is because it is either favoured over grazing in fields or other areas of green around the shore or at the very least it is better than starving in the absence of any other food supply. Either way it is energetically beneficial to eat the algae on the bags which would not be present in the first place if it wasn't for the bags on the trestles and the trestles on the shore.

My report would suggest that Light-Bellied Brent Geese are doing particularly well around my oyster farm (the location of the three subsites studied) and indeed in 10 years nothing much has changed from the NPWS 2011/12 counts.

From BTWBSReport 2018-21:

4.9.1 Light-bellied Brent Goose

During the baseline data period used for SPA designation, Light-bellied Brent Goose occurred in numbers of international importance across Ballyteigue Bay SPA. It is notable therefore, that numbers of international importance occurred within the area covered by the three subsites (0OL02, 0OL04, 0OL06) used during the current winter surveys, a much smaller area than the entire SPA. While peak counts within the study area in recent years exceed those of 2011/12, numbers appear to have dropped slightly in recent winters, consistent with the national trend over five- and ten-years (Lewis et al. 2019).

Of the three subsites, numbers of geese have been consistently higher in 0OL06 (Blackstone) during low tide surveys in recent winters, although it is clear that all three subsites can support peak numbers on occasion. Across the entire SPA site, numbers were ranked as 'very high' in the low tide surveys of 2011/12 (NPWS, 2014b), so recent results are consistent with these earlier findings. –

Also in relation to Wigeon from the BTWBS Report-2018-21:-

*-Numbers of **Wigeon** across the time period assessed appear to be stable, while Teal, Oystercatcher and **Grey Plover numbers appear stable/increasing***

From Section 5 of the TAR:

-The predicted displacement impacts to all other spaces are either negligible or not significant. The authors conclude that the limitations of data availability mean that there is a moderate level of uncertainty about these predictions.

As described above, the inadequacies of the available data (with respect to the spatio-temporal availability of count information), makes it difficult to generate robust displacement assessments and therefore generate conclusions about the potential impacts of the proposed developments.

Overall, the many inadequacies highlighted in the Appropriate Assessment are so significant that many of the conclusions are unreliable. The many uncertainties expressed within the AA in this regard arise from the lack of sufficient data. In such circumstances it is simply impossible to conclude, beyond all reasonable scientific doubt, that the proposed activities will not have negative impacts on the QIs of the SPA. Case C-258/11/Sweetman & others v An Bord Pleanala & others, the CJEU held that: 'authorisation for a plan or project …may therefore be given only on condition that the competent authorities….are certain that the plan or project will not have lasting adverse effects on the integrity of the site. That is so where no reasonable scientific doubt remains as to the absence of such effects.'

My comment:
There have been no lasting adverse effects from the presence of my oyster farm on the shore in Ballyteigue since 1985. The Ballyteigue Winter Bird Surveys over three winter periods involving top ornithologists and considerably more fieldwork than the TA has undertaken, along with Appropriate Assessment of the SPA by the State and their AA conclusion statement does rule out significant negative impacts and thus the DAFM granted a licence. Follow up studies of managed oyster farming in Bannow Bay and Dungarvan Harbour reassure the MI that aquaculture is not causing lasting significant negative impacts and indeed there are other larger scale factors as the trends are not significantly different from site to national scale.

From the AA Conclusion statement:

-13.1 Having considered the conclusions and recommendations of the Appropriate Assessment process, the Licensing Authority is satisfied that, from a Natura 2000 perspective, a decision can be taken in favour of licensing proposed aquaculture operations in Ballyteigue Burrow SAC/SPA, subject to the mitigation measures referenced above. Accordingly, the Licensing Authority is satisfied that the proposed licensing of aquaculture in the Bay is not likely to significantly and adversely affect the integrity of Ballyteigue Burrow SAC/SPA.

The TA is going against:

-the expert opinion of the Marine Institute garnered during the ultra-conservative SPA AA process,

-the follow up MI commissioned bird studies in the region at aquaculture sites within SPA's

- the Department of Housing Local Government and Heritage (DHLGH) who are the parent department for National Parks and Wildlife Service (NPWS) who supported my licence application.

-the findings of the BTWBS Report 2018-2021.

There is doubt in my mind as to whether the TA is like An Taisce and others misinterpreting the meaning of the 5% displacement threshold

The NPWS are the expert agency responsible for SPA, SAC and Nature Reserve Conservation Interests (and who set the Conservation Objectives and determine the designation of SPA's and SAC's) have **no objection to my application**. Let that sink in. Their field officers have spoken to me on the shore since I have been there with my oyster farm. They have never once told me to get out and indeed were surprised that I hadn't received a licence a long time ago. **They have publicly expressed approval for my application as part of the consultation process.**

The TA's opinion is even contrary to the expert opinion of the consultancy that produced the Ballyteigue Winter Bird Survey Report following standard methodology used for surveying

wintering waterbirds at low tide (Lewis & Tierney, 2014) and which the included four low tide surveys and a single high tide survey each winter over three winters and a disturbance study.

From the BTWBS Report 2018-21

4.6. Trends in waterbird numbers

A robust analysis of trends in waterbird population size at the site is not possible based on a limited dataset, however the assessment of peak counts of selected waterbird species across the three recent winter surveys, plus a comparison with the NPWS survey data of winter 2011/12 (Table 4.6.1) does provide some insights as follows:

- **Light-bellied Brent Goose peak counts in recent years exceed that of 2011/12**, but in recent winters appear to have dropped slightly.

- Shelduck are listed as a waterbird SCI for Ballyteigue Burrow SPA but peak counts from the four winter surveys shown in Table 4.6.1 show very low numbers within the study area, and within the entire SPA (2011/12 data). The site trend from I-WeBS data also shows a decline (Table 4.6.2).

- **Numbers of Wigeon across the time period assessed appear to be stable, while Teal, Oystercatcher and Grey Plover numbers appear stable/increasing.**

- Golden Plover, Ringed Plover, Dunlin and Redshank peak counts are variable and no trend can be determined. At whole site level, numbers of Golden Plover appear to have declined (Table 4.6.2).

- Numbers of Lapwing and Knot appear to have declined within the study area and within the entire site (Table 4.6.2).

- Numbers of Black-tailed Godwit, Bar-tailed Godwit and Curlew across the time period assessed appear to be stable. However, at whole site level, numbers of Black- and Bar-tailed Godwits appear to be in decline (Table 4.6.2).

From the BTWBS Report 2018-21

Section 5: Discussion

> *-The recent three winters of low and high tide surveys are, to our knowledge, the first such surveys undertaken since the winter of 2011/12 when NPWS undertook the Waterbird Survey Programme. A decade on, it is therefore timely that a comparison be made between the results of these surveys.* ***On the whole, the distribution of waterbird species between the three subsites remained relatively consistent with that recorded during the winter surveys of 2011/12.*** *This goes to show a good degree of subsite faithfulness, and also highlights that waterbirds' patterns of distribution are not random, rather species distribute for a reason, be it food resources or other factors such as shelter from prevailing winds or protection from predators.*

My comment:

It also reinforces the fact that my presence and indeed increased production since 2011/12 hasn't made a negative impact.

From the **BTWBS Report 2018-2021**:

> *-Numbers of several species across the past decade appear* ***stable including Light-bellied Brent Goose, Wigeon, Teal, Oystercatcher and Grey Plover, the latter a species known to be in decline nationally.***

My Comment:
This corroborates the view of the MI in their AA Conclusion statement re Grey Plover stability.

From the **BTWBS Report 2018-2021**:

> *-**Updated waterbird population estimates for Ireland were published in 2018. These quantified the loss of 40% of wintering waterbirds in Ireland over the past nearly 20 years (Burke et al., 2018). Such large declines nationally obviously have implications for numbers at individual sites,** but conversely, declines at individual sites across the country will have driven the observed national trends. While the impacts of climate change are now evident, with some waterbirds simply not migrating as far as Ireland for winter, site-level factors no doubt have, and continue to contribute to such observed trends, especially when various activities and human use of wetland sites are considered in a cumulative way. How such declines can be addressed and/or reversed is not known. With regard to Shelduck, this species is not a long-distance migrant, therefore effects of climate change on migration strategies should not be affecting this species as much as long distance migrants such as many wading birds. The species is, however, known to be highly dependent on prey resources and in particular the Mud snail Hydrobia ulvae, so any effects of climate change upon the prey base, could impact this duck. The species is also a resident breeding bird so increased pressures for example recreational disturbance during spring and summer, could also be driving the declines.*

My Comment:
I would also argue that declines in water quality could reduce certain prey species numbers and that oysters are a positive force in preventing eutrophication (well established academic view).

From the **BTWBS Report 2018-2021:**

> *-Waterbird population trends in Ballyteigue Bay are clearly complex, with some species increasing, some stable and some in decline; this echoes the national data of complex trends in this group of species. The drivers for population change are not fully known or understood but may occur at global (e.g. climate change), regional (run-off/pollution from domestic, agriculture or industrial sources) or site-based levels (e.g. recreational disturbance). Benthic data for the site are now old and out-of-date, and the distribution and abundance of benthic macroinvertebrates, critical to the over-winter survival of waterbirds, may also be experiencing pressures from a variety of sources, including climate change.*
>
> *-Based upon the Appropriate Assessment (AA) of Aquaculture at Ballyteigue Bay (Gittings et al., 2019), the patterns of aquaculture at the site is not fully known. Based on aerial imagery, aquaculture has been in pace since the mid-1990s, and local producers state they have been active on the site since the mid-1980s. Production levels have fluctuated since this time, with the AA (Gittings et al., 2019) noting "Production data received indicates an increase in production from 2008 to 2013, with a slight decrease after 2015".*
> ***Based upon the data reported here, Shelduck would be the principal species of conservation concern at Ballyteigue due to the declines observed. However, in the AA***

(Gittings et al., 2019) it was concluded that impacts to Shelduck from aquaculture activities were not likely to be significant.

From the SPA AA

- *The predicted displacement impacts to **Shelduck**, Lapwing, Curlew, Black-tailed Godwit, Bar-tailed Godwit, Dunlin and Redshank are not significant. The predicted displacement impact to Golden Plover is negligible. The limited data that was available for this assessment means that there is a moderate level of uncertainty about these predictions. For two of the species (Curlew and Redshank) there may be no net displacement impact due to the variable nature of their response to oyster trestle cultivation.*

Shelduck	2	1.5-1.6%	not significant

The calculated displacement impacts from full occupation of the aquaculture sites would be non-significant but measurable.

The Remainder of Section 5 in the TAR briefly discusses the Screening of the SAC AA.

The TA uses the word 'likely' in the phrase **-***These conclusions are likely sound* when describing the SAC AA conclusions. Couching his words again whenever there is something positive to say. So just in case there is any doubt in ALAB minds I have included points made in the MI AA Conclusion Statement below:

From the AA Conclusion Statement:

Findings of the Appropriate Assessment of Aquaculture in relation to the Ballyteigue Burrow Special Area of Conservation

5.1 *Based upon the spatial overlap and sensitivity analysis, it is concluded that aquaculture activities at trestle sites **do not pose a risk of significant disturbance to the conservation of the habitat features of Estuaries [1130] and Mudflats and sandflats not covered by seawater at low tide [1140] or their associated community types.***

*5.2 Aquaculture activity has the potential to act as a significant vector for the introduction of non-native species to the SAC, that have the potential to impact Qualifying Interest habitats and species for which the SAC is designated. **With strict adherence to the relevant legislation and best practice guidelines, there will likely be no significant adverse effects.***

*5.3 There is one access route in Ballyteigue Bay used by tractors and trailers to access main production areas of the Bay. Access routes overlap 0.17% of the Qualifying Interest 1130 and 0.20% of the Qualifying Interest 1140. **While access routes are considered disturbing, the extent of this disturbance is considered small and is considerably lower than the 15% disturbance threshold** (which must account for all likely disturbing activities). No other disturbing activities were identified that act in-combination with the aquaculture activity (see Section 10 below).*

In regard to point 5.2 above: I operate under Fish Health Authorisation granted by the Marine Institute. In all my time operating in Ballyteigue Bay I have not introduced non-native species to the SAC. Add in the ecosystem services of my oysters and oyster farming structures and there is no doubt that my operation is not having a significant environmental impact on the SAC.

In **Section 6.0 Screening for Climate Change Impacts** the TAR states that:

-the 2023 Climate Change Action Plan does not specify any particular actions to be required for aquaculture.

My Comment.

Oyster farming is one of the lowest carbon footprints of any protein production. It also removes Nitrogen and Phosphorus through feeding on algae and incorporation into tissues along with benthic pelagic coupling leading to enhanced denitrification in sediments. Thus, given that we are now experiencing global warming the importance of the positive ecosystem services of bivalve shellfish farming will be even more important to prevent eutrophication and its associated oxygen deficit problems. Clearly a missed opportunity by the TA to reemphasise these positive services that I included in my original submission.

In Section 7.0 Section 61 Assessment the TAR states that:

-Section 61 (a-e) of the Act outlines the matters which the licensing authority shall take account of when an application for or an appeal regarding an aquaculture licence is being considered. This section is used to assess the impact of the proposed aquaculture development under these headings, which are listed in **6.1 – 6.7 below**.

My Comment:

There are no headings in the TAR from 6.1-6.7. I assume this is an error and that the TAR should read 7.1-7.7.

In Section 7.1 Site Suitability the TAR states:

-The two sites under consideration are so close together to make it necessary to consider them together from an ecological standpoint. One of these sites (T03/038A) appears to be an application for what is an area of existing aquaculture with bags and trestles but no evidence of attendance during the short multiple visits made. As such, ***this application would appear to be a retrospective licence for an aquaculture site already in existence*** *(operational status unknown). The second application (T03/095A), would appear to propose to have an easting at the western extremity of ca. 50m from the easterly extent of the existing trestles, running for approximately 350m ESE.*

My comment:

I was one of the first oyster producers in the country with one of the first applications to be made for a licence. No decision was ever made on it and I was advised in recent years to apply for the area which I did. It is not necessarily true to say that it is necessary to consider the two applications together from an ecological standpoint. There are differences namely that my trestles have been there since the 1980's.

From the TAR (Section 7.1)

-If the existing structures are not being managed then their presence has reduced the available habitat area for some SCI species (especially Grey Plover) and may therefore have a displacement effect on that species (they cannot use the area but there is no data available prior to the trestles being put in place to know whether it was utilised). If the existing structures are being managed currently, then there would, without doubt, be some additional displacement effects during aquaculture management operations due to disturbance.

My Comment:

The structures are managed by myself and the AA for the SPA and SAC have concluded that my operations within that site can be licenced as there will not be any significant negative impact on the SAC or SPA species. The BTWBS Report 2018-21 also corroborates this. Neither the BTWBS Report 2018-21 nor the Marine Institute AA Conclusion Statement have any concerns of significant impacts in Grey plover nor by default the NPWS as they were supportive of my application. Only the TA and the appellants have a problem with Grey Plover. The ALAB Board need to be cognisant of how the TA's opinion is bucking the opinion of many experts who have undertaken significantly more fieldwork than the TA in an ultra-conservative manner to derive their conclusions.

From the TAR (Section 7.1)

> *- The general principle of allowing an application to proceed when there is scientific uncertainty as to the potential impacts would apply, as it does for any application. In my opinion, there is inadequate information to underpin a decision on this, and that precautionary principle must apply.*

My comment:

As I stated in my first submission on the appeals, I believe that the precautionary principle should be applied to the 'removal' of my farm from the shore. This is because there is a wealth of man hour expertise that counters the TA's view and if the positive ecosystem services my farm provides are removed there will be negative consequences for water quality/ecosystem health which could have major negatives for the SAC and the SPA SCI's both of which depend on good water and ecosystem.

From the TAR (Section 7.1)

> *-Whilst potentially beyond my remit, I wonder if authorising an existing trestle site to operate under a licence (where none apparently existing currently), sets an unwanted precedent.*

My comment:

The precedent of licensing and application with existing oyster trestles has already been set.

From the TAR (Section 7.1)

> *-The sites are **suitable** for the proposed development for the following reasons:*
> *• The area of the proposed development is in close proximity to existing structures, has little or no additional visual impact and does not impact navigation.*
> *• The proposed site location would not have a significant impact on recreational activity including shore angling.*

My Comment:

My application covers the existing trestles in their entirety. In addition, my site has proved itself as one of the best sites for the production of top quality oysters and I have even won National Oyster awards for them. So, it is very suitable and sustainably so as after being there since the 1980's there has been negative significant impact.

From the TAR (Section 7.1)

*-The sites are **not suitable** for the proposed development for the following reasons:*
• The competent authority for the Habitats and Birds Directives (DHLGH) are of the view that only existing aquaculture be licenced (presumably the area to which T/03/038A applies). They conclude

that there is a lack of certainty with respect to the potential negative displacement effects on Grey Plover.

My Comment:
Department of Housing, Local Government and Heritage (DHLGH) support my application and that means *de facto* that NPWS do so also. Therefore, my application should be added to the 'site is suitable' section in the TAR.
The DHLGH state in their original submission to my applicant:

> *-Given the available information and the absence of certainty that the Grey Plover will not be negatively affected,* ***it is recommended that a licence only be provided for existing aquaculture operations within the bay, i.e. for the licencing of existing trestles only within application T03/38.***

This is a subtle but significant difference to the TA version of the DHLGH comment. There is much more certainty towards approving my licence application in the actual words of the DHLGH as opposed to how the TA has interpreted the DHLGH submission. This is troubling.

From the TAR (Section 7.1)

> *-Two Appellants, Jim Hurley and An Taisce, contest that many of the conclusions of the AA are flawed and most significantly that the many uncertainties give arise to it being impossible to conclude beyond all reasonable scientific doubt that the proposed developments will not have a negative impact on the QIs of the site, in particular Grey Plover.*

My Comment:
Is the Technical advisor agreeing with the appellants statements? Did the TA disagree with everything that I submitted on the 27/03/23? If not, why is the TA 'cherry picking' the negative opinions of the appellants? Surely the TA can agree to and reemphasise in this discourse (TA views on site suitability section of the TAR) some of the comments I submitted. It goes back to the theme I touched on at the start. Significant positive relevant information in the Wexford County Development Plan was not included in the TAR, relevant bird reports were not included in the TAR and no reemphasising of the very important ecosystem services of shellfish. All a bit one sided and in favour of portraying negative Technical Advice.

Section 7.3 Statutory Status of the TAR deals with the TA assessment of impacts on the Wexford County Development Plan 2022-2028 and my comments on how the TA has assessed the impacts inadequately are dealt with earlier in this submission. I strongly reject the TA's piecemeal approach to sourcing relevant parts of the Wexford County Development plan. I also contend as described earlier that I have a significant positive impact in terms of the County Development Plan.

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In Section 7.4 Economic effects of the TAR its states:

> *-Section 61 (d) takes into account the likely effect a proposed aquaculture development (or its amendment / revocation) would have on the economy of the area in which the aquaculture is to be located. It seems likely that the proposed development would have direct and indirect benefits for the local economy.*
> *Overall, these developments are likely to have a* ***positive economic impact*** *given that the activity at the site(s) would be expected to create employment and associated economic benefits. It seems unlikely that there would be any direct negative economic effects (e.g. on other sectors of the local economy).*

My Comment:
There is that word again – 'likely' being used in the context of a positive impact. One can be certain that my oyster farming is having positive direct (employment on site), indirect (services paid to other companies e.g. transport, mechanics, accountants solicitor etc) and induced economic benefits (my workers spend in the locality). Add in the ecosystem services provided by my oysters such as Nitrogen and Phosphorus removal which has a shadow price and my economic impact in a Coastal Rural depopulated area with poor unemployment indices is significantly positive.

In Section 7.5 Ecological Effects of the TAR it states:

> *-Section 61 (e) considers the likely effect that the proposed aquaculture operation would have on wild fisheries, natural habitats and the fauna and flora of the area. DHLGH and two Appellants highlighted significant inadequacies in data which gave rise, at least in part, to significant uncertainties and the concomitant conclusions of the SPA Appropriate Assessment. For these parties, this uncertainty was sufficient for them to conclude that they could not rule out significant negative ecological impacts on SCI bird species. Overall, the absence of information to prove beyond all reasonable scientific doubt as to there being no negative impacts led these organisations/individuals to conclude that* ***the proposed developments would have a significant impact on the ecology of the area****.* ***It is the considered opinion of the technical advisor that this is indeed the case.***

My Comments:
<u>This is INCORRECT</u>. The DHLGH supported my application ('development' as the TA calls it). The TA has again cherry picked negative comments made by appellants to repeat in his report whilst ignoring the wealth of information on the beneficial ecosystem services of oyster culture and the findings of the SPA AA, the AA Conclusion Statement, the BTWBS Report 2018-2021 and the plethora of MI follow up bird studies in Dungarvan and Bannow Bay. The TA does not reflect the support DHLGH had for my application in their recommendation. It is my considered opinion that this TA has not done his job thoroughly nor with impartiality.

In Section 7.6 General Environmental Effects the TAR states that:

> *-Section 61 (f) considers any other effects on the environment in general that could occur in the vicinity of the area where the proposed site is to be located.*
> *There are possibly some positive effects of the proposed activity on water quality (through filtration) through removing excess nutrients from agricultural runoff and wastewater discharges. However, Ballyteigue Bay is classified as 'moderate' water quality status and it is unknown if the scale of the proposed developments would significantly improve that status. Whilst the existing/new trestle structures have the potential to increase food for foraging birds (e.g. green algae accumulation which could be eaten by herbivorous waterfowl including Wigeon and Brent Geese), this is likely a small and limited benefit which it outweighed by the direct (loss of area under trestles) and indirect (loss of buffer area around/beyond trestles impacted by disturbance) negative effects which extend beyond the footprint of the proposed developments.*
> *Whilst there may some positive effects of the proposed development it is* ***considered that these would be relatively minor and insignificant****; a* ***likely net significant negative environmental effect (intertidal habitat loss)*** *is more likely.*

My Comment:
The TA finds it very difficult to say with conviction that there are positive effects on the environment. The way he couches is statements concerning positive impacts is astounding and

clearly done to down play them e.g. **'possibly'** some positive effects**, 'potential'** to increase food for foraging birds (e.g. green algae accumulation which **'could'** be eaten by herbivorous waterfowl including Wigeon and Brent Geese. This is incredible language given that he has already stated earlier in his TAR that Brent Geese do indeed eat the green algal accumulations on the oyster bags. But in the earlier mention of this the 'energetics' query was used to attempt to downplay such a positive impact. It's clear to me by the use of such language the TA is set against aquaculture full stop and he is certainly not giving the aquaculture licences are fair chance of surviving the appeals. If it is just ignorance of the positive effects of aquaculture, then I suggest the TA read the following:

A global review of the ecosystem services provided by bivalve aquaculture. (Andrew van der Schatte Olivier, Laurence Jones, Lewis Le Vay, Michael Christie, James Wilson, Shelagh K. Malham 2018) available at **https://onlinelibrary.wiley.com/doi/full/10.1111/raq.12301**

And also the book of reviews on 'Goods and Services of Marine Bivalves' Edited by Aad C. Smaal, Joao G. Ferreira, Jon Grant, Jens K. Petersen, Øivind Strand available at **https://library.oapen.org/handle/20.500.12657/22923**

In Section 7.8 Section 61 Assessment Conclusions the TAR States:

-In conclusion, the section 61 assessment finds that the proposed development is deemed unsuitable for the proposed development on the grounds of site suitability, statutory status, ecological and environmental impact as outlined in Sections 7.1, 7.3, 7.5 & 7.6 above.

My **Comments**:
I strongly reject this conclusion for the reasons given above in response to the relevant sections.

In Section 7.9 Confirmation re Section 50 Notices the TAR states:

-Under Section 50 of the Fisheries (Amendment) Act the Board has the power to consider any issues, other than those raised in the appeals documents, if they are matters to which, under Section 61, the Board may have regard. However, the same section also obliges the Board, if it does not intend to take into account such other issues apart from those raised in the appeal documents, to give notice in writing to the parties and to persons who made submissions and observations, in accordance with section 50 (2) of the 1997 Act.
The Technical Advisor is of the opinion that there are not matters which arise in Section 61 which the board ought to take into account which have not been raised in the appeal documents, and it is not necessary to give notice in writing to any parties in accordance with section 50 (2) of the 1997 Act.

My Comments:
I am not sure of the meaning of this but suffice to say if this is relevant to the consideration of the BTWBS Report 2018-2021 I would reiterate again that I would like the report to be considered in this determination. It may be the case that the point I am making is more relevant to section 7.10 of the TAR.

In Section 7.10 Section 46 and Section 47 Notices the TAR states:

-Section 46 of the Act provides for the Board to request that a party to the appeal who has already made submissions/observations to the Board make further submission /observations in relation to a matter which has arisen in the course of the appeal. We are unaware of any additional information which exists and which we could request.

My Comments:

The TA would have known about the MI follow up bird studies other than the one that he wrote and should have requested these from the Marine Institute for consideration. ALAB are aware of the existence of the BTWBS Report 2018-2021 and should consider the findings of it hence I include in my submission.

In Section 8.0 of the TAR deals with the Technical Advisor's Evaluation of the Issues in Respect of Appeal and Submissions/Observations Received in the TAR.

My comments:
In this section of the TAR the TA **only expresses views on the Appeal Issues**. **The TA does not express views on the submissions that I made in my defence against the appeal issues**. This is completely one sided. The Chapter Heading for Section 8 of the TAR would indicate that the TA has to evaluate the issues in respect of appeal and Submissions/Observations Received. In other words, a balance rounded assessment of the pros and cons.

Technical Advisors view on the Ecological impacts are re paucity of data:

> *-Available data for this site is poor and I believe robust conclusions cannot be drawn on any aspects of this project as a consequence*.

My Comments
As discussed in more detail earlier in my submission the TA hasn't undertaken full research of the facts as evidenced by not seeking the plethora of MI Bird Study Reports relating to Dungarvan and Bannow whilst only considering his own report in Dungarvan. The TA presumably has not read the BTWBS Report 2018-2021. There isn't a paucity of data and indeed the highly stringent and ultra conservative displacement assessments used in the SPA AA have given the Marine Institute confidence in recommending licencing of both sites (not just my own one).

Technical Advisors view on the Ecological impacts are re legal framework are:

> *-A key point here is the uncertainty upon which decision-making is based. The evidence-base is poor and the paucity of site-specific data so poor that robust conclusions cannot be drawn. It cannot be established, therefore, beyond all reasonable scientific doubt that the proposed activities will not have an adverse impact on the site. Indeed, the presence of the current (apparently unlicensed) aquaculture structures may already be having an adverse impact on the site and by inference be contributing to the recent population trends at the site.*

My Comments:
The ultra-conservative SPA AA along with other reports that the TA hasn't considered give confidence of no negative impact. There is no evidence that my farm is already having a negative impact. Once again, the TA fails to even recognise known positive impacts to ecosystem (water quality on particular), biodiversity and additional food for geese. The site is actually doing well compared to national trends and indeed in recent MI Bird Study report as discussed earlier in the reports there are big factors causing issues with birds in general which as stated in the 22/23 MI Winter bird monitoring report for Dungarvan Harbour

> - ***the overall trends for many species are broadly similar to the national trends, or regional trends. In particular, the trends for the six target species do not appear to be obviously***

different from the national trends, which <u>may indicate a lack of impact from oyster trestle cultivation</u>.

Technical Advisors view on the Ecological impacts are re potential negative impact on grey plover:

-The AA identifies potential displacement effects and some uncertainty surrounding that. The paucity of data indicates that there is sufficient uncertainty that a licence should not be granted

My Comments:

Grey plover have been discussed extensively in my submission above. The ultra-conservative SPA AA had a predicted potential displacement impact of less than 5%, the population trends are fantastic compared to national trends. The BTWBS Report 2018-21 had no issues with grey plover and finds that grey plover numbers are stable to increasing and consistent with NPWS 2011/2012 data a decade before. No negative impacts despite my oyster farm being there the whole time.

Technical Advisors view on the Ecological impacts are re potential negative impact on Brent geese.

-The response of Brent Geese is indeed variable, with geese certainly exploiting green algae but access to this being constrained by disturbing activities. Whilst this species habituates to human activities, it is hard to assess whether the overall impact is positive or negative. It seems likely that responses are site-specific and relate to a combination of human factors (such as number of persons, distribution around the site, whether in vehicles or on foot, their behaviour etc) and site-specific factors (such as location of marine or terrestrial feeding opportunities, other activities that may be occurring on the site, the scale and location of aquaculture sites relative to these).

There is sufficient doubt (cannot be sure of no negative effect) that we should not assume no negative effect.

My Comments.

Here we go again. The TA has adjusted his views on Brent Geese once again. Earlier in section 7.6 of the TAR he said that 'green algae accumulation which **'could'** be eaten by herbivorous waterfowl including Wigeon and Brent Geese'. Now he states that they 'certainly' exploiting green algae. We do not prevent geese from feeding on our green covered oyster bags. They are well habituated to us. It's very clear to me that the shore that my site is on does not support the growth of green algae without the trestle and bags located on them. So, without doubt we are creating an additional resource for geese that would not be there if I wasn't there. By getting rid of me (as the TA is recommending) then there will be a negative impact on the geese.

Technical Advisors view on the Ecological impacts are re Waterbird occupancy data.

-Whilst the AA has done its best with the data available, the paucity of data is such that robust conclusions cannot be drawn

My comments:

The AA Conclusion statement addresses this point by saying:

***-**Any data constraints were adequately dealt with via the adoption of worst-case assumptions in the analysis and prediction of displacement impacts.*

The assessment of potential displacement effect of the proposed aquaculture activities in the SPA AA report followed worst-case principles by adopting the following assumptions:

- *100% trestle occupation within both aquaculture sites;*

- *Assuming the maximum, instead of mean, rate of occupancy in the two bird count subsites; and*

- *Increased the categorical 'Assessment of significance" in Table 7.5 from not significant/ measurable (4.6% – 4.9%) to significant, on the basis that Grey Plover are known to exhibit negative behavioural responses to trestle cultivation.*

As uncomfortable as I am with the ultra-conservative MI approach I think that it is acceptable to any rational thinking person that there is confidence in licencing my site.

Technical Advisors view on the Ecological impacts are re potential negative impacts on Wigeon.

-Paucity of data in this case and including wider studies of potential impacts means that there is sufficient uncertainty to not rule out negative effects

My Comments:
From BTWBSReport 2018-2021:

-Numbers of Wigeon across the time period assessed appear to be stable.

Note Wigeon are not an SCI species in Ballyteigue but rather Tacumshin Lake. The conservation objectives for the Wigeon SCI of the Tacumshin Lake SPA is to maintain its favourable conservation condition (NPWS, 2018b). Tacumshin Lake is greater than 10km from Ballyteigue Bay at their closest points and closer to 13.6km from my oyster farm location to Tacumshin Lake. The Ballyteigue SPA AA says that Whooper Swan can be screened out because the distance of Ballyteige Bay from Tacumshin Lake (around 10 km) is a lot greater than its likely core foraging range of 5 km (SNH, 2016). A huge national study of Wigeon in the UK entitled: **Winter distribution and habitat requirements of Wigeon in Britain** published in the Wildfowl Journal https://wildfowl.wwt.org.uk/index.php/wildfowl/article/view/515

states that for Wigeon they '*Very seldom do they fly more than 5 miles (8 km) to feed.'*

Maybe KRC could tag a few with GPS and we will see if they are making the trip over to Ballyteigue Bay. Who knows they might even me coming over to my site to feed on top of the oyster bags. There's a thought…. Might leave the TA's argument about 'energetics' of feeding on top of bags in shreds.

In the AA Conclusion Statement

-9.2 The predicted displacement impacts to Light-bellied Brent Goose (6.7-7%) and Wigeon (6.7-7%) are significant. However, there is a high level of uncertainty about this prediction due to the variable nature of their responses to oyster trestle cultivation, and the likely significant overestimation of sub-site occupancy levels in the displacement calculations.

Remember above 5% only indicates a potential negative impact. Add in the 'variable' nature of response of Wigeon (**includes positive responses** and feeding on bags), the ultra-cautious worst-case scenario approach of the AA for the SPA and you can be sure that my oyster farm will not impact negative on this Tacumshin Lake SCI species.

I note also that the TA has not included in Section 1.7 of the TAR my original points made about Wigeon in my submission in March 23. I'm very troubled by cherry picking approach this TAR has and I would urge the ALAB Board to take the time to scrutinize everything. The points made in my original submission are the ones I made before the TA's filter was put over them.

Advisors view on the Ecological impacts are re mitigation measures.

-The mitigation measures indicated are standard (e.g. access routes etc) but the key questions are whether the impact of more trestles on the site will have significant negative impacts on the site - which we do not know the answer to beyond doubt.

My Comments:

There would only be a marginal increase in trestle deployment within my application as I am not starting with a blank site. I already have most of the site in use. I refer back to the SPA ultra conservative approach detailed in the AA conclusion statement and findings of the BTWBS Report 2018-21 along with the fact that it is coming to light in follow up SPA/aquaculture MI Bird studies that it appears aquaculture isn't really a factor. It's the large-scale factors that are causing issues with birds. Of note again Grey Plover doing very well in Ballyteigue Bay. So, it is highly unlikely that there will be negative impacts. Note also when AA's are undertaken certain species can be screened out on the basis that the development is 'highly unlikely to be significant negative impacts'. It is never stated that it is beyond doubt. I think the TA is trying to be even more conservative that the SPA AA.

Technical Advisors view on the 'Inappropriately located' section of issues re Shellfish Designated Waterbody and SUMS

-The legal necessity of this I am unsure about. However, it seems to be illogical to authorize new (or existing) aquaculture in areas outwith areas zoned for such.

My Comments:

The TA has taken no heed of my original submission on these points (although has rehashed it in his Section 1.7 of the Report). Nor has he bothered to get an answer to resolve his doubt. Fact is a site can be licenced without the area being within a shellfish designated waterbody and without a SUMS present. Marking of site is detailed on the licence. This usually involves either individual site marks or development of a SUMS under guidance and sanction from Commissioners of Irish Lights.

Technical Advisors view on Wider Biodiversity Issues re contributing to current biodiversity crisis

-While this may or may not be the case, the scale of the proposed development is such that it a 'stretch' to conclude that the impact would be so – the cumulative impact of unregulated/illegal etc development poses a serious threat to biodiversity, however, and the cumulative effects of aquaculture (nationally) via inter-tidal habitat loss can only be negative for waterbird populations

My Comments:

Wow! The TA can't even definitively rule out categorically that my application is contributing to the current biodiversity crisis. The use of the word 'stretch' suggests there is a small chance that I am. My farm is not unregulated. I have a Fish Health Authorisation, I am part of a shellfish monitoring programme run by the SFPA and the Marine Institute for E. coli and biotoxins. Everyone is aware of

my presence here (even the NPWS) and that I haven't gone beyond my site application in 35 years. Does the TA believe I am a 'serious threat' to biodiversity? The TA hasn't a clue what he is talking about. Then he goes on to take a shot at the cumulative impact of aquaculture nationally. It has taken 34 pages of the 36-page TAR for the TA to reveal his true colours. **He is anti-aquaculture**. Worse still anti-bivalve shellfish aquaculture which means he is a real hardliner. An Taisce would be proud of such a member.

Technical Advisors view on Specific Ecological Issues: re negative physical and biological impacts

> *-There appear to be a range of positive and negative impacts of aquaculture on the broader ecology. It appears likely that indirect impacts of disturbance to sediments (via traffic etc) is likely to have negative impacts.*
> *The unauthorized activity described has been addressed above.*
> *The 'missed' opportunity could be applied to many sites. A robust study examining before-after-control-intervention across sites and building on the previous Gittings/O'Donoghue would be beneficial in this regard*

My Comments:
I have been here since before the area was designated under Natura. I remember back when designations were taking place the NPWS were reassuring aquaculture operators not to worry if you were there first you will stay its only pertaining to new developments. I refer the TA back to the review paper and book on marine shellfish ecosystem services for further reading in this area. It's clear in the time-frame that this TAR was cobbled together that the TA does not want to educate himself on these services. I refer back to my original submission concerning the positive effects my oyster farm is having on the ecosystem.

Technical Advisors view on Specific Ecological Issues: re Data deficiencies which underpinned the SPA AA

> *-The Technical Advisor is of the opinion that this is correct – the AA was unable to draw robust conclusions on predicted effects based on a paucity of data. No conclusions reached would meet the threshold of being 'beyond reasonable doubt'.*

My Comments:
The TA and ALAB need to read **all of the relevant reports** and also interpret the findings of the ultra-conservative SPA AA correctly.

Technical Advisors view on Specific Ecological Issues: re Impacts on Grey Plover and Negative Impacts on other SCI species (Light-bellied Brent Geese and Wigeon).

> *-This is possible and unknown. The primary point is that there is insufficient data to suggest that there would be no negative impact beyond all reasonable doubt – which is the required test*
>
> *-As above the AA conclusions are flawed insofar as they cannot be considered robust as the data on which they are based is inadequate*

My Comments:
As made re Grey Plover, Brent Geese and Wigeon *ad nauseum* in this submission.

In Section 10.0 Recommendation of Technical Advisor with Reasons and Considerations the TAR states:

-It is the recommendation of the Technical Advisor to ***overturn the decision of the Minister and refuse the granting of licences*** *for sites T03/038A for the reasons below:*

These sites are ***not suitable*** *for the proposed developments for the following reason:*

-The application being sought for T03/38A overlaps wholly with an area of existing aquaculture. Whilst I cannot confirm that the site is being actively managed, to all intents and purposes it appears to be a current oyster farm – as such this is a retrospective application which, as I understand it, is in breach of the Act.

-Moreover, Section 61 assessment findings conclude that the proposed development is not suitable for aquaculture on the grounds of site suitability, statutory status, ecological and environmental impacts.

-It is not possible, based on existing information, to conclude beyond reasonable scientific doubt that the proposed developments will not significantly impact the qualifying interests of the SPA, in particular the potential displacement effects on Grey Plover, but also potentially on other species.

-This conclusion is based on and inadequacy of data which formed the basis of the AA and not the flawed interpretation of the limited data that exists per se.

My Comments:
The granting of a licence to an application that already has oyster farming structures on it has occurred before in Ireland. My oyster farm as stated before has a positive impact on the Wexford CoCo Development Plan 22-28. As argued above my oyster farm will not cause any lasting negative impacts on both the SAC and the SPA as determined by the ultra-conservative SPA AA. The DHLGH don't have a problem with my oyster farm getting licenced. The findings of the BTWBS Report 2018-21 and the plethora of MI commissioned winterbird studies all suggest that aquaculture in Ballyteigue Bay and outside Ballyteigue bay are not significant for negative impacts and that factors operating at a bigger scale are more important.

As argued the licensing of my oyster farm will not make much of a difference physically on the ground to my operation. It is extremely unlikely that issuing a licence to me will increase the chance of any significant negative impacts. There would be greater risk of significant negative impacts by removing me and maybe the precautionary principle should be applied in that regard.

The MI, the bird consultants, ecological consultants and Departments have put **in extensive man hours over years to make their 'considered opinions'**. The TA commissioned by ALAB went down to Ballyteigue for 3 days (maximum) outside of the winter bird monitoring period, for how long each day is anybody's guess, did no bird monitoring, put together an incomplete desk top study (cut and paste job), quite clearly reinforcing some of the negative opinions stated by the appellants and not corroborating/reinforcing one positive point stated by the applicants in their submissions. But in his considered opinion all of the above experts are wrong and that the licences should be overturned. In his TAR the TA ha clearly shown that he either doesn't understand nor has taken the time to understand shellfish farming in terms of ecosystem benefits or at worst chooses to ignore when writing the TAR.

Is this what ALAB calls a proper impartial handling of an appeal to my granted licence based on sound science? I would argue that if ALAB accept the recommendation of this TA that it would be the beginning of the end of shellfish farming in this country. If I can't get a licence of 1.698 Ha (a tiny fraction of the SAC and SPA) that has been farmed for over 35 years and which was put through an ultra-conservative SPA AA, was granted a licence by DAFM and was supported by the DHLGH (NPWS) and Wexford County Council and other agencies then there would appear to be little hope of any new application or renewal application being granted. An Taisce and other like- minded anti-aquaculture appellants buoyed up by such an unbelievable victory would only have to submit and appeal and threaten ALAB of impending legal action again should ALAB grant the licence. That's a sad state of affairs. Unfortunately, in my case it's even more sad. The TA is actually calling for an overturning of my licence. I would say An Taisce and others can't believe their luck after reading the TAR.

The BTWBS Report 2018-21 supports the view that my activities are not causing issues. I would urge ALAB to read it this time around. I would also urge ALAB members not to be swayed by the wording in the TAR. As you can see from my efforts here it was worthwhile double-checking things as it led to a realisation that certain valid excerpts from/reports were not included/considered in the TAR and some were reworded by the TA and the meaning distorted (DHLGH submission in particular).

ALAB should also remember that behind all of this is my business, my family and employment for local people. An honest sustainable business that has won awards for excellence and one that is very environmentally conscious.

I sincerely hope that ALAB will not overturn the licence that I was granted.

Yours Sincerely,

Ballyteigue Oysters Ltd.

Ballyteigue Burrow Waterbird Survey

Winter 2018-19, 2019-20 &

2020-21

Bird Survey Report

June 2021

INIS Environmental Consultants Ltd.

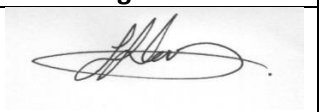
Suite 11,
Shannon Commercial Properties,
Information Age Park,
Ennis,
County Clare
Ireland.

Quality Assurance

The findings outlined within this report and the data we have provided are to our knowledge true and express our bona fide professional opinions. This report has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Code of Professional Conduct. Where pertinent, CIEEM Guidelines used in the preparation of this report include the *Guidelines for Ecological Report Writing* (CIEEM, 2017), *Guidelines for Preliminary Ecological Appraisals* (CIEEM, 2015) and *Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine*, (CIEEM, 2018). CIEEM Guidelines include model formats for Preliminary Ecological Appraisal and Ecological Impact Assessment. Also, where pertinent, evaluations presented herein take cognisance of recommended Guidance from the EPA such as *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2017), and in respect of European Sites, *Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC* (European Commission, 2018).

Due cognisance has been given at all times to the provisions of the *Wildlife Act (1976),* the *Wildlife (Amendment) Act (2000)*, the *European Union (Natural Habitats) Regulations (SI 378/2005)*, the *European Communities (Birds and Natural Habitats) Regulations (2011),* EU Regulation on Invasive Alien Species under *EU Regulation 1143/2014*, the *EU Birds Directive 2009/147/EC* and the *EU Habitats Directive 92/43/EEC*.

No method of assessment can completely remove the possibility of obtaining partially imprecise or incomplete information. In line with Best Practice, any limitation to the methods applied or constraints however are clearly identified within the main body of this document.

Version	Date		Author(s)	Signature
1.0	14/06/2021	Report prepared by:	Dr Lesley J Lewis BSc PhD MCIEEM	
1.0	17/06/2021	Report checked by:	Dr Alex Copland BSc PhD MIEnvSc	
1.0	18/06/2021	Report signed off by:	Howard Williams, BSc CEnv MCIEEM CBiol MRSB MIFM	
2.0	08/11/2022	Report updated by:	Dr Alex Copland BSc PhD MIEnvSc	
Title		**Ballyteigue Burrow Waterbird Survey – Winter Bird Survey Report**		

Notice

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1. INTRODUCTION

INIS Environmental Consultants Ltd were contracted to co-ordinate a series of waterbird surveys at Ballyteigue Burrow Co. Wexford during the winter seasons of 2018/19, 2019/20 and 2020/21. Following standard methodology used for surveying wintering waterbirds at low tide (Lewis & Tierney, 2014), the surveys included four low tide surveys and a single high tide survey. This report details the results of the three winter seasons. The results are examined and discussed in light of similar surveys undertaken during 2009/10 as part of the National Parks & Wildlife Service (NPWS) Waterbird Survey Programme (NPWS, 2012).

1.1. Constraints and limitations

There are a number of limitations inherent to field-based surveying. These particularly relate to availability of suitable weather conditions for completing surveys, with good visibility and little wind or rain of paramount importance. As such, when undertaking and completing fieldwork, careful consideration and planning is made to ensure optimal weather conditions during survey periods. The data presented here were all collected in optimal weather conditions.

When counting shorebirds, disturbance can substantially impact on the birds present within small areas if they are able to disperse away from the source of disturbance to adjacent areas of similar habitat but out with the areas where surveying is taking place. Such disturbance may happen in advance of the count taking place or during the survey period. To gauge levels of disturbance Best Practice methods include an assessment of disturbance levels encountered during the recording period. Such an assessment of disturbance allows the likely impact on shorebird numbers and distribution to be determined, particularly when looking at likely response to different disturbance events. Details of recorded disturbance are therefore provided.

Constraints and any limitations to available datasets used for comparative analysis are presented in where known.

1.2. Statement of Authority

Mr Howard Williams MCIEEM CEnv CBiol MRSB MIFM is Lead Ecologist with Inis and has more than 20 years' experience as a professional ecologist, specialising in birds. Following his degree, he worked as a biologist for the ESB for three years (1997-2000). Mr Williams has completed in excess of 500 separate ecology assessments in Ireland and the UK since 2000. Mr Williams is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). He is a Chartered Environmentalist (CEnv) with the Society for the Environment (Soc Env) and a Chartered Biologist (CBiol) with the Society of Biology. He is also a full member of the Institute of Fisheries Management. Mr Williams is principal ecologist with INIS Environmental Consultants Ltd and currently project manager on all INIS projects in the Republic of Ireland and the UK.

Dr. Lesley Lewis BSc PhD MCIEEM is a specialist waterbird ecologist. Lesley has a first-class honours degree in Zoology and a PhD in waterbird ecology (PhD Title: Ecological disturbance and its effects on estuarine benthic invertebrate communities and their avian predators).

Lesley has run the ecological consultancy 'Limosa Environmental' for the past 17 years. Lesley acts as Project Manager for each contract and over the years has gained considerable experience working on a range of contracts including Environmental Impact Assessments, Ecological Assessments (EcIA), Stage I Screening for Appropriate Assessment and Natura Impact Statements (NIS).

In addition, Lesley has worked part-time for BirdWatch Ireland since 2009, and from 2009 to 2014 was contracted to the National Parks and Wildlife Service (NPWS) as a Waterbird Ecologist. In this role, Lesley was responsible for the design and implementation of the NPWS baseline low tide waterbird survey programme and the preparation of site-specific Conservation Objectives for 32 coastal SPA sites. This work culminated in the publication of standard low-tide survey methods for waterbirds (Lewis & Tierney, 2014). After November 2014, Lesley was engaged in a number of BirdWatch Ireland projects including various aspects of the Irish Wetland Bird Survey (I-WeBS), as well as work on forestry birds, seabirds and the Hen Harrier. In 2015 she was assistant project manager on the Seabird4 Survey (survey of cliff-nesting seabirds 2015, NPWS). From September 2017, Lesley took over the project management of both the Irish Wetland Bird Survey (I-WeBS) and the Countryside Bird Survey (CBS).

Dr. Alex Copland BSc PhD is Technical Director (Ecology) with INIS and has over 25 years of bird survey experience. He is proficient in experimental design and data analysis and has been working on bird populations in Ireland for over 20 years. He has managed several large-scale, multi-disciplinary conservation projects, including research and conservation work for species of conservation concern, the design and delivery of practical conservation actions, education and interpretation on the environment and the development of co-ordinated, strategic plans for birds and biodiversity in Ireland.

He has written numerous scientific papers, developed and contributed to evidence-based position papers, visions and strategies on birds and habitats in Ireland. He has supervised the successful completion of research theses for several post-graduate students, including doctoral candidates. He lectures to both undergraduate and post-graduate students at UCD, as well as being a collaborative researcher with both UCD and UCC. He sits on the Editorial Panel of the scientific journal, *Irish Birds*.

2. EXISTING ENVIRONMENT

2.1. Site Description

Ballyteige Burrow is located on the south coast of Co. Wexford between the towns of Kilmore Quay and Cullenstown. The site is dominated by a long sand and shingle barrier (spit) which supports an impressive dune complex known as the Burrow. On the seaward side is a long beach, approximately 8km in length. Behind the spit lies a shallow, tidal sea inlet and estuary of the Duncormick River (The Cull). To the east of the intertidal habitats are polderlands (Killag) claimed in the 19th century by construction of the Cull Bank; comprising mostly improved grassland and arable land. The western portion of The Cull retains semi-natural habitat including mudflats which are exposed at low tide, as well as saltmarsh (NPWS, 2014a).

Ballyteige Burrow is important for wintering waterbirds and provides intertidal and terrestrial feeding grounds as well as high-tide roosts. Consequently, the site is designated as a Special Protection Area (SPA) under the EU Birds Directive (2009/147/EC)[1] (Ballyteigue Burrow SPA 4020) (Figure 2.1.1). At the time of site designation, the site supported non-breeding (wintering) Light-bellied Brent Goose *Branta bernicla hrota* and Black-tailed Godwit *Limosa limosa* in numbers of international importance plus a further five waterbird species in numbers of all-Ireland importance. Ballyteigue Burrow is also a designated Special Area of Conservation (SAC Site Code 00696) under the EU Habitats Directive[2]. The SPA site synopsis is given in Appendix 1.

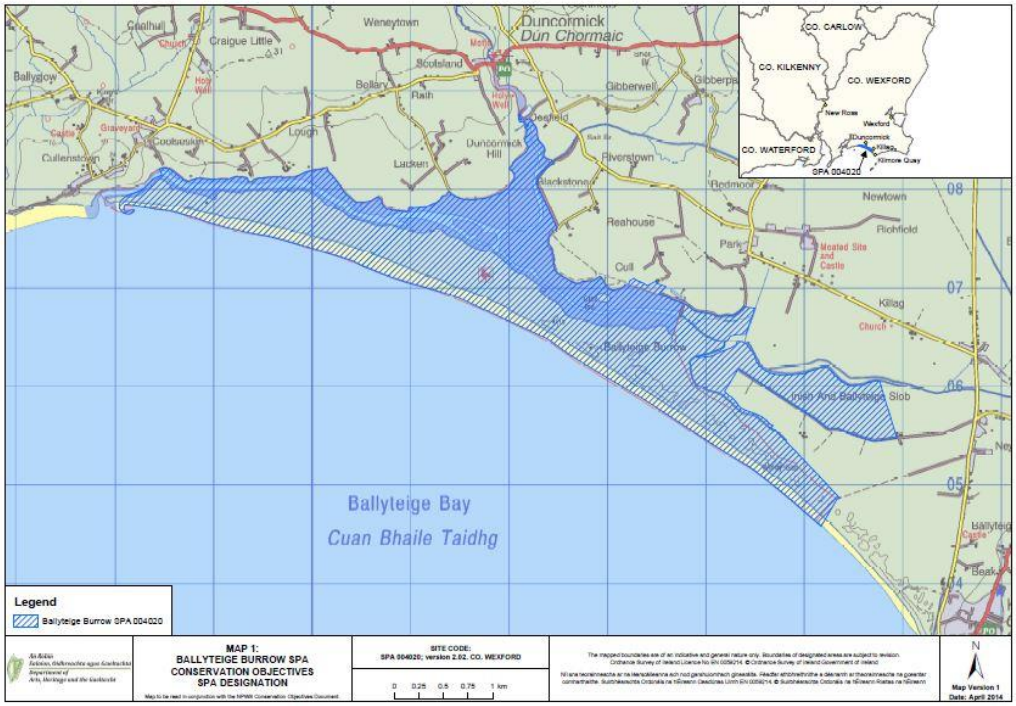

Figure 2.2.1: Location of Ballyteigue Burrow SPA, Co. Wexford (source: NPWS, 2014a)

[1] Directive 2009/147/EC on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended).

[2] Council Directive 92/43/EEC on the conservation of natural habitats and wild flora and fauna, as amended by Council Directive 97/62/EC. The Directive was transposed into Irish law by the European Communities (Natural Habitats) Regulations, SI 94/1997 which were amended and later consolidated by the European Communities (Birds and Natural Habitats) Regulations 2011 – 2015 (S.I. 355/2015).

2.2. Waterbirds of Ballyteigue Burrow

2.2.1. Waterbird Special Conservation Interests (SCIs)

Ballyteigue Burrow SPA (4020) (Figure 2.1.1) covers a total area of 559ha and is of special conservation interest for seven waterbird species (Table 2.2.1), two of which (Light-bellied Brent Goose and Black-tailed Godwit) have occurred in numbers of international importance in the past. In addition to the seven waterbird SCI species, a further 11 species occur regularly at the site during winter (NPWS, 2014b):

Mute Swan (*Cygnus olor*)
Teal (*Anas crecca*)
Cormorant (*Phalacrocorax carbo*)
Little Egret (*Egretta garzetta*)
Dunlin (*Calidris alpina*)
Redshank (*Tringa totanus*)
Wigeon (*Anas penelope*)
Red-breasted Merganser (*Mergus serrator*)
Grey Heron (*Ardea cinerea*)
Oystercatcher (*Haematopus ostralegus*)
Curlew (*Numenius arquata*)

Baseline data for the waterbird SCIs species of Ballyteigue Burrow SPA are shown in Table 2.2.1 (data period 1995/96-1999/2000). This table also shows waterbird population trends for SCI species at the site, which were reported in 2014 (NPWS, 2014b). However, based on data from the Irish Wetland Bird Survey (I-WeBS) for the period up to 2010/11, these site trends for wintering waterbirds of Ballyteigue Burrow are now considered out-of-date.

Table 2.2.1: Waterbird Special Conservation Interest (SCI) species listed for Ballyteigue Burrow SPA

Special Conservation Interests (SCIs)	Baseline population[a]	Population status at baseline[c]	Reported population trend in 2014[d]
Light-bellied Brent Goose *Branta bernicla hrota*	290	International Importance	Favourable
Shelduck *Tadorna tadorna*	167	All-Ireland Importance	Highly Unfavourable
Golden Plover *Pluvialis apricaria*[b]	4,630	All-Ireland Importance	Favourable
Grey Plover *Pluvialis squatarola*	69	All-Ireland Importance	Intermediate (Unfavourable)
Lapwing *Vanellus vanellus*	7,808	All-Ireland Importance	Highly Unfavourable
Black-tailed Godwit *Limosa limosa*	474	International Importance	Unfavourable
Bar-tailed Godwit *Limosa lapponica*[b]	582	All-Ireland Importance	Highly Unfavourable

[a]Five year peak mean for the period 1995/96-1999/00 (Source: NPWS, 2014b)
[b]Annex I species.
[c]numbers of all-Ireland importance (Baseline: after Crowe & Holt, 2013); numbers of international importance (Baseline: after Wetlands International, 2012)
[d]Favourable (stable/increasing); intermediate unfavourable (population declines 1.0 – 24.9%); unfavourable (population declines 25.0 – 49.9%); highly unfavourable (population declines > 50%) (NPWS, 2014b).

3. METHODOLOGIES

3.1. Background to the low tide survey programme

The Irish Wetland Bird Survey (I-WeBS) is the primary method by which data are collected for wintering waterbird populations at Irish wetland sites. These data, largely collected by volunteer field surveyors since the winter season of 1994/95, have underpinned the designation of Special Protection Areas (SPAs), and have enabled the production of waterbird population estimates and trends at national and at site level (e.g. Crowe & Holt, 2013; Burke *et al*., 2019; Lewis *et al*., 2019). I-WeBS surveys are undertaken primarily on a rising or high tide, when birds are pushed closer to shore or are gathering at roost sites and are therefore easier to count than when widely distributed across exposed tidal flats.

While I-WeBS surveys are designed to obtain the most accurate peak counts of waterbirds at a site, they cannot provide information about waterbird abundance or distribution during the low tide period, when many waterbirds are feeding. This gap in knowledge was addressed somewhat in 2009/10, when the National Parks and Wildlife Service (NPWS) initiated a programme of low tide surveys which took place over the three winter seasons of 2009/10, 2010/11 and 2011/12 at 32 coastal SPAs (The NPWS Waterbird Survey Programme). Each SPA site was surveyed in a single winter season and Ballyteigue Burrow was surveyed in 2011/12. Standard methodology was designed to ensure consistency in data capture and recording at each site (Lewis & Tierney, 2014).

Waterbird surveys at Ballyteigue Burrow during the three winter seasons reported here therefore followed the standard methodology developed by the NPWS waterbird survey programme.

3.2. Survey design and count area

During each of the three winter seasons of 2018/19, 2019/20 and 2020/21, a standard survey programme of four low tide counts and one high tide count was undertaken. Low tide surveys were scheduled for the months of October, November, December and February, while a high tide survey was carried out in January.

Optimum dates were chosen in each month when the survey period spanned midday to facilitate travel to/from the site, but also to ensure surveys were carried out in the best weather and light conditions.

During the NPWS Waterbird Survey Programme of 2011/12, a survey area covering over 1,200 ha was surveyed comprising 14 count subsites. These subsites covered not only the area designated as a SPA, but also surrounding grassland habitat thought important for foraging geese. For the current surveys, three intertidal subsites were counted, namely 0OL02 (Duncormick Marsh), 0OL04 (Lacken) and 0OL06 (Blackstone), covering an intertidal area of c.106ha (Table 3.2.1). These subsites, together with the other subsites used in the NPWS baseline survey are shown in Figure 3.2.1.

Table 3.2.1 Count Subsites of Ballyteigue Burrow 2018/19, 2019/20 and 2020/21. Subsite areas taken from NPWS 2014b.

Subsite Code	Subsite Name	Area (ha)
0OL02	Duncormick Marsh	8.8
0OL04	Lacken	48.3
0OL06	Blackstone	48.9

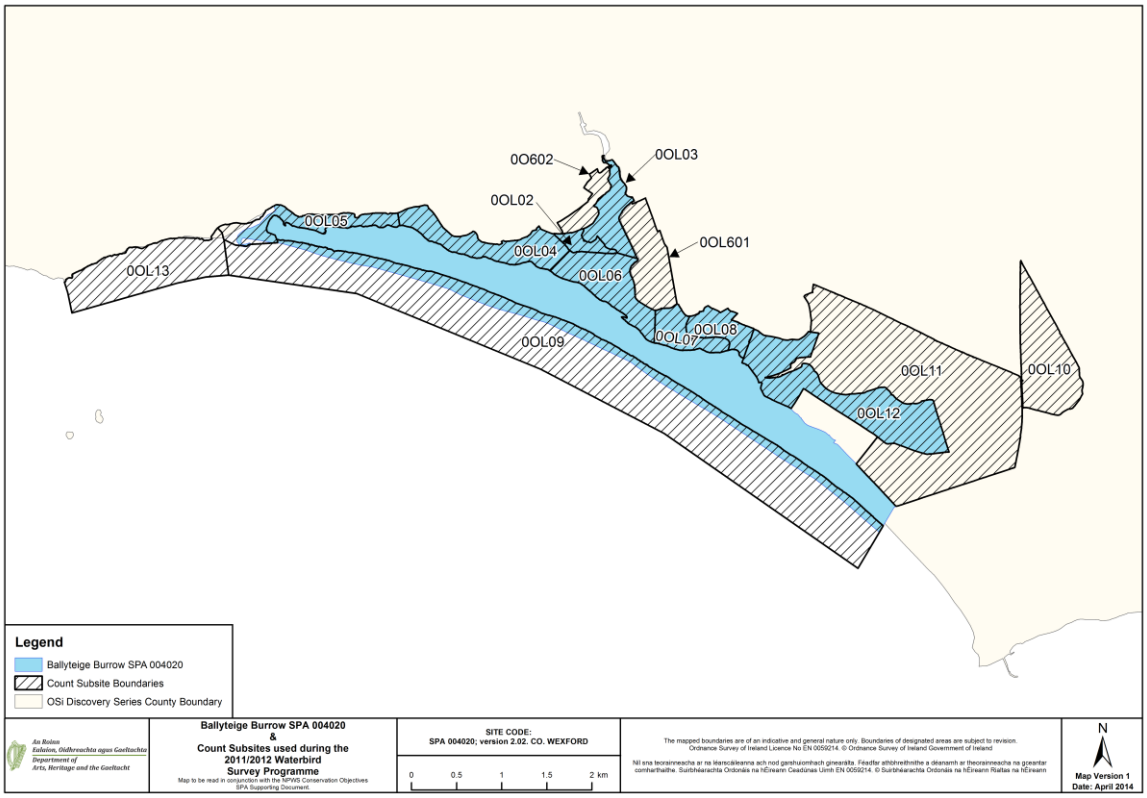

Figure 3.2.1: Count subsites used by the NPWS Waterbird Survey Programme.

3.3. Field survey methods

The survey period on each day extended from two hours either side of low or high tide (depending on the survey being undertaken). Waterbirds were counted within each of the three count subsites, and the data for each subsite were recorded separately. Waterbird counts were conducted on the 'look-see' basis (Bibby *et al*., 2000) which involves scanning across the survey area and counting all birds seen. Birds were recorded according to their species code following the two-letter coding system used by I-WeBS and developed by the British Trust for Ornithology.

In addition to counts of each species, the behaviour of waterbirds during counts was attributed to one of two categories (foraging or roosting/other) while the position of the birds was recorded as per one of four broad habitat types (intertidal, subtidal, supratidal and terrestrial). Field maps of count subsites were used to map significant flocks of foraging/roosting birds ('flock maps').

Information on the presence of activities that could cause disturbance to waterbirds was also recorded. Following Lewis & Tierney (2014), activity types were assigned to the following categories:

(1) human, on-foot - shoreline (2) human, on foot – intertidal aquaculture, (3) bait-diggers (4) non-powered watercraft (5) powered watercraft, (6) water-based recreation (e.g. wind-surfers) (7) horse-riding (8) dogs (9) aircraft (10) shooting (11) other (12) winkle pickers (13) aquaculture machinery (14) other vehicles.

When an activity was observed to cause a disturbance, the waterbird species affected were recorded and a letter code system used to indicate the bird's response to the activity as follows:

W - Weak response, waterbirds move slightly away from the source of the disturbance.
M - Moderate response, waterbirds move away from the source of the disturbance to another part of your subsite; they may return to their original position once the activity ceases.
H - High response, waterbirds fly away to areas outside of your subsite and do not return during the current count session.

The length of the activity was also recorded by adding by the codes **A – D** (see below) and a record was made as to whether the activity was already occurring within the subsite when the count started.

A – short/discrete event.
B – activity occurs for up to 50% of the count period.
C – activity length estimated at >50% but < 100% of the count period.
D – activity continues after the count period has ended.

3.4. Disturbance study

In addition to the recording of activities and disturbance during the low and high tide surveys, a one-day disturbance study was completed on 25th November 2018. The study focused on the low tide period, whereby the surveys were carried out across the period 2-4 hours either side of low water. Waterbirds were counted within each of the three subsites (0OL02, 0OL04 and 0OL06) on an hourly basis i.e. each sector had one count per hour. During the hour, repeat counts were made to obtain the maximum number of birds per sector per hour. Counts were undertaken using the 'look see' method (Bibby *et al*., 2000) whereby each sector was scanned by the observer using a telescope and all waterbirds observed were identified and counted. The number of waterbirds was recorded within the following categories:

Position re. tideline – either 'on tideline' or 'not on tideline'. Note that 'on tideline' includes birds +/- 10m away from it, and birds within the channel that is present at low water.
Activity – foraging or roosting/other.
Trestles – recorded as either 'on trestles' or 'not on trestles.'

The effects of any activities upon waterbirds within subsites was recorded as per described above.

3.5. Data analysis

3.5.1. General

Field data were collected in notebooks and later transferred by the field surveyor into an Excel datasheet. At the end of the survey season the Excel datasheets were compiled and validated before being formatted and entered into an Access database. From Access, data summaries were produced such as site totals, subsite totals, etc.

Waterbird numbers were assessed with reference to national and international threshold levels as follows:

- A waterbird species that occurs in numbers that correspond to 1% or more of the individuals in the all-Ireland population of the species is said to occur in numbers of all-Ireland importance. Current population threshold values are published in Burke *et al*. (2019).
- A waterbird species that occurs in numbers that correspond to 1% or more of the individuals in the biogeographic population of the species or subspecies is said to occur in 'internationally important numbers.' Current international population threshold values are published by the African-Eurasian Migratory Waterbird Agreement (AEWA) Conservation Status Review 7 (CSR7) (AEWA 2018) (published online at wpe.wetlands.org).

3.5.2. Waterbird distribution

Methods to assess waterbird distribution diverged somewhat from that used by NPWS (2014b), because only three, compared to their 14 count subsites were counted in the current surveys. Analyses were undertaken on datasets as follows:

- Total numbers (low tide surveys),
- Total numbers (high tide survey),
- Total densities (low tide survey).

For each of the analyses listed above and for each survey date completed, subsites were ranked in succession from the highest to the lowest in terms of their relative contribution to each species' distribution across the three subsites. Subsite were ranked simply as 1, 2 or 3.

3.5.3. Trends

A robust analysis of trends in waterbird numbers within the study area was not possible based on a limited dataset. However, we assessed peak counts of selected waterbird species across the three recent winter surveys as well as comparing recent peak counts with those from the NPWS Waterbird Survey Programme of winter 2010/11.

Site trends were examined by comparing recent five-year mean peak counts from I-WeBS, with five - year mean peak counts from the baseline data period used for SPA designation.

4. RESULTS

4.1. Survey schedule and conditions

The winter waterbird surveys proceeded relatively unhampered by weather conditions. All surveys were carried out in good weather conditions (Table 4.1.1).

Table 4.1.1: Weather conditions for the 2020/21 survey programme.

Winter	Date	Survey	Wind	Cloud (%)	Rain	Visibility	Notes
2020/21	19.10.20	LT1	Breezy	33-66	None	Good	No survey constraints
	15.11.20	LT2	Breezy	33-66	None	Moderate	No survey constraints
	03.12.20	LT3	Light	66-100	None	Good	No survey constraints
	08.01.21	HT1	Breezy	0-33	None	Good	No survey constraints
	12.02.21	LT4	Breezy	0-33	None	Moderate	No survey constraints
2019/20	30.10.19	LT1	Breezy	33-66	Showers	Moderate	No survey constraints
	11.11.19	LT2	Breezy	0-33	None	Good	No survey constraints
	11.12.19	LT3	Breezy	0-33	None	Good	No survey constraints
	18.01.20	HT1	Light	0-33	None	Good	No survey constraints
	10.02.20	LT4	Light	33-66	None	Moderate	No survey constraints
2018/19	11.10.18	LT1	Light	0-33	None	Good	No survey constraints
	27.11.18	LT2	Light	0-33	Showers	Good	No survey constraints
	09.12.18	LT3	Breezy	66-100	None	Good	No survey constraints
	16.01.19	HT1	Breezy	33-66	None	Good	No survey constraints
	10.02.19	LT4	Breezy	66-100	None	Good	No survey constraints

4.2. Overview of species assemblage and diversity

Species diversity at low tide was relatively consistent for the three winters with 26, 25 and 27 waterbird species recorded respectively for winters 2018/19, 2019/20 and 2020/21 (Table 4.2.1). Twenty-nine species were recorded over the course of the three winters. The species list includes nine wildfowl and allies, 15 wader species and five gull species. The species list includes three species (Little Egret, Golden Plover and Bar-tailed Godwit) listed on Annex I of the EU Bird's Directive, and 24 species that are on the *Birds of Conservation Concern in Ireland* lists (Gilbert et al. 2021), including 11 that are Red-listed and are of highest concern, and a further 13 species that are Amber-listed. All Special Conservation Interest (SCI) species listed for Ballyteigue Burrow SPA were recorded in all three winters of survey. Of the total 29 species recorded over the course of the three winters, 23 species were recorded in all three winters. Three species (Mallard, Red-breasted Merganser and Sanderling) were recorded in two winters, and Knot, Snipe and Common Gull were recorded in one winter only.

A total of 24 waterbird species was recorded during high tide surveys over the course of the three winters, with 16, 18 and 22 species recorded in the three winters of 2018/19, 2019/20 and 2020/21 respectively (Table 4.2.2). All Special Conservation Interest (SCI) species listed for Ballyteigue Burrow SPA were recorded in all three winters. Twelve species occurred in high tide surveys in all three winters.

Table 4.2.1: Species recorded during low tide surveys at Ballyteigue Burrow. The table highlights Annex I species (EU Bird's Directive) and Red and Amber-listed species under 'Birds of Conservation Concern 4' (Gilbert et al. 2021). A √ means that a species was present during a low tide survey.

Code	Species name	Latin name	Annex I	BoCCI-4	2018/19 (LT)	2019/20 (LT)	2020/21 (LT)
PB	Light-bellied Brent Goose	*Branta bernicla hrota*		Amber	√	√	√
SU	Shelduck	*Tadorna tadorna*		Amber	√	√	√
WN	Wigeon	*Anas penelope*		Amber	√	√	√
T.	Teal	*Anas crecca*		Amber	√	√	√
MA	Mallard	*Anas platyrhynchos*		Amber	√		√
RM	Red-breasted Merganser	*Mergus serrator*		Amber	√		√
CA	Cormorant	*Phalacrocorax carbo*		Amber	√	√	√
ET	Little Egret	*Egretta garzetta*	1		√	√	√
H.	Grey Heron	*Ardea cinerea*			√	√	√
OC	Oystercatcher	*Haematopus ostralegus*		Red	√	√	√
RP	Ringed Plover	*Charadrius hiaticula*		Amber	√	√	√
GP	Golden Plover	*Pluvialis apricaria*	1	Red	√	√	√
GV	Grey Plover	*Pluvialis squatarola*		Red	√	√	√
L.	Lapwing	*Vanellus vanellus*		Red	√	√	√
KN	Knot	*Calidris canutus*		Red			√
SS	Sanderling	*Calidris alba*				√	√
DN	Dunlin	*Calidris alpina*		Red	√	√	√
SN	Snipe	*Gallinago gallinago*		Red	√		
BW	Black-tailed Godwit	*Limosa limosa*		Red	√	√	√
BA	Bar-tailed Godwit	*Limosa lapponica*	1	Red	√	√	√
CU	Curlew	*Numenius arquata*		Red	√	√	√
GK	Greenshank	*Tringa nebularia*			√	√	√
RK	Redshank	*Tringa totanus*		Red	√	√	√
TT	Turnstone	*Arenaria interpres*		Amber	√	√	√
BH	Black-headed Gull	*Chroicocephalus ridibundus*		Amber	√	√	√
CM	Common Gull	*Larus canus*		Amber		√	
LB	Lesser Black-backed Gull	*Larus fuscus*		Amber	√	√	√
HG	Herring Gull	*Larus argentatus*		Amber	√	√	√
GB	Great Black-backed Gull	*Larus marinus*			√	√	√
	Total number of species >				**26**	**25**	**27**

Table 4.2.2: Species recorded during high tide surveys at Ballyteigue Burrow. The table highlights Annex I species (EU Bird's Directive) and Red and Amber-listed species under 'Birds of Conservation Concern 4' (Gilbert et al. 2021). A √ means that a species was present during a high tide survey.

Code	Species name	Latin name	2018/19 (HT)	2019/20 (HT)	2020/21 (HT)
PB	Light-bellied Brent Goose	*Branta bernicla hrota*	√		√
SU	Shelduck	*Tadorna tadorna*	√		√
WN	Wigeon	*Anas penelope*	√	√	√
T.	Teal	*Anas crecca*	√	√	√
RM	Red-breasted Merganser	*Mergus serrator*		√	√
CA	Cormorant	*Phalacrocorax carbo*	√	√	
ET	Little Egret	*Egretta garzetta*	√	√	√
OC	Oystercatcher	*Haematopus ostralegus*	√	√	√
RP	Ringed Plover	*Charadrius hiaticula*			√
GP	Golden Plover	*Pluvialis apricaria*		√	√
GV	Grey Plover	*Pluvialis squatarola*	√	√	√
L.	Lapwing	*Vanellus vanellus*	√	√	√
DN	Dunlin	*Calidris alpina*	√	√	√
SN	Snipe	*Gallinago gallinago*	√		
BW	Black-tailed Godwit	*Limosa limosa*		√	√
BA	Bar-tailed Godwit	*Limosa lapponica*		√	√
CU	Curlew	*Numenius arquata*	√	√	√
GK	Greenshank	*Tringa nebularia*			√
RK	Redshank	*Tringa totanus*	√	√	√
TT	Turnstone	*Arenaria interpres*		√	√
BH	Black-headed Gull	*Chroicocephalus ridibundus*	√	√	√
LB	Lesser Black-backed Gull	*Larus fuscus*			√
HG	Herring Gull	*Larus argentatus*	√	√	√
GB	Great Black-backed Gull	*Larus marinus*	√	√	√
		Total number of species >	**16**	**18**	**22**

4.3. Subsite diversity and species frequency of occurrence

The count subsite 0OL06 (Blackstone) supported the greatest number of waterbird species during low tide surveys during all three winters of survey (Figure 4.3.1). 0OL04 (Lacken) was the second most diverse subsite in all three winters, while 0OL02 (Duncormick Marsh) was the least diverse overall (Figure 4.3.1).

During high tide surveys, subsite species diversity varied greatly. During winter 2019/19 0OL02 and 0OL06 both supported a maximum 11 waterbird species. The following winter high tide survey saw only two species recorded within 0OL06. During winter 2020/21, species diversity was relatively similar across all three subsites (Figure 4.3.2).

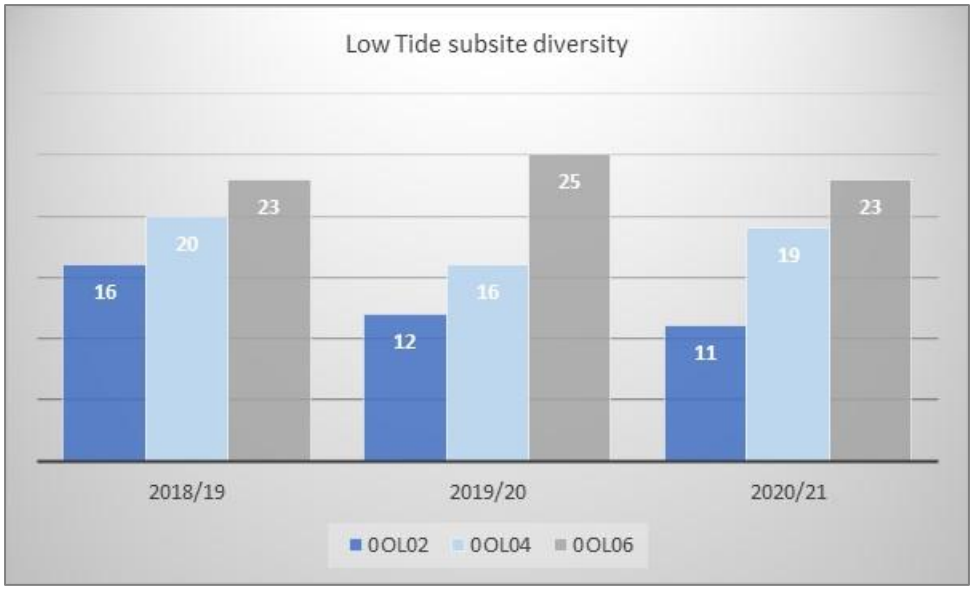

Figure 4.3.1: Subsite diversity (number of species) during low tide surveys.

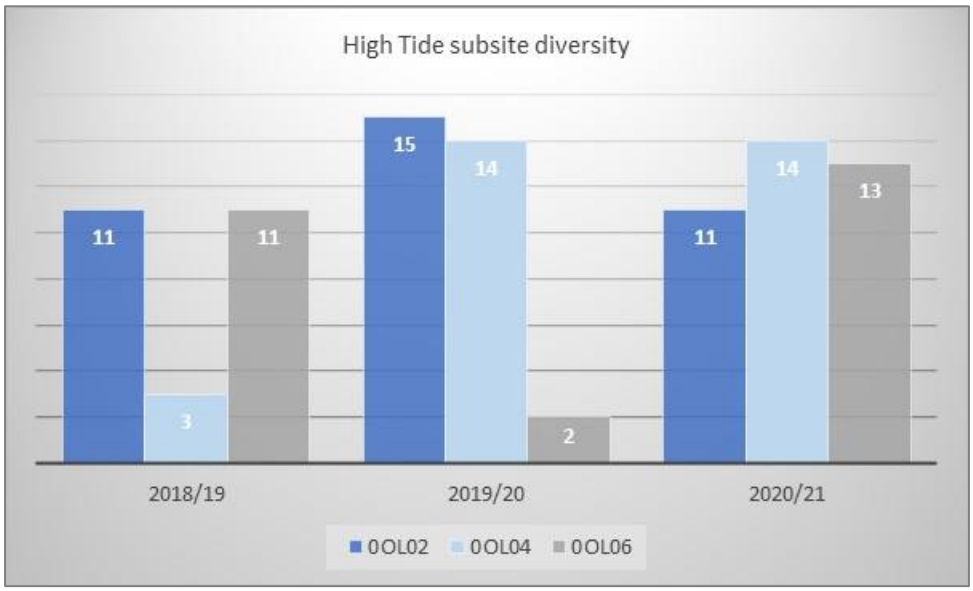

Figure 4.3.2: Subsite diversity (number of species) during high tide surveys.

Five waterbird species were present during all three winters in 0OL02 (Duncormick Marsh). The most frequently occurring species within this area during low tide surveys were Teal and Redshank, both recorded in most monthly surveys of all three winters (Table 4.3.1).

Table 4.3.1: Species recorded in subsite 0OL02 (Duncormick Marsh). Shading means that a species was present during a low tide *survey. The number in brackets denotes how many of the four low tide surveys a species was present in.*

Species name	Latin name	2018/19	2019/20	2020/21
Light-bellied Brent Goose	*Branta bernicla hrota*		(2)	(1)
Shelduck	*Tadorna tadorna*		(1)	(2)
Wigeon	*Anas penelope*			(2)
Teal	*Anas crecca*	(4)	(2)	(4)
Little Egret	*Egretta garzetta*	(2)	(2)	(1)
Grey Heron	*Ardea cinerea*		(1)	
Oystercatcher	*Haematopus ostralegus*	(1)		
Ringed Plover	*Charadrius hiaticula*	(1)		
Golden Plover	*Pluvialis apricaria*	(1)		
Grey Plover	*Pluvialis squatarola*	(2)		
Lapwing	*Vanellus vanellus*		(2)	(1)
Dunlin	*Calidris alpina*	(2)	(1)	
Snipe	*Gallinago gallinago*	(1)		
Black-tailed Godwit	*Limosa limosa*	(3)	(1)	(1)
Bar-tailed Godwit	*Limosa lapponica*	(1)		(1)
Curlew	*Numenius arquata*	(4)	(3)	(2)
Greenshank	*Tringa nebularia*	(2)		
Redshank	*Tringa totanus*	(3)	(3)	(3)
Black-headed Gull	*Chroicocephalus ridibundus*	(1)		(2)
Lesser Black-backed Gull	*Larus fuscus*		(1)	
Herring Gull	*Larus argentatus*	(1)	(1)	
Great Black-backed Gull	*Larus marinus*	(1)		

Fourteen waterbird species were present during all three winters in 0OL04 (Lacken). The most frequently occurring species within this area were Redshank, Curlew, Oystercatcher, Little Egret, Black-headed Gull, Herring Gull and Great Black-backed Gull (Table 4.3.2).

Nineteen waterbird species were present during all three winters in 0OL06 (Blackstone). The most frequently occurring species were Oystercatcher and Redshank, both present in all four low tide surveys in all three winters. Also frequently occurring were Grey Plover (present in three months in all three winters), and Dunlin, Curlew and Herring Gull that were present in three or more months in all three winters) (Table 4.3.3).

Table 4.3.2: Species recorded in subsite 0OL04 (Lacken). Shading means that a species was present during a low tide *survey. The number in brackets denotes how many of the four low tide surveys a species was present in.*

Species name	Latin name	2018/19	2019/20	2020/21
Light-bellied Brent Goose	*Branta bernicla hrota*	(1)	(2)	(2)
Wigeon	*Anas penelope*	(2)	(1)	(2)
Teal	*Anas crecca*			(3)
Mallard	*Anas platyrhynchos*	(1)		
Red-breasted Merganser	*Mergus serrator*	(2)		(1)
Cormorant	*Phalacrocorax carbo*	(3)	(2)	(3)
Little Egret	*Egretta garzetta*	(4)	(3)	(1)
Grey Heron	*Ardea cinerea*	(1)		
Oystercatcher	*Haematopus ostralegus*	(4)	(4)	(2)
Ringed Plover	*Charadrius hiaticula*	(1)	(1)	(1)
Golden Plover	*Pluvialis apricaria*	(1)		
Grey Plover	*Pluvialis squatarola*	(3)	(2)	(2)
Dunlin	*Calidris alpina*	(2)		(1)
Black-tailed Godwit	*Limosa limosa*	(2)	(1)	
Bar-tailed Godwit	*Limosa lapponica*			(1)
Curlew	*Numenius arquata*	(4)	(4)	(2)
Greenshank	*Tringa nebularia*	(3)	(3)	(1)
Redshank	*Tringa totanus*	(4)	(3)	(4)
Turnstone	*Arenaria interpres*	(1)	(1)	(1)
Black-headed Gull	*Chroicocephalus ridibundus*	(4)	(3)	(2)
Common Gull	*Larus canus*		(1)	
Lesser Black-backed Gull	*Larus fuscus*			(2)
Herring Gull	*Larus argentatus*	(4)	(4)	(2)
Great Black-backed Gull	*Larus marinus*	(3)	(4)	(2)

Table 4.3.3: Species recorded in subsite 0OL06 (Blackstone). Shading means that a species was present during a low tide *survey. The number in brackets denotes how many of the four low tide surveys a species was present in.*

Species name	Latin name	2018/19	2019/20	2020/21
Light-bellied Brent Goose	*Branta bernicla hrota*	(3)	(3)	(2)
Shelduck	*Tadorna tadorna*	(1)	(2)	
Wigeon	*Anas penelope*	(1)	(3)	(3)
Teal	*Anas crecca*	(2)	(2)	(1)
Mallard	*Anas platyrhynchos*			(1)
Red-breasted Merganser	*Mergus serrator*	(1)		
Cormorant	*Phalacrocorax carbo*	(2)	(1)	
Little Egret	*Egretta garzetta*	(2)	(3)	(2)
Grey Heron	*Ardea cinerea*	(1)	(1)	(1)
Oystercatcher	*Haematopus ostralegus*	(4)	(4)	(4)
Ringed Plover	*Charadrius hiaticula*	(2)	(2)	(1)
Golden Plover	*Pluvialis apricaria*		(1)	(1)
Grey Plover	*Pluvialis squatarola*	(3)	(3)	(3)
Lapwing	*Vanellus vanellus*	(1)	(2)	(1)
Knot	*Calidris canutus*			(1)
Sanderling	*Calidris alba*		(1)	(1)
Dunlin	*Calidris alpina*	(3)	(4)	(3)
Black-tailed Godwit	*Limosa limosa*	(1)	(2)	(1)
Bar-tailed Godwit	*Limosa lapponica*	(2)	(3)	(3)
Curlew	*Numenius arquata*	(4)	(3)	(3)
Greenshank	*Tringa nebularia*	(4)	(1)	(3)
Redshank	*Tringa totanus*	(4)	(4)	(4)
Turnstone	*Arenaria interpres*	(1)	(1)	
Black-headed Gull	*Chroicocephalus ridibundus*	(3)	(3)	(3)
Common Gull	*Larus canus*		(1)	
Lesser Black-backed Gull	*Larus fuscus*	(1)	(1)	(1)
Herring Gull	*Larus argentatus*	(4)	(4)	(3)
Great Black-backed Gull	*Larus marinus*	(3)	(4)	(3)

4.4. Total numbers of waterbirds

Monthly counts of waterbirds within the study area show great variation in all years of survey. Overall total waterbird numbers during low tide show a trend for decline over the four winter surveys while numbers at high tide seem stable (Figure 4.4.1).

Table 4.4.1: Total numbers of waterbirds counted in the study area at Ballyteigue Burrow during winters 2018/19, 2019/20 and 2020/21, plus totals from the NPWS baseline survey in winter 2011/12. Winter peaks shown in bold font.

Winter	Total Numbers of Waterbirds				
	LT1	LT2	LT3	LT4	HT
2020/21	**1,582**	382	1,150	568	1,509
2019/20	706	1,331	733	1,982	**2,342**
2018/19	516	**2,867**	1,315	1,415	1,281
2011/12	267	1,726	1,081	**2,614**	1,172

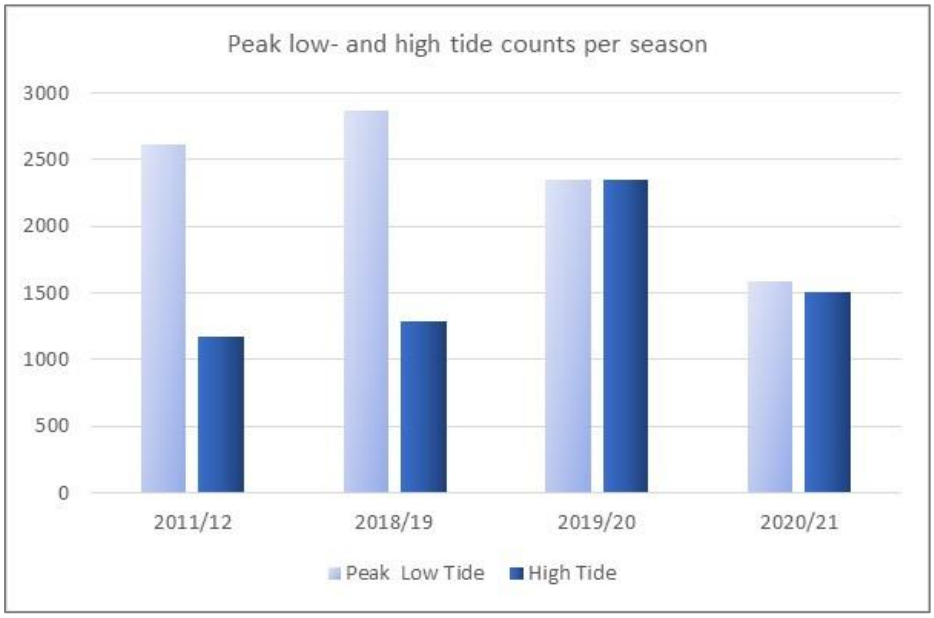

Figure 4.4.1: Peak low-and high-tide counts per season.

4.5. Species totals

Waterbird species peak counts for the winters of 2018/19, 2019/20 and 2020/211 are shown in Table 4.5.1, along with the counts from the NPWS Waterbird Survey Programme surveys of winter 2011/12.

One species was recorded in numbers of international importance (Light-bellied Brent Goose) in the most recent winter (2020/21), a count of 450 individuals exceeding the threshold of 400. Two species occurred in numbers of national importance during winter 2020/21 (Teal and Grey Plover). In recent previous winters, Redshank, Black-tailed Godwit and Golden Plover also occurred in numbers of national importance.

Table 4.5.1: Peak counts of waterbird species during low tide (LT) and high tide (HT) surveys within the study area at Ballyteigue Burrow, plus peaks from the baseline NPWS Waterbird Survey Programme counts of winter 2011/12. The table highlights numbers of international (i) and national (n) (all-Ireland) importance. The thresholds used are applicable to the timing of the survey hence all-Ireland thresholds currently follow (Burke et al. *2019) with Crowe & Holt (2013) for previous surveys, while international thresholds currently follow AEWA (2018) with Wetlands International, 2012 for earlier. Waterbird SCI species for Ballyteigue Burrow SPA are in bold font.*

Species name	2020/21 (LT Peak)	2019/20 (LT Peak)	2018/19 (LT Peak)	2011/12 (LT Peak)	2020/21 (HT)	2019/20 (HT)	2018/19 (HT)	2011/12 (HT)
Light-bellied Brent Goose	160	171	300	430 (i)	450 (i)		228	84
Shelduck	6	16	4	5	9		2	1
Wigeon	316	404	100	395	9	107	23	101
Teal	884 (n)	300	520 (n)	475 (n)	123	221	96	297
Mallard	12		6	6				14
Red-breasted Merganser	5		6	15	4	9		11
Cormorant	2	4	8	10		2	1	
Little Egret	4	8	3	4	4	5	1	
Grey Heron	1	2	1	3				
Oystercatcher	26	68	23	41	61	34	37	
Ringed Plover	10	74	75	55	2			8
Golden Plover	80	100	1000 (n)	18	100	90		
Grey Plover	81 (n)	206 (n)	44 (n)	71 (n)	80 (n)	20	60 (n)	
Lapwing	333	350	293	1,809	5	632	450	10
Knot	19			4				219
Sanderling	1	20		6				
Dunlin	113	420	457	80	218	260	80	
Snipe			1				5	100
Black-tailed Godwit	90	25	362 (n)	73	50	13		49
Bar-tailed Godwit	32	50	33	35	42	570		7
Curlew	230	159	181	147	230	6	132	82
Greenshank	3	4	3	7	3			2
Redshank	75	301 (n)	206	66	51	195	123	186
Turnstone	1	8	5	9	1	10		
Black-headed Gull	117	20	106	28	27	134	1	1
Common Gull		6		68				
Lesser Black-backed Gull	8	14	1	24	1			
Herring Gull	29	40	67	31	18	10	41	
Great Black-backed Gull	25	10	15	40	21	24	1	

4.6. Trends in waterbird numbers

A robust analysis of trends in waterbird population size at the site is not possible based on a limited dataset, however the assessment of peak counts of selected waterbird species across the three recent winter surveys, plus a comparison with the NPWS survey data of winter 2011/12 (Table 4.6.1) does provide some insights as follows:

- Light-bellied Brent Goose peak counts in recent years exceed that of 2011/12, but in recent winters appear to have dropped slightly.
- Shelduck are listed as a waterbird SCI for Ballyteigue Burrow SPA but peak counts from the four winter surveys shown in Table 4.6.1 show very low numbers within the study area, and within the entire SPA (2011/12 data). The site trend from I-WeBS data also shows a decline (Table 4.6.2).
- Numbers of Wigeon across the time period assessed appear to be stable, while Teal, Oystercatcher and Grey Plover numbers appear stable/increasing.
- Golden Plover, Ringed Plover, Dunlin and Redshank peak counts are variable and no trend can be determined. At whole site level, numbers of Golden Plover appear to have declined (Table 4.6.2).
- Numbers of Lapwing and Knot appear to have declined within the study area and within the entire site (Table 4.6.2).
- Numbers of Black-tailed Godwit, Bar-tailed Godwit and Curlew across the time period assessed appear to be stable. However, at whole site level, numbers of Black- and Bar-tailed Godwits appear to be in decline (Table 4.6.2).

Table 4.6.1: Assessment of peak numbers of waterbird SCIs and other selected species.

Species name	2020/21 Peak	2019/20 Peak	2018/19 Peak	2011/12 Peak	Recent change?	Recent peak vs baseline
Light-bellied Brent Goose	160	171	300	84	↓	↑
Shelduck	9	16	4	5		
Wigeon	316	404	100	395	stable	stable
Teal	884	300	520	475	↑	↑
Oystercatcher	61	68	37	41	↑	↑
Ringed Plover	10	74	75	55	?	?
Golden Plover	100	100	1,000	18	?	?
Grey Plover	81	206	60	71	↑	↑
Lapwing	333	632	450	1,809		↓
Knot	19	0	0	219		↓
Dunlin	218	420	457	80	?	?
Black-tailed Godwit	90	25	362	73		stable
Bar-tailed Godwit	42	570	33	35	stable	stable
Curlew	230	159	181	147	stable	stable
Redshank	75	301	206	186	?	?

Table 4.6.2: Comparison of baseline with recent five-year mean peak counts for waterbird SCIs.

Special Conservation Interests (SCIs)	Baseline population[1]	Reported site trend in 2014[b]	5-Yr mean 2014/15 – 2018/19[c]	Change
Light-bellied Brent Goose	290	Favourable	597	↑
Shelduck	167	Highly unfavourable	46	↓
Golden Plover	4,630	Favourable	3,200	↓
Grey Plover	69	Intermediate unfavourable	73	Stable
Lapwing	7,808	Highly unfavourable	1,585	↓
Black-tailed Godwit	474	Unfavourable	234	↓
Bar-tailed Godwit	582	Highly unfavourable	198	↓

[a]Five year peak mean for the period 1995/96-1999/00 (Source: NPWS, 2014b).
[b]Favourable (stable/increasing); intermediate unfavourable (population declines 1.0 – 24.9%); unfavourable (population declines 25.0 – 49.9%); highly unfavourable (population declines > 50%) (NPWS, 2014b).
[c]Data from I-WeBS.

4.7. Subsite totals

0OL06 (Blackstone) has supported the largest number of waterbirds during most low tide surveys although 0OL04 and 0OL02 have held peak numbers on occasion and particularly 0OL02 during 2018/19 (Table 4.7.1).

Table 4.7.1: Total numbers of waterbirds within subsites during the winters of 2018/19, 2019/20 and 2020/21. Peak count per survey shown in bold font.

		LT1	LT2	LT3	LT4	HT
0OL02	2018/19	**298**	**1,791**	240	410	264
	2019/20	312	38	188	922	**1,347**
	2020/21	291	**220**	228	158	496
0OL04	2018/19	63	74	31	137	62
	2019/20	65	202	**278**	46	743
	2020/21	119	47	169	150	**639**
0OL06	2018/19	155	1,002	**1,044**	**868**	**955**
	2019/20	**329**	**1,091**	267	**1,014**	252
	2020/21	**1,172**	115	**753**	**260**	374

Assessing peak subsite counts over time suggests that numbers have dropped within 0OL02 but remained relatively stable within 0OL04 and 0OL06 (Figure 4.7.1).

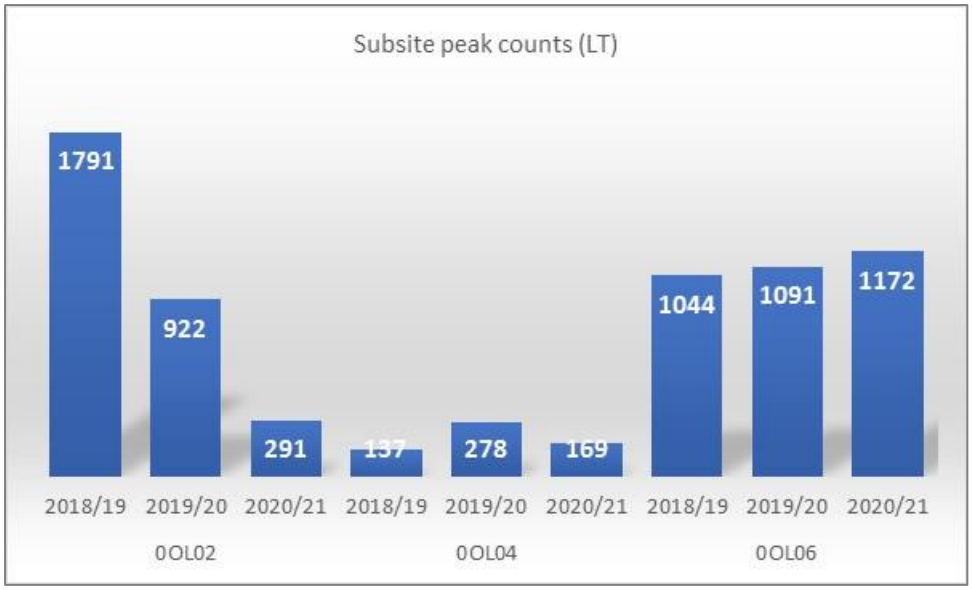

Figure 4.7.1: Subsite peak counts (LT) over winters 2018/19, 2019/20 and 2020/21.

4.8 Waterbird distribution

Distribution was assessed for the waterbird SCI species of Ballyteigue Burrow SPA. Subsites were ranked in succession from the highest to the lowest (1-3) in terms of their relative contribution to each species' distribution across the three subsites during low tide surveys in Table 4.8.1. The results show that all three subsites 0OL02, 0OL04 and 00L06 can support peak numbers, with all except one species (Shelduck) being present in numbers ranked most highly (1) in all three subsites. However, on the whole 0OL06 (Blackstone) appears to have supported peak numbers most consistently over time during low tide surveys (Table 4.8.1) and high tide surveys (Table 4.8.2) and holds the highest densities (Table 4.8.3).

*Table 4.8.1: Subsite ranking (rank numbers) based on **total numbers** during low tide surveys.*

Subsites> Species	0OL02	0OL04	0OL06
PB	1, 1 - -	1, 2, 2, 2	1, 1, 1, 1
SU	1, 1 - -	- - - -	- 1, 1, 1
GP	- - 1 -	- - 1 -	1, 1 - 1
GV	- - 1 -	- 1, 2, 2	1, 1, 1, 1
L.	1, 1 - -	- - - 1	1, 1, 1, 1
BW	1, 1 1, -	- 2, 1, 1	1, 1, 2, 1
BA	1 – 1 -	2 - - 1	1, 1 - 1

NOTE: numbers in sequence refer to the winters 2020/21, 2019/20, 2018/19, and 2011/12. '-' means that a species was not recorded in subsite.

*Table 4.8.2: Subsite ranking (rank numbers) based on **total numbers** during high tide surveys.*

Subsites> / Species	0OL02	0OL04	0OL06
PB	- - 2, 2	1 - - -	- - 1, 1
SU	- - - 1	- - - -	1 – 1 -
GP	1, 1 - -	- - - -	- - - -
GV	- 1 - -	2 - - -	1 – 1, 1
L.	- 3 - 3	1, 2 - 2	- 1, 1, 1
BW	- - - -	- 1 - 1	1, - - 2
BA	- 1 - -	2, 2 - 1	1, - - -

NOTE: numbers in sequence refer to the winters 2020/21, 2019/20, 2018/19, and 2011/12. '-' means that a species was not recorded in subsite.

*Table 4.8.3: Subsite ranking (ranked densities) based on **total densities** during low tide surveys.*

Subsites> / Species	0OL02	0OL04	0OL06
PB	1, 1, - -	1, 2, 2, 1	1, 1, 1, 1
SU	1, 1 - -	- - - -	- 1, 1, 1
GP	- - 1 -	- - 1 -	1, 1 - 1
GV	- - 2 -	1, 1, 2, 2	1, 1, 1, 1
L.	1, 1 - -	- 1 - 1	1, 1, 1, 1
BW	1, 1, 1 -	- 2, 1, 1	1, 1, 2, 1
BA	1 – 1 -	2 - - 1	1, 1, 1, 1

NOTE: numbers in sequence refer to the winters 2020/21, 2019/20, 2018/19, and 2011/12. '-' means that a species was not recorded in subsite.

Key roost sites and/or foraging flocks of the waterbird SCI species of Ballyteigue Burrow SPA and other species are shown in Figures 4.8.1 to 4.8.7.

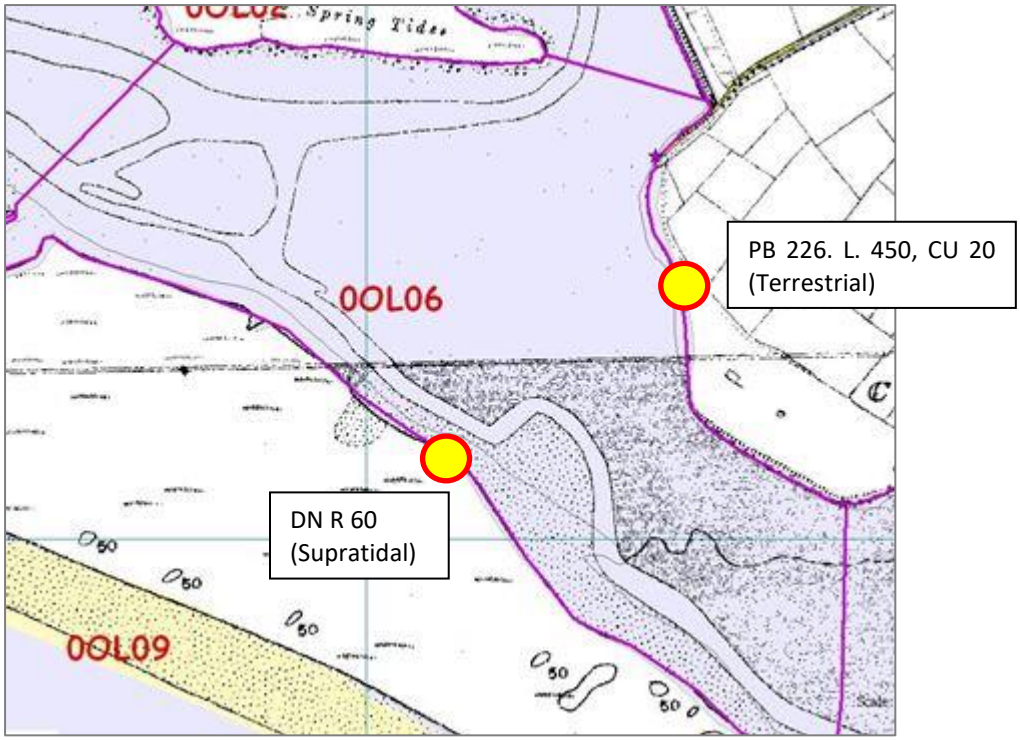

Figure 4.8.1: Key high tide roots roosts January 2019.

(CU Curlew, DN Dunlin, L. Lapwing, PB Light-bellied Brent Goose).

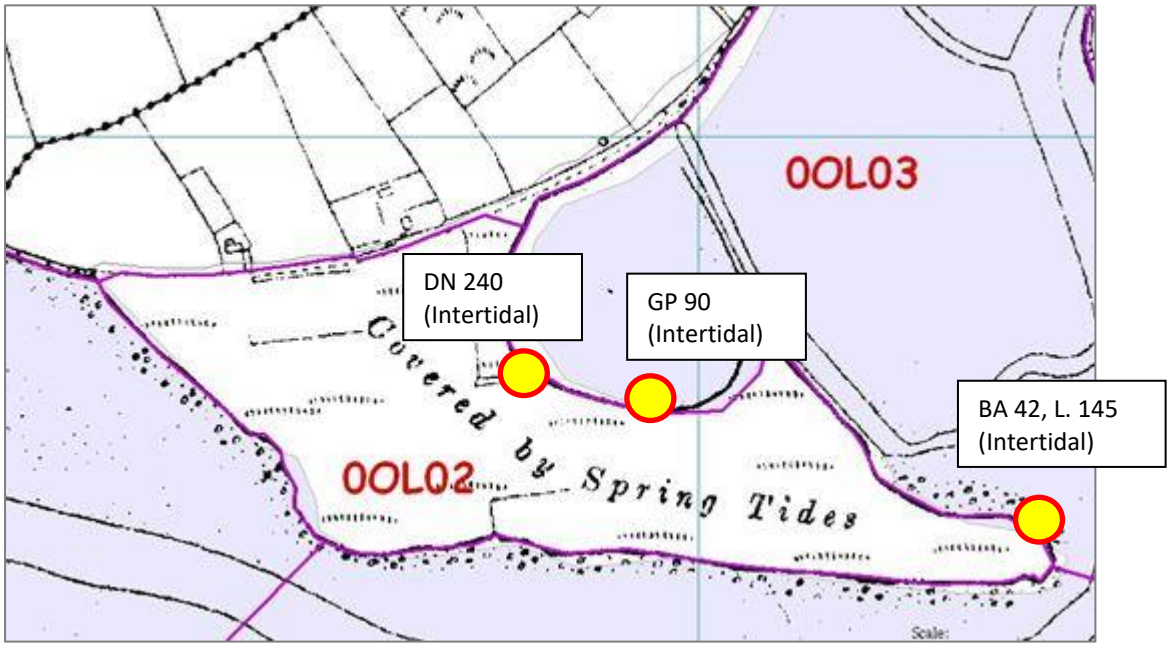

Figure 4.8.2: Key high tide roots roosts January 2020.

(BA Bar-tailed Godwit, DN Dunlin, GP Golden Plover, L. Lapwing)

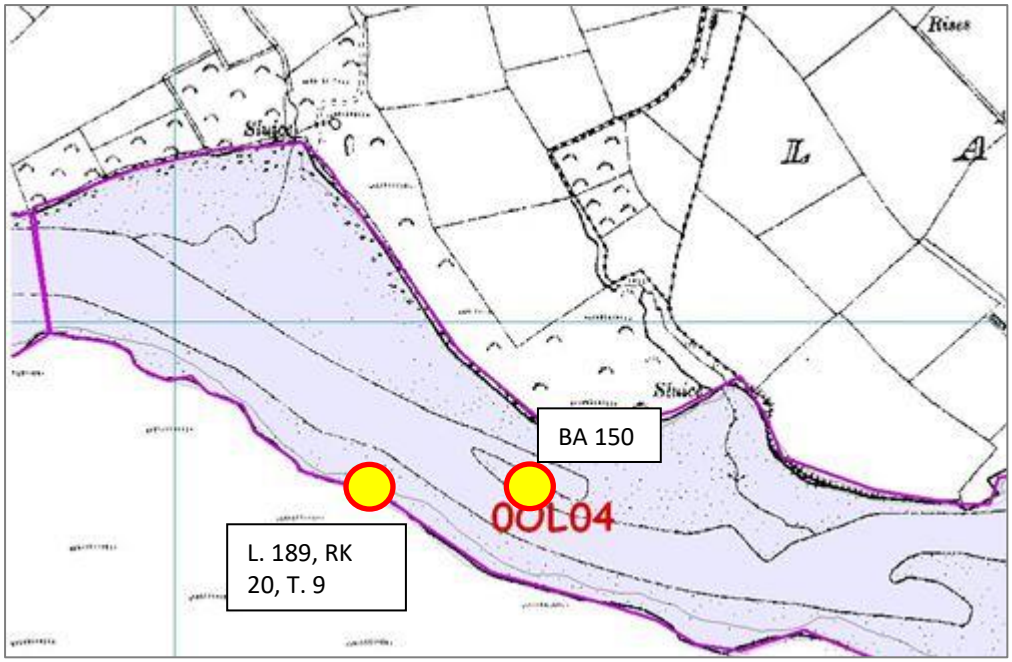

Figure 4.8.3: Key high tide roots roosts January 2020.

(BA Bar-tailed Godwit, L. Lapwing, RK Redshank, T. Teal)

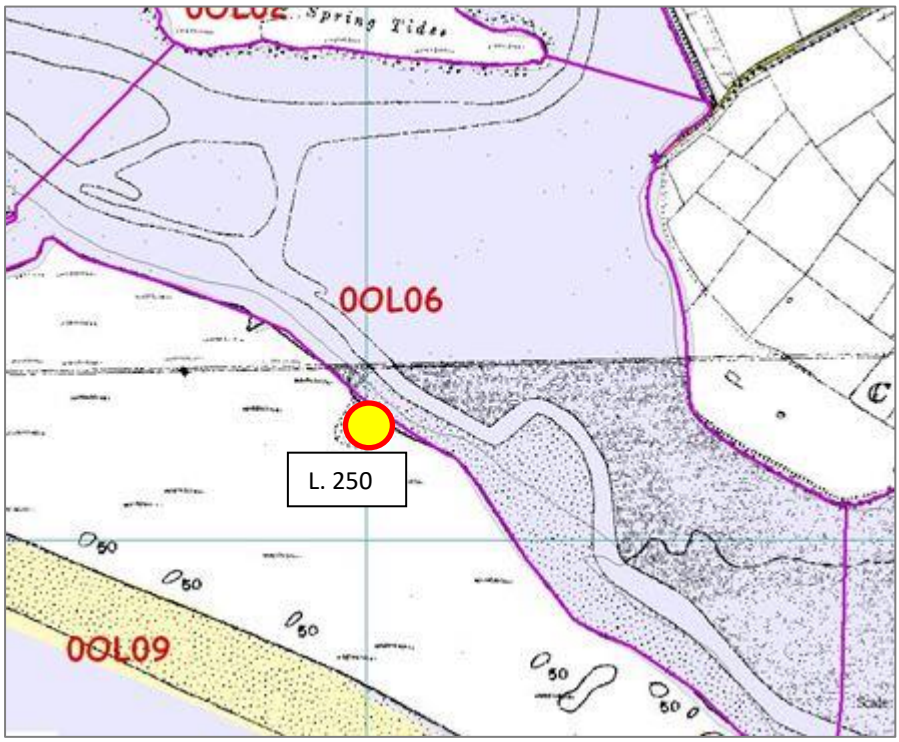

Figure 4.8.4: Key high tide roots roosts January 2020. (L. Lapwing)

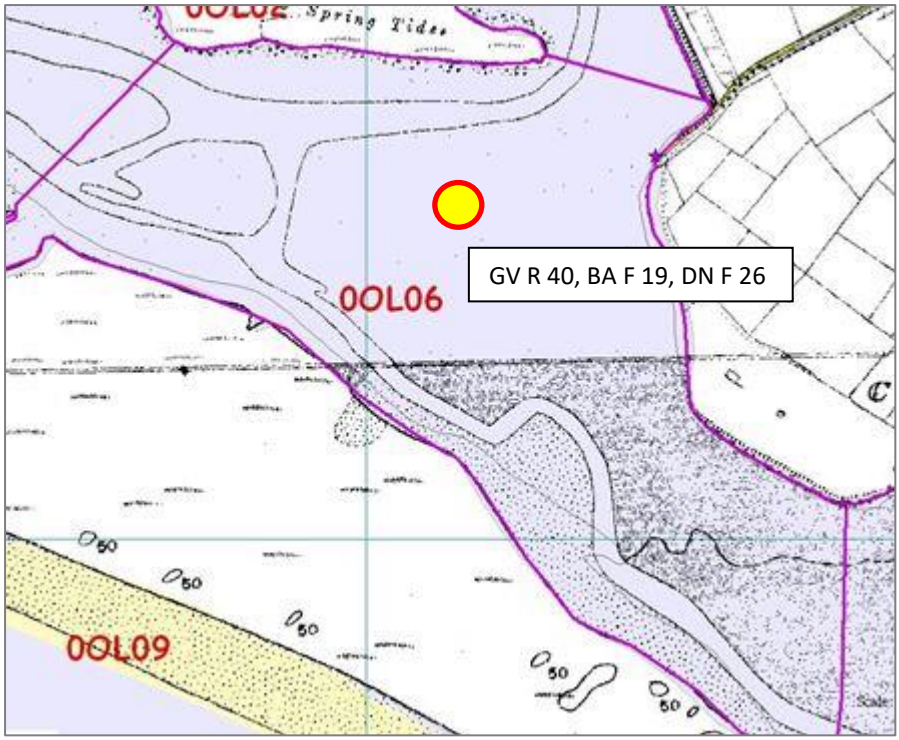

Figure 4.8.5: Key high tide roots roosts and foraging flocks January 2021.

(BA Bar-tailed Godwit, DN Dunlin, GV Grey Plover, F = Forage, R = Roost).

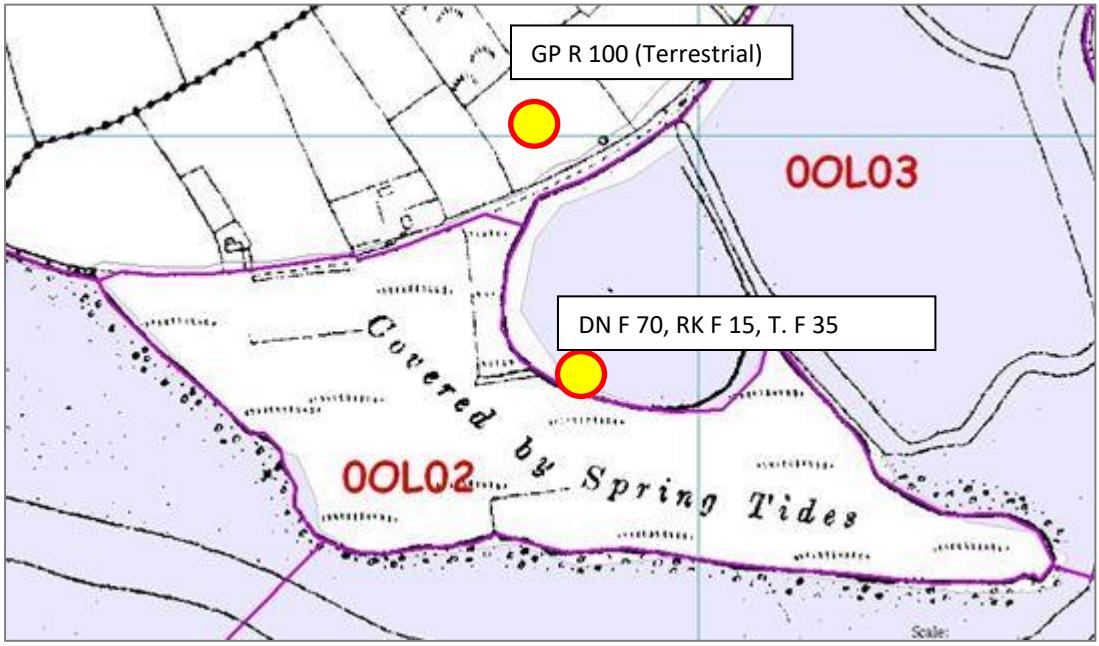

Figure 4.8.6: Key high tide roots roosts and foraging flocks January 2021.

(DN Dunlin, GP Golden Plover, RK Redshank, T. Teal, F = Forage, R = Roost).

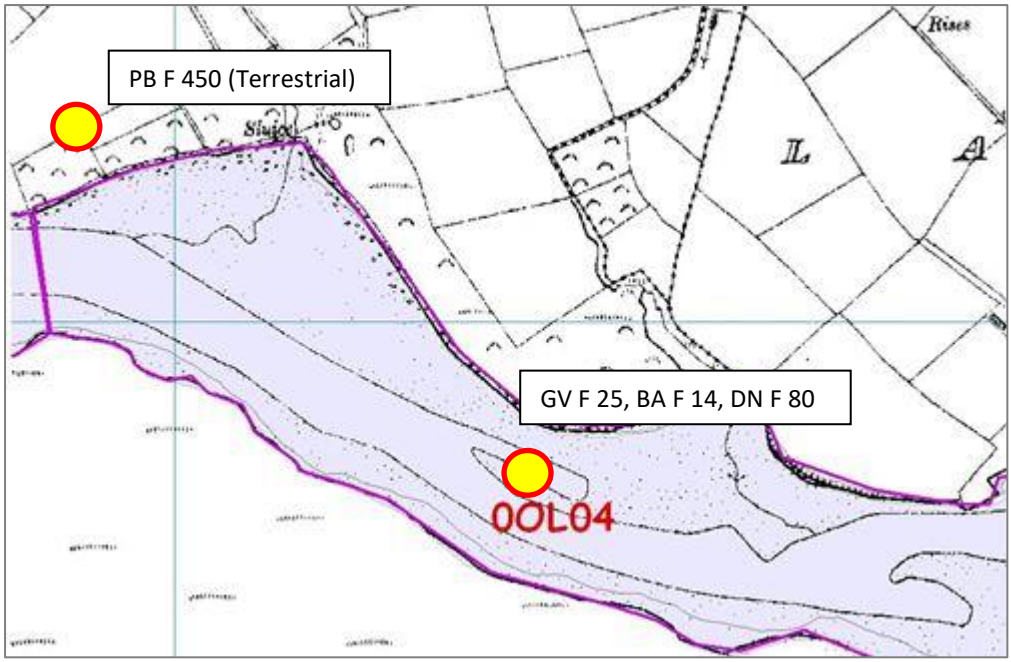

Figure 4.8.7: Key high tide roots roosts and foraging flocks January 2021.

(BA Bar-tailed Godwit, DN Dunlin, GV Grey Plover, PB Light-bellied Brent Goose,, F = Forage, R = Roost).

4.9 Waterbird distribution and status – species summaries

The following species accounts examines the low tide distribution of waterbird SCI species within the study area during winters 2018/19, 2019/20 and 2020/21 and assesses patterns in light of the baseline NPWS winter survey of 2011/12 (NPWS Waterbird Survey Programme). Species status and trends are assessed in light of those at national and international level.

4.9.1 Light-bellied Brent Goose

During the baseline data period used for SPA designation, Light-bellied Brent Goose occurred in numbers of international importance across Ballyteigue Bay SPA. It is notable therefore, that numbers of international importance occurred within the area covered by the three subsites (0OL02, 0OL04, 0OL06) used during the current winter surveys, a much smaller area than the entire SPA. While peak counts within the study area in recent years exceed those of 2011/12, numbers appear to have dropped slightly in recent winters, consistent with the national trend over five- and ten-years (Lewis *et al.* 2019).

Of the three subsites, numbers of geese have been consistently higher in 0OL06 (Blackstone) during low tide surveys in recent winters, although it is clear that all three subsites can support peak numbers on occasion. Across the entire SPA site, numbers were ranked as 'very high' in the low tide surveys of 2011/12 (NPWS, 2014b), so recent results are consistent with these earlier findings.

4.9.2 Shelduck

During the baseline data period used for SPA designation, Shelduck occurred in numbers of national importance across Ballyteigue Bay SPA. Peak counts from the three recent winter surveys and from winter 2011/12 show very low numbers within the study area however, and also within the entire SPA. The site trend from I-WeBS data is also for decline although numbers recorded during I-WeBS (2014/15 – 2018/19) far exceed (*c*.40 individuals) those recorded during recent low tide surveys. The species is also in decline nationally over five, ten and 22 years (Lewis *et al.*, 2019), while the species trend is stable at flyway level (Wetlands International, 2017). Shelduck are now amber-listed (moderate conservation concern) as a wintering species (Gilbert *et al.,* 2021).

Peak numbers of Shelduck were recorded within 0OL02 (Duncormick Marsh) and 0OL06 (Blackstone), numbers generally higher in the latter. Of the three subsites surveyed across the three recent winter, only one subsite (0OL06) supported the species during winter 2011/12 (NPWS, 2014b). Numbers were particularly low during high tide surveys, and the species was not present at all during the high tide survey of 2019/20.

4.9.3 Golden Plover

During winter, Golden Plovers are attracted to winter cereals, stubbles, fallows, harvest-fields and closed-grazed pastures, with the use of intertidal habitats restricted to roosting behaviour at low tide (Béchet, 2006). Wintering Golden Plovers are site faithful but individual roosting and foraging sites within the sites have the potential to differ within and between years (Wernham *et al*., 2002).

Numbers of Golden Plover within the study area have varied greatly over the recent winters, but a peak count of 1,000 individuals during winter 2018/19 suggest good numbers can still occur at the site. Indeed, numbers across the entire SPA during winter still exceed 2,500 individuals within I-WeBS counts. Perhaps the species is recorded more from the terrestrial parts of the SPA, than from the three intertidal subsites counted during the recent three winters. The 2011/12 winter survey also found that an inner estuary subsite was also important (not counted within the recent winters). Over the long-term however, and since Ballyteigue Burrow was designated as a SPA, whole site numbers do appear to have declined. Nationally, Golden Plover numbers have been in decline over the long-term (Lewis *et al.*, 2019) while at flyway level the trend is uncertain (stable/decline?) (Wetlands International,,2017). Golden Plover are red-listed as both a breeding and wintering species (Gilbert *et al.,* 2021).

Within recent winter surveys, Golden Plover have appeared to favour subsite 0OL06 (Blackstone) over 0OL02 or 0OL04. This is consistent with the results from the winter 2011/12 survey (NPWS, 2014b).

4.9.4 Grey Plover

Peak counts of Grey Plover within the study area have exceeded the threshold for national importance in all three recent winters and during the winter of 2011/12. Numbers across the study area therefore appear to be stable, and they also appear stable across the entire SPA when comparing recent five-year mean peak numbers with those from the baseline period (mid 1990's). This contrasts to the national trend; nationally, the species has been in decline over the long-term (Lewis *et al.*, 2019) while

the flyway trend is also for decline (Wetlands International, 2017). As a consequence, Grey Plover is now red-listed as a wintering species (Gilbert *et al.*, 2021).

Although peak numbers were recorded in all three subsites, 0OL06 (Blackstone) appeared to be favoured by Grey Plover during low tide. Of the three subsites, 0OL06 is the only one to have been ranked as 'very high' during winter 2011/12 (NPWS, 2014b) therefore the observed species distribution is consistent with these earlier results, a decade later.

4.9.5 Lapwing

Like Golden Plover, Lapwings are generally known to forage terrestrially and use intertidal flats as safe roosting habitat during periods of low tide. Numbers of Lapwing have declined within the study area and in the entire SPA site over time. Nationally, the species has been in decline over the long-term (Lewis *et al.*, 2019) while the flyway trend is also for decline (Wetlands International, 2017). The Lapwing is red-listed as a breeding and wintering species (Gilbert *et al.*, 2021).

Although peak numbers were recorded on occasion in any of the three subsites over the course of the three winters of survey, 0OL06 (Blackstone) appeared to be favoured by Lapwings during low tide. This subsite supported numbers ranked as 'high' during the winter of 2011/12 (NPWS, 2014b).

4.9.6 Black-tailed Godwit

While numbers of national importance were recorded within the study area during winter 2018/19, since then peak numbers have been much lower with a trend hard to determine. However, at whole site (SPA) level, numbers of Black-tailed Godwits appear to be in decline based on data from I-WeBS. Nationally, Black-tailed Godwits are one of only a few wading bird species showing a trend for increasing numbers (Lewis *et al.*, 2019).

Black-tailed Godwits occurred across all three subsites with regularity and all three held peak numbers on occasion during low tide. Numbers can be highly variable but there is some pattern for larger numbers within 0OL02 (Duncormick Marsh). This subsite did not support the species during winter 2011/12 survey, but peak numbers were held by the adjacent inner subsite (0OL03) which was not counted during the current surveys.

4.9.7 Bar-tailed Godwit

Numbers of Bar-tailed Godwit across the time period 2011/12 – current appear to be stable. However, at whole site level, numbers appear to be in decline based on I-WeBS data. This is consistent with a short-term (5-year) decline now evident nationally (Lewis *et al.* 2019). Bar-tailed Godwits are now red-listed as a wintering species (Gilbert *et al.*, 2021).

Bar-tailed Godwits occurred across all three subsites with regularity and all three held peak low tide numbers on occasion. Numbers were highly variable but there was some pattern for larger numbers within 0OL02 (Duncormick Marsh). This subsite did not support the species during winter 2011/12 (NPWS, 2014b).

4.9 Activities and disturbance across the study area

4.9.1 Survey Programme

Each activity within the study area was recorded separately and over the course of the three winters of 2018/19, 2019/20 and 2021, some 15 individual count days, a total of 20 activity events was recorded (Table 4.9.1). Events were most frequent in 0OL06 (Blackstone), followed by 0OL04 (Lacken), and infrequent (one only) in 0OLO2 (Duncormick Marsh) (Figure 4.9.1).

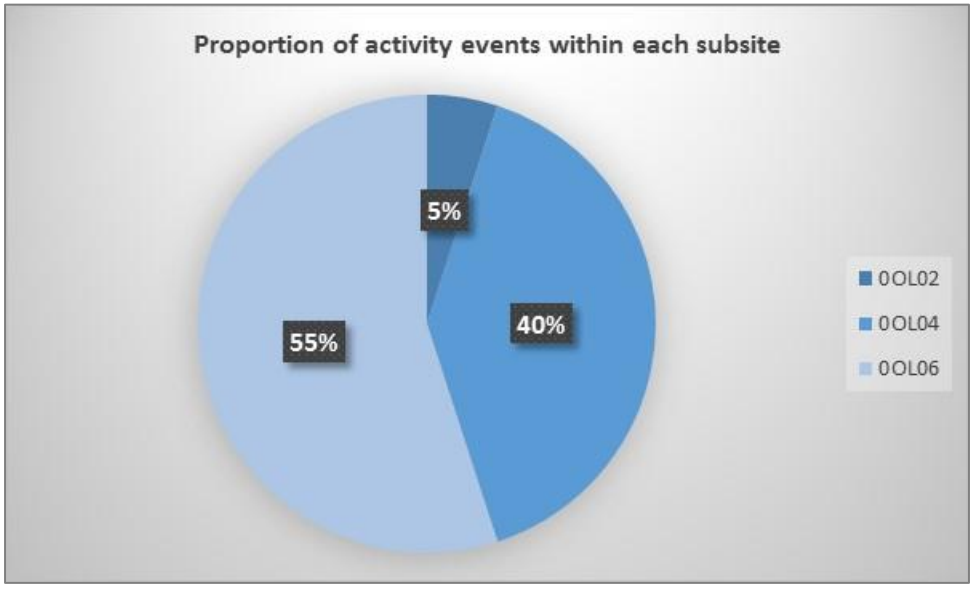

Figure 4.9.1: Proportion of recorded activity events within each of the three count subsites.

Table 4.9.1: Summary of activities

Subsite	Winter	Activity Type	Number of events	Disturbance caused?
0OL02	2018/19	Horse riding	1	Yes
0OL04	2018/19	Person on shoreline	1	Yes
	2020/21	Person on shoreline	1	Yes
	2018/19	Horse riding	1	Yes
	2018/19	Dogs	1	Yes
	2020/21	Dogs	1	Yes
	2018/19	Vehicles	1	Yes
	2019/20	Aquaculture machinery	1	Yes
	2020/21	Bird-scarers, nearby field	1	Yes
0OL06	2018/19	Person on shoreline	2	Yes
	2019/20	Person on shoreline	2	Yes
	2018/19	Dogs	1	Yes
	2019/20	Dogs	2	Yes
	2018/19	Vehicles	1	Yes
	2018/19	Aquaculture machinery	2	Yes
	2018/19	Other	1	Yes

4.9.2 Disturbance study

The disturbance study, undertaken on 25th November 2018, was completed between the hours of 10am and 4pm (Table 4.9.2.1), spanning four hours before low tide and two hours after low tide.

Intertidal aquaculture (oyster bags and trestles) occurs within subsite 0OL04. Throughout the study however, no activities or disturbance events related to aquaculture were recorded.

Table 4.9.2.1: Summary of disturbance study count times

Hour	Time	Tide
1	10.00 – 11.00	HT+3
2	11.00 – 12.00	LT-3
3	12.00 – 13.00	LT-2
4	13.00 – 14.00	LT-1
5	14.00 – 15.00	LT+1
6	15.00 – 16.00	LT+2

The number of waterbirds within 0OL02 was largest as the study commenced (659 individuals), dropping in number within the first two hours but then rising during the hour before low tide (LT-1) (Figure 4.9.2.1). An activity occurred during the hour LT-2, but this did not cause an observed response from waterbirds.

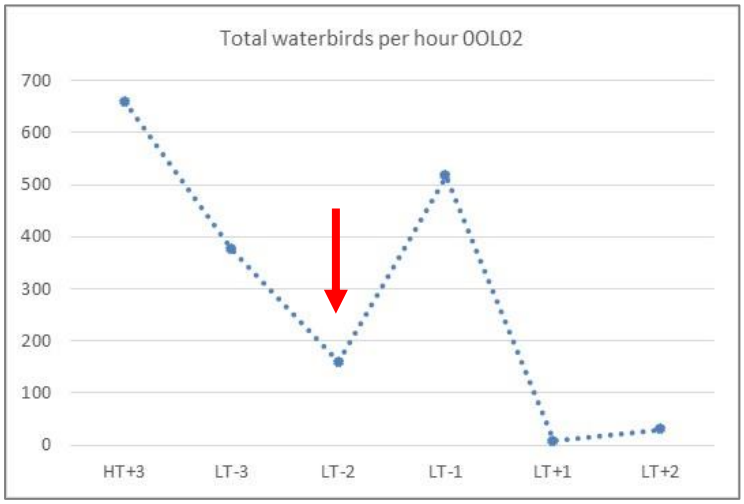

Figure 4.9.2.1: Total waterbirds per hour – 0OL02. Red arrow indicates the hour that a disturbance event was recorded.

Waterbird numbers were low within 0OL04 throughout the six-hour study period, peaking at 35 waterbirds during the hour after low tide (Figure 4.9.2.2). Activities that caused disturbance were recorded in the hour before and after low tide; these activities being sea anglers and a vehicle that drove along the shoreline. These activities caused Light-bellied Brent Goose, Oystercatcher and Redshank to move within the subsite, but as Figure 4.9.2.2 shows, numbers of birds within the subsite did not drop.

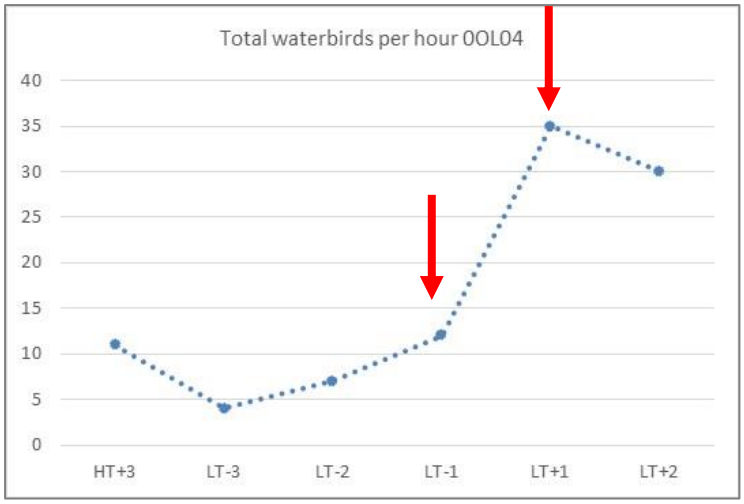

Figure 4.9.2.2: Total waterbirds per hour – 0OL04. Red arrows indicate the hour that a disturbance event was recorded.

Waterbird numbers were relatively low within 0OL06 throughout the six-hour study period but peaked at two hours before low tide (1,824 birds) largely made up of a flock of Lapwing (1,200 individuals). Recorded activities (people and dogs on shoreline, sea anglers and vehicles on shoreline) did not cause waterbirds to leave the subsite as the activity was recorded, but as Figure 4.9.2.3 shows, numbers were much lower in the corresponding hourly counts, due largely to the fact that the Lapwing flew out of the subsite.

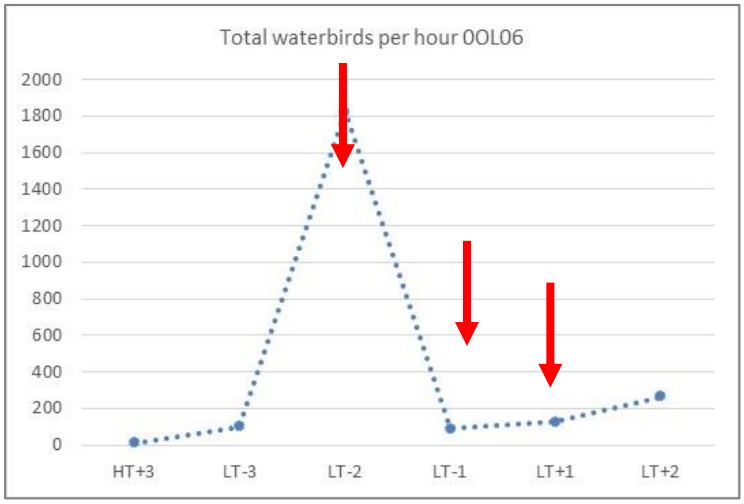

Figure 4.9.2.3: Total waterbirds per hour – 0OL06. Red arrows indicate the hour that a disturbance event was recorded.

As noted above, no activities or disturbance events related to aquaculture were recorded during this one-day study. From the results, the main forms of disturbance originated from people walking with dogs along the shoreline, and vehicles. It is interesting to note that the *Ballyteigue Burrow SPA Conservation Objectives Supporting Document*, shows these two forms of activity to be the most predominant form of activity at the site.

5 DISCUSSION

The recent three winters of low and high tide surveys are, to our knowledge, the first such surveys undertaken since the winter of 2011/12 when NPWS undertook the Waterbird Survey Programme. A decade on, it is therefore timely that a comparison be made between the results of these surveys. On the whole, the distribution of waterbird species between the three subsites remained relatively consistent with that recorded during the winter surveys of 2011/12. This goes to show a good degree of subsite faithfulness, and also highlights that waterbirds' patterns of distribution are not random, rather species distribute for a reason, be it food resources or other factors such as shelter from prevailing winds or protection from predators.

Numbers of several species across the past decade appear stable including Light-bellied Brent Goose, Wigeon, Teal, Oystercatcher and Grey Plover, the latter a species known to be in decline nationally. Numbers of Black-tailed Godwit, Bar-tailed Godwit and Curlew also appear to be stable across this time period. Numbers of Lapwing, Knot and Dunlin however, appear to have declined; all species known to be in decline nationally. Shelduck is perhaps most notable, listed as a waterbird SCI for Ballyteigue Burrow SPA with once numbers of national importance, this species now occurs in very low numbers. Comparing data over a longer period of time, recent I-WeBS data with baseline data from SPA designation, reveals that only Knot and Light-bellied Brent Goose appear to be stable in numbers across Ballyteigue Burrow SPA. I-WeBS data also indicate declines for site populations of Shelduck, Golden Plover, Lapwing, Black- and Bar-tailed Godwits.

Updated waterbird population estimates for Ireland were published in 2018. These quantified the loss of 40% of wintering waterbirds in Ireland over the past nearly 20 years (Burke *et al.*, 2018). Such large declines nationally obviously have implications for numbers at individual sites, but conversely, declines at individual sites across the country will have driven the observed national trends. While the impacts of climate change are now evident, with some waterbirds simply not migrating as far as Ireland for winter, site-level factors no doubt have, and continue to contribute to such observed trends, especially when various activities and human use of wetland sites are considered in a cumulative way. How such declines can be addressed and/or reversed is not known. With regard to Shelduck, this species is not a long-distance migrant, therefore effects of climate change on migration strategies should not be affecting this species as much as long distance migrants such as many wading birds. The species is, however, known to be highly dependent on prey resources and in particular the Mud snail *Hydrobia ulvae,* so any effects of climate change upon the prey base, could impact this duck. The species is also a resident breeding bird so increased pressures for example recreational disturbance during spring and summer, could also be driving the declines.

Waterbird population trends in Ballyteigue Bay are clearly complex, with some species increasing, some stable and some in decline; this echoes the national data of complex trends in this group of species. The drivers for population change are not fully known or understood, but may occur at global (e.g. climate change), regional (run-off/pollution from domestic, agriculture or industrial sources) or site-based levels (e.g. recreational disturbance). Benthic data for the site are now old and out-of-date, and the distribution and abundance of benthic macroinvertebrates, critical to the over-winter survival of waterbirds, may also be experiencing pressures from a variety of sources, including climate change.

Based upon the Appropriate Assessment (AA) of Aquaculture at Ballyteigue Bay (Gittings *et al.*, 2019), the patterns of aquaculture at the site is not fully known. Based on aerial imagery, aquaculture has been in pace since the mid-1990s, and local producers state they have been active on the site since

the mid-1980s. Production levels have fluctuated since this time, with the AA (Gittings *et al.*, 2019) noting "*Production data received indicates an increase in production from 2008 to 2013, with a slight decrease after 2015*".

Based upon the data reported here, Shelduck would be the principal species of conservation concern at Ballyteigue due to the declines observed. However, in the AA (Gittings *et al.*, 2019) it was concluded that impacts to Shelduck from aquaculture activities were not likely to be significant.

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APPENDIX I: BALLYTEIGUE BURROW SPA SITE SYNOPSIS

SITE NAME: BALLYTEIGE BURROW SPA

SITE CODE: 004020

This site is located on the south coast of Co. Wexford between the towns of Kilmore Quay and Cullenstown. It comprises a sand and shingle barrier beach, approximately 8 km in length, and the estuary of the Duncormick River. The extensive overlying sand spit is known as the Burrow, while the estuary that it encloses is known as the Cull.

The site has a range of coastal habitats, including various types of sand dunes, salt meadows, and intertidal sand and mud flats. Former estuarine areas adjacent to the site have been reclaimed as polders and are intensively managed for agriculture. The dune system includes embryonic shifting dunes and Marram (*Ammophila arenaria*) dunes along the seaward side with more stable fixed dunes and dune heath inland. Typically, plants such as Marram, Portland Spurge (*Euphorbia portlandica*) and Seaholly (*Eryngium maritimum*) are common on the seaward dunes. The fixed dunes are well-developed and species-rich and include species such as Common Restharrow (*Ononis repens*), Wild Pansy (*Viola tricolor* subsp*. curtisii*), Common Centaury (*Centaurium erythraea*), Wild Thyme (*Thymus praecox*) and Red Fescue (*Festuca rubra*). In places, scrub is encroaching and Bracken (*Pteridium aquilinum*) and Burnet Rose (*Rosa pimpinellifolia*) are common. The dune heath element is typified by Bracken and Gorse (*Ulex europaeus*).

Saltmarsh vegetation fringes The Cull, with such species as Sea Aster (*Aster tripolium*), Sea Arrowgrass (*Triglochin maritima*), Sea Lavender (*Limonium humile*) and Glasswort (*Salicornia* spp.). Part of the saltmarsh complex contains halophilous scrub vegetation, a very rare habitat in Ireland. The estuary empties almost entirely on most tides, apart from the main central channel. Sediments vary from muds in the innermost areas, especially towards Duncormick, to sands elsewhere. In addition to the Duncormick River, the estuary receives the flow from a network of canals which drain the extensive polders to the east and north-east of the site. Water quality of the inflowing freshwater is moderate to poor.

The principal ornithological importance of Ballyteige Burrow SPA is wintering waterfowl, with an internationally important population of Brent Goose (290, average maximum in the five winters 1995/96-1999/00). It also supports nationally important numbers of Shelduck (167), Ringed Plover (133), Golden Plover (4,630), Lapwing (7,808), Black-tailed Godwit (474) and Bar-tailed Godwit (582). A range of other species occurs in numbers of regional importance including Wigeon (306), Grey Plover (69), Dunlin (1,020) and Redshank (206). Both the Golden Plover and Bar-tailed Godwit populations represent just over 3% of the respective national totals, while the Lapwing population is almost 4% of the total. The estuarine habitats provide feeding and roosting areas for the waterfowl species, though a lot of the birds also feed on the intensively managed lands of the adjacent polders. Cullenstown Strand has a small colony of breeding Little Tern, though nesting may not occur in every year.

The site is host to a range of rare Red Data Book plant species, including Wild Asparagus (*Asparagus officinalis*), Borrer's Saltmarsh-grass (*Puccinellia fasciculata*), Perennial Glasswort (*Arthrocnemum perenne*) and Lesser Centaury (*Centaurium pulchellum*), and is the only Irish site for the protected (Flora (Protection) Order, 1999) lichen *Fulgensia fulgens*. The invertebrate fauna of the site includes a number of scarce species, examples being the bumble bees *Bombus distinguendus* and *B. sylvarum*, the jewel wasp *Hedychridium ardens* and the ant *Tetramorium caespitum*.

This coastal site is of high ecological value for its range of good quality coastal habitats, several being listed on Annex I of the E.U. Habitats Directive. It is a major site for wintering waterfowl, with an internationally important population of Brent Goose and a further six species with populations of national importance. Of particular note is that two of the species, Golden Plover and Bar-tailed Godwit, are listed on Annex I of the E.U. Birds Directive. Little Tern is also listed on Annex I of this Directive. Most of the site is designated as a Nature Reserve.

16.2.2004