Uisce Éireann
Bosca OP 6000
Baile Átha Cliath 1
Éire

Irish Water
PO Box 6000
Dublin 1
Ireland

T: +353 1 89 25000
F: +353 1 89 25001
www.water.ie

Éimer Godsil
Office of Climate, Licensing & Resource Use
Environmental Protection Agency
Inniscarra
Co. Cork.

30th March 2015

IW-ER-LT0222

RE: Ballyliffen Waste Water Discharge Licence Application D0-01

Dear Éimer Godsil,

In response to the Regulation 18(3)(b) request for further information notice dated the 5th February 2015, please see below relevant information.

You are thereby required to submit a Natura Impact Statement as defined in Regulation 2(1) of the European Communities (Birds and Natural Habitats) Regulations (S.I. No. 477 of 2011).

Please see the attached Appropriate Assessment (Natura Impact Statement) report for the Ballyliffen agglomeration as requested. The report concluded that the Ballyliffen WwTP discharge, alone or in-combination with other plans and / or projects will not give rise to significant effects on the integrity of North Inishowen Coast SAC and Trawbreaga Bay SPA, as long as the recommended mitigation measure of installing an appropriate waste water treatment process at Ballyliffen to ensure that the discharge complies with the Urban Waste Water Treatment Regulations is implemented.

Best Regards,

Gerry Galvin
Chief Technical Advisor

Irish Water Report

Natura Impact Statement as part of the Ballyliffen Waste Water Discharge Licence Application: D0351-01

Contents

Introduction

This Natura Impact Statement provides an Appropriate Assessment (AA) of the existing Waste Water Treatment Plant (WwTP), located at Ballyliffen, County Donegal, for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007), as amended. It assesses whether the on-going operation of the plant, alone or in combination with other plans and projects, is likely to have significant effects on a European Site(s) in view of best scientific knowledge and the conservation objectives of the site(s). European Sites are those identified as sites of European Community importance designated as Special Areas of Conservation under the Habitats Directive or as Special Protection Areas under the Birds Directive.

This report follows the guidance for AA published by the Environmental Protection Agency's (EPA) '*Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007)*' (EPA, 2009); and takes account of the Department of the Environment, Heritage and Local Government's guidelines '*Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities*' (DoEHLG, 2009) and Circular L8/08 '*Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments*' (DoEHLG, 2008).

The field survey and report was completed by a qualified ecologist, and full member of the CIEEM, working for Tobins Consulting Engineers on behalf of Irish Water.

Legislative Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as "The Habitats Directive", provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/ECC) as codified by Directive 2009/147/EC.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment (AA):

> *Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*

Article 6(4) states:

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

Methodology

Guidance Followed

Both EU and national guidance exists in relation to Member States fulfilling their requirements under the EU Habitats Directive, with particular reference to Article 6(3) and 6(4) of that Directive. The methodology followed in relation to this AA has had regard to the following guidance:

- Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007). Environmental Protection Agency, (EPA, 2009).
- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of Environment, Heritage and Local Government, (DoEHLG, 2010).
- Circular L8/08 – Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments. Department of Environment, Heritage and Local Government, (DoEHLG, 2008).
- Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg, (EC, 2000a).
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg, (EC, 2000b).
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels (EC, 2001).
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission. Office for Official Publications of the European Communities, Luxembourg, (EC, 2007).
- Nature and biodiversity cases: Ruling of the European Court of Justice. Office for Official Publications of the European Communities, Luxembourg (EC, 2006).
- Marine Natura Impact Statements in Irish Special Areas of Conservation: A working document, National Parks and Wildlife Service, Dublin (NPWS, 2012).
- European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No.477 of 2011).
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013).

Stages Involved in the Appropriate Assessment Process

Stage 1: Screening / Test of Significance
This process identifies whether the WwTP discharge is directly connected to or necessary for the management of a European Site(s); and identifies whether the discharge is likely to have significant impacts upon a European Site(s) either alone or in combination with other projects or plans.

The output from this stage is a determination for each European Site(s) of not significant, significant, potentially significant, or uncertain effects. The latter three determinations will cause that site to be brought forward to Stage 2.

Stage 2: Appropriate Assessment
This stage considers the impact of the WwTP discharge on the integrity of a European Site(s), either alone or in combination with other projects or plans, with respect to (1) the site's conservation objectives; and (2) the site's structure and function and its overall integrity. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts

The output from this stage is a Natura Impact Statement (NIS). This document must include sufficient information for the EPA to carry out the appropriate assessment. If the assessment is negative, i.e. adverse effects on the integrity of a site cannot be excluded, then the process must consider alternatives (Stage 3) or proceed to Stage 4.

Stage 3: Assessment of Alternatives
This process examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European Site. This assessment may be carried out concurrently with Stage 2 in order to find the most appropriate solution. If no alternatives exist or all alternatives would result in negative impacts to the integrity of the European sites then the process either moves to Stage 4 or the project is abandoned.

Stage 4: Assessment Where Adverse Impacts Remain
An assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

Field Walkover Surveys
Field walkover surveys were undertaken on the 11th of March 2015 to identify the potential for qualifying species and habitats in the surrounding environs of the WwTP discharge.

Consultation
The EPA, as the competent authority, will seek NPWS advice as may be required in reaching their decision on a WwTP discharge. The NPWS can only communicate with the applicant (i.e. Irish Water) on request from the competent authority, when the formal application process to the competent authority has already commenced.

Inland Fisheries Ireland (IFI) Ballyshannon division were contacted requesting any information that might be relevant to this NIS however no response was received.

Stage 1: Screening

Screening for Appropriate Assessment was undertaken by the Environmental Protection Agency who determined that an Appropriate Assessment of the existing discharge from the Ballyliffen WwTP is required due to the potential adverse impact on the qualifying interests of the North Inishowen Coast SAC and Trawbreaga Bay SPA. This determination was based on the following:

- The quality of the effluent discharged from the agglomeration;
- The limited capacity of the receiving water to assimilate the primary discharge;and
- The proximity (<500m) of the primary discharges to the North Inishowen Coast SAC.

Therefore, applying the Precautionary Principle and in accordance with Article 6(3) of the Habitats Directive, the current WwTP discharge at Ballyliffen will be brought forward for a Stage 2 Appropriate Assessment.

Stage 2: Appropriate Assessment

North Inishowen Coast SAC and Trawbreaga Bay SPA, which have been determined as requiring AA, are described and all the potential impacts resulting from the Ballyliffen WwTP discharge are discussed in relation to the conservation objectives of these designated sites.

Description of the Project

Ballyliffen is a small village located in the north west of the Inishown Peninsula. Ballyliffen Waste Water Treatment plant was installed in 1972 to serve a population equivalent of 400.

Data provided by Irish Water indicates that the current population equivalent for the agglomeration is 553p.e. and the estimated 2021 load will be 557p.e. Based on a loading of 225l/pp/day the dry weather flow for the current discharge is calculated at 0.00144m^3/sec, with the 2021 dry weather flow calculated at 0.00145m^3/sec. The 95-percentile flow for the receiving river into which the WwTP discharges as obtained from the WWDL Application Documentation (no EPA hydrometric gauge data) is 0.0006m^3/sec.

The Main elements of the WWTP are:

1. Intake Works – The inlet works comprises a vertical (manually cleaned) bar screen in a concrete gravity flow chamber. Manual sampling of the intake takes place at this point. There is also a storm water overflow at this location discharging into the near by unnamed stream (Grid Ref. 238718 448794).
2. Secondary Treatment unit – this incorporates an activated sludge compartment followed by a settlement compartment. Compressed air is blown into the activated sludge compartment through a pipe manifold with submerged terminals. The air blowers are mounted directly above the activated sludge compartment. The overall plan dimensions of the secondary treatment units are 8.1mx6.1m.
3. Clarification – The unit comprises a square bottomed vertical flow clarifer with a suspended pea gravel medium through which the liquid flows upwards to the surface. The surface plan dimensions are 2.74mx2.74m.
4. Outlet Chamber – Treated effluent from the clarifer is piped to an outlet chamber, where it flows over a V-notch plate. Effluent flows by gravity from the outlet chamber to the receiving water.
5. Sludge handling and treatment – There are four over ground sludge beds. The gross plan area of the beds is 60m2. Sludge was formally pumped from the settlement compartment and from the clarifer to a distribution chamber above the beds. The sludge drying beds are no longer in use although the media is still in place. Sludge is now transferred to the Carndonagh waste water treatment plant.
6. Effluent Outfall – Effluent from the outlet chamber discharges to a stream flowing past the site boundary.

Sewer Network.

There is a public sewer network in Ballyliffen. The majority of the network runs by gravity to the treatment plant with the exception of a small pumped sewer line on the Carndonagh Road.

Pump Station

There is a pump station located on Carndonagh Road (Grid Ref. 238876 448373). There is no emergency overflow associated with this pump station.

Storm Water overflow

There is only one storm water overflow associated with the sewerage works. This is located at the intake to the treatment plant (Grid ref. 238742 448776) with the outlet entering the aquatic environment at location 238718 448794.

Effluent data from 2013 and 2014 is presented in Table 1.0 together with Urban Wastewater Treatment Regulations (UWWT) limit values. Exceedances are highlighted in bold.

Table 1.0: Ballyliffen WwTP Monitoring Data (mg/l)

Date	pH	Conductivity	BOD mg/l O2	COD mg/l O2	SS mg/l	Ammonia	Orthophosphate	Total Nitrogen	Total Phosphorus
UWWT EQS			25	125	35			15	2
24/01/2013	7.3	415	18.7	82	35	6.79	0.45	-	
26/03/2013	7.2	469	**63.4**	**204**	**61**	15.1	0.748	-	**2.3**
16/05/2013	6.96	371	18.84	54	25.5	NT	NT	-	-
19/07/2013	7.17	708	**124.8**	**362**	**127**	26.8	2.79	-	**5.29**
15/08/2013	6.88	471	**129.8**	**464**	26	-	-	-	-
29/09/2013	7.32	544	**44**	111	15	-	-	-	-
21/11/2013	7.37	470	19.08	87	16.5	1.66	<0.01	-	0.89
21/01/2014	7.53	486	**63.2**	**139**	**63**	8.14	0.54	-	1.33
13/03/2014	7.5	310	**35**	101	**37**	5.82	0.531	11.8	1.18
20/05/2014	7.66	551	8.4	118	27	16.9	0.454	**23.4**	**4.55**
08/07/2014	6.87	563	**153**	**477**	**166**	17.4	1.37	**24**	**2.41**
18/09/2014	7.02	663	**122.4**	**498**	**198**	15.7	1.14	**22**	**2.29**
18/11/2014	7.12	445	**73.5**	**195**	**92.5**	3.83	0.575	12.3	1.54

The effluent discharge is not in compliance with the Urban Wastewater Treatment Regulations (2001) (S.I. No. 254/2001) (Table 2.0). Exceedances for all parameters measured occur.

Description of the Receiving Environment and Monitoring Results

The discharge enters the Cloghorna stream (EPA Segment Code: 40_602) that flows eastwards from the lower eastern slops of Binnion Hill. This stream flows into the larger flatly graded Ardagh 40 stream (EPA Segment Code: 40_1000), that drains the low lying plain that lies between Doagh Island and the mainland. This larger stream flows eastwards into Trawbreaga Bay. The discharge point is 300m from the North Inishowen Coast SAC and 2.2km from Trawbreaga Bay SPA.

An unnamed 'stream' is indicated flowing northwards towards Pollan Bay from a point just downstream of where the Cloghorna joins the Ardagh stream. This area was inspected during the site visit and found to be a dry ditch with some areas of ponded water and no evidence of water flow. Given the site survey was carried out in early spring following heavy rain it is not expected that this drain would receive any regular water flow.

Ballyliffen is located in the North Western International River Basin district in Co. Donegal. This sub-basin is named Ballyliffen River (Coastal) (IE_NW_40_615). This waterbody is noted to have Poor ecological status (NWIRBD, 2010) and to be 'as risk' from WwTP's[1]. The overall status is Poor, the overall objective is to "restore" and the overall risk is "1a-at risk".

Trawbreaga Bay's designated shellfish water (S.I. No. 55 of 2009) boundary is 4.5km from the WwTP. The Marine Institute carries out ongoing shellfish monitoring for biotoxins in Trawbreaga Bay (ca. 5km east of the WwTP) with occasional low levels of some biotoxins recorded at this site[2]. Trawbreaga Bay is a 'Class B' bivalve mollusc production area and Oysters[3] indicating E.coli levels <4600 and requiring treatment of shellfish harvested.

The EPA currently class the coastal waters of Trawbreaga Bay and Pollan Bay as being 'Unpolluted'[4]. The nearest locations monitored for bathing water quality are Culdaff and Portsalon, located a significant distance away (>15km). Both these sites have been classed as 'Good' for all years sampled[5] with water quality meeting EU Guide and Mandatory values.

Monitoring data for 2013 and 2014 on the Cloghorna stream from both immediately upstream and 1.4km downstream of the discharge location (Table 2.0) demonstrates that the water quality within the stream both upstream and downstream of the WwTP was not in compliance with Schedule 5 of the European Communities Environmental Objectives (Surface Water) Regulations 2009 (S.I. No. 272 of 2009) for BOD, Orthophosphate and Ammonia. There are occasional exceedances upstream of the discharge location, and frequent exceedances downstream.

[1] http://watermaps.wfdireland.ie/NsShare_Web/Viewer.aspx?Site=NsShare&ReloadKey=True
[2] http://www.marine.ie/Home/site-area/data-services/interactive-maps/latest-shellfish-safety-data
[3] http://www.sfpa.ie/SeafoodSafety/Shellfish/ClassifiedAreas.aspx
[4] http://gis.epa.ie/Envision
[5] http://www.epa.ie/pubs/reports/water/bathing/#.VPRad42vncs

Table 2.0:Monitoring Data both Upstream and Downstream of WwTP Discharge 2013/2014

Sample ID	pH	Conductivity	BOD	SS	Ammonia	Nitrate	Nitrite	Ortho P	TN	Total P
			mg/l	mg/l	mg/l NH3	mg/l N	mg/l N	mg/l	mg/l	mg/l
SW EQS			≤2.6 (good) ≤2.2 (high)		≤0.14 (good) ≤0.090 (high)			≤0.075 (good) ≤0.045 (high)		
Upstream										
24/01/2013	7.48	280	1.39	18	-	-	-	-	-	-
26/03/2013	7.52	317	**6.33**	18.25	-	-	-	-	-	-
16/05/2013	7.58	282	0.56	5.6	-	-	-	-	-	-
19/07/2013	7.46	343	0.82	21.4	-	-	-	-	-	-
15/08/2013	7.45	171	1.97	8.8571	<0.040	0.193	<0.010	0.015	-	0.016
29/09/2013	7.56	346	0.92	6.4	-	-	-	-	-	-
21/11/2013	7.69	322	0.74	5.8	0.062	0.918	0.01	<0.01	-	<0.010
21/01/2014	7.6	336	1.96	104.4	<0.040	0.806	<0.010	0.019	-	0.049
13/03/2014	7.7	207	1	7.5	<0.040	<0.100	<0.010	<0.010	1.6	0.016
20/05/2014	7.55	399	**79**	69	**2.9**	0.4	0.371	**0.872**	8.7	1.84
08/07/2014	7.42	327	1.6	90.5	0.045	0.381	<0.010	0.045	<1	0.241
18/09/2014	7.32	320	1.25	7.2	0.08	0.59	<0.01	**0.13**	<1	0.04
18/11/2014	7.51	295	<1	<6	<0.040	0.605	<0.010	<0.010	<1	0.053
Downstream										
24/01/2013	7.35	305	**4.9**	14.5	-	-	-	-	-	-
26/03/2013	7.12	347	**16.88**	22.75	-	-	-	-	-	-
16/05/2013	7.22	294	1.74	7.2	-	-	-	-	-	-
19/07/2013	7.1	530	**22.96**	65.5	-	-	-	-	-	-
15/08/2013	6.95	230	**8.48**	3	**2.29**	<0.100	0.121	**0.182**	-	0.55
29/09/2013	7.34	345	1.04	2.6	-	-	-	-	-	-
21/11/2013	7.46	355	1.63	5.8	**2.4**	0.758	0.02	**0.092**	-	0.246
21/01/2014	7.51	376	**10.08**	130	**1.58**	0.441	0.035	**0.15**	-	0.55
13/03/2014	7.51	237	**5.4**	12.75	**1.88**	0.466	0.012	**0.139**	3.8	0.392
20/05/2014	7.36	388	**65.2**	48	**2.9**	0.401	0.373	**0.883**	8.5	1.3
08/07/2014	6.98	432	**9.8**	100	**4.28**	0.135	<0.010	**0.687**	12	1.18
18/09/2014	7	450	**17**	116	**6.91**	0.1	0.01	**0.45**	11.4	1.04
18/11/2014	7.13	328	**19.6**	31.6	**0.568**	0.576	<0.010	**0.155**	2.7	0.843

The EPA do not currently monitor the Cloghorna or Ardagh 40 streams for water quality.

A Tobins ecologist sampled two locations for biological water quality:

- The Cloghorna stream as sampled ca. 70m upstream of the WwTP discharge where it flows down a slope between a hedgerow and access track. The small stream is 0.5m wide and 0.1-0.2m deep with a rock/gravel substrate and a fast riffle-type flow. The water appeared silty and had signs of oil contamination. The invertebrate fauna was dominated by oligochaetes and the gastropod *Potamopyrgus antipodarum*, a brown deposit on the substrate was also notable. The site warrants a Q2-3 rating, which indicates it could be assigned Poor status under the Water Framework Directive, although this is considered unreliable given this small stream was in flood at the time of sampling. Adjacent habitats are pasture.

- The Ardagh 40 stream was sampled ca. 1.4km downstream of the WwTP discharge. The stream is ca. 3m wide and 0.3-0.5m deep with a stone and silt substrate. Water flow is a fast riffle and was slightly silty. Adjacent habitats are gardens and pasture fields. Reeds were present along the river margins and increase in abundance downstream towards Trawbreaga Bay. The invertebrate fauna was dominated by the mayfly nymph *Baetis rhodani* and the leech *Glossiphonia complanata*, with dipteran larvae also common. The site warranted a Q2-3 rating which indicates it could be assigned Poor status under the Water Framework Directive.

Photo 1: Ardagh 40 stream downstream of WwTP

Waste Assimilative Capacity

Table 3.0 summaries the assimilative capacity calculations which are based on the 2021 loading of 557.e., 95%ile river flow (0.0006m^3/sec) and water quality standards in the European Communities Environmental Objectives (Surface Water) Regulations, 2009 (S.I. No. 272 of 2009). Assimilative capacity calculations use both actual background concentrations (mean figures for 2013 and 2014) and the 'notionally clean river' approach.

Table 3.0: Cloghorna stream assimilative capacity calculations at estimated 2021 loadings of 557p.e. for actual background concentrations and for a notionally clean river.

Parameter		Background (mg/l)	Predicted downstream quality (mg/l)	EQS* (mg/l)
BOD	Actual Background[1]	1.628	48.041	≤2.6
	Notionally Clean	0.260	47.641	
Ammonia	Actual Background	0.373	3.749	≤0.14
	Notionally Clean	0.008	3.642	
Orthophosphate	Actual Background	1.903	8.220	≤0.075
	Notionally Clean	0.005	7.664	

*European Communities Environmental Objectives (Surface Waters) Regulations 2009, S.I. No. 272 of 2009 (95%ile standards presented for 'good' status)

Note 1: Background concentrations for BOD exclude the exceptional figure on the 20/5/2014.

Using both the actual background concentrations and the notional clean river concentrations demonstrates that the Cloghorna Stream does not have the assimilative capacity for the discharge.

The Ardagh 40 stream would appear to have a greater capacity to assimilate the discharge however no flow data was available for this watercourse.

Field Walkover Survey

The WwTP is located on the northern side of the village of Ballyliffen in a low-lying area of agricultural fields ca. 2.2km upstream of Trawbreaga Bay SPA and ca. 300m south of the habitats around Pollan Bay which form part of the North Inishowen Coast SAC.

No Annex I habitats occur in the immediate vicinity of the WwTP. At Pollan Bay ca. 500m to the north of the WwTP there is Annex I 'Machair' and 'Fixed Coastal Dune' habitats, together with the intertidal beach area ('Mudflats and sandflats not covered by seawater at low tide'). The latter habitat is also present at Trawbreaga Bay ca. 2.6km to the east of the WwTP discharge.

The Cloghorna and Ardagh 40 watercourses may provide habitat for the Annex II species otter, though no signs of this species were recorded during the site visit.

The Machair habitat is suitable foraging habitat for the Annex I bird species Chough.

Fish Stocks

Trawbreaga Bay is a Designated Shellfish Water designated under the European Communities (Quality of Shellfish Waters) Amendment Regulations (S.I. 55 of 2009). Oyster cultivation is predominant in the area, with some clam and mussel licensed areas (DoECLG, 2009). Trawbreaga Bay is known to hold good stocks of sea trout (O'Reilly, 2004).

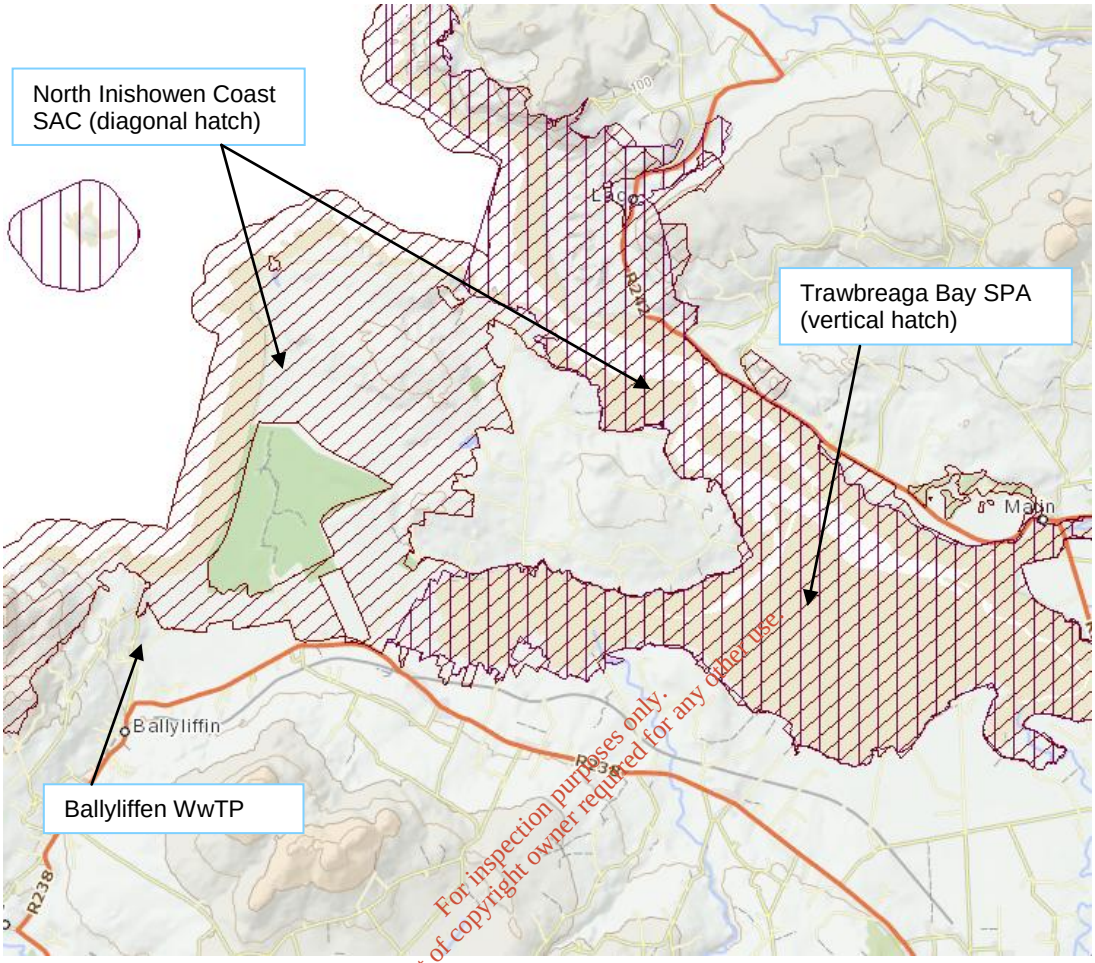

Figure 1: Site location relative to European Sites (Source: NPWS Mapviewer)

Description of the Natura 2000 Site Affected

North Inishowen Coast SAC Site Synopsis (NPWS)

The North Inishowen Coast SAC stretches from Crummies Bay in the west up to Malin Head and back down to Inishowen Head to the east. It encompasses an excellent variety of coastal habitats including high rocky cliffs, offshore islands, sand dunes, saltmarsh, a large intertidal bay, and rocky, shingle and sand beaches. There are excellent raised beaches along the east coast including the oldest and best preserved late-glacial fossil coast in Ireland (between Ineuran Bay and Esky Bay). Indeed it is the only well preserved such coast in Europe and so is of international importance. Also of geomorphological interest is the small area of stone polygons near Malin Tower.

Sea cliffs are a feature of the site, with the best examples found in the west of the site (Dunree to Leenan Head and Dunaff Head) and in the area to the north-west of Glengad Head. Cliffs are often less than 50 m in height, though they reach over 200 m at Dunaff and to the north-west of Glengad Head. The dominant rock type is quartzite which is particularly hard and unyielding. The vegetation cover of the cliffs is variable, depending on factors such as underlying geology, aspect and the degree of exposure to winds and sea spray. Common plant species of the rocky cliffs are Thrift (*Armeria maritima*), sea-spurrey (*Spergularia* spp.), Sea Aster (*Aster tripolium*), Red Fescue (*Festuca rubra*), Common Scurvygrass (*Cochlearia officinalis*), Sea Campion (*Silene vulgaris* subsp. *maritima*) and Buck's-horn Plantain (*Plantago coronopus*). In addition to the higher plants, the saxicolous lichen *Ramalina siliquosa* is a very characteristic feature of cliffs throughout the site. The cliffs contain a number of rare plant species, notably Scots Lovage (*Ligusticum scoticum*), a legally protected species. Two other scarce species recorded at the site, Moss Campion (*Silene acaulis*) and Purple Saxifrage (*Saxifraga oppositifolia*), are listed in the Red Data Book. Ivy Broomrape (*Orobanche hederae*), a locally rare species that is parasitic on Ivy (*Hedera helix*), has been recorded from sea cliffs to the north of Leenan Bay. The striking succulent species Roseroot (*Rhodiola rosea*), which is largely restricted to high mountain cliffs and sea cliffs in the west and the north of the country, is frequent throughout the site. In many parts of the site sea cliff areas support dry heath and grassland vegetation.

Shingle beaches are well represented at the site, with the best examples at Rockstown harbour/Tullagh Point and along the north-western shoreline of Malin Head promontory. These areas contain good examples of raised beaches, characterised by large mounds of shingle, which may be interspersed by low cliffs (as seen at Tullagh Point). Although the vegetation of these shingle areas is usually quite sparse, plant species such as Sea Sandwort (*Honkenya peploides*), Sea Mayweed (*Matricaria maritima*) and Curled Dock (*Rumex crispus*) are locally frequent. The rare species Oysterplant (*Mertensia maritima*), which is listed in the Flora (Protection) Order, 1999, has been recorded growing on shingle substrate within the site.

Sand dune systems occur within the site at several locations, with good examples of fixed dunes and machair. The dune habitat at the Isle of Doagh is by far the most extensive. Typical species of the fixed dunes include Marram (*Ammophila arenaria*) and Red Fescue, accompanied by Common Bird's-foot-trefoil (*Lotus corniculatus*), Sand Sedge (*Carex arenaria*), mouse-ears (*Cerastium* spp.), Wild Thyme (*Thymus praecox*), Smooth Meadow-grass (*Poa pratensis*) and Mouse-ear Hawkweed (*Hieracium pilosella*). Bryophyte cover is usually well developed, with species such as *Rhytidiadelphus squarrosus, Hypnum cupressiforme* and *Calliergon cuspidatum*

being frequent. Although much of the botanical character of the machair habitat at Doagh Isle has been modified due to agricultural reclamation, re-seeding and over-grazing, significant areas with a typical machair flora remain. The sward is typically dominated by low herb species such as Red Fescue, Ribwort Plantain (*Plantago lanceolata*), Daisy (*Bellis perennis*), Red Clover (*Trifolium repens*) and Lady's Bedstraw (*Galium verum*).

Shifting dunes and fixed dunes also occur above the rocky shore at Meallalaghtra/ Lenan Head. This area also contains marsh with Mare's-tail (*Hippuris vulgaris*), Brookweed (*Samolus valerandi*) and sedges (*Carex* spp.). *Hygrocybe* species, fungi that are indicators of unimproved grassland, occur in the coastal grassland sward.

Significant areas of dry heath occur in the site at both low and high altitudes. The best-developed and most extensive areas are to be found at Dunaff Head, Binnion Hill and in the Urris Hills from Mamore Gap, south-west to Lough Fad and beyond to Crockfadda. However the habitat is also encountered at sea level where it tends to form a mosaic with grassland vegetation. Typically the vegetation develops on shallow peats less than 50 cm deep and is dominated by Heather (*Calluna vulgaris*). Other frequent shrub species include Bell Heather (*Erica cinerea*), Cross-leaved Heath (*Erica tetralix*), Crowberry (*Empetrum nigrum*) and Bilberry (*Vaccinium myrtillus*). Fir Clubmoss (*Huperzia selago*) and the diminutive Lesser Twayblade (*Listera cordata*) are present in the heath on the Urris Hills. In addition to the dwarf ericoid component, acid grassland species such as Mat-grass (*Nardus stricta*), Velvet Bent (*Agrostis canina*), Tormentil (*Potentilla erecta*) and Heath-grass (*Danthonia decumbens*) are frequent components. This combination of plant species gives rise to a mosaic of dwarf heath and acid grassland, the relative proportion of which depends on factors such as degree of exposure, grazing intensity and the frequency of fire. Often there is much outcropping rock present and invasion by Bracken (*Pteridium aquilinum*) is a frequent feature of the habitat (as seen at Binnion Hill). At Dunaff Head the habitat forms a mosaic with blanket bog, containing Common Cottongrass (*Eriophorum angustifolium*), Hare's-tail Cottongrass (*E. vaginatum*), Cross-leaved Heath and Eared Willow (*Salix aurita*). The main threats to the heath habitat at present are over-grazing and uncontrolled burning.

A diverse fern flora is found on damp, north-facing rock outcrops in the Urris Hills, including Wilson's Filmy-fern (*Hymenophyllum wilsonii*), Broad Buckler-fern (*Dryopteris dilatata*), Hay-scented Buckler-fern (*D. aemula*), Black Spleenwort (*Asplenium adiantum-nigrum*) and polypody ferns (*Polypodium* spp.). The Urris Hills also contain the oligotrophic lakes Crunlough and Lough Fad, and on their lower slopes dry and wet acid grassland, Hazel (*Corylus avellana*) scrub, dense Bracken, blanket bog and wet heath occur.

Trawbreaga Bay is a very sheltered sea bay with a narrow strait to the open sea at the north end. It is fed by a number of small rivers or streams. An estimated 80% of the bay area is exposed at each low tide to expose a mixture of mudflats, sandbanks and stony/rocky substrates. In the inner reaches of the bay, the substrate consists of muddy sand and coarse sediments with an infaunal community of polychaetes, oligochaetes and crustaceans. Within the narrow strait, the community is comprised of bivalves and polychaetes within a sandy substrate. The polychaete *Arenicola marina* is a conspicuous species within the intertidal soft sediments of the bay. Beds of Dwarf Eelgrass (*Zostera noltii*) display temporal variation in occurrence within the bay; they were recorded on the shore at Doaghmore and currently present south west of Glassagh Point. Mats of green algae occur on the open flats. Some areas of saltmarsh fringe the bay.

Throughout the site, exposed sandy beaches occur in embayments and in coves bordered by bedrock and in the outer reaches of Trawbreaga Bay. Here a sand community with crustaceans and polychaetes occurs. Where the intertidal reef is present on exposed shores the community consists of the bivalve *Mytilus edulis* and barnacles. In such areas where reef extends into the subtidal the kelp *Laminaria hyperborea* occurs. In the less exposed areas and within Trawbreaga Bay the brown algae *Pelvetia canaliculata, Fucus vesiculosus, F. spiralis* and *Ascophyllum nodosum* are found.

Otter are regularly seen along the shoreline and may breed within the site. Otter is a species listed on Annex II of the E.U. Habitats Directive. Another Annex II species, the tiny whorl snail *Vertigo angustior*, is also known from this site.

Key threats noted on the Natura 2000 Data form for this site include Fertilization and Grazing. Discharges from residential properties are also highlighted as a moderate threat together with aquaculture, hunting and sport/recreational activities. Pollution from WwTPs is not explicitly stated as a threat.

Description of the Conservation Interests of the SAC
Annex I Habitats
North Inishowen Coast SAC supports six Annex I habitats:

- [1140] Tidal Mudflats and Sandflats
- [1220] Perennial Vegetation of Stony Banks
- [1230] Vegetated Sea Cliffs
- [2130] Fixed Dunes (Grey Dunes)*
- [21A0] Machairs*
- [4030] Dry Heath

Detailed conservation objectives have been developed for this site (NPWS, 2014a) and the documentation available includes mapping and details for each Annex I habitat.

Tidal Mudflats and Sandflats are found at Pollan Bay (intertidal beach habitat) and Trawbreaga Bay (enclosed shallow bay). Given the connection via watercourses/drains this habitat at Trawbreaga Bay has the potential to be impacted by Ballyliffen WwTP. While a drain extends from the Cloghorna/Ardagh watercourses towards the sandflats in Pollan Bay area, it is blocked before it enters the dune area. This habitat at Pollan Bay does not have the potential to be impacted by Ballyliffen WwTP.

Perennial Vegetation of stony banks and Vegetated Sea Cliffs habitats were not recorded downstream of the WwTP with the nearest known examples of these habitats occurring along the Doagh Island coast between the northern end of Pollan Bay and Doaghmore Point. Dry Heath habitat is associated with the hard coastline and also occurs in higher altitude areas such as at Binnion Head ca. 1km to the west of the WwTP. As habitats are coastal/terrestrial, and given their locations outside of the potential zone of influence of the WwTP, they do not have the potential to be impacted by the Ballyliffen WwTP.

Fixed dunes are located ca. 675m to the north of the WwTP in the area to the south of Pollan Bay. While a drain extends from the Cloghorna/Ardagh watercourses towards this area, it is blocked before it enters the dune area. This habitat does not have the potential to be impacted by Ballyliffen WwTP.

Machair habitat is present ca 300m to the north of the WwTP in the area to the south of Pollan Bay. The drain that extends from the Cloghorna/Ardagh watercourses through this habitat may occasionally become inundated with water, however there was no water flow in this drain noted during the site visit despite recent heavy rain, and it is infilled in sections which would pevent any water reaching Pollan Bay. As there is a potential connection via a drain to this habitat however, Ballyliffen WwTP is assessed as having the potential to impact Machair.

Annex II Species

North Inishowen Coast SAC is selected for the following Annex II species:

- [1014] Narrow-mouthed Whorl Snail (*Vertigo angustior*)
- [1355] Otter (*Lutra lutra*)

Narrow-mouthed Whorl Snail has been recorded in the townlands of lag and Drung behind Back Strand (ca. 5km north east of the WwTP) as well as at Tullagh Bay (ca. 3.5km west of the WwTP). Optimal habitat is considered to be Fixed Dune which occurs in Pollan Bay. However, as described above this habitat does not have the potential to be impacted by Ballyliffen WwTP, and consequently Narrow-mouthed Whorl Snail does not have the potential to be impacted.

Otter is widespread in the Inishowen area and is recorded within the 10K square C34 where the study area is located, although there are no records in the immediate vicinity of the WwTP. NPWS (2014a) state that the 10m buffer along the shoreline has been identified as crucial for otters. Otters have two basic requirements: aquatic prey and safe refuges where they can rest. This species is dependent on fish stocks which are ultimately dependent on water quality. Coastal sites can provide important foraging areas for otter where they have been found to feed on marine fish, particularly in estuaries and shallow coastal waters which may act as nursery areas for marine fish species (Kingston *et al*, 1999; Parry *et al*, 2011). No otter signs (e.g. spraints, feeding remains, paths/slides) were recorded in the vicinity of the WwTP during the site visit. The overall assessment of the conservation status of otter is 'Favourable' (NPWS, 2013b).

Table 4.0: Qualifying Interests along Surveyed Stretch

Site	Qualifying Habitats	Present within potential zone of influence of discharge
Inishowen Coast SAC	Tidal Mudflats and Sandflats	Yes
	Perennial Vegetation of Stony Banks	No
	Vegetated Sea Cliffs	No
	Fixed Dunes (Grey Dunes)*	No
	Machairs*	Yes
	Dry Heath	No
	Narrow-mouthed Whorl Snail	No
	Otter	Yes

Conservation Objectives of the North Inishowen Coast SAC

Article 6 of the Habitats Directive states that:

> *Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications of the site in view of the site's conservation objectives.*

The importance of a site designated under the Habitats Directive is defined by its qualifying features or interests. Qualifying interests for any Natura 2000 site are listed on a *pro forma*, called the Natura 2000 standard data form, which forms the basis of the rationale behind designation, and informs the Conservation Management Plan for targeted management and monitoring of key species and habitats.

Favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- The conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The generic conservation objective is to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:

- [1140] Tidal Mudflats and Sandflats (conservation status: Inadequate, Improving)
- [1220] Perennial Vegetation of Stony Banks (conservation status: Inadequate, Stable)
- [1230] Vegetated Sea Cliffs (conservation status: Inadequate, Stable)
- [2130] Fixed Dunes (Grey Dunes)* (conservation status: Bad, Stable)
- [21A0] Machairs* (conservation status: Bad, Stable)
- [4030] Dry Heath (conservation status: Bad, Stable)
- [1014] Narrow-mouthed Whorl Snail (*Vertigo angustior*) (conservation status: Inadequate, Declining)
- [1355] Otter (*Lutra lutra*) (conservation status: favourable)

Detailed conservation objectives (for the qualifying interests assessed as having the potential to be impacted) as as follows:

Tidal Mudflats and Sandflats

- Attribute: Habitat Area;
  Target: The permanent habitat area is stable or increasing subject to natural processes.
- Attribute: Community Extent;
  Target: Maintain the extent of the Zostera community subject to natural processes.
- Attribute: Community Structure – Zostera density;
  Target: Conserve the high quality of the Zostera-dominated community, subject to natural processes.
- Attribute: Community Distribution;
  Target: Conserve the high quality of the Zostera-dominated community, subject to natural processes.
- Attribute: Typical Invertebrate Species;
  Target: Maintain listed lagoon specialists subject to natural variation.

Machairs

- Attribute: Habitat Area;
  Target: The permanent habitat area is stable or increasing subject to natural processes including erosion and succession.
- Attribute: Habitat Distribution;
  Target: No decline or change in habitat distribution, subject to natural processes.
- Attribute: Physical structure, functionality and sediment supply – Physical Barriers;
  Target: Maintain the natural circulation of sediment and organic matter without any physical obstructions.
- Attribute: Physical structure, functionality and sediment supply – Water Table;
  Target: Maintain natural hydrological regime.
- Attribute: Vegetation structure - Zonation;
  Target: Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
- Attribute: Vegetation structure – Bare Ground;
  Target: Bare ground should not exceed 10% of machair habitat, subject to natural processes.
- Attribute: Vegetation structure – Sward height;
  Target: Maintain structural vegetation within sward.
- Attribute: Vegetation composition – Typical species and sub-communities;
  Target: Maintain range of sub-communities with typical spices.
- Attribute: Vegetation composition – Negative indicator species;
  Target: Negative indicator species (including non-natives) to represent less than 5% cover.
- Attribute: Vegetation composition – Bryophytes;
  Target: Should always be at least an occasional component of the vegetation.

Otter

- Attribute: Distribution;
  Target: No significant decline.
- Attribute: Extent of terrestrial habitat;
  Target: No significant decline (146.6ha above HWM, 61.3ha along river banks/ponds).
- Attribute: Extent of marine habitat;

Target: No significant decline (1099.2ha).

- Attribute: Extent of freshwater habitat;
  Target: No significant decline (30.9km).
- Attribute: Extent of freshwater lake/lagoon habitat;
  Target: No significant decline (2.7ha).
- Attribute: Couching sites and holts;
  Target: No significant decline.
- Attribute: Fish biomass available;
  Target: No significant decline.
- Attribute: Barriers to connectivity;
  Target: No significant increase.

Trawbreaga Bay SPA Site Synopsis (NPWS)

Trawbreaga Bay is a well-sheltered sea bay which lies on the north-western coast of the Inishowen Peninsula, Co. Donegal. Doagh Isle, a low-lying, sandy promontory, stretches across the mouth of the bay, leaving only a narrow strait to the open sea. The bay is fed by a number of small rivers and streams, chiefly the Ballyboe, Donagh and Glennagannon rivers. The village of Malin is situated on the eastern shore of the bay. The bay is mostly surrounded by agricultural land of low to moderate intensity. An estimated 80% of the bay area empties at low tide to expose a mixture of mudflats, sandbanks and stony/rocky substrates. Mats of green algae occur on the open flats and brown algae (*Fucus* spp.) on the stones. Some areas of saltmarsh fringe the bay. The intertidal flats provide the main feeding area for the majority of wintering waterfowl. Trawbreaga Bay supports a good diversity of wintering waterfowl though numbers of most species are relatively low. The main importance of the site lies in the Barnacle Goose population, which is of international importance. The mean peak count for the winters 1995/96-1999/00 was 645, though up to 800 have been recorded in the same period. While the geese utilise other sites in the vicinity, including Doagh Isle, Glashedy Island, Inishtrahull and the Garvan Isles, Trawbreaga Bay has been the most regularly used site in recent years. An internationally important population of Lightbellied Brent Goose also occurs, with a mean peak of 362 for the winters 1995/96- 1999/00. Other species which occur in regionally or locally important numbers include Whooper Swan (10), Wigeon (14), Mallard (161), Oystercatcher (163), Ringed Plover (89), Lapwing (247), Dunlin (288), Bar-tailed Godwit (37), Curlew (190) and Redshank (34). Gulls are regular, with significant numbers of Blackheaded Gull (206), Common Gull (75) and Herring Gull (325).

Trawbreaga Bay SPA, which is the most northerly wetland in Ireland, is a fine example of a bay with extensive intertidal sand and mud flats, a habitat that is listed on Annex I of the E.U. Habitats Directive. It is of international ornithological importance owing to the Barnacle and Brent Goose populations. Also of note is that Barnacle Goose, along with Whooper Swan and Bar-tailed Godwit, are species that are listed on Annex I of the E.U. Birds Directive. Shooting is prohibited at Trawbreaga Bay as it is a designated Wildfowl Sanctuary.

Key threats noted on the Natura 2000 Data form for this site include Aquaculture and Grazing. Discharges from residential properties are highlighted as a low threat. Pollution from WwTPs is not explicitly stated as a threat.

Description of the Conservation Interests of the SPA

The SPA is designated for the following bird species and the wetlands that support them:

- A045 Barnacle Goose *Branta leucopsis*
- A046 Brent Goose *Branta bernicla hrota*
- A346 Chough *Pyrrhocorax pyrrhocorax*
- A999 Wetlands

Detailed conservation objectives are available for this SPA which further define the attributes and targets necessary to maintain the favourable conservation status of the species listed above as follows:

- Attribute: Population Trend; Target: Long term population trend stable or increasing.
- Attribute: Distribution; Target: No significant decrease in the range, timing and intensity of use of areas by the qualifying bird species, other than that occurring from natural patterns of variation.

In addition the target for wetlands (attribute – habitat area) is as follows:

- The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 1317 ha, other than that occurring from natural patterns of variation.

Information on populations (where available), requirements and sensitivities of key species are considered in more detail below with data taken from Crowe (2005), BirdWatch Ireland website and iWeBS data[6], NPWS (2014b) and the referenced geese census reports.

Barnacle Goose is a winter visitor from Greenland. They are amber-listed in Ireland as the majority winter at less than ten sites. They feed primarily on coastal pastures during the winter. A total of 890 geese were recorded by the latest census at this site in 2013 (Mitchell & Hall, 2013). This is above the latest threshold for international importance (1% =817 birds). Numbers in Ireland and throughout the wintering range are continuing so show a long-term upward trend.

Brent Goose

Light-bellied Brent geese winter almost entirely in Ireland. They are amber-listed as they winter at less than ten sites. During winter they feed mostly on eel-grass which grows in muddy estuaries, and also on grasslands when coastal supplies have been depleted at estuarine sites. Winter 2012/2013 iWeBS data for Brent Geese indicates that internationally important numbers were recorded in that winter. Trawbreaga Bay continues to be an important site for this species where they feed at low tide in the mudflats and sandflats (Robinson *et al*, 2004).

Chough

The SPA contains coastal habitats used by Chough. They feed mostly on insects and their larvae, worms, and other subterranean invertebrates, but will also eat berries, grain and small mammals. The most important area is the foraging resource centred on the dune system at Lag and parts of the coastal slope that support coastal heath and maritime grassland. These areas are used by recently fledged young and others particularly during the autumn period. Coastal cliffs also contain a regularly-used communal roost site.

[6] www.birdwatchireland.ie iWeBS site summary data for Trawbreaga Bay

Wetlands are also listed as a feature of the SPA. Eutrophication has the potential to alter wetland habitats as certain wetland species would be sensitive to changes in water quality. Influxes in nutrients can result in a shift in species composition toward more tolerant competitive species and a loss of rarer species which typically require lower nutrient inputs. Floristic diversity generally decreases and sensitive invertebrate species may be lost. Some aquatic plants and algae may increase in biomass. Trawbreaga Bay is a sensitive wetland habitat located downstream of the WwTP.

Table 5.0: Qualifying SPA Features along Surveyed Stretch

Site	Qualifying Species	Observed or signs of species presence within potential zone of influence of discharge	Suitable habitat present within potential zone of influence of discharge
Trawbreaga Bay SPA	Barnacle Goose	No	Yes
	Brent Goose	No	Yes
	Chough	No	Yes
	Wetlands	Yes	-

Impact Prediction

The WwTP is 300m from the closest SAC habitats and 2.2km upstream of the SPA. Recent effluent sampling data indicates that the plant is not complying with prescribed standards.

The Cloghorna stream does not have the capacity to assimilate the discharge, and while the larger Ardagh stream may provide some additional assimilative capacity, water quality 1.4km downstream of the WwTP continues to be classed as Poor based on the macroinvertebrate community. Marginal reedbeds occurring in the 1.2km stretch of river channel between this downstream monitoring point and the entrance to Trawbreaga Bay (a total of 2.6km downstream of the WwTP), may assist in assimilating further nutrients.

Cumulative impacts in the catchment possibly pose the greatest risk to the conservation objectives. The potential threat(s) of the Ballyliffen WwTP on water quality (long term or single event) is greatly increased when taken in combination with other water quality concerns in the catchment.

The West Inishowen Water Management Unit Action Plan (NWIRBD, 2010) indicates that there are risks to water quality from point sources (WwTPs and discharge authorisations), diffuse sources (mainly agriculture), and abstraction. The source of total phosphorus load is predominately from agriculture (56%), WwTPs (11%) and forestry (16%).

Clonmany and Culdaff WwTPs are noted as having capacity issues which may pose a risk to water quality. Proposed measures for all these plants are to increase the capacity of the treatment plant. Both these plants discharge to rivers which untimately enter the coastal waters of the Inishowen Coast SAC.

There are no Section 4 licenses in the catchment identified in the Water Management Unit Action Plan (NWIRBD, 2010).

The Donegal County Council planning database was reviewed for any other significant developments in the agglomeration area. A holiday resort development has been granted planning permission (Ref 0870822/1450122) and will be located at the end of the minor road between Ballyliffen village and Pollan Beach car park. The development includes the following:

1. Demolition of existing vacant hotel and existing dwelling and garage and erection of a holiday resort with hotel and residential apartments in include the following facilities; Bar, restaurant, function rooms, business centre, crèche, 64 no hotel rooms and 64 no. residential apartments, and car park and coach park.
2. Infrastructural improvements from Shore road to the site including road widening and footpath provision.
3. The decommissioning of the existing municipal wastewater treatment system to be replaced with new municipal wastewater treatment works serving Ballyliffen.
4. New car parking spaces to be created in Ballyliffen village centre, between main street and shore road.

In terms of fisheries, there is intensive shellfish culture for oysters within Trawbreaga Bay. Guidance values for water quality in shellfish waters has been exceeded in the past (DoECLG, 2009).

Other impacts which are likely to act cumulatively and impact on the SAC/SPA result from the following:

- Chemical fertiliser application to agricultural lands (the main fertilisers in use supply nitrogen, phosphorus, potassium and sulphur);
- Agricultural practices such as ploughing leads to greater mineralisation and nitrification, and in the case of old grassland, it can result in an increase in the release of nitrogen over a number of years (OECD, 1986);
- Artificial drainage increases nitrate leaching and reduce the morphological qualities of watercourses, thereby reducing the quality of habitat for flora and fauna;
- Endocrine disruptors in domestic sewage, including the main active component in the oral contraceptive pill, can interfere with the endocrine system of plants and animals which controls a wide range of processes including metabolism, growth and reproduction. Effects include a high degree of intersexuality downstream of sewage works (Routledge *et al*. 1998);
- Forestry may alter water quality indirectly through increased evaporation losses and hence an increase in solute concentrations; and
- On-site wastewater treatment systems, poorly performing septic tank units and other small effluent systems can be significant sources of nutrients to rivers.

The Ballyliffen WwTP in combination with other catchment pressures has the potential to impact on the water quality of the SAC/SPA. Mitigation measures to improve water quality are detailed below.

Impacts on Annex I Habitats

The discharge enters the Ardagh stream by the Cloghorna stream which pass through fields to Trawbreaga Bay. While the designation boundary runs directly adjacent to the river no machair habitat occurs in these areas which have been modified for agriculture, residential properties and golf courses. Any nutrient-rich floodwaters in these areas would therefore not have the potential to affect the machair habitat.

A drain also extends north from a point on the Cloghorna stream entering the machair habitat to the north. While there was no flow in this drain at the time of the site visit despite recent heavy rain, it may receive some irregular flow from the Cloghorna stream. Any such flow is not considered likely to significantly effect the adjacent machair habitat however as there were no signs of nutrient enrichment or associated habitat alteration in the vicinity of the drain from the ongoing operation of the existing WwTP.

The Cloghorna stream has no capacity to assimilate the discharge from Ballyliffen WwTP. It is possible that the Ardagh stream would have additional capacity, and the marginal reedbeds potentially some additional ability to take up nutrients, however even taking this into consideration, given the very poor quality of the effluent, potential adverse effects to the mudflat habitats in Trawbreaga Bay cannot be ruled out and precautionary mitigation should be applied.

Photo 2: Trawbreaga Bay

Table 6.0: Qualifying Habitats Potentially Impacted by WwTP Discharge

Qualifying Habitats	Potential Impacts	Brief Explanation	Mitigation required
Tidal Mudflats and Sandflats	Yes	Significant effects to the conservation status of this habitat as a result of the discharge are considered unlikely, however precautionary mitigation should be applied.	Yes
Machairs	No	There is little or no flow of waters connected to the WwTP through Machair habitat. Significant effects on the conservation status of this habitat are not predicted.	No

Impacts on Annex II Species

Otter (1355)

No otter signs were observed during the site visit and there are no specific records for the Cloghorna/Ardagh streams. Any significant reduction in water quality and ecological status downstream of the discharge of WwTP could therefore potentially have indirect effects on otters as a result of reduced food supply i.e. reduced macroinvertebrate and fisheries production. The otter is dependent on fish stocks, which are ultimately dependent on water quality. However potential eutrophication is likely to be minor and is more likely to affect fish species composition than fish biomass which has negligible potential to significantly affect the otter population. There is no indication that the ongoing operation of this plant is having an adverse effect on otters within the North Inishowen Coast as a whole, and no specific additional mitigation is required.

Table 7.0: Qualifying Species Potentially Impacted by WwTP Discharge

Qualifying Species	Potential Impact	Brief Explanation	Mitigation Required
Otter	No	Species not considered highly sensitive to indirect effects from what is likely to be only low levels of nutrient enrichment. Significant effects on the conservation status of otter not predicted.	No

Impacts on designated features of the SPA

Eutrophication causing increased phytoplankton growth could increase the amount of food available for bird species, however it can also lead to an increase algal blooms which may interfere with terns/gulls fishing during their breeding season. Elevated levels of nutrients in the discharge are of concern particularly when considered with other catchment pressures and have the potential to adversely affect wetland habitats. There is also evidence to suggest that reduced primary production (measured as chlorophyll a) due to better water quality can lead to a decline in the density and biomass of benthic invertebrates, and a consequent reduction in the abundance of diving ducks as has been the case on Lough Neagh where Pochard, Tufted Duck, Scaup and Goldeneye have all declined in numbers over the last 10 years (Burton *et al*, 2003; Tománková, 2013).

Barnacle and Brent geese utilise the mudflats within the SPA as well as the adjacent agricultural fields. These species are not considered highly sensitive to minor-moderate levels of eutrophication. There is no evidence that to suggest that they have been negatively affected by the operation of the WwTP's located upstream to date.

The habitats used by Chough – dunes, coastal cliffs and machairs - have no potential to be impacted by the WwTP discharge.

Precautionary mitigation is recommended to prevent eutrophication of wetland habitats, however the potential for adverse effects on the conservation status of SPA Annex I bird species is considered negligible, and no specific additional mitigation is required.

Table 8.0: Qualifying Features of SPA Potentially Impacted by WwTP Discharge

Qualifying Features	Potential Impacts	Brief Explanation	Mitigation required
Barnacle Geese **Brent Geese**	No	Feed primarily on mudflats within the bay, and adjacent agricultural habitats. Internationally important numbers occur regularly in recent years while the operation of the WwTP has been ongoing. No evidence to suggest that these species have been impacted by the WwTP to date, or that they would be particularly sensitive to minor changes in nutrient levels in Trawbreaga Bay.	No
Chough	No	This species or the habitats it uses, has no potential to be impacted by the ongoing operation of the WwTP.	No
Wetlands	Yes	Potential for eutrophication, potentially resulting in an unfavourable shift in species composition, cannot be ruled out when the high nutrient levels in the discharge are considered together with other sources of these nutrients in the catchment.	Yes

Mitigation Measures

The current discharge from the existing WwTP at Ballyliffen does not comply with Urban Wastewater Treatment Standards. In order to avoid adverse effects to the integrity of North Inishowen Coast SAC and Trawbreaga Bay SPA the following mitigation is required:

- Implementation of an appropriate waste water treatment process at Ballyliffen to ensure that the discharge complies with the Urban Waste Water Treatment Directive Regulations.

Should the proposed WwTP associated with the permitted hotel development proceed then it will need to be built by the developer by October 2019 whereafter the planning permission expires.

Once operational, to ensure continued satisfactory operation of the new plant mitigation measures recommended for the ongoing operation of the new plant are as follows:

- Ensure that the capacity of the WwTP is not exceeded; and
- Continuation of monitoring of the discharge, both upstream and downstream of the plant on a consistent regular basis. Annual biological water quality monitoring should also be undertaken upstream and downstream of the WwTP primary discharge. Any biological monitoring should be carried out during the summer / autumn periods.

Stage 2 Appropriate Assessment Conclusion Statement

The current Appropriate Assessment has been prepared following the EPA (2009) '*Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007)*'. The Department of the Environment, Heritage and Local Government guidance '*Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities'* (DoEHLG, 2009a) has also been taken into account. The current assessment for the Waste Water Discharge Licence Application investigates the potential adverse effects on the aquatic qualifying interests of the Natura 2000 network arising from the plant discharge, in combination with other plans / projects affecting the aquatic environment. The assessment considers whether the discharge, alone or in combination with other projects or plans, will have adverse effects on the *integrity* of a Natura 2000 site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects.

When the above mitigation measures are implemented in full, it is envisaged that there will be no significant adverse effects on the integrity of North Inishowen Coast SAC and Trawbreaga Bay SPA in view of these site's conservation objectives and that the conservation status of the Annex I habitats, Annex II species and protected bird species will not be compromised by WwTP discharge either directly, indirectly or cumulatively.

It is therefore concluded that the Ballyliffen WwTP discharge, alone or in-combination with other plans and / or projects will not give rise to significant effects on the integrity of North Inishowen Coast SAC and Trawbreaga Bay SPA, as long as the mitigation measures as listed above are implemented in full. Stage 2 concludes the Appropriate Assessment process of the Ballyliffen Waste Water Discharge Licence Application.

References

Burton, N.H.K., Paipai, E., Armitage, M.J.S., Maskell, J.M., Jones, E.T., Struve, J., Hutchings, C.J. & Rehfisch, M.M. (2003) Effects of reductions in organic and nutrient loading on bird populations in estuaries and coastal waters of England and Wales. Phase 2 Report. English Nature Research Report No 586. December 2003.

Colhoun, K & Cummins, S.(2013) Birds of Conservation Concern in Ireland 2014-2019. Irish Birds 9: 523-544.

DoECLG (2009) Shellfish Pollution Reduction Programme. Characterisation Report Number 29. Trawbreaga Shellfish Area County Donegal.

Kingston S, O'Connell M, Fairley JS (1999) Diet of Otters *Lutra lutra* on Inishmore, Aran islands, west coast of Ireland. Biology and Environment: Proc R Ir Acad B 99B:173-182
IFI (2009) Sampling Fish for the Water Framework Directive - Transitional Waters 2009. The Central and Regional Fisheries Boards.

Mitchell, C. & C. Hall 2013. Greenland Barnacle Geese *Branta leucopsis* in Britain and Ireland: results of the international census, spring 2013. Wildfowl & Wetlands Trust, Slimbridge. 31pp

NPWS (2013a) The Status of EU Protected Habitats and Species in Ireland. Habitats Assessments Volume 2, Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

NPWS (2013b) The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 3, Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

NPWS (2014a) Conservation Objectives: North Inishowen Coast SAC 002012. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2014b) Conservation Objectives: Trawbreaga Bay SPA 004034. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

O'Reilly (2004) Rivers of Ireland. A flyfishers Guide. Central Fisheries Board/Merlin Unwin Books.

OECD (1986) Water pollution by fertilisers and pesticides. Organisation for Economic Cooperation and Development, Paris, 144 pp.

Parry, G.S; Burton, S; Cox, B; and D.W. Forman. Diet of coastal foraging Eurasian otters (*Lutra lutra* L.) in Pembrokeshire south-west Wales. Eur. J. Wildl. Res (2011) 57: 485-494.

Robinson, JA, K Colhoun, GA Gudmundsson, D Boertmann, OJ Merne, M O'Briain, AA Portig, K Mackie & H Boyd. 2004. Light-bellied Brent Goose *Branta bernicla hrota* (East Canadian High

Arctic population) in Canada, Ireland, Iceland, France, Greenland, Scotland, Wales, England, the Channel Islands and Spain 1960/61 – 1999/2000. Waterbird Review Series, The Wildfowl & Wetlands Trust/Joint Nature Conservation Committee, Slimbridge.

Routledge, E.J., D. Sheahan, C. Desbrow, G. Brighty, M. Waldock, and J.P. Sumpter (1998). Identification of estrogenic chemicals in sewage treatment effluent, 2. In vivo responses in trout and roach, *Environment, Science and Technology,* 32: 1559-65.

Tománková, I. 2013 The causes of diving duck population declines on Lough Neagh, Northern Ireland. phD Thesis. Queens University Belfast.

NWIRBD (2010) North Western River Basin Management Plan – Crana Water Management Unit: http://www.wfdireland.ie/docs/1_River%20Basin%20Management%20Plans%202009%20-%202015/NWIRBD%20RBMP%202010/Water%20Management%20Unit%20Action%20Plans/West%20Inishowen%20WMU%20Action%20Plan%20March%202010.pdf