

**Ballybeg**  
**2019 Ecological Survey**



**Final Report**

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**2019 Ecological Survey**

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## Ballybeg

### 2019 Ecological Survey

#### 1. Introduction

A baseline habitat condition and ecological survey and habitat management plan was prepared for the Ballybeg Commonage in 2018<sup>1</sup> and the measures within same underwent screening for Appropriate Assessment<sup>2</sup>.

The implementation of the management prescriptions in the plan began in 2019. The management prescriptions in the SUAS plan for this commonage set out to address the impacts highlighted in that report so progress is made towards attaining **Favourable status** for the Annex I habitats present on the site – principally 4010 Northern Atlantic Wet Heaths with *Erica tetralix* and 4030 Dry Heath.

The major impacts to the habitats in this commonage arise predominantly from under grazing, timing of grazing, lack of active shepherding which has resulted in more areas becoming acid grassland as sheep congregate in certain areas, and bracken and gorse encroachment and a legacy of uncontrolled burning.

The extent of habitats present within the Ballybeg Commonage and their affinities to either Fossitt (Level 3) or Annex I habitats were mapped as presented on **Figures 1 and 2** (See **Appendix 1**) and their conservation status was assessed and mapped as shown on **Figure 3** (See **Appendix 1**). A series of management prescriptions were drawn up for the Ballybeg Commonage as detailed in **Table 1** and mapped on **Figure 4** (See **Appendix 1**).

#### 2. SUAS Vegetation Management Measures

The proposed management measures for the Ballybeg Commonage under SUAS are as follows:

##### Year 1 (2019)

1. Cut a number of small sections in the wetter parts on the west side of area 1. Cut sections of up to 0.5ha in size. It is recommended to cut these in the autumn as the ground will be drier at that time of the year.
2. Control burn a section on the south of area 1, avoiding the areas burned in the last fire which can be clearly seen on the management map, to encourage sheep to spread out more over these areas. Fire control lines, at least 3m wide shall be cut around each section, either by tractor mounted machine or by hand, to ensure these controlled burning areas are contained. Controlled burning may be carried out either in the spring or the autumn (or both) so long as it is within the legal burning season. The total area between cutting and burning should not exceed 3ha in 2019.
3. Cut gorse in areas 23 & 38 to open up where it is starting to dominate. Cut up to 2ha in 2019 and encourage grazing by stock afterwards.
4. Cut/roll bracken in areas 24, 27 & 34, where a machine will travel. This is to be done at least twice; once in early June and again in late August. This will act as a trial to test the practicality of this method of controlling bracken.

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<sup>1</sup> Wilson, F. (2019). Ecological Baseline Survey prepared for Ballybeg Commonage as part of the Commonage Management Plan for SUAS. 27<sup>th</sup> January 2019. Unpublished report for SUAS EIP.

<sup>2</sup> Wilson, F. (2019). Report for Screening for Appropriate Assessment for a Commonage Management Plan at Ballybeg, Tinahely, Co. Wicklow in accordance with the requirements of Article 6(3) of the EU Habitats Directive. 12<sup>th</sup> February 2019. Unpublished report for SUAS EIP.

5. Increase grazing in spring in areas 22, 19, 8 and 9 to see if trampling will assist in reducing the vigour of bracken, making sure that lazy beds are not damaged. Spray could be considered in area 22 away from the flushes.
6. Spray Bracken in areas 36 & 28 with Asulox using a tractor mounted sprayer if the machine can travel here or spray using hand held equipment.

#### **Year 2 (2020)**

1. Cut or burn a further number of sections in areas 1, up to 2ha in total. Follow the guidelines for year 1 in relation to the size and distribution of controlled burning/cutting areas.
2. Control further small areas of gorse in areas 23 & 38 by either cutting or burning, up to 2ha in total.
3. Increase grazing levels in area 7 to control bracken during 2020. If required follow up with cutting or strimming up to 3ha with either a machine or using hand held equipment if desired and feasible.
4. Spray Bracken in areas 36 & 28 with Asulox using a tractor mounted sprayer if the machine can travel here or spray using hand held equipment.
5. Cut/roll bracken in areas 24, 27 & 34, where a machine will travel. This is to be done at least twice; once in early June and again in late August.
6. Increase grazing in spring in areas 22, 19, 8 and 9 to see if trampling will assist in reducing the vigour of bracken making sure that lazy beds are not damaged. Spray could be considered in area 22 away from the flushes.

#### **Year 3 (2021)**

1. Cut or burn a further number of sections in areas 1, up to 2ha in total. Follow the guidelines for year 1 in relation to the size and distribution of controlled burning/cutting areas.
2. Increase grazing levels in area 7 to control bracken during 2021. If required follow up with cutting or strimming up to 3ha with either a machine or using hand held equipment if desired and feasible.
3. Spray Bracken in areas 36 & 28 with Asulox using a tractor mounted sprayer if the machine can travel here or spray using hand held equipment.
4. Cut/roll bracken in areas 24, 27 & 34, where a machine will travel. This is to be done at least twice; once in early June and again in late August.
5. Increase grazing in spring in areas 22, 19, 8 and 9 to see if trampling will assist in reducing the vigour of bracken making sure that lazy beds are not damaged. Spray could be considered in area 22 away from the flushes.

#### **Year 4 (2022)**

1. Cut or burn a further number of sections in areas 1, up to 2ha in total. Follow the guidelines for year 1 in relation to the size and distribution of controlled burning/cutting areas.
2. Increase grazing levels in area 7 to control bracken during 2022. If required follow up with cutting or strimming up to 3ha with either a machine or using hand held equipment if desired and feasible.
3. Spray Bracken in areas 36 & 28 with Asulox using a tractor mounted sprayer if the machine can travel here or spray using hand held equipment.
4. Cut/roll bracken in areas 24, 27 & 34, where a machine will travel. This is to be done at least twice; once in early June and again in late August.
5. Increase grazing in spring in areas 22, 19, 8 and 9 to see if trampling will assist in reducing the vigour of bracken making sure that lazy beds are not damaged. Spray could be considered in area 22 away from the flushes.

#### **Shepherding:**

Average time per shepherding: 6 Hours

No of times sheep are to be shepherded: 2-3 Times per week from 1<sup>st</sup> May to 30<sup>th</sup> November.

Identified objective of the shepherding;

- Sheep are to be kept from straying off the commonage onto surrounding areas.
- Move off sheep from other commonages.
- Monitor sheep health for signs of tick diseases.
- Count numbers of deer grazing the commonage and areas they are grazing.

**Other works to be carried out for entire commonage:**

Repair the sheep fence in area 7, joining the forestry in year 1 to stop sheep getting out into the forestry.

Use feed buckets to encourage more sheep grazing the commonage in the Jan/Feb and the April/May period.

Use the feed buckets to move grazing pressure away from the grassy areas in Jan/Feb and April/May periods.

**Details of sheep stocking rates proposed**

Accurate sheep numbers will be obtained in year 1 and over the remaining 3 years, they will be increased gradually up to GLAS stocking rates.

**Ecological Assessment**

The commonage was surveyed in December 2019 by Faith Wilson to examine and review the implementation of the proposed measures and make any recommendations regarding same. The observations and recommendations from this visit are set out below.

### 3. 2019 Walkover Survey

The following observations, comments on same and recommendations on the works completed in 2019 are presented.

#### Firebreaks for controlled burning

A number of firebreaks for controlled burning were created on the 26<sup>th</sup> February 2019 on the hillside using a flail mulcher behind a tractor. These can be seen in the Bing Maps imagery of the commonage as presented on **Figure 1** below.



**Figure 1. New firebreaks cut on Ballybeg in 2019 (Bing Maps).**

The prepared control burning areas were located up towards the top of the commonage near the forestry to encourage the sheep up out of the sheltered valley slopes. The areas prepared varied in size from 0.2ha to 0.8ha.

#### Controlled burning

Only one area was burnt on 28th February 2020. The burning here appeared to be very intense and uniform compared with what was done on Glasnamullen which allowed some areas to have remained unburnt. The burn here may have been too intense as there are large areas of bare peat (this may be what was beneath the leggy heather if no bryophyte (moss) layer was present and had been shaded out by the tall heather). There has been a very large congregation of sheep here with significant dunging and browsing pressure as can be seen in Plate 3. There is some regeneration of bilberry with some deergrass, tormentil, sedges (*Carex flacca* and *Carex binervis*) and some parts of moss remain intact. The peat and moss layer is generally more intact in the flailed areas – this may be the more appropriate management technique here than burning.





**Plate 1. Firebreak created with flail.**

In general some of the areas (especially the northern ones) prepared for burning may possibly be too large and would allow sheep to remain grazing in them on the regrowth for a long time and possibly not move across the hill?

This may not of course be the case but is an observation based on what was observed in the site visit which showed sheep are tending to congregate in them based on the amount of dunging present (see below).

It might be worth seeing if smaller patches of heather in a patchwork are prepared for burning would this encourage sheep to move on more readily as fodder within regenerated areas will be browsed out earlier and the sheep will have to find fresh forage.

In the absence of having detailed information on how many years it takes for the heather to reach the desired height on Ballybeg, we cannot define the average figure for the area to be burnt/flailed each year but those areas of heath, which were recently burnt as can be seen on the aerial photos in 2005, 2008 and 2012 are being allowed to recover the bryophyte and lichen communities which they are currently lacking.



**Plate 2. *Molinia* developing in flailed areas.**

Some areas within the flailed track areas are dominated by ling whilst others are dominated by purple moor grass whereas bilberry remained relatively scarce.

Areas of ground such as that shown either side of the flailed track in Plate 2 above probably do not need any burning/flailing as animals will be able to move through it and graze without impediment.





**Plate 3. Sheep are tending to congregate within the flailed/burnt areas resulting in bare peat and dunging and intense grazing pressure which will limit regeneration of ling heather and bilberry.**



**Plate 4. Areas of dense heather could be treated with flailing in 2020 or could have buckets placed into them to encourage sheep to move around.**

*Observations/Challenges*

The project was constrained as to where areas could be prepared for burning by where the tractor could travel, and where the contractor could access the hill from.

Instead of leaving the flail down and mowing a track it might be worth considering lifting it and just doing small patches so that sheep disperse and move through unmanaged areas to those which have been opened up?

The cut areas have avoided those areas which were previously burnt, which is very welcome and were obviously constrained as to where the machine could safely travel and work.



**Bracken control**

It is great to see bracken control being implemented on this hill as this is one of the main challenges in many upland sites. Two techniques have been used at Ballybeg – spraying and bracken bruising.

This was done using a bracken bruiser and was carried out on the 5th July 2019. The bracken bruiser was pulled by a quad and was used to cut/roll bracken in areas 24, 27 & 34. In areas 36 & 28 bracken was treated with Asulox on the 20th September 2019 using a small 40 hp tractor and mounted sprayer. A rate of 11 litres of asulox per ha was applied and an area of 3 ha was treated. The spraying was delayed by about 3 weeks waiting for suitable weather on a day the contractor was actually available.

The results of these treatments will not be completely clear until the growing season begins in 2020 but preliminary observations of the areas of bracken treated with bruising looked very promising.



**Plate 5. Spraying from the tractor.**



**Plate 6. Bracken bruiser in operation.**



**Plate 7. Bruised v's unbruised areas.**





**Plate 8. Bracken within the valley slopes will be treated in 2020 and the treatment/control measure used will be influenced by the results from 2019.**

#### **4. Appendix 1. Maps & Management Recommendations**

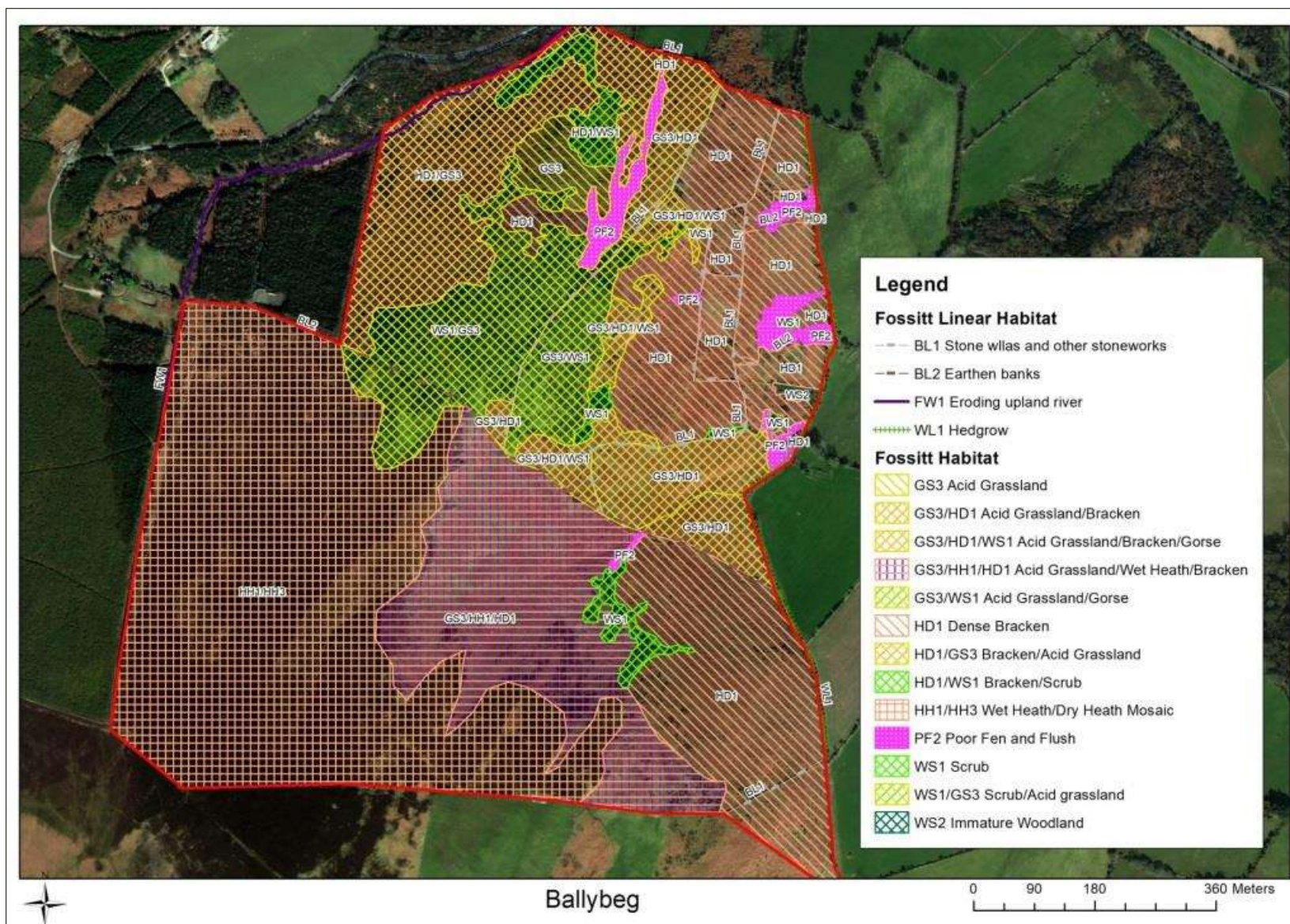


Figure 1. Habitats mapped to Level Three (Fossitt, 2000) within Ballybeg.



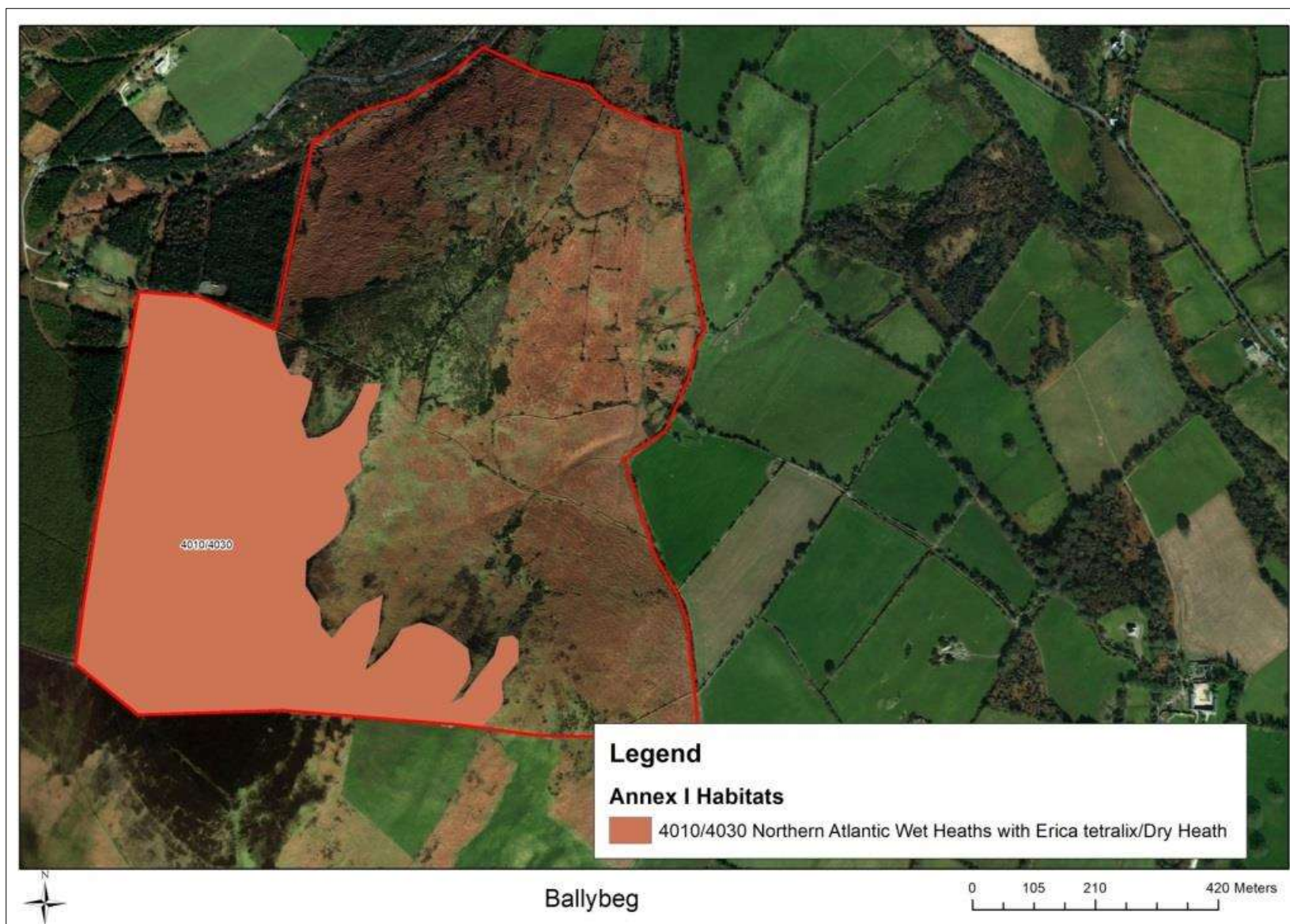


Figure 2. Habitats mapped according to their correspondence with Annex I habitats within Ballybeg.



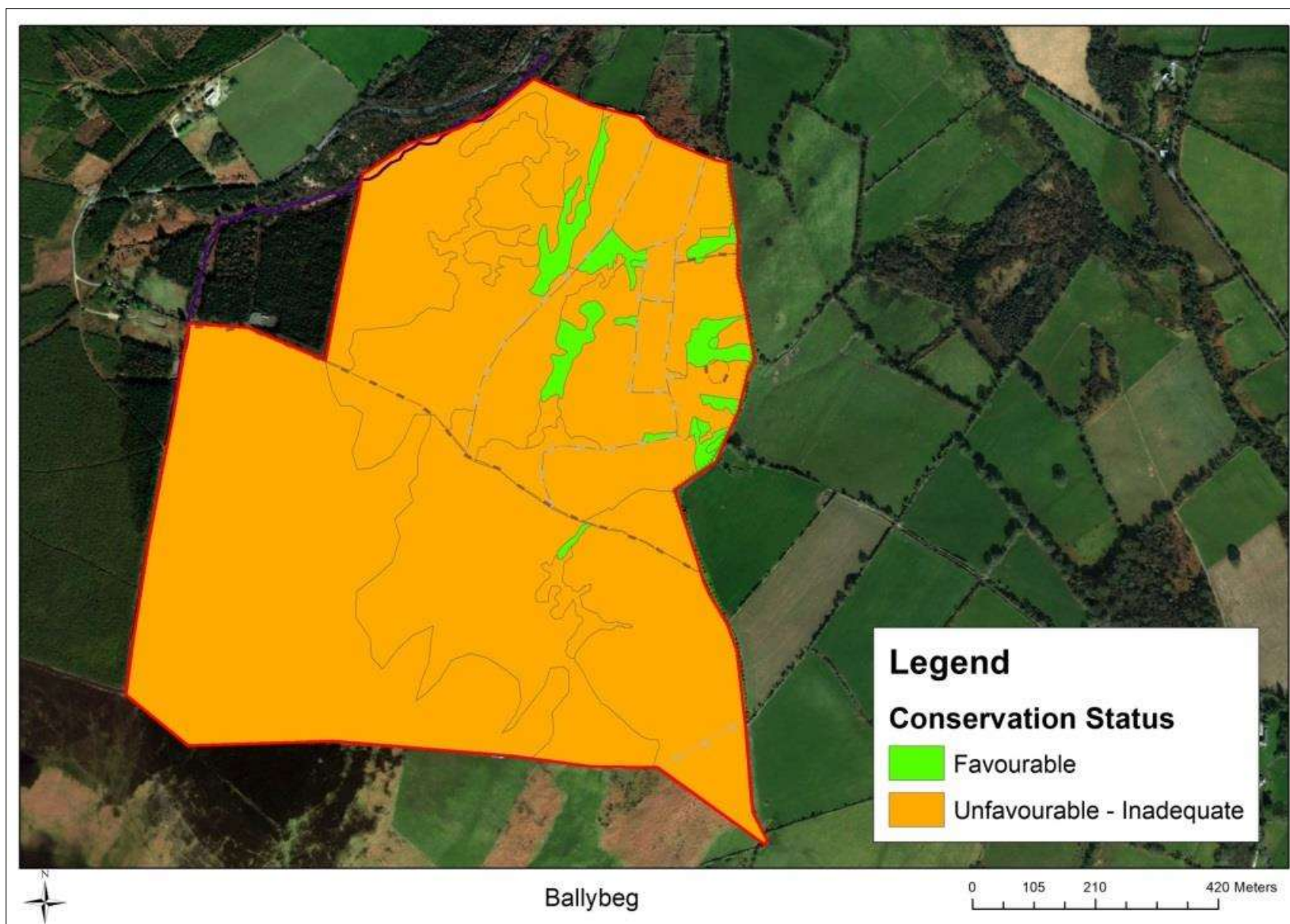


Figure 3. Habitat Condition Assessment for Ballybeg.

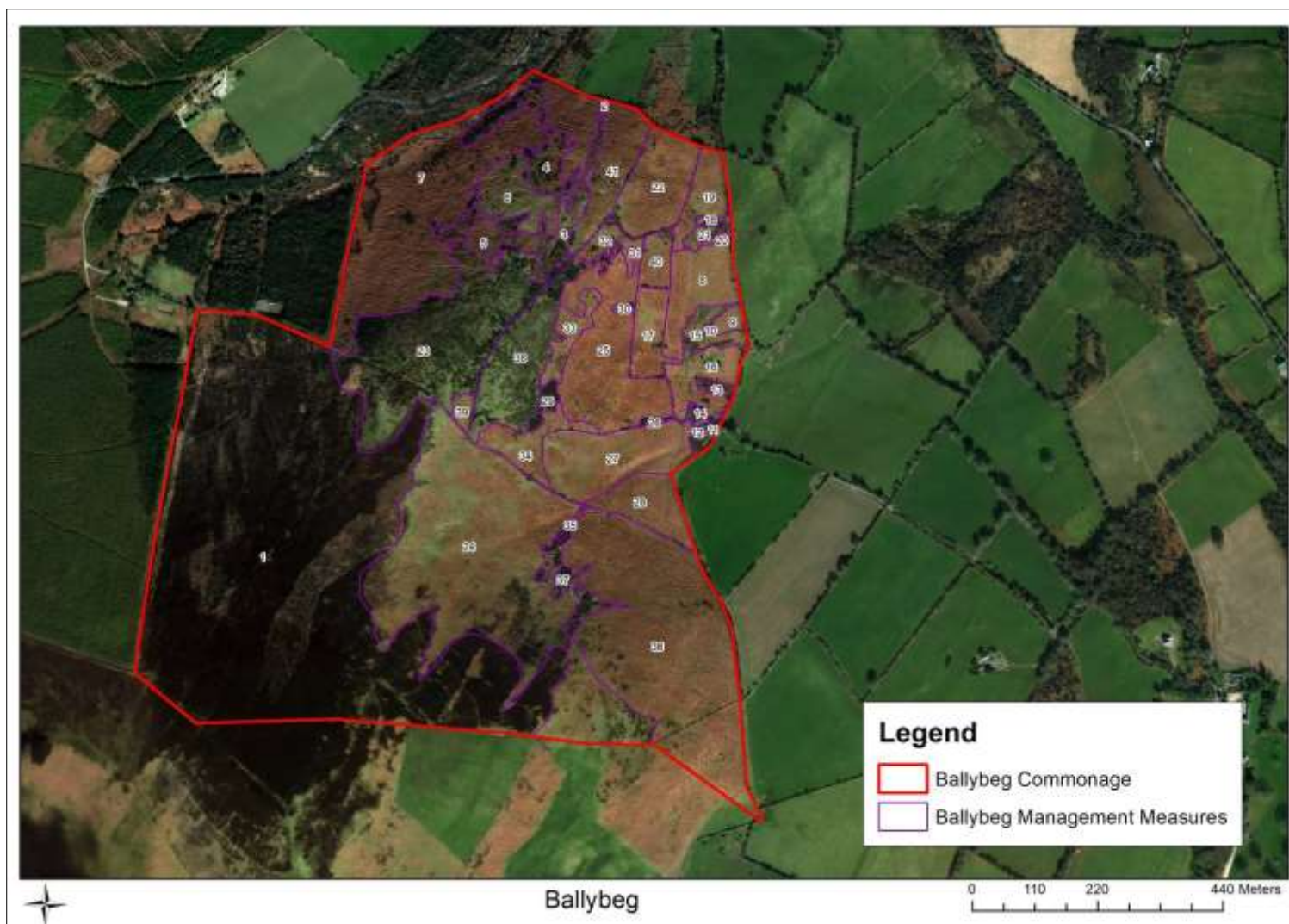


Figure 4. Management measures for Ballybeg.

**Table 1. Habitats present on Ballybeg Commonage and Management Recommendations.**

<b>Id</b>	<b>Annex I Code</b>	<b>Annex I Description</b>	<b>Fossitt Code</b>	<b>Habitat</b>	<b>Area (m)</b>	<b>Area (Ha)</b>	<b>Conservation Status</b>	<b>Management Measures</b>
1	4030/4010	Dry Heath/Northern Atlantic Wet Heaths with <i>Erica tetralix</i>	HH1/HH3	Dry Heath/ Wet Heath	305365	30.54	Unfavourable - Inadequate	<p>Ensure no further uncontrolled burning</p> <p>Monitor grazing and sheep movements to return to good condition.</p> <p>Graze with sheep/cattle/horses to open up</p>
2			HD1	Dense bracken	218	0.02	Unfavourable - Inadequate	<p>Control bracken</p> <p>Graze with sheep/cattle/horses to open up</p>
3			PF2	Poor fen and flush	9049	0.90	Favourable	<p>Control bracken surrounding the flush</p> <p>Monitor condition and move livestock if becoming poached</p>
4			HD1/WS1	Dense bracken/scrub	11967	1.20	Unfavourable - Inadequate	<p>Control bracken</p> <p>Graze with sheep/cattle/horses to open up</p> <p>Flail 50% of gorse if possible (retaining areas near the river as breeding habitat for birds)</p>
5			HD1	Dense bracken	5385	0.54	Unfavourable - Inadequate	<p>Control bracken</p>
6			GS3	Acid grassland	11868	1.19	Unfavourable - Inadequate	<p>Bracken beginning to encroach</p> <p>Graze with sheep/cattle/horses to open up</p>
7			HD1/GS3	Dense bracken/acid grassland	81015	8.10	Unfavourable - Inadequate	<p>Control bracken</p> <p>Graze with sheep/cattle/horses to open up</p>

<b>Id</b>	<b>Annex I Code</b>	<b>Annex I Description</b>	<b>Fossitt Code</b>	<b>Habitat</b>	<b>Area (m)</b>	<b>Area (Ha)</b>	<b>Conservation Status</b>	<b>Management Measures</b>
8			HD1	Dense bracken	15402	1.54	Unfavourable - Inadequate	Archaeological/cultural heritage interest  Recommend the use of sprays in this area to prevent damage to lazy beds or light stocking
9			HD1	Dense bracken	2099	0.21	Unfavourable - Inadequate	Bracken beginning to encroach  Graze with sheep/cattle/horses to open up  Ensure no significant poaching to adjoining flushed area
10			WS1	Scrub	271	0.03	Favourable	No measures required
11			HD1	Dense bracken	608	0.06	Favourable	Monitor bracken but adds diversity and cover in this area for breeding birds
12			PF2	Poor fen and flush	2325	0.23	Favourable	Monitor condition and move livestock if becoming poached
13			WS2	Immature woodland	1349	0.13	Favourable	Fence to allow natural regeneration and woodland development to continue
14			WS1	Scrub	448	0.04	Favourable	Provides cover for breeding birds - retain
15			PF2	Poor fen and flush	5407	0.54	Favourable	Monitor condition and move livestock if becoming poached
16			HD1	Dense bracken	11641	1.16	Unfavourable - Inadequate	Archaeological/cultural heritage interest  Recommend the use of sprays in this area to prevent damage to ring fort or light stocking
17			HD1	Dense bracken	9311	0.93	Unfavourable - Inadequate	Control bracken  Recommend trialling the use of horses or cattle in this enclosed field to see the effects of trampling on spring growth



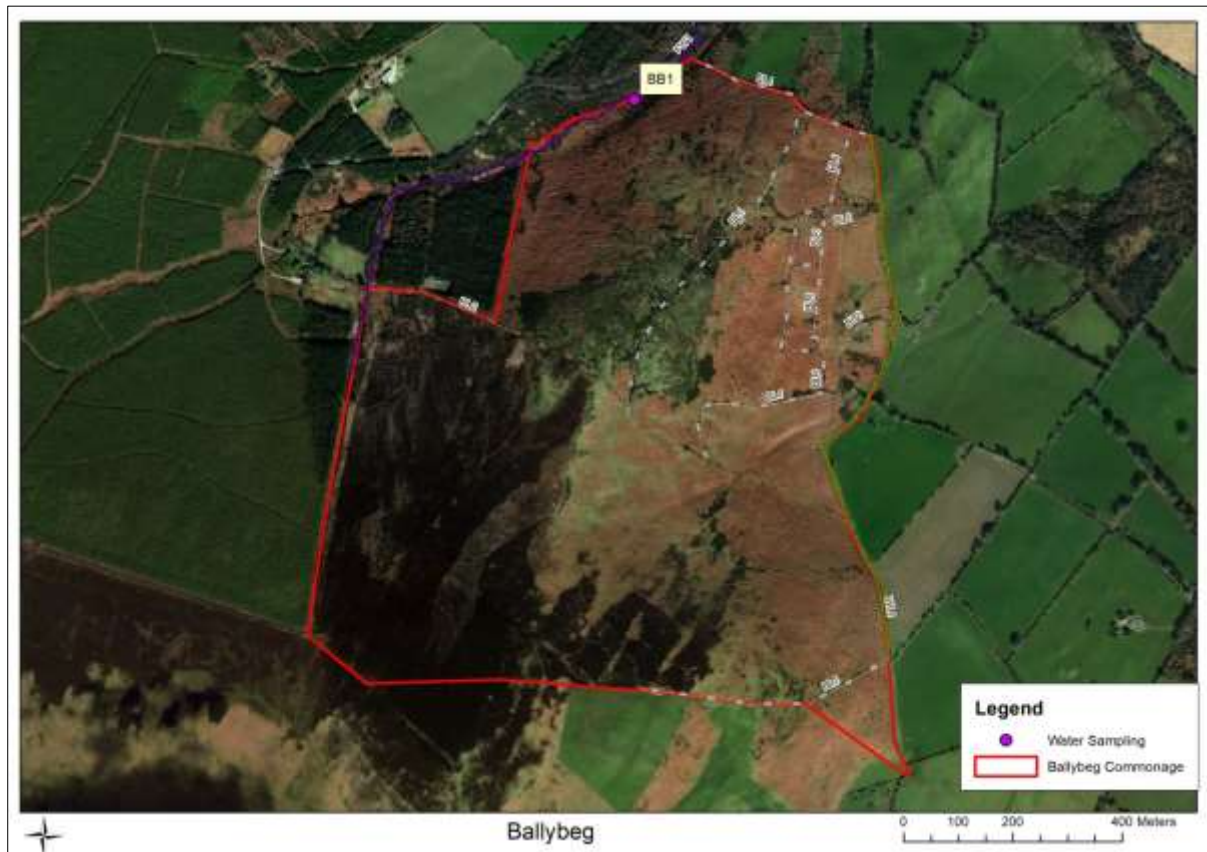
<b>Id</b>	<b>Annex I Code</b>	<b>Annex I Description</b>	<b>Fossitt Code</b>	<b>Habitat</b>	<b>Area (m)</b>	<b>Area (Ha)</b>	<b>Conservation Status</b>	<b>Management Measures</b>
18			HD1	Dense bracken	773	0.08	Unfavourable - Inadequate	Archaeological/cultural heritage interest  Recommend the use of sprays in this area to prevent damage to lazy beds or light stocking
19			HD1	Dense bracken	8995	0.90	Unfavourable - Inadequate	Archaeological/cultural heritage interest  Recommend the use of sprays in this area to prevent damage to lazy beds or light stocking
20			HD1	Dense bracken	699	0.07	Unfavourable - Inadequate	Archaeological/cultural heritage interest  Recommend the use of sprays in this area to prevent damage to lazy beds or light stocking
21			PF2	Poor fen and flush	2363	0.24	Favourable	Monitor condition and move livestock if becoming poached
22			HD1	Dense bracken	19060	1.91	Unfavourable - Inadequate	Archaeological/cultural heritage interest  Recommend the use of sprays in this area to prevent damage to lazy beds or light stocking
23			WS1/GS3	Scrub/acid grassland	67312	6.73	Unfavourable - Inadequate	Gorse beginning to dominate – open up with appropriate levels of grazing
24			GS3/HD1	Acid grassland/bracken mosaic	124040	12.40	Unfavourable - Inadequate	Bracken beginning to encroach  Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate as this is favouring grassland over heath and the heath is being browsed out.  Control bracken through grazing rather than sprays as bluebells beneath this layer which could be impacted.

<b>Id</b>	<b>Annex I Code</b>	<b>Annex I Description</b>	<b>Fossitt Code</b>	<b>Habitat</b>	<b>Area (m)</b>	<b>Area (Ha)</b>	<b>Conservation Status</b>	<b>Management Measures</b>
25			HD1	Dense bracken	35319	3.53	Unfavourable - Inadequate	Control bracken  Recommend trialling the use of horses or cattle in this enclosed field to see the effects of trampling on spring growth
26			WS1	Scrub	624	0.06	Favourable	Provides cover for breeding birds - retain
27			GS3/HD1	Acid grassland/bracken mosaic	25248	2.52	Unfavourable - Inadequate	Bracken beginning to encroach  Graze with sheep/cattle/horses to open up
28			GS3/HD1	Acid grassland/bracken mosaic	12603	1.26	Unfavourable - Inadequate	Bracken beginning to encroach  Graze with sheep/cattle/horses to open up
29			WS1	Scrub	2330	0.23	Unfavourable - Inadequate	Dense gorse in this area.  Has a biodiversity value for nesting birds.  Recommend that other areas of scattered gorse are controlled and to see if grazing prevents gorse from returning before effort is put into clearing this
30			PF2	Poor fen and flush	505	0.05	Favourable	Monitor condition and move livestock if becoming poached
31			WS1	Scrub	277	0.03	Favourable	Provides cover for breeding birds - retain
32			GS3/HD1/WS1	Acid grassland/bracken/scrub mosaic	4281	0.43	Unfavourable - Inadequate	Bracken (and minor gorse) beginning to encroach  Graze with sheep/cattle/horses to open up
33			GS3/HD1/WS1	Acid grassland/bracken/scrub mosaic	6309	0.63	Favourable	Bracken (and minor gorse) beginning to encroach  Graze with sheep/cattle/horses to open up

<b>Id</b>	<b>Annex I Code</b>	<b>Annex I Description</b>	<b>Fossitt Code</b>	<b>Habitat</b>	<b>Area (m)</b>	<b>Area (Ha)</b>	<b>Conservation Status</b>	<b>Management Measures</b>
34			GS3/HD1/WS1	Acid grassland/bracken/scrub mosaic	9770	0.98	Unfavourable - Inadequate	Bracken beginning to encroach  Graze with sheep/cattle/horses to open up
35			PF2	Poor fen and flush	792	0.08	Favourable	Monitor condition and move livestock if becoming poached
36			HD1	Dense bracken	95785	9.58	Unfavourable - Inadequate	Control bracken.  Monitor grazing and sheep movements.
37			WS1	Scrub	6868	0.69	Unfavourable - Inadequate	Some localised control of gorse may be required to ensure that it does not spread further on the hill – grazing should keep it in check. Adds some value for breeding birds in this part of the hill.
38			GS3/WS1	Acid grassland/scrub mosaic	26256	2.63	Unfavourable - Inadequate	Some localised control of gorse  Graze with sheep/cattle/horses to open up
39			GS3/HD1	Acid grassland/bracken mosaic	2074	0.21	Unfavourable - Inadequate	Bracken beginning to encroach  Graze with sheep/cattle/horses to open up
40			HD1	Dense bracken	5182	0.52	Unfavourable - Inadequate	Control bracken  Recommend trialling the use of horses or cattle in this enclosed field to see the effects of trampling on spring growth of bracken
41			GS3/HD1	Acid grassland/bracken mosaic	15345	1.53	Unfavourable - Inadequate	Bracken beginning to encroach  Graze with sheep/cattle/horses to open up

## 5. Water Quality

A water sample was taken on the Ballycumber South Stream in February 2019 at one sampling location as shown on **Figure 5** below. This location was chosen as the other areas of the watercourse in the commonage adjoin a conifer plantation (WD4). The water sample was assessed by Carl Dixon. The Ballycumber South Stream (BB1) was assessed as 'Indeterminate – may be at risk of not achieving 'Good' water quality status'.



**Figure 5. Water quality sample location at Ballybeg.**

The Small Streams Risk Score (SSRS) is a biological risk assessment system for identifying rivers that are definitely 'at risk' of failing to achieve the 'good' water quality status goals of the Water Framework Directive (WFD). It was developed by the Environmental Protection Agency (EPA) in association with the Western River Basin District (WRBD) in 2006. The main aim of the SSRS is to support the programme of measures for the WFD, which has its main objective to achieve 'good' water quality status in all water bodies by 2020.

### *Previous Data*

There has been some previous water quality monitoring on streams and watercourses in the area associated with the development of the nearby Ballycumber Windfarm<sup>3</sup>.

Three sampling points, which are in close proximity to the Ballybeg commonage (**Sites 1, 2 and 3**), are described below in **Table 1** and their locations are shown below on **Figure 6**. Site 4 was located on the Derry River near Tinahealy village.

<sup>3</sup> Sweeney, P. & N. Sweeney (2012). Biological Water Quality of Streams and Rivers in the Vicinity of the Proposed Windfarm at Ballycumber, Co. Wicklow. Ballycumber Windfarm Environmental Impact Statement.



Table 1. Water sampling locations associated with the Ballycumber Windfarm.

TABLE 1				
	Site 1	Site 2	Site 3	Site 4
<b>Location</b>	Stream 1. Upstream of small public road, c. 400m upstream of confluence with Derry Water.	Stream 2 c. 5m upstream of confluence with Derry Water.	Derry Water. Immediately downstream of the ford downstream of the confluence of Stream 2	Derry River. c. 250m upstream of the bridge in Tinahely.
<b>Grid Reference</b>	T0440 7774	T0498 7713	T0499 7712	T0364 7334
<b>Width (m.)</b>	2.5	2.0	8	8
<b>Depth (cm.)</b>	5	20	30 - 60	30 - 50
<b>Substrate Composition (in order of occurrence)</b>	1. Gravel 2. Sand	1. Cobble 2. Sand 3. Gravel	1. Large rocks 2. Sand 3. Cobble 4. Gravel	1. Gravel 2. Sand 3. Cobble
<b>Flow Type</b>	Riffle: 100%	Riffle: 100%	Riffle: 100%	Riffle: 100%
<b>Shade</b>	High	High	High	Moderate
<b>Dominant Bankside Vegetation</b>	Ash, Hawthorn, Sitka Spruce	Birch, Holly	Alder Ash, Birch	Alder, Willow

The results of water sampling in these streams conducted by Sweeney in 2009 and 2012 are presented below:

TABLE 6. Q-values 2009 & 2012		
	2009	2012
<b>Site 1: Stream 1</b>	Not suitable for Q-scheme	Not suitable for Q-scheme
<b>Site 2: Stream 2</b>	Q4-5	Q4
<b>Site 3: Derry Water</b>	Q4-5	Q4
<b>Site 4: Derry River</b>	Q4-5	Q3-4

These results show a decline in biological water quality from 2009 to 2012 at the three sites where the Q-scheme can be applied. The drop to Q3-4 at the bridge at Tinahely on the Derry River was also reported by EPA in 2010 (Appendix 3).

This water sampling shows that Stream 2, which is the stream coming off the Ballycumber Ridge and through the commonage, has shown a decrease in water quality from Q4-5 in 2009 to Q4 in 2012.



Figure 6. Water sampling locations associated with the Ballycumber Windfarm near Ballybeg Commonage. Site 2 is located downstream of the commonage on Ballycumber Stream South.

# SUAS Water Quality Sampling - Ballycumber South Stream

<b>River:</b>	<b>Code:</b>	<b>Date:</b>	<b>Sample Taken By:</b>
Ballycumber South Stream	IE_EA_10D020600	19/02/2019	Faith Wilson
<b>Sample Number:</b>	<b>Location:</b>	<b>Stream Order:</b>	<b>Grid Reference:</b>
BB1	Adjacent to Ballybeg commonage	1 <sup>st</sup> order	T 04582 76775
<b>Velocity:</b>	<b>Clarity:</b>	<b>Colour:</b>	<b>Discharge:</b>
Torrential	<b>Very clear</b>	<b>None</b>	Flood
<b>Fast</b>	Clear	Slight	<b>Normal</b>
Moderate	Slightly turbid	Moderate	Low
Slow	Highly turbid	High	Very low
Very Slow			Dry
			Recent flood
<b>Modifications: N</b>	<b>Dominant Types:</b>	<b>Slope:</b>	<b>Geology:</b>
Canalised	<b>Bedrock</b>	Low	Calcareous
Widened	<b>Boulder (&gt;128mm)</b>	<b>Medium</b>	<b>Siliceous</b>
Bank erosion	<b>Cobble (32 - 128mm)</b>	High	Mixed
Arterial drainage	<b>Gravel (8 - 32mm)</b>	Very high	
	Fine gravel (2 - 8mm)		
	Sand (0.25mm - 2mm)		
	Silt (<0.25mm)		
<b>Substratum Condition:</b>	<b>Substratum:</b>	<b>Degree of Siltation:</b>	<b>Depth of Mud:</b>
Compacted	<b>Stoney bottom</b>	<b>Clean</b>	<b>None</b>
<b>Loose</b>	Muddy bottom	Slight	<1cm
Normal	Mud over stones	Moderate	1-5cm
		Heavy	5-10cm
			>10cm
<b>Litter:</b>	<b>Filamentous Algae:</b>	<b>Stream Flow:</b>	<b>Shading:</b>
None	<b>None</b>	<b>Riffle</b>	High
<b>Present</b>	Present	Riffle/glide	<b>Moderate</b>
Moderate	Moderate	Slow flow	Low
Abundant	Abundant		None
<b>Stock Access:</b>	<b>Sewage Fungus:</b>	<b>Sample Type (Mins): 3</b>	<b>Main Land Use Adjacent/Upstream:</b>
<b>Yes - from the adjoining commonage</b>	<b>None</b>	<b>Kick sample - 2</b>	Pasture
	Present	<b>Stone washing - 1</b>	<b>Bog</b>
	Moderate	Weed sweep	<b>Forestry</b>
	Abundant		Tillage
			Urban
			<b>Other - windfarm</b>





Plate 1. Photographic record of sampling location.

Ballybeg 1

[illegible]

NOTE: *Diatra* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

BALLYBEG 2

**Step 1.** Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from *each macroinvertebrate group* calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.

<p><b>Group 1 - 3 Tails</b> Ephemeroptera</p> <p>No. of taxa</p> <p>0 1 2+</p> <p>Relative Abundance</p> <p>Score</p> <p>0 4 6 4 8</p>	<p><b>Group 2 - 2 Tails</b> Plecoptera</p> <p>No. of taxa</p> <p>0 1 2+</p> <p>Relative Abundance</p> <p>Score</p> <p>0 4 6 6 8</p>
<p><b>Group 3</b> Trichoptera</p> <p>No. of taxa</p> <p>0 1-2 3+</p> <p>Relative Abundance</p> <p>Score</p> <p>0 2 4 4</p>	<p><b>Group 4</b> G.O.L.D</p> <p>No. of taxa</p> <p>0 1-2 3+</p> <p>Relative Abundance</p> <p>Score</p> <p>0 4 2 0 4 0</p>
<p><b>Group 5</b> Amphibia</p> <p>No. of taxa</p> <p>Absent Few (1-20) Common (&gt;20)</p> <p>Score</p> <p>0 2 0</p>	<p><b>Step 2</b></p> <p>a) Index Score Group 1</p> <p>b) Index Score Group 2</p> <p>c) Index Score Group 3</p> <p>d) Index Score Group 4</p> <p>e) Index Score Group 5</p>

**Step 3.** Calculate the Total Index Score, the Average Index Score and the SSR Score using the boxes below

Total Index Score (TIS)  
sum (as recorded) **18**

Average Index Score (AIS)  
TIS/5 (5 for 5 groups) **3.6**

SSR Score  
(AIS x 2) **7.2**

**Step 4.** Assess the stream by comparing the final SSR score with the categories below and tick the appropriate box

> 7.25  
Probably not at risk ☐

> 6.5 - 7.25  
Indeterminate  
Stream may be at risk ☒

< 6.5  
Stream at risk ☐

Surveyor (signed): [Signature] Name (print): CARL DIXON Date: 1/1/1