

Glassavullaun Commonage

2020 Ecological Survey



Final Report

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Glassavullaun Commonage

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Glassavullaun Commonage

2020 Ecological Survey

1. Introduction

A baseline habitat condition and ecological survey and habitat management plan was prepared for the Glassavullaun Commonage in 2019¹ and the measures within same underwent screening for Appropriate Assessment².

A Commonage Management group was established for the commonage and the implementation of the management prescriptions in the plan began in 2020.

The management prescriptions in the plan set out to address the impacts highlighted in the report and to ensure that 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 areas of upland blanket bog are now so badly damaged from burning that they no longer correspond to the habitat **7130 Blanket Bog** and are best described as eroding blanket bog.

However, in the long term, **Favourable status** should be aimed for, as well as the protection for the legally protected plant species, Bog Orchid (*Hammarbya paludosa*).

The major impacts arise from a legacy of decades of uncontrolled burning, inappropriate grazing (from both sheep and also from deer) which has not allowed burnt areas to recover and has also favoured the development of acid grassland over heath, lack of control of bracken, and to a lesser extent recreational access on the ridge from quad, scrambler, ATV bikes and mountain bikes, resulting in localised peat erosion along the track, coupled with natural exposure and erosion following burning activities.

The management prescriptions in the SUAS plan for the commonage also need to ensure that **Favourable status** is achieved for the Annex I bird species, which form the Special Conservation Interests for this SPA:

- Peregrine falcon (*Falco peregrinus*),
- Merlin (*Falco columbarius*).

The extent of habitats present within the commonage and their affinities to either Fossitt (Level 3) or Annex I habitats on the Glassavullaun Commonage 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 commonage as detailed in **Table 1** below and mapped on **Figure 4 (See Appendix 1)**.

2. SUAS Vegetation Management Measures

¹ Wilson, F. (2019). Ecological Baseline Survey prepared for Glassavullaun Commonage as part of the Commonage Management Plan for SUAS. 5th December 2019. Unpublished report for SUAS EIP.

² Wilson, F. (2019). Report for Screening for Appropriate Assessment for a Commonage Management Plan at Glassavullaun, Co. Wicklow in accordance with the requirements of Article 6(3) of the EU Habitats Directive. 15th November 2019. Unpublished report for SUAS EIP.

The proposed management measures for the Glassavullaun commonage in 2019 under SUAS were as follows:

Year 1 (2020)

1. Carry out repairs to the track in areas 27 & 28 to allow improved access by quad for management purposes.
2. Spray bracken alongside the track in area 27 to allow sheep to be moved more easily along the track, as it is currently closed in in a lot of places. Spray 2-3m wide each side of the track.
3. Spray bracken (approx. 3ha in total) with Asulox to control Bracken. Start in areas 33 & 39 where bracken is encroaching on dry heath areas. Use a bracken bruiser on slopes where it is possible to travel with a quad. Spray area of bracken in area 27, enclosed by walls and owned by Glen Jones, to see how practical & successful it is.
4. Cut back encroaching scrub in plots 1, 2 & 3.
5. Reduce sheep grazing pressure in areas that were burned in recent years, especially in the late summer/early autumn period. Use feed buckets and active shepherding to encourage more grazing in areas of taller heather and bracken areas.
6. Plant some areas of native trees along Slade Brook to help prevent erosion and provide some protection from flooding. Fence off a few areas and allow to self-seed, may need bracken control there.
7. Fence off at least 2 enclosure areas in areas 20 & 29 to see if we get natural regeneration of trees.

Year 2 (2021)

1. Carry out further bracken control in areas 16, 20, 39, using asulox herbicide and by bruising.
2. Cut back encroaching scrub in plots 1, 2 & 3
3. Reduce sheep grazing pressure in areas that were burned in recent years, especially in the late summer/early autumn period. Use feed buckets to encourage more grazing in areas of taller heather and bracken areas.
4. Carry out controlled burning in N/W of area 33 to control tall heather.

Year 3 (2022)

To be reviewed at the end of year 2

Shepherding

Average time per shepherding: 6 Hours

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

Identified objective of the shepherding;

- Move off sheep from neighbouring commonages.
- Sheep to be moved off area recently burned areas and along ridges regularly to reduce grazing pressure there and allow vegetation to recover. Move sheep into the taller vegetation regularly to get them to graze these areas.
- 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

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 to overgrown areas in Jan/Feb time.

Set up a number of enclosures for deer & sheep in the bare peat areas to see if natural regeneration will take place.

Details of sheep stocking rates proposed

Sheep numbers grazing the commonage shall be accurately monitored in year 1, in conjunction with shepherding and use of feed buckets to control location of grazing. Based on a review of these numbers, sheep grazing numbers may be amended for the following year based on the condition of the commonage and rate of recovery of damaged areas.

Ecological Assessment

The commonage was surveyed in October 2020 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. 2020 Walkover Survey

The following observations, comments on same and recommendations on the works completed in 2020 are presented.

3.1 Bracken Control

Bracken control was implemented in 2020 in Area 27 adjoining the track. This was done between the 28th August & the 12th September using a hand lance on a quad sprayer. A dilution rate of 100 to 1 of asulox, at a ret of 11 litres per ha was applied and an area of 1.5 ha was treated. Bracken control was also implemented in Area 27, 33 and 39 using a bracken bruiser during the same period.



Plate 1. Bracken control in Area 27.

The bracken appears to have been knocked back here quite successfully. This will be further assessed in 2021.



Plate 2. Bracken control in Area 27- looking upslope.



Plate 3. Bracken control in the eastern part of Area 27- looking north west across the slope.



Plate 4. Bracken control along access track downslope into the eastern part of Area 27.



Plate 5. Regeneration of bilberry below bracken in the eastern part of Area 27.

3.2 Upland Gully Woodland Restoration

The establishment of gully woodland along the two watercourses in the commonage through a variety of techniques is to be conducted in early 2021.

Some mature stands of gully woodland are present and these should be expanded and connected to remnant areas with additional planting and tree establishment measures. The terrain along the watercourses will provide some shelter for trees from exposure and wind but they will need significant protection from browsing pressure and deer.



Plate 6. Looking over areas of treated bracken towards the Slade Brook and mature gully woodland habitat.

Ground around scattered trees and shrubs on the rocky slopes in Area 20 and 29 will be fenced to see if natural regeneration from this seed source can become established in the absence of grazing pressure.



Plate 7. Fencing around trees such as these will allow us to see if natural regeneration from this seed source can become established in the absence of grazing pressure.

3.3 Access Track

Upgrading of the old existing access track onto and across the hill was an agreed measure as part of SUAS and this work was carried out between the 9th May and the 20th May 2020. It was unclear if this work was fully completed prior to the site visit and additional works are recommended in terms of the addition of water bars and other works to reduce erosion and water run off.

An additional track was created running east from this – possibly to provide access for the quad and bracken bruiser to the eastern portion of Area 27. There was removal of stones and other material here with a machine, significant rutting of ground by a machine and general disturbance of vegetation including areas of wet heath all of which provide a pathway for water to erode the underlying peat.

This is further exacerbated by the route chosen, which is directly downslope as opposed to contouring across the hill in a gentle zig zag, travelling on drier ground and avoiding Annex habitats.

These works will require remediation and considered design. This new track is visible from the public roads coming down from the Featherbeds into the Bohernabreena Valley.

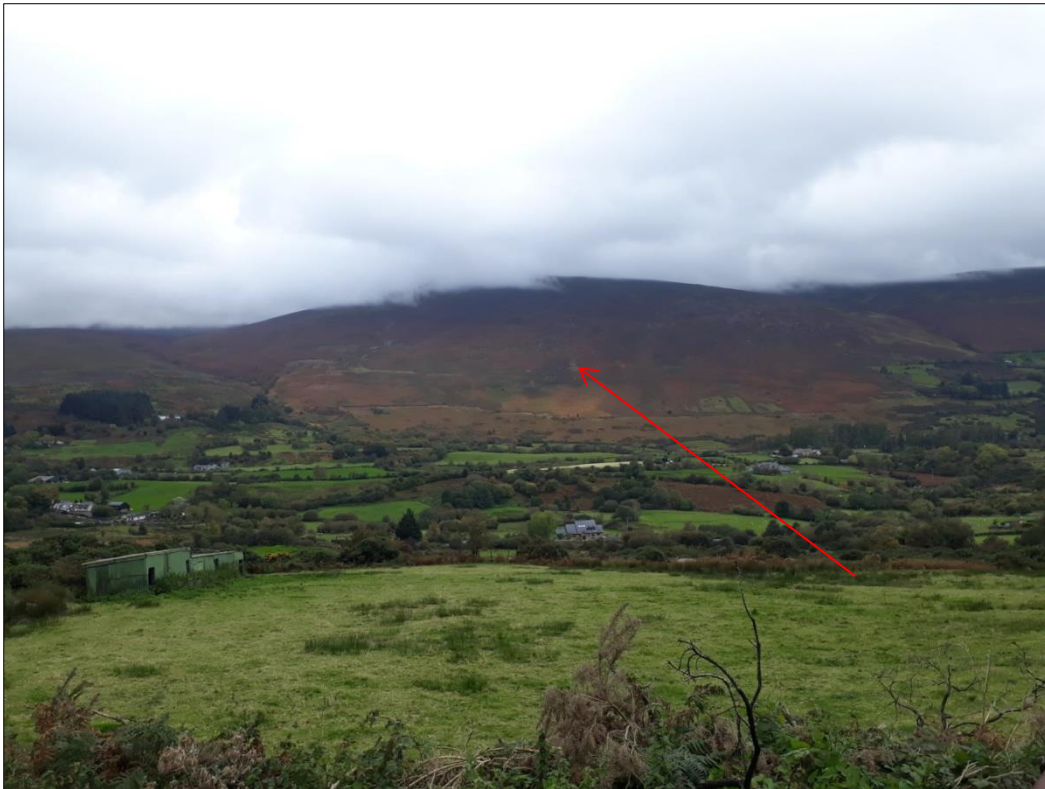


Plate 8. The track across the hill is clearly visible within the commonage now as bracken cover has been reduced in the vicinity of same.

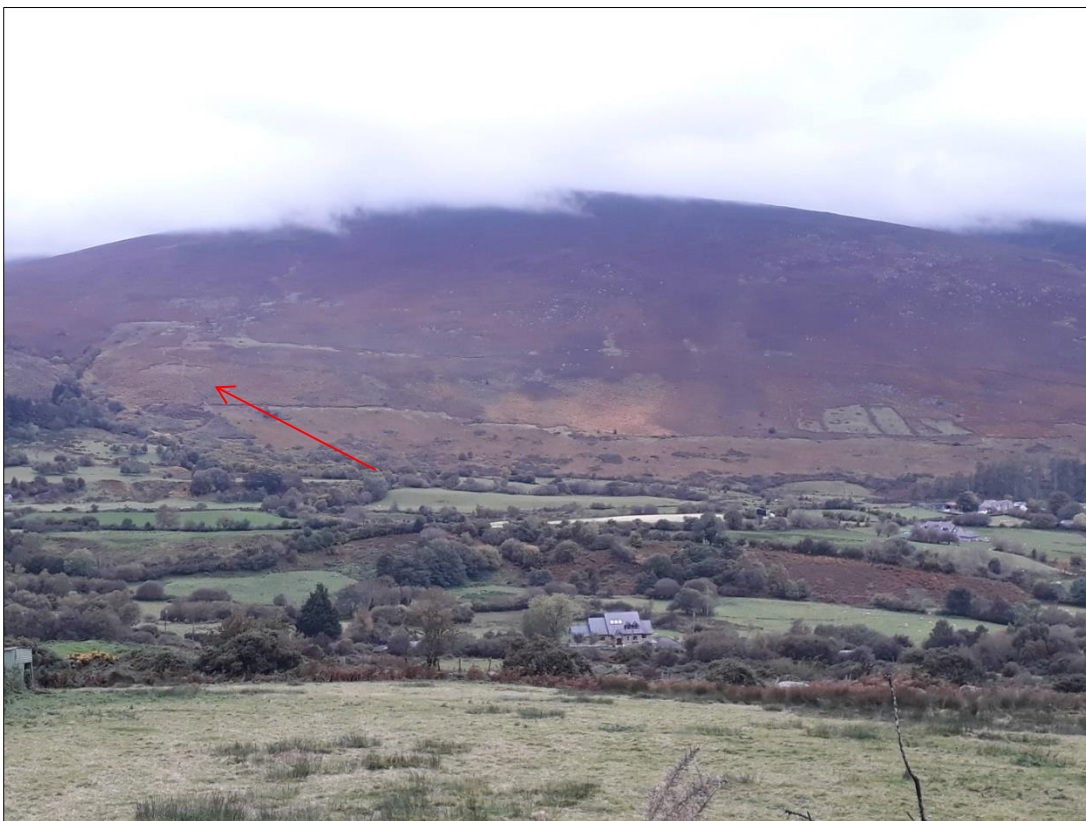


Plate 9. The new track created running directly downslope in Area 27 and the cleared areas of bracken can be seen.



Plate 10. Damage caused by the new section of track.



Plate 11. The new section of track travelled through areas of wet heath, which should have been avoided.

3.4 Burnt Areas

Large areas of badly damaged hillside following burning in Area 33 are slowly beginning to revegetate. These are dominated by a low sward of ling heather of uniform height. There is occasional growth of bilberry but this is sparse. In some parts both hare's tail and common cotton grass are beginning to get established but cross leaved heath and *Sphagnum* moss cover remains very rare.



Plate 12. Uniform sward of heather regrowth following burning in Area 33.

3.5 Acid Grassland Habitats

The areas of acid grassland within the commonage below the treated/bruised bracken contains a good diversity of species including tormentil, wood sorrel, bilberry, heath bedstraw and grasses and grazing pressure in these areas needs to be managed through active shepherding, hunting out of sheep from these areas and the use of buckets to encourage sheep out of these areas to allow elements of heath vegetation to recover. There has been some localised damage to this habitat from quad access and some areas are at risk of erosion.



Plate 13. Quad access beginning to pose a threat of erosion.

3.6 Gorse Removal/Rare Plant Protection

Gorse removal had reportedly taken place in Areas 1, 2 and 3 but evidence of this was not obvious during the site visit and it was unclear if this has not yet been tackled.

The commonage members need to be cognisant of the presence of a legally protected plant in this area (Bog orchid *Hammarbya paludosa*) and works here may need a licence from NPWS and to be supervised by an ecologist. This will be clarified with NPWS before works commence.



Plate 14. European gorse in Areas 1, 2 and 3 will be tackled under supervision in 2021.

3.7 Faunal Observations

One pair of red grouse were flushed during the walkover. Grouse were favouring the upper slopes of Area 33 on the hill.

A single merlin was seen hunting along the contour line of the access track and was being mobbed by ravens. Meadow pipit and skylark were also recorded.

Snipe were flushed from the wet ground on the lower slopes in Area 3.

3.8 Deer control

Twenty invasive Sitka deer hybrids were recorded during the site visit. Deer populations on the commonage need to be addressed and culled in a collaborative programme with NPWS, Irish Water, private forest owners, Coillte and adjoining commonage shareholders.

3.7 Management for 2021

A review of the works which were proposed for 2020 in the plan, coupled with the outcomes from the 2020 walkover was conducted. Items highlighted in red have not been completed. This has informed the proposed works for 2021.

2020

1. Carry out repairs to the track in Areas 27 & 28 to allow improved access by quad for management purposes.
2. Spray bracken alongside the track in Area 27 to allow sheep to be moved more easily along the track, as it is currently closed in in a lot of places. Spray 2-3m wide each side of the track.
3. Spray bracken (approx. 3ha in total) with Asulox to control Bracken. Start in Areas 33 & 39 where bracken is encroaching on dry heath areas. Use a bracken bruiser on slopes where it is possible to travel with a quad. Spray area of bracken in Area 27, enclosed by walls and owned by Glen Jones, to see how practical & successful it is.
4. Cut back encroaching scrub in plots 1, 2 & 3 by hand as it is too wet for machinery
5. Reduce sheep grazing pressure in areas that were burned in recent years, especially in the late summer/early autumn period. Use feed buckets and active shepherding to encourage more grazing in areas of taller heather and bracken areas.
6. Plant some areas of native trees along Slade Brook to help prevent erosion and provide some protection from flooding. Planting will use appropriate species of local provenance and be based on recommendations from a suitably qualified consultant with appropriate experience. Fence off a few areas along these gullies and allow to self-seed, (may need bracken control there).
7. Fence off at least 2 enclosure areas in areas 20 & 29 to see if we get natural regeneration of trees.

Works in red were not carried out

2021

1. Carry out further bracken control along the margins of 33 & 39 where the bracken is encroaching into the Annex I habitat using asulox herbicide and by bracken bruising with a quad if safe to do so. Spraying to be concentrated where bracken is encroaching into dry heath areas. Plan for 3ha to be sprayed if asulox is available for use in 2021. Additional bracken control to continue in Areas 20, 27, 28 and 29
2. Cut back encroaching scrub in plots 1, 2 & 3 once a licence and approval from NPWS has been granted. The license may require that these works are supervised by an ecologist to ensure the protection of the Bog Orchid. Annual monitoring of this population will be conducted under the SUAS project.
3. Reduce sheep grazing pressure in areas that were burned in recent years, especially in the late summer/early autumn period. Use feed buckets to encourage more grazing in areas of taller heather and bracken areas.
4. Plant at least 150 native trees along the river gullies & in the upland grassland areas around existing/extant trees.
5. Fence off at least 2 enclosure sites to see if natural regeneration of trees occurs, with bracken sprayed in at least one of these enclosures.

Other works to be carried out for entire commonage

Use feed buckets to encourage more sheep grazing the commonage in the Jan/Feb and April/May period. Discourage grazing in Area 3 as this could impact on the legally protected plant.

4. Appendix 1. Maps & Management Recommendations

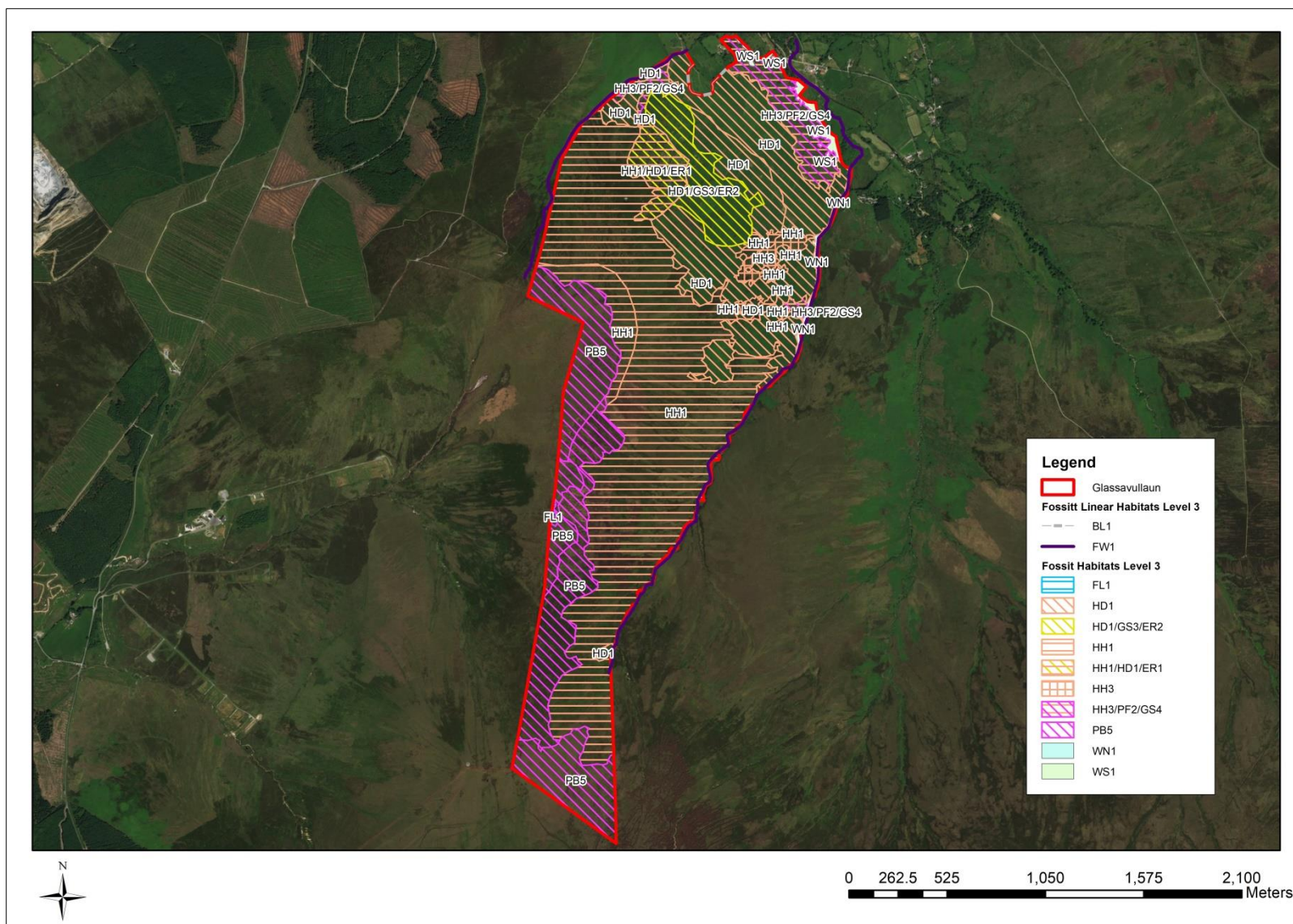


Figure 1. Habitats mapped to Level Three (Fossitt, 2000) within the Glassavullaun commonage.

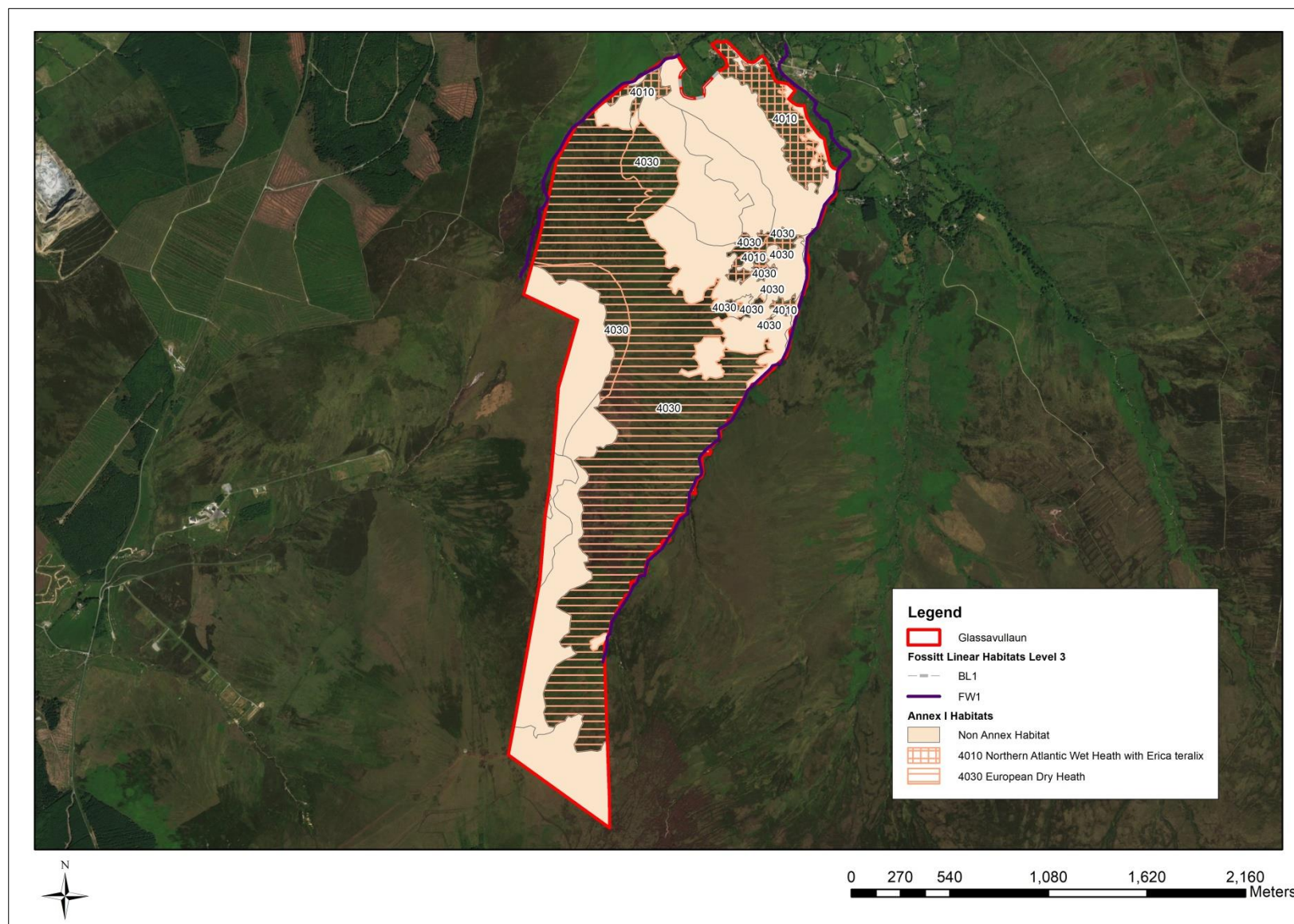


Figure 2. Habitats mapped according to their correspondence with Annex I habitats within the Glassavullaun commonage.

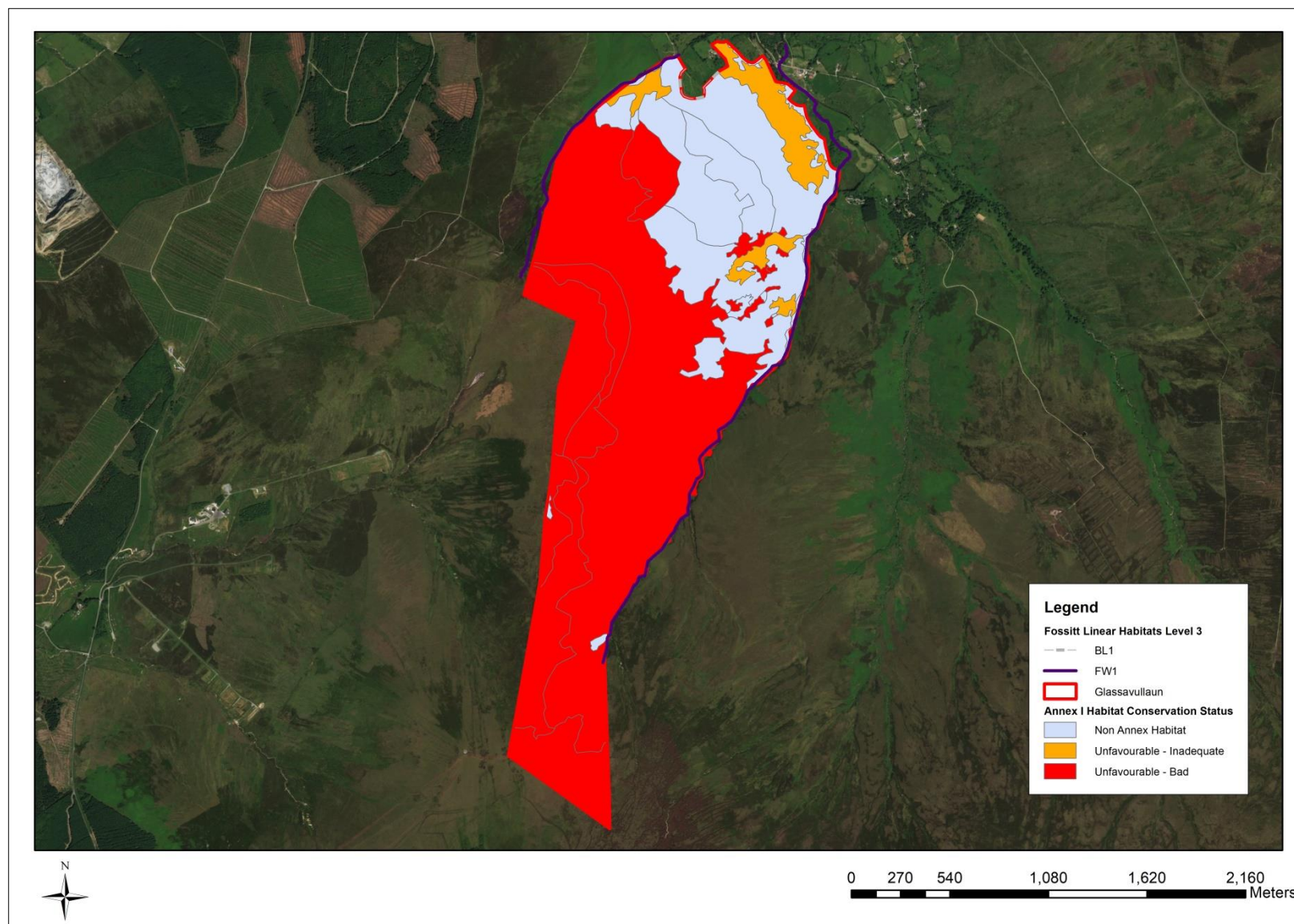


Figure 3. Habitat Condition Assessment for Glassavullaun Commonage.

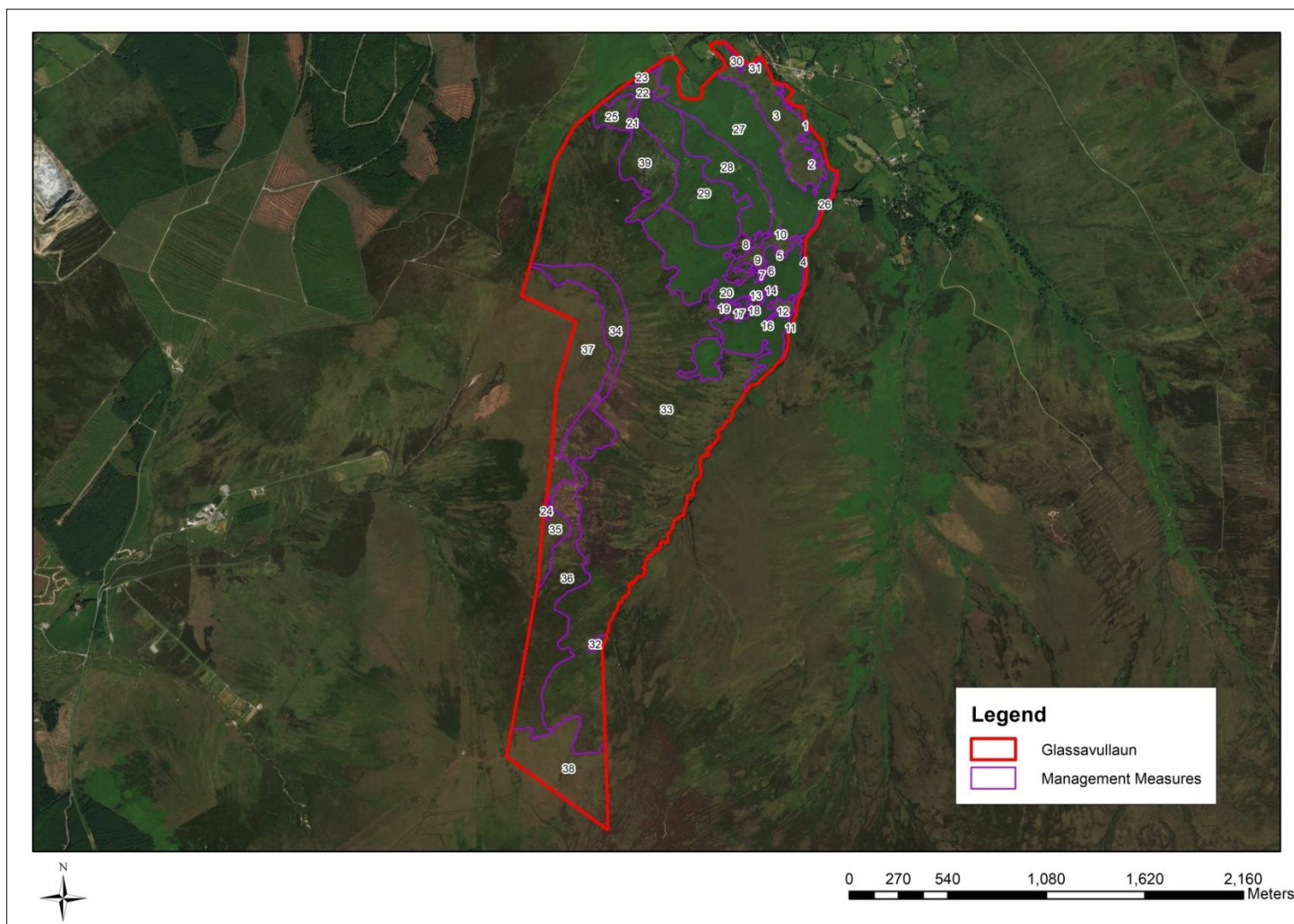


Figure 4. Management measures for Glassavullaun.

Table 1. Habitats present on Glassavullaun Commonage and Management Recommendations.

Id	Annex 1 Code	Fossitt Code	Habitat	Area (m²)	Conservation Status	Management Prescription
1		WS1	Scrub	18928		Cut and remove encroaching gorse in areas of wet heath/flush
2		WS1	Scrub	2493		Cut and remove encroaching gorse in areas of wet heath/flush
3	4010	HH3/PF2/GS4	Wet Heath/Wet Flush	133468	Unfavourable - Inadequate	No further burning. Cut and remove encroaching gorse in areas of wet heath/flush
4		WN1	Gully Woodland	6592		Extend woodland area along this watercourse through new planting, protection from browsing, development of exclosures within areas of bracken
5	4030	HH1	Dry Heath	1860	Unfavourable - Bad	No further burning. Control bracken which is beginning to invade the habitat.
6	4030	HH1	Dry Heath	1547	Unfavourable - Bad	No further burning. Control bracken which is beginning to invade the habitat.
7	4030	HH1	Dry Heath	3855	Unfavourable - Bad	No further burning. Control bracken which is beginning to invade the habitat.
8	4030	HH1	Dry Heath	14660	Unfavourable - Bad	No further burning. Control bracken which is beginning to invade the habitat.
9	4010	HH3	Wet Heath	34043	Unfavourable - Inadequate	No further burning. Control bracken which is beginning to invade the habitat.

Id	Annex 1 Code	Fossitt Code	Habitat	Area (m²)	Conservation Status	Management Prescription
10	4030	HH1	Dry Heath	1435	Unfavourable - Bad	No further burning. Control bracken which is beginning to invade the habitat.
11		WN1	Gully Woodland	6735		Extend woodland area along this watercourse through new planting, protection from browsing, development of exclosures within areas of bracken
12	4010	HH3/PF2/GS4	Wet Heath/Wet Flush	9827	Unfavourable - Inadequate	No further burning. Control bracken which is beginning to invade the habitat.
13		HD1	Dense Bracken	1429		Control bracken
14	4030	HH1	Dry Heath	1514	Unfavourable - Bad	No further burning. Control bracken which is beginning to invade the habitat.
15		HD1	Dense Bracken	421		Control bracken
16	4030	HH1	Dry Heath	1763	Unfavourable - Bad	No further burning. Control bracken which is beginning to invade the habitat.
17		HD1	Dense Bracken	7126		Control bracken
18	4030	HH1	Dry Heath	5503	Unfavourable - Bad	No further burning. Control bracken which is beginning to invade the habitat.
19	4030	HH1	Dry Heath	3310	Unfavourable - Bad	No further burning. Control bracken which is beginning to invade the habitat.
20		HD1	Dense Bracken	345190		Control bracken
21		HD1	Dense Bracken	3716		Control bracken

Id	Annex 1 Code	Fossitt Code	Habitat	Area (m²)	Conservation Status	Management Prescription
22	4010	HH3/PF2/GS4	Wet Heath/Wet Flush	29212	Unfavourable - Inadequate	<p>No further burning.</p> <p>Control bracken which is beginning to invade the habitat.</p> <p>Extend woodland area along this watercourse through new planting, protection from browsing, development of exclosures within areas of bracken</p>
23		HD1	Dense Bracken	4648		<p>Control bracken</p> <p>Extend woodland area along this watercourse through new planting, protection from browsing, development of exclosures within areas of bracken</p>
24		FL1	Bog Pools	2742		No further burning. Exclude grazers from the ridge
25		HD1	Dense Bracken	28162		<p>Control bracken</p> <p>Control bracken which is beginning to invade the habitat.</p> <p>Extend woodland area along this watercourse through new planting, protection from browsing, development of exclosures within areas of bracken</p>
26		WN1	Gully Woodland	4901		Extend woodland area along this watercourse through new planting, protection from browsing, development of exclosures within areas of bracken
27		HD1	Dense Bracken	274421		<p>Control bracken</p> <p>Extend woodland area along this watercourse through new planting, protection from browsing, development of exclosures within areas of bracken</p>
28		HD1	Dense Bracken	124690		Control bracken
29		HD1/GS3/ER2	Dense Bracken/ Acid Grassland/Exposed Rocks	190236		Control bracken
30		WS1	Scrub	5811		Cut and remove encroaching gorse in areas of wet heath/flush

Id	Annex 1 Code	Fossitt Code	Habitat	Area (m²)	Conservation Status	Management Prescription
31		WS1	Scrub	565		Cut and remove encroaching gorse in areas of wet heath/flush
32		HD1	Dense Bracken	4891		Control bracken
33	4030	HH1	Dry Heath	1545056	Unfavourable - Bad	<p>No further burning.</p> <p>This area was extremely badly burnt over numerous years in the last two decades including in April 2019. This has resulted in the degradation of the peatland vegetation here and drying out of the peat which is cracking in several locations and is at risk of erosion and landslide.</p> <p>Restoration of the vegetation is required.</p> <p>Destocking and exclusion of grazing is recommended.</p> <p>Regular shepherding to hunt out trespassing sheep.</p> <p>Control bracken which is beginning to invade the dry heath on the lower slopes</p> <p>Extend woodland area along this watercourse through new planting, protection from browsing, development of exclosures within areas of bracken</p>
34	4030	HH1	Dry Heath	95296	Unfavourable - Bad	<p>No further burning.</p> <p>This area was extremely badly burnt over numerous years in the last two decades including in April 2019. This has resulted in the degradation of the peatland vegetation here and drying out of the peat which is cracking in several locations and is at risk of erosion and landslide.</p> <p>Restoration of the vegetation is required.</p> <p>Destocking and exclusion of grazing is recommended.</p> <p>Regular shepherding to hunt out trespassing sheep.</p> <p>Control bracken which is beginning to invade the dry heath</p>

Id	Annex 1 Code	Fossitt Code	Habitat	Area (m ²)	Conservation Status	Management Prescription
35		PB5	Eroding Blanket Bog	58408	Unfavourable - Bad	<p>No further burning.</p> <p>This area was extremely badly burnt over numerous years in the last two decades. This has resulted in the degradation of blanket bog vegetation on the ridge and drying out of the peat which is cracking in several locations and is at risk of erosion and landslide.</p> <p>Restoration of the blanket bog vegetation is required.</p> <p>Destocking and exclusion of grazing is recommended.</p> <p>Regular shepherding to hunt out trespassing sheep.</p> <p>Bad erosion in the vicinity of the track. Track repairs required. The bog surface has been damaged here by a quad/ATV/Scrambler. No further quad/scrambler access to the entire commonage should be allowed – on other commonages this has been controlled through locked gates.</p>

Id	Annex 1 Code	Fossitt Code	Habitat	Area (m ²)	Conservation Status	Management Prescription
36		PB5	Eroding Blanket Bog	277229	Unfavourable - Bad	<p>No further burning.</p> <p>This area was extremely badly burnt over numerous years in the last two decades. This has resulted in the degradation of blanket bog vegetation on the ridge and drying out of the peat which is cracking in several locations and is at risk of erosion and landslide.</p> <p>Restoration of the blanket bog vegetation is required.</p> <p>Destocking and exclusion of grazing is recommended.</p> <p>Erection of deer exclosures to assess deer browsing pressures. Provide grouse flight diverters on fencing if erected to reduce collision risk.</p> <p>Regular shepherding to hunt out trespassing sheep.</p> <p>Bad erosion in the vicinity of the track. Track repairs required. The bog surface has been damaged here by a quad/ATV/scrambler. No further quad/scrambler access to the entire commonage should be allowed – on other commonages this has been controlled through locked gates.</p>

Id	Annex 1 Code	Fossitt Code	Habitat	Area (m ²)	Conservation Status	Management Prescription
37		PB5	Eroding Blanket Bog	202667	Unfavourable - Bad	<p>No further burning.</p> <p>This area was extremely badly burnt over numerous years in the last two decades. This has resulted in the degradation of blanket bog vegetation on the ridge and drying out of the peat which is cracking in several locations and is at risk of erosion and landslide.</p> <p>Restoration of the blanket bog vegetation is required.</p> <p>Destocking and exclusion of grazing is recommended.</p> <p>Erection of deer exclosures to assess deer browsing pressures. Provide grouse flight diverters on fencing if erected to reduce collision risk.</p> <p>Regular shepherding to hunt out trespassing sheep.</p> <p>Bad erosion in the vicinity of the track. Track repairs required. The bog surface has been damaged here by a quad/ATV/scrambler. No further quad/scrambler access to the entire commonage should be allowed – on other commonages this has been controlled through locked gates.</p>

Id	Annex 1 Code	Fossitt Code	Habitat	Area (m²)	Conservation Status	Management Prescription
38		PB5	Eroding Blanket Bog	172218	Unfavourable - Bad	<p>No further burning.</p> <p>This area was extremely badly burnt over numerous years in the last two decades. This has resulted in the degradation of blanket bog vegetation on the ridge and drying out of the peat which is cracking in several locations and is at risk of erosion and landslide.</p> <p>Restoration of the blanket bog vegetation is required.</p> <p>Destocking and exclusion of grazing is recommended.</p> <p>Regular shepherding to hunt out trespassing sheep.</p> <p>Bad erosion in the vicinity of the track. Track repairs required. The bog surface has been damaged here by a quad/ATV/scrambler. No further quad/scrambler access to the entire commonage should be allowed – on other commonages this has been controlled through locked gates.</p>
39	4030	HH1/HD1/ER1	Dry Heath/Dense Bracken/Exposed Rocks	100557	Unfavourable - Bad	Control bracken which is beginning to invade the dry heath

5. Appendix 2. Water Quality

Two headwater streams, which are both tributaries of the Dodder River (IE_EA_09D010100), rise within the commonage. The Slade Brook is unnamed in the EPA datasets but the stream, which forms the western boundary of the commonage, is mapped as the Glassamucky Stream. From west to east the streams are known locally/mapped on the 6" series as Glassamullyawn (East West mapping)/Glassamucky (EPA), and Slade Brook.

Water samples were taken from three sampling locations, two on the Slade Brook and one on the Glassamucky Stream, both of which rise within the Glassavullaun commonage as shown on **Figure 5** below.

The water samples were assessed by Carl Dixon and two of the headwater streams (GV1 and GV3) were assessed as a stream 'At Risk' of not achieving 'Good' water quality status. The exception was GV2, the upstream sampling point on the Slade Brook, which was assessed as 'Indeterminate' – where the stream is at risk of not achieving 'Good' water quality status.

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.

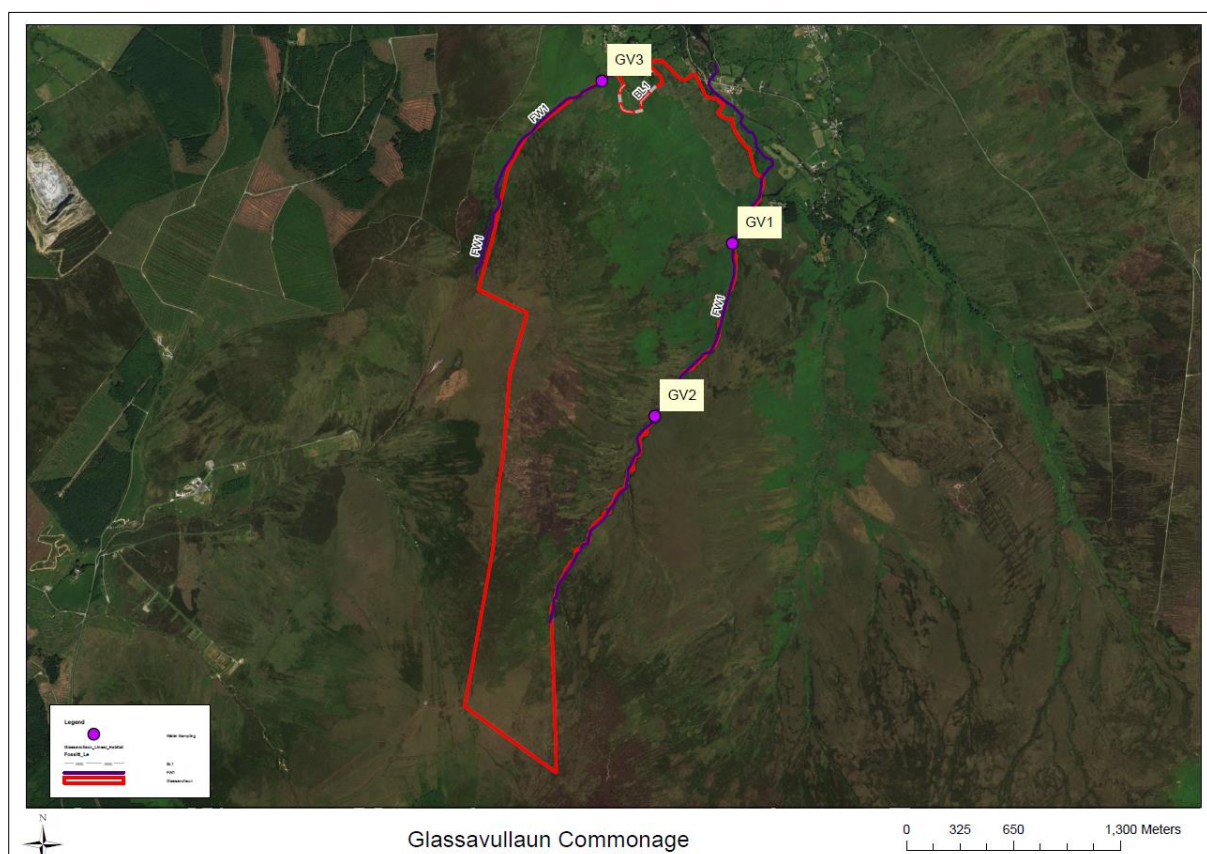


Figure 5. Water quality sample locations at Glassavullaun.

SUAS Water Quality Sampling

River:	Code:	Date:	Sample Taken By:
Slade Brook	IE_EA_09D010100	01/08/2019	Faith Wilson
Sample Number:	Location:	Stream Order:	Grid Reference:
GV1	Headwater stream of Dodder River in Glassavullaun commonage – within gully woodland	1 st order	O 10301 19788
Velocity:	Clarity:	Colour:	Discharge:
Torrential	Very clear	None	Flood
Fast	Clear	Slight	Normal
Moderate	Slightly turbid	Moderate	Low
Slow	Highly turbid	High	Very low
Very Slow			Dry
			Recent flood
Modifications: N	Dominant Types:	Slope:	Geology:
Canalised	Bedrock	Low	Calcareous
Widened	Boulder (>128mm)	Medium	Siliceous
Bank erosion	Cobble (32 - 128mm)	High	Mixed
Arterial drainage	Gravel (8 - 32mm)	Very high	
	Fine gravel (2 - 8mm)		
	Sand (0.25mm - 2mm)		
	Silt (<0.25mm)		
Substratum Condition:	Substratum:	Degree of Siltation:	Depth of Mud:
Compacted	Stoney bottom	Clean	None
Loose	Muddy bottom	Slight	<1cm - peat
Normal	Mud over stones	Moderate	1-5cm
		Heavy	5-10cm
			>10cm
Litter:	Filamentous Algae:	Stream Flow:	Shading:
None	None	Riffle	High
Present	Present	Riffle/ glide	Moderate
Moderate	Moderate	Slow flow	Low
Abundant	Abundant		None
Stock Access:	Sewage Fungus:	Sample Type (Mins):	Main Land Use Adjacent/Upstream:
Yes - from the adjoining commonage	None	Kick sample - 4	Pasture
	Present	Stone washing	Bog
	Moderate	Weed sweep	Forestry
	Abundant		Tillage
			Urban
			Other



Plate 1. Photographic record of sampling location.

GV1

River:	Code:	Date:	Time:
Station no.	Location:	Grid (6 figure):	
Field Chemistry	Stream Order:	Stream flow:	
DO%	Modifications: Y/N Canalised-widened-bank erosion-arterial drainage	Riffle	
DO mg/l	Dominant Types:	Riffle/Glide	
Temp (°C)	Bedrock	Slow flow	
Conductivity	Boulder (> 128mm)		
pH	Cobble (32-128mm)		
Bank width (cm)	Gravel (8-32mm)		
Wet width (cm)	Fine Gravel (2-8mm)		
Avg Depth (cm)	Sand (0.25-2mm)		
Staff gauge	Silt (<0.25mm)		
Velocity	Slope: Low – Medium – High – Very High	Shading: High – Moderate – Low – None	
Torrential	Geology: Calcareous-Siliceous-Mixed	Cattle access: Y: upstream – downstream or N	
Fast	Substratum Condition: Calcareous-Compacted-	Photo: Y / N	
Moderate	Loose - Normal		
Slow	Substratum:		
Very slow	Stoney bottom-Muddy bottom-Mud over stones		
Clarity	Degree of siltation: Clean-Slight-Moderate-Heavy		
Very clear	Depth of mud: None < 1cm: 1-5cm: 5-10cm: > 10cm		
Clear	Litter: None – Present – Moderate – Abundant		
Slightly turbid	Filamentous Algae:	Sewage Fungus:	
Highly turbid	None – Present – Moderate – Abundant	None – Present – Moderate – Abundant	
	Main land use u/s:	Sample retained:	Sampled in Minutes:
	Pasture	Y / N	Pond net x
	Bog		Stone wash x
	Forestry		Weed sweep x
General Comments:			
Macroinvertebrate Composition			
The macroinvertebrates are divided into the following 5 specific groups: • Group 1 = Ephemeroptera (3-tails) – note that tails may be damaged during sampling • Group 2 = Plecoptera (2-tails) – note that tails may be damaged during sampling • Group 3 = Trichoptera • Group 4 = G.O.L.D (Gastropoda, Oligochaeta and Diptera) • Group 5 = Asellus • Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance – Ab)			Relative Abundance 1-5 1 6-20 2 21-50 3 51-100 4 101+ 5
Ephemeroptera:	<i>Ecdyonurus</i> Ab <i>Rhyacogenia</i> Ab <i>Heptagenia</i> Ab <i>Ephemerella</i> Ab <i>Gaenitis</i> Ab <i>Paraleptophlebia</i> Ab <i>Ephemera clunice</i> Ab Other Ephem Ab	Plecoptera:	<i>Leuctra</i> Ab 2 <i>Isoperla</i> Ab <i>Protonemura</i> Ab <i>Amphimemura</i> Ab <i>Pteronarcys</i> Ab <i>Dinocras</i> Ab Other Plecop Ab Other Plecop Ab
Total no. of taxa 0	Total Relative Abundance 0	Total no. of Taxa 1	Total Relative Abundance 2
Trichoptera:	<i>Hydropsychidae</i> Ab <i>Polycentropodidae</i> Ab <i>Rhyacophila</i> Ab <i>Philopotamidae</i> Ab <i>Limnephilidae</i> Ab <i>Sericostomatidae</i> Ab <i>Glossosomatidae</i> Ab <i>Leptostomatidae</i> Ab Other Trichoptera Ab	G.O.L.D:	<i>Limnoria</i> (G) Ab <i>Procladius</i> (G) Ab <i>Blattella</i> (G) Ab <i>Angitia</i> (G) Ab <i>Rhyssalus</i> (G) Ab <i>Lumbriculus</i> (O) Ab <i>Eisenella</i> (O) Ab <i>Tubificoides</i> (O) Ab
Total no. of Taxa 1	Total Relative Abundance 1	Total no. of Taxa 1	Total Relative Abundance 1
		Chironomidae (D) Ab	Asellus:
		<i>Chironomus</i> (D) Ab	Absent
		<i>Simulidae</i> (D) Ab	Few (1-20)
		<i>Dicranota</i> (D) Ab	Common (> 20)
		<i>Tipulidae</i> (D) Ab	
		<i>Ceratopogonidae</i> (D) Ab	
		Other GOLD Ab	
			NOTE: Asellus must be recorded as absent if none are found

NOTE *Baetis* 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*.

GV1

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.

Group 1 - 3 Tails
Ephemeroptera

No. of taxa

0 1 2+

Relative Abundance

Score

0 4 6 4 8

Group 2 - 2 Tails
Plecoptera

No. of taxa

0 1 2+

Relative Abundance

Score

0 4 6 6 8

Group 3
Trichoptera

No. of taxa

0 1-2 3+

Relative Abundance

Score

0 2 4 4

Group 4
G.O.L.D

No. of taxa

0 1-2 3+

Relative Abundance

Score

0 4 2 0 4 0

Group 5
Aseilus

No. of taxa

Absent Few (1-20) Common (> 20)

Score

4 2 0

Step 2

a) Index Score Group 1 0

b) Index Score Group 2 4

c) Index Score Group 3 2

d) Index Score Group 4 4

e) Index Score Group 5 4

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

Total Index Score (TIS) 14 Average Index Score (AIS) 2.8 SSR Score 5.6
sum (all boxes) TIS/5 (5 for 5 groups) (AIS x 2)

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

> 7.25 ☐ > 6.5 - 7.25 ☐ < 6.5 ☒

Probably not at risk Indeterminate Stream at risk

Surveyor (signed): [Signature] Name (print): Carl Ryan Date: / /

SUAS Water Quality Sampling

River:	Code:	Date:	Sample Taken By:
Slade Brook	IE_EA_09D010100	01/08/2019	Faith Wilson
Sample Number:	Location:	Stream Order:	Grid Reference:
GV2	Headwater stream of Dodder River in Glassavullaun commonage	1 st order	O 09831 18741
Velocity:	Clarity:	Colour:	Discharge:
Torrential	Very clear	None	Flood
Fast	Clear	Slight	Normal
Moderate	Slightly turbid	Moderate	Low
Slow	Highly turbid	High	Very low
Very Slow			Dry
			Recent flood
Modifications: N	Dominant Types:	Slope:	Geology:
Canalised	Bedrock	Low	Calcareous
Widened	Boulder (>128mm)	Medium	Siliceous
Bank erosion	Cobble (32 - 128mm)	High	Mixed
Arterial drainage	Gravel (8 - 32mm)	Very high	
	Fine gravel (2 - 8mm)		
	Sand (0.25mm - 2mm)		
	Silt (<0.25mm)		
Substratum Condition:	Substratum:	Degree of Siltation:	Depth of Mud:
Compacted	Stoney bottom	Clean	None
Loose	Muddy bottom	Slight	<1cm - peat
Normal	Mud over stones	Moderate	1-5cm
		Heavy	5-10cm
			>10cm
Litter:	Filamentous Algae:	Stream Flow:	Shading:
None	None	Riffle	High
Present	Present	Riffle/ glide	Moderate
Moderate	Moderate	Slow flow	Low
Abundant	Abundant		None
Stock Access:	Sewage Fungus:	Sample Type (Mins):	Main Land Use Adjacent/Upstream:
Yes - from the adjoining commonage	None	Kick sample - 4	Pasture
	Present	Stone washing	Bog
Burning on adjoining slopes	Moderate	Weed sweep	Forestry
	Abundant		Tillage
			Urban
			Other



Plate 1. Photographic record of sampling location.

GV 2

River:	Code:	Date:	Time:
Station no.	Location:	Grid (6 figure):	
Stream Order:		Stream flow:	
Field Chemistry		Riffle Riffle/Glide Slow flow	
DO%	Modifications: Y/N Canalised-widened-bank erosion-arterial drainage Dominant Types: Bedrock Boulder (>128mm) Cobble (32-128mm) Gravel (8-32mm) Fine Gravel (2-8mm) Sand (0.25-2mm) Silt (<0.25mm) Slope: Low – Medium – High – Very High Geology: Calcareous-Siliceous-Mixed Substratum Condition: Calcareous-Compacted-Loose - Normal Substratum: Stony bottom-Muddy bottom-Mud over stones Degree of siltation: Clean-Slight-Moderate-Heavy Depth of mud: None <1cm: 1-5cm: 5-10cm: >10cm Litter: None – Present – Moderate – Abundant Filamentous Algae: None – Present – Moderate – Abundant Main land use u/s: Pasture Urban Bog Tillage Forestry Other	Shading: High – Moderate – Low – None	
DO mg/l		Cattle access: Y: upstream – downstream or N	
Temp (°C)		Photo: Y / N	
Conductivity			
pH			
Bank width (cm)			
Wet width (cm)			
Avg Depth (cm)			
Staff gauge			
Velocity		Colour	
Torrential	None		
Fast	Slight		
Moderate	Moderate		
Slow	High		
Very slow			
Clarity	Discharge		
Very clear	Flood		
Clear	Normal		
Slightly turbid	Low	Sewage Fungus: None – Present – Moderate – Abundant	
Highly turbid	Very Low	Sampled in Minutes: Pond net x Stone wash x Weed sweep x	
	Dry		
	Recent Flood		
General Comments:			
Macroinvertebrate Composition The macroinvertebrates are divided into the following 5 specific groups: • Group 1 = Ephemeroptera (3-tails) – note that tails may be damaged during sampling • Group 2 = Plecoptera (2-tails) – note that tails may be damaged during sampling • Group 3 = Trichoptera • Group 4 = G.O.L.D. (Gastropoda, Oligochaeta and Diptera) • Group 5 = Asellus • Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance – Ab)			
Ephemeroptera: <i>Ecdyonurus</i> Ab <i>Rhyacophila</i> Ab <i>Heptagenia</i> Ab <i>Ephemerella</i> Ab <i>Gaenla</i> Ab <i>Paraleptophlebia</i> Ab <i>Ephemerella danica</i> Ab Other Ephem Ab		Plecoptera: <i>Leuctra</i> Ab 2 <i>Isoperla</i> Ab 1 <i>Protonemura</i> Ab 1 <i>Amphinemura</i> Ab 1 <i>Pteronarcys</i> Ab Other Plecop Ab Other Plecop Ab	
Total no. of taxa 7	Total Relative Abundance 0	Total no. of Taxa 4	Total Relative Abundance 5
Trichoptera: <i>Hydropsychidae</i> Ab <i>Polycentropodidae</i> Ab 1 <i>Rhyacophila</i> Ab <i>Philopotamidae</i> Ab <i>Limnephilidae</i> Ab <i>Sericostomatidae</i> Ab <i>Glossosomatidae</i> Ab <i>Leptostomatidae</i> Ab Other Trichoptera Ab		G.O.L.D.: <i>Lymantrae</i> (G) Ab <i>Rotamanyus</i> (G) Ab <i>Planorbis</i> (G) Ab <i>Ancylus</i> (G) Ab <i>Rhyssa</i> (G) Ab <i>Lumbriculus</i> (OI) Ab <i>Eisenella</i> (OI) Ab <i>Tubificidae</i> (OI) Ab	
Total no. of Taxa 11	Total Relative Abundance 1	Total no. of Taxa 11	Total Relative Abundance 1
		Chironomidae (D) Ab <i>Chironomus</i> (D) Ab <i>Simuliidae</i> (D) Ab <i>Dicranota</i> (D) Ab <i>Tipulidae</i> (D) Ab <i>Ceratopogonidae</i> (D) Ab Other GOLD Ab	
		Asellus: Absent Few (1-20) Common (>20)	
		NOTE: Asellus must be recorded as absent if none are found	

NOTE *Baetis* 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*.

GV 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.

Group 1 - 3 Tails
Ephemeroptera

No. of taxa: 0 (circled), 1, 2+

Relative Abundance: 1-2, 3+, 2, 3+

Score: 0 (circled), 4, 6, 4, 8

Group 2 - 2 Tails
Plecoptera

No. of taxa: 0, 1, 2+ (circled)

Relative Abundance: 1-2, 3+, 2, 3+ (circled)

Score: 0, 4, 6, 6, 8 (circled)

Group 3
Trichoptera

No. of taxa: 1-2 (circled), 3+

Relative Abundance: 1-2 (circled), 3+, 3+, 3+

Score: 2 (circled), 4, 4

Group 4
G.O.L.D

No. of taxa: 0, 1-2 (circled), 3+

Relative Abundance: 1-2 (circled), 3-6, 7+, 3-6, 7+

Score: 0, 4 (circled), 2, 0, 4, 0

Group 5
Asellus

No. of taxa: Absent (4 circled), Few (1-20), Common (>20)

Score: 4 (circled), 2, 0

Step 2

a) Index Score Group 1: 0 (circled)

b) Index Score Group 2: 8 (circled)

c) Index Score Group 3: 2 (circled)

d) Index Score Group 4: 4 (circled)

e) Index Score Group 5: 4 (circled)

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

Total Index Score (TIS)
sum (a+b+c+d+e) **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 O'HAN

Date:

____/____/____

SUAS Water Quality Sampling

River:	Code:	Date:	Sample Taken By:
Glassamucky Brook	IE_EA_09D010100	16/01/2020	Faith Wilson
Sample Number:	Location:	Stream Order:	Grid Reference:
GV3	Headwater stream of Dodder River in Glassavullaun commonage	1 st order	O 09510 20771
Velocity:	Clarity:	Colour:	Discharge:
Torrential	Very clear	None	Flood
Fast	Clear	Slight	Normal
Moderate	Slightly turbid	Moderate	Low
Slow	Highly turbid	High	Very low
Very Slow			Dry
			Recent flood
Modifications: N	Dominant Types:	Slope:	Geology:
Canalised	Bedrock	Low	Calcareous
Widened	Boulder (>128mm)	Medium	Siliceous
Bank erosion	Cobble (32 - 128mm)	High	Mixed
Arterial drainage	Gravel (8 - 32mm)	Very high	
	Fine gravel (2 - 8mm)		
	Sand (0.25mm - 2mm)		
	Silt (<0.25mm)		
Substratum Condition:	Substratum:	Degree of Siltation:	Depth of Mud:
Compacted	Stoney bottom	Clean	None
Loose	Muddy bottom	Slight	<1cm - peat
Normal	Mud over stones	Moderate	1-5cm
		Heavy	5-10cm
			>10cm
Litter:	Filamentous Algae:	Stream Flow:	Shading:
None	None	Riffle	High
Present	Present	Riffle/ glide	Moderate
Moderate	Moderate	Slow flow	Low
Abundant	Abundant		None
Stock Access:	Sewage Fungus:	Sample Type (Mins):	Main Land Use Adjacent/Upstream:
Yes - from the adjoining commonage	None	Kick sample - 4	Pasture
	Present	Stone washing	Bog
Burning on adjoining slopes	Moderate	Weed sweep	Forestry
Deer	Abundant		Tillage
Sheep			Urban
Cattle			Other



Plate 1. Photographic record of sampling location.

GV3

River:		Code:	Date:	Time:
Station no.		Location:		Grid (6 figure):
Field Chemistry		Stream Order:		Stream flow:
DO%		Modifications: Y/N Canalised-widened-bank erosion-arterial drainage		Rifle
DO mg/l		Dominant Types:		Rifle/Glide
Temp (°C)		Bedrock		Slow flow
Conductivity		Boulder (> 128mm)		
pH		Cobble (32-128mm)		
Bank width (cm)		Gravel (8-32mm)		
Wet width (cm)		Fine Gravel (2-8mm)		
Avg Depth (cm)		Sand (0.25-2mm)		
Staff gauge		Silt (<0.25mm)		
Velocity	Colour	Slope: Low – Medium – High – Very High		Shading: High – Moderate – Low – None
Torrential	None	Geology: Calcareous-Siliceous-Mixed		Cattle access: Y: upstream – downstream or N
Fast	Slight	Substratum Condition: Calcareous-Compacted-		
Moderate	Moderate	Loose - Normal		
Slow	High	Substratum:		
Very slow		Stoney bottom-Muddy bottom-Mud over stones		Photo: Y / N
Clarity	Discharge	Degree of siltation: Clean-Slight-Moderate-Heavy		
Very clear	Flood	Depth of mud: None < 1cm: 1-5cm: 5-10cm: > 10cm		
Clear	Normal	Litter: None – Present – Moderate – Abundant		
Slightly turbid	Low	Filamentous Algae:		Sewage Fungus:
Highly turbid	Very Low	None – Present – Moderate – Abundant		None – Present – Moderate – Abundant
	Dry	Main land use u/s:		Sample retained:
	Recent Flood	Pasture	Urban	Y / N
		Bog	Tillage	
		Forestry	Other	
General Comments:				
<p>Macroinvertebrate Composition</p> <p>The macroinvertebrates are divided into the following 5 specific groups:</p> <ul style="list-style-type: none"> Group 1 = Ephemeroptera (3-tails) – note that tails may be damaged during sampling Group 2 = Plecoptera (2-tails) – note that tails may be damaged during sampling Group 3 = Trichoptera Group 4 = G.O.L.D. (Gastropoda, Oligochaeta and Diptera) Group 5 = Asellus <p>Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance – Ab)</p>				
Ephemeroptera:		Plecoptera:		Relative Abundance
<i>Ecdyonurus</i> Ab		<i>Leuctra</i> Ab		1-5 1
<i>Rhythrogena</i> Ab		<i>Isoperla</i> Ab		6-20 2
<i>Hemiptera</i> Ab		<i>Protonemura</i> Ab		21-50 3
<i>Ephemerella</i> Ab		<i>Amphinemura</i> Ab		51-100 4
<i>Chironis</i> Ab		<i>Pedra</i> Ab		101+ 5
<i>Paraleptophlebia</i> Ab		<i>Dinocras</i> Ab		
<i>Ephemerella danica</i> Ab		<i>Other Plecop</i> Ab		
<i>Other Ephem</i> Ab		<i>Other Plecop</i> Ab		
Total no. of taxa	Total Relative Abundance	Total no. of Taxa	Total Relative Abundance	
0	0	1	1	
Trichoptera:		G.O.L.D.:		Asellus:
<i>Hydropsychidae</i> Ab		<i>Limnoria</i> (G) Ab		<i>Asellus</i>
<i>Polycentropodidae</i> Ab		<i>Notamphipus</i> (G) Ab		Absent
<i>Rhyacophila</i> Ab		<i>Planorbis</i> (G) Ab		Few (1-20)
<i>Philoctamidae</i> Ab		<i>Acydus</i> (G) Ab		Common
<i>Limnephilidae</i> Ab		<i>Physa</i> (G) Ab		(> 20)
<i>Sericostomatidae</i> Ab		<i>Lumbriculus</i> (O) Ab		
<i>Glossosomatidae</i> Ab		<i>Eiseniella</i> (O) Ab		
<i>Leptostomatidae</i> Ab		<i>Tubificidae</i> (O) Ab		
<i>Other Trichoptera</i> Ab				
Total no. of Taxa	Total Relative Abundance	Total no. of Taxa	Total Relative Abundance	
0	0	1	1	

NOTE: *Baetis* 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*.

GV3

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.

Group 1 - 3 Tails
Ephemeroptera

No. of taxa: 0 (circled), 1, 2+

Relative Abundance: 1-2, 3+, 2, 3+

Score: 0 (circled), 4, 6, 4, 8

Group 2 - 2 Tails
Plecoptera

No. of taxa: 0, 1-2 (circled), 2+

Relative Abundance: 1-2 (circled), 3+, 2, 3+

Score: 0, 4 (circled), 6, 6, 8

Group 3
Trichoptera

No. of taxa: 0 (circled), 1-2, 3+

Relative Abundance: 1-2, 3+, 3+

Score: 0 (circled), 2, 4, 4

Group 4
G.O.L.D

No. of taxa: 0, 1-2 (circled), 3+

Relative Abundance: 1-2 (circled), 3-6, 7+, 3-6, 7+

Score: 0, 4 (circled), 2, 0, 4, 0

Group 5
Asellus

No. of taxa: Absent (circled), Few (1-20), Common (>20)

Score: 4 (circled), 2, 0

Step 2

a) Index Score Group 1: 0

b) Index Score Group 2: 4

c) Index Score Group 3: 0

d) Index Score Group 4: 4

e) Index Score Group 5: 4

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

Total Index Score (TIS)
sum (a+b+c+d+e) 12

Average Index Score (AIS)
TIS/5 (5 for 5 groups) 2.4

SSR Score
(AIS x 2) 4.8

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):

Name (print):

CALL DUM

Date:

____/____/____