Glasnamullen Commonage

2019 Ecological Survey

Final Report

16th March 2020

Faith Wilson BSc CEnv MCIEEM

Faith Wilson
ECOLOGICAL CONSULTANT

Faith Wilson Ecological Consultant BSc CEnv MCIEEM
Kestrel Ridge, Tigroney West, Avoca, Co. Wicklow

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1. Introduction

A baseline habitat condition and ecological survey and habitat management plan was prepared for the Glasnamullen Commonage in 2018[1] and the measures within same underwent screening for Appropriate Assessment[2].

A Commonage Management group was established for the commonage and the implementation of the management prescriptions in the plan began in 2019.

The management prescriptions in the plan set out to address the impacts highlighted in the report and to ensue that progress is made towards attaining **Favourable status** for the Annex I habitats present on the site – principally **4030 Dry Heath** and **4060 Alpine and Boreal Heath**.

The major negative impacts on these habitats arise from under grazing, lack of active shepherding, lack of vegetation management, and recreational access resulting in localised peat erosion. Self seeding of Sitka spruce and rhododendron in the southern part of the commonage and the encroachment of bracken into grassland areas are also being addressed.

The extent of habitats present within the commonage and their affinities to either Fossitt (Level 3) or Annex I habitats on the Glasnamullen 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

The proposed management measures for the Glasnamullen commonage under SUAS are as follows:

Year 1 (2019)

1. Cut/burn a number of small sections in areas 1 & 2. Cut up to a maximum of 18ha, in sections of approx. 2-3ha in size. These areas should be dispersed around areas 1 & 2 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. This controlled burning will help build up experience among the farmers and in future years they may be able to work with much smaller control lines. 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 and has the approval of NPWS.
2. Cut/mulch a firebreak in area 2 west joining the forestry. Approx. 30m wide area to be cut (400m long X 30m wide = 1.2ha).
3. Cut/burn gorse in plot 2 west.
4. Spray Bracken in area 11. A number of small areas, totalling up to 2ha, to be trialled in 2019.

[1] Wilson, F. (2019). Ecological Baseline Survey prepared for Glasnamullen Commonage as part of the Commonage Management Plan for SUAS. 27th January 2019. Unpublished report for SUAS EIP.
[2] Wilson, F. (2019). Report for Screening for Appropriate Assessment for a Commonage Management Plan at Glasnamullen, Roundwood, Co. Wicklow in accordance with the requirements of Article 6(3) of the EU Habitats Directive. 11th February 2019. Unpublished report for SUAS EIP.

Year 2 (2020)

1. Cut or burn a further number of sections in areas 1 & 2 (up to a max of 20ha). Follow the guidelines for year 1 in relation to the size and distribution of controlled burning/cutting areas.
2. Control gorse in area 2 by either cutting or burning
3. Spray a section in area 11, up to 10ha for bracken during 2020.
4. Control the rhododendron and cut out the self-seeded Sitka spruce plants in area 1.

Year 3 (2021)

1. Cut or burn a further number of sections in areas 1 & 2 (up to a max of 20ha). Follow the guidelines for year 1 in relation to the size and distribution of controlled burning/cutting areas.
2. Spray a section in area 11, up to 10ha for bracken during 2021.

Year 4 (2022)

1. Cut or burn a further number of sections in areas 1 & 2 (up to a max of 20ha). Follow the guidelines for year 1 in relation to the size and distribution of controlled burning/cutting areas.
2. Spray a section in area 11, up to 10ha for bracken during 2022.

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;

- 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 gathering pen in area 2 in year 1. New wire fence to replace the old one, some new gates, a race and a sorting gate shall be required.

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.

Ecological Assessment
The commonage was surveyed in November 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.

Bracken control

There has been some bracken control implemented in Area 11 which is great to see as this is one of the main challenges in many upland sites. This was done on 22/08/2019 by spraying from a tractor. A rate of 11 litres of asulox per ha was applied and an area of 2 ha was treated. The results of this will not be clear until the growing season begins in 2020.

Observations/Challenges

It was difficult to find a contractor willing to do it. It was difficult to get the tractor & sprayer on to the hill and then the booms of the sprayer were hitting the ground when the tractor went over a hump or into a hole. The booms were also catching the bracken meaning the tractor had to go very slowly.

Plate 1. Bracken control in Area 11 – the tracks from the tractor in the bracken can be clearly seen.

In year 1, the aim was to see if the tractor sprayer was an option at all, and what the issues with it are, so the easier most accessible parts of the hill were chosen for spraying. Hopefully the areas sprayed in 2019 will help open up the heavy bracken areas and that we can move into the more difficult areas as the project progresses.

The browsed bilberry beneath the bracken should begin to show signs of recovery as light levels are increased.

It is great to see a good dense area of bracken had been sprayed. If possible it would be good in 2020 to attempt to target those areas of bracken which are encroaching on or invading dry heath as this is compromising the favourable condition of this Annex I habitat.

Firebreaks for controlled burning

This is the first time that controlled burning has been carried out by upland farmers in County Wicklow and many invaluable lessons were learned in the first year it was implemented as part of SUAS.

The original plan agreed to control burn an area of up to 18ha in sections of 2-3ha in size. To do this, fire breaks were cut around the proposed burning areas on the 14th & 16th February 2019. A flail mulcher on the back of a tractor was used, and two widths of the machine were cut. On the inside of the cut area, it was cut a second time in the opposite direction to the first cut to see what difference that made to the creation of fire breaks and also to the recovery rates.

These firebreaks can be seen in the Bing Maps imagery of the commonage as presented on **Figure 1** below.

Figure 1. Firebreaks cut on Glasnamullen Commonage in 2019 (Bing Maps).

The prepared control burning areas were located up towards the top of the commonage to encourage the sheep up away from the hill ditch (on the advice of the farmers who are aware of how their sheep use the hill).

The areas prepared varied in size from 1 to 2ha. As it was the first year of burning on the project, only one area got burnt each day, but with experience, one could expect to do 2 or even 3 sections per

day. If we get 2 suitable days in the year and can do 3 sections in a day that is 6 sections in a year (which is optimistic and probably wouldn't happen every year). The maximum area that should be burnt is 18 ha per year (but note that applies to areas actually requiring burning).

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.

Plate 2. Looking south across the Glasnamullen Stream – area prepared for burning on the slope – the lower part of this large area should not be burnt and smaller areas prepared over the brow of the slope…

The cut areas have generally 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.

In general the areas 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 was just an observation based on what had been seen in the large flailed

areas on Powerscourt Paddock where sheep were then tending to congregate. 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.

The majority of the cut areas appear to have been prepared in and around the valley slopes of the Glasnamullen Stream. It was previously noted that sheep were favouring this area for shelter and that they should be moved out of here. As the prepared areas are burnt this will create a mosaic of areas for the sheep to move through and out of the valley.

No preparation of ground for burning/cutting appears to have yet taken place towards the Ballinastoe end of the commonage which is where we ultimately want sheep to move to. Although the contractor could have kept further out to the west of the site towards Ballinastoe, but there was no one available to bring him out on the day. This area will be mulched in 2020.

It would be advisable that any burning planned for 2020 is limited to very small patches within the areas prepared in 2019 and that additional areas are prepared and burnt to the south and west of here to encourage sheep movement across the commonage.

I would have concerns about the preparation of an area for burning on the slopes of the watercourse as if a controlled burn got out of hand here/was too intense resulting in areas of bare peat this could wash into the Glasnamullen Stream and the Vartry River downstream.

Burnt areas
It was initially unclear to the ecologist as to why the areas where the controlled burning had taken place had been chosen as the heather was not that tall and sheep could move through and graze the area. Other areas that were taller and in need of burning did not appear to have been selected but it is understood that this was a combination of where the machine could travel and this was also to reduce risk of a fire getting out of control with a large fuel loading.

Within the prepared burning areas there was already some good regeneration of ling heather and bilberry within the flailed firebreak.

The burning that was completed within the two areas which were burnt in 2019 was favourable in that not every patch of vegetation within the prepared area had been burnt and some areas of tall standing heather were left. This resulted in a nice mosaic of differing vegetation heights and material was left to provide seed source for regeneration and ensure stability of the soil. It is understood that it actually proved quite difficult to get the fire established but there are lessons to be learned here in terms of a favourable outcome from burning…

Sitka spruce removal
Sitka spruce removal from within the commonage will take place in 2020.

Rhododendron control
Rhododendron removal from within the commonage will take place in 2020.

Plate 3. Regeneration of ling heather and bilberry within the flailed firebreak.

Plate 4. Patches of unburnt vegetation in the controlled burn area – this is a good outcome of burning as a diversity of vegetation heights and ages have been achieved resulting in a good structural mosaic of grazing habitat.

Plate 5. Flailed areas in preparation for burning.

4. Appendix 1. Maps & Management Recommendations

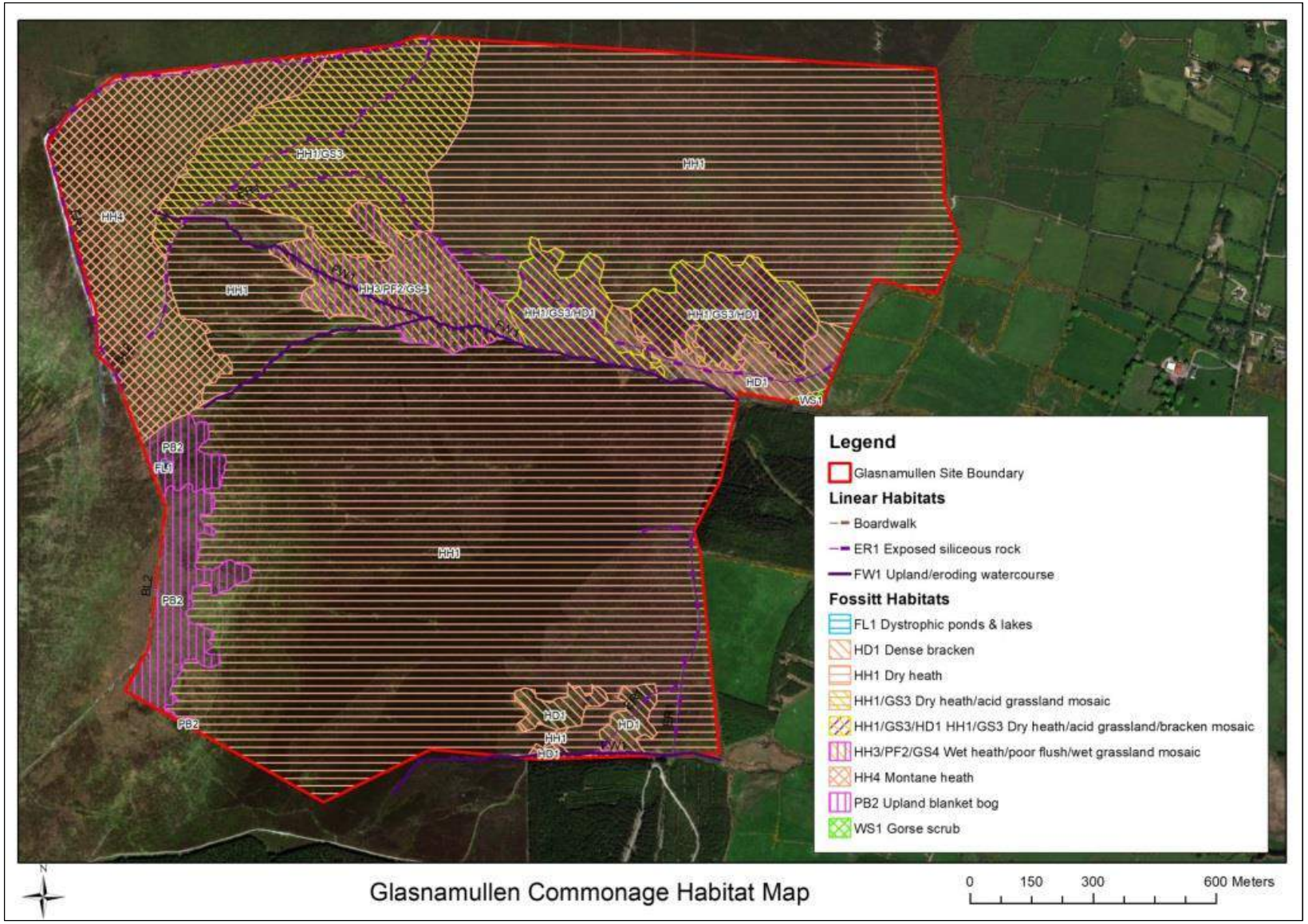


Figure 1. Habitats mapped to Level Three (Fossitt, 2000) within the Glasnamullen commonage.

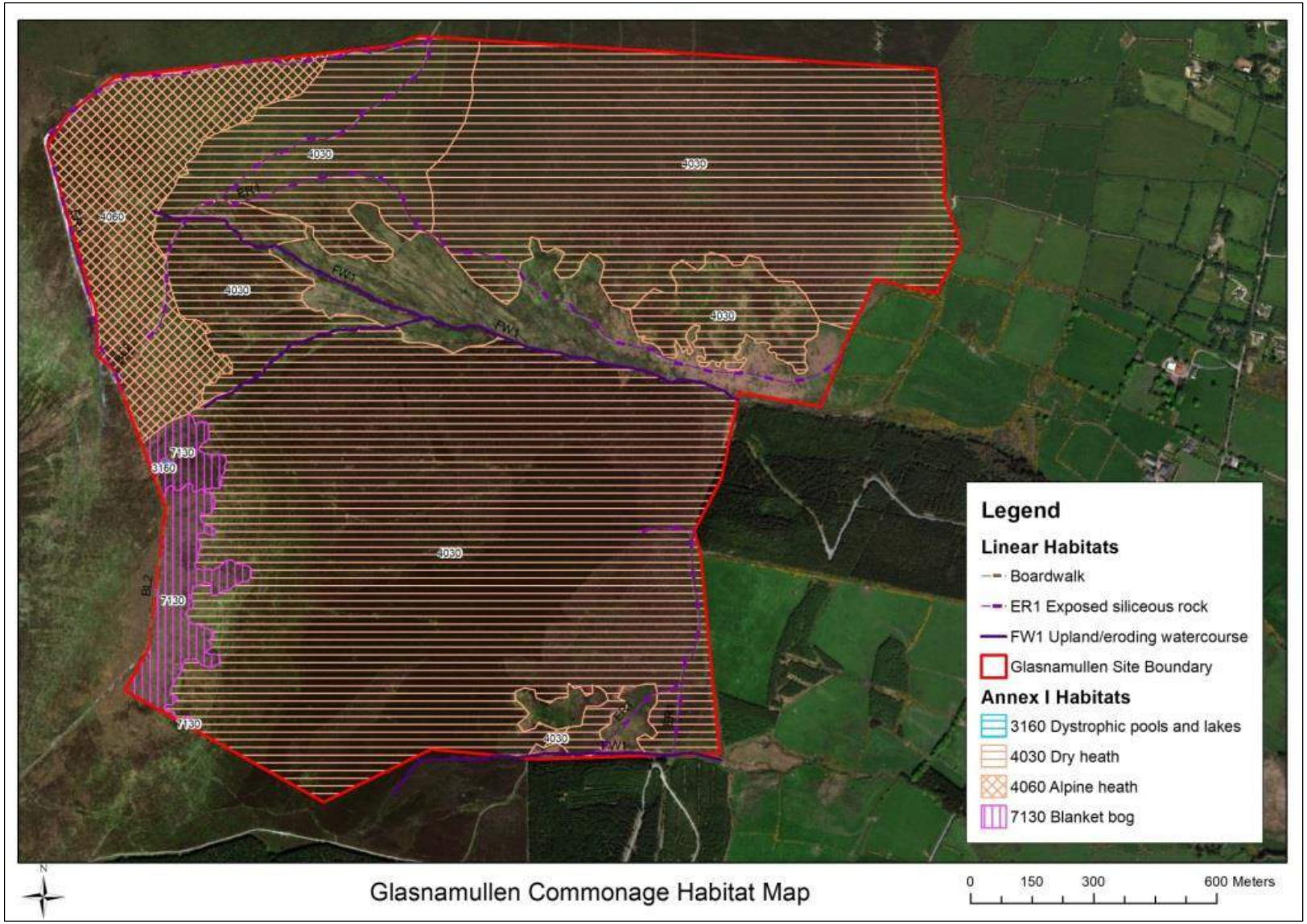


Figure 2. Habitats mapped according to their correspondence with Annex I habitats within the Glasnamullen commonage.

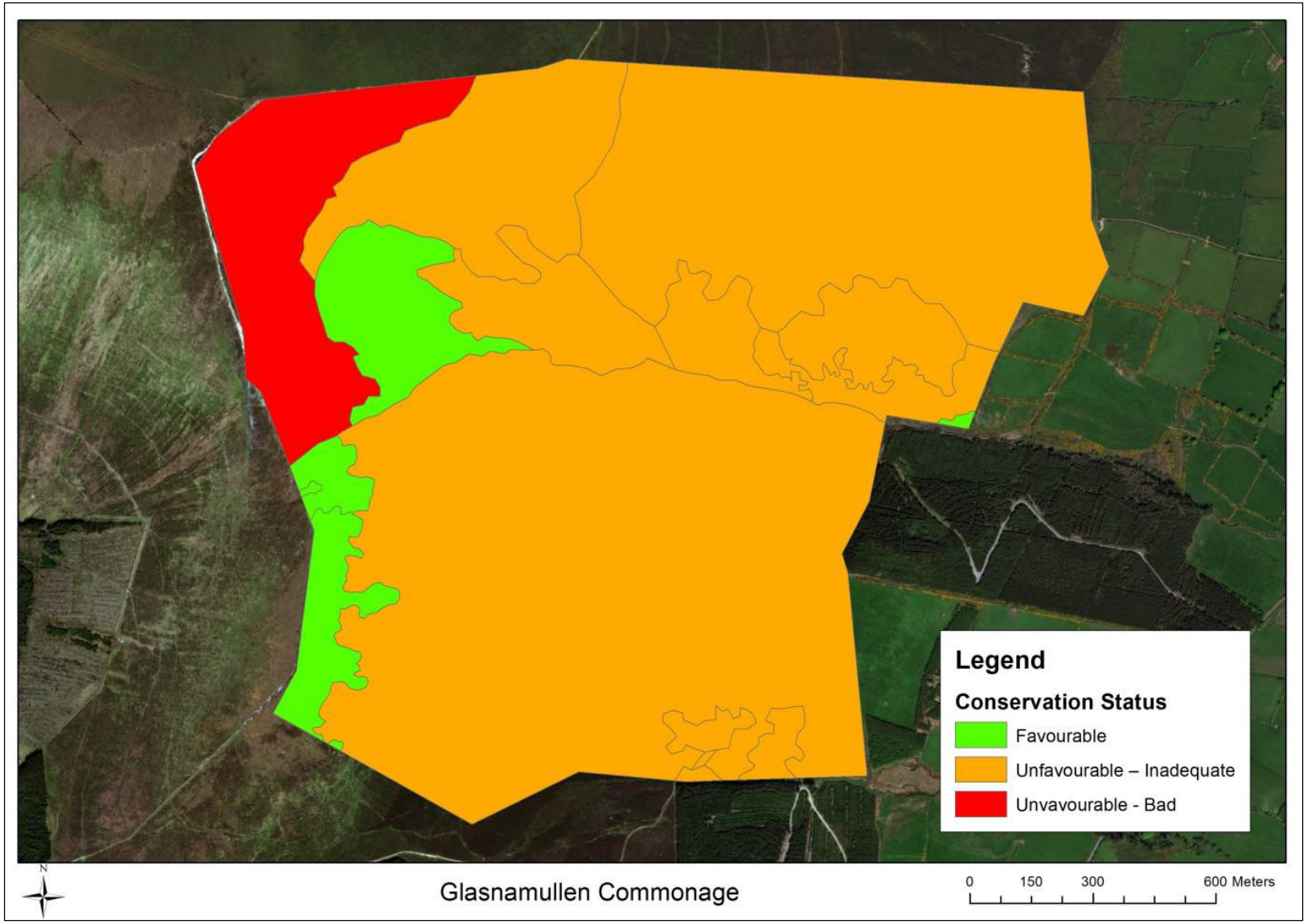


Figure 3. Habitat Condition Assessment for Glasnamullen Commonage.

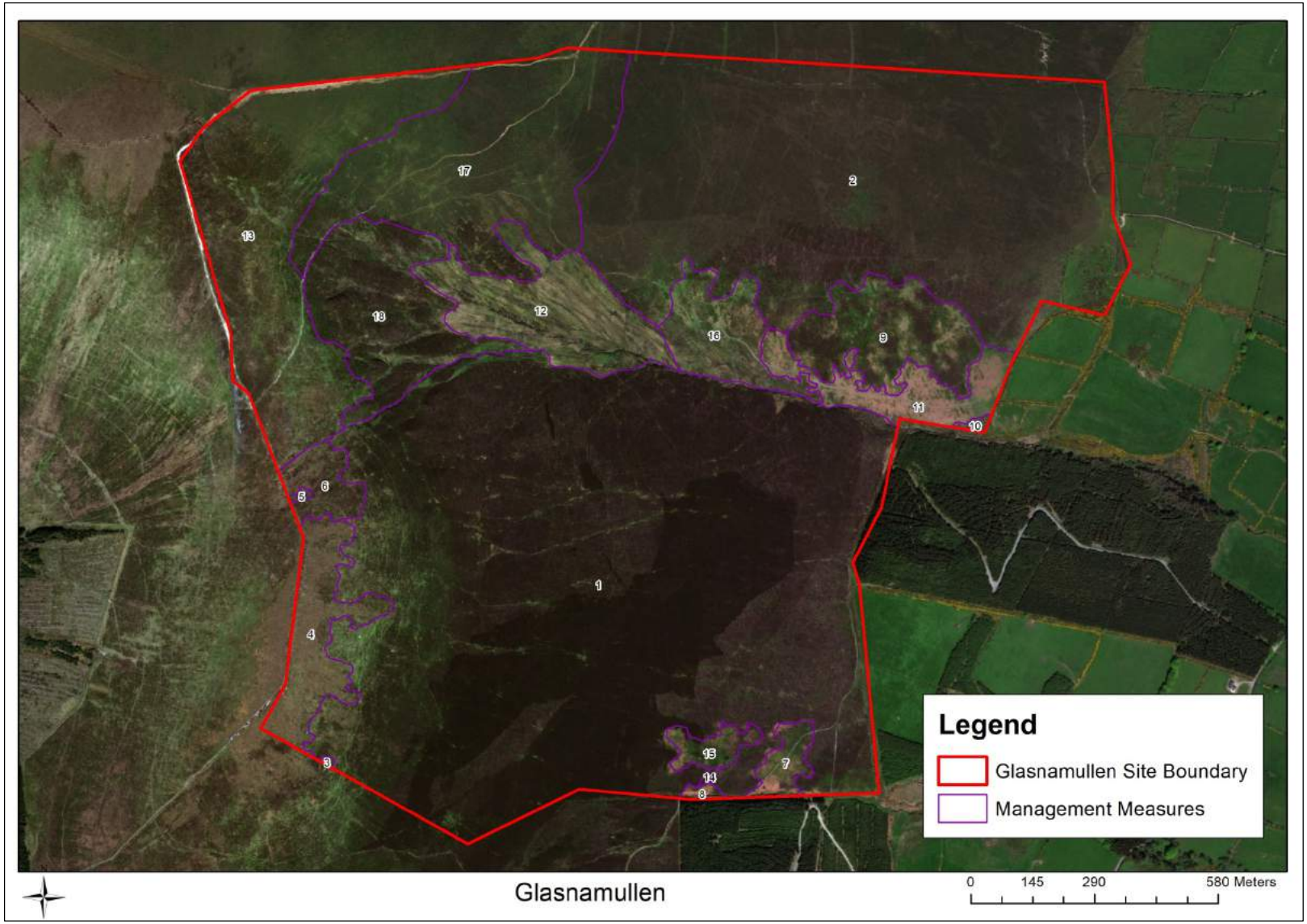


Figure 4. Management measures for Glasnamullen.

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

Id	Annex I Code	Fossitt Code	Conservation Status	Habitat	Area (m Sq)	Area (hectares)	Management Measure
1	4030	HH1	Unfavourable - Inadequate	Dry Heath	1201285	120.13	Controlled burning measures as detailed above. Removal of Sitka spruce and rhododendron regeneration.
2	4030	HH1	Unfavourable - Inadequate	Dry Heath	669959	67.00	Controlled burning measures as detailed above.
3	7130	PB2	Favourable	Upland Blanket Bog	598	0.06	Monitor grazing and sheep movements to keep in good condition.
4	7130	PB2	Favourable	Upland Blanket Bog	65059	6.51	Monitor grazing and sheep movements to keep in good condition.
5	3160	FL1	Favourable	Bog Pool	1117	0.11	Monitor grazing and sheep movements to keep in good condition.
6	7130	PB2	Favourable	Upland Blanket Bog	24676	2.47	Monitor grazing and sheep movements to keep in good condition.
7		HD1	Not assessed but needs management	Dense Bracken	16654	1.67	Control bracken.
8		HD1	Not assessed but needs management	Dense Bracken	2955	0.30	Control bracken.
9	4030	HH1/GS3/HD1	Unfavourable - Inadequate	Dry Heath/Acid grassland/Bracken	83534	8.35	Monitor grazing and sheep movements. Control bracken.
10		WS1	Retained for breeding birds	Gorse Scrub	1973	0.20	No measures required.
11		HD1	Not assessed but needs management	Dense Bracken	51663	5.17	Control bracken.
12		HH3/PF2/GS4	Unfavourable - Inadequate	Wet Heath/Flush/Wet Grassland	103105	10.31	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate.
13	4060	HH4	Unfavourable - Bad	Montane Heath	251955	25.20	Restoration work to the walking path.
14	4030	HH1	Unfavourable - Inadequate	Dry Heath	982	0.10	Very small area – monitor.
15		HD1	Not assessed but needs management	Dense Bracken	14494	1.45	Control bracken.
16		HH1/GS3/HD1	Unfavourable - Inadequate	Dry Heath/Acid grassland/Bracken	55680	5.57	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate. Control bracken.
17	4030	HH1/GS3	Unfavourable - Inadequate	Dry Heath/Acid grassland	238734	23.87	Monitor grazing and sheep movements. Move sheep out of this area where they tend to congregate. Monitor erosion along the walking track.
18	4030	HH1	Favourable	Dry Heath	116876	11.69	Monitor grazing and sheep movements. Move sheep out of this area if it begins to get overgrazed.

5. Appendix 2. Water Quality

Water samples were taken in the Glasnamullen Stream in February 2019 at two sampling locations as shown on **Figure 5** below. The water samples were assessed by Carl Dixon and the Glasnamullen Stream was assessed at both the downstream and upstream sampling points (GM1 and GM2) as a stream 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.

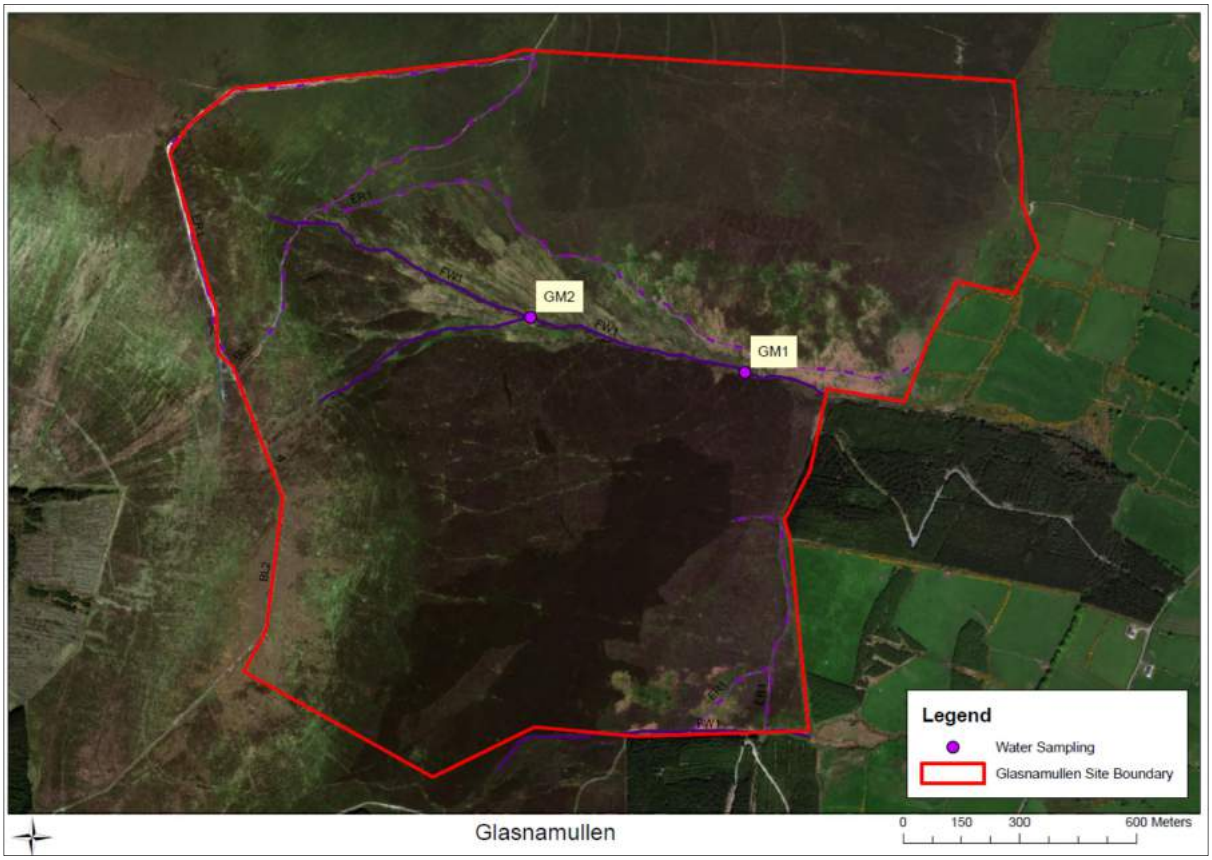


Figure 5. Water quality sample locations at Glasnamullen.

SUAS Water Quality Sampling

River:	Code:	Date:	Sample Taken By:
Glasnamullen Stream	IE_EA_10V010050	22/02/2019	Faith Wilson
Sample Number:	**Location:**	**Stream Order:**	**Grid Reference:**
GM1	Glasnamullen Commonage – just above the oak tree	2nd order	O 19193 09621
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: Y/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
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:**
Sheep	**None**	**Kick sample - 2**	Pasture
Deer	Present	**Stone washing - 1**	**Bog**
	Moderate	Weed sweep	Forestry
	Abundant		Tillage
			Urban
			Other

Plate 1. Photographic record of sampling location.

FM 1

River:	Code:	Date:	Time:
Station no.	Location:		Grid (6 figure):
	Stream Order:		Stream flow: Riffle / Riffle/Glide / Slow flow

Field Chemistry	
DO%	
DO mg/l	
Temp (°C)	
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
Highly turbid	Very Low
	Dry
	Recent Flood

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: Stoney 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

Shading: High – Moderate – Low - None

Cattle access Y: upstream – downstream or N

Photo: Y / N

Filamentous Algae: None – Present – Moderate - Abundant

Sewage Fungus: None – Present – Moderate - Abundant

Main land use u/s:
Pasture
Bog
Forestry
Urban
Tillage
Other

Sample retained: Y / N

Sampled in Minutes:
Pond net x
Stone wash x
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:		Plecoptera:	
Ecdyonurus Ab		*Leuctra* Ab	
Rhithrogena Ab		*Isoperla* Ab	1
Heptagenia Ab		*Protonemura* Ab	1
Ephemerella Ab		*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paraleptophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	3
Total no. of taxa	Total Relative Abundance	Total no. of Taxa 3	Total Relative Abundance

Trichoptera:		G.O.L.D:			
Hydroptychidae Ab		*Lymnaea* (G) Ab		*Chironomidae* (D) Ab	1
Polycentropodidae Ab		*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab	
Rhyacophila Ab		*Planorbis* (G) Ab		*Simuliidae* (D) Ab	
Philopotamidae Ab		*Anguis* (G) Ab		*Dicranota* (D) Ab	
Limnephilidae Ab		*Physa* (G) Ab		Tipulidae (D) Ab	
Sericostomatidae Ab		*Lumbriculus* (Ol) Ab		*Ceratopogonidae* (D) Ab	
Glossosomatidae Ab		*Eiseniella* (Ol) Ab		Other GOLD Ab	
Lepidostomatidae Ab		Tubificidae (Ol) Ab			
Other Trichoptera Ab					
Total no. of Taxa	Total Relative Abundance	Total no. of Taxa 1		Total Relative Abundance 1	

Asellus: Absent / Few (1-20) / Common (>20)

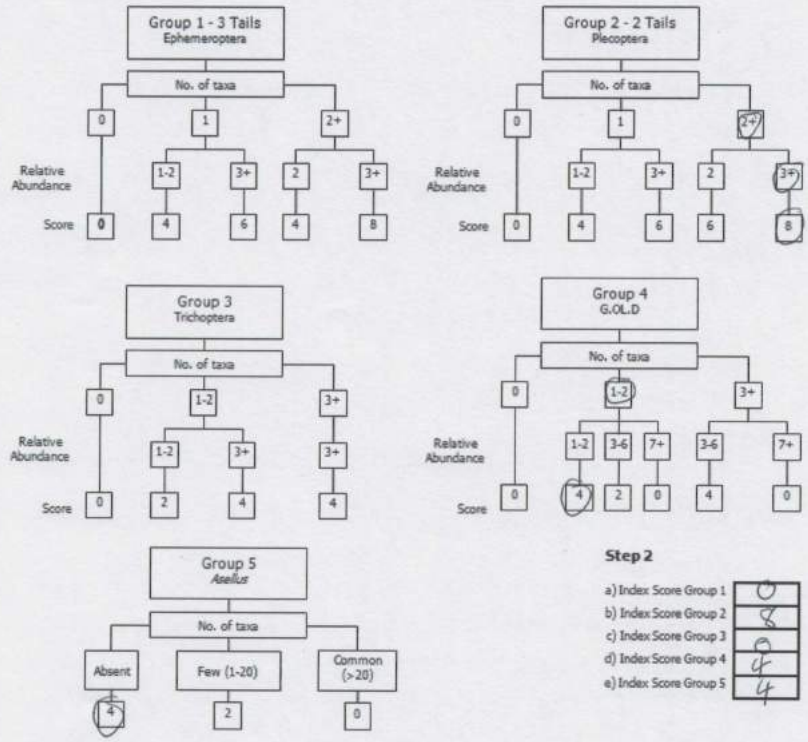
NOTE: *Asellus* must be recorded as absent if none are found

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*.

GM 1

Strong odour

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.



Step 2

a) Index Score Group 1	0
b) Index Score Group 2	8
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)	Average Index Score (AIS) TIS/5 (5 for 5 groups)	**SSR Score** (AIS x 2)
16	3.2	6.4

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): CARL NIM Date: ___/___/___

River:	Code:	Date:	Sample Taken By:
Glasnamullen Stream	IE_EA_10V010050	22/02/2019	Faith Wilson
Sample Number:	**Location:**	**Stream Order:**	**Grid Reference:**
GM2	Glasnamullen Commonage – just below the confluence	2nd order	O 18643 09762
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: Y/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
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:**
Sheep	**None**	**Kick sample - 2**	Pasture
Deer	Present	**Stone washing - 1**	**Bog**
	Moderate	Weed sweep	Forestry
	Abundant		Tillage
			Urban
			Other

Plate 1. Photographic record of sampling location.

GM2

River:	Code:	Date:	Time:
Station no.	Location:		Grid (6 figure):
	Stream Order:		Stream flow: Riffle / Riffle/Glide / Slow flow

Field Chemistry	
DO%	
DO mg/l	
Temp (°C)	
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
Highly turbid	Very Low
	Dry
	Recent Flood

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:
Stoney 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

Sample retained: Y / N

Shading: High – Moderate – Low - None

Cattle access Y: upstream – downstream or N

Photo: Y / N

Sewage Fungus:
None – Present – Moderate - Abundant

Sampled in Minutes:
Pond net x
Stone wash x
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.OL.D (Gastropoda, Oligocheata 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:

Ecdyonurus Ab	
Rhithrogena Ab	
Heptagenia Ab	
Ephemerella Ab	
Caenis Ab	
Paraleptophlebia Ab	
Ephemera danica Ab	
Other Ephem. Ab	
Total no. of taxa	**Total Relative Abundance**

Plecoptera:

Leuctra Ab	
Isoperla Ab	
Protonemura Ab	
Amphinemura Ab	
Perla Ab	
Dinocras Ab	
Other Plecop Ab	
Other Plecop Ab	
Total no. of Taxa	**Total Relative Abundance**

Trichoptera:

Hydropsychidae Ab	
Polycentropodidae Ab	1
Rhyacophila Ab	
Philopotamidae Ab	
Limnephilidae Ab	
Sericostomatidae Ab	
Glossosomatidae Ab	
Lepidostomatidae Ab	
Other Trichoptera Ab	

G.OL.D:

Lymnaea (G) Ab	
Potamopyrgus (G) Ab	
Planorbis (G) Ab	
Anguilus (G) Ab	
Physa (G) Ab	
Lumbriculus (Ol) Ab	
Eiseniella (Ol) Ab	
Tubificidae (Ol) Ab	1

Chironomidae (D) Ab	
Chironomus (D) Ab	
Simuliidae (D) Ab	
Dicranota (D) Ab	
Tipulidae (D) Ab	1
Ceratopogonoidae (D) Ab	
Other GOLD Ab	

Asellus: Absent / Few (1-20) 5 / Common (>20)

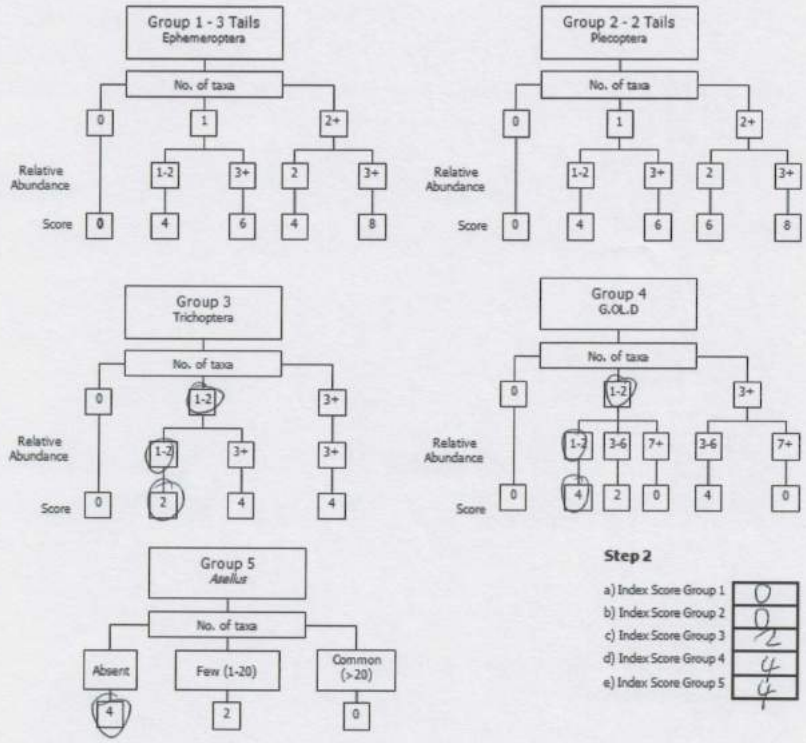
NOTE: *Asellus* must be recorded as absent if none are found

Total no. of Taxa	1	**Total Relative Abundance**	1	**Total no. of Taxa**	2	**Total Relative Abundance**	2

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*.

GM2

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.



Step 2

a) Index Score Group 1	0
b) Index Score Group 2	0
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) sum (a+b+c+d+e)	Average Index Score (AIS) TIS/5 (5 for 5 groups)	SSR Score (AIS x 2)
10	2	4

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): CAMC DUM Date: ___/___/___