Corrasillagh Commonage

2020 Ecological Survey

Final Report

20th April 2021

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1. Introduction

A baseline habitat condition and ecological survey and habitat management plan was prepared for the Corrasillagh Commonage in 2019[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 2020.

The management prescriptions in the SUAS plan for the 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* , 4030 Dry Heath, 4060 Alpine and Boreal Heath** and **7130 Blanket Bog**.

The major impacts arise from a legacy of inappropriate grazing (from sheep and also from deer), erosion of peat along the summits and ridges (impacting on upland blanket bog and montane heath), with subsequent severe landslides and damage and losses to acid grassland/dry heath/blanket bog habitat below, invasion of grassland by dense bracken, and localised trampling impacts from walkers and illegal quad activity. Overgrazing is also contributing to erosion, not only on the ridges and summits and the cliffs behind Kelly's Lough but also on the slopes of the commonage above the Carrawaystick Stream. These impacts, coupled with natural exposure, increased rainfall and storm events and clear felling in the uplands pose a serious risk of flooding to the houses, farms and inhabitants of the Glenmalure valley below.

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 Corrasillagh 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).**

[1] Wilson, F. (2019). Ecological Baseline Survey prepared for Slievemweel 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 Corrasillagh Commonage, Co. Wicklow in accordance with the requirements of Article 6(3) of the EU Habitats Directive. 15th November 2019. Unpublished report for SUAS EIP.

2. SUAS Vegetation Management Measures

The proposed management measures for the Corrasillagh commonage in 2020 under SUAS were as follows:

Year 1 (2020)

1. Carry out necessary repairs to the Zig Zags roadway to allow improved access by quads for management purposes. Gateway out through the fence to be levelled up to allow easier access and prevent erosion.
2. Spray bracken alongside the track in area 2 for sheep gathering, as existing track is closing in and it is hard to move sheep along it. Spray approx. 2-3m wide either side of the track using quad with handlance.
3. Spray bracken in areas 4, 6, 9 & 10 (approx. 2ha in total) with Asulox to control Bracken. This may be done by quad with hand lance or with knapsack sprayers as it is inaccessible for tractors.
4. Remove self-seeded Sitka spruce trees in area 2.
5. Reduce sheep grazing numbers in area above Kelly's Lake by hunting out neighbouring sheep and using feed buckets and active shepherding to encourage own sheep to graze other non-damaged areas of the hill
6. Put in small sheep pen (approx. 3m X 3m) near the gateway in the fence across the hill for holding sheep for treatment, etc.
7. Fence off at least 2 enclosure areas to see what recovery rates are like in areas 1 & 17.

Year 2 (2021)

1. Spray bracken in areas 4, 6, 9 & 10 (approx. 2ha in total) with Asulox to control Bracken. This may be done by quad with hand lance or with knapsack sprayer.
2. Cut/pull more of the self-seeded Sitka spruce trees in area 2.
3. Reduce sheep grazing numbers in area above Kelly's Lake by hunting out neighbouring sheep and using feed buckets to encourage own sheep to graze other non-damaged areas of the hill
4. Discuss repairs to walking track above the zig-zags up with NPWS to see what is possible or practical.
5. Plant some native trees along Kelly's Brook to help prevent erosion and provide some protection from flooding and creating small areas of gully woodland.
6. Look at trialling some peatland restoration measures in at least one area of bare peat.

Year 3 (2022)

1. 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 1 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 ticks or other 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 April/May period. Graze more of them in plot 2, especially over the winter months.

Put a herd of cattle on plot 2 to help control bracken. Leave cattle on the hill for as long as possible and especially over the winter if possible. Can use supplementary feeding to keep them there over the winter.

Set up a number of exclosure sites for deer & sheep in the bare peat areas to see if natural regeneration will take place. May carry out some peat restoration work following discussion with NPWS.

Details of sheep stocking rates proposed
In 2019, there were approx. 600 ewes on the hill, at various times of the year. There were high losses of hoggets and so they were took down early and didn't go back.

The plan is for to have 400 to 450 sheep (ewes & hoggets) on the hill for 9-10 months of the year, which will happen over the next 2 to 3 years and will involve a change in breeding for Pat and Patrick. Numbers will be recorded accurately in 2020 and if amendments need to be made to this plan, it will be done at the end of 2020.

Pat Dunne is also proposing to keep 6-7 cattle on the area below the fence to help bracken control. It is planned to keep these cattle out all year round and will need a small pen and crush at the bottom of the hill for routine works and testing. This will be incorporated into the existing sheep pen that is already there and the SUAS project will fund it.

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 along the edges of the zig zags track. The effect of this was noticeable in that bracken here had begun to die back. Unfortunately some native ferns which are not invasive and provide an important role is stabilising the slope were also sprayed – if possible these should be avoided in any future treatments.

Plate 1. Bracken treatment adjoining the zig zags track.

Plate 2. Bracken treatment adjoining the zig zags track.

Plate 3. Native ferns were inadvertently sprayed adjoining the track – avoid in future if possible.

3.2 Upland Gully Woodland Restoration/Native Woodland Establishment

The establishment of gully woodland along the Carrawaystick Stream and it's tributaries in the commonage through a variety of techniques is to be conducted in early 2021.

Small areas of native woodland could also be established in Area 2 in areas of outcropping rock/scree where bracken treatment will be difficult to implement – this could be done through the use of fencing/exclosures (covering several square meters) should also be erected around existing isolated trees to allow natural regeneration to occur.

Plate 4. Restoration of native woodland habitat along the watercourses in the site will be completed in 2021.

Plate 5. Fencing around trees such as this which are rich with seed will allow us to see if natural regeneration from this seed source can become established in the absence of grazing pressure.

3.3 Track Works

Extensive track repairs and drainage works have been conducted along the zig zags track. This work has been sensitively done and may require some small finishing off/guidance on stone pitching techniques in some areas.

Plate 6. Localised repairs on the zig zag track.

Plate 7. Some areas may benefit from some stone pitching techniques.

Plate 8. Drainage works adjoining the zig zag track.

Plate 9. Stone could be reutilised along track edges as low walls honouring the built heritage of the zig zag track.

3.4 Cattle Grazing

A most welcome addition to the hill is that of a small herd of Black Galloway cattle to Area 2. As reported on the SUAS project Facebook Page on 18th August:

> 'An exciting new arrival to Corrasillagh commonage last week! A healthy Black Galloway heifer calf was calved on the mountain close to Kelly's Lake. Cow and calf are doing great.
>
> Reintroducing mixed grazing was one of the measures for Corrasillagh to help manage *Molinia* grass and Bracken. *Molinia* grass grows in dense tufts and excludes other species such as heather and bilberry while Bracken is notorious for spreading and becoming invasive.
>
> Both are very difficult to manage. However grazing and trampling by cattle has been found effective to break up the heavier vegetation and will hopefully encourage more diversity.
>
> The farmer bought 7 Black Galloway cows in January and the herd have continuously grazed the hillside since. They have free roam of a large area. Supplementary feeding was given till April on a Molinia dominated area and they happily continued to graze the same area throughout the summer.
>
> The Black Galloway breed was chosen as they are extremely hardy having a double layer of hair, and are known as easy calvers.
>
> The cow made a break for a higher part of the mountain to calve but she is back with the others now. It is the first time in living memory that a cow calved on the mountain and great to see both doing well. 3 more are due later in the Autumn.
>
> Extensive agricultural plays an important role in managing our natural heritage and the activities of upland farmers an important part of our cultural heritage. Great to see the reintroduction of cattle and the positive impact it is having'.

Plate 10. Facebook post celebrating the new arrival.

The grazing impact of the cattle on *Molinia* could be clearly seen during the site visit – a complete contrast to the browsing pattern of sheep. Their dung was also evident on the zig zags track where it was being utilised by a variety of coprophilic (dung loving) invertebrates, which were then fed on by birds – increasing biodiversity on the hill.

It would be interesting to trial the use of radio tracking collars on the cattle, which could allow them to be released onto the open hillside above Area 2 and their locations monitored. Some systems notify you if animals leave a designated area so they can be rounded up.

https://smartertechnologies.com/smarter-products/gps-cattle-collar/

Use of GPS tracking collars and accelerometers for rangeland livestock production research – available at https://academic.oup.com/tas/article/2/1/81/4824982

Monitoring cattle behaviour and pasture use with GPS and GIS - available at https://cdnsciencepub.com/doi/pdf/10.4141/A99-093

Other options include the use of a 'virtual fence'

https://www.independent.ie/business/farming/gps-technology-offers-alternative-to-paddock-fences-31356001.html

https://cdnsciencepub.com/doi/pdf/10.4141/A99-093

https://www.farmprogress.com/livestock/can-cattle-be-confined-virtual-fence

https://www.frontiersin.org/articles/10.3389/fvets.2019.00445/full

Plate 11. Purple moor grass being favoured by the Belted Galloways on the hill.

Plate 12. Various invertebrates rely on cow pats to complete their lifecycle.

Plate 13. A Black Galloway and her young calf at the base of the hill.

3.5 Sitka Spruce Removal

Sitka spruce has been removed from Area 2**.**

Plate 14. Felling of Sitka spruce in Area 2.

3.6 Faunal Observations

Fresh badger tracks were noted on the commonage.

Plate 15. Fresh badger track.

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 necessary repairs to the Zig Zags roadway to allow improved access by quads for management purposes. Gateway out through the fence to be levelled up to allow easier access and prevent erosion.
2. Spray bracken alongside the track in area 2 for sheep gathering, as existing track is closing in and it is hard to move sheep along it. Spray approx. 2-3m wide either side of the track using quad with handlance.
3. Spray bracken in areas 4, 6, 9 & 10 (approx. 2ha in total) with Asulox to control Bracken. This may be done by quad with hand lance or with knapsack sprayers as it is inaccessible for tractors.
4. Remove self-seeded sitka spruce trees in area 2.
5. Reduce sheep grazing numbers in area above Kelly's Lake by hunting out neighbouring sheep and using feed buckets and active shepherding to encourage own sheep to graze other non-damaged areas of the hill
6. Put in small sheep pen (approx. 3m X 3m) near the gateway in the fence across the hill for holding sheep for treatment, etc.
7. Fence off at least 2 enclosure areas to see what recovery rates are like in areas 1 & 17

Items highlighted in red have not been completed.

2021

1. Spray bracken in areas 4, 6, 9 & 10 (approx. 3ha in total) with Asulox to control Bracken. This may be done by quad with hand lance or with knapsack sprayer. Care will be taken to avoid any non-invasive native ferns present as these are not the target species.

2. Cut/pull any remaining self-seeded sitka spruce trees in area 2.

3. Reduce sheep grazing numbers in area above Kelly's Lake by hunting out neighbouring sheep and using feed buckets to encourage own sheep to graze other non-damaged areas of the hill (where possible)

4. Discuss repairs to walking track above the zig-zags up with NPWS to see what is possible or practical.

5. Plant at least 150 native trees along Kelly's Brook to help prevent erosion and provide some protection from flooding and creating small areas of gully woodland.

6. Keep the cattle grazing on the hill and trial the use of GPS fencing to allow more controlled grazing activity, particularly in *Molina* dominated areas.

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. Graze more of them in plot 2, especially over the winter months.

4. Appendix 1. Maps & Management Recommendations

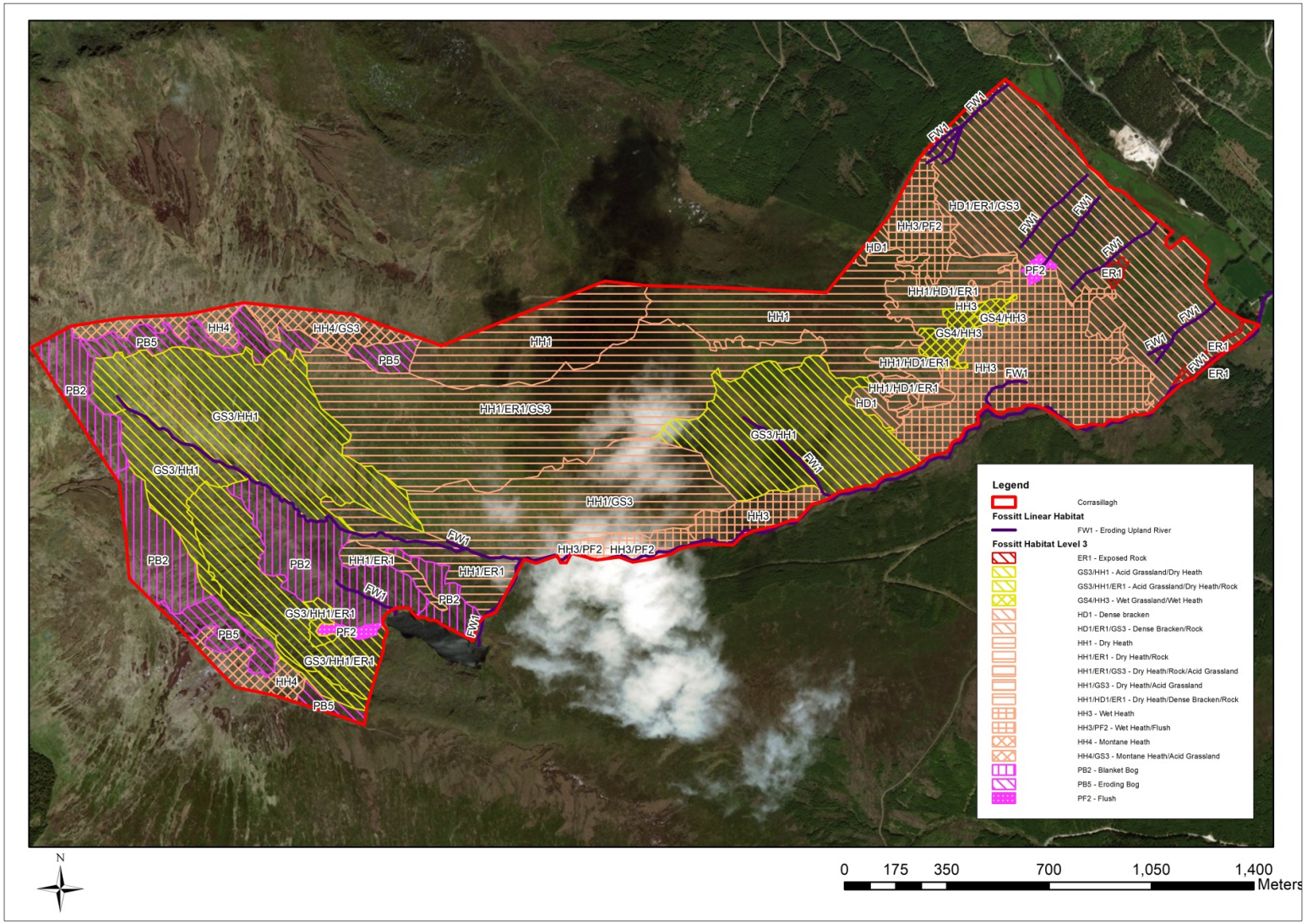


Figure 1. Habitats mapped to Level Three (Fossitt, 2000) within the Corrasillagh commonage.

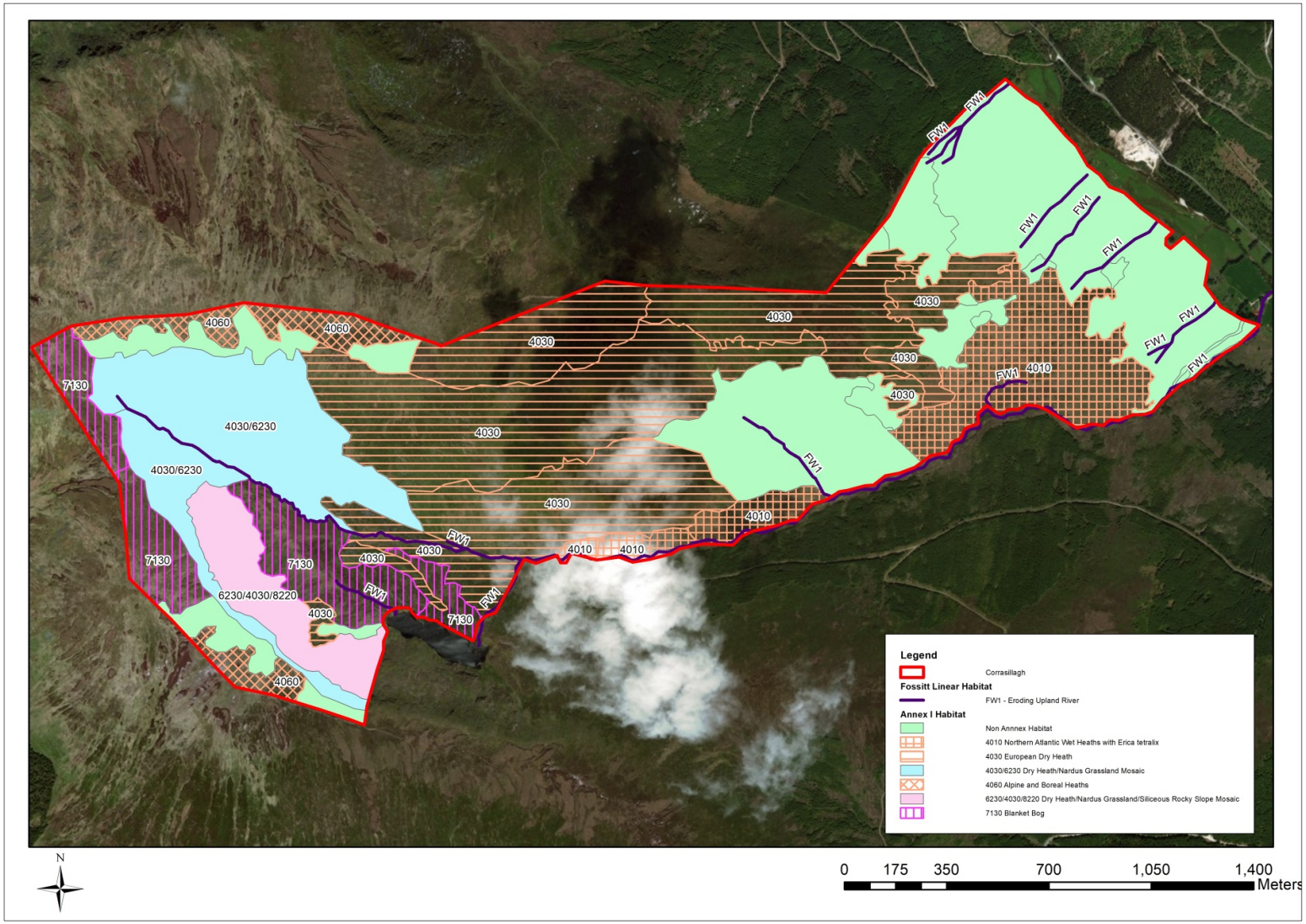


Figure 2. Habitats mapped according to their correspondence with Annex I habitats within the Corrasillagh commonage.

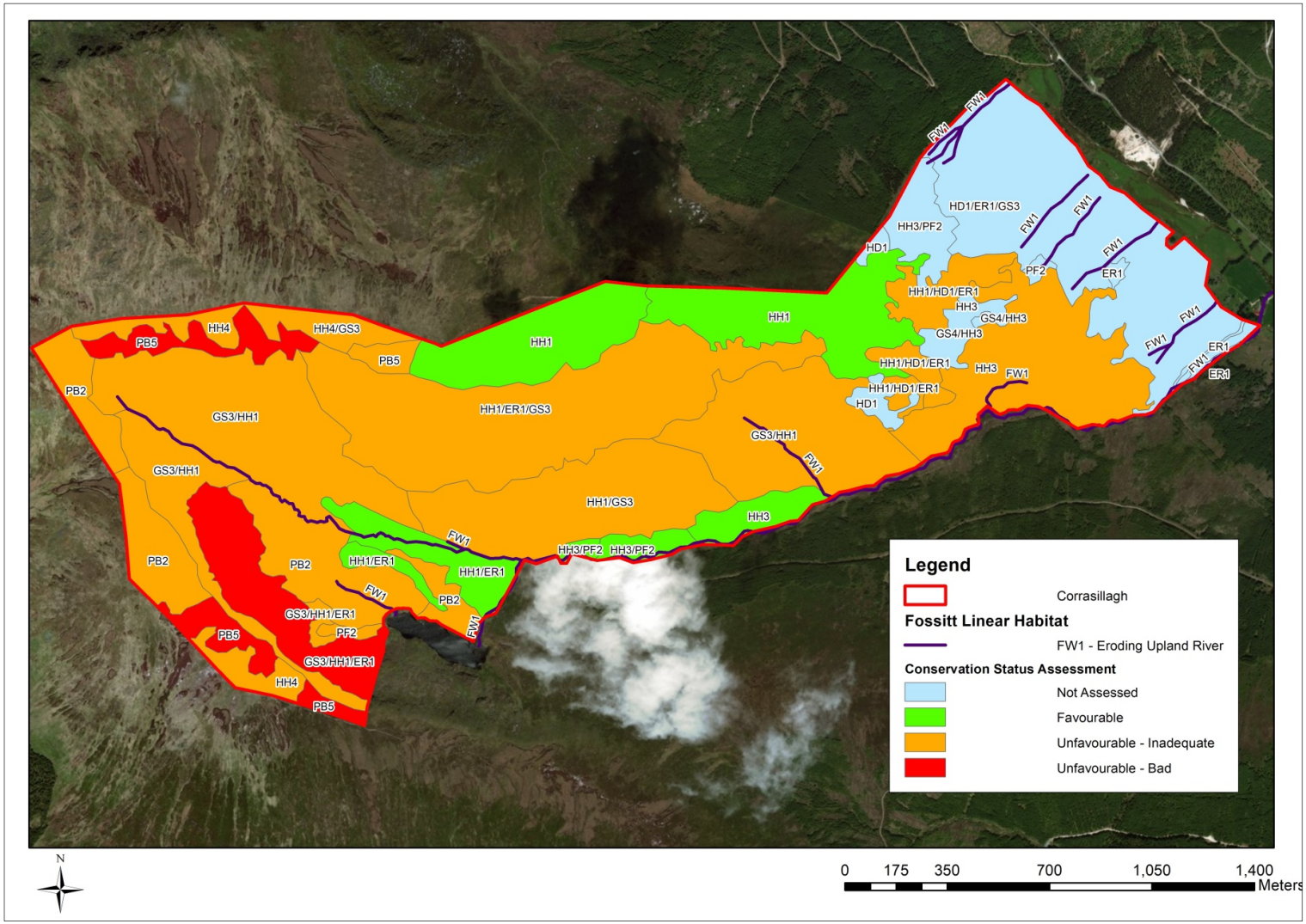


Figure 3. Habitat Condition Assessment for Corrasillagh Commonage.

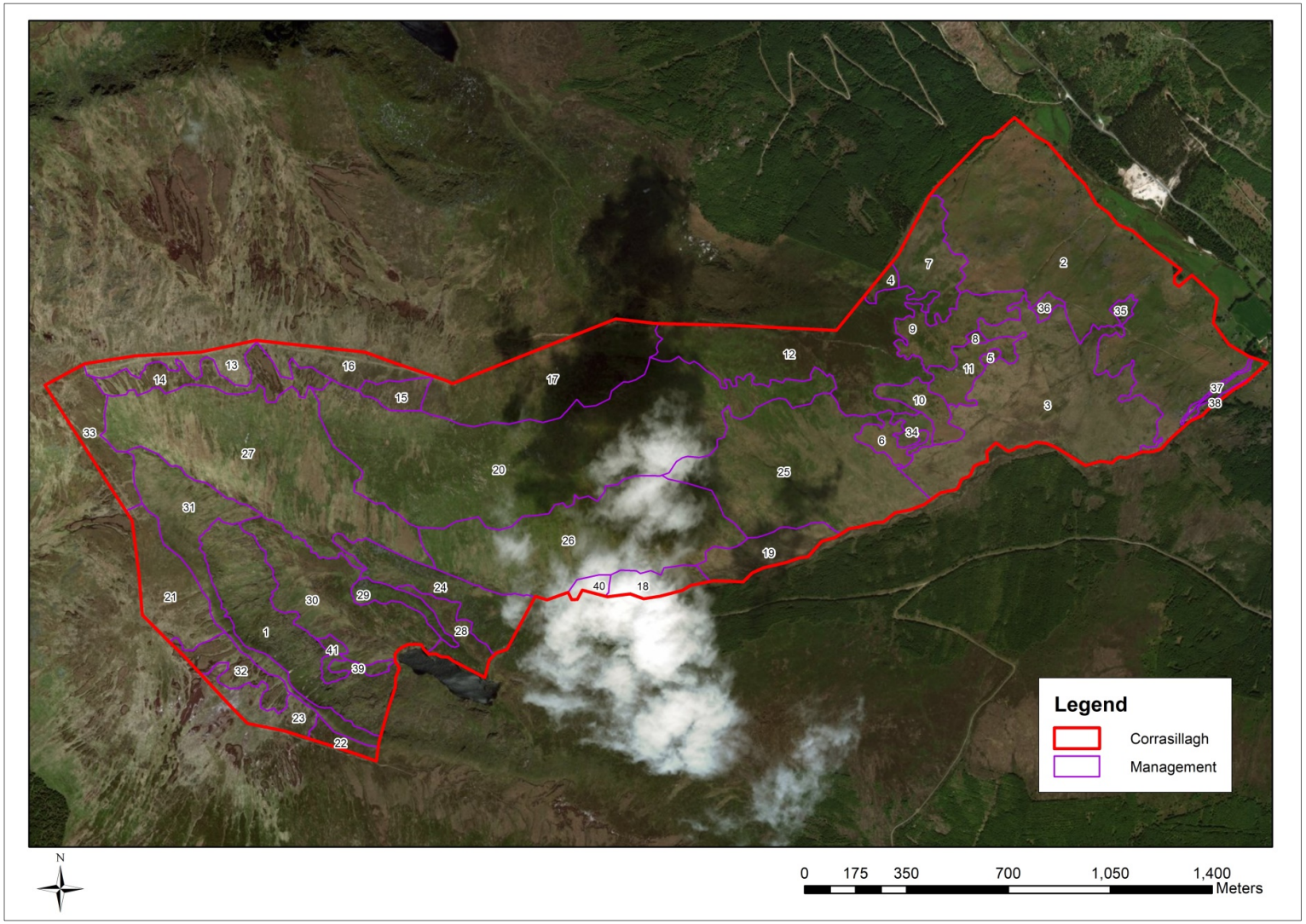


Figure 4. Management measures for Corrasillagh.

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

Id	Annex I Code	Fossitt Code	Area (m2)	Area (Ha)	Conservation Status Assessment	Management Prescription
1	6230/4030/8220	GS3/HH1/ER1	152973	15.30	Unfavourable - Bad	Reduce stocking density in key areas Shepherd out trespassing sheep and deer Allow vegetation to recover and slopes to stabilise Peat restoration works higher on the ridge should also assist in reducing landslip risk
2		HD1/ER1/GS3	486222	48.62		Bracken Control Several options – see what impact sheep have, graze with cattle, spray bracken Remove self-seeded Sitka spruce Could enter into the Native Woodland Scheme as a Protection Forest for the farm and valley Minor repairs to Zig Zags track – ongoing…
3	4010	HH3	274357	27.44	Unfavourable - Inadequate	Reduction in deer numbers Reduction in grazing pressure
4		HD1	6798	0.68		Control bracken
5		GS4/HH3	2461	0.25		
6		HD1	19268	1.93		Control bracken
7		HH3/PF2	59515	5.95		Reduction of browsing pressure from deer and sheep will aid this area
8		HH3	2139	0.21		Reduction of browsing pressure from deer and sheep will aid this area

9	4030	HH1/HD1/ER1	58978	5.90	Unfavourable - Inadequate	Control bracken Track repair works
10	4030	HH1/HD1/ER1	25951	2.60	Unfavourable - Inadequate	Control bracken
11		GS4/HH3	32833	3.28		
12	4030	HH1	196186	19.62	Favourable	Track repair works
13	4060	HH4	36452	3.65	Unfavourable - Inadequate	Track repair works Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
14		PB5	59836	5.98	Unfavourable - Bad	Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
15		PB5	19399	1.94	Unfavourable - Inadequate	Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
16	4060	HH4/GS3	46484	4.65	Unfavourable - Inadequate	Track repair works Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
17	4030	HH1	163751	16.38	Favourable	Track repair works Destock/reduce grazing pressure to allow vegetation to continue to recover
18	4010	HH3/PF2	26464	2.65	Favourable	
19	4010	HH3	48288	4.83	Favourable	
20	4030	HH1/ER1/GS3	489178	48.92	Unfavourable - Inadequate	Reduction of browsing pressure from deer and sheep will aid this

						area
21	7130	PB2	77712	7.77	Unfavourable - Inadequate	Track repair works
22		PB5	12504	1.25	Unfavourable - Bad	Track repair works Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
23	4060	HH4	35534	3.55	Unfavourable - Inadequate	Track repair works Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
24	4030	HH1/ER1	79394	7.94	Favourable	
25		GS3/HH1	260561	26.06	Unfavourable - Inadequate	Destock/reduce grazing pressure to allow heath vegetation to recover
26	4030	HH1/GS3	269969	27.00	Unfavourable - Inadequate	Destock/reduce grazing pressure to allow heath vegetation to recover
27	4030/6230	GS3/HH1	327416	32.74	Unfavourable - Inadequate	Destock/reduce grazing pressure to allow heath vegetation to recover Quad Damage
28	7130	PB2	30909	3.09	Unfavourable - Inadequate	Quad Damage
29	4030	HH1/ER1	19914	1.99	Favourable	
30	7130	PB2	137842	13.78	Unfavourable - Inadequate	Quad Damage
31	4030/6230	GS3/HH1	111777	11.18	Unfavourable - Inadequate	Destock/reduce grazing pressure to allow vegetation to recover
32		PB5	38178	3.82	Unfavourable - Bad	Track repair works Peatland Restoration Works

						Destock/reduce grazing pressure to allow vegetation to recover
33	7130	PB2	57105	5.71	Unfavourable - Inadequate	Track repair works Peatland Restoration Works Destock/reduce grazing pressure to allow vegetation to recover
34	4030	HH1/HD1/ER1	12580	1.26	Unfavourable - Inadequate	Control bracken
35		ER1	4906	0.49		
36		PF2	5549	0.55		
37		ER1	3128	0.31		
38		ER1	3352	0.34		
39		PF2	7525	0.75	Unfavourable - Inadequate	
40	4010	HH3/PF2	7766	0.78	Favourable	
41	4030	GS3/HH1/ER1	9264	0.93	Unfavourable - Inadequate	

5. Appendix 2. Water Quality

The Carrawaystick Stream or Kelly's Brook rises within the commonage and Lough Brook flows from Kelly's Lough to join this watercourse within the boundaries of the commonage. The stream then falls as the spectacular Carrawaystick Waterfall over the hanging valley of Glenmalure before joining Avonbeg River, which is a tributary of the Avoca River.

Water samples were taken from three sampling locations on the Carrawaystick Stream within the commonage as shown on **Figure 5** below.

The water samples were assessed by Carl Dixon and one of the headwater streams (CO1) was assessed as a stream 'At Risk' of not achieving 'Good' water quality status, whereas (CO2 and CO3) were assessed 'Indeterminate' (a stream that may be '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.

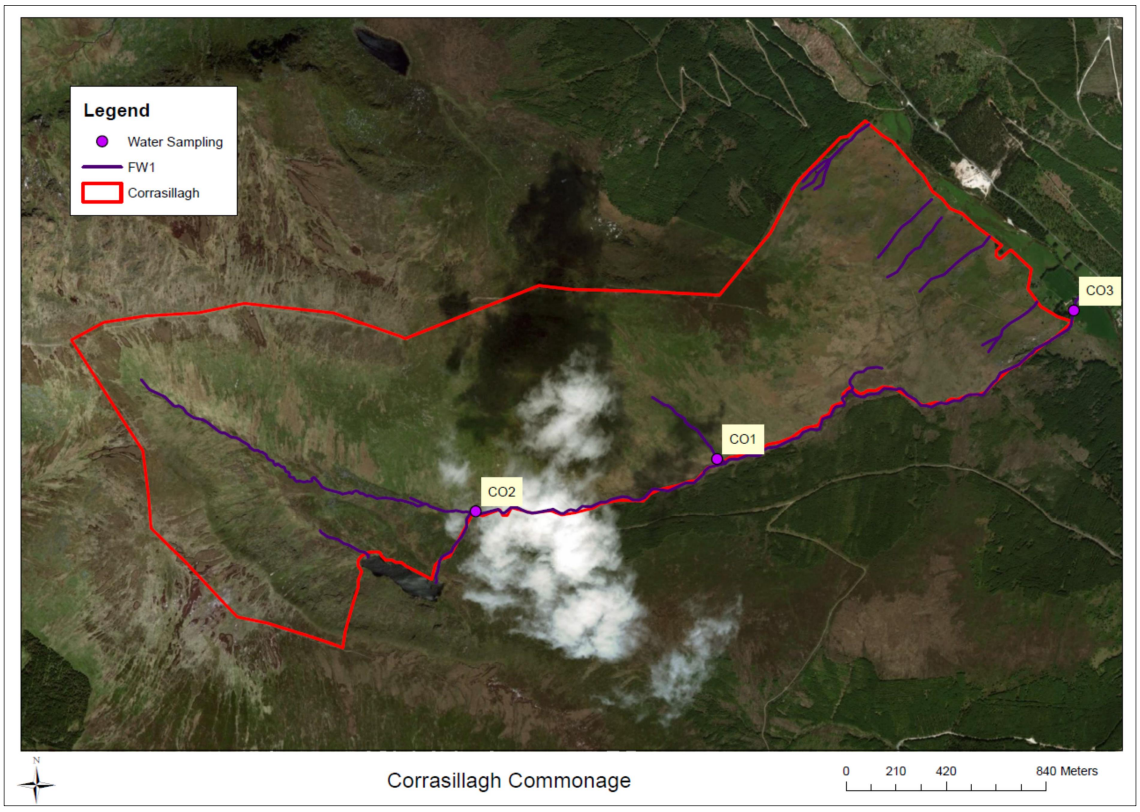


Figure 5. Water quality sample locations at Corrasillagh.

SUAS Water Quality Sampling

River:	Code:	Date:	Sample Taken By:
Clonkeen Stream (Carrawaystick River)	IE_EA_10A040400	29.07.2019	Faith Wilson
Sample Number:	**Location:**	**Stream Order:**	**Grid Reference:**
CO 1	Clonkeen Stream above the confluence with Carrawaystick River within the Corrasillagh upland farm	1st order	T 07160 91377
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
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:**
Deer	**None**	**Kick sample – 4 mins**	Pasture
Sheep	Present	Stone washing	**Bog**
	Moderate	Weed sweep	Forestry
	Abundant		Tillage
			Urban
			Other

Plate 1. Photographic record of sampling location.

Corrasillagh
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

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, 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	
Heptagenia Ab		*Protonemura* Ab	
Ephemerella Ab	2	*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paralentophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
Total no. of taxa: 1	Total Relative Abundance: 2	Total no. of Taxa: 0	Total Relative Abundance: 0

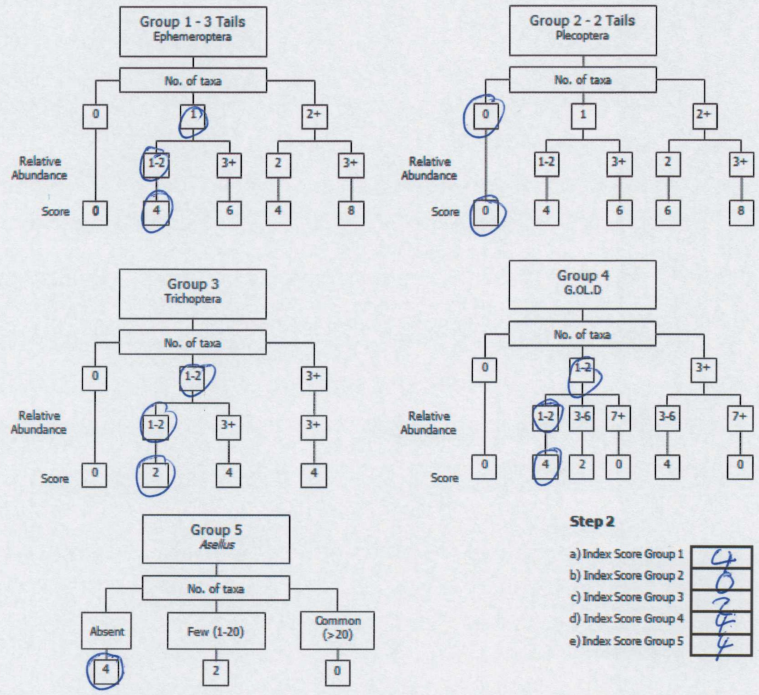
Trichoptera:		G.OL.D:				Asellus:	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab		Absent	✓
Polycentropodidae Ab		*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few (1-20)	
Rhyacophila Ab		*Planorbis* (G) Ab		Simuliidae (D) Ab	1	Common (>20)	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab			
Limnephilidae Ab	1	*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: 1	Total Relative Abundance: 1	Total no. of Taxa: 1		Total Relative Abundance: 1			

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*.

Corrasillagh
1

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	4
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~~) 14

Average Index Score (AIS) TIS/5 (5 for 5 groups) 2.8

SSR Score (AIS x 2) 5.6

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): _____ Date: ____/____/____

SUAS Water Quality Sampling

River:	Code:	Date:	Sample Taken By:
Carrawaystick River	IE_EA_10A040400	29.07.2019	Faith Wilson
Sample Number:	**Location:**	**Stream Order:**	**Grid Reference:**
CO 2	Carrawaystick River just below the confluence with stream from Kelly's Lake within the Corrasillagh upland farm	2nd order	T 06147 91158
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
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:**
Deer	**None**	**Kick sample – 4 mins**	Pasture
Sheep	Present	Stone washing	**Bog**
	Moderate	Weed sweep	Forestry
	Abundant		Tillage
			Urban
			Other

Plate 1. Photographic record of sampling location.

Corabsillagh
2

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.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	2
Heptagenia Ab		*Protonemura* Ab	
Ephemerella Ab	1	*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paraleptophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
Total no. of taxa	1	**Total no. of Taxa**	1
Total Relative Abundance	1	**Total Relative Abundance**	2

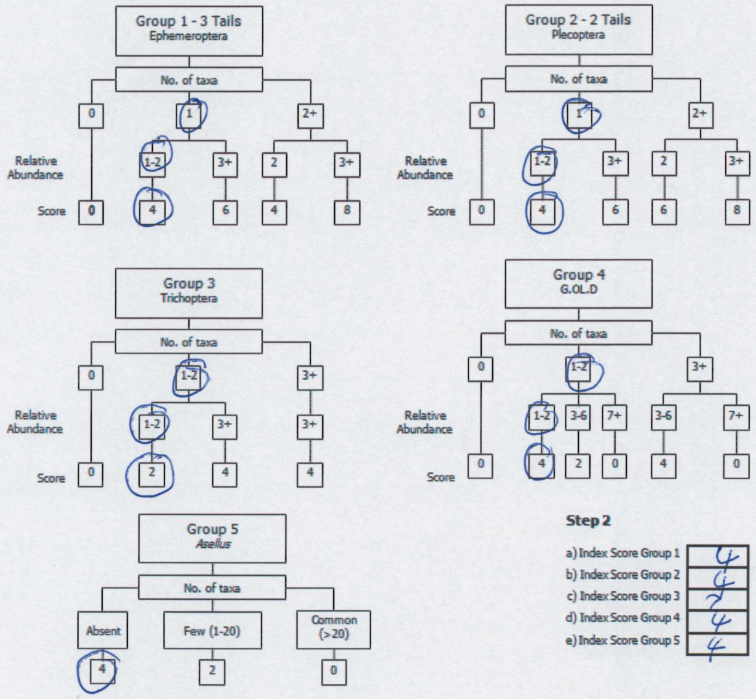
Trichoptera:		G.O.L.D:				*Asellus*:	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab	1	Absent	✓
Polycentropodidae Ab		*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few (1-20)	
Rhyacophila Ab		*Planorbis* (G) Ab		Simuliidae (D) Ab		Common (>20)	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab			
Limnephilidae Ab	1	*Physa* (G) Ab		Tipulidae (D) Ab			
Sericostomatidae Ab		*Lumbriculus* (Ol) Ab		Ceratopogonidae (D) Ab			
Glossosomatidae Ab	1	*Eiseniella* (Ol) Ab		Other GOLD Ab			
Lepidostomatidae Ab		Tubificidae (Ol) Ab					
Other Trichoptera Ab							
Total no. of Taxa	2	**Total Relative Abundance**	2	**Total no. of Taxa**	1	**Total Relative Abundance**	1

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*.

CONAG Sillagh
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.



Step 2

a) Index Score Group 1	4
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) 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	> 6.5 – 7.25	<6.5
Probably not at risk	Indeterminate Stream may be at risk	Stream at risk
	✓	

Surveyor (signed): _____ Name (print): CARL DUNN Date: ___/___/___

SUAS Water Quality Sampling

River:	Code:	Date:	Sample Taken By:
Carrawaystick River	IE_EA_10A040400	29.07.2019	Faith Wilson
Sample Number:	**Location:**	**Stream Order:**	**Grid Reference:**
CO 3	Carrawaystick River just below the waterfall within the Corrasillagh upland farm	2nd order	T 08656 92000
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
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:**
Deer	**None**	**Kick sample – 4 mins**	Pasture
Sheep	Present	**Stone washing**	**Bog**
	Moderate	Weed sweep	**Forestry**
	Abundant		Tillage
			Urban
			Other

Corrysillagh
3

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, 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	2
Rhithrogena Ab		*Isoperla* Ab	1
Heptagenia Ab		*Protonemura* Ab	
Ephemerella Ab	1	*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paraleptophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
Total no. of taxa	1	**Total no. of Taxa**	2
Total Relative Abundance	1	**Total Relative Abundance**	3

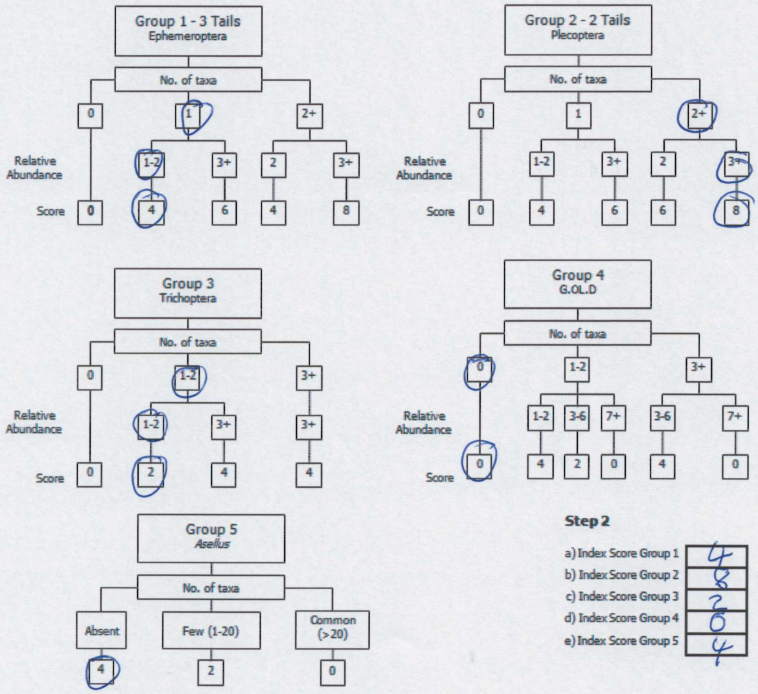
Trichoptera:		G.O.L.D:				*Asellus*:	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab		Absent	✓
Polycentropodidae Ab		*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few (1-20)	
Rhyacophila Ab		*Planorbis* (G) Ab		Simuliidae (D) Ab		Common (>20)	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab			
Limnephilidae Ab		*Physa* (G) Ab		Tipulidae (D) Ab			
Sericostomatidae Ab		*Lumbriculus* (Ol) Ab		Ceratopogonidae (D) Ab			
Glossosomatidae Ab	1	*Eiseniella* (Ol) Ab		Other GOLD Ab			
Lepidostomatidae Ab		Tubificidae (Ol) Ab					
Other Trichoptera Ab							
Total no. of Taxa	1	**Total Relative Abundance**	1	**Total no. of Taxa**	0	**Total Relative Abundance**	0

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*.

Coe Aysgarth
3

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	4
b) Index Score Group 2	8
c) Index Score Group 3	2
d) Index Score Group 4	6
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)
18	3.6	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): _____ Name (print): CARL DIXON Date: ____/____/____