APPENDIX 3-3

2023 AQUATIC ASSESSMENT REPORT

MKO Planning and Environmental Consultants

Aquatic Macroinvertebrates Sampling Report

Meenbog Peatslide Remediation Q-Value Monitoring

DOCUMENT DETAILS

Client:	**Planree Ltd.**
Project Title:	**Meenbog Peatslide Remediation Q-Value Monitoring**
Project Number:	**230721**
Document Title:	**Aquatic Macroinvertebrates Sampling Report**
Document File Name:	**KS F – 2023.12.14 - 230721**
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Planning and Environmental Consultants

Rev	Status	Date	Author(s)	Approved By
01	Final	14/12/2023	CF/KS	AvdGM

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1. INTRODUCTION

1.1 Site location

The kick sampling points surveyed were located along the Mourne Beg River and associated tributaries in Co. Donegal and Co. Tyrone. The location of the first and last sampling points are as follows; First sampling station - M1 (Grid Reference: H 06471 88281), Last sampling station - M8 (Grid Reference: H 20683 83792).

The site location is shown in Figure 1.1.

1.2 Survey Background

MKO were appointed by Planree Ltd to conduct surveys for aquatic macroinvertebrates for Q-Value determination to continue environmental monitoring of the Mourne beg River following a peat slide at the Meenbog Windfarm.

Sampling was carried out at 10 sites along the Mourne Beg River and its tributaries, the Bunadaowen River and the Shruhangarve River, on the 3rd and 4th of October 2023. Previous sampling has been undertaken in 2021 and 2020 as part of the ongoing environmental monitoring. The method used was the same as that used by the EPA for their national water sampling regime (Toner *et al.* 2003) and is described below in Section 1.3. The location of the survey points is provided in Figure 1.2 and are considered representative of the watercourse both upstream, in the vicinity of and downstream of the peatslide. The locations were chosen to investigate whether any differences in macroinvertebrate communities occurred as a result of the peatslide.

1.3 Sampling Methodology

A three-minute kick sample was collected from a stream bed area of approximately one square metre with a standard handnet (250 mm x 250 mm, with a 300 mm bag depth and a 1 mm mesh size). One minute hand searches, of large objects such as tree branches or stones, was undertaken prior to each of the kick samples. The kick sampling time was then divided proportionally among the habitats present in the area, such as fast-moving riffles, shallow water, and silted banks. Samples were sorted on site. Specimens were identified using the FBA Guide to Freshwater Invertebrates (Dobson *et al.*, 2012).

1.4 Desk Study

1.4.1.1 Water Quality

The study area comprised a section of the Mourne Beg River [EPA Code: 01M01] and its associated tributaries; the Bunadaowen River [EPA Code: 01B01] and the Shruhangarve River [EPA Code: 01S26] The Mourne Beg River flows to the east until it meets the River Derg. The Mourne Beg River [EPA Code: 01M01] is located within the Foyle surface water catchment [Catchment ID: 01], in the MOURNE BEG_010 river sub basin, and hydrometric area 01.

The Biotic Index of Water Quality (BIWQ) was developed in Ireland by the Environmental Protection Agency (EPA). Q-values are assigned using a combination of habitat characteristics and structure of the macro-invertebrate community within the waterbody. Individual macro-invertebrate families are classified according to their sensitivity to organic pollution and the Q-value is assessed based primarily on their relative abundance within a sample.

The EPA Envision map viewer was consulted on 30th of November 2023 regarding the water quality status of the rivers which comprise the study area. Q-rating data is available for the Mourne Beg River upstream and throughout sections of the study area. The upstream EPA monitoring point at Red Burn Bridge was given a Q rating of 3-4 (Moderate Status) in 2022. There were four EPA monitoring points within the study area, with two on the Mourne Beg River itself, one on the Bunadaowen River, and one on the Shruhangarve River.

Table 1-1 EPA Water Quality Data.

Watercourse Name	Sampling Station	Location	Sampling Year	Q-Value & Water Quality Status
Mourne Beg River [EPA Code: 01M01]	Red Burn Bridge [Station Code: RS01M010100]	E205846, N389307	2022	Q3-4 - Moderate
	Bridge S.W. of Tonreagh [Station Code: RS01M010200]	E209903, N388300	2022	Q4 - Good
	~150m u/s Croagh Bridge (u/s Croagh Burn trib Conflu) [Station Code: RS01M010420]	E212470.33, N385903.4	2022	Q4 - Good
Bunadaowen River [EPA Code: 01B01]	Br. u/s Mourne Beg Confluence [Station Code: RS01B010100]	E208140.55, N387608.56	2022	Q4* - Good
Shruhangarve River [EPA Code: 01S26]	Sruhangarve Bridge [Station Code: RS01S260830]	E210229.29, N38723	2022	Q3/0 - Poor

1.4.1.2 Inland Fisheries Ireland Data

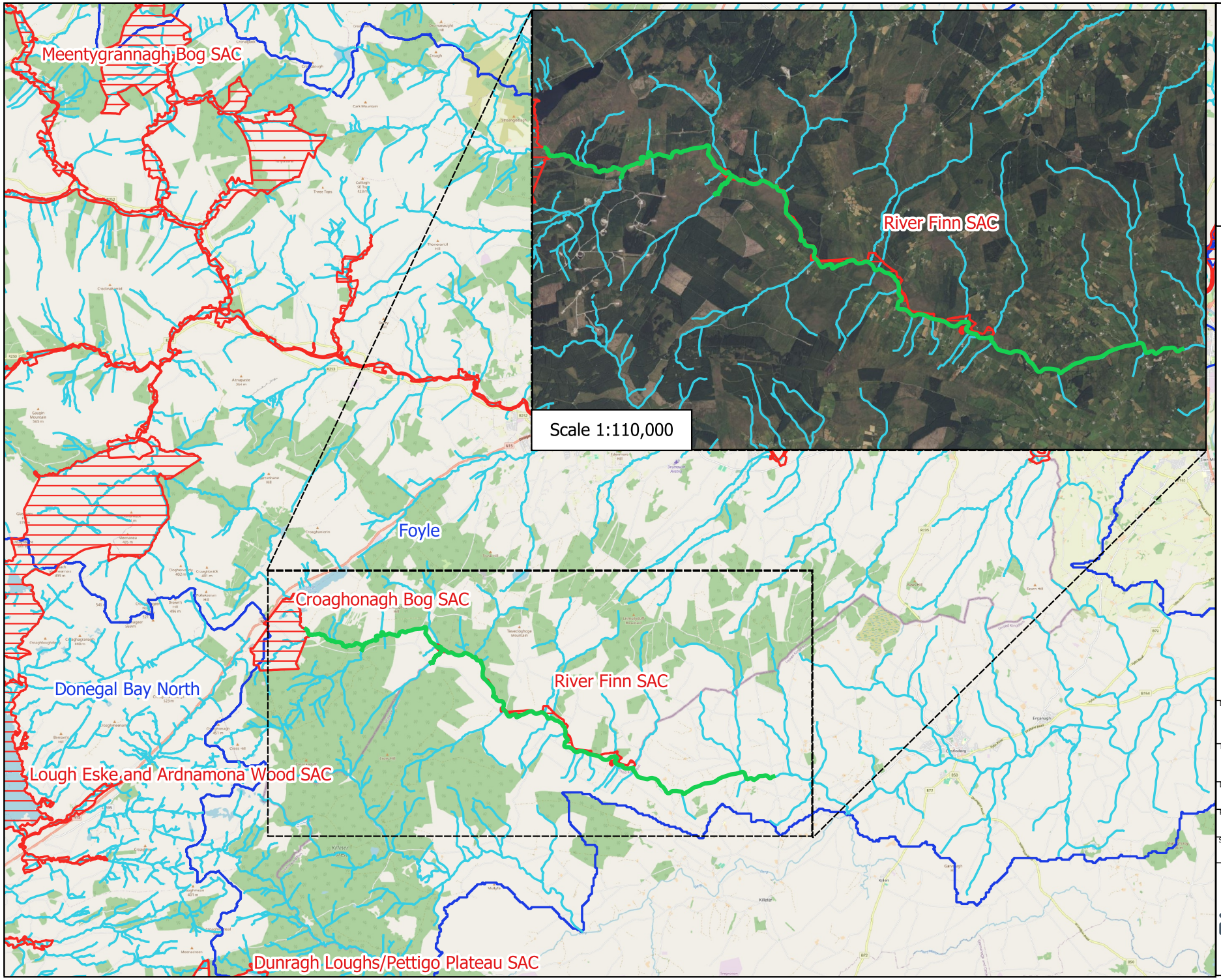
No IFI fish record data was available online for the Mourne Beg River, which flows east to the River Derg.

1.4.1.3 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The NPWS *Margaritifera* Sensitive Area map (Updated March 2018) was consulted during the desk study. The study area does not lie within a freshwater pearl mussel (*Margaritifera margaritifera*) sensitivity area. The study area is located within the MourneBeg_010 and the MourneBeg_020 sub-catchments which have not been identified as being occupied by the species.

1.5 Statement of Authority

Aquatic macroinvertebrate sampling was undertaken on the 3rd and the 4th of October 2023 by Aran von der Geest Moroney (B.Sc.), Caitrin Farren (B.Sc.) and Kieran Sugrue (B.Sc.) of MKO. This report has been prepared by Caitrin Farren and Kieran Sugrue. This report has been reviewed by Aran von der Geest Moroney who is a suitably qualified ecologist with experience in ecological assessment.



Map Legend

- Special Area of Conservation (SAC)
- WFD Hydrological Catchments
- EPA River Network
- Survey Area

N

Drawing Title
Meenbog Peatslide Remediation

Project Title
Site Location

Drawn By	Checked By
KS	AvdGM
Project No.	Drawing No.
201174	Fig 1-1
Scale	Date
1:150,000	30.11.2023

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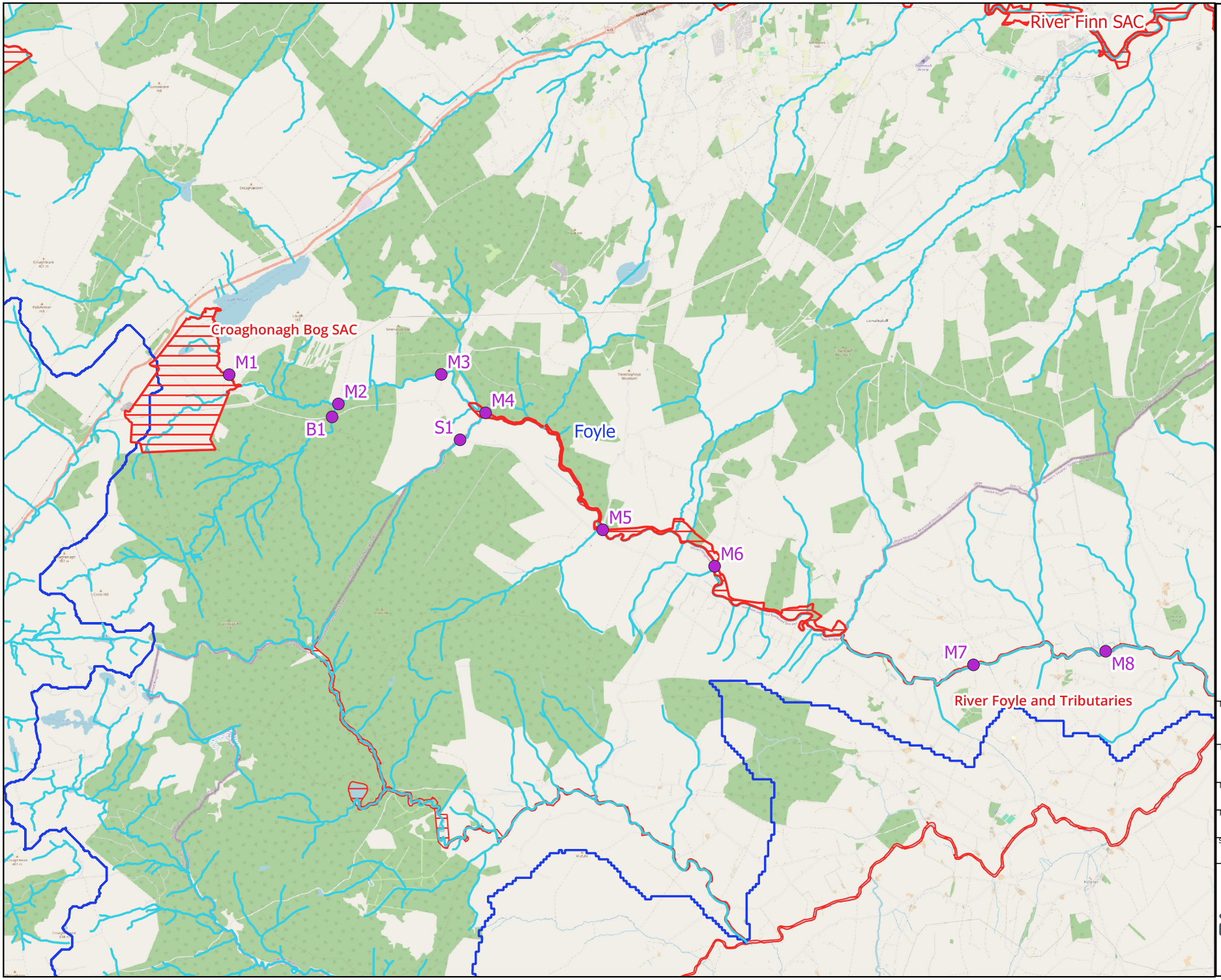

Map Legend

- Special Area of Conservation (SAC)
- WFD Hydrological Catchments
- EPA River Network
- 2023 Kick Sampling Points

N

Drawing Title	Location of Sampling Points
Project Title	Meenbog Peatslide Remediation
Drawn By: KS	Checked By: AvdGM
Project No.: 201174	Drawing No.: Fig 1-2
Scale: 1:8,000	Date: 30.11.2023

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2. RESULTS

The following sections provide the findings of the ten surveys performed on the Mourne Beg River (M1, M2, M3, M4, M5, M6, M7, M8), the Bunadaowen River (B1) and the Shruhangarve River (S1).

2.1 Sample Point M1 – Upstream of the Indicative Peat Slide Site

This sample site was located upstream of the indicative peat slide site (IG Ref.: H 08146 87592). This section of the watercourse was in high flow, with some riparian vegetation on the riverbanks including ling heather (*Calluna vulgaris),* bog asphodel *(Narthecium ossifragum*), devil's-bit scabious *(Succisa pratensis)*, hawkbit (*Leontodon sp.),* purple moor-grass *(Molinia caerulea),* moss *(sphagnum sp.),* tormentil (*Potentilla sp.*) and marsh marigold (*Caltha palustris*), which provided negligible shade to the watercourse. There was a moderate macrophyte cover which was dominated by *Ranunculus sp. and Callitriche sp.* The substrate comprised of 40% cobble, 30% large gravel, 20% fine gravel and 10% silt. The sample point was taken in a section of riffle with areas of glide. The properties of the stream at the sample point are shown in Table 2-1.

Table 2-1 Properties of the stream at sample point M1

Properties	Record
Average Depth	20 cm
Average Bank Width (m)	4.5m
Wet Width (m)	4m
Dominant Substrates	Cobble, large gravel, fine gravel & silt
Substratum Condition	Compacted

The brown colour of the stream was attributed to the peaty influence of the surrounding area, rather than siltation, as the stream bed was not notably silted. The water had a high flow rate and was slightly turbid. The diversity and density of macro-invertebrates was moderate. The majority of the sample (77%, comprising of 20 individuals) were pollution tolerant. Six individuals within one taxon for 'very pollution sensitive' groups were recorded, this comprised of 23% of the sample. The Q rating assigned to the sample location was **Q4 Good** on the basis that while the majority of the species recorded in the sample were pollution tolerant, individuals that were highly sensitive species were also present in relatively large numbers. The results of the kick sampling are summarised in Table 2-2 and a photo of the location is shown in Plate 2-1.

Table 2-2 Results of macroinvertebrates sample at sample point M1

Indicator Group	Taxon	Abundance
Group A – Very Pollution Sensitive	*Perla sp.*	6
Group B – Moderately Pollution Sensitive	-	-
Group C – Pollution Tolerant	*Coleoptera sp.*	1
	Rhyacophila sp.	1
	Simuliidae sp.	10
	Baetis rhodani	6
	Polycentropus sp.	1
	Tipula sp.	1
Group D – Very Pollution Tolerant	-	-
Group E – Most Pollution Tolerant	-	-

Plate 2-1: Representative picture of Sampling Point - M1

2.2 Sample Point B1 – Upstream of the Indicative Peat Slide Site

This sample site was located upstream of the indicative peat slide site (IG Ref.: H 08146 87592). This section of the watercourse was in high flow, with some riparian vegetation on the riverbanks including soft rush (*Juncus effusus)*, bramble (*Rubus fruticosus agg.),* willow *(Salix sp.),* purple moor-grass *(Molinia caerulea),* sitka spruce *(Picea sitchensis), and* sycamore *(Acer sp.).* This riparian vegetation provided light-moderate shade to the watercourse. There was a moderate macrophyte cover which was dominated by *Fontinalis squamosa.* The substrate comprised of 55% bedrock, 30% boulder, 5% cobble, 5% coarse gravel and 5% fine gravel. The sampling was predominantly carried out in a section of riffle and glide. The properties of the stream at the sample point are shown in Table 2-3.

Table 2-3 Properties of the stream at sample point B1

Properties	Record
Average Depth	40 cm
Average Bank Width (m)	6.5m
Wet Width (m)	6m
Dominant Substrates	Bedrock, boulder, cobble, coarse gravel & fine gravel
Substratum Condition	Compacted

The light brown colour of the stream was attributed to the peaty influence from the surrounding area, rather than siltation as the stream bed was not silted. The diversity and density of macro-invertebrates within the sample was low. Five individuals within one taxon for very pollution sensitive groups were recorded. The Q rating assigned to the sample location was **Q4 Good** on the basis that the majority of the sample (83%) was comprised of pollution sensitive species. The results of the kick sampling are summarised in Table 2-4 and a photo of the location is shown in Plate 2-2.

Table 2-4 Results of macroinvertebrates sample at sample point B1

Indicator Group	Taxon	Abundance
Group A – Very Pollution Sensitive	*Perla sp.*	5
Group B – Moderately Pollution Sensitive	-	-
Group C – Pollution Tolerant	*Philopotamus sp.*	1
Group D – Very Pollution Tolerant	-	-
Group E – Most Pollution Tolerant	-	-

Plate 2-2: Representative picture of Sampling Point - B1

2.3 Sample Point M2 - Upstream of the indicative peat slide site

This sample site was located upstream of the indicative peat slide site (IG Ref.: H 08281 87637). This section of the watercourse was in very high flow. Due to the high flow of the river, visibility proved to be low and therefore macrophyte cover was not visible. Similarly due to the high flow substrate composition could not be assessed. The sampling area predominantly consisted of glide.

No sample could be taken at this location due to the depth of water and high flow and as a result no records or results are presented below.

2.4 Sample Point M3 – Upstream of the Indicative Peat Slide Site

This sample site was located upstream of the indicative peat slide site (IG Ref.: H 09915 88290). This section of the watercourse was in moderate-high flow, with some riparian vegetation on the riverbanks including hard rush (*Juncus inflexus*), moor grass (*Molinia sp.*), scotch broom (*Cytisus scoparius*) and bramble (*Rubus fruticosus agg.*) which provided low-negligible shade to the watercourse. Visibility was low and therefore macrophyte cover was not able to be recorded. The substrate comprised of 60% gravel, 20% cobbles and 20% fine gravel. The sample point was taken in a section of glide. The properties of the stream at the sample point are shown in Table 2-5.

Table 2-5 Properties of the stream at sample point M3

Properties	Record
Average Depth	60 cm – 100 cm
Average Bank Width (m)	8m
Wet Width (m)	6-8m
Dominant Substrates	Gravel, cobble & fine gravel
Substratum Condition	Compacted

The dark brown/black colour of the stream was attributed to the influence of a peat in the surrounding area rather than siltation. The diversity and density of macro-invertebrates was moderate. The majority of the sample (53%, comprising of 10 individuals within 4 taxa) were pollution sensitive, with the remainder of the sample (47%, comprising of 9 individuals within 5 taxa) comprised of pollution tolerant taxa. The Q rating assigned to the sample location was **Q4 Good** on the basis that a high number of species that recorded in the sample were pollution sensitive and of different genera and that a moderate diversity of pollution tolerant species were recorded. The results of the kick sampling are summarised in Table 2-6 and a photo of the location is shown in Plate 2-3.

Table 2-6 Results of macroinvertebrates sample at sample point M3

Indicator Group	Taxon	Abundance
Group A – Very Pollution Sensitive	*Heptagenia sp.*	6
	Isoperla sp.	2
	Perla sp.	1
Group B – Moderately Pollution Sensitive	*Leuctra sp.*	1
Group C – Pollution Tolerant	*Hydropsyche sp.*	3
	Polycentropus sp.	2
	Simuliidae sp.	1
	Elmidae sp.	2
	Hydrachnidia sp.	1
Group D – Very Pollution Tolerant	-	-
Group E – Most Pollution Tolerant	-	-

Plate 2-3: Representative picture of Sampling point – M3

2.5 Sample Point S1 – Downstream of the Indicative Peat Slide Site

This sample site was located downstream of the indicative peat slide site (IG Ref.: H 10222 87219). This section of the watercourse was in high and fast flow, with some riparian vegetation on the riverbanks including nettles (*Urtica dioca*), Thistle (*Cirsium sp.),* bracken (*Pteridium aquilinum*), soft rush (*Juncus effusus)* and multiple grass species. This vegetation provided low-negligible shade to the watercourse. Areas of Soft rushe (*Juncus effusus)* were recorded emerging from the channel at multiple locations along the watercourse. Macrophytes were not visible from the riverbed, however there was a high percentage of *Chiloscyphus sp.* within the kick sample. The substrate comprised of approximately 35% bedrock, 25% boulder, 20% cobble and 20% coarse gravel. The sample point was taken in a section of cascade to riffle. The properties of the stream at the sample point are shown in Table 2-7.

Table 2-7 Properties of the stream at sample point S1

Properties	Record
Average Depth	50 cm – 90 cm
Average Bank Width (m)	2m
Wet Width (m)	2m
Dominant Substrates	Bedrock, boulder, cobble & coarse gravel
Substratum Condition	Compacted

The dark brown/black colour of the stream was attributed to the influence of a peat in the surrounding area rather than siltation. The diversity of macro-invertebrates was low while the density of macro-invertebrates was moderate. The majority of the sample (71%, comprising of 12 individuals from two separate taxa) were pollution sensitive, while the minority of the sample (29%, comprising of 5 individuals from two separate taxa) were pollution tolerant. The Q rating assigned to the sample location was **Q4 Good** on the basis that the majority of the species recorded in the sample were

pollution sensitive with fewer pollution tolerant specimens recorded. The results of the kick sampling are summarised in Table 2-8 and a photo of the location is shown in Plate 2-4.

Table 2-8 Results of macroinvertebrates sample at sample point S1

Indicator Group	Taxon	Abundance
Group A – Very Pollution Sensitive	*Perla sp.*	8
Group B – Moderately Pollution Sensitive	*Leuctra sp.*	4
Group C – Pollution Tolerant	*Philopotamus sp.*	4
	Tipula sp.	1
Group D – Very Pollution Tolerant	-	-
Group E – Most Pollution Tolerant	-	-

Plate 2-4: Representative picture of Sampling point – S1

2.6 Sample Point M4 – Downstream of the Indicative Peat Slide Site

This sample site was located downstream of the indicative peat slide site (IG Ref.: H 10637 87140). This section of the watercourse was in high flow, with some riparian vegetation on the riverbanks including rush (*Juncus sp.),* gorse (*Ulex europaeus)*, purple moor-grass (*Molinia caerulea)*, bracken (*Pteridium aquilinum)*, sitka spruce (*Picea sitchensis),* which provided light shade to the watercourse. Due to the flow of the river, visibility proved to be low and therefore macrophyte cover and substrate type was not visible.

Weather conditions and the high flow of the river meant that taking a kick sample was not feasible.

2.7 Sample Point M5 – Downstream of the indicative Peat Slide Site

This sample site was located downstream of the indicative peat slide site (IG Ref.: H 12550 85760). This section of the watercourse was in moderate-high flow. Riparian vegetation on the riverbanks included gorse (*Ulex europaeus),* soft rush *(Juncus effusus),* bracken (*Pteridium aquilinum)*, thistle *(Cirsium sp.),* bramble *(Rubus fruticosus agg.),* willow *(Salix sp.),* birds foot trefoil (*Lotus corniculatus),* buttercup *(ranunculus sp.)* and ribwort plantain *(Plantago lanceolata)* which provided low shading to channel margins. Macrophyte cover was dominated by *Fontinalis squamosa.* The substrate comprised of approximately 50% coarse gravel, 25% cobble and 25% fine gravel. The sample point was taken in a section of glide. The properties of the stream at the sample point are shown in Table 2-9.

Table 2-9 Properties of the stream at sample point M5

Properties	Record
Average Depth	50 cm
Average Bank Width (m)	15m
Wet Width (m)	12m
Dominant Substrates	Coarse gravel, cobble & fine gravel
Substratum Condition	Compacted

The dark brown/black colour of the stream was attributed to the influence of a peat in the surrounding area rather than siltation. The diversity of macro-invertebrates was moderate-high, while the density of macro-invertebrates was high. The majority of the sample (58%, comprising of 19 individuals from 5 separate taxa) were pollution tolerant. 42% of the sample (comprised of fourteen individuals from five separate taxa) were within pollution sensitive groups. The Q rating assigned to the sample location was **Q4-5 High** as although the majority of species recorded in the sample were pollution tolerant, there were sensitive species recorded in relatively high abundance from different genera. The results of the kick sampling are summarised in Table 2-10 and a photo of the location is shown in Plate 2-5.

Table 2-10 Results of macroinvertebrates sample at sample point M5

Indicator Group	Taxon	Abundance
Group A – Very Pollution Sensitive	*Ecdyonurus sp.*	4
	Heptagenia sp.	3
	Perla sp.	5
Group B – Moderately Pollution Sensitive	*Leuctra sp.*	1
	Limnephilidae sp.	1
Group C – Pollution Tolerant	*Hydropsyche sp.*	12
	Philopotmus sp.	1
	Elmidae sp.	2
	Orectochilus sp.	1
Group D – Very Pollution Tolerant	-	-
Group E – Most Pollution Tolerant	*Tubificidae sp.*	3

Plate 2-5: Representative picture of Sampling point – M5

2.8 Sample Point M6 – Downstream of the Indicative Peat Slide Site

This sample site was located downstream of the indicative peat slide site (IG Ref.: H 14355 85182). This section of the watercourse was in medium- high flow, Riparian vegetation on the riverbanks included scotch broom (*Cytisus scoparius*), soft rush (*Juncus effusus*), thistle (*Cirsium sp.*), buttercup (*Ranunculus sp.*), fuchsia (*Fuchsia magellanica*), gorse (*Ulex europaeus*), bramble (*Rubus fruticosus agg.*), and willow (*Salix sp.*) which provided light shade to the watercourse at the channel margins. Macrophyte cover was dominated by *Fontinalis squamosa*, with a small amount of green algae present. The substrate comprised of 40% cobble, 25% coarse gravel, 20% fine gravel and 10% boulder. The sample point was taken in a section of glide. The properties of the stream at the sample point are shown in Table 2-11.

Table 2-11 Properties of the stream at sample point M6

Properties	Record
Average Depth	100 cm
Average Bank Width (m)	14m
Wet Width (m)	12m
Dominant Substrates	Cobble, coarse gravel, fine gravel, boulder
Substratum Condition	Compacted

The dark brown/black colour of the stream was attributed to the influence of a peat in the surrounding area rather than siltation. The diversity of macro-invertebrates was moderate while the density of macro-invertebrates was high. The majority of the sample (82%, comprising of 32 individuals) were pollution tolerant. Seven individuals within three taxa for pollution sensitive groups were recorded, which comprised of 18% of the sample. The Q rating assigned to the sample location was **Q3-4 Moderate** on the basis that the majority of species recorded in the sample were pollution tolerant with fewer species

sensitive to pollution recorded. The results of the kick sampling are summarised in Table 2-12 and a photo of the location is shown in Plate 2-6.

Table 2-12 Results of macroinvertebrates sample at sample point M6

Indicator Group	Taxon	Abundance
Group A – Very Pollution Sensitive	*Perla sp.*	4
	Heptagenia sp.	2
Group B – Moderately Pollution Sensitive	*Paraleptophlebia sp.*	1
Group C – Pollution Tolerant	*Hydropsyche sp.*	10
	Philopotamus sp.	3
	Polycentropus sp.	3
Group D – Very Pollution Tolerant	-	-
Group E – Most Pollution Tolerant	*Tubificidae spp.*	16

Plate 2-6: Representative picture of Sampling Point – M6

2.9 Sample Point M7 – Downstream of the Indicative Peat Slide Site

This sample site was located downstream of the indicative peat slide site (IG Ref.: H 18535 84003). This section of the watercourse was in moderate flow. Riparian vegetation on the riverbanks including willow (*Salix sp.*), hawthorn (*Crataegus monogyna)*, alder *(Alnus glutinosa),* gorse (*Ulex europaeus*), bramble (*Rubus fruticosus agg.*), rush (*Juncus sp.*), clover (*Trifolium sp.),* bracken (*Pteridium aquilinum*) and multiple grass species. This vegetation provided slight – moderate shade to the watercourse at the channel margins. *Fontinalis squamosa* was the dominant macrophyte of the stream. The substrate comprised of 50% coarse gravel, 40% fine gravel, 10% cobble. The sample point was taken in an area of glide. The properties of the stream at the sample point are shown in Table 2-13.

Table 2-13 Properties of the stream at sample point M7

Properties	Record
Average Depth	50 cm
Average Bank Width (m)	20m
Wet Width (m)	18m
Dominant Substrates	Coarse gravel, fine gravel & cobble
Substratum Condition	Compacted

The dark brown/black colour of the stream was attributed to the influence of a peat in the surrounding area rather than siltation. However, there was evidence of livestock access to the stream and siltation of the stream at these access points. The diversity of macro-invertebrates was moderate while the density of macro-invertebrates was moderate-high. The majority of the sample (83%, comprising of 24 individuals) were pollution tolerant. Five individuals within two taxa for pollution sensitive groups were recorded, which comprised of 17% of the sample. The Q rating assigned to the sample location was **Q3-4 Moderate** on the basis that the majority of species recorded in the sample were pollution tolerant, however, pollution sensitive species were present within the sample. The high percentage of group E taxa within the sample was also taken into account. The results of the kick sampling are summarised in Table 2-14 and a photo of the location is shown in Plate 2-7.

Table 2-14 Results of macroinvertebrates sample at sample point M7

Indicator Group	Taxon	Abundance
Group A – Very Pollution Sensitive	*Heptagenia sp.*	3
Group B – Moderately Pollution Sensitive	*Caenis sp.*	2
Group C – Pollution Tolerant	*Gammarus sp.*	8
	Ancylus sp.	2
	Hydropsyche sp.	1
Group D – Very Pollution Tolerant	*Chironomus sp.*	1
Group E – Most Pollution Tolerant	*Tubificidae sp.*	12

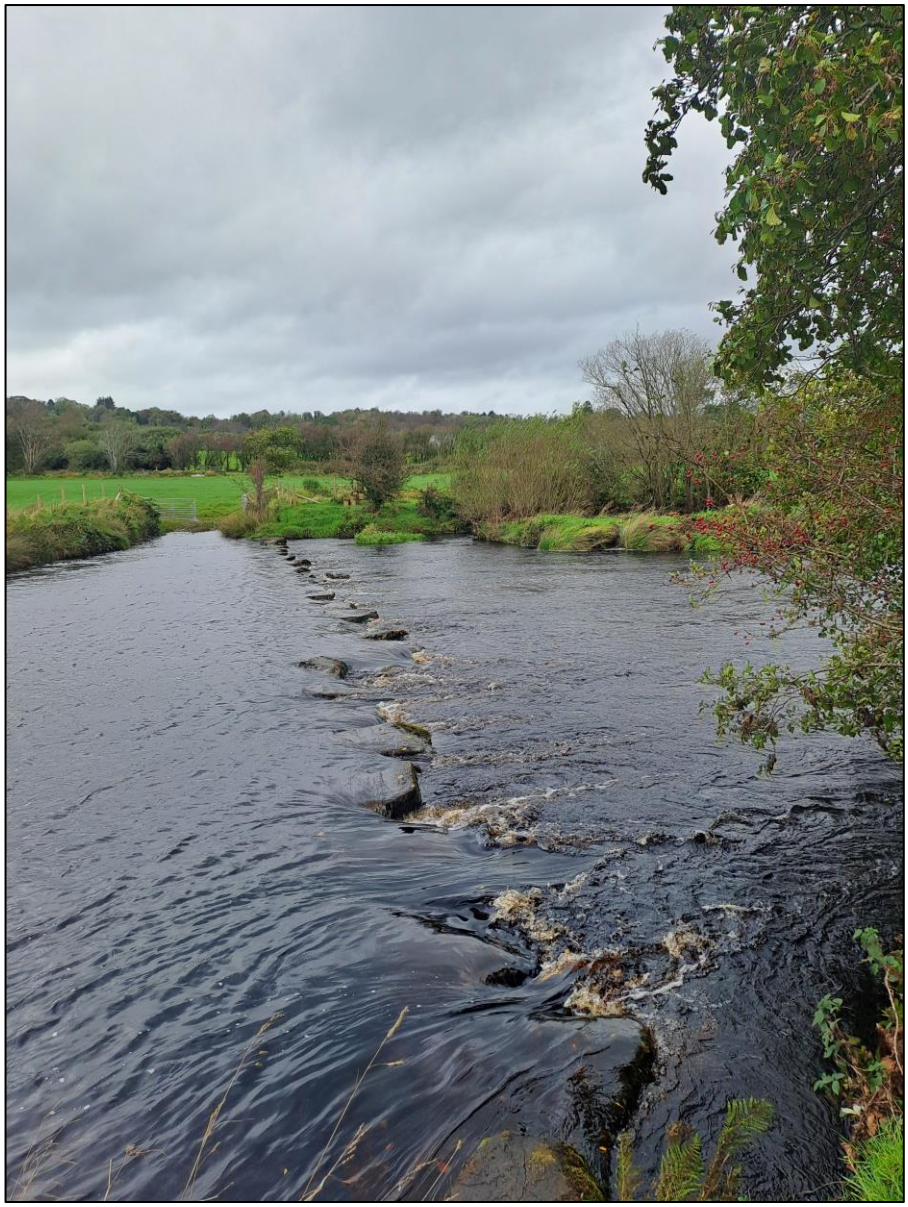

Plate 2-7: Representative picture of Sampling point – M7

2.10 Sample Point M8 – Downstream of the Indicative Peat Slide Site

This sample site was located downstream of the indicative peat slide site (IG Ref.: H 20685 83790). This section of the watercourse was in moderate-high flow, with some riparian vegetation on the riverbanks including birch (*Betula sp.*), bramble (*Rubus fruticosus agg.*), brome (*Bromus sp.*), bracken (*Pteridium aquilinum*), foxglove (*Digitalis purpurea*) and thistle (*Cirsium sp.*). The vegetation provided light – moderate shade to the watercourse especially at the channel margins. Macrophyte cover was dominated by *Ranunculus sp., Fontinalis squamosa* and green algae. The substrate comprised of 40% boulder, 40% cobble, 15% coarse gravel and 5% fine gravel. The sample point was taken in a section of riffle with areas of glide. The properties of the stream at the sample point are shown in Table 2-15.

Table 2-15 Properties of the stream at sample point M8

Properties	Record
Average Depth	60 cm
Average Bank Width (m)	20m
Wet Width (m)	20m
Dominant Substrates	Boulder, cobble, coarse gravel & fine gravel
Substratum Condition	Compacted

The dark brown/black colour of the stream was attributed to the influence of a peat in the surrounding area rather than siltation. The diversity of macro-invertebrates was moderate-high while the density of macro-invertebrates was high. The majority of the sample (69%, comprising of 29 individuals) were pollution tolerant. Thirteen individuals within two taxa for pollution sensitive groups were recorded, this comprised of 31% of the sample. The Q rating assigned to the sample location was **Q4 Good** on the basis that while the majority of the species recorded in the sample were pollution tolerant, a considerable number of pollution sensitive species were recorded and of multiple genera. The results of the kick sampling are summarised in Table 2-16 and a photo of the location is shown in Plate 2-8.

Table 2-16 Results of macroinvertebrates sample at sample point M8

Indicator Group	Taxon	Abundance
Group A – Very Pollution Sensitive	*Ecdyonurus sp.*	1
	Perla sp.	2
	Heptagenia sp.	5
Group B – Moderately Pollution Sensitive	*Leuctra sp.*	5
Group C – Pollution Tolerant	*Gammarus sp.*	5
	Coleoptera sp.	10
	Orectochilus sp.	1
Group D – Very Pollution Tolerant	*Sialis sp.*	1
	Asellus sp.	1
Group E – Most Pollution Tolerant	*Tubificidae sp.*	11

Plate 2-8: Representative picture of Sampling Point – M8

3. CONCLUSION

The surveys undertaken provide a baseline against which any water quality monitoring can be compared and provide a continuing record of Q-Value results from the area. The substrate was not notably silted in the sampling areas, and samples were undertaken in riffles and glides, therefore the results of the kick sample provide a baseline of conditions in the river and an accurate Q value and estimation of pollution levels in the watercourses. The brown colouration of the water across all points sampled was attributed to the influence of a peat in the catchment.

No significant differences were observed between the survey results at any of the sampling points for 2023 and 2021. The results of the surveys are consistent with the habitats in which the samples were taken. The samples were taken in riffle and glide sections of a lowland depositing river and its tributaries, with a relatively silt free substrate in an area that is characterised largely by agriculture.

The Majority of sample points scored a **Q4 Good,** while two sample points scored a **Q3-4 Moderate** and one scored a **Q4-5 High**. Two sample points could not be sampled as weather and river conditions were not suitable to do so.

4. REFERENCES

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