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SMALL STREAMS RISK SCORE (SSRS) REPORT

2023

GREEN GENERATION LIMITED
GORTEEN LOWER, NURNEY, CO. KILDARE

EPA LICENCE NO. P0420-03

Date:	03rd May 2023	**Prepared By:**	Martin O'Looney, BSc.
Report Number:	SSRS_21955	**Checked:**	Mike Fraher, BSc.

TABLE OF CONTENTS

1.0 INTRODUCTION AND SCOPE OF WORK

Green Generation Limited is located approximately 2.5 km south of Nurney Village in Co. Kildare. The plant was established on a green field site in 1991 and production commenced there in 1994.

The onsite integrated pig farm and anaerobic digestion activities are licenced under the name Future Pigs Limited to carry out the following activity, under Industrial Emissions Licence No P0420-03;

-: 6.2 - The rearing of pigs in an installation, whether within the same complex or within 100 metres of the same complex, where the capacity exceeds 750 places for sows in a breeding unit.

-: 11.1 - The recovery or disposal of waste in a facility, within the meaning of the Act of 1996, which facility is connected, or associated with another activity specified in this Schedule in respect of which a licence or revised licence under Part IV is in force or in respect of which a licence under the said Part is or will be required.

Panther Environmental Solutions Ltd (PES Ltd) was commissioned by Green Generation Limited to carry out an assessment of the Kildoon River (also known as the Finnery River).

This report was compiled as a requirement under the IED licence, as follows:

Schedule C.6.2 Receiving Water Monitoring

Location: One upstream (SW-7; 271342E, 202746N) and two downstream (SW-8; 271040E, 202838N and SW-9; 269776E, 203100N) of the installation as shown in Drawings 53-02-003 and 53-02-004, Section 90 response received 4/04/20/2.

Parameter	Monitoring Frequency	Analysis Method/Technique
SSRS Assessment [Note 1] or Biological Quality (Q) Rating [Note 2]	Within twelve months of the date of To be agreed by the Agency grant of licence and thereafter as required by the Agency	To be agreed by the Agency

Note 1: Small Stream Risk Score (SSRS) Assessment shall be undertaken by an appropriately qualified person Le., a person who has undertaken an EPA-approved SSRS course and follow-up QC scheme. Monitoring period for SSRS Assessment - October to April. Samples should be taken within the same calendar month as the initial sample for each subsequent year as required.

Note 2: Monitoring period for Biological Quality (Q) Rating - June to September.

2.0 DESCRIPTION OF THE KILDOON RIVER & CATCHMENT

Hydrometric Area 14 contains the Barrow Catchment (area 3,015 km^2).

The Kildoon River, also known as the Finnery River, (EPA Name: KILDOON_010, EU Code: IE_SE_14K270950, Area: 97.63 km^2) is a tributary of the Tully Stream (EPA Name: TULLY STREAM_040, EU Code: IE_SE_14T020600, Area: 36.52 km^2), which is in turn a tributary of the River Barrow (EU Code: IE_SE_14B011500). From the Green Generation site, the Kildoon River flows for approximately 4.32 km to the confluence with the Tully Stream. From this location, the Tully Stream flows for approximately 5.74km to the confluence with the River Barrow.

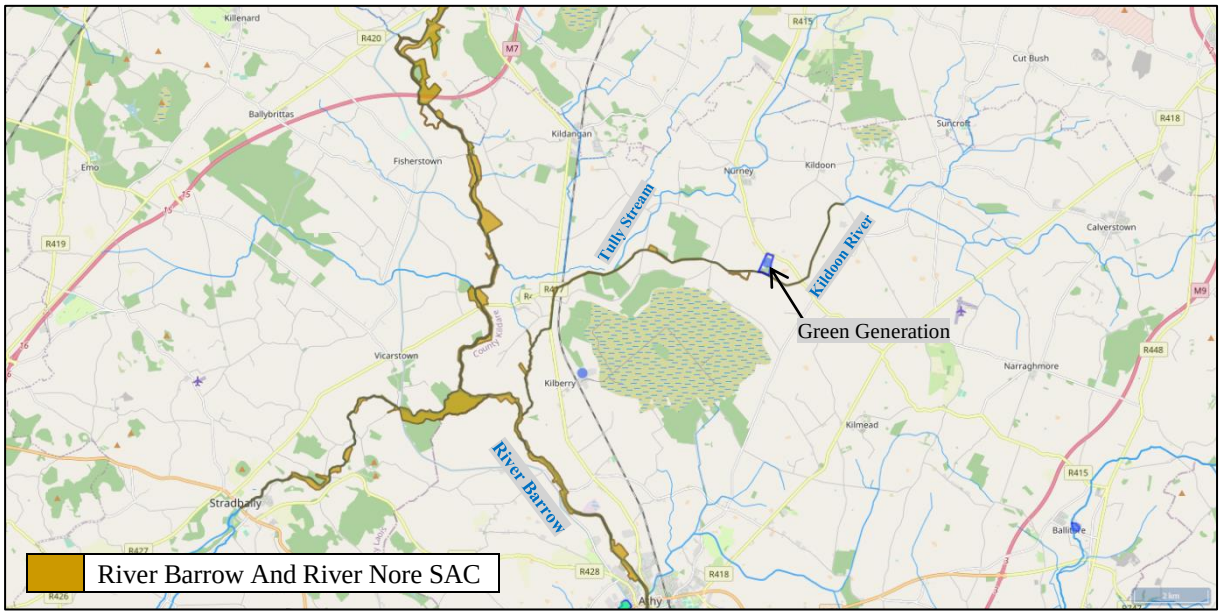

Figure 2.1: Site Location and Kildoon Catchment

The 2019 WFD Cycle 2 Assessment of the Tully/Kildoon sub-catchment (Barrow_SC_060) identified pressures such as wastewater treatment plants and several large areas of urbanisation on the outskirts of the greater Dublin area, including Kildare, Kildangan and Monasterevin. Agricultural land (both pastures and arable) are common throughout, with areas of peat bog also present, particularly at the lower end of the Tully Stream

The Calverstown Agglomeration Urban WWTP (A0125-01) discharges to the Kildoon River approximately 11.83km upstream of the site. The EPA licenced site Kildare Chilling Ltd (P0170-02) discharge to the Tully Stream c. 12.8km upstream of the confluence with the Kildoon. While the primary effluent discharge from the Kildare UWWTP (D0178-01) is to the River Barrow, facility is available for overflow discharges to the Tully Stream. The Nurney UWWTP (A0113-01) discharges to the Tully Stream approximately 6.12 km upstream of the confluence with the Kildoon.

No public monitoring programme is currently undertaken on the status of the Kildoon River. The EPA and local authorities undertake monitoring of the Tully Stream under the Environmental Objectives (Surface Waters) Regulations (S.I. 272 of 2009), as amended.

The results for the nearest monitoring stations on the Tully Stream with available monitoring results for the period 2000-2020 are summarised below for indicative purposes.

Table 2.1: Active Monitoring Stations of the Tully Stream

STATION NO.	STATION LOCATION	EASTING	NORTHING	APPROX. DISTANCE FROM KILDOON CONF.
RS14T020390	Soomeragh Br	270989	206352	7.2km upstream
RS14T020500	Br W of Cherrymills Ho	268173	204321	1.9km upstream
RS14T020600	Cloney Br	265517	201249	2.75km downstream

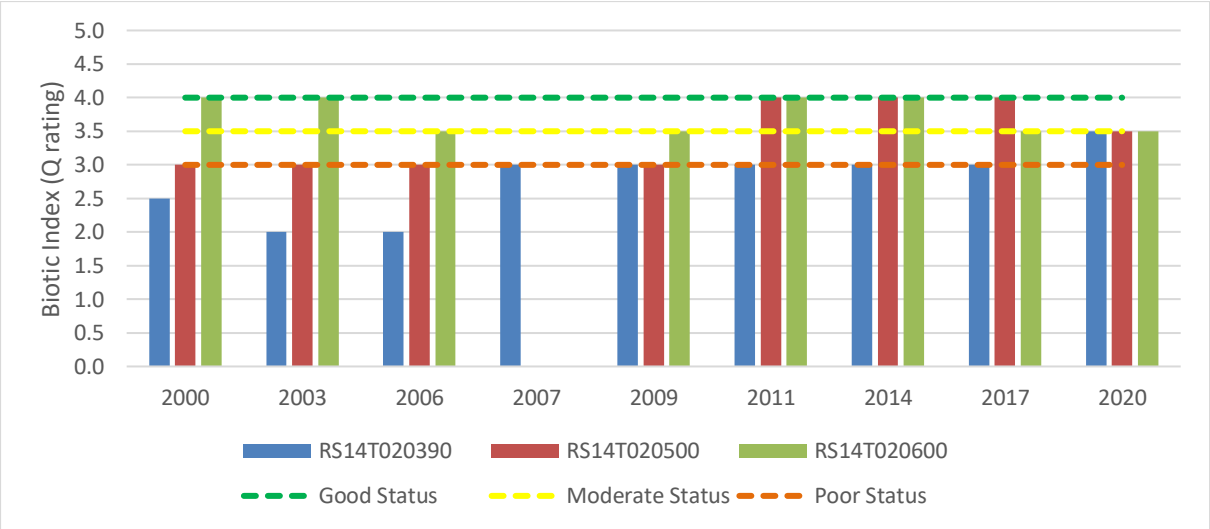

Figure 2.2: EPA Ecological Monitoring of Tully Stream 2000-2020

As can be seen in Figure 2.2 above, the Tully Stream is achieving a water quality status of Q3-Q4 (Poor-Good) during 2009-2020.

EPA comments on the most recent monitoring results for the Tully Stream are as follows; "*The macroinvertebrate fauna indicated poor ecological conditions in the upper reaches of the Tully Stream (0200, 0300) when surveyed in August 2020. Ecological condition has improved to Moderate at 0390, but quality declined to Moderate at 0500 meaning the whole of the Tully Stream is in an unsatisfactory ecological condition.*"

The Tully Stream is classified as being "at risk of not achieving good" status. The Kildoon River is not classified due to a lack of information, however, catchments.ie data on the river indicated an expected status of Moderate during the 2013-2018 and 2016-2021 reporitng periods.

The lower sections of the Kildoon River, in the vicinity of the site, form part of the River Barrow And River Nore Special Area of Conservation (IE002162) with particular habitats and species of interest being *Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation* [3260], *Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels* [6430], *Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* [91E0], Freshwater Pearl Mussel (*Margaritifera margaritifera*), Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*Lampetra fluviatilis*), Twaite Shad (*Alosa fallax*), Atlantic Salmon (*Salmo salar*) and Otter (*Lutra lutra*).

The main channel of the River Barrow is classified as a Nutrient Sensitive River under the Urban Waste Water Treatment Regulations (SI 254 of 2001), as amended.

3.0 DESCRIPTION OF MONITORING LOCATIONS

Three sampling stations were agreed previously between the client and the EPA;

Table 3.1: Sampling Station Locations

Station	River	Location	Easting	Northing
SW7	Kildoon	c. 300m u/s of drainage channel	271342	202746
SW8	Kildoon	c. 300m d/s of drainage channel	271040	202838
SW9	Kildoon	c. 1.3km d/s of drainage channel	269776	203100

Appendix A contains a map which gives an overview of monitoring locations.

Monitoring Point 1 is located approximately 300m upstream of the field drainage channel, near the eastern boundary of the licenced site.

Figure 3.1: Monitoring Point 1 (Gorteen Lower / Derrynine)

Monitoring Point 2 is located approximately 35m downstream of the field drainage channel, below the western boundary of the licenced site.

Figure 3.2: Monitoring Point 2 (Clarey / Derrynine townland)

Monitoring Point 3 is located approximately 1.35km downstream of the field drainage channel, downstream of a bridge crossing the L8003 local road.

Figure 3.3: Monitoring Point 3 (Boghall / Cloneybeg townlands)

4.0 METHODOLOGY

4.1 GENERAL METHOD

The fieldwork and assessment method followed was such as set out in the "Small Streams Risk Score Method Manual, Decmeber 2005".

The SSRS methodology only uses certain biological indicators to calculate the risk. The taxa used have been placed into 5 groups:
Group 1 – Ephemeroptera (Mayflies)
Group 2 – Plecoptera (Stoneflies)
Group 3 – Trichoptera (Caddisflies)
Group 4 – G.Ol.D (Gastropods, Oligochaetes and Dipterns)
Group 5 – Asellus (Waterlouse)

The groupings are based on their sensitivity to organic pollution, e.g., mayflies and stoneflies are sensitive to pollution and are given a high score, whilst taxa within Group 4 are less sensitive and are given a lower score. The overall score for each river sample is based on the number of taxon present in each sample along with the relative abundance of each taxon. These scores are added together and divided by five to give an average index score (AIS). The final SSRS is achieved by multiplying the AIS by 2.

Table 4.1: SSRS Risk Scoring

SSRS Score	Risk Category
<6.5	At Risk
6.5-7.25	Probably at Risk
>7.25	Not at Risk

4.2 SAMPLING PERSONNEL & METHOD

Monitoring of the three sampling stations was conducted by Martin O'Looney BSc of PES Ltd on Monday 24th April 2023 under normal flow conditions.

A net of 500µm pore size and a metal frame was used and kick sampling was carried out from one side of the river to the other for a duration of 2 minutes. The net was held against the substrate at a distance of 1-2 feet downstream of where the kicking took place. Where possible, weed sweeps were taken over 1 minute periods. There were no suitable locations for stone wash samples.

The samples were retained in plastic containers at the sampling site and removed to the laboratory for further analysis. The samples were then sorted live in a white tray under a bench lamp. All macroinvertebrates were preserved in 70% methanol, before being counted and identified to the appropriate taxonomic level.

It should be noted that kick sampling should preferably be carried out in a riffle area (i.e. shallower areas of water flowing /breaking over stones) or glide area (slightly deeper water with good flow) and the sampling points used were not ideal. Sample stations SW7 / SW8 in particular would be described more as deep pool areas. Consequently SSRS results may indicate that the river is more "at risk" than is actually the case.

However, sampling locations are defined within the sites licence and more appropriate sample locations may not be available within a reasonable distance of the site. It is noted that upstream and downstream locations are quite similar in substrate, depth and profile.

5.0 RESULTS

The following tables detail the finding of the single upstream (SW-7) and two downstream (SW-8 and SW-9) stations:

Table 5.1: Upstream Station (SW-7)

Order	Taxon	Abundance
Ephemeroptera	Ephemerella	5
Ephemeroptera	Caenis	3
Trichoptera	Sericostomatidae	3
Oligochaeta	Tubificidae	21
Diptera	Simuliidae	4
Diptera	Chironomidae	2
Diptera	Ceratopogonidae	1
Malacostraca	Asellus	13

Table 5.2: Down-stream Station (SW-8)

Order	Taxon	Abundance
Ephemeroptera	Ephemerella	7
Ephemeroptera	Caenis	2
Trichoptera	Sericostomatidae	8
Gastropoda	Lymnaea	4
Oligochaeta	Tubificidae	47
Diptera	Simuliidae	44
Diptera	Chironomidae	7
Diptera	Dicranota	2
Diptera	Ceratopogonidae	6
Malacostraca	Asellus	2

Table 5.3: Down-stream Station (SW-9)

Order	Taxon	Abundance
Ephemeroptera	Ephemerella	3
Ephemeroptera	Caenis	2
Trichoptera	Limnephilidae	1
Trichoptera	Sericostomatidae	6
Oligochaeta	Eiseniella	2
Oligochaeta	Tubificidae	39
Diptera	Chironomidae	2
Diptera	Ceratopogonidae	3
Malacostraca	Asellus	6

SSRS field sheets for the sampling stations are provided in appendix B. The following table outlines the final scores for each of the locations:

Table 5.4: Small Stream Risk Score (SSRS) recorded at each station

Station	Score	Risk Status
Upstream (SW-7)	4.8	At Risk
Downstream (SW-8)	4.8	At Risk
Downstream (SW-9)	5.6	At Risk

6.0 CONCLUSIONS

Overall the Kildoon River is categorised as "At risk".

This is due to the relative lack of diversity and abundance within the Group 1-Ephemeroptera, Group 2 – Plecoptera and Group 3 – Trichoptera. Group 4 taxon were dominant within the samples, while Group-5 Asellus were present but at low numbers at each station.

The SSRS score immediately upstream and downstream of the drainage channel confluence were identical, with the score increasing at SW-9 1.3km downstream. However, species present and abundances changed dramatically at each location.

It is considered that this is largely due to the substrates present at each location, with SW7 comprised of deep mud, SW-8 containing areas of sand and mud, and SW-9 containing areas of mud / sand and boulders.

It is not considered that the discharge from the drain channel is having a significant influence on the existing SSRS risk status of the Kildoon River

7.0 REFERENCES

- Walsh et al. 2005, Small Streams Risk Score Method Manual
- Wallace, 2007 Caddis Training Course, Supplementary larval identification notes
- Dobson, M., Pawley, S., Fletcher, M. and Powell, A. (2012) "*Guide to Freshwater Invertebrates, Volume 68*" Freshwater Biological Association
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- Woods, C.S. (1974) "*Freshwater Life in Ireland*" Irish University Press Ltd.
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- Edington J.M. & A.G. Hildrew (1995) "A Revised Key to the Caseless Caddis Larvae of the British Isles, with Notes on their Ecology".
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- Hynes, H.N.B. (1917) "A key to the Adults and Nymphs of the British Stoneflies (Plecoptera)" Freshwater Biological Association
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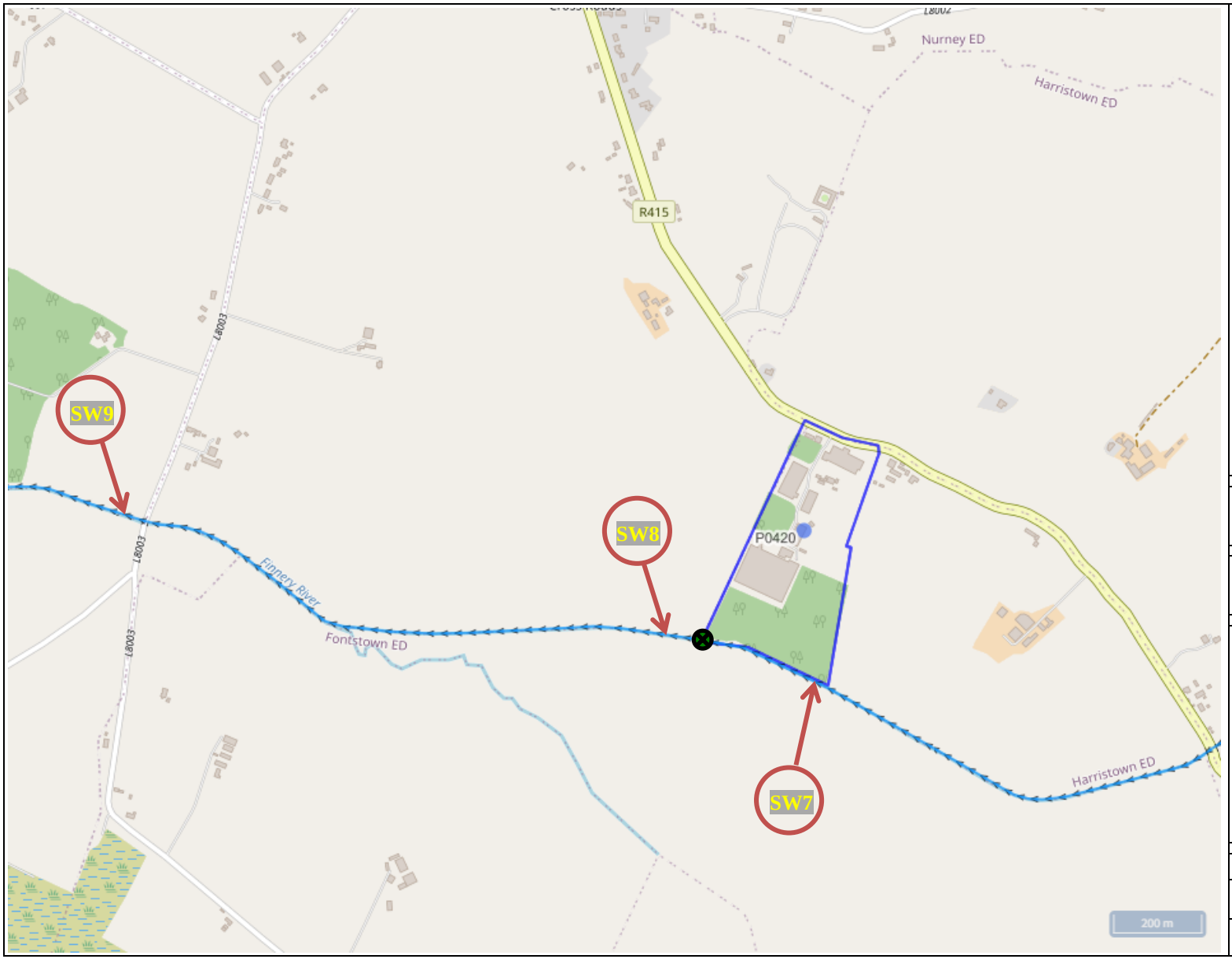
- Macan, T.T. (1979) "*A key to the Nymphs of British Ephemeroptera*" Freshwater Biological Association

APPENDIX A
RIVER COURSE MAPS AND MONITORING LOCATIONS



Notes:

N

SW7 – Upstream Monitoring Point

SW8 – Downstream Monitoring Point

SW9 – Downstream Monitoring Point

– Site Area

– Drain Confluence (Site SW drain)

LICENCED ECOLOGICAL MONITORING LOCATIONS MAP

FUTURE PIGS LIMITED
GORTEEN LOWER, NURNEY, CO. KILDARE

PANTHER ENVIRONMENTAL SOLUTIONS LTD
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GREEN ROAD
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TELEPHONE: 059 91 34222
MOBILE: 087 851 9284
EMAIL: info@pantherwms.com
WEB: www.pantherwms.com

datum:	EPA	scale:	NTS A4
		drawn:	MOL
drawing no.	rev	checked:	MF
PES_23_2695	A	approved:	-
		date:	13.04.23

APPENDIX B
ECOLOGICAL MONITORING RESULTS

River:	Kildoon	Code:	SE14K270950	Date:	24-04-2022	Time:	09:30
Station no.		**Location:**	Gorteen Lower, Nurney			**Grid (6 figure):**	
SW7		**Stream Order:**	3			271342, 202746	

Field Chemistry	
DO %	-
DO mg/l	-
Temp (°C)	-
Conductivity	251
pH	7.3
Bank width (cm)	480
Wet width (cm)	780
Avg Depth (cm)	85
Staff gauge	CR

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:		**Sample Retained:**		
Pasture	Urban			
Bog	Tillage	Y	N	
Forestry	Other			

Stream Flow:	
Riffle	
Riffle / Glide	
Slow Flow	
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	2
Stone wash x	n/a
Weed sweep x	n/a

General Comments:
Baetis, Gammarus and Elmidae and were also present in the sample. The DO meter was not operating on the morning of the assessment.

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)

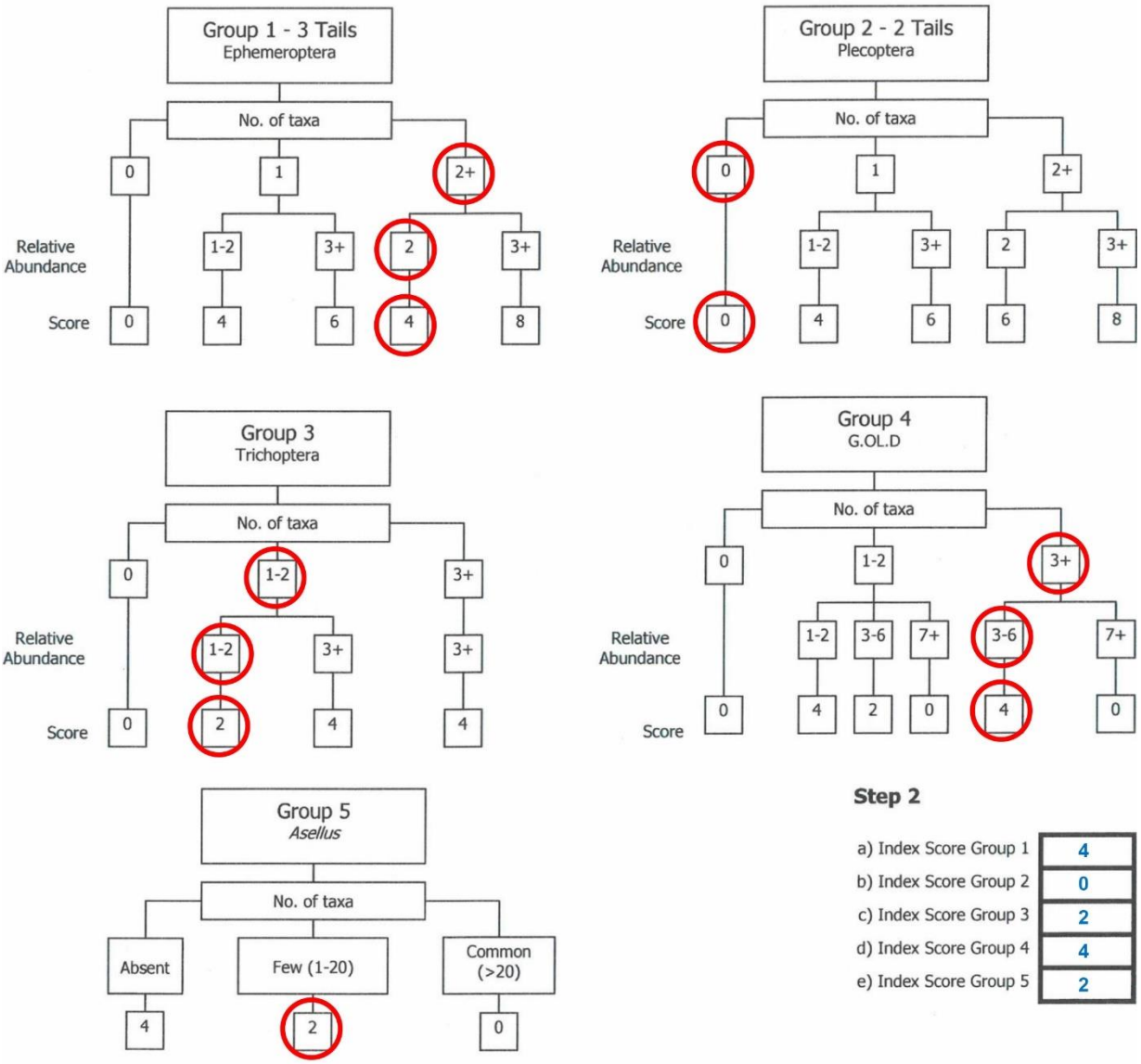
Relative Abundance	
1-5	1
6-20	2
21-50	3
51-100	4
101+	5

Ephemeroptera:		Plecoptera:	
Ecdyonurus Ab	0	*Leuctra* Ab	0
Rhithrogena Ab	0	*Isoperla* Ab	0
Heptagenia Ab	0	*Protonemura* Ab	0
Ephemerella Ab	1	*Amphinemura* Ab	0
Caenis Ab	1	*Perla* Ab	0
Paraleptophlebia Ab	0	*Dinocras* Ab	0
Ephemera danica Ab	0	Other Plecop Ab	0
Other Ephem Ab	0	Other Plecop Ab	0
Total no. of Taxa	2	**Total no. of Taxa**	0
Total Relative Abundance	2	**Total Relative Abundance**	0

Trichoptera:		G.OL.D:				Asellus:	
Hydropsychidae Ab	0	*Lymnaea* (G) Ab	0	Chironomidae (d) Ab	1	Absent	
Polycentropodidae Ab	0	*Potamopyrgus* (G) Ab	0	*Chirinomus* (D) Ab	0	Few/Low	X
Rhyacophila Ab	0	*Planorbis* (G) Ab	0	Simuliidae (D) Ab	1	Common / Numerous	
Philopotamidae Ab	0	*Ancylus* (G) Ab	0	Dicranota (D) Ab	0		
Limnephilidae Ab	0	*Physa* (G) Ab	0	Tipulidae (D) Ab	0		
Sericostomatidae Ab	1	*Lumbriculus* (Ol) Ab	0	Ceratopogonidae (D) Ab	1		
Glossosomatidae Ab	0	*Eiseniella* (Ol) Ab	0	Other GOLD Ab	0	**NOTE:** Asellus must be recorded as absent if none are found.	
Lepidostomatidae Ab	0	Tubufucudae (Ol) Ab	3				
Other Trichoptera Ab	0						
Total no. of Taxa	1	**Total no. of Taxa**	4	**Total Relative Abundance**	6		
Total Relative Abundance	1						

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

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	2

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

Total Index Score (TIS) sum (a+b+c+d+e)	12	Average Index Score (AIS) TIS/5 (5 for 5 groups)	2.4	**SSR Score** (AIS x 2)	4.8

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

> 7.25 Probably not at risk		> 6.5 – 7.25 Indeterminate Stream may be at risk		<6.5 Stream at risk	X

Surveyor (signed): Martin O'Looney Name (print): MARTIN O'LOONEY Date: 24 / 04 / 2023

River:	Kildoon	Code:	SE14K270950	Date:	24-04-2022	Time:	10:30
Station no.		Location:	Clarey, Nurney			Grid (6 figure):	
SW8		Stream Order:	3			271040, 202838	

Field Chemistry	
DO %	-
DO mg/l	-
Temp (°C)	-
Conductivity	249
pH	7.2
Bank width (cm)	560
Wet width (cm)	780
Avg Depth (cm)	89.5
Staff gauge	CR

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

Stream Flow:
Riffle
Riffle / Glide
Slow Flow

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	2
Stone wash x	n/a
Weed sweep x	2

General Comments:
Baetis, Gammarus and Elmidae were also present in the sample. The DO meter was not operating on the morning of the assessment.

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

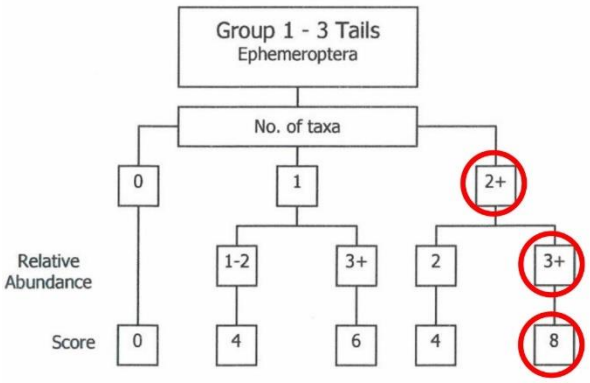
Ephemeroptera:		Plecoptera:	
Ecdyonurus Ab	0	*Leuctra* Ab	0
Rhithrogena Ab	0	*Isoperla* Ab	0
Heptagenia Ab	0	*Protonemura* Ab	0
Ephemerella Ab	2	*Amphinemura* Ab	0
Caenis Ab	1	*Perla* Ab	0
Paraleptophlebia Ab	0	*Dinocras* Ab	0
Ephemera danica Ab	0	Other Plecop Ab	0
Other Ephem Ab	0	Other Plecop Ab	0
Total no. of Taxa	2	Total no. of Taxa	0
Total Relative Abundance	3	Total Relative Abundance	0

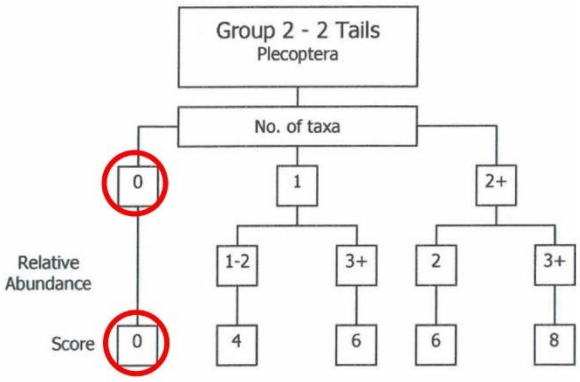
Trichoptera:		G.OL.D:				Asellus:	
Hydropsychidae Ab	0	*Lymnaea* (G) Ab	1	Chironomidae (d) Ab	2	Absent	
Polycentropodidae Ab	0	*Potamopyrgus* (G) Ab	0	*Chirinomus* (D) Ab	0	Few/Low	X
Rhyacophila Ab	0	*Planorbis* (G) Ab	0	Simuliidae (D) Ab	3	Common / Numerous	
Philopotamidae Ab	0	*Ancylus* (G) Ab	0	Dicranota (D) Ab	1		
Limnephilidae Ab	0	*Physa* (G) Ab	0	Tipulidae (D) Ab	0		
Sericostomatidae Ab	2	*Lumbriculus* (Ol) Ab	0	Ceratopogonidae (D) Ab	6		
Glossosomatidae Ab	0	*Eiseniella* (Ol) Ab	0	Other GOLD Ab	0		
Lepidostomatidae Ab	0	Tubufucudae (Ol) Ab	3				
Other Trichoptera Ab	0						
Total no. of Taxa	1	Total no. of Taxa	6	Total Relative Abundance	16		
Total Relative Abundance	2						

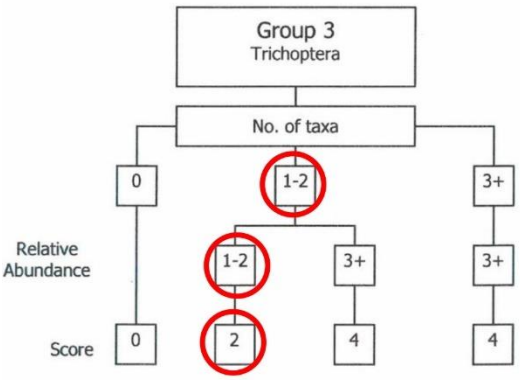
NOTE: Asellus must be recorded as absent if none are found.

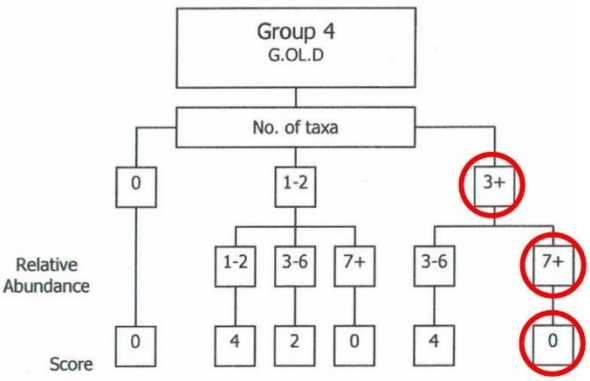
NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

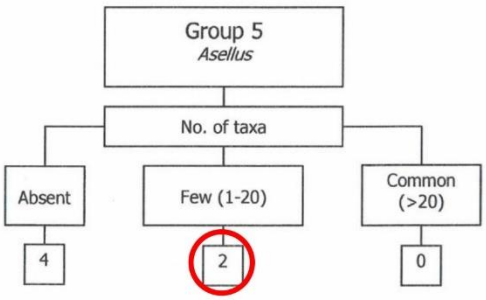
Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.











Step 2

a) Index Score Group 1	8
b) Index Score Group 2	0
c) Index Score Group 3	2
d) Index Score Group 4	0
e) Index Score Group 5	2

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

Total Index Score (TIS) sum (a+b+c+d+e)	12	Average Index Score (AIS) TIS/5 (5 for 5 groups)	2.4	**SSR Score** (AIS x 2)	4.8

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

> 7.25 Probably not at risk		> 6.5 – 7.25 Indeterminate Stream may be at risk		<6.5 Stream at risk	X

Surveyor (signed): Martin O'Looney Name (print): MARTIN O'LOONEY Date: 24 / 04 / 2023

River:	Kildoon	Code:	SE14K270950	Date:	24-04-2022	Time:	11:30
Station no.		Location:	Cloneybeg, Nurney			Grid (6 figure):	
SW9		Stream Order:	3			269776, 203100	

Field Chemistry	
DO %	-
DO mg/l	-
Temp (°C)	-
Conductivity	249
pH	7.2
Bank width (cm)	710
Wet width (cm)	810
Avg Depth (cm)	120
Staff gauge	CR
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:		**Sample Retained:**		
Pasture	Urban			
Bog	Tillage	Y	N	
Forestry	Other			

Stream Flow:	
Riffle	
Riffle / Glide	
Slow Flow	
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	2
Stone wash x	n/a
Weed sweep x	n/a

General Comments:
Baetis, Gammarus and Elmidae were also present in the sample. The DO meter was not operating on the morning of the assessment.

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	0	*Leuctra* Ab	0
Rhithrogena Ab	0	*Isoperla* Ab	0
Heptagenia Ab	0	*Protonemura* Ab	0
Ephemerella Ab	1	*Amphinemura* Ab	0
Caenis Ab	1	*Perla* Ab	0
Paraleptophlebia Ab	0	*Dinocras* Ab	0
Ephemera danica Ab	0	Other Plecop Ab	0
Other Ephem Ab	0	Other Plecop Ab	0
Total no. of Taxa	2	**Total no. of Taxa**	0
Total Relative Abundance	2	**Total Relative Abundance**	0

Trichoptera:		G.OL.D:				Asellus:	
Hydropsychidae Ab	0	*Lymnaea* (G) Ab	0	Chironomidae (d) Ab	1	Absent	
Polycentropodidae Ab	0	*Potamopyrgus* (G) Ab	0	*Chirinomus* (D) Ab	0	Few/Low	X
Rhyacophila Ab	0	*Planorbis* (G) Ab	0	Simuliidae (D) Ab	0	Common / Numerous	
Philopotamidae Ab	0	*Ancylus* (G) Ab	0	Dicranota (D) Ab	0		
Limnephilidae Ab	1	*Physa* (G) Ab	0	Tipulidae (D) Ab	0		
Sericostomatidae Ab	2	*Lumbriculus* (OI) Ab	0	Ceratopogonidae (D) Ab	1		
Glossosomatidae Ab	0	*Eiseniella* (OI) Ab	1	Other GOLD Ab	0	**NOTE:** Asellus must be recorded as absent if none are found.	
Lepidostomatidae Ab	0	Tubufucudae (OI) Ab	3				
Other Trichoptera Ab	0						
Total no. of Taxa	2	**Total no. of Taxa**	4	**Total no. of Taxa**			
Total Relative Abundance	3	**Total Relative Abundance**	6	**Total Relative Abundance**			

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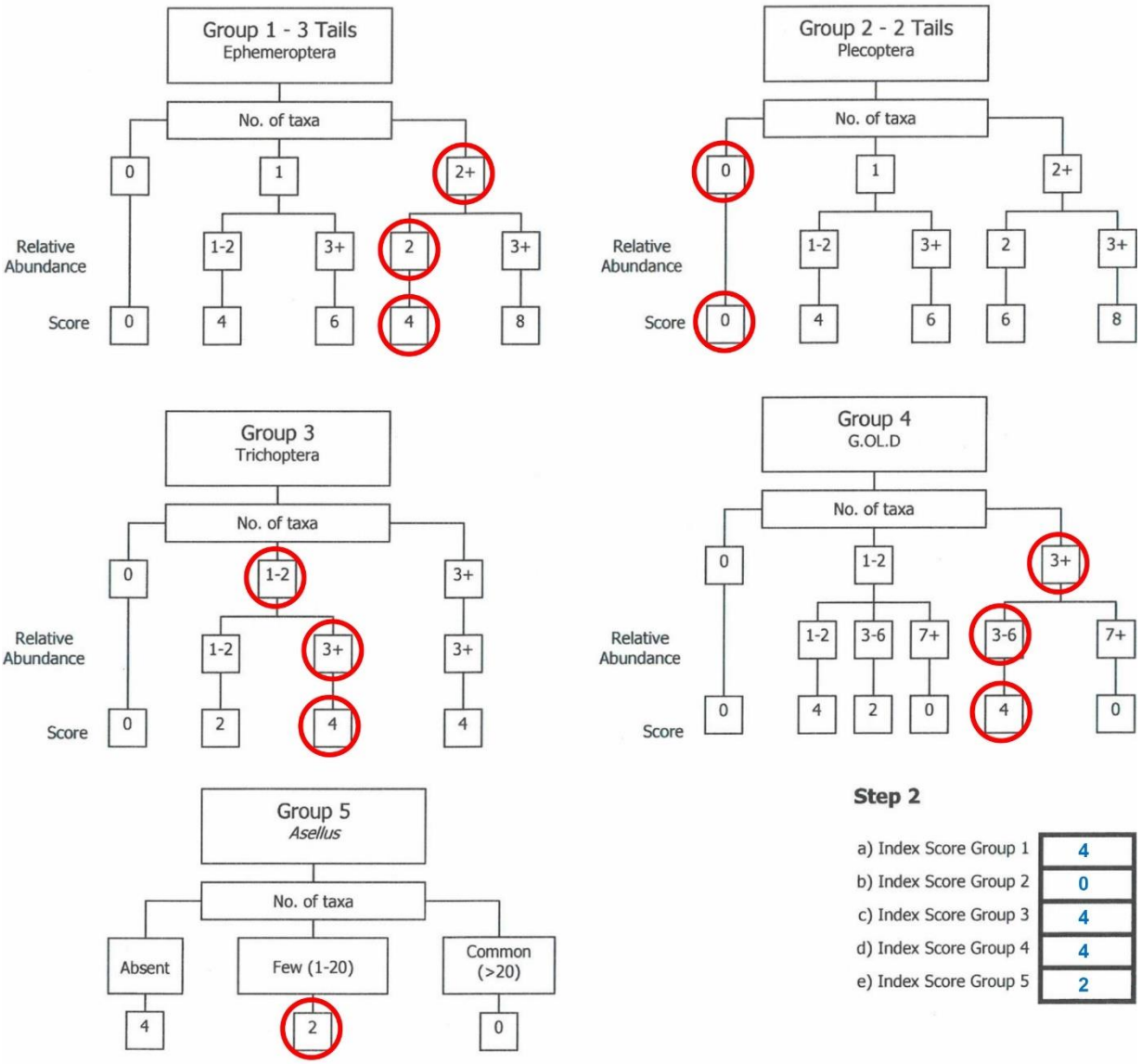

Step 2

a) Index Score Group 1	4
b) Index Score Group 2	0
c) Index Score Group 3	4
d) Index Score Group 4	4
e) Index Score Group 5	2

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	X

Surveyor (signed): Martin O'Looney Name (print): MARTIN O'LOONEY Date: 24 / 04 / 2023