BSc in Applied Freshwater & Marine Biology, Limnology & Oceanography
Lough Corrib Catchment Follow-up Practical

Tasks during the follow-up practical (2hrs):

1. <u>Collate class data</u> (chemical and river discharge)
Everyone should have the same data

2. <u>Conduct Nitrates and Phosphates tests:</u>
One sample bottle will be analysed from the R Kipp and Cross by each group

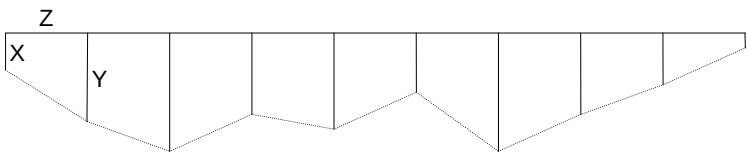
Phosphate analysis (LR)
1. *Carefully* remove the foil from the screwed on DosiCap Zip.
2. Unscrew the DosiCap Zip.
3. Pipette *2.0 mL of your water* sample into the tube.
4. Pipette into the cuvette: *0.2 mL* Reagent *B* (LCK 349 B). Close Reagent B *immediately* after use.
5. Screw a *grey* DosiCap C (LCK 349 C) onto the cuvette.
6. Invert a few times. After *10 min* invert a few times more, thoroughly clean the outside of the cuvette and evaluate.
7. Record you results

Nitrate Analysis
1. Unscrew the green cap.
2. Fill a sample tube with 1ml of your water sample
3. Pipette into the cuvette: *0.2 mL* Reagent *A* (LCK 339 A). Close Reagent A *immediately* after use.
4. Close cuvette
5. Invert a few times until no more streaks can be seen
6. After 15 mins thoroughly clean the outside of the cuvette and place in spectrophotometer for analysing
7. Record you results

3. Estimating discharge of a river

- Calculate the area of each interval:

$$Area = \frac{(Depth_X + Depth_Y)}{2} \times Width_Z$$



- Work out the flow of the river in seconds per one pulse
- Using this number, look up the **Valeport Conversion Chart** to get the velocity (you will be shown how to do this in practicals)

- Multiply the area by the water velocity to get discharge in m^3 / s for each interval
- Continue on to estimate the area (m^2) and discharge of each of the intervals
- Sum the discharges of each interval to calculate the overall discharge
- Calculate discharge in day per year

Discharge from Lough Kipp River

Position (m)	Depth (m)	**Area* (m^2)**	Seconds per 50 pulses	Seconds per 1 pulse	**Velocity (m/s)**	**Discharge**
0						
1						
2						
3						
4						
5						
6						
7						
8						
Total						

Discharge from River Cross

Position (m)	Depth (m)	**Area* (m^2)**	Seconds per 50 pulses	Seconds per 1 pulse	**Velocity (m/s)**	**Discharge**
0						
1						
2						
3						
4						
5						
6						
7						
8						
Total						

4. <u>Analysis your macroinvertebrate samples,</u> <u>collate class data</u> and <u>calculate the SSRS</u> for each river

- Spend at least 20-30mins studying the contents of each macroinvertebrate sample in order to ensure that all macroinvertebrate are identified to the taxonomic level required (genus or species).
- Place the macroinvertebrates you identified into their assigned SSRS groups (A-E) for each sample. Add up the species richness and total abundance for each group
- Total relative abundance can only be calculated once the whole class has analysed all three macroinvertebrate samples from the two rivers.

NB! Please remember this when calculating your SSRS scores

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

Field Chemistry	
DO%	
DO mg/l	
Temp (°C)	
Conductivity	
pH	
Bank width (cm)	
Wet width (cm)	
Avg Depth (cm)	
Staff gauge	

Velocity	Colour
Torrential	None
Fast	Slight
Moderate	Moderate
Slow	High
Very slow	

Clarity	Discharge
Very clear	Flood
Clear	Normal
Slightly turbid	Low
Highly turbid	Very Low
	Dry
	Recent Flood

Modifications: Y/N Canalised-widened-bank erosion-arterial drainage

Dominant Types:
Bedrock
Boulder (>128mm)
Cobble (32-128mm)
Gravel (8-32mm)
Fine Gravel (2-8mm)
Sand (0.25-2mm)
Silt (<0.25mm)

Slope: Low – Medium – High – Very High

Geology: Calcareous-Siliceous-Mixed

Substratum Condition: Calcareous-Compacted-Loose - Normal

Substratum: Stoney bottom-Muddy bottom-Mud over stones

Degree of siltation: Clean-Slight-Moderate-Heavy

Depth of mud: None: <1cm: 1-5cm: 5-10cm: >10cm

Litter: None – Present – Moderate - Abundant

Shading: High – Moderate – Low - None

Cattle access Y: upstream – downstream or N

Photo: Y / N

Filamentous Algae: None – Present – Moderate - Abundant

Sewage Fungus: None – Present – Moderate - Abundant

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

Sample retained: Y / N

Sampled in Minutes:
Pond net x
Stone wash x
Weed sweep x

General Comments:

Macroinvertebrate Composition

The macroinvertebrates are divided into the following 5 specific groups:

- Group 1 = Ephemeroptera (3-tails) – note that tails may be damaged during sampling
- Group 2 = Plecoptera (2-tails) - note that tails may be damaged during sampling
- Group 3 = Trichoptera
- Group 4 = G.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

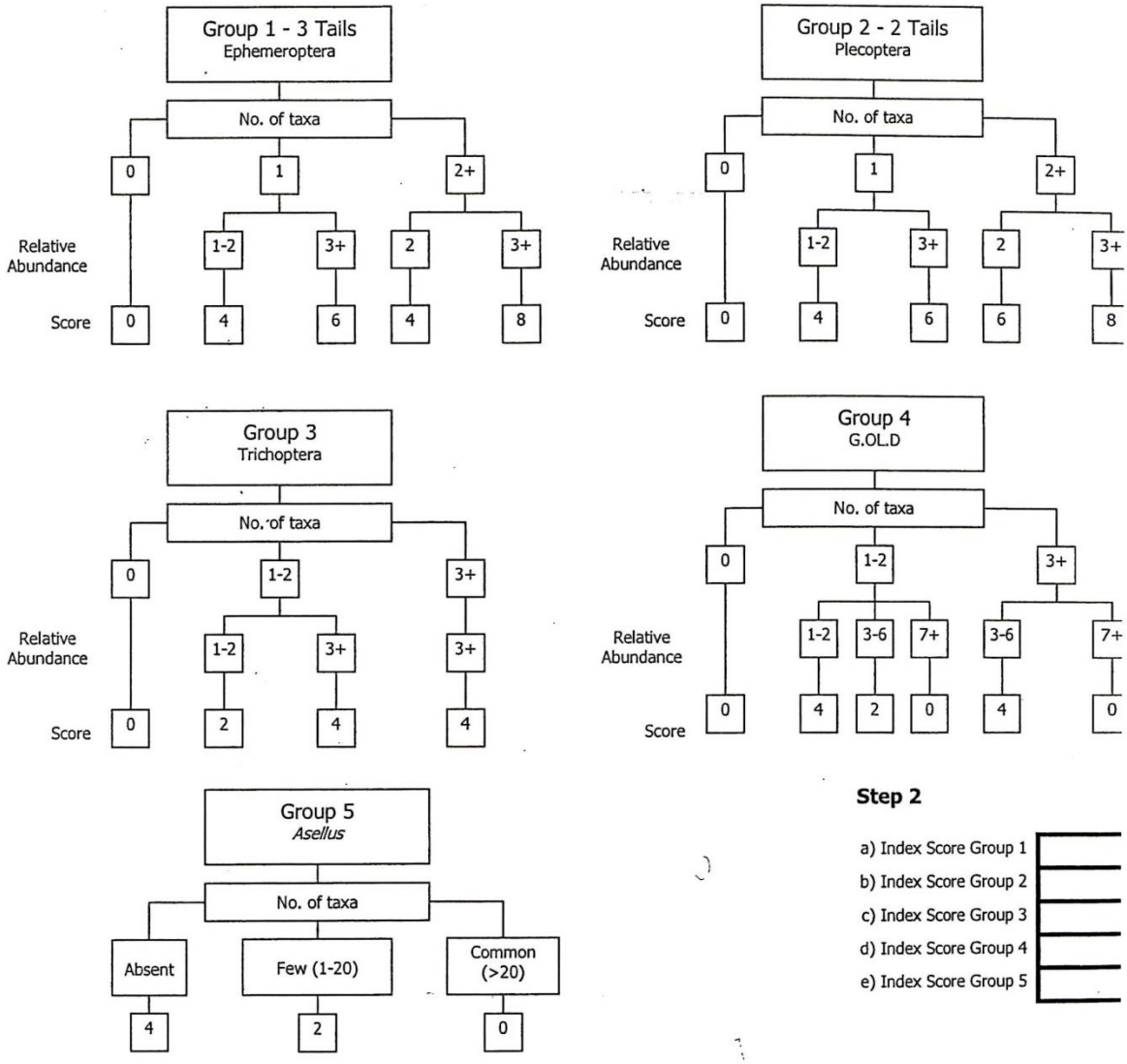
Ephemeroptera:		Plecoptera:	
Ecdyonurus Ab		*Leuctra* Ab	
Rhithrogena Ab		*Isoperla* Ab	
Heptagenia Ab		*Protonemura* Ab	
Ephemerella Ab		*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paraleptophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
Total no. of taxa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

Trichoptera:		G.O.L.D:				*Asellus*:	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab		Absent	
Polycentropodidae Ab		*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few/Low	
Rhyacophila Ab		*Planorbis* (G) Ab		Simuliidae (D) Ab		Common/ Numerous	
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		*Eiseniella* (Ol) Ab		Other GOLD Ab			
Lepidostomatidae Ab		Tubificidae (Ol) Ab					
Other Trichoptera Ab							
Total no. of Taxa	**Total Relative Abundance**	**Total no. of Taxa**		**Total Relative Abundance**			

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 ☐
b) Index Score Group 2 ☐
c) Index Score Group 3 ☐
d) Index Score Group 4 ☐
e) Index Score Group 5 ☐

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) ☐

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: ____/____/____