

A word from your Natural Resources Wales Co-ordinator

Welcome to your first Riverfly Report of 2014!

Huge thanks to everybody that managed to get out and take samples during the autumn months despite the combination of abysmal weather and high flows. We've been stuck inside here as well processing routine samples in the lab, so we're really hoping that January becomes drier so we can actually get in some rivers again and do some WFD investigation work!

A Note regarding Health and Safety

Seeing as this is the season of high flows, and rapidly rising rivers, I felt a quick reminder about health and safety when working in and around rivers was overdue. I've taken the following points from our own work instruction:

Drowning/Injury Risk Prevention:

You must wear an appropriate lifejacket when you are working in water:

- where the bottom is not visible;
- that is higher than knee depth;
- If there's a foreseeable risk of immersion or drowning
 - Make sure your footwear has a good grip on the soles.
 - Use a walking stick/ net pole to help you to keep your balance when walking in water.
 - It may be advisable to take a spare set of clothes.
 - Don't sample alone!

Infection Risk Prevention:

- Consider wearing water-resistant gloves if you're likely to come into contact with water.
- Cover any cut or graze with a waterproof dressing.
- Wash and disinfect your hands after contact with water.
- Avoid working near blue-green and red algae

Most importantly, if it doesn't look safe, **don't go in!!** No sample is worth risking a life for.

Freshwater Invertebrates and their varying lifecycles.

Common questions that get asked by samplers include "Why do we find some families of invertebrate at certain times of the year and not others?" and "Why are they different sizes depending on the season"?

The presence or absence of different species of mayfly nymph at certain times of the year is all down to the different life cycle patterns they have. Life cycles of British Mayflies basically fall into 5 categories:

GROUP 1A – Univoltine (one generation per year); overwinter in egg stage. – e.g *Seratella ignita*, the Blue Winged Olive. These will typically be absent during the winter months and tiny in spring. Very rarely tiny larvae might be found in winter/late autumn samples during warm weather (our Pems RT samplers found one this winter at Pantmaenog Forest), but these are unlikely to survive the winter.



Blue Winged Olive Nymph

GROUP 1B – Univoltine (one generation per year): overwinter in larval stage – e.g. *Rhithrogenia semicolorata* and *Ecdyonurus venosus*, two species of flat bodied mayfly, that are present all year round but large in spring, and the stonefly family, Taeniopterygidae, which have a very short nymphal stage and are only found in kick samples during winter and early spring.



Flat Bodied Mayfly Nymph



Taeniopterygidae nymph

Group 2A – Bivoltine (two generations per year) or Multivoltine (more than two generations per year): Overwinter in egg stage – e.g a few species of Olive, and *Simulium* midge larvae.



Simulium larva

Group 2B – Bivoltine or Multivoltine: Overwinter in larval stage – e.g our most common Olive species, *Baetis rhodani*. Present most of the year round in varying sizes.



Olive nymph

Group 3 – Semivoltine (one generation every two years or even every three years) – e.g the true mayfly, *Ephemera danica*. Present all year but takes two years to reach full size. One of our largest stoneflies, *Perla bipunctata*, takes 3 years to reach full size!!



True mayfly nymph



Perla Stonefly larva.

Something we don't see anymore (and probably would only just fit in our trays!).

Meet one of the largest Mayflies that has ever existed, *Bojophlebia prokopi!*



This giant invertebrate was alive during the Carboniferous Period, and had a 45 cm wingspan (larger than a blackbird!) and would probably make a mess of your windscreen if you hit one in your car!. It's the common ancestor of the mayflies we get today.

Insects evolved to become smaller over time due to a reduction of oxygen in the atmosphere. Insects breathe via diffusion through a network of tiny spiracles leading to tracheal tubes below their skin. Back in the giant insect heyday, there was up to 35% more oxygen in the earth's atmosphere, so the insects living around that time could get away with having a larger body mass as the greater oxygen concentration per spiracle meant it could penetrate far deeper within the body tissues. As the oxygen levels got less and less, only the smaller species could cope as there wasn't sufficient oxygen available to fully penetrate body tissue of larger invertebrates. Basically, larger insects have a smaller surface

area in comparison to their size than smaller ones. As a result insects have gradually evolved to be smaller and smaller with the reduction in atmospheric oxygen.

TRIM Results

Tyweli Catchment

River Name		Cwerchyr	Gran	Talog	Tyweli
Site Name					
NGR		SN368446	SN368466	SN464376	SN442379
Samplers		Ian Thomas and Eric Davies			
Conditions					
Caddis Flies	Cased Caddis	2	1		2
	Caseless Caddis	5	4	1	5
Mayfly nymphs	Up-wing (Ephemeraeidae)				
	Blue-winged Olive up-wing (Heptageniidae)	20	20	10	10
	Olive up-wing (Baetidae)	50	50	30	50
Stonefly nymphs	Stonefly nymphs	12	2	10	10
Freshwater shrimps		15	2	1	2
Leeches	Leeches				
Snails	Spire shells				
	Ramshorn				
Hoglouse	Hoglouse				
Density/biomass indicator (totals)		104	79	52	79
Other	Fish				
	Other		1 Saucer Bug		
Comments					

No problems at any of these sites. Good numbers of heptagenids and stoneflies present.

Western Cleddau

Summer 2013		St Catherines Bridge		Cutty Bridge		Anghof	
Location Code		1		2		31	
GPS		SM945198		SM941188		SM 98090 28397	
Date		30/09/2013		07/10/2013		15/09/2013	
Name of Monitors		David Nattress/John Codd		David Nattress/John Codd		JCu/PP	
Conditions		15°C pH 6		15°C, pH6		Low flow, raining.	
Caddis Flies	Cased Caddis	B	30	B	30	A	5
	Caseless Caddis	B	40	B	30	A	1
Mayfly nymphs	Up-w ing (Ephemeraidae)	-	0	A	1	-	0
	Blue-w inged Olive up-w ing	-	0	-	0	A	1
	Flat-bodied up-w ing (Heptageniidae)	A	6	B	10	A	3
	Olive up-w ing (Baetidae)	B	30	B	20	B	63
Stonefly nymphs	Stonefly nymphs	A	8	A	2	B	50
Freshwater shrimps	Freshwater shrimps	C	100	B	30	B	17
Leeches	Leeches	-	0	A	1	B	29
Snails	Spire shells	B	80	A	2	-	0
	Ramshorn	-	0	-	0	-	0
Hoglouse	Hoglouse	-	0	-	0	A	4
Density/biomass indicator (totals)		294		126		173	
Previous Density/biomass indicator (totals)		24.6.13 = 1074		25.6.13 = 447			
Previous Density/biomass indicator (totals)		16.4.13 = 434		16.4.13 = 101		-	
Previous Density/biomass indicator (totals)		26.2.13 = 103		26.2.13 = 54		-	
Previous Density/biomass indicator (totals)		26.10.12 = 558		-		-	
Previous Density/biomass indicator (totals)		9.8.12 = 1037		10.8.12 = 184		-	
Previous Density/biomass indicator (totals)		21.5.12 = 590		22.5.12 = 274		-	
Other	Fish	4 bullheads		-		-	
	Other	2 beetles, lots of midge larvae.		Snails were freshwater limpet, 6 beetles.		14 freshwater limpets.	
Comments		6 of the snails were freshwater limpets, the rest were spire shells. 2 of the shrimp had the orange spot of a parasite. 33% of the site was weed.		1 shrimp had orange spot. No weed in our sample stretch this time.		Fresh otter spraint nearby upstream of bridge.	

No major issues at any of the sites this time round. The "Orange Spot" parasite found in gammarus is an interesting one to see, although not indicative of water quality issues. These parasites are part of the phylum *Acanthocephala*, commonly known as thorny headed worms, and have a complex life cycle involving two or more hosts.

Healthy Gammarus usually lurk in shady areas and under stones to avoid predation, but when infected with these parasites, they behave oddly, become attracted to light and swim towards the surface of the water. This behaviour, combined with the dayglo orange spots formed by the developing worms within the body of the shrimp, makes them more likely to be predated by ducks or fish, which are the primary hosts of the worm.

Eastern Cleddau - September

September 2013		Narberth Brook - Shipping Factory		Narberth Brook - Canaston Bridge		Syfni - Gelli Bridge		Eastern Cleddau - Glanleddau Farm	
Location code [for future]		6		27		12		13	
GPS		SN 09582 14482		SN 06727 15105		SN 195 085		SN 098 212	
Date		11/09/2013		29/09/2013		20/09/2013		20/09/2013	
Name of Monitors		JH/JeH		JH/JeH		RB/CB		RB/CB	
Conditions		Depth 15 cm average. Fallen trees = some dense canopy over part of sample area, fish flow not affected. Channel now returned to shallow silted side and a faster main channel. Growth from fallen trees increasing shading by canopy, tunnel effect from the more open sampling site upstream to Shipping Factory itself.		Depth varying from 0-30cm average 12 cm. Sample area shaded to west and from balsam covered banks. Substrate ½ weed covered, stones/silt over rest of sample area. Access point now much less visible due to balsam growth, balsam becoming dominant in the sample region and for 50m upstream, some removed to enable access.		Mild day		Mild day	
Caddis Flies	Cased Caddis	A	9	B	17	C	100	B	40
	Caseless Caddis	A	4	A	6	C	200	B	35
Mayfly nymphs	Up-w ing (Ephemeraidae)	-	0	-	0	-	0	-	0
	Blue-w inged Olive up-w ing	A	1	-	0	-	0	-	0
	Flat-bodied up-w ing (Heptageniidae)	B	19	A	2	-	0	B	20
	Olive up-w ing (Baetidae)	A	2	B	10	A	5	B	25
Stonefly nymphs	Stonefly nymphs	B	10	A	1	A	1	A	35
Freshwater shrimps	Freshwater shrimps	B	59	B	20	B	50	A	9
Leeches	Leeches	-	0	A	1	-	0	A	3
Snails	Spire shells	B	14	B	14	A	1	-	0
	Ramshorn	-	0	-	0	-	0	-	0
Hoglouse	Hoglouse	-	0	-	0	-	0	A	8
Density/biomass indicator		118		71		357		175	
Previous Density/biomass		3.7.13 = 217		5.8.13 = 105		22.7.13 = 153		22.7.13 = 89	
Previous Density/biomass		17.3.13 = 344				21.05.13 = 260		21.05.13 = 307	
Previous Density/biomass indicator (totals)		24.10.12 = 262				26.4.13 = 135		26.4.13 = 146	
Previous Density/biomass		28.07.12 = 204							
Previous Density/biomass		19.6.12 = 410							
Other	Fish	1 bullhead fish		3 bullhead fish. Trout observed in water.		One bullhead in sample		One river fluke in sample	
	Other	Freshwater limpets 6, 8 beetles and		Large number of water beetles 27 in					
Comments		There were in the water a number of uprooted Himalayan balsam plants, unfortunately throwing them into the water or leaving them with the root ball on the side still allows flowering/seeding.		Greater weed growth than August. Detaching weed makes it difficult to isolate/count. A lot of silt. Larger rocks/stones covered on upper surfaces only with red layer, looks like encrusting lichen? Will photograph					

Eastern Cleddau – December

Winter 2013		Syfni - Gelli Bridge		Eastern Cleddau - Glanleddau Farm		Syfynwy Tributary Pantmaenog		Syfynwy Tributary Pantmaenog	
Location code [for future interactive map]		12		13		33		34	
GPS		SN 082 195		SN 098 212		SN 07075 29854		SN 07152 30065	
Date		11/12/2013				08/12/2013		08/12/2013	
Name of Monitors		RB/CB		RB/CB		JCu/VS		JCu/VS	
Conditions		Mild day, low water.		Mild day, low water.		Cold sunny conditions.		Cold sunny conditions.	
Caddis Flies	Cased Caddis	B	20	B	20		4	A	4
	Caseless Caddis	C	110	B	25		8	A	4
Mayfly nymphs	Up-wing (Ephemeroidea)	-	0	-	0		-	-	0
	Blue-winged Olive up-wing	-	0	-	0		1	A	2
	Flat-bodied up-wing (Heptageniidae)	B	30	C	120		1	-	0
	Olive up-wing (Baetidae)	C	110	A	8		1	-	0
Stonefly nymphs	Stonefly nymphs	A	8	A	9		10	B	14
Freshwater shrimps	Freshwater shrimps	C	110	A	1		13	-	0
Leeches	Leeches	A	1	A	2		0	-	0
Snails	Spire shells/ramshorn	-	0	-	0		0	-	0
Hoglouse	Hoglouse	A	5	-	0		0	-	0
Density/biomass indicator (totals)		394		185		38		24	
Previous Density/biomass indicator (totals)		20.9.13 = 357		20.9.13 = 175					
Previous Density/biomass indicator (totals)		22.7.13 = 153		22.7.13 = 89					
Previous Density/biomass indicator (totals)		21.05.13 = 260		21.05.13 = 307					
Previous Density/biomass indicator (totals)		26.4.13 = 135		26.4.13 = 146					
Previous Density/biomass indicator (totals)									
Other	Fish	1 bullhead fish.							
	Other	40 earthworms.		40 earthworms.					
Comments								No gammarus or baetids, lots of orange deposits: iron oxide algae?	

All sites on the Narberth Brook, lower Syfni and Eastern Cleddau are looking fine, the increased plant growth in September was most probably due to the warm weather and low flows we had during late summer and early autumn (it seems a long time ago now!).

It will be interesting to see pictures of the lichen spotted at Canaston Bridge too. The comments made about the Himalayan balsam being uprooted and left by/in the river were also correct! It sounds like the landowner needs educating about proper disposal! Uprooting them in September is generally a bad idea as their exploding seed heads will be ripe and pinging everywhere, causing even further spread of the Balsam plants.

The second site in Pantmaenog Forest is definitely showing signs of acidification. The use of Forestry Cypermethrin had been suspected in the area in the past, although the presence of stoneflies, which are highly sensitive to even tiny concentrations of the chemical but tolerant of acidification, indicates that this isn't the case now. The pesticide Cypermethrin, although banned for use in sheep dip formulations, is still legal for use in forestry to prevent weevil infestation of young trees.

Nevern - Autumn

Autumn 2013		Nevern - Crosswell Bridge		Nevern - Sheepdip pool, Felindre		Brynberian
Location code [for future interactive map]		11		24		
GPS		SN 12597 37014		SN 096 388		
Date		10/09/2013		15/10/2013		
Name of Monitors		DS/CS		NP/DP/Jcu		
Conditions		Low water. Air temp 16 C.		Sunny but cold, low flow		
Caddis Flies	Cased Caddis	A	5	B	16	
	Caseless Caddis	B	18	A	9	
Mayfly nymphs	Up-wing (Ephemeroidea)	-	0	-	0	
	Blue-winged Olive up-wing	B	15	A	1	
	Flat-bodied up-wing (Heptageniidae)	B	30	A	3	
	Olive up-wing (Baetidae)	B	25	A	6	
Stonefly nymphs	Stonefly nymphs	A	8	B	12	
Freshwater shrimps	Freshwater shrimps	C	100	B	20	
Leeches	Leeches	-	0	A	3	
Snails	Spire shells	A	1	-	0	
	Ramshorn	-	0	-	0	
Hoglouse	Hoglouse	A	5	-	0	
Density/biomass indicator (totals)		207		70		
Previous density/biomass indicator (totals)		29.4.13 = 390		7.6.13 = 80		
Other	Fish			Minnow.		
	Other	Over 10 freshwater muscels found		4 threadworms 2 beetles. Pondskaters		
Comments		River very low with some brown alga on riverbed.		Japanese Knotweed noted nearby.		

No obvious major issues at either site.

Carmarthenshire Results

Doethie Results

River Name	Doethie		Doethie		Pysgotwr		Doethie Fawr		Doethie Fach		Pysgotwr		Doethie		
Site Name	Blaendoethie		Rhydygroes		Nant Gwernog		U/S Doethie Fawr		U/S Doethie Fach		U/S Doethie		U/S Pysgotwr		
NGR															
Samplers	Gethyn Thomas, Caroline Orr		Gethyn Thomas, Caroline Orr		Gethyn Thomas, Caroline Orr		Gethyn Thomas, Caroline Orr		Gethyn Thomas, Caroline Orr		Gethyn Thomas, Caroline Orr		Gethyn Thomas, Caroline Orr		
Conditions															
	Category	Number found	Category	Number Found	Category	Number Found	Category	Number Found	Category	Number Found	Category	Number Found	Category	Number Found	
Caddis Flies	Cased Caddis	A	2			A	3			A	1	B	14	A	3
	Caseless Caddis	A	4	A	6	A	7	A	9	A	8	A	1	A	1
Mayfly nymphs	Up-wing (Ephemeraidae)														
	Blue-winged Olive up-wing	A	2	A	8	A	8								
	Flat-bodied up-wing (Heptageniidae)			B	29			A	3	A	1	B	12	B	22
	Olive up-wing (Baetidae)							B	20	A	1	A	7	A	8
Stonefly nymphs	Stonefly nymphs	B	16	A	3	B	23	B	15	A	9	B	24	A	6
Freshwater shrimps	Freshwater shrimps														
Leeches	Leeches														
Snails	Snails														
Hoglouse	Hoglouse														
Density/bio mass indicator (totals)		24		46		41		47		20		58		40	
Notes															
Biological Quality															
Comments		14th October, 2013		14th October, 2013		14th October, 2013		14th October, 2013		14th October, 2013		14th October, 2013		14th October, 2013	

As usual, the sites at the upper end of the catchment are showing the greatest impact from acidification, with a total absence of Heptagenids and low numbers of other mayflies. There are lower numbers of invertebrates in general which is to be expected in the autumn/winter months.