



## Scientific Update

15<sup>th</sup> February 2012

Dr Adam Moolna

### Overview

The sampling team members have done a great job and the data is starting to build up. Monthly data collection began in September 2011 on our initial series of a dozen sites and a further three sites were added by new team members in November. The gap in data for December and January (due to high river levels) is not a major problem and the team were back sampling again this month.

Here I'll give a brief update on the data situation and list the initial site scores. I will also explain why the Anglers Monitoring Initiative is so useful and explain what to concentrate on getting right. Full analysis must wait until we have our first year's data set - but I just want to reassure you that your collecting efforts are proceeding well and all is on course for a successful long-term scheme.

### The sampling power of river invertebrates

As anglers, you all know how variable the water in a specific spot along the river can be. Water quality varies greatly with rainfall, for example, as water dilutes pollutants, washes in debris, or causes sewers to overflow. Water sampled in the same particular spot can be very different if taken in summer or winter and if taken before or after rain.

Invertebrates, however, can live on that riverbed for several years and their survival depends on the overall water quality to which they are exposed over that time. The invertebrate community therefore provides a continuous monitoring population that averages the quality effects of the changing water.

### Anglers Monitoring Initiative: clean water flies correlate to clean water

The nymph stages of well-known river flies (such as mayflies and caddis) spend the first year or more of their lives living amongst the gravels of the river bed, before hatching out as the adult flies. Trout are associated with clean waters because the flies on which they feed require clean water for successful reproduction - cleaner waters mean more abundant flies.

The Riverfly Partnership ([www.riverflies.org](http://www.riverflies.org)) set up the Anglers Monitoring Initiative (AMI) scheme to give essentially a broad brush measure of how clean the water is from the abundance of clean water flies. The AMI site score is an index of the abundance in the riverbed substrate of 8 groups of clean water indicator invertebrates. Essentially, the greater the abundance of indicator invertebrates picked up by a 3 minute kick sample the cleaner the typical water at that location is.

### Estimating the abundance category for each invertebrate group

In the AMI scheme, each of the 8 groups is given equal weighting. The score itself is the total points over all 8 groups for their abundance category (A = 1 point, B = 2 points etc.). What matters for the AMI scoring is the abundance category you assign, not the actual count of individuals, so don't worry about counting every last one - just an approximate number is sufficient.

<u>Category</u>	<u>Numbers</u>	<u>Accuracy to aim for</u>	<u>Category</u>	<u>Numbers</u>	<u>Accuracy to aim for</u>
A	0-9	Quick count	C	100-999	Nearest 100
B	9-99	Nearest 10	D	Over 1000	Nearest 1000

## Long-term: building up the data set for each sampling site to get an averaged score

The preliminary scores generated so far give us an indication of how water quality changes along the River Irwell. By their very nature, however, kick samples are variable - and we need more replicates before we can establish baseline scores for each site. Statistical treatment with sufficient replicates will give the evidence that we can present in demanding action from relevant bodies much more weight.

## AMI site scores generated so far for all our sites

The River Irwell sampling site list begins at Rawtenstall (Site 01) up in the hills and ends at the Boddingtons Ramp (Site 11) just outside Manchester city centre. Please do not worry if your site is one of those that is particularly variable - that is the nature of the river's variability and of the sampling techniques, it does not mean you are doing anything wrong!

Irwell sampling site	MEAN	Team member (s)	Sep.	Oct.	Nov.
01 Rawtenstall	= 5.7	Adam Kirkpatrick	6	6	5
02 Ewood Bridge	= 4.3	Arthur Hamer	5	4	4
03 Chatterton	= 6.0	Nick Carter	6	6	6
04 Nuttall Park	= 5.3	Phil Kelly	4	3	9
05 Burrs	= 8.7	Derek Kenyon	9	9	8
06 Warth Fold Gravels	= 6.5	Iain Johnson	9	n/a	4
07 Springwater Park	= 9.7	Bob Morris	13	7	9
08 Sion St Bridge	= 5.3	Graham King	6	5	5
09 Balls Bend	= 2.7	DV, MF, AQ	3	3	2
10 Agecroft	= 1.3	Ian Goodwin	1	3	0
11 Boddingtons Ramp	= 2.0	Ian Ross	2	1	3

Tributary sampling site	MEAN	Team member (s)	Sep.	Oct.	Nov.
12 Valley Bolton	= 7.7	DV, MF, AQ	6	9	8
13 Roch Bank	= 5.0	Phil Brookes	n/a	n/a	5
14 Roch Heywood	= 7.0	Ian Hedley	n/a	n/a	7

## Different invertebrate groups and further analysis possible

You will have noted that, in addition to the official 8 AMI groups, we are collecting data on the abundance of crane fly larvae, hog louse, bloodworm and leeches. This is because the River Irwell includes some stretches of relatively polluted water and these 'extra' groups are relatively tolerant of dirtier water. Furthermore, the 8 invertebrate groups all scored equally by the AMI do themselves have differences in tolerance to water pollution. The 'extra' groups, alongside the individual AMI groups, allow exploration of the full water quality range.

## Identification level: no need to get too stressed

The Environment Agency have full-time expert taxonomists to identify the collected invertebrates (back in the lab using microscopes and a plethora of scientific guides) down to species level. They also use a much more complicated weighting system (the Biological Monitoring Working Party, BMWP, score) to analyse their data. For the AMI scheme, please do not get too stressed about identification beyond the basics. And do not worry about making some mistakes - they will be averaged out by monthly replication.

## The monitoring sites and the sampling team

If you can, please try to use the names below for your sites (and include the site # too) so that data is filed with the correct location. Ordnance Survey (O.S.) grid references are given for the sampling sites along with the team members I have down for each site. If there are any errors, please let me know.

In due course we will put together an online map showing these sites and incorporating the results.

#	Site name	O.S. grid reference	Member(s) sampling
01	Rawtenstall	SD 80407 22259	Adam Kirkpatrick
02	Ewood Bridge	SD 79552 20846	Arthur Hamer
03	Chatterton	SD 79319 18771	Nick Carter
04	Nuttall Park	SD 79578 16083	Phil Kelly
05	Burrs	SD 80171 12437	Derek Kenyon
06	Warth Fold Gravels	SD 80021 08893	Iain Johnson
07	Springwater Park	SD 79991 07027	Bob Morris
08	Sion St Bridge	SD 77277 06487	Graham King
09	Balls Bend	SD 76976 04397	David Vickery, Mike France, Tony Quinn
10	Agecroft	SD 80856 01493	Ian Goodwin
11	Boddingtons Ramp	SJ 83463 99282	Ian Ross
12	Valley Bolton	SD 72213 11277	David Vickery, Mike France, Tony Quinn
13	Roch Bank	SD 80857 08046	Phil Brookes
14	Roch Heywood	SD 86319 11679	Ian Hedley

## Want to get involved?

Mike Duddy is coordinating the guys in the field and will be pleased to help you get involved. Email me your details - [adam.moolna@uclmail.net](mailto:adam.moolna@uclmail.net) - and I'll put you in touch.

The more people we have in our team the better we can support each other - stepping in to take the kick sample when a member is ill, for example - and the more sites we can sample along the Irwell.

## Data handling and analysis

I'm running the data handling and scientific reporting side for the Salford Friendly Anglers' Society. The data that comes in from your sampling sheets is compiled into a single database and processed in various ways for analysis. Full analysis, with much more than the simple AMI scores, will be carried out on the first 12 months data once that is in during autumn 2012.

We also have Dr Keith White (Senior Lecturer in Environmental Science at the University of Manchester) supporting us with expertise on invertebrate taxonomy and water quality. Keith has been one of the leaders in water quality improvements along the River Irwell, Manchester Ship Canal and Salford Quays since the 1980s.

## Read more

Further information, including the data recording form and a PDF file of this update, is available under the 'River Irwell' section of my website.

