

## Anglers Monitoring Initiative

at the Salford Friendly Anglers' Society

### Baseline invertebrate community results and report

February 2014



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

Water quality in any one spot on a river varies greatly day-to-day with weather and flow. Rainfall, for example, dilutes pollutants, washes in debris, or causes sewers to overflow. Invertebrates, however, live on riverbeds for several years and their survival depends on the overall water quality to which they are exposed over time. The invertebrate community therefore indicates the long-term overall water quality.

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 anglers a way to assess how clean their river environment 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.

#### Salford Friendly Anglers' Society

In September 2011 we began collecting monthly samples to get a picture of the riverbed invertebrate community at a number of sites of interest to anglers through the Irwell catchment. We began with 14 sites and have achieved comprehensive data sets of at greater than one year coverage for 5 of these.

All 5 sites have moderate water quality and reasonable cleanliness is indicated by the presence of sensitive Blue-Winged Olives and Stone Clingers. Hog-louse, Leech and Bloodworm tolerate poor water conditions but they are also found in cleaner waters and their presence does not indicate pollution.

Site	Average AMI score	Range (minimum to maximum)	Number of samples	Sampling months covered
01 Rawtenstall	6	2-7	12	Sep.'11 to Apr.'13
02 Ewood Bridge	4	2-8	25	Sep.'11 to Dec.13
09 Balls Bend	3	1-5	17	Sep.'11 to Jun.'13
12 Valley Bolton	8	4-13	24	Sep.'11 to Nov.'13
14 River Roch	9	5-14	21	Nov.'11 to Dec.13

Having these baseline datasets gives the Society evidence of the typical water quality of these sites. If we see the invertebrate community wiped out we have records to show that there has been a certain consistent community there and can persuade the Environment Agency to investigate what has happened. On the positive side, increasing scores would show evidence of improving water quality.

Please talk to Mike Duddy at [www.salfordfriendlyanglers.co.uk](http://www.salfordfriendlyanglers.co.uk) if you have contributions.

## ANGLERS' MONITORING INITIATIVE (AMI) SAMPLING

### Invertebrate groups being sampled

The AMI 'kick sample' collects river gravel invertebrates, within specific parameters, in a sampling net and they are identified and counted on the river bank. In the AMI scheme, the invertebrates are identified to a broad group because detailed identification of species takes full-time expert taxonomists. The Environment Agency, for example, identifies collected invertebrates back in the lab using microscopes and a plethora of scientific guides.

The AMI score comes from which groups are present and their abundance. Each group is given equal indicator value and the score is simply calculated by adding the total abundance points across the groups (A means 0-9 individuals and = 1 point; B means 9-99 individuals and = 2 points; etc.).

<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

The Environment Agency requires species-level identification to distinguish low, moderate or high water quality using a system called the BMWP (Biological Monitoring Working Party) score. The approximate range of BMWP scores that different species within each of the AMI groups have is given below.

<u>Invertebrate</u>	<u>Taxa</u>	<u>BMWP Score</u>	<u>Water quality indicated</u>
1. Caddis - Cased	(Trichoptera)	6-10	Moderate/high
2. Caddis - Caseless	(Trichoptera)	5-8	Moderate/high
3. Mayfly	(Ephemeroidea)	10	High
4. Blue Winged Olive	(Ephemeroidea)	10	High
5. Stone clinger	(Heptageniidae)	10	High
6. Olives	(Baetidae)	4	Low/moderate
7. Stoneflies	(Plecoptera)	7-10	Moderate/high
8. Freshwater shrimp	(Gammarus)	6	Moderate

### Additional invertebrate groups sampled

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.

<u>Invertebrate</u>	<u>Taxa</u>	<u>BMWP Score</u>	<u>Water quality indicated</u>
9. Crane-fly	(Tipulidae)	5	Moderate
10. Hog-louse	(Isopoda)	3	Low/moderate
11. Leech	(Hirudinae)	3	Low/moderate
12. Bloodworm	(Chironomidae)	2	Low

## Appendix 1. Invertebrate taxa abundance recorded

A = 0-9; B = 9-99; C = 100-999; D = over 1000

01. Rawtenstall	Average AMI score = 6 (range 2-13) from 12 samples												Dec.'13							
	Sep.'11																			
AMI score	6	6	5	.	.	4	.	7	6	13	5	5	2	.	.	.	.	2	.	5
Caddis - Cased	A	A	A	.	.	A	.	A	A	A	A	.	.	.	.	.	.	.	.	A
Caddis - Caseless	A	A	A	.	.	A	.	A	A	B	.	.	.	.	.	.	.	.	.	.
Mayfly	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Blue Winged Olive	A	A	.	.	.	.	.	A	A	C	A	A	.	.	.	.	.	.	.	.
Stone clinger	A	.	.	.	.	.	.	A	B	B	.	.	.	.	.	.	.	.	.	A
Olives	B	C	B	.	.	B	.	C	B	C	B	B	.	.	.	.	.	B	.	C
Stoneflies	A	.	.	.	.	.	.	B	B	A	A	.	.	.	.	.	.	.	.	.
Freshwater shrimp	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Crane-fly</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Hog-louse</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Leech</i>	.	.	.	.	.	.	.	A	.	.	.	.	.	.	.	.	.	.	.	.
<i>Bloodworm</i>	.	.	.	.	.	.	.	A	A	A	.	.	.	.	.	.	.	.	.	.

02. Ewood Bridge	Average AMI score = 4 range 2-8) from 25 samples																									Dec.'13			
	Sep.'11																												
AMI score	5	4	4	5	3	3	5	5	3	5	.	4	3	3	4	3	3	2	3	4	4	4	4	8	4	5	3	4	4
Caddis - Cased	A	A	A	A	A	A	A	A	B	.	A	B	A	A	A	A	A	A	A	A	A	A	A	B	A	B	A	A	A
Caddis - Caseless	A	A	A	A	.	.	A	A	.	A	.	A	.	.	.	.	.	.	.	.	.	.	.	A	.	.	.	A	
Mayfly	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Blue Winged Olive	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stone clinger	.	.	.	A	.	.	.	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	A	.	.	.	.	A	
Olives	B	B	B	B	B	B	C	C	B	C	.	B	A	B	B	B	B	B	B	B	B	C	B	C	B	B	B	B	B
Stoneflies	A	.	.	.	.	.	.	.	.	.	.	.	.	.	A	.	.	.	.	.	A	.	B	A	.	.	.	.	.
Freshwater shrimp	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	A	.	
<i>Crane-fly</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Hog-louse</i>	A	A	.	.	.	.	.	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Leech</i>	A	A	A	.	.	.	.	A	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	A
<i>Bloodworm</i>	.	.	.	A	A	A	.	.	.	.	.	.	.	.	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**09. Balls Bend**

Average AMI score = 3 (range 1-5) from 17 samples

Sep.'11

Dec.'13

AMI score	3	3	2	.	.	2	4	3	4	5	.	2	3	.	3	2	1	.	4	4	3	3	.	
Caddis - Cased			.	.						A	.		.	A	A	.			A					
Caddis - Caseless	A	A	A	.	.		A	A	A	A	.		A	.	A				A		A			
Mayfly			.	.						.	.								.					.
Blue Winged Olive			.	.						A	.		.						.					.
Stone clinger			.	.	A	A			A	.	.		.						.					.
Olives	B	B	A	.	.	A	B	B	B	B	.	B	B	.	A		A	.	B	B	A	C	.	
Stoneflies			.	.						.	.								.					.
Freshwater shrimp			.	.						.	.				A	.			A	A	A			.
Crane-fly		A	A	.	.					.	.								.					.
Hog-louse	A	A	.	.	A		A	A	A	.	A	.							.	A				.
Leech	A	A	A	.	.	A		A	A	A	.	A	A	.	A				.				A	.
Bloodworm			.	.						A	.		.						.					.

**12. Valley, Bolton**

Average AMI score = 9 (range 5-14) from 21 samples

Sep.'11

Dec.'13

AMI score	6	9	8	.	.	7	7	8	8	11	8	7	8	7	7	6	7	7	6	4	6	9	13	11	7	4	
Caddis - Cased	A	B	A	.	.	A		A	A	A	A	A	A	A	A		A	A					A	A	A		
Caddis - Caseless	A	A	A	.	.		B	A	A	A	A	A	A	A	A	A	A	A	A		A	B	B	A			
Mayfly			.	.																							
Blue Winged Olive			.	.						B	A													C	B	A	
Stone clinger	A	B	B	.	.	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Olives	B	B	B	.	.	B	C	C	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Stoneflies	A	A	.	.			A	A	A	A	A	A											A	A	B	B	B
Freshwater shrimp	A	B	.	.	A			A	A	A		A	A	A		A	A	A					A	A	A		
Crane-fly			.	.																							
Hog-louse			.	.																							
Leech			.	.	A		A	A	A															A	A	A	A
Bloodworm			.	.		A											A			A	A	A	A	A	A	A	

14. River Roch Average AMI score = 8 (range 4-13) from 24 samples

	Sep.'11												Dec.'13															
AMI score	.	.	7	6	.	5	7	9	9	10	9	12	12	8	8	8	.	7	9	8	8	9	10	10	1	3	7	7
Caddis - Cased	.	.	A	.	.	A	.	A	.	A	.	A	A	A	.	.	A	A	A	.	.	A	A	.	.	.	.	.
Caddis - Caseless	.	.	A	A	.	A	A	B	B	A	A	B	B	A	A	A	.	A	B	A	A	A	.	A	A	.	A	A
Mayfly	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Blue Winged Olive	.	.	.	.	.	.	.	.	.	A	B	B	B	.	.	.	.	.	.	.	.	B	C	B	.	.	.	.
Stone clinger	.	.	.	.	.	.	A	A	A	A	B	B	.	A	.	A	A	B	A	A	.	A	.	.	.	A	A	
Olives	.	.	B	B	.	B	C	C	C	C	C	C	C	C	C	C	.	C	C	C	C	C	C	C	C	.	B	B
Stoneflies	.	.	.	.	.	.	.	.	.	.	A	A	A	A	.	.	A	.	.	.	.	.	.	.	.	.	.	.
Freshwater shrimp	.	.	C	C	.	B	B	C	C	C	B	B	B	B	B	B	.	B	B	B	B	B	C	C	.	C	C	C
Crane-fly	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hog-louse	.	.	B	A	.	A	B	B	B	B	B	B	B	A	A	B	.	A	A	A	A	B	B	.	B	B	B	
Leech	.	.	B	.	.	A	A	B	A	A	B	A	A	B	B	B	.	A	A	A	A	A	.	A	A	.	A	A
Bloodworm	.	.	C	.	.	A	A	.	.	.	.	.	.	A	A	.	A	A	A	A	A	.	A	.	.	B	A	

## Appendix 2. Original sampling sites

#	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

**Appendix 3. AMI scores for each site: each month over the course of the survey (mm/yy)**

	9/11	10/11	11/11	12/11	1/12	2/12	3/12	4/12	5/12
01 Rawtenstall	6	6	5			4		7	6
02 Ewood Bridge	5	4	4			3	5	5	3
03 Chatterton	6	6	6						
04 Nuttall Park	4	3	9						
05 Burrs	9	9	8						
06 Warth Fold Gravels	9		4						
07 Springwater Park	13	7	9						
08 Sion St Bridge	6	5	5						
09 Balls Bend	3	3	2			2	4	3	4
10 Agecroft	1	3							
11 Boddingtons Ramp	2	1	3						
12 Valley Bolton	6	9	8			6	7	8	8
13_Roch Bank	5								
14 River Roch	7	6		5	7	9	9		

	6/12	7/12	8/12	9/12	10/12	11/12	12/12	1/13	2/13
01 Rawtenstall	5	5	2					2	
02 Ewood Bridge	5		4	3	3	4	3	3	2
09 Balls Bend	5		2	3		3	2	1	
12 Valley Bolton	11	8	7	8	7	7	5	7	7
14 River Roch	10	9	12	12	8	8			

	3/13	4/13	5/13	6/13	7/13	8/13	9/13	10/13	11/13	12/13
01 Rawtenstall	5									
02 Ewood Bridge	3	4	4	4	8	4	5	3	4	5
09 Balls Bend	4	4	3	3						
12 Valley Bolton		6	4	6	9	13	13	9		6
14 River Roch	10	8	8	9	7	14		6	11	11

#### Appendix 4. AMI scores for each site: average, range, number of samples

Site	Average AMI score	Range (minimum to maximum)	Number of samples
01 Rawtenstall	5	2-13	12
02 Ewood Bridge	4	2-8	25
03 Chatterton	6	(6)	3
04 Nuttall Park	5	3-9	3
05 Burrs	9	8-9	3
06 Warth Fold Gravels	7	4-9	2
07 Springwater Park	10	7-13	3
08 Sion St Bridge	5	5-6	3
09 Balls Bend	3	1-5	17
10 Agecroft	2	1-3	2
11 Boddingtons Ramp	2	1-3	4
12 Valley Bolton	8	4-13	24
13 Roch Bank	5	5-5	1
14 River Roch	9	5-14	21