Arkengarthdale NFM

BioBlitz

BioBlitz Report

Yorkshire Dales Rivers Trust

Unit 8 Kings Court,
High street,
Pateley Bridge,
HG3 5AP

www.yorkshiredalesriverstrust.com

Yorkshire Dales Rivers Trust is a registered in England as a company limited by guarantee No 5220147 and as Charity No 1107918

Report Overview

On the 16th June, Yorkshire Dale Rivers Trust (YDR) hosted a BioBlitz on the Arkle Beck as part of the Arkengarthdale Natural Flood Management (NFM) project. The day formed part of a wider BioBlitz being carried out by the cluster of landowners that we are working with this year to deliver NFM in the catchment. YDRT staff and volunteers participated in three activities throughout the day to assess the wildlife and health of the beck.

The activities included invertebrate surveys, electrofishing and macrophyte surveys. Results from the day will be used to establish a baseline dataset that can form the basis of work being carried out in the catchment to achieve the landholders aims to renature the landscape.

Picture 1. BioBlitz volunteer day, introductions, and overview of project by landowner.

Location

Picture 2. Map of landowner cluster area in relation to Reeth, North Yorkshire.

Picture 3. Map of fish survey sections

Invertebrate Survey Results

The Standard Riverfly surveying technique was adopted for this exercise. This consists of a three-minute kick sample with a hand net followed by a one minute hand search (Picture 4 and 5).

Within the survey site, Four Riverfly records were obtained from Arkle Beck, these were combined and averaged across the survey site (Table 1).

Table 1. Riverfly results from Arkle Beck

Riverfly Group		Score	Number
Caddisflies	Cased caddis	1	2
	Caseless caddis	1	5
Up-wing flies	Mayfly	0	0
	Blue winged olive	2	20
	Flat-bodied stone clinger	2	35
	Olives	2	75
Stoneflies	Stoneflies	1	4
Freshwater shrimp	Freshwater shrimp	0	0

This gives an overall Riverfly score of 9.

The overall assessment is that diversity is good but numbers are not high. If sites had more organic matter, shrimp may have been found and more caddis. There may also be small pockets of large mayfly (Ephemeridae) where there is a suitable substrate. Blue winged olive (*Serratella ignita*) is one of the few which we could definitively identify to species level. They were quite immature, probably requiring another month or so to hatch into adults. Another nymph which is easy to ID to species level is a Heptageniidae, the olive upright (*Rhithrogena semicolorata*). Mature nymphs were in good numbers and it was pleasing to capture some aerborne duns and spinners. Olives (Baetidae) were the most abundant group, with a few different species which would require further work to identify. Stonefly nymphs were low in number, surprisingly, given that there were plenty of adults. These seemed to be mainly Chloroperlidae, known to anglers as yellow sally.

Picture 4. Volunteers kick sampling for invertebrates in Arkle Beck

Picture 5. Volunteers identifying invertebrates from kick sample obtained from Arkle Beck

Fish Survey Results

Fish surveys were carried out by the Wild Trout Trust with the support of volunteers (Picture 6). The Electric fishing methodology was just a single run within 5 separate sections along Arkle Beck. Abundance of species and length distribution were recorded of the fish captured during the survey.

Table 2. Fish survey site locations

Site	Downstream Grid Reference	Upstream Grid Reference	Location
1	NZ 02816 00780	NZ 02780 00810	Downstream
2	NZ 02768 00828	NZ 02759 00918	Downstream
3	NZ 02753 00978	NZ 02738 01020	Downstream
4	NZ 02771 01026	NZ 02796 01065	Downstream
5	NZ 02792 01092	NZ 02747 01137	Downstream

Picture 6. Wild Trout Trust and volunteers carrying out fishing surveys in Arkle Beck

There were three fish species (bullhead, brown trout and stone loach) captured along the survey sections in Arkel Beck (Table 3). Bullhead were the most abundant species captured, with lower numbers of brown trout found at all of the five sites. Stone loach were found in lower numbers and only at two of the five survey sections.

Table 3. Fish species count at each site

Site	Species Count (Number)		
	Brown Trout	Bullhead	Stone Loach
1	3	32	3
2	8	14	0
3	2	12	0
4	1	12	0
5	7	14	1

Brown trout length distribution indicated a range of age classes, which suggests recruitment within Arkle Beck (Figure1). There were higher number of younger brown trout in comparison to older trout. This could be an indicator of the habitat availability within the survey sections with limited larger pools for larger trout to live within. Scale ageing analysis would be able to confirm age classifications but from the data available it is estimated that there are brown trout up to the age of four living within the sections surveyed.

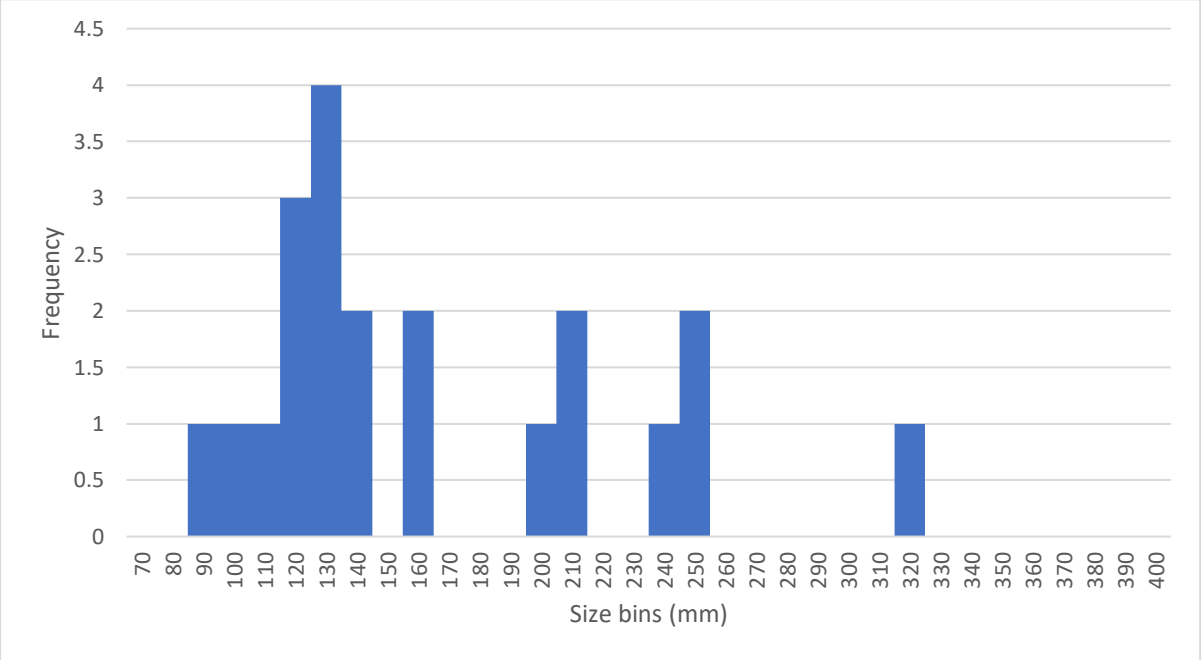

Figure 1. Brown trout length distribution from all survey sites sampled on Arkle Beck, June 2021.

Macrophyte Survey Results

Aquatic plant (macrophyte) communities were surveyed along one 100 m stretch of river (U/S NGR NZ0278601030 to D/S NGR NZ0275900885) according to the standard LEAFPACS2 survey methodology UKTAG LAKE ASSESSMENT METHOD (wfduk.org). This involved wading the length of the survey section, zigzagging across the channel and searching all instream habitats present, recording all plant species visible to the naked eye within the area of channel judged to be wetted ~95% of the time. Abundance of taxa along the stretch was recorded using a 9 point scale (Table 4).

Table 4. Macrophyte survey method cover values

Percentage cover range (% of channel area)	Taxon Cover Value
<0.1%	1
0.1 – 1%	2
1 – 2.5%	3
2.5 – 5%	4
5 – 10%	5
10 – 25%	6
25 – 50%	7
50 – 75%	8
>75%	9

Table 5. Macrophyte survey data

	Taxa	Common name	Cover value
Algae	Blue-green algal pelt		4
	Lemanea fluviatilis	Red alga	2
	Batrachospermum spp.	Red alga	1
	Filamentous Green Algae		1
	Crustose lichens		1
Bryophytes	*Hygrohypnum luridum*	Drab Brook-moss	2
	Platyhypnidium riparioides	Long-beaked water feather-moss	2
	Brachythecium plumosum	Rusty feather-moss	1
	Calliergonella cuspidata	Pointed spear-moss	1
	Cinclidotus fontinaloides	Smaller lattice-moss	1

	Conocephalum conicum	Great scented liverwort	1
	Fissidens sp.	Pocket-moss	1
	Fontinalis antipyretica	Greater water-moss	1
	Hygroamblystegium fluviatile	Brook-side feather-moss	1
	Leafy liverwort sp.		1
	Marchantia polymorpha	Common liverwort	1
	Mnium hornum	Swan's-neck thyme-moss	1
	Pellia epiphylla	Overleaf Pellia (Liverwort)	1
	Plagiomnium undulatum	Hart's-tongue thyme-moss	1
	Racomitrium aciculare	Yellow fringe-moss	1
	Scapania undulata	Water earwort (Leafy liverwort)	1
	Schistidium rivulare	River Grimmia (Moss)	1
Higher plants	*Agrostis stolonifera*	Creeping bent	1
	Alnus glutinosa	Alder	1
	Ranunculus repens	Creeping buttercup	1
	Rorippa sp.	Small cress	1

The macrophyte community was found to be dominated by lower plants (algae and bryophytes), reflecting the shaded, upland nature of the reach. The community was relatively diverse for this river/community type, with 26 taxa recorded over the 100 m reach. Total cover of macrophytes was estimated to be approximately 5% of the channel. Cover of blue green algae growing in pelts across the substrate was higher than expected, estimated as covering 2.5 -5% of the substrate along the reach. Otherwise, the instream habitat was dominated by three species; Long-beaked water feather-moss, Drab brook-moss, and the red algae *Lemanea fluviatilis,* which were all present at between 0.1 – 1% cover of the channel.

The relative sparsity of plant cover in the channel is as expected for an upland river with a mobile substrates and probably reflects both the flashy nature of the river with mobile substrate types (predominantly cobble, pebble and gravel) and the level of shading along the reach (20% dense shade and 30% broken shade was recorded along the channel from both banks).

Acknowledgements

Thank you to Dr Jonathan Grey from the Wild Trout Trust, who led the electrofishing activity. And thank you to all the volunteers who attended the Bioblitz event. Thank you to the landowners Martin, Liz and Andrew for their support.