

THE CURRENT STATUS OF
HEPTAGENIA LONGICAUDA (STEPHENS, 1835)
(EPHEMEROPTERA: HEPTAGENIIDAE)

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Heptagenia longicauda (Stephens, 1835) is a priority species in the UK Biodiversity Action Plan which was last recorded in Britain in 1933. Despite searches at previously recorded locations during 1958, there have been no further confirmed records of this species. There are a number of records that purport to be *H. longicauda* (Table 3); however where a voucher specimen is available these records are in fact misidentifications. This species is clearly rare, if not extinct. However, due to difficulties with the identification of *Heptagenia* nymphs using the current British key (Elliott, Humpesch & Macan, 1988) it is suggested that *H. longicauda* may be surviving overlooked in some watercourses (Macadam, 2003).

The Ephemeroptera Recording Scheme has records of *Heptagenia sulphurea* (Müller, 1776) from several sites in the catchments of the River Thames and River Wey. Due to the possibility of mis-identification of *Heptagenia longicauda* when using the current larval key, these records of *H. sulphurea* may relate to an unknown population of *H. longicauda*.

METHODS

During April 2004 visits were made to watercourses in the London area (Table 1a). Following these surveys, and after discussions with European colleagues and the Environment Agency, the following criteria were used to select sites for future surveys:

- 1) they should be within the Environment Agency Thames Region – all historical records have been from watercourses within the catchment of the River Thames.
- 2) the slope of the watercourse should be less than 1 metre/kilometre. In Europe, *Heptagenia longicauda* is found in the lower reaches of rivers, where the flow is slower.
- 3) Heptageniidae have been recorded from the location in recent surveys.

Using these criteria, an analysis of the results of the 1995 National River Quality survey for England and Wales produced five sites that appeared suitable for *Heptagenia longicauda* (Table 1b). The Environment Agency does not hold voucher specimens for the Heptageniidae collected at these sites, and there were no plans to re-survey these sites in the immediate future. The sites were therefore visited during May 2005 to investigate the Ephemeropteran fauna.

Samples of the Ephemeropteran fauna were collected by kick sampling using a standard pond net and by hand-examination of aquatic vegetation and submerged stones. These samples were sorted on site and the Ephemeroptera present preserved and retained for identification. The remaining invertebrates were returned to the watercourse. The identification of *Heptagenia* species collected was confirmed using European keys and voucher specimens.

TABLE 1a – SITES VISITED IN APRIL 2004 (NGR = Nat. Grid. Ref.)

Date	Site	NGR	Surveyed?
05/04/2004	River Lee at Waterend	TL204138	Yes
05/04/2004	River Mimram at Tewin Bury Farm	TL266140	Yes
05/04/2004	River Beane at Hertford (North) Station	TL317130	No
05/04/2004	River Lee at Amwell Magna Fishery	TL380127	Yes
06/04/2004	River Wey at Elstead	SU905437	Yes
06/04/2004	River Wey downstream of Tilford	SU883437	Yes
06/04/2004	River Wey (South) at Pierre Point Farm	SU858421	Yes
06/04/2004	River Wey (North) at Sheephatch Lane	SU868444	Yes
07/04/2004	Holy Brook at Reading	SU683715	Yes
07/04/2004	River Kennett at Reading	SU674707	No
07/04/2004	River Kennett at Theale	SU649707	No
08/04/2004	Wraysbury River at Hythe End	TQ027725	Yes
08/04/2004	Colne Brook at Wraysbury	TQ016742	Yes
08/04/2004	River Colne at Staines Moor	TQ032726	Yes

TABLE 1b – SITES VISITED IN MAY 2005

Date	Site	NGR	Surveyed?
08/05/2005	River Wey at Eashing	SU946438	Yes
11/05/2005	Blackwater at Swallowfield	SU731648	Yes
11/05/2005	Whitewater at Heckfield	SU739602	Yes
11/05/2005	River Thames at Sonning	SU753756	Yes
11/05/2005	Holy Brook above Kennett	SU720735	No

RESULTS

A total of 12 Ephemeroptera species were recorded during these surveys. Details of the sites at which they were found, together with their relative numbers are given in Table 2. It should be noted that sites that were visited but not surveyed have been omitted from this table. Similarly, the visits to the River Lee at Waterend and the River Mimram at Tewin Bury Farm are omitted as the landowners requested that no specimens be collected. In both cases no Heptageniidae were present.

Heptageniidae were absent from all samples collected in Hertfordshire. This is peculiar, as several sites visited would appear to be suitable for this family. The local Environment Agency office confirmed that Heptageniidae are scarce in Hertfordshire, with only the River Chess supporting a population. The reason for this restricted distribution is unclear; however, gravel extraction around London in the 1920s has altered the aquatic environment, particularly in the Hertford and Staines areas. Similarly, the growth of urban areas such as London and Reading has resulted in degradation of aquatic habitats through the diversion and straightening of watercourses and, in many cases, the total loss of habitat through culverting. The course of the River Chess appears to skirt around urban areas rather than flowing through them, which, along with the absence of any major gravel excavation schemes in the catchment, may explain the survival of a heptageniid population. Subsequent examination by the author of specimens collected from the River Chess by the

TABLE 2 – DETAILS OF SPECIES FOUND AT EACH SITE.

Site	<i>Alainites muticus</i>	<i>Baetis buceratus</i>	<i>Baetis scambus/fuscatus</i>	<i>Baetis rhodani</i>	<i>Baetis vernus</i>	<i>Caenis luctuosa/macrura</i>	<i>Caenis rivulorum</i>	<i>Centroptilum luteolum</i>	<i>Ephemera danica</i>	<i>Heptagenia sulphurea</i>	<i>Paraleptophlebia submarginata</i>	<i>Serratella ignita</i>
Blackwater at Swallowfield		5	1		3	1			1	1		
Colne Brook at Wraysbury	2	4				4		2	4			1
Holy Brook at Reading		1		3					1	14		
River Colne at Staines Moor	2	2		3		3						
River Lee at Amwell Magna Fishery				5		2			1		1	
River Thames at Sonning						9			1			
River Wey (North) at Sheephatch Lane		2		5					3			
River Wey (South) at Pierre Point Farm				15						23	17	
River Wey at Eashing			1	1	1				2	13		7
River Wey at Elstead	7						3		1	5	1	
River Wey downstream of Tilford				14			6		2	37	7	
Whitewater at Heckfield			5		1	5		1	1	2		
Wraysbury River at Hythe End	2								2			

Environment Agency established that this is a population of *Heptagenia sulphurea*.

Heptageniidae were found in the River Wey at Eashing, the Whitewater at Heckfield, the Holy Brook at Reading and the Blackwater at Swallowfield, but these were subsequently identified as *Heptagenia sulphurea*. Of the five locations visited, the Blackwater at Swallowfield appears the most suitable, although water quality may be a problem here, as there was a faint smell of sewage effluent from this watercourse.

Although these surveys did not produce any specimens of *H. longicauda*, the possibility remains that it is surviving overlooked in some watercourses. It is therefore recommended that all larval Heptageniidae collected in the EA Thames Region should be identified to species. To ensure the correct separation of *H. longicauda* and *H. sulphurea* the couplets contained in Macadam (2003) should be used in conjunction with the current Freshwater Biological Association key to Ephemeroptera larvae (Elliott, *et al.*, 1988) to confirm any identification.

This will not only ensure that any populations of *H. longicauda* are identified, but will also reveal any populations of *Kageronia fuscogrisea* (Retzius, 1783), another scarce Ephemeroptera species known from the Thames catchment.

TABLE 3. — KNOWN RECORDS OF *HEPTAGENIA LONGICAUDA* (STEPHENS, 1835) FROM THE BRITISH ISLES.

Date	Collector	Determiner	Locality	NGR	Voucher	Stage	Gender	Species
June <1835 1868	J.F. Stephens A.E. Eaton	J.F. Stephens A. E. Eaton	Near Hertford, Kennet and Holybrook, Reading		NHM NHM	Adult Adult	? ?	<i>Heptagenia longicauda</i> <i>Heptagenia longicauda</i>
12/06/1886	J.J.F.X. King	J.J.F.X. King	Loch Lubnaig/Loch Voil, Balquhider		LoFG	Adult	Male	<i>Ecdyonurus venosus</i>
19/06/1886	J.J.F.X. King	J.J.F.X. King	Mouse Water, Cleghorn (nr. Lanark)		LoFG	Adult	Female	prob. <i>Ecdyonurus venosus</i>
19/06/1886	J.J.F.X. King	J.J.F.X. King	Mouse Water, Cleghorn (nr. Lanark)		LoFG	Adult	Female	prob. <i>Ecdyonurus venosus</i>
19/06/1886	J.J.F.X. King	J.J.F.X. King	Ministers Burn, Carlisle Strathglass, Inverness-shire		LoFG NMGW	Adult Adult	Female Female	prob. <i>Ecdyonurus venosus</i> poss. <i>Rithrogena semicolorata</i>
June 1899	C.A. Briggs	C.A. Briggs	River Thames at Staines		NHM	Adult	Female	<i>Heptagenia longicauda</i>
19/05/1904	E.E. Austen	E.E. Austen	River Wey, Tilford/Elstead, Surrey		NHM	Adult	Male	<i>Heptagenia longicauda</i>
28/05/1933	D.E. Kinnmins	D.E. Kinnmins	River Spey at Speybridge		None	Adult	Male	poss. <i>Heptagenia sulphurea</i>
12/06/1982	W.A. Ely	W.A. Ely	Downholme Park, Yorkshire		None	Adult	Male	poss. <i>Heptagenia sulphurea</i>
25/07/1987	W.A. Ely	W.A. Ely	River Irthing at Wileysike		None	Nymph	N/A	prob. <i>Heptagenia sulphurea</i>
28/04/1999	Ray Prigg	David Scott	Whitendale River at Brennand River		None	Nymph	N/A	prob. <i>Heptagenia sulphurea</i>
05/05/1999	Helen Hamilton	APEM Ltd.	Whitendale River at Brennand River		None	Nymph	N/A	prob. <i>Heptagenia sulphurea</i>
03/05/2000	Helen Hamilton	APEM Ltd.	Whitendale River at Brennand River	SD653532	None	Nymph	N/A	prob. <i>Heptagenia sulphurea</i>

Notes:

NHM = Natural History Museum; LoFG = Zoology Museum, University of Glasgow; NMGW = National Museums and Galleries of Wales.

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BIOLOGIST — The latest issue of this Journal of the Institute of Biology (Vol. 53, No. 2, April 2006) includes entomological articles on: 'vital pollinators: honey bees in apple orchards' (A.G.S. Cuthbertson & M.A. Brown; pp. 78–81) and 'fleas, lice, bed bugs, centipedes and Liberkühns [reflectors]' (David Jones; pp. 96–98).