



## **Trichoptera from the Great Falls and Turkey Run units of the George Washington Memorial Parkway, Fairfax Co., Virginia, USA**

OLIVER S. FLINT, JR.

*Department of Entomology, National Museum of Natural History, Washington, DC 20013-7012 USA*  
*E-mail: FLINTO@si.edu*

### **Abstract**

A 3-year effort to collect and identify caddisflies (Trichoptera) along 2 sections of the Potomac River was undertaken at the request of the National Park Service. A variety of techniques including Malaise traps, light traps, and hand netting resulted in the collection of 105 species belonging to 17 families and 38 genera. Fifty-seven species or 54% were deemed rare, 20 species or 19% were common and 28 species or 27% were abundant. Comments are made on 7 species of special interest. An addendum lists 6 additional species collected during the 4th year's survey.

**Key words:** Trichoptera, caddisflies, Great Falls, Turkey Run

### **Introduction**

In 2005 the park naturalist, Brent W. Steury of the George Washington Memorial Parkway, National Park Service, approached the entomologists at the National Museum of Natural History with a proposal to provide funding for a 3-year survey of various insect groups at certain sections of the Parkway. Five of us agreed to survey for our research groups along 2 sections of the Parkway, viz. Great Falls (GF) and Turkey Run (TR).

The Parkway lies on the southwestern rim of the Potomac River in northern Virginia and runs for 25 miles (40 km) between the Beltway (the highway that encircles Washington at a radius of about 16 km) at the western end and Mt. Vernon, George Washington's home, at the southern end. Four and a half air miles (7.2 km) beyond the western end of the Parkway lies Great Falls Park, also administered by the same agency. The Parkway follows a sharp escarpment, known as the Palisades, along the southern side of the river west from Washington, with Great Falls and the Mather Gorge just downriver, marking the western end of the canyon the river has cut through the bedrock.

### **Methods and materials**

Collections were made using a variety of methods: Malaise traps, light traps, ultraviolet light at a sheet, and hand netting. Specimens taken in the Malaise traps went directly into alcohol, but those collected by the other methods were killed dry with "excess" numbers being put into alcohol.

Three Townes-style Malaise traps (Townes 1962) were operated at each park unit, for 2006 only from May 4 until November 9, but for longer periods in 2007 (13 March–28 November), and 2008

(13 March–17 November). Two of the traps at Turkey Run were placed at, or close to (and twice inundated during floods) the riverside each year. The 3rd trap was placed, for 2 years, at the edge of the forest far from the river, but it still collected caddis. This trap on the 3rd year was moved close to the river and placed directly over a small, first order streamlet. Two of the Great Falls traps at were placed in the “Swamp” for the first 2 years, one where the soil was wet or rarely flooded, the other at a drier situation. One of these was moved the last year to where the soil was even wetter or rarely shallowly flooded. The 2nd swamp trap was moved the last year and placed over the small stream that drains the swamp near the “Quarry” site. The 3rd trap was operated at the edge of the “Quarry” all years, and placed under small trees, at the edge of an open field.

In addition to the Malaise traps, battery operated Universal Black Light Traps (BioQuip #2851) were set at various sites, 17 times each at TR and at GF. Hand net collections were made at both areas, 19 times at TR and 20 times at GF. One collection was made at TR with a UV illuminated sheet and hand picking, while 5 such collections were made at GF. Individuals of interest were selected and pinned while fresh from these collections, with excess numbers then placed into alcohol.

Identifications were made later in the laboratory using standard references. In case of doubt, genitalia would be cleared in warm KOH and then stored with the specimen. Generally all examples were sexed, counted and records kept electronically. On some occasions when large numbers of a common species were taken, an estimate only was made of the numbers. No attempt was made to identify females of the *Hydropsyche scalaris* group, as their specific identification is not readily possible.

## Results

After 3 years work we had records for 105 species. In comparison, 358 species are known from Virginia (Flint, Hoffman & Parker 2004, 2008, 2009): the Park’s fauna is thus slightly over 29% of the whole state fauna. These are placed in 16 families and 38 genera. Great Falls contained 95 species and Turkey Run 76, with 66 species known from both sites.

These results may be compared with those of a 2-day “Bioblitz” of the same area in June of 2006 which resulted in 42 species of caddisflies, 1 of which, *Oecetis ditissa*, was taken in the “Bioblitz” but not recovered in our large survey (Evans 2008).

An attempt was made to determine relative abundance of the various species. Three categories were established: rare=up to 5 specimens/site/year, common=up to 25 specimens/site/year, and abundant=more than 25. On these criteria, 57 species or 54% were deemed rare, 20 species or 19% were common and 28 species or 27% were abundant.

There are a number of records of special interest when considering the fauna of Virginia. The first verified Virginian examples of *Ceraclea resurgens* (Walker) were taken at both GF and TR in May of 2007. Only the 2nd state records of *Ceraclea uvalo* Ross and *Setodes guttatus* (Banks) were made at GF. Several species of *Polycentropus* were of considerable interest. A thriving colony of *P. carlsoni* Morse, the first known in the state, was found at TR in a small, lateral stream that often dries in summer, and a single, distinctive female of an unknown species of *Polycentropus* was taken at GF. *Neophylax mitchelli* Carpenter was found at the same small stream as *P. carlsoni*. This species is common at high elevations in the western part of the state, but otherwise unknown in the lower Piedmont. Finally, an undescribed species of *Neophylax* was common in the river here. It is also known from several other larger rivers in the lower Piedmont of Virginia.

In Table 1, the families, genera, and species are arranged alphabetically. For each species, the number of examples taken are given for each year and each site. After the species name is shown the range of months the species was taken and whether it is classified as rare (R), common (C), or abundant (A).

**TABLE 1.** List of species, flight periods and number of examples found in Townes traps at Turkey Run and Great Falls in 2006–2008.

	Time of Year		Turkey Run			Great Falls		
			2006	2007	2008	2006	2007	2008
<b>Brachycentridae</b>								
<i>Brachycentrus nigrosoma</i> (Banks)	March-May	A	0	197	268	0	30	52
<i>Micrasema rusticum</i> (Hagen)	May	R	0	1	0	0	0	0
<i>Micrasema wataga</i> Ross	May	R	0	1	0	0	1	0
<b>Dipseudopsidae</b>								
<i>Phylocentropus lucidus</i> (Hagen)	May-Sept	C	0	0	0	0	7	121
<i>Phylocentropus placidus</i> (Banks)	April-Oct	R	0	0	3	0	3	23
<b>Glossosomatidae</b>								
<i>Glossosoma nigrior</i> Banks	June-July	R	0	0	0	0	1	1
<i>Protoptila georgiana</i> Denning	May-Oct	A	34	122	8	1	1	0
<i>Protoptila palina</i> Ross	May-Oct	A	51	274	27	1	110	6
<b>Helicopsychidae</b>								
<i>Helicopsyche borealis</i> (Hagen)	May-Oct	A	261	240	120	1	2	60
<b>Hydropsychidae</b>								
<i>Cheumatopsyche analis</i> (Banks)	April-Oct	C	9	7	2	1	27	19
<i>Cheumatopsyche campyla</i> Ross	April-July	C	4	48	0	3	1	1
<i>Cheumatopsyche ela</i> Denning	March-Oct	A	445	134	183	4	183	224
<i>Cheumatopsyche geora</i> Denning	July	R	0	0	0	0	0	1
<i>Cheumatopsyche minuscula</i> (Banks)	April-Oct	A	581	381	56	3	262	148
<i>Cheumatopsyche pinaca</i> Ross	April-May	R	0	0	0	0	2	0
<i>Cheumatopsyche sordida</i> (Hagen)	June	R	0	0	0	0	1	0
<i>Diplectrone modesta</i> Banks	April-Sept	C	3	5	18	4	61	42
<i>Hydropsyche betteni</i> Ross	May-July	C	1	0	2	0	23	28
<i>Hydropsyche bronta</i> Ross	June-July	C	0	1	0	0	32	0
<i>Hydropsyche brunneipennis</i> Flint & Butler	May-Oct	C	123	9	4	0	5	2
<i>Hydropsyche dicantha</i> Ross	May-June	R	0	0	0	0	0	1
<i>Hydropsyche hageni</i> Banks	April-Oct	A	316	29	12	6	51	22
<i>Hydropsyche hoffmani</i> Ross	April-Oct	C	9	6	9	5	22	14
<i>Hydropsyche leonardi</i> Ross	April-Oct	A	46	172	23	0	125	100

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**TABLE 1** (continued)

	Time of Year		Turkey Run			Great Falls		
			2006	2007	2008	2006	2007	2008
<i>Hydropsyche ophthalmica</i> Flint	June	R	0	0	0	0	1	0
<i>Hydropsyche phalerata</i> Hagen	April-Oct	A	298	175	62	1	123	66
<i>Hydropsyche scalaris</i> Hagen	May-Oct	C	17	7	7	0	1	3
<i>Hydropsyche sparna</i> Ross	April-July	C	1	0	0	0	60	10
<i>Macrostemum zebratum</i> (Hagen)	May-Oct	A	540	198	181	0	2	2
<b>Hydroptilidae</b>								
<i>Hydroptila armata</i> Ross	April-Oct	C	0	0	30	0	2	1
<i>Hydroptila consimilis</i> Morton	June-July	R	0	5	0	0	5	0
<i>Hydroptila delineata</i> Morton	May-June	R	0	0	0	0	0	3
<i>Hydroptila gunda</i> Milne	June-July	R	0	0	0	0	4	0
<i>Hydroptila perdita</i> Morton	April-Oct	C	11	6	19	0	6	1
<i>Hydroptila spatulata</i> Ross	April-Nov	A	228	191	94	0	288	48
<i>Hydroptila waubesiana</i> Betten	April-July	R	0	1	8	0	1	2
<i>Mayatrichia ayama</i> Mosely	Aug-Oct	C	0	1	1	0	34	0
<i>Ochrotrichia tarsalis</i> (Hagen)	May-Oct	A	19	102	10	0	72	4
<i>Orthotrichia aegerfasciella</i> (Chambers)	May-Aug	C	6	11	0	0	24	0
<i>Oxyethira grisea</i> Betten	May	R	0	0	0	0	1	1
<i>Oxyethira pallida</i> (Banks)	July-Aug	R	0	5	0	0	22	1
<b>Lepidostomatidae</b>								
<i>Lepidostoma sommermanae</i> Ross	May-Oct	R	0	0	1	0	2	3
<i>Lepidostoma togatum</i> (Hagen)	April-Oct	A	208	21	45	0	13	8
<i>Lepidostoma vernalis</i> (Banks)	April-May	R	0	1	2	0	6	1
<b>Leptoceridae</b>								
<i>Ceraclea ancyla</i> (Vorhies)	June	R	0	0	0	0	0	1
<i>Ceraclea cancellata</i> (Betten)	June-July	R	0	0	0	0	10	1
<i>Ceraclea enodis</i> Whitlock & Morse	June-Aug	R	0	1	0	0	7	0
<i>Ceraclea flava</i> (Banks)	May-July	R	2	8	0	0	20	0
<i>Ceraclea maculata</i> (Banks)	June-Sept	C	0	7	0	0	63	0
<i>Ceraclea punctata</i> (Banks)	July-Sept	R	0	0	1	0	0	2
<i>Ceraclea resurgens</i> (Walker)	May	R	0	3	0	0	22	0
<i>Ceraclea slossonae</i> (Banks)	June-Aug	C	10	1	1	0	104	1
<i>Ceraclea tarsipunctata</i> (Vorhies)	May-June	R	8	1	0	0	9	1
<i>Ceraclea transversa</i> (Hagen)	June-Oct	C	0	3	0	0	34	0
<i>Ceraclea uvalo</i> (Ross)	June	R	0	0	0	0	1	0

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**TABLE 1** (continued)

	Time of Year		Turkey Run			Great Falls		
			2006	2007	2008	2006	2007	2008
<i>Mystacides sepulchralis</i> (Walker)	May-June	R	5	0	0	0	0	0
<i>Nectopsyche candida</i> (Hagen)	June	R	0	0	0	0	3	0
<i>Nectopsyche exquisita</i> (Walker)	May-Aug	C	9	2	0	0	20	1
<i>Nectopsyche pavida</i> (Hagen)	June	R	3	0	0	0	1	0
<i>Oecetis avara</i> (Banks)	May-Oct	A	305	270	42	1	309	145
<i>Oecetis cinerascens</i> (Hagen)	May-July	R	0	1	0	0	1	14
<i>Oecetis inconspicua</i> (Walker)	May-Oct	A	259	255	60	3	269	114
<i>Oecetis nocturna</i> Ross	July	R	0	0	0	0	1	0
<i>Oecetis persimilis</i> (Banks)	May-Oct	A	229	166	12	1	23	75
<i>Setodes guttatus</i> (Banks)	June	R	0	0	0	0	0	2
<i>Setodes incertus</i> (Walker)	May	R	4	0	0	0	0	0
<i>Triaenodes flavescens</i> Banks	May-July	A	65	41	3	0	114	66
<i>Triaenodes ignitus</i> (Walker)	May-June	R	0	0	0	0	3	4
<i>Triaenodes injustus</i> (Hagen)	May-Oct	A	36	40	4	0	140	84
<i>Triaenodes pernus</i> Ross	May-July	R	2	0	0	0	4	0
<i>Triaenodes tardus</i> Milne	May	R	0	0	0	0	1	0
<b>Limnephilidae</b>								
<i>Ironoquia punctatissima</i> (Walker)	Sept-Nov	R	0	1	2	0	11	4
<i>Pycnopsyche gentilis</i> McLachlan	Oct-Nov	R	0	0	0	0	1	6
<i>Pycnopsyche scabripennis</i> (Rambur)	July-Aug	R	0	0	0	0	0	1
<i>Pycnopsyche subfasciata</i> (Say)	Oct-Nov	R	1	0	22	0	0	0
<b>Molannidae</b>								
<i>Molanna blenda</i> Sibley	May-Oct	R	0	0	0	0	5	19
<i>Molanna ulmerina</i> Navas	May-Sept	R	1	0	1	0	2	1
<b>Odontoceridae</b>								
<i>Psilotreta frontalis</i> Banks	May-June	R	0	0	0	0	4	4
<b>Philopotamidae</b>								
<i>Chimarra aterrima</i> Hagen	April-Oct	A	370	43	57	33	191	91
<i>Chimarra obscura</i> (Walker)	May-Nov	A	11	44	45	2	483	15
<i>Chimarra socia</i> Hagen	May-Nov	A	13	171	70	2	276	67
<i>Dolophilodes distinctus</i> (Walker)	March-Oct	A	55	86	157	12	107	68
<i>Wormaldia moesta</i> (Banks)	March-Nov	A	2	1	405	1	5	69
<b>Phryganeidae</b>								
<i>Ptilostomis ocellifera</i> (Walker)	June-Aug	R	0	0	0	2	3	10

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**TABLE 1** (continued)

	Time of Year		Turkey Run			Great Falls		
			2006	2007	2008	2006	2007	2008
<i>Ptilostomis postica</i> (Walker)	August	R	0	0	0	0	0	1
<i>Phryganea sayi</i> Milne	June-Sept	R	0	0	1	0	2	2
<b>Polycentropodidae</b>								
<i>Cyrnellus fraternus</i> (Banks)	May-Sept	A	33	77	9	0	131	51
<i>Neureclipsis crepuscularis</i> (Walker)	April-Nov	A	230	286	143	2	40	2
<i>Nyctiophylax affinis</i> (Banks)	May-July	R	0	0	0	0	0	12
<i>Polycentropus blicklei</i> Ross & Yamamoto	May-June	R	0	0	2	0	0	0
<i>Polycentropus carlsoni</i> Morse	May-Oct	A	0	6	207	2	1	0
<i>Polycentropus carolinensis</i> Banks	May-Oct	R	1	0	0	0	1	0
<i>Polycentropus cinereus</i> Hagen	May-Nov	A	291	181	177	24	57	32
<i>Polycentropus confusus</i> Hagen	May-June	R	0	0	0	0	1	3
<i>Polycentropus sp.</i> [diferent from all above]	June	R	0	0	0	0	1	0
<b>Psychomyiidae</b>								
<i>Lype diversa</i> (Banks)	April-Aug	R	0	0	0	1	5	17
<b>Rhyacophilidae</b>								
<i>Rhyacophila carolina</i> Banks	April-Nov	C	2	3	126	0	1	12
<i>Rhyacophila glaberrima</i> Ulmer	Aug-Nov	R	0	1	13	0	0	0
<i>Rhyacophila invaria</i> (Walker)	April-June	C	0	0	104	0	0	0
<i>Rhyacophila ledra</i> Ross	May-July	R	0	0	0	0	1	19
<b>Uenoidae</b>								
<i>Neophylax concinnus</i> McLachlan	Sept-Nov	R	0	0	1	0	1	6
<i>Neophylax fuscus</i> Banks	Sept-Oct	R	0	1	0	0	0	0
<i>Neophylax mitchelli</i> Carpenter	Oct-Nov	R	1	0	1	0	0	0
<i>Neophylax oligius</i> Ross	Sept-Oct	R	0	1	0	0	0	0
<i>Neophylax n.sp.</i>	Sept-Nov	A	64	42	227	4	0	0

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## Addendum

Since the meetings in Poland, the 6 Malaise traps have been in operation through July 2009, most at or near the usual sites, and light trap collections made. However 1 Malaise trap was moved from Swamp Run to Mine Run, at GF. This trap has collected 2 more species new to the park: *Nyctiophylax denningi* Morse and *Polycentropus elarus* Ross. An additional 4 species have been taken either in the Malaise traps or in the light traps: *Hydropsyche slossonae* Banks, *Hydroptila hamata* Morton and *Ithytrichia clavata* Morton at TR, and *Limnephilus submonilifer* at both GF and TR. Thus the total number of species now stands at 111 for the park, 98 from GF and 80 from TR with 67 taken at both sites.