

Wyre Forest Study Group

THE LAND OR TERRESTRIAL CADDIS (*Enoicyla pusilla*) AND WYRE FOREST

Harry Green and Brett Westwood

The Land Caddis was first discovered in Britain by John Edward Fletcher in 1858 and his discovery was confirmed and reported by Robert McLachlan, doyen of Victorian European Trichopterists. The species has a widespread but discontinuous distribution throughout much of Europe. It, and two other European species, are unique amongst caddis-flies because the larvae are wholly terrestrial, living amongst leaf litter, and female Land Caddis are flightless.



Male Land Caddis (*Enoicyla pusilla*) Harry Green

We (Green and Westwood 2005 referred to as ‘our review article’ in this paper) have recently reviewed the current status of Land Caddis in Britain showing that it apparently occurs only in west Worcestershire and small parts of adjacent counties. It is found throughout the Wyre Forest. Modern interest in Land Caddis was triggered by Norman Hickin and it is worth quoting from his books on the subject. In 1965 he wrote in his autobiographical book *Wyre Forest Refreshed* (pages 98 - 99) as follows:

“I must tell the story of our finding the larvae of the species *Enoicyla pusilla*. This species is the only one in the British list whose larvae are not aquatic. They were said to be found in moss at the foot of trees and the only records of their being found in England were nearly a hundred years ago in the county of Worcester. For many years I had been searching for them in Wyre Forest without success and I had been in correspondence with entomologists on the Continent who had described

in great detail the sort of habitat in which they would be found. Then, at Whitsun 1958, I had been camping in Wyre Forest with my younger daughter Sari, and we were just packing up our tents when Sari exclaimed, “Daddy, I’ve got a caddis on my tent !” “Don’t be foolish,” I replied, “it’s just a case-bearing clothes moth, I expect.” “Well,” she said, “they look like caddis to me and I’ve got some walking up my leg,” not being put off. So I took one and examined it with the naked eye, and seeing the little tubercles on the first abdominal segment I pronounced it *Enoicyla pusilla*, the terrestrial caddis, rediscovered in Britain after nearly a hundred years. We then found hundreds all around us and we had not only been living with them cheek by jowl that Whitsun but for some years I had been camping amongst them.”

In 1967 he wrote *Caddis Larvae*, a large book describing British caddis-fly larvae. His account of Land Caddis (pages 332 - 337) commences as follows:

“*Enoicyla pusilla* (Burmeister) was collected a number of times between 1868 and 1879 by McLachlan and Fletcher in localities near the City of Worcester. Since then it has not been recorded from the British Isles until, on 22 April 1957, my daughter Sari and I collected several larvae from a small meadow on the Worcestershire edge of Wyre Forest. The first larvae were found in a tent which my daughter had pitched in the meadow, but subsequently they were found in large numbers at the bases of tufts of grass within 10 feet of the hedge, or forest edge, usually under dead oak leaves which surrounded each grass tuft and often within mouse tunnels. When the particular habitat had been recognized the larvae were found very easily—about 200 being observed within an hour.”



Land Caddis - full grown larva 8 mm long Harry Green

In 1971 Hickin wrote *The Natural History of an English Forest* about Wyre Forest and on pages 134 - 136 he writes:

“... With the exception of *Enoicyla pusilla*, the species [of caddis-flies] recorded [in Wyre Forest] are generally common insects, but the distribution of this latter species is extraordinary. In Britain, it is known only from the fringes of a coppice extending southwards from Dowles Brook in the

vicinity of Wyre Forest railway station. Between 1868 and 1879 it was collected by two eminent entomologists, Fletcher and McLachlan, the name of the locality being given as 'near Worcester'. R. McLachlan, in 1874, published the great work on this group of insects entitled *A Monographic Revision and Synopsis of the Trichoptera of the European Fauna*. The exact locality of the capture of *E. pusilla* remains a mystery unless it was a guarded reference to Wyre Forest; the Victorian entomologists often resorted to this in order to put their collecting rivals off the track. Be that as it may, it was not rediscovered in Britain until 1957 when, with my daughter Sari, we actually camped on ground from which the larvae crawled and wandered on to our clothes!

“In addition to the unusual character of the locality of this species in Britain it is, indeed, an extraordinary insect. The genus *Enoicyla* is unique in the Trichoptera, in that the larvae are terrestrial. Instead of spending the larval and pupal period in freshwater it is found around the fringes of oakwoods where it consumes the dead leaves, reducing them to a skeletal condition. The adults emerge very late in the year, usually during October and November, and the females are wingless. This species then is of special interest and its biology is being studied in several countries on the European mainland. It has, so far, not received special attention in Britain.”



Female Land Caddis (*Enoicyla pusilla*) Harry Green

On reading these accounts one wonders whether Norman Hickin actually read what John Fletcher had written about Land Caddis. Fletcher lived in Worcester all his life. He was a remarkable man who studied a wide range of insect groups. His publications are mostly very brief notes in the *Entomologists Record*, although he wrote most of the sections on insects in the *Victoria County History* published in 1902, just before his death. Fletcher found Land Caddis near Worcester and we have been able to deduce that some of his sites are now within urban areas of the City in St Johns. This information is based on specimen labels in the Natural History Museum in London, and in Worcester City Museum. Most were found by streams, in fragments of relatively undisturbed habitat derived from ancient woodland. Fletcher also visited woodland just outside Worcester and

his records, most distant from the City, are from Monkwood, near Grimley, where he swept adult flying males from moist vegetation and was pleased to have found them in habitat similar to that described by continental entomologists. In his studies Fletcher apparently reared larvae through to emergence of adult insects and also observed flightless females egg laying.

With hindsight we can now see that Norman Hickin's findings in Wyre were of a totally new British locality. There appear to be no records whatsoever of Land Caddis anywhere in Britain between Fletcher's work in the 1800s and Hickin's discovery in 1957 (or 1958 as he uses both dates – which is correct?). Although it is surprising, the leading Trichopterists of the 20th Century simply quoted McLachlan's reports from the 19th Century and apparently never went in search of the Land Caddis themselves. Incidentally, Robert McLachlan probably never visited Worcestershire, but received specimens from John Fletcher. I understand from Peter Barnard that McLachlan's papers are in the Natural History Museum library but cannot be accessed at present due to building alterations: it will be fascinating to see if they contain letters from Fletcher.

Hickin's reports triggered a new interest in Land Caddis and various people started to look for them. We have not tried to work out the exact time lines for this but suspect that Noel King had a lot to do with encouraging new research. He was Worcestershire's man for the Nature Conservancy Council (NCC), later English Nature (EN) at the time and well-known and respected amongst Worcestershire's naturalists and conservationists. David Harding with colleagues and students at the University of Wolverhampton started work on Land Caddis in 1975 and their studies continued for many years, especially into the growth of larvae and the conditions under which they lived. They worked mainly in Chaddesley Woods, near Bromsgrove, and Shrawley Wood, north of Worcester, but David Harding also explored other woodlands and found Land Caddis larvae in about a dozen 10 km squares of the national grid around and to the south of Wyre Forest. Another NCC/EN man, Mike Taylor, systematically searched for Land Caddis larvae and found them throughout Wyre Forest. Malcolm Clark came across the larvae in Chaddesley Wood in 1974 while he was searching for tiny fungi amongst grass and leaf litter. John Day (1985) gathered together various reports from the 1980s (and we accidentally missed referencing his notes in our 2005 article – apologies!) and amongst those reports was one from Brett Westwood (Eyemoor Wood, 1983). More recently moth-trappers (via Dave Grundy) have sent us records of larvae which have climbed into moth traps, probably because they did not like being squashed by the trap!

I (Harry Green) cannot remember exactly when I first became aware of Land Caddis although it was probably from Norman Hickin's books. I can

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remember the occasion on which I first saw one! Tony Simpson called at my place of work with several larvae in a tube which he thought I would like to photograph, which I did, and if I could find the photograph (which, at present, I cannot!) I would be able to find the date as the old Kodak cardboard transparency holders always carried a date of processing – it was in the 1980s. Later I became interested in snails and started to collect and search for them in woodland leaf litter. On one of these occasions Brett and I found Land Caddis larvae in a bag of leaf litter and I was hooked! Our first appeal for records appeared in issue 2 of *Worcestershire Record* in April 1997 and further requests and updates have appeared in subsequent issues, all of which can be found on the web site www.wbrc.org.uk. Since then we have searched hundreds of sites and greatly extended our knowledge of the distribution of Land Caddis.

Most of our records of Land Caddis larvae are from tree leaf litter, usually in woodlands, but this is not the only habitat they use. We have found them in open sites on Catherton Common on Clee Hill in thin mixtures of grass and birch leaf litter, and both Malcolm Clark and Norman Hickin found them amongst grass litter in or adjacent to woodland. Both reported an association with mouse runs but in our view this is probably more accidental than a real choice by Land Caddis. Classically the larvae are found in oak litter but they also use many other tree leaf litters: hazel, beech, sweet chestnut, birch, alder, even holly and occasionally amongst conifer needles. Recently we have found them in deep alder litter in narrow wooded margins to streams. They also use mossy areas, often near the base of big trees, and we have found them amongst

liverworts growing on stream banks. All these sites are on well drained soils. The larvae require a relatively humidity of near 100% although they can survive in levels down to 70% for a while. The most critical period is probably during diapause and pupation, which apparently occur within soil, although these stages have not been found wild in Britain. However, the larvae cannot survive water-logging and avoid poorly drained clay soils. If they do get soaked, perhaps during rain, they may climb amongst brambles or other vegetation and ‘hang out to dry’ dropping back to the ground when dry.

We have recorded a similar situation at Joan’s Hole just south of Wyre when many larvae were seen crawling over the surface of thalloid liverworts after rain. We have never found them in ash woods, even if well - drained, perhaps because ash leaves rot away very quickly and these woods are often on alkaline clay soils. A somewhat particulate structure to the soil may be required so that the larvae can gain entry and the pupa can work its way through the soil just before the adults emerge – but this is speculation.

During our researches preparing for the review article (Green and Westwood 2005), David Pryce put us in contact with Graham Vick who he felt sure had kept larvae in captivity and hatched the adults. This proved to be correct although only two females and some males emerged from pupae derived from the small number of larvae collected. Nevertheless this was probably the first sightings of living females in Britain since Fletcher’s work one hundred years previously. This was in 1988 and Graham Vick and Bob Kemp returned to Wyre in the same year and found eleven living males by shaking large quantities of leaf litter through a sieve onto a white sheet.

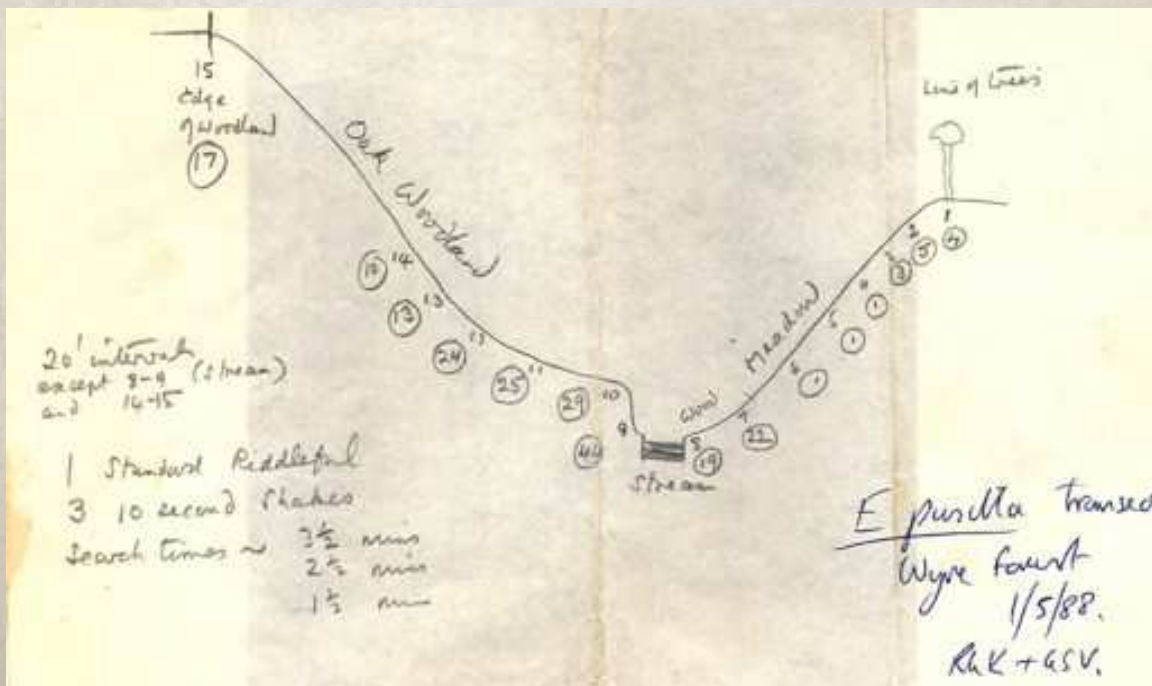


Chart prepared by Bob Kemp to show numbers of caddis larvae found along a transect line near The Newalls, Wyre Forest, 1 May 1988

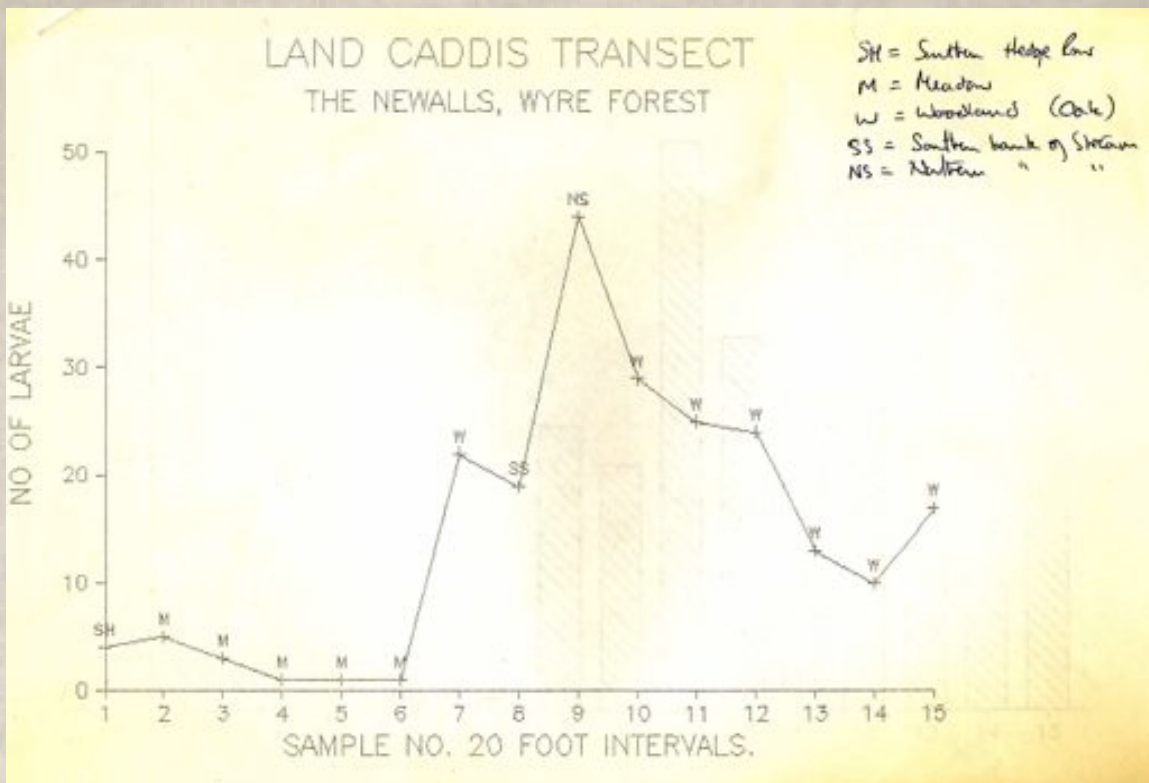


Chart prepared by Bob Kemp to show numbers of caddis larvae found along a transect line near The Newalls, Wyre Forest, 1 May 1988

During a telephone conversation with Bob Kemp, I (HG) learned that he and Graham Vick (unpublished) carried out a simple transect survey near The Newalls in Wyre Forest on 1 May 1988, using a 'standard riddling times,' at points 20 feet apart along a line through woodland, across a stream and through a meadow. Bob found his original graphs plotted from the survey and sent me scans of the yellowing documents which are reproduced here with his permission. They show that in this survey larvae were more frequent in the woodland and near the stream although they did occur in grassland leaf litter 100 feet from the woodland.

After our review article was published we received an email from Peter Hiley telling us that while researching for his PhD in 1975 he had visited Wyre, collected larvae of Land Caddis and the successfully reared the adult insects! Interestingly, as will become apparent later, he was working with Ian Wallace and his work was used by Ian in constructing the key to caddis (see reference list).

About a year before writing our review article Brett had been in contact with Ian Wallace from Liverpool Museum while making a Radio 4 programme. Arising from this we arranged a foray 14 and 15 October 2005 with the aim of finding adult Land Caddis which we thought had not been seen in Britain since Fletcher's day. When we arranged this we were all unaware of the work by Graham Vick, Bob Kemp and Peter Hiley! For this foray it was essential that Ian Wallace was there as national expert able to confirm, definitely, the identity of the adults.

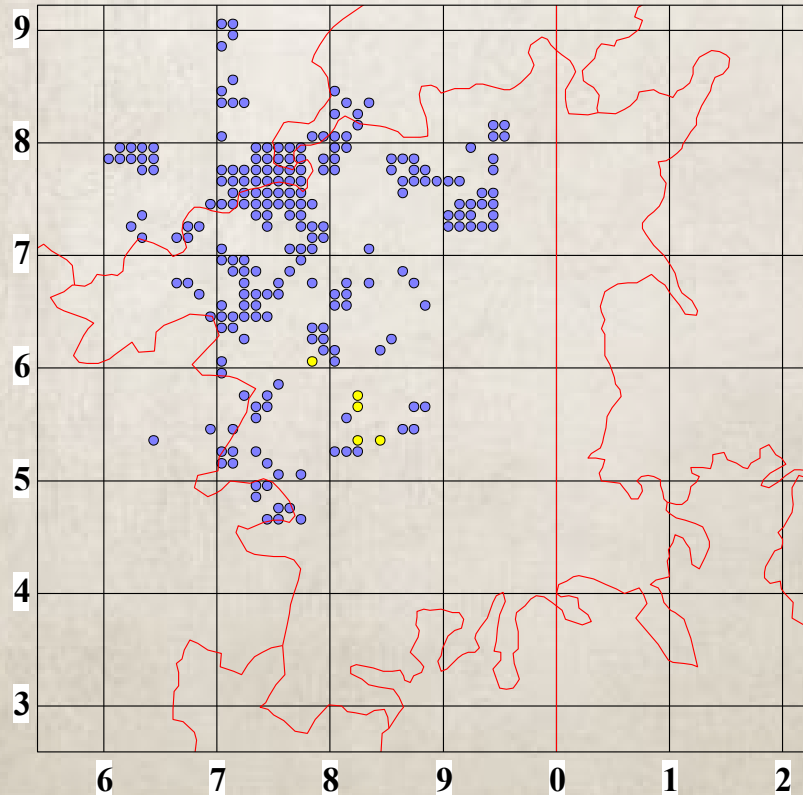
The foray was a success. On the 14 we visited Chaddesley Woods and soon found the flying males and during the evening of the same day we found a female. Next day, in the morning, we visited Lower Sapey woodlands without success. In the afternoon we found flying males in Wyre Forest (around grid reference SO753765) but they were not abundant so we returned to Chaddesley Wood in the evening and were fortunate to find more males and another female. The tiny flightless females were very hard to find amongst leaf litter riddled into a white tray. The males usually only flew short distances and this activity soon caught the observers eye. We took very many digital pictures and amongst them were a few good ones of males and females. These are the first adult land caddis to be photographed in Britain and the first females to be seen in the wild since Fletcher's reports in the 1800s.

During the foray David Harding recollected that he had seen occasional male Land Caddis during his research and he later found notes of the dates. His records were from Chaddesley Woods in on 29 September and 13 October in 1977, and 17 October 1978. He also found a male in Seckley Ravine, Wyre Forest on 13 October 1981. Although he kept many caddis larvae in laboratory culture over many years the only adult to hatch was a male on 6 October 1977.

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Land Caddis *Enoicyla pusilla* were found in these 1 km squares by J E Fletcher between 1868 and 1900 and were the first records in Britain.. All are near Worcester City. The boundaries are of Vice-counties – Worcestershire VC37.



The distribution of Land Caddis *Enoicyla pusilla* in Worcestershire (VC37 boundary) and neighbouring counties plotted by presence in 1km squares. The yellow dots indicate sites where they were found between 1868 and 1900 with no modern records probably because they are now within the City of Worcester.

Further Research

Although we now have a better picture of the distribution of Land Caddis in Britain we feel sure it is not complete and further searching is required. We do urge all readers to get on their knees in suitable countryside and look for the larvae. They are perhaps easier to find in the winter months from November onwards when they are most abundant although the cases are only 2-3 mms long, compared by David Harding to animated All-Bran! They gradually become less abundant (death, predation) although bigger, finally becoming about 8 mms long and 2 mm diameter. During the summer they disappear, probably into cracks and crannies in the soil beneath leaf litter, where they undergo a long period of diapause before pupating, probably in September. The old cases can be found in litter throughout the year and appear to survive in dry conditions for a long time – probably several years. Many of our records are of cases alone.

Perhaps the greatest puzzle is why do Land Caddis in Britain only occur in our area and nowhere else? David Harding has made many appeals for records over many years in national publications and we have added our voices to the appeal more recently. Since the publication of our review article we have received several reports of lepidopteron bagworms suspected of being Land Caddis, but no positive sightings. We have one tantalising report from a possible sighting in East Anglia many years ago but this is entirely unproven and there is no specimen. We do encourage every reader to search for Land Caddis in suitable sites and if you find anything suspicious please collect it and contact Harry Green!

Published reports of European studies and the scanty reports from Britain show that the adults emerge in the autumn. The date of 14 - 15 October was chosen for our foray for adults on that basis as being 'about average'. We should like to determine the period when adults are about more exactly. This could be done by daily searches in suitable sites where we know Land Caddis are common. For example, Mervyn Needham is planning such a survey in Chaddesley Wood in 2006 at the site where we found the adults 14-15 October 2005 and where David Harding found tiny larvae 4 November 2005 three weeks after we saw the adults. This agrees with published information which states that females lay eggs shortly after mating and they hatch about a fortnight later. David also found the larvae in Shrawley Wood on the same date.

It would also be interesting to obtain observations of mating. It is thought that the flightless females attract males by using pheromones.

More information on the life history of Land Caddis can be found in the French paper by Kelner-Pillault (1960). Brett translated much of the paper and used the information to write the brief account within our review article. There are older papers in the German literature which we have not followed up, partly because we cannot read German, and we have not seen details of studies undertaken in Holland.

Acknowledgements

Although there are two names at the beginning of this article it has been written by Harry Green, based on our joint fieldwork and publications. This gives me an opportunity to thank my colleague and fellow searcher Brett Westwood for the better part of 20 years of exciting caddis hunting! This has taken us into many back alleys and corners of the countryside, which we sometimes think have never been visited by naturalists before! It's all been great fun, never mind about the science!

Readers will realise that many people have given unstinting help to us in the search for Land Caddis, both locally and nationally.

Many thanks to the following (in random order!): David Harding, Rosemary Winnall, John Day, Will Watson, John Meiklejohn, John Partridge, Ian Wallace (Liverpool Museum), Peter Barnard (Natural History Museum, London), Graham Vick, Bob Kemp, David Hollis, David Grundy, Paul Whitehead, Mike Taylor, David Pryce, Garston Phillips (Worcester City Museum), and to all those who have sent us records. Also many thanks to Bert Reid who prepared the maps using the DMAP software.

We have published several reports on the progress of our survey and appeals for records in *Worcestershire Record*. These can be found on the Worcestershire Biological Record Centre web site www.wbrc.org.uk



Left to Right – Brett Westwood, Harry Green and Ian Wallace searching for adult Land Caddis in Chaddesley Wood 14 October 2005.
Rosemary Winnall



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