The status and distribution of the Nationally Rare sawfly *Pamphilius fumipennis* in Morecambe Bay (and specific areas of South Lancashire, V.C. 59) in 2023

Ben Hargreaves
The Wildlife Trust for Lancashire, Manchester & North Merseyside

December 2023

ACKNOWLEDGEMENTS

Many thanks to Tanyptera Trust for funding the research and to Natural England, National Trust and Lancashire Wildlife Trust for survey and image permissions. Many thanks to Gary Hedges for the QGIS maps.

CONTENTS

SUMMARY

The Wildlife Trust for Lancashire, Manchester & North Merseyside (Lancashire Wildlife Trust) were commissioned by National Museums Liverpool to undertake a targeted survey to look for the Endangered (and regionally very rare) sawfly *Pamphilius fumipennis* in likely areas of Lancashire (V.C. 60 and V.C. 59).

Pamphilius fumipennis is not confirmed as extant in Lancashire (with likely sites visited both near the only Lancashire record and on sites that showed similar ecology and habitats); it may still occur as a very rare species or could be extinct in the county.

INTRODUCTION

PRIMARY SPECIES (Status)

Pamphilius fumipennis is an Endangered (Musgrove, 2022) "leaf-rolling" sawfly with few confirmed records for the UK. There are – between 1831 and 2020 - 22 records of the insect for the UK (all for England except one for Wales), though four of these records lack recorder details and two of the 22 records only have vague dates (date ranges – between 10 and 15 years). Please refer to the maps on pages 11-12 and the attached excel list showing the data points. There is only one Lancashire record (Warton Crag, 2011, Guy T Knight) - based on a malaise trap specimen collected between 23/05/2011 and 27/06/2011. Additionally, a leaf roll thought to represent evidence of the species was also found near to the location of the malaise trap, but this is unconfirmed. Beyond Lancashire the species is recorded from various locations in England with concentrations of records in Bedfordshire, Hertfordshire, and Norfolk. The sole larval foodplant (the larvae feed from within a leaf roll – see example image below) in the UK is Hazel *Corylus avellana*. In mainland Europe the sawfly preferentially utilises Grey Alder *Alnus incana* (an association not recorded for the UK where *A. incana* is a non-native introduction, often to landfill reclamation sites and amenity areas) though will use *C. avellana* as well (Marko Mutanten pers. comm). Beyond the UK, Benson (1952) lists Latvia and Finland as recorded countries. Zhelokhovtsev et al (1994) simply state the northwest, central, eastern, and northern parts of Western Europe. GBIF list several records for Europe – these include other European countries (further south to Italy) with the greatest concentration of records occurring in southern Finland according to this platform. The species is recently recorded from Norway (around the Oslo Fjord – Gunnar Engen pers. comm.).

Leaf roll of *P. fumipennis* seen from upper side of leaf in Bedfordshire © Andrew Green.

AIM AND OBJECTIVES

AIM

1. Determine the status and distribution of the Endangered (GB) sawfly *Pamphilius fumipennis* focused on the one previously known site at Warton Crag (and proximal sites in North Lancashire, V.C. 60).
2. Survey similar potential habitats in terms of geology and host plant in South Lancashire, V.C. 59 (Whalley, Billington Clitheroe) for *P. fumipennis*.
3. Report on all other identifiable invertebrates encountered.

OBJECTIVES

1) Using available regional and national data, plan visits to areas with potential to support the species. Gain permission and licences for site access and for collecting voucher specimens where required.
2) Survey the one recorded North Lancashire site and other potential sites for evidence of active adults, leaf rolls and larvae during Summer 2023.
3) Identify and report on any adverse management issues that could have a detrimental effect on the status of the above species. Report on any other notable species found and any opportunities to improve or secure habitat quality in the future.

METHODS

AREA OF COVERAGE

Although several areas in Lancashire have potential to support the target species, priority was given to Warton Crag, the specific land holding with the one and only Lancashire record for the species. Designated as a Site of Special Scientific Interest and a Local Nature Reserve, Warton Crag is owned by Lancashire County Council, Lancashire Wildlife Trust and RSPB and is managed by the latter two organisations. Proximal sites in the Silverdale area were surveyed including Gait Barrows, Yealand Hall Allotments, Eaves Wood, Silverdale Green, Myers Allotment, Jenny Brown's Point. Several miles of Public Rights of Way (PROW) and land between the sites in Silverdale were surveyed. Additional visits to areas with substantial limestone geology and plentiful Hazel in South Lancashire, V.C. 59 were undertaken. Areas visited in South Lancashire included Whalley and Billington (public land, common land, PROW, areas with public open access) and the Cross Hill Quarry and Salt Hill Quarry Nature Reserves managed by Lancashire Wildlife Trust. Most of the surveyed sites are shown on the next three pages.

Warton Crag © Lancashire Wildlife Trust

Gait Barrows © Arnside and Silverdale Area of Outstanding Natural Beauty (AONB)

Eaves Wood © Arnside and Silverdale AONB

Apoderus coryli leaf roll on Hazel at Silverdale Green © Craig McCoy.

Yealand Hall Allotments SSSI © John Lamb

Cross Hill Quarry LNR © Lancashire Wildlife Trust

Salthill Quarry © Lancashire Wildlife Trust

Whalley Nab / Billington © Lancashire Evening Telegraph

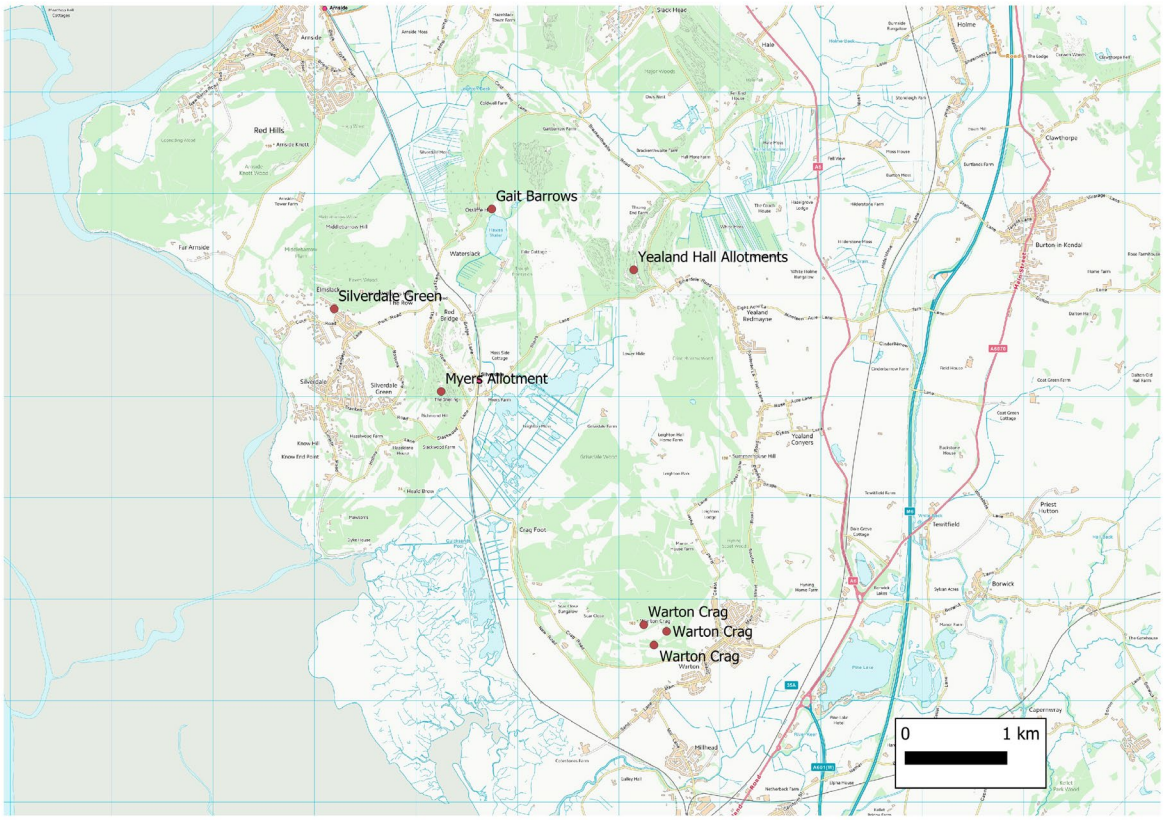
SURVEY

- 12 days field survey were carried out between 02/06/2023 and 30/07/2023.
- Most surveys were undertaken in temperatures of at least 17°C (as an average, daily minimum), with light winds and a low (<10 %) chance of precipitation. Later in the field survey period three visits were made during sub-optimal weather with some heavy rain. The focus in this later survey period was on finding leaf rolls and larvae.
- Surveys usually started between 09.00 and 10.00 and finished between 15.30 and 17.00. When daytime temperatures of greater than 23 degrees Celsius were predicted, surveys started earlier (08.00 – 08.30) as insect activity would start earlier in the day. A short (15-30 min) break was usually undertaken during the middle part of the day (between 13.00 and 14.00).
- Surveys were conducted at a slow walking speed (approximately 50 meters per minute).
- The bulk of the surveying approach in the June period was direct netting of insects from areas of activity such as trees, flowering plants, edges of vegetation and tree lines and beating and sweeping of trees and shrubs. Priority on all sites was given to areas where Hazel was the dominant tree species.

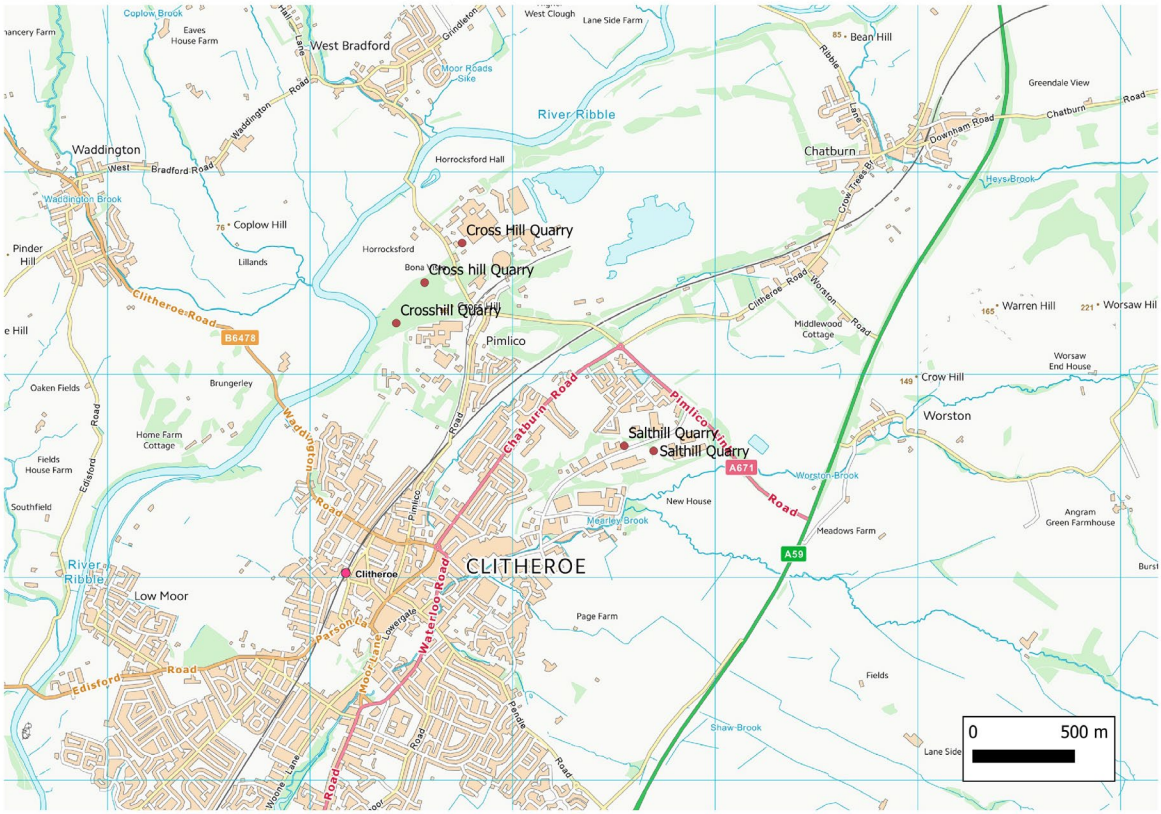
- Later in the season (late June to July), the survey approach concentrated on searching Hazel for the characteristic leaf roll which the larvae use as concealment during the larval feeding stage. With only one July field record of an adult for the UK, it was thought unlikely that adult specimens would be found from July onwards.
- All species unidentifiable with certainty using field characters were sampled as specimens in 70% ethanol and subsequently pinned, identified under a microscope, and labelled. The specimens will be deposited in perpetuity at World Museum, Liverpool.

On the following two pages are maps showing the surveyed areas (central grid references used for most site records).

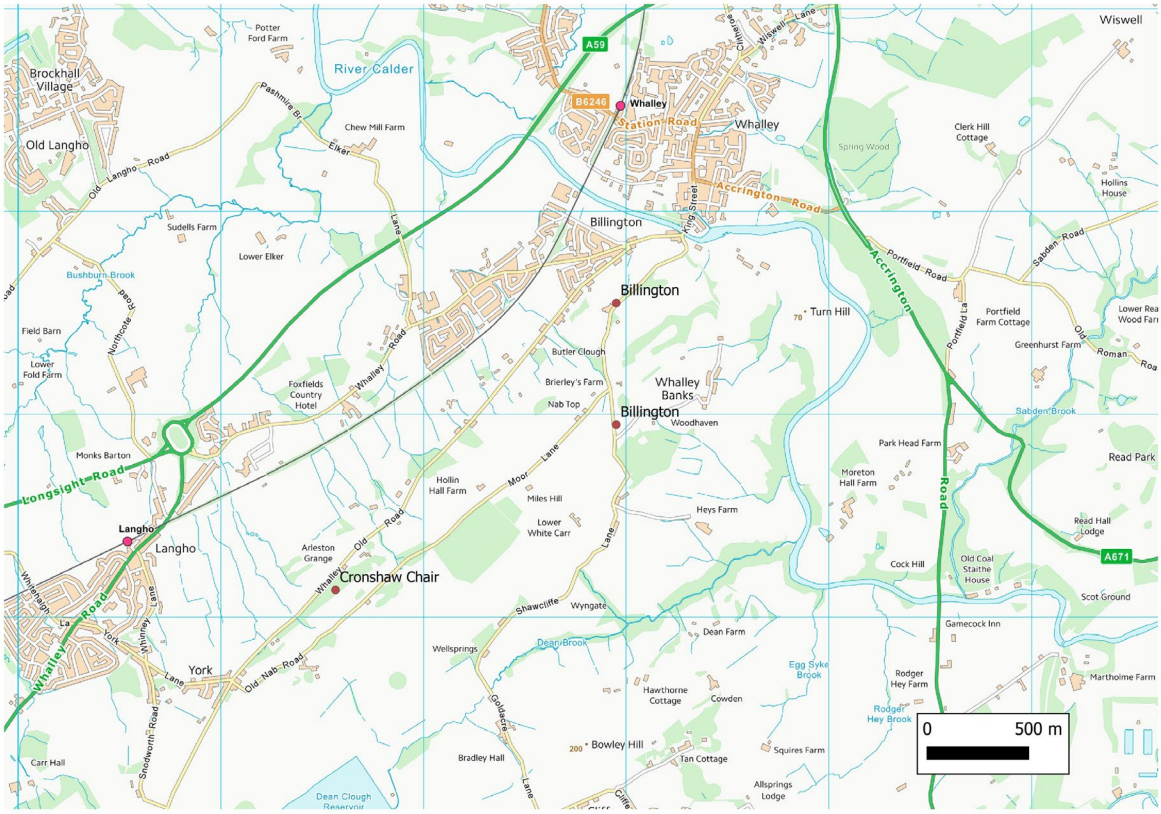
Morecambe Bay survey points



Clitheroe area survey points



Whalley and Billington area survey points



RESULTS

No records of the target species were made, either of the adult insect, larvae, or leaf roll. Had a vacant leaf roll been found, then it was planned to excavate around the base of the tree to try and find mature larvae (which create a 5-15 cm burrow in the soil near to the tree). However, as no leaf rolls were found this was not carried out.

A total of 99 individual invertebrate records were made. Most of the records are based on voucher specimens, as they are of species unidentifiable in the field. Most of the records are to species level - exceptions have been commented on in the excel list (under the "other comments" column) and it is hoped that at least two of these can be confirmed or assigned to species. Most of the records are from solo visits by Ben Hargreaves (BH), except for records from Cross Hill Quarry and Salthill Quarry in Clitheroe, where Allen Holmes accompanied BH. One record - of a Hazel leaf roll of *Apoderus coryli* - was submitted by Ruthie Cooper of The National Trust (N.T.) and was taken at Silverdale Green.

DISCUSSION

LIMITATIONS

- Malaise traps were not used. There were some sites within the current study area that would have been suitable to site a malaise trap and it is suggested that malaise trapping and/or pan trapping could be carried out at the precise location where the adult was recorded during surveys carried out by National Museums Liverpool (Guy Knight and Tony Hunter) in 2011.

OTHER NOTABLE RECORDS:

The weevil *Apoderus coryli* (recorded from three sites) appears to be restricted to Morecambe Bay in North Lancashire, V.C. 60, which has most of the records for Lancashire. There are two other records for South Lancashire, V.C 59 (Ainsdale and Liverpool). The species is listed as widespread and locally common in the UK according to https://www.ukbeetles.co.uk/apoderus-coryli - but is much more frequent in the south.

The hoverfly *Microdon mutabilis* sensu stricto was recorded from Warton Crag. This species has only 5 records for Lancancashire (all V.C. 60) and although locally common where it is found, is restricted to certain sites on limestone. Given that the associated ants were certainly *Formica fusca* (at the point of collection) and in the habitat where they were found it is felt safe that the ones seen (and the one voucher collected) are of *M. mutabilis* s.s.

The record from Yealand Hall Allotments of *Trypoxylon clavicerum* was the first one for Lancashire, coming only a few days before a second county record by Steve Garland from Artle Dale SSSI. This species is not rare nationally but is predominantly southern compared to more common species of the genus. As there are three Cheshire records between 1989 and 2021 it is perhaps not surprising that it should be present in Lancashire.

Several of the species of parasitic wasps (Ichneumonidae) that were collected may be of restricted distribution, though little is known about the distribution and status of most species in this family so it would be unwise to speculate as to any possible regional status. That said, some of the recorded species are listed as uncommon in the only sources of literature that do venture a status (Perkins, 1960).

FOLLOW-UP WORK

It is suggested that specific areas of Warton Crag – near to where the 2011 record of *P. fumipennis* was made - could be target searched in 2024. A malaise trap and/or yellow pan traps would need to coincide with the flight period of the adult according to records. I will recommend that the species is added to the revised, Lancashire Biological Heritage Sites Hymenoptera target list / guidelines and those for Merseyside (Local Wildlife Sites) and Greater Manchester (Sites of Biological Importance). It would also be prudent to consider this species as part of any Local Nature Recovery strategies (Lancashire County Council) and Important Invertebrate Areas (Buglife).

It would be useful to elucidate the true status of the *P. fumipennis* in Lancashire, even if this part of a longer-term search. This could be allied to surveys for other Red Data Book (RDB) Symphyta that are subsequently identified by the GB RDB list revision currently being completed by Andy Musgrove.

REFERENCES

Achterberg, C van., & Aartsen, B. van., (1986). The European Pamphiliidae (Hymenoptera: Symphyta), with special reference to the Netherlands. - Zoologische Verhandelingen, (234): 1-98.

Benson, R.B., (1952). Handbooks for the Identification of British Insects. Hymenoptera, Symphyta, Vol 6, Section 2(a-c), Royal Entomological Society, London.

Brock, J.P., (date unknown), Draft key to genera of Gelini (unpublished draft).

BWARS (2013a) List of British and Irish aculeate Hymenoptera (January 2012), bees, wasps and ants recording society.

BWARS (species accounts) https://www.bwars.com/species_gallery

Else & Edwards., (2018) Handbook of the Bees of the British Isles Vol 1 & II. The Ray Society.

Falk,S., (1991) A review of the scarce and threatened bees, wasps and ants of Great Britain. Research and Survey in Nature Conservation No. 35. Nature Conservancy Council for England, Peterborough

Falk,S.,(2015) Field Guide to the Bees of Great Britain and Ireland. Bloomsbury.

Gardner, W., (1901) A list of the Hymenoptera-aculeata so far observed in the counties of Lancashire and Cheshire: with notes on the habits of the genera.

Liston A, Knight G, Sheppard D, Broad G, Livermore L (2014) Checklist of British and Irish Hymenoptera - Sawflies, 'Symphyta'. *Biodiversity Data Journal 2*: e1168. https://doi.org/10.3897/BDJ.2.e1168.

Lomholdt, O., (1984) The Sphecidae (Hymenoptera) of Fennoscandia and Denmark: 1984.

Musgrove, A.J., (2022). A review of the status of sawflies of Great Britain - Phase 1: families other than Tenthredinidae. Natural England, unpublished.

Perkins, R.C.L., (1960) Hymenoptera. Ichneumoidea. Ichneumonidae, subfamilies Ichneumoninae II, Alomyinae, Agriotypinae and Lycorininae. Handbooks for the Identification of British Insects 7(2aii): 117 – 213.

Quinlan, J. & Gauld, I. D., (1981). Handbooks for the Identification of British Insects. Hymenoptera, Symphyta, Vol 6, Section 2(a) New Edition, Royal Entomological Society, London.

Rasnitsyn, A. P., & Siitan, U.V., (1981). Ichneumoninae [in Russian]. In D.R. Kasparyan (ed.), [A guide to the identification of insects of the European part of the USSR. Vol. 3. Hymenoptera]. Opredeliteli faune SSSR, no. 129: 1-688. Nauka Press, Moscow. 688 pp.

Richards, O.W., (1980) Scoliodea, Vespoidea and Sphecoidea. Hymenoptera, Aculeata. Royal Entomological Society Handbooks.

Townes, H., (1969). The Genera of Ichneumonidae Part 1. Memoirs of the American Entomological Institute Number 11. The American Entomological Institute, 5950 Warren Road, Ann Arbor, Michigan, 48105, U. S. A.

Valemberg, J., (1986). Clef de determination inedite des genres de la s/famille Ichneumoninae Ashmead 1900. Bulletin de la Societe Entomologique du Nord de la France: 1-78.

Viitasaari, M. ed., (2002). Sawflies (Hymenoptera, Symphyta), I: a review of the suborder, the Western Palaearctic taxa of Xyeloidea and Pamphilioidea. Tremex Press.