

The status and distribution of the nationally rare micro-moth *Anacamptis temerella* (Lienig and Zeller, 1846) (Lepidoptera: Gelechiidae) in Lancashire in 2021, with observations on other *Salix repens*-feeding Lepidoptera

on behalf of The Tanyptera Project



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Abstract

The history of the moth in Lancashire, as well as nationally and internationally, is discussed. An account is given of a survey undertaken in May-June 2021 to look for larvae of *Anacamptis temerella* amongst Creeping Willow (*Salix repens*) on the dunes of the Sefton and Fylde coasts in Lancashire. Twenty *A. temerella* moths were reared from spun leaves of *S. repens*, as well as nineteen other species of Lepidoptera. The information gained proved the continued existence of the moth in the Sefton coast, and allowed differences to be identified between the larvae of *A. temerella* and *A. populella*. The species was not detected on the Fylde coast during this survey. Recommendations are made regarding habitat management and future surveying to further assess distribution.

Survey Rationale

Anacamptis temerella is a rarely recorded and inconspicuous moth of the Gelechiidae family. The moth has Nationally Notable (Scarce) category A conservation status, and has been classified as pRDB 2 (species likely to appear in the Red Data Book and be categorised as vulnerable) (Davis, 2012). The moth's position in the UK, and in the Sefton coast in particular, where it was formerly known to be common, is of great concern.

This study was carried out to ascertain whether the moth was still present on the Sefton coast, and indeed in Lancashire. Failure to locate the moth would add weight to the possibility that the moth may now be extinct in the county. Positive recording of the moth could be used to help inform management plans for the conservation of the sand dune habitats that are so important for this moth.

Historical Records in Lancashire

A. temerella has formerly been recorded from the dunes at Formby, Freshfield, Ainsdale, Crosby and Lytham (table 1). The moth has occasionally been netted, but the majority of records relate to larvae found in spinings on Creeping Willow (*Salix repens*).

The last record of *A. temerella* from the Sefton coast was of three moths from the Formby area in 1984. The last Lancashire records are of moths netted on the Fylde coast at Lytham St Annes in 2007 and 2013. The last larval record was from Ainsdale in 1976. These are the only known Lancashire records since the early 1960's.

Historical Lancashire records suggest a local, but at times locally common, species. The earliest Lancashire records are from the Crosby sandhills in 1857. Further records from 1950 describe the larvae as common on *S. repens* at Ainsdale, Crosby and Formby, all on the Sefton coast.

Table 1. *Anacamptis temerella* records from Lancashire (VC59 and VC60). (Gelechiidae Recording Scheme Database)

('0' refers to the species being present but numbers not recorded)

Site	Gridref	VC	No	Date	Recorder	Stage	Comment
Crosby sandhills	SJ3098	59	0	1857	Gregson, C S	Adult	approx year
Lytham area	SD32	60	0	Jul 1865	J B Hodgkinson	Adult	amongst small willow on dunes
Lytham area	SD32	60	0	22 May 1866	J B Hodgkinson	Larval	good many larvae on <i>Salix repens</i>
Crosby	SJ39	59	1	1887	Ellis List	Not recorded	approx date - pre 1887
Lytham St Anne's LNR	SD3130	60	2	Jul 1891	J B Hodgkinson	Adult	approx grid - in E C Bazett coll.
Crosby	SJ39	59	1	14 Jul 1914	Unknown	Larval	
Formby area	SD20	59	6	Jul 1921	Mansbridge, W	Not recorded	
Formby area	SD20	59	2	1922	Mansbridge, W	Larval	emerged 22.6 and 30.6.1922
Ainsdale Dunes	SD21	59	1	1940	Mansbridge, W	Not recorded	
Formby area	SD20	59	1	1940	Mansbridge, W	Not recorded	
Formby	SD20	59	1	Jul 1949	B.B. Snell	Larval	on <i>Salix repens</i>
Ainsdale	SD21	59	1	1950	Various	Larval	Common on Creeping Willow
Crosby	SJ39	59	1	1950	Various	Larval	Common on Creeping Willow
Formby area	SD20	59	1	1950	Michaelis, H N	Not recorded	Common
Formby area	SD20	59	1	1950	Various	Larval	Common on Creeping Willow
Ainsdale Dunes	SD21	59	1	1950	Michaelis, H N	Not recorded	Common
Formby	SD20	59	1	29 Jun 1952	R. Prichard	Larval	on <i>Salix repens</i> larva on 24.5.1952
Formby	SD20	59	2	29 Jun 1953	B.B. Snell	Larval	on <i>Salix repens</i>
Formby	SD20	59	2	30 Jun 1953	B.B. Snell	Larval	on <i>S. repens</i> - larva found 6.6.1953
Formby	SD20	59	2	01 Jul 1953	B.B. Snell	Larval	on <i>Salix repens</i>
Formby	SD20	59	2	04 Jul 1953	B.B. Snell	Larval	on <i>Salix repens</i>
Formby	SD20	59	4	21 Jul 1954	B.B. Snell	Larval	on <i>Salix repens</i>
Freshfield	SD20	59	2	09 Jul 1956	B.B. Snell	Larval	on <i>Salix repens</i>
Freshfield	SD20	59	2	14 Jul 1956	B.B. Snell	Larval	on <i>Salix repens</i>
Freshfield	SD20	59	1	21 Jul 1963	Jones, C.M.	Adult	gen det
Ainsdale	SD21	59	1	1976	M R Shaw	Larval	emerged 24.6.1976 ex. <i>Salix repens</i>
Formby area	SD20	59	3	1984	L.W. Hardwick	Adult	A few over <i>Salix repens</i>
Lytham St Anne's dunes.	SD3130	60	1	17 Jun 2007	Steeden, J	Adult	In dunes, west of road.
Lytham St Anne's LNR	SD3130	60	1	30 Jul 2013	Palmer, S M and C A	Adult	

Distribution in UK and Ireland

The moth has been recorded on the Wirral, but not since 1948. It has also been recorded from coastal sites in north and south Wales from 1974 to 2003, from the Isle of Coll in Scotland in 1984 and 1985, and from Ireland, most recently in 2003. Prior to this survey period, the most recent known record in the British Isles is the moth recorded at Lytham St Annes in 2013.

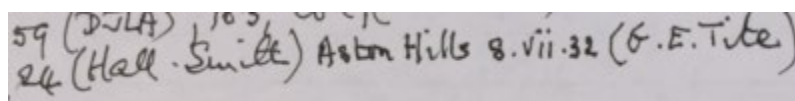
Bland (2002) noted unconfirmed reports of the moth on the sandy heaths of Berkshire and Buckinghamshire. Of course, as inland records, these would be extremely significant if confirmed.

I have discussed the records with the County Recorders for the two vice-counties concerned.

Martin Harvey, County Moth Recorder for Berkshire (VC22) notes that there is a Berkshire record shown on the NBN Atlas, deriving from Natural England's Invertebrate Site Register. The record appears to date from 1966, but the recorder name is absent. The grid reference given is SP4802. Harvey notes that the location is somewhat vague, although "there are some sandpits in that area and some surprising moths have been recorded there in the past". He concludes that the record cannot be accepted without supporting evidence, and further notes that Brian Baker did not list *A. temerella* in his book *The Butterflies and Moths of Berkshire* (Hedera Press, 1994).

Martin Albertini, the County Moth Recorder for Buckinghamshire (VC24) notes that *A. temerella* is mentioned on the micro maps held by A. M. Emmet and then maintained by J. R. Langmaid and M. R. Young, now on-line via Butterfly conservation at [Micro-Moth Distribution Maps \(butterfly-conservation.org\)](http://butterfly-conservation.org).

On the map, VC24 and VC22 are circled and have a "?" in the circle next to the number 22. The back of the map for *A. temerella* has the following entry for VC24 Buckinghamshire:



59 (DJLA) 10.5 Aston Hills 8.vii.32 (G.E. Tite)
24 (Hall-Smith)

Don Hall-Smith was an entomologist from Leicestershire. Gerald Edward Tite (1904–1987), was an officer in the Department of Entomology at The Natural History Museum in London.

Albertini notes that "the location, Aston Hills, is a bit ambiguous. There is an Aston Hill in VC24 near Wendover, but there is also an Aston Hill outside VC24 on the border between Bucks CC and Oxfordshire. It is not unusual for the county boundary to be mistaken for the VC boundary".

There is also a Cumbrian record noted on the map, with the recorder listed as Meyrick. No date is documented. I have discussed this record with Stuart Colgate, Recording Officer for the Cumbria Biodiversity Data Centre, who suggested that the recorder was Edward Meyrick (1854-1938), a leading international entomologist with a particular interest in Microlepidoptera.

On further discussion with Steve Palmer (the National Gelechiid Recorder), he was able to confirm that this latter record refers to Meyrick, and to an entry in his book, *A Revised Handbook of Lepidoptera* (1928). In this book (p.642), under *Compsolechia temerella* Zell., Meyrick notes the species has been recorded from Cheshire to Westmorland. However, the details of where Meyrick obtained the record from are not known.

European Continental Distribution

Stainton, in 1865, commented on European distribution when he noted that:

“Few localities are yet known for this insect. In this country it occurs on the sandhills of Cheshire and Lancashire, whence I received the larvae from Mr Gregson. It would seem to be a particularly northern insect, as the only continental localities recorded are Rambdau in Livonia, Abo and Kexholm in Finland, near St. Petersburg, and in central Sweden.”

A more recent appraisal is that the moth is widespread in northern and central Europe, less so in southern Europe and is thought to be absent from the Iberian Peninsula (Emmet & Langmaid, 2002). Tymo Muus reports the moth as common in the dunes of The Netherlands (personal comment, 2021).

Larval feeding signs

Anacamptis temerella larvae feed on Creeping Willow (*Salix repens*) in late May and June, a typical plant of the fixed dunes on the Lancashire coast. They have also been recorded in Ireland on Eared Willow (*Salix aurita*).

The larval feeding signs described in *The Moths and Butterflies of Great Britain and Ireland Volume 4 (Part 2)* (Emmet & Langmaid, 2002) note that the willow leaves are spun against the twig, forming a tube approximately 5cm in length.

The larval description is taken from Stainton (1865), and documents a larva 8mm in length with a black head and prothoracic plate. The body is dull whitish with small, black pinacula. Thoracic legs are blackish and prolegs are dull and whitish. The accompanying illustration seemed to suggest the possibility of a small, dark, anal plate, but is a little unclear on this point.

Stainton describes the feeding habits as drawing together the leaves of the terminal shoots of *S. repens*, sometimes fastening two shoots together, and eating holes in the leaves.

Similar feeding signs are made by the larva of *Anacamptis populella* on *S. repens*. The larvae of this common species can be found on many species of larger-leaved willows and poplars, where the larva feeds in a single, spun leaf, rolled from side to side to form a tube. The larva has a black head and a medially divided, black prothoracic plate. The greyish green body is covered with many large, black pinacula. Thoracic legs are black. The anal plate is variable, in some cases pale orange, in others much darker, and often with a blackish line anteriorly.

One aspiration of the study was to be able to clearly differentiate between larvae of the two *Anacamptis* species.

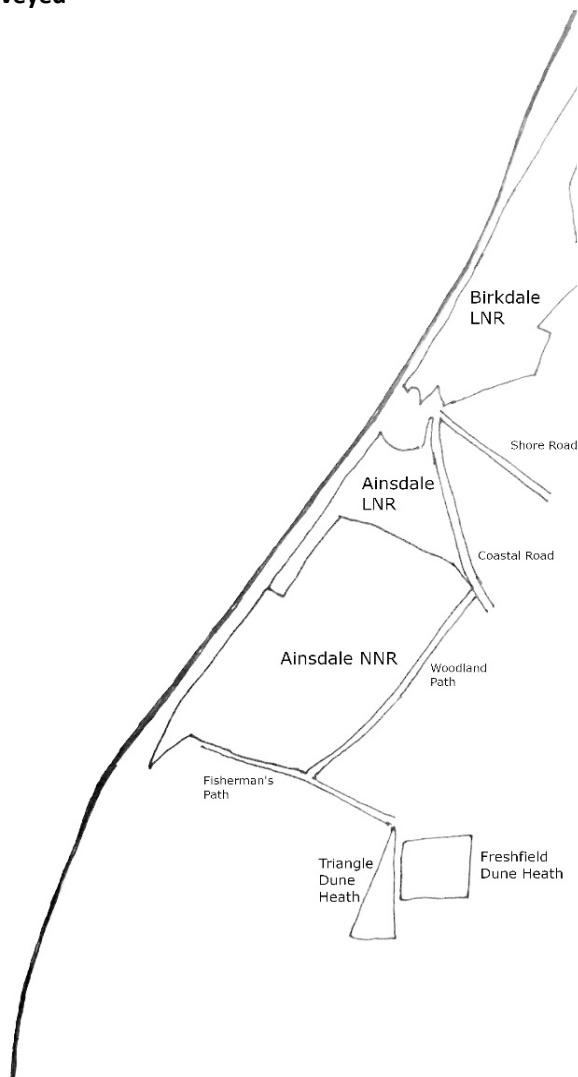


Feeding signs of the larva of *Anacamptis temerella* on *Salix repens* (Stainton, 1865).



The larva of *Anacamptis temerella* on *Salix repens* (Stainton, 1865).

Map of Ainsdale Dunes showing areas to be surveyed



Survey Method

The survey was carried out by looking for the larval stage of the moth in spinnings of *S. repens*, in the sand dunes of the Sefton and Fylde Coasts in Lancashire. It was expected that owing to the similarity of the larva of *A. populella*, and the lack of any photographs comparing the two species, larvae would need to be retained and reared to imago before identity could be absolutely confirmed.

Spinings of *S. repens* were to be collected from eight visits to the sites; two to Starr Hills LNR, Lytham St. Annes on the Fylde Coast, and six to various locations within the Ainsdale NNR and the Ainsdale and Birkdale LNR sites on the Sefton Coast. If time allowed, or spinnings were thin on the ground, then an option was to move south to investigate the dunes at Ravenmeols and Cabin Hill NNR.

The intention was to search each location for between four to six hours for tenanted spinnings, and to photograph all spinnings and larvae, so that on emergence they could be correlated with the moths.

By the end of the survey, I had made two visits to Starr Hills LNR, and eight visits to Ainsdale Dunes. I also made a further visit to the dunes at Hightown, south of Formby on 22.6.21. No tenanted micro-moth spinnings were found on *S. repens* at the latter site.

The ten visits were made between May 25th 2021 and June 22nd 2021, and are detailed below.

Table 2. Survey dates and sites, and confirmed presence of *A. temerella* larvae.

Day	Date	Central Grid Ref.	Site	<i>A. temerella</i> recorded
1	25.5.21	SD310308	Starr Hills Sand Dunes LNR, Lytham St Annes	No
2	28.5.21	SD292090 to SD291103	Triangle Dune Heath / south-eastern quarter of Ainsdale NNR	No / Yes
3	1.6.21	SD296122	Ainsdale LNR from Discovery centre	No
4	2.6.21	SD300115	Ainsdale LNR from West End Lodge	No
5	4.6.21	SD282100	South-western quarter of Ainsdale NNR from Fisherman's Path	Yes
6	7.6.21	SD296125 to SD299130	Northern section of Ainsdale LNR and southern section of Birkdale LNR	Yes
7	11.6.21	SD304137	Towards centre of Birkdale LNR from Discovery Centre.	Yes
8	14.6.21	SD310308	Starr Hills Sand Dunes LNR, Lytham St Annes	No
9	18.6.21	SD295106 to SD291105	Along Woodland Path from Coastal Road, to centre of Ainsdale NNR	No
10	22.6.21	SD299114 to SD291104	North-eastern quarter of Ainsdale NNR from Coastal Road	Yes

A secondary survey was also made of larvae of other species found feeding on *S. repens*, and this turned out to be quite an impressive list. Records were also made of species noted to be feeding on other foodplants in the same habitat, and of various insects, primarily Lepidoptera, found flying in the daytime visits to the dunes.

Results

Starr Hills Sand Dunes Local Nature Reserve (LNR)

The survey began with a visit to Starr Hills LNR, Lytham St. Annes on 25th May 2021, the last site where the moth was recorded. I was accompanied by Gary Hedges (from the Tanyptera Trust), Steve Palmer (County Moth Recorder for South Lancashire (VC59) and the National Gelechiid Recorder), and Richard Gallon (arachnologist).

Perhaps owing to the cold May, the *Salix repens* was somewhat undeveloped. However, we found spinnings of Microlepidoptera larvae in the terminal shoots to be plentiful. There were no obvious larvae of *A. temerella* noted on the visit to this site on 25th May 2021 (or on a subsequent visit on 14th June 2021).

Anacampsis populella was the most plentiful larva noted on both visits. Other species present in the larval form on *S. repens* included *Gelechia sororculella*, *Coleophora albidella*, *Coleophora lusciniapennella*, *Archips rosana*, *Acleris hastiana*, *Epinotia cruciana*, *Epinotia caprana* and White Satin Moth (*Leucoma salicis*).

Moths were reared from the larvae collected on both visits. There was no emergence of *A. temerella* from those collected.

Richard was using vacuum sampling using G-vac primarily to record spiders. A couple of elachistid moths were obtained from this process (*Elachista argentella*, *E. canapennella*), as well as his target arachnid species (*Styloctetor romanus*).

Ainsdale Dunes

The first visit was made to Freshfield and Ainsdale Dunes on 28th May 2021. The *S. repens* was much more advanced.

At Freshfield Dune Heath, the commonest larva was the Red-line Quaker (*Agrochola lota*), present in ten spinnings. These were not collected as their identity was clear. *Coleophora lusciniapennella* and *Coleophora albidella* were also present, with an adult moth reared from the latter. A couple of Microlepidoptera larvae were collected, one clearly *Anacampsis populella*.

Many spinnings were collected from Ainsdale Dunes NNR on this date, many of which potentially fitted the descriptions of the feeding signs of *A. temerella* given by Stainton and Bland et al. However, the larvae within appeared likely to be *A. populella*. As well as the two Coleophora species, a number of *Epinotia cruciana*, *E. caprana*, *A. hastiana* and *Pammene populana* larvae were also present.

Further visits to the Sefton Coast covered the area between Freshfield and the Ainsdale and Birkdale Sandhills LNR sites. Again, no larvae were immediately noted as definite specimens of *A. temerella*.

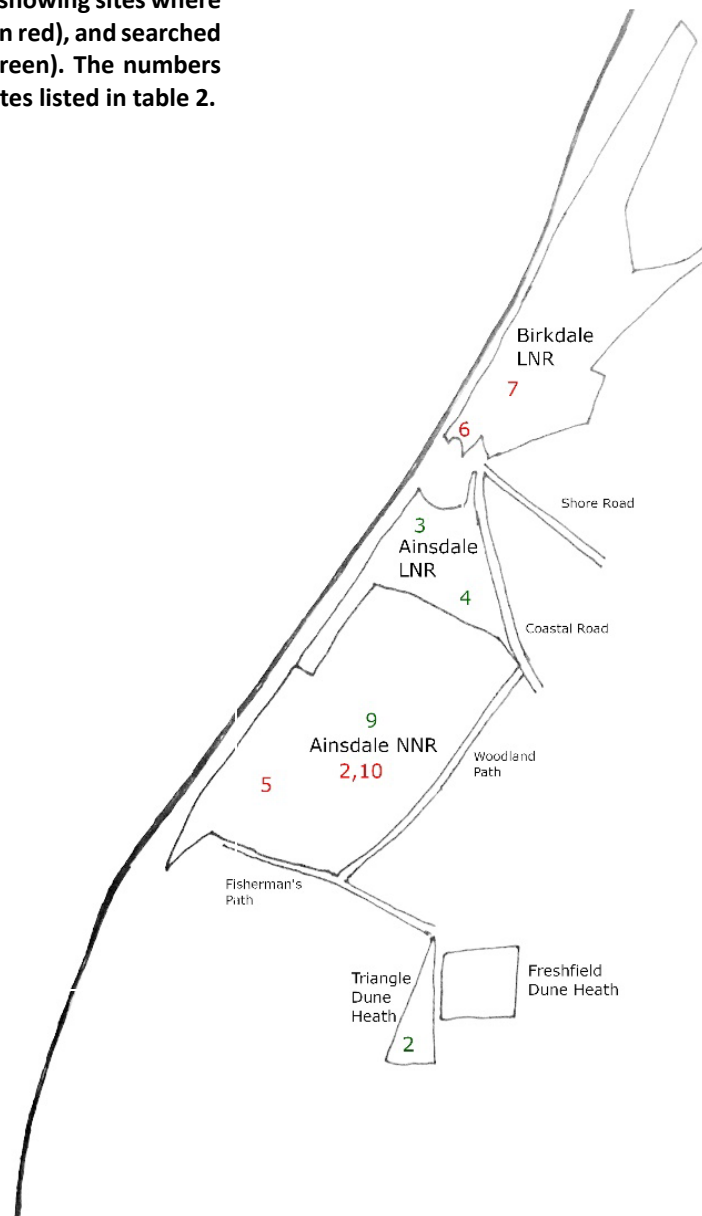
However, the spinnings were retained, and within a relatively short time, a number of *A. temerella* adults emerged. The first appeared on 15th June 2021 from a larva collected on 28th May 2021 at the Ainsdale Dunes NNR.

In total, twenty moths of *A. temerella* emerged between 15th June 2021 and 9th July 2021 from the spinnings collected from the Sefton Coast between 28th May 2021 and 22nd June 2021.

Nine of these emerged from the larvae collected on 28th May 2021 at the Ainsdale Dunes NNR, with seven of these from SD291104, and two from SD291103.

A return visit was made to this location at SD291104 on 22nd June 2021 for the purpose of releasing the moths. On this date, three further tenanted spinnings of *S. repens* were noted. Two of these contained larvae of *Anacamptis temerella*, one of which gave rise to an adult on 9th July 2021.

Map of Ainsdale Dunes showing sites where *A. temerella* recorded (in red), and searched for unsuccessfully (in green). The numbers indicate the days and sites listed in table 2.



Three further specimens of *A. temerella* emerged from larvae collected on 7th June 2021 at the Ainsdale and Birkdale Sandhills LNR in an area north of the Ainsdale Discovery Centre towards Birkdale at SD299130. Two more emerged on 29th June 2021, from larvae collected further north in the Birkdale Sandhills on 11th June 2021, with another three of this batch appearing over the next four days.

One imago emerged from spinings collected in the dunes, just north of Freshfield at SD282100 on 4th June 2021.

The records of *A. temerella* are summarised in table 3. The quantity relates to the number of adults successfully reared.

Because of the previous successful emergences, it was now possible to safely differentiate the larva of *A. temerella* from that of *A. populella*. This meant that the *A. temerella* larvae found on 22nd June 2021 could be recorded as such without the requirement to rear to imago. Having said that, two moths did subsequently emerge from the larvae.

Table 3. Records of *Anacamptis temerella* during 2021 survey.

Date	Location	No.	Details
28.05.21	Ainsdale Dunes NNR, SD291104	7	Emerged from spinings of <i>S. repens</i> from 15.06.21 to 23.06.21.
28.05.21	Ainsdale Dunes NNR, SD291103	2	Emerged from spinings of <i>S. repens</i> on 21.06.21.
04.06.21	Ainsdale Dunes NNR, SD282100	1	Emerged from spinning of <i>S. repens</i> on 26.06.21.
07.06.21	Birkdale Sandhills LNR, SD299130	3	Emerged from spinings of <i>S. repens</i> from 25.06.21 to 26.06.21.
11.06.21	Birkdale Sandhills LNR, SD304137	5	Emerged from spinings of <i>S. repens</i> from 29.06.21 to 03.07.21.
22.06.21	Ainsdale Dunes NNR, SD291104	2	Larvae in spinning of <i>S. repens</i> . Moths emerged 09.07.21 and 12.07.21.

Observations regarding the adult moth

There was very little variation in the twenty specimens of *Anacamptis temerella* reared. All had dark, fuscous forewings with a slight purplish reflection, and a broad, black fascia at three-quarters. A few small, obscure dark spots were also present on the discal area of the forewing, and at the base of the dark cilia. All had forewings between 5.5 and 6 mm in length, significantly smaller than the more plentiful *A. populella*, as the comparison shot below illustrates. The hindwing was also dark fuscous as was the abdomen. There was no sexual dimorphism apparent in external appearance.

The moth appears to have a reluctance to fly any distance. Following emergence, it would invariably just sit still in the pot. The moths are very easy to photograph as will quickly settle on the leaf. If the moth escaped whilst being photographed, it would flutter to the floor rather than flying towards the door or window. Behaviour was similar when released, with moths quickly settling on a leaf of *S. repens*, or descending to the base of the plant.

Small leaves of *S. repens* quickly turn black when damaged or fallen. It was noticeable how superficially similar the moth was to one of these leaves upon emergence.

Photographs of emerged *Anacamptis temerella*:



The first *Anacamptis temerella* to emerge on 15.06.21 from larva on *Salix.repens* at Ainsdale NNR 28.05.21.



One of the moths emerged on 21.06.21 from *S. repens*, shown at the release site at Ainsdale NNR.



Newly emerged moth on 26.06.21. From larva on *S. repens*, Ainsdale and Birkdale Sandhills LNR, Lancs 07.06.21.



Comparison of *A. temerella* and *A. populella*, both emerged 20.06.21 from *S. repens* at Ainsdale NNR 28.05.21.



Anacampsis temerella (female) em. 25.06.21 from larva on *Salix.repens* at Birkdale LNR 07.06.21 (set and photographed by Steve Palmer)

Description of larva, pupa and larval feeding signs

From the evidence of this survey, the larva does not appear particularly variable, although earlier instars have not been noted.

The final instar is 8 mm in length, and essentially matches the description given by Stainton (1865). The head is black, as is the finely medially divided prothoracic plate. The body is greyish white, although occasionally with a greenish or yellowish tinge. Black pinacula are present but are much smaller on the abdominal segments than on the thoracic segments. The anal plate is greyish white and finely speckled with darker grey markings. The thoracic legs are black. Prolegs are concolorous with the abdomen. Pale grey setae are present along the length of the body, and are approximately half of the abdomen width in length.

The most obvious ways to separate the larva visually from that of *A. populella* are:

- Smaller size (Final instar 8mm in *A. temerella*, 12mm in *A. populella*)
- The much smaller spots on the abdominal segments of the *A. temerella* larva
- The concolorous, slightly speckled, anal plate of *A. temerella*. Brown to orange in *A. populella*

The feeding signs of the two species are very similar, and thus far I have not been able to separate these without checking the larva within. Both spin terminal leaves together, usually with conspicuous, white stitches of silk. Long, tube-like spinings can be made by either species. However, in some cases the spinning is much shorter, only encompassing two or three leaves. Much frass is retained within the spinning.

Photographs of *Anacampsis temerella* larvae and feeding signs, and comparison to *Anacampsis populella* larvae and feeding signs:



Feeding signs of *Anacampsis temerella* on *Salix.repens* at Ainsdale and Birkdale Sandhills LNR 07.06.21.



Larval feeding signs of *A. temerella* on *S.repens* at Ainsdale NNR 22.06.21.



Larva of *A. temerella* from spinning on *S.repens*, Ainsdale and Birkdale Sandhills LNR, Lancs 11.06.21.



Larva of *A. temerella* from spinning on *S.repens* at Ainsdale NNR 22.06.21.



Larval feeding signs of *Anacampsis populella* on *S.repens* at Ainsdale NNR 04.06.21.



Larva of *Anacampsis populella* from Lytham 25.05.21. Adult emerged 19.06.21.



Larva of *A. temerella* from spinning on *Salix.repens*, Birkdale Sandhills LNR, Lancs 07.06.21.

Pupae were formed in lightly spun leaves, or in a few cases in tissue paper, or between paper and the side of the pot. The pupae were 5 to 5.5mm in length, brown, and slightly hairy. The cremaster contains about ten long bristles as can be seen in the photo below, right.



Anacamptis temerella pupa from larva collected at Ainsdale NNR on *Salix repens* 18.06.21. Moth emerged 09.07.21.

Description of micro-habitat

Nine of the moths emerged from larvae collected on 28th May 2021 at the Ainsdale Dunes NNR. Seven of these were from SD291104, and two from SD291103. Larvae, identifiable as those of *A. temerella*, were also collected from the first of these locations on 22nd June 2021.

These two grid references relate to areas close to the edge of the fixed dunes, near the western edge of the pinewoods. The soil was sandy, but was fixed soil nonetheless. Dune slacks were evident, although had largely dried at the time of the visit. The vegetation was short, no doubt aided by the presence of the rabbits evidenced by their droppings and their burrows. Sheep and cattle are also used within the dunes over winter to prevent excessive vegetation growth, so were not present at the time of the survey.

Large stands of Creeping Willow (*S. repens*) are present at the site, fully exposed to the elements. Small saplings of Silver Birch (*Betula pendula*) were also noted. Presently, these are not shading the *S. repens*, but need to be managed to ensure this does not happen.

Other plants recorded at the site included Common Bird's-foot-trefoil (*Lotus corniculatus*), White Clover (*Trifolium repens*), Common Self-heal (*Prunella vulgaris*), Tufted Vetch (*Vicia cracca*), Creeping Cinquefoil (*Potentilla reptans*), Bramble (*Rubus* sp.), Creeping Thistle (*Cirsium arvense*), Common Sorrel (*Rumex acetosa*) and Heath Speedwell (*Veronica officinalis*).

There were many short grasses growing around and amongst the *S. repens*, apparently kept short by rabbits, with no evidence of taller duneland grasses such as Marram (*Ammophila arenaria*) or Lyme-grass (*Leymus arenarius*) in the immediate vicinity.

Photographs from this site are included on the following page.

Photographs from site of *Anacamptis temerella* larval spinnings at Ainsdale Dunes NNR SD291104.



View from the *Salix.repens* at Ainsdale NNR SD291104, westwards towards the sand dunes.



View from the *Salix.repens* at Ainsdale NNR SD291104, eastwards towards the pine plantations.

Other vegetation at site of *Anacamptis temerella* larval spinnings at Ainsdale Dunes NNR SD291104.



Short grasses interspersed with *Trifolium repens*, *Lotus corniculatus*, *Rumex acetosa* and *Potentilla reptans*, surrounds the large patches of *Salix repens*.



There are patches of bare soil, with rabbit droppings and burrowing providing evidence of their presence.



A number of *Betula pendula* seedlings present in areas adjacent to the *Salix repens*.

Species richness on *Salix repens*

A secondary aim of the survey was to identify the number of Lepidoptera species that utilised *S. repens* in the dune habitats of Lancashire during this time of year. A total of 20 species were recorded feeding on the plant, and are listed in the table below.

Table 4: Species of Lepidoptera recorded on *Salix repens* during daytime larval searches on Sefton Coast and Starr Hills Dune LNR, 25th May 2021 to 22nd June 2021.

Species	Location(s) recorded	Total number of adults emerged
<i>Agonopterix conterminella</i>	Starr Hills Dunes LNR, Lytham	1
<i>Agonopterix ocellana</i>	Ainsdale Dunes NNR	1
<i>Anacamptis populella</i>	Starr Hills Dunes LNR, Lytham St Annes Freshfield Dune Heath Ainsdale Dunes NNR Ainsdale and Birkdale Sandhills LNR	88
<i>Anacamptis temerella</i>	Ainsdale Dunes NNR Ainsdale and Birkdale Sandhills LNR	20
<i>Gelechia sororculella</i>	Starr Hills Dunes LNR, Lytham Ainsdale and Birkdale Sandhills LNR	3
<i>Coleophora lusciniæpennella</i>	Starr Hills Dunes LNR, Lytham Freshfield Dune Heath Ainsdale Dunes NNR Ainsdale and Birkdale Sandhills LNR	1
<i>Coleophora albidella</i>	Starr Hills Dunes LNR, Lytham Freshfield Dune Heath Ainsdale Dunes NNR	1
<i>Archips rosana</i>	Starr Hills Dune LNR, Lytham Ainsdale Dunes NNR	4
<i>Acleris hastiana</i>	Starr Hills Dunes LNR, Lytham Ainsdale Dunes NNR Ainsdale and Birkdale Sandhills LNR	12
<i>Celypha lacunana</i>	Starr Hills Dunes LNR, Lytham	1
<i>Epinotia caprana</i>	Starr Hills Dunes LNR, Lytham	9
<i>Epinotia cruciana</i>	Starr Hills Dunes LNR, Lytham Freshfield Dune Heath Ainsdale Dunes NNR Ainsdale and Birkdale Sandhills LNR	20
<i>Pammene populana</i>	Starr Hills Dunes LNR, Lytham Freshfield Dune Heath Ainsdale Dunes NNR Ainsdale and Birkdale Sandhills LNR	8
July Highflyer (<i>Hydriomena furcata</i>)	Ainsdale Sandhills LNR	1
Winter Moth (<i>Operophtera brumata</i>)	Starr Hills Dunes LNR, Lytham Birkdale Sandhills LNR	0
Early Tooth-striped (<i>Trichopteryx carpinata</i>)	Birkdale Sandhills LNR	0
White Satin Moth (<i>Leucoma salicis</i>)	Starr Hills Dunes LNR, Lytham Ainsdale Dunes NNR Ainsdale and Birkdale Sandhills LNR	0
Yellow-tail (<i>Euproctis similis</i>)	Birkdale Sandhills LNR	0
Dark Tussock (<i>Dicallomera fascelina</i>)	Starr Hills Dunes LNR, Lytham	0
Red-line Quaker (<i>Agrochola lota</i>)	Starr Hills Dunes LNR, Lytham Freshfield Dune Heath Ainsdale Dunes NNR Ainsdale and Birkdale Sandhills LNR	0

Larvae feeding on *Salix repens* at Sefton and Fylde dunes.



Agonopterix conterminella larva*



Agonopterix ocellana larva*



Gelechia sororculella larva*



Coleophora luscinaepennella larval case*



Coleophora albidella larval case*



Archips rosana larva*



Epinotia caprana larva*



Epinotia cruciana larva*



Pammene populana larva*



July Highflyer (*Hydriomena furcata*) larva*



Winter Moth (*Operophtera brumata*) larva



Early Tooth-striped (*Trichopteryx carpinata*) larva



White Satin Moth (*Leucoma salicis*) larva



Yellow-tail (*Euproctis similis*) larva



Red-line Quaker (*Agrochola lota*) larva

* Indicates the moth was reared from the larval stage.

Species richness of the Lancashire Coast

Table 5: Other species of Lepidoptera recorded during daytime searches on Sefton Coast and Starr Hills Dunes LNR, 25th May 2021 to 22nd June 2021.

Species	Location	Details
<i>Dyseriocrania subpurpurella</i>	Ainsdale SD2909	Mines on oak (<i>Quercus</i> sp.).
<i>Eriocrania unimaculella</i>	Ainsdale SD2909	Mines on birch (<i>Betula</i> sp.).
<i>Eriocrania salopiella</i>	Ainsdale SD2909	Mines on birch (<i>Betula</i> sp.).
<i>Eriocrania semipurpurella</i>	Ainsdale SD2909	Mines on birch (<i>Betula</i> sp.).
<i>Gracillaria syringella</i>	Freshfield SD2908	Mines on Lilac (<i>Syringa vulgaris</i>).
<i>Aspilapteryx tringipennella</i>	Starr Hills SD3130	Mine on Ribwort Plantain (<i>Plantago lanceolata</i>).
<i>Yponomeuta padella</i>	Ainsdale SD3011	Larval web on Hawthorn (<i>Crataegus monogyna</i>).
<i>Swammerdamia pyrella</i>	Hightown SD2902	Larva in web on Hawthorn (<i>Crataegus monogyna</i>).
<i>Plutella xylostella</i>	Birkdale SD2913	Moth flying in day.
<i>Glyphipterix fuscoviridella</i>	Ainsdale SD2912	Moths flying in day.
<i>Lyonetia clerkella</i>	Ainsdale SD3011	Mines on Hawthorn (<i>Crataegus monogyna</i>).
<i>Depressaria daucella</i>	Birkdale SD2913	Larvae on Hemlock Water-dropwort (<i>Oenanthe crocata</i>).
<i>Aproaerema anthyllidella</i>	Starr Hills SD3130	Larvae on Kidney Vetch (<i>Anthyllis vulneraria</i>).
<i>Neofaculta ericetella</i>	Freshfield SD2909	Flying over Heather (<i>Calluna vulgaris</i>).
<i>Coleophora limosipennella</i>	Freshfield SD2908	Larval case on elm (<i>Ulmus</i> sp.). New Lancs record.
<i>Coleophora discordella</i>	Starr Hills SD3130	Larval case on Common Bird's-foot-trefoil (<i>Lotus corniculatus</i>).
<i>Coleophora paripennella</i>	Starr Hills SD3130	Larval case on Common Knapweed (<i>Centaurea nigra</i>).
<i>Elachista argentella</i>	Ainsdale SD2912 etc.	Moth common at Lytham, Ainsdale, Birkdale. Also obtained by 'vacuum' sampling by R. Gallon.
<i>Elachista canapennella</i>	Starr Hills SD3130	Moth obtained by 'vacuum' sampling by R. Gallon.
<i>Mompha conturbatella</i>	Ainsdale SD2909	Spinings of Rosebay Willowherb (<i>Chamaenerion angustifolium</i>).
<i>Mompha langiella</i>	Ainsdale SD3011	Mine on Rosebay Willowherb (<i>Chamaenerion angustifolium</i>).
<i>Mompha sturnipennella</i>	Ainsdale SD2909	Galls on Rosebay Willowherb (<i>Chamaenerion angustifolium</i>).
<i>Mompha raschkiella</i>	Ainsdale SD2909	Mine on Rosebay Willowherb (<i>Chamaenerion angustifolium</i>).
<i>Zelotherses paleana</i>	Starr Hills SD3130	Larva feeding between spun grasses.
<i>Apotomis turbidana</i>	Ainsdale SD3011	Moth resting on bridge by Pinfold Meadow.
<i>Orthotaenia undulana</i>	Starr Hills SD3130	Larva on apple (<i>Malus</i> sp.).
<i>Hedya nubiferana</i>	Starr Hills SD3130	Larvae on apple (<i>Malus</i> sp.) and Hawthorn (<i>Crataegus monogyna</i>).
<i>Gyponoma aceriana</i>	Birkdale SD2913	Larval feeding signs on Black-poplar hybrid (<i>Populus nigra</i> var.)
<i>Notocelia uddmanniana</i>	Ainsdale SD2912	Larva in spinings on Bramble (<i>Rubus fruticosus</i>).
<i>Clavigesta purdeyi</i>	Ainsdale SD2910	Larvae descending from Scots Pine (<i>Pinus sylvestris</i>).
<i>Cydia ulicetana</i>	Freshfield SD2909	Moths flying around Gorse (<i>Ulex europaeus</i>).
<i>Grapholita compositella</i>	Starr Hills SD3130	Moth observed during day.
<i>Homeosoma sinuella</i>	Starr Hills SD3130	Moth observed during day.
<i>Acrobasis advenella</i>	Starr Hills SD3130	Larva on Hawthorn (<i>Crataegus monogyna</i>).
<i>Anania fuscalis</i>	Ainsdale SD2912	Moth flying. Also at Birkdale and Starr Hills, Lytham.
<i>Chrysoteuchia culmella</i>	Birkdale SD2913	Moth flying in day.
<i>Crambus lathoniellus</i>	Ainsdale SD2912	Moth flying. Also at Birkdale Dunes.
Scalloped Hook-tip (<i>Falcaria lacertinaria</i>)	Ainsdale SD2909	Larva on birch (<i>Betula</i> sp.).
Satin Wave (<i>Idaea subsericeata</i>)	Birkdale SD2913	Moth flying in day.
Dark-barred Twin-spot Carpet (<i>Xanthorhoe ferrugata</i>)	Birkdale SD2913	Moth flying in day.
Yellow Shell (<i>Camptogramma bilineata</i>)	Starr Hills SD3130	Moth flying in day.
Grass Rivulet (<i>Perizoma albulata</i>)	Birkdale SD2913	Moth flying. Also at Starr Hills, Lytham.
Puss Moth (<i>Cerura vinula</i>)	Birkdale SD2913	Larvae and eggs on White Poplar (<i>Populus alba</i>) and Black-poplar hybrid (<i>Populus nigra</i> var.)
Dark Tussock (<i>Dicallomera fascelina</i>)	Starr Hills SD3130	Larva feeding on Hawthorn (<i>Crataegus monogyna</i>). (recorded on this foodplant as well as <i>Salix repens</i>)
White Ermine (<i>Spilosoma lubricipeda</i>)	Ainsdale SD3011	Moth flying in day.
Cinnabar (<i>Tyria jacobaeae</i>)	Ainsdale SD2910	Larvae on Common Ragwort (<i>Jacobaea vulgaris</i>).
Silver Y (<i>Autographa gamma</i>)	Ainsdale SD3011	Moth flying in day.
Lychnis (<i>Hadena bicruris</i>)	Ainsdale SD2909	Larvae feeding in heads of Red Campion (<i>Silene dioica</i>).

Larvae feeding on foodplants other than Creeping Willow (*Salix repens*) at Sefton and Fylde dunes.



Dyseriocrania subpurpurella mine on oak (*Quercus* sp.)



Eriocrania unimaculella leaf-mine on birch (*Betula* sp.)



Eriocrania salopiella leaf-mine on birch (*Betula* sp.)



Depressaria daucella larva on Hemlock Water-dropwort (*Oenanthe crocata*)*



Aproaerema anthyllidella larva on Kidney Vetch (*Anthyllis vulneraria*)



Coleophora limosipennella larval case on elm (*Ulmus* sp.). New for Lancashire.



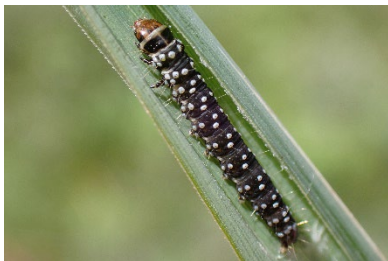
Coleophora paripunctella larval case on Common Knapweed (*Cenataurea nigra*)



Mompha conturbatella larva from spinning on Rosebay Willowherb (*Chamaenerion angustifolium*)*



Mompha sturnipennella feeding signs on Rosebay Willowherb (*Chamaenerion angustifolium*)*



Zelotes paleana larva between spun grass blades



Clavigesta purdeyi larva descended from Scots Pine (*Pinus sylvestris*) branches*



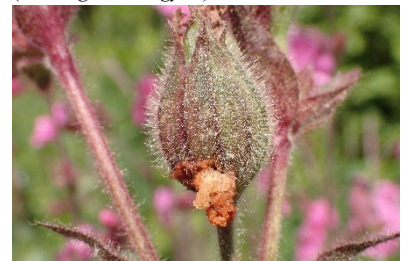
Acrobasis advenella larva on Hawthorn (*Crataegus monogyna*)



Puss Moth (*Cerura vinula*) larva on Black-poplar hybrid (*Populus nigra* var.)



Dark Tussock (*Dicallomera fascelina*) larva on Hawthorn (*Crataegus monogyna*)



Lychnis (*Hadena bicruris*) larva feeding signs on Red Campion (*Silene dioica*)

* Indicates the moth was reared from the larval stage.

Recommendations

1. Further surveys of Starr Hills Dunes, Lytham St Annes and wider areas of Sefton coast (Ravenmeols, Cabin Hill NNR, Formby Dunes, Hightown etc.) to assess if *Anacamptis temerella* is geographically more widespread than this survey has been able to demonstrate.
2. Continued management of fixed dunes to ensure good stands of *Salix repens* remain unshaded by saplings of other tree species, particularly *Betula pendula* and *Pinus sylvestris*. Continued use of sheep and cattle, plus ongoing presence of rabbits, helps to ensure vegetation does not become overgrown and patches of bare soil remain.
3. Ensure the findings of this survey are publicly available to micro-lepidopterists to encourage similar surveys of likely habitats in other parts of the country, particularly in those counties where the moth has previously been recorded. Increased awareness of the crucial differences between larvae of *Anacamptis temerella* and *A. populella* should aid such surveys.

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