

Moth recording in the Burren in 2021 and 2022



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An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage



An tSeirbhís Páirceanna Náisiúnta
agus Fiadhúlra
National Parks and Wildlife Service

Front cover photographs clockwise from top left: Native Scots Pine at Rockforest (ÁOC), Burren Green (BN), Autumnal Rustic (BN), Small Elephant and Elephant Hawk-moths (BN)

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1. INTRODUCTION

In January 2021, a group of NPWS staff based at North King Street who are also moth recorders made plans to survey the Scots Pine woodland at Rockforest. Few invertebrate records existed for the site. This and the occurrence of a native population of Scots Pine made survey of the associated insect fauna desirable.

While in the Burren, the opportunity was taken to visit and sample a number of other sites, chief amongst which were the Burren National Park properties at Ballyogan and Slieve Carran. This work continued in 2022 associated with the Burren Invertebrate Conference held at the Michael Cusack Centre, when a range of sites in the National Park and wider Burren were surveyed.

Access to all NPWS sites was facilitated by CR Emma Glanville, who also, essentially, guided the surveyors into the Rockforest Pine Wood on their first visit.

The principal surveyors were Brian Nelson, Ferdia Marnell and Áine O Connor (Scientific Unit, NPWS) and Michael O Donnell of Moths Ireland. Gareth O'Donnell and Cindy Kingston also moth-trapped in July 2021 at Ballyogan and kindly provided their trap lists from this site. Assistance with opening traps was provided by Emma Glanville, Amanda Pedlow, Áine Dillon, and Rachel McKenna.

An initial excursion was planned for May 2021, after which a September 2021 trip was scheduled. Brian Nelson made additional trips to the Burren in July and October 2021. In 2022, trapping took place on several dates in June and August with a dedicated trip in September by Brian Nelson, Ferdia Marnell and Áine O Connor.

2. METHODS AND SITES SURVEYED

Table 1 lists the survey trips, sites visited and surveyors and Figure 1 shows the locations of the sites.

Table 1 Burren moth and other insect survey trips in 2021 and 2022. Full details of moth trapping effort are provided in Appendix I. Sites which are in NPWS ownership are underlined. Sites where light-traps were not used to sample moths are shown in blue text.

Trip	Dates	Sites surveyed	Surveyors
1	24 to 28 May 2021	<u>Ballyogan Nature Reserve</u> , <u>Muckanagh Lough</u> , Rockforest Lough and Townland, <u>Rockforest Pine Wood</u> and <u>Turlough, Slieve Carran</u>	Ferdia Marnell, Brian Nelson, Áine O Connor
2	19 to 21 July 2021	<u>Ballyogan Nature Reserve</u> , Crehaun Townland, <u>Rockforest Pine Wood</u>	Brian Nelson, Gareth O'Donnell, Cindy Kingston
3	1 to 3 September 2021	<u>Ballyogan Nature Reserve</u> , <u>Lough Bunny</u> , <u>Rockforest Pine Wood</u> , Rockforest Townland, <u>Slieve Carran Nature Reserve</u>	Ferdia Marnell, Brian Nelson, Áine O Connor, Michael O'Donnell
4	11 to 12 October 2021	<u>Ballyogan Nature Reserve</u> , <u>Cooloorta-Burren National Park</u>	Brian Nelson
5	7 to 8 June 2022	<u>Ballyogan Nature Reserve</u> , Cartron Townland, <u>Garryland Nature Reserve</u>	Brian Nelson
6	13 to 15 June 2022	<u>Cahercommaun</u> , <u>Knockaunroe Townland and Turlough (West)</u> , Michael Cusack Centre <u>Poulaphouca Townland</u> , <u>Poulnalour Townland</u> , <u>Tullycommon Townland</u> ,	Brian Nelson, Áine O Connor
7	9 to 10 August 2022	<u>Cooloorta-Burren National Park</u> , Michael Cusack Centre <u>Poulaphouca Townland</u> ,	Ferdia Marnell, Brian Nelson, Áine O Connor
8	19 to 21 September 2022	<u>Coole Park</u> , <u>Cooloorta-Burren National Park</u> , <u>Crehaun Townland</u> , <u>Cooloorta and Leitra Townlands</u>	Ferdia Marnell, Brian Nelson, Áine O Connor

For moth surveying, Actinic Heath traps (6w) (see Figure 2), Robinson traps (125w) (Figure 3), a Skinner trap (125w) and a compact Skinner trap (20w) (Figure 4) were used (see Appendix I for details of dates and locations at which traps were used). Traps were set before sunset and collected within two hours of sunrise the following morning. Moths were released following identification (Figure 5) on the day of collection. Moth trapping took place on 12 nights in 2021 and 9 nights in 2022.

At Rockforest Turlough, located within the Rockforest Pine Wood, Muckanagh Lough, Rockforest Lough and turlough system at Knockaunroe West, aquatic Coleoptera were sampled (by BN and ÁOC) using standard 1 mm mesh pond nets. Brian Nelson also used sweep-netting and beating at all locations. Specimens of critical taxa were taken when necessary for identification and as vouchers.

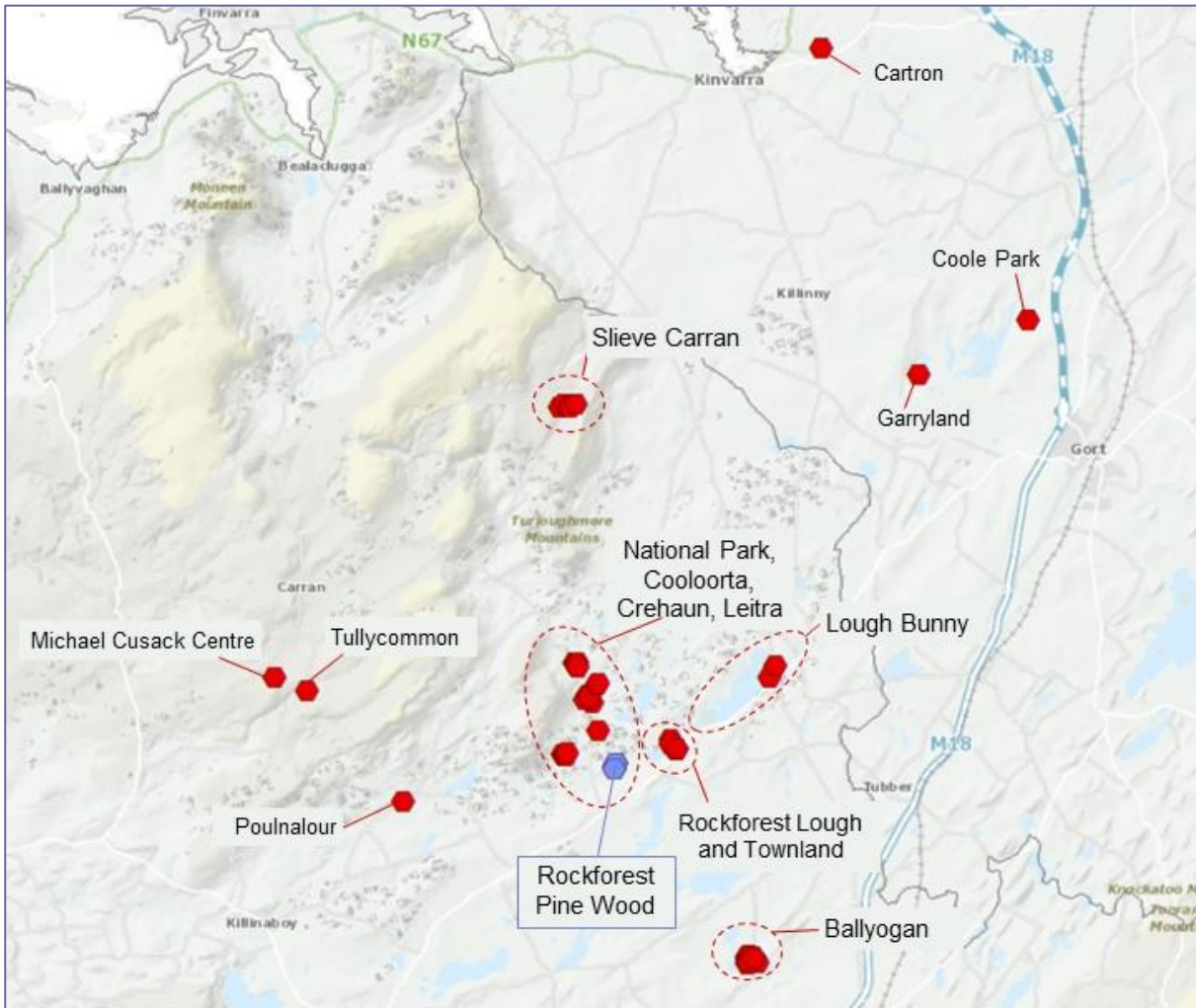


Figure 1 Overview map of Burren sites surveyed where light traps were deployed in 2021 and 2022.



Figure 2 Actinic Heath trap (6w) at Rockforest Pine Wood with, left to right, Michael O'Donnell, Brian Nelson and Ferdia Marnell.



Figure 3 Robinson trap (left foreground, light removed) with, left to right, Ferdia Marnell, Michael O'Donnell, Amanda Pedlow and Rachel McKenna.



Figure 4 Compact Skinner Trap with, left to right, Áine O Connor and Ferdia Marnell.



Figure 5 Going through traps September 2022, Coole Park with left to right, Ferdia Marnell, Áine Dillon and Áine O Connor. Few of the moth-trap locations had such excellent facilities.

3. RESULTS

In total, 1,429 records of 312 moth species or aggregate species were made over the two years (Appendices II and III). 1,397 (98%) of the records came from traps from the trapping sessions. The remaining 32 records of 21 species were daytime sightings of adults or caterpillars, species netted or attracted to pheromone traps. Four threatened and four near threatened moth species were recorded, plus one species new to the Burren and one new to County Clare (Table 2). These finds were across a number of the trapped sites and not just on the well-trapped locations. The most species-rich site was Ballyogan Nature Reserve with 209 species, followed by the broad Cooiloorta area with 100 species, Rockforest Lough and adjacent field and garden with a combined total of 93 species and Rockforest Pine Wood with total of 92 species (Appendices II and III). These totals very much reflect the effort put in to the sites, Ballyogan's total being boosted by a night of trapping in July 2021 at the height of the season in optimal conditions with large traps run by an expert micro-moth recorder.

Other insect groups are not covered in this report but a couple of records are worth highlighting. Áine O Connor and Brian Nelson found *Ochthebius nilssoni* in Lough Bunny and the lough at Cooiloorta in September 2022. This water beetle, which is restricted to the most extremely base-rich and oligotrophic marl lakes, is known from both but these are the first records since 2013 and 2007, respectively. Another very significant record was that of *Pilophorus clavatus*, a new species of Heteroptera (true bug) for Ireland collected at Ballyogan by Brian Nelson during his visit in July (Nelson and Doherty, 2022).

Table 2 List of threatened and near threatened moths recorded in the survey along with and those which are new county or Burren records.

ABH code	Species common name	Scientific name	Attribute
63.077		<i>Chilo phragmitella</i>	New to Burren
54.002	Forester	<i>Adscita stances</i>	Endangered
70.056	Royal Mantle	<i>Catarhoe cuculata</i>	Vulnerable
70.096	Autumn Green Carpet	<i>Chloroclysta miata</i>	New to Co Clare
70.056	Chimney Sweeper	<i>Odezia atrata</i>	Vulnerable
70.056	Heath Rivulet	<i>Perizoma minorata</i>	Vulnerable
72.067	Small Purple-barred	<i>Phytometra viridaria</i>	Near Threatened
73.033	Figure of Eight	<i>Diloba caeruleocephala</i>	Near Threatened
73.116	Burren Green	<i>Calamia tridens</i>	Near Threatened
73.164	Reddish Light Arches	<i>Apamea sublustris</i>	Near Threatened

Section 3.1 below provides further information on the noteworthy moth species recorded and section 3.2 has accounts of the main sites surveyed: Rockforest Pine Wood and Turlough; Rockforest Lough and adjacent field and garden; Ballyogan Nature Reserve; Slieve Carran Nature Reserve and the Cooiloorta area.

3.1 Notable species accounts

This section gives short accounts of 20 micro-moth and 32 macro-moth species considered noteworthy in some way. Summary information on these species is provided in Tables 3 and 4 with brief information on their habitat and the number of records for each species.

Table 3 List of the noteworthy micro-moth species recorded in the Burren region in 2021 and 2022. The number of 1 km records each species was recorded from is given with, in brackets, the number of those that are new 1 km.

Species	1 km records	Sites recorded	Habitat information
<i>Psyche casta</i>	1 (1 new)	Rockforest Pine Wood	Tree trunks; feeds on mosses
<i>Paraswammerdamia albicapitella</i>	1 (1 new)	Ballyogan	Blackthorn scrub
<i>Depressaria badiella</i>	1 (1 new)	Cooloorta (Burren National Park)	Dry sandy or calcareous grassland
<i>Aproaerema anthyllidella</i>	1 (1 new)	Ballyogan	Calcareous grassland with Kidney Vetch <i>Anthyllis vulneraria</i> .
<i>Acompsia cinerella</i>	1 (1 new)	Ballyogan	Associated with moss growing on trees; largely coastal in Ireland
<i>Scrobipalpa costella</i>	1 (1 new)	Ballyogan	Hedges and wetlands with Bitter-sweet <i>Solanum dulcamara</i>
<i>Elachista albidella</i>	1 (1 new)	Ballyogan	Wet heaths.
<i>Mompha subbistrigella</i>	1 (1 new)	Ballyogan	Wetlands and woodlands with <i>Epilobium</i> species
Thyme Plume <i>Merrifieldia leucodactyla</i>	1 (1 new)	Ballyogan	Calcareous grassland with Wild Thyme <i>Thymus drucei</i>
<i>Epagoge grotiana</i>	1 (1 new)	Ballyogan	Woodland and sand dunes, feeding on dead leaves of oak and bramble
<i>Eana penziana</i>	2 (1 new)	Ballyogan, Slieve Carran	Rocky coasts and limestone pavement
<i>Acleris holmiana</i>	1 (1 new)	Ballyogan	Hawthorn feeder
<i>Acleris schalleriana</i>	1 (1 new)	Slieve Carran	Scrub with Guelder Rose <i>Viburnum opulus</i>
<i>Lobesia littoralis</i>	1 (1 new)	Ballyogan	Sea-cliffs, saltmarshes, vegetated shingle and limestone pavement
<i>Notocelia incarnatana</i>	1 (1 new)	Rockforest Lough and Townland	Calcareous areas with Burnet Rose <i>Rosa pimpinellifolia</i>
<i>Lathronympha strigana</i>	2 (2 new)	Ballyogan, Slieve Carran	Limestone pavement, open scrub.
Scarce Crimson & Gold <i>Pyrausta sanguinalis</i>	2 (1 new)	Ballyogan, Cooloorta (Burren National Park)	Calcareous grassland with scrub
White-spotted Sable <i>Anania funebris</i>	2 (2 new)	Slieve Carran, Tullycommon Townland	Open scrub, woodland clearings and rocky grassland
<i>Eudonia lineola</i>	1 (1 new)	Ballyogan	Coastal rocks and limestone pavement
<i>Chilo phragmitella</i>	1 (1 new)	Ballyogan	New to the Burren. Wetlands

Table 4 List of the noteworthy macro-moth species recorded in the Burren region in 2021 and 2022. The number of 1 km records each species was recorded in is given with, in brackets, the number of those that are new 1 km.

Species	1 km records	Sites recorded	Habitat information
Red-tipped Clearwing <i>Synanthedon formicaeformis</i>	1 (1 new)	Ballyogan	Wetlands with willow; larvae feed internally in trees
Forester <i>Adscita statices</i>	1 (1 new)	Michael Cusack Centre and surrounds	Red-listed Endangered Grassland and fen; larval foodplants are species of sorrel <i>Rumex</i>
Pale Eggar <i>Trichiura crataegi</i>	6 (5 new)	Ballyogan, Rockforest Pine Wood, Slieve Carran	Woodland, scrub, foodplant are birch <i>Betula</i> spp.
Lackey <i>Malacosoma Neustria</i>	2 (2 new)	Ballyogan, Rockforest Pine Wood	Sunny scrub with Hawthorn <i>Crataegus monogyna</i> and Blackthorn <i>Prunus spinosa</i> .

Species	1 km records	Sites recorded	Habitat information
Small Elephant Hawk-moth <i>Deilephila porcellus</i>	1 (1 new)	Rockforest Lough and Townland	Dry grasslands with Ladies Bedstraw <i>Galium verum</i>
Royal Mantle <i>Catarhoe cuculata</i>	1 (1 new)	Ballyogan	Red-listed Vulnerable Dry, calcareous grassland and scrub; larval foodplants are species of bedstraw <i>Galium</i> spp.
Galium Carpet <i>Epirrhoe galiata</i>	2 (2 new)	Ballyogan, Creehaun (National Park)	Coastal and calcareous grassland; larval foodplants are species of bedstraw <i>Galium</i> spp.
Chestnut-coloured Carpet <i>Thera cognata</i>	2 (2 new)	Ballyogan, Rockforest Pine Wood	One of the Juniper-feeding species
Autumn Green Carpet <i>Chloroclysta miata</i>	1 (1 new)	Cooloorta (Burren National Park)	New to Co Clare. Open woodland and scrub. Foodplants include Rowan <i>Sorbus aucuparia</i> and willows <i>Salix</i> spp
Chimney Sweeper <i>Odezia atrata</i>	1 (1 new)	Tullycommon Townland and Cahercommaun	Red-listed Vulnerable Day-flying moth of woodland rides, damp grasslands. Foodplant is Pignut <i>Conopodium majus</i>
Twin-spot Carpet <i>Mesotype didymata</i>	2 (1 new)	Slieve Carran	Heath and grassland with scrub; feeding amongst others on Heather <i>Calluna vulgaris</i>
Heath Rivulet <i>Perizoma minorata</i>	1 (1 new)	Slieve Carran	Red-listed Vulnerable Calcareous grassland with eyebright <i>Euphrasia</i> spp. Burren only species
Juniper Pug <i>Eupithecia pusillata</i>	1 (1 new)	Rockforest Lough and Townland	Calcareous areas with Juniper <i>Juniperus communis</i>
Tawny-speckled Pug <i>Eupithecia icterata</i>	5 (5 new)	Ballyogan, Cooloorta (Burren National Park), Michael Cusack Centre, Slieve Carran	Grassland with Yarrow and other <i>Achillea</i> spp.
Speckled Yellow <i>Pseudopanthera macularia</i>	4 (3 new)	Ballyogan, Muckanagh Lough, Rockforest Lough and Townland	Calcareous grassland with scrub
Dew Moth <i>Setina irrorella</i>	1 (1 new)	Ballyogan	Rocky habitats with lichens
Small Purple-barred <i>Phytometra viridaria</i>	1 (0 new)	Ballyogan	Near Threatened Calcareous grassland and heathland; foodplants are species of milkwort <i>Polygala</i> spp.
Figure of Eight <i>Diloba caeruleocephala</i>	2 (1 new)	Ballyogan, Cooloorta (Burren National Park)	Near Threatened Scrub and woodland edge with Blackthorn <i>P. spinosa</i>
Sweet Gale Moth <i>Acronicta cinerea</i>	2 (1 new)	Ballyogan, Poulnalour	Heaths and calcareous grassland on rocky sites. Larval foodplants include Heather <i>C. vulgaris</i> and Bog Myrtle <i>Myrica gale</i>
Coronet <i>Craniophora ligustri</i>	1 (1 new)	Ballyogan	Woodland and scrub adjacent to calcareous grassland and fens. Ash <i>Fraxinus excelsior</i> is one of the main foodplants.
Anomalous <i>Stilbia anomala</i>	9 (8 new)	Ballyogan, Cooloorta (Burren National Park), Creehaun, Cooloorta-Leitra townland, Lough Bunny, Rockforest Pine Wood, Rockforest Lough and Townland	Mainly coastal grasslands. Feed on <i>Deschampsia</i> spp.
Straw Underwing <i>Thalpophila matura</i>	2 (1 new)	Ballyogan, Creehaun	Calcareous grassland, heathland and sand-dunes. The larvae feed on grasses.

Species	1 km records	Sites recorded	Habitat information
Burren Green <i>Calamia tridens</i>	6 (3 new)	Ballyogan, Cooloorta (Burren National Park), Rockforest Lough and Townland, Slieve Carran,	Near Threatened Calcareous grassland with Blue Moor-grass <i>Sesleria caerulea</i> .
Least Minor <i>Photedes captiuncula</i>	2 (0 new)	Poulnalour, Rockforest Pine Wood	Calcareous grassland. Known foodplant is the sedge <i>Carex flacca</i> but possibly also Blue Moor-grass <i>S. caerulea</i>
Reddish Light Arches <i>Apamea sublustris</i>	1 (0 new)	Poulnalour	Near Threatened Calcareous grassland. Feeds on grasses
Grey Chi <i>Antitype chi</i>	5 (5 new)	Ballyogan, Lough Bunny, Rockforest Lough and Townland, Slieve Carran,	Heath, moor and grassland with rocky outcrops. Many foodplants reported
Northern Deep-brown Dart <i>Aporophyla lueneburgensis</i>	4 (4 new)	Cooloorta (Burren National Park), Cooloorta-Leitra townland, Creehaun (National Park), Slieve Carran	Heathland and upland grassland. Foodplants are Heather and Bird's-foot Trefoil <i>Lotus corniculatus</i>
Hedge Rustic <i>Tholera cespitis</i>	6 (6 new)	Ballyogan, Lough Bunny, Rockforest Pine Wood, Rockforest Lough and Townland, Slieve Carran	Open habitats. Larvae feed on coarse grasses
Shoulder-striped Wainscot <i>Leucania comma</i>	1 (1 new)	Rockforest Lough and Townland	Open habitats. Larvae feed on Cock's-foot <i>Dactylis glomerata</i>
Barred Chestnut <i>Diarsia dahlia</i>	5 (5 new)	Ballyogan, Rockforest Pine Wood, Rockforest Lough and Townland, Slieve Carran	Broad-leaved woodland and heath; foodplants include birch, bramble and willows
Northern Rustic <i>Standfussiana lucernea</i>	2 (2 new)	Creehaun, Rockforest Pine Wood, Slieve Carran	Sparsely vegetated open habitats. Foodplants low growing herbaceous plants including stonecrops <i>Sedum</i> spp.
Autumnal Rustic <i>Eugnorisma glareosa</i>	9 (9 new)	Ballyogan, Cooloorta (Burren National Park), Cooloorta-Leitra townland, Creehaun (National Park), Lough Bunny, Rockforest Pine Wood, Rockforest Lough and Townland, Slieve Carran	Many open habitats heath and grasslands, open woods. Utilises a number of foodplants

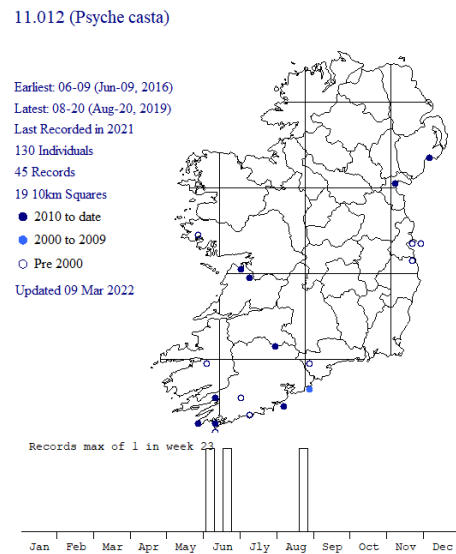
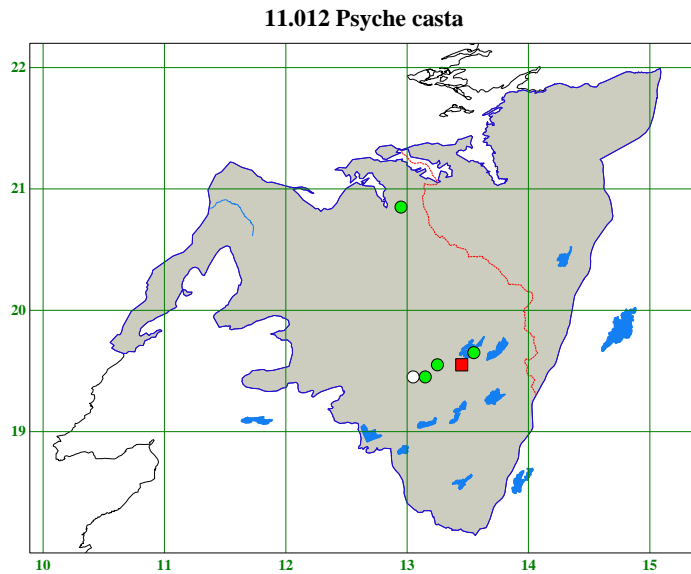
In the following sub-sections, species are listed in taxonomic order following Agassiz *et al.* (2013). This order is indicated by a unique number for each species (the ABH number) which comprises two parts. The first part, the number before the decimal point, denotes the family. The second part, the number after the decimal point, denotes the species and the order it falls within that family. Aggregate species which are those that cannot be identified by sight are denoted by “x” after the ABH number. The ABH number is shown on the maps that accompany the species accounts. The accounts are brief and highlight features and aspects of the species that are considered most relevant to the Burren National Park. Citations are not provided in the species accounts, but they draw heavily from the all-Ireland Red List (Allen *et al.*, 2016), the atlas of larger moths of Britain and Ireland (Randle *et al.*, 2019), field guides especially Waring and Townsend (2019) and Sterling *et al.* (2012) and the MothsIreland website (MothsIreland 2022).

Species maps are provided with each species account. The left hand map shows the distribution within the Burren region mapped at 1 km resolution, the extent of the Burren being indicated by the grey shading. The definition of the Burren boundary used in this report is provided in Appendix IV. This boundary is being used to compile a catalogue and critical checklist of the Burren Lepidoptera. The dashed red line running through the shaded area marks the county boundary between Clare and Galway (which is also the boundary between the two vice counties of Clare and South-east Galway). The right hand map shows the Irish distribution taken from the MothsIreland website. The symbols used on the Burren map are colour coded to indicate the date of the record as follows:

- green circles signify the species has been recorded since 1 January 1980
- white circles signify that the species has not been recorded since 1 January 1980
- red symbols denote the records in this survey. A square red symbol indicates the species record is the first for that 1 km square. A red circle denotes that the species has been recorded from the square before.

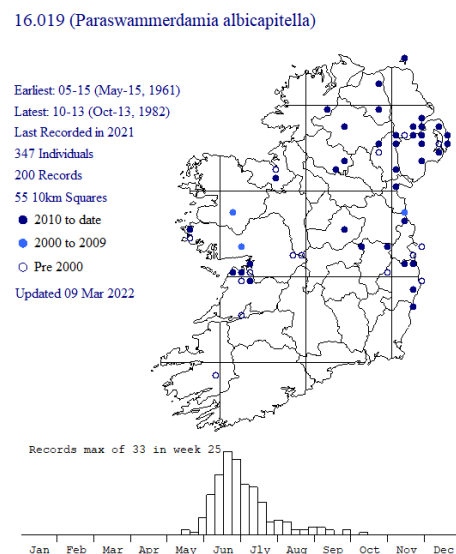
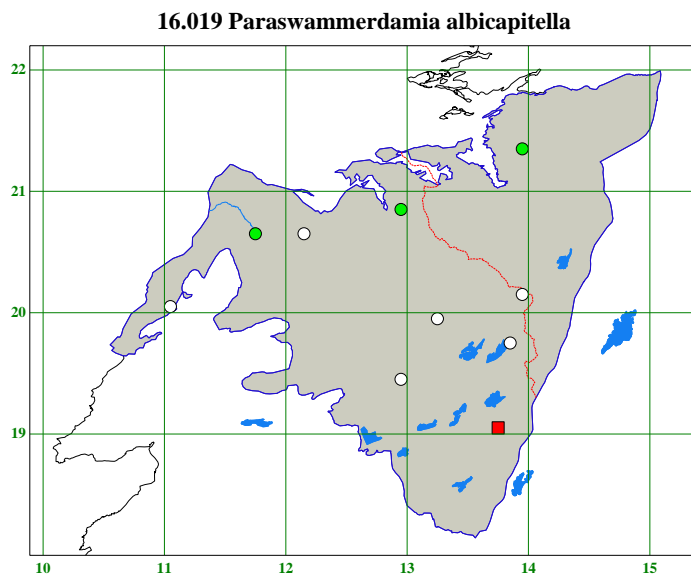
3.1.1 *Psyche casta* 11.012

Psyche casta is one of the bagworms (Psychidae) so-called because the larvae live within a portable case made of plant fragments and debris; in some ways they are a terrestrial equivalent of a cased caddis fly larva. The females of most species of bagworm are wingless and most records, including one from Rockforest in this survey, are of the larvae. The case of *Psyche casta* is made of short lengths of grass or rushes and they can typically be found on tree trunks. This species is mostly coastal in Ireland and Burren sites are amongst very few inland locations.



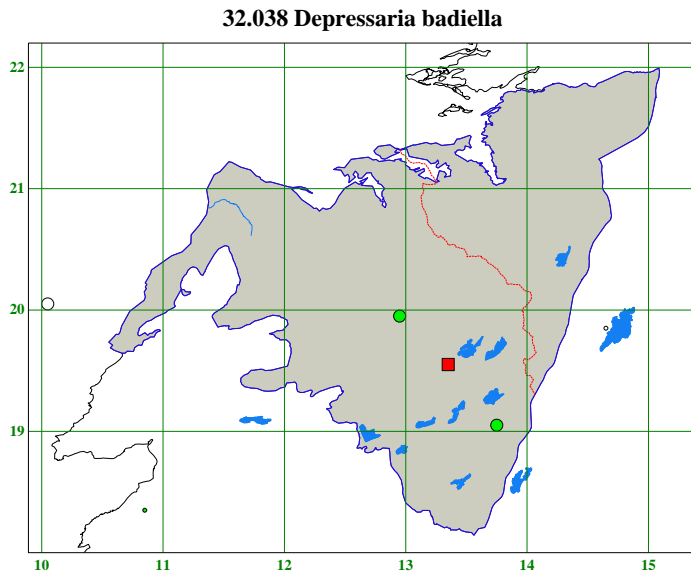
3.1.2 *Paraswammerdamia albicapitella* 16.019

Blackthorn *Prunus spinosa* is the larval foodplant of this micro-moth. The moth appears much less widespread than the foodplant and records from the Burren are in the south-western part of its Irish range. Several were trapped at Ballyogan in September 2021.



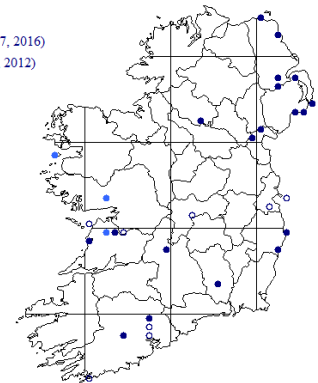
3.1.3 *Depressaria badiella* 32.038

The species of *Depressaria* found in Ireland are tricky to identify and dissection of specimens may be needed in some cases. This species was recorded once from Cooiloorta in 2022 based on a dissected male. The species has a very scattered distribution in Ireland with no clear pattern. The habitat is said to be dry, sandy or calcareous grassland and the foodplants include Cat's Ear *Hypochaeris radicata*, Perennial Sow-thistle *Sonchus arvensis* and dandelion *Taraxacum* spp.

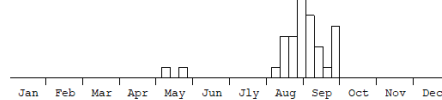


32.038 (*Depressaria badiella*)

Earliest: 05-07 (May-07, 2016)
 Latest: 09-29 (Sep-29, 2012)
 Last Recorded in 2021
 43 Individuals
 34 Records
 30 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre 2000
 Updated 09 Mar 2022

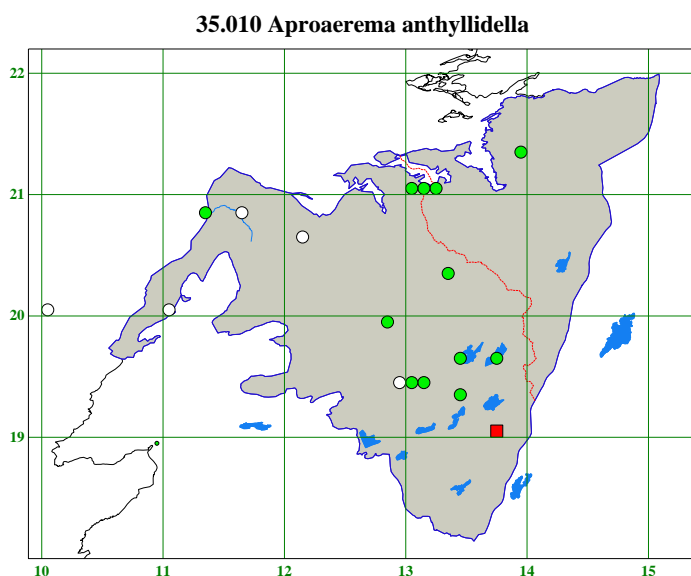


Records max of 8 in week 35



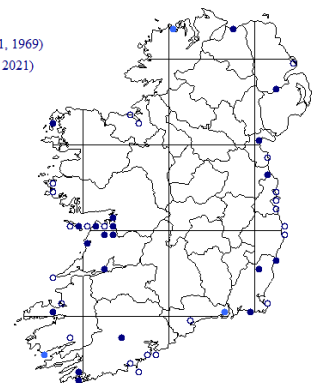
3.1.4. *Aproaerema anthyllidella* 35.010

This is a double-brooded moth that can be seen by day but also comes to light. It is associated with grasslands containing Kidney Vetch *Anthyllis vulneraria* and related species. It was recorded at light from Ballyogan in September 2021. There are scattered records from the Burren where it appears widespread and well-established. The majority of records away from the Burren are from coastal sites but many are old.

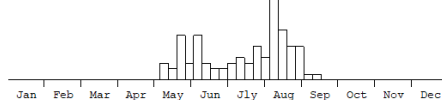


35.010 (*Aproaerema anthyllidella*)

Earliest: 05-11 (May-11, 1969)
 Latest: 09-10 (Sep-10, 2021)
 Last Recorded in 2021
 175 Individuals
 107 Records
 46 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre 2000
 Updated 09 Mar 2022

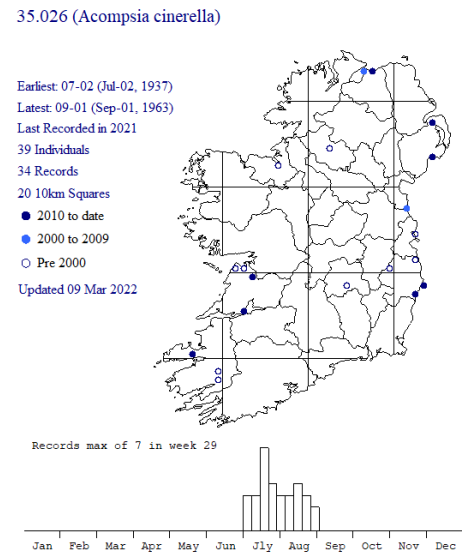
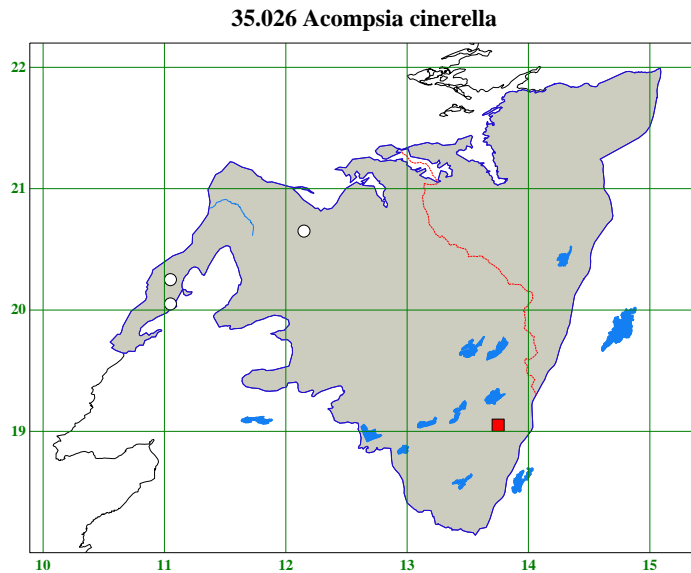


Records max of 15 in week 32



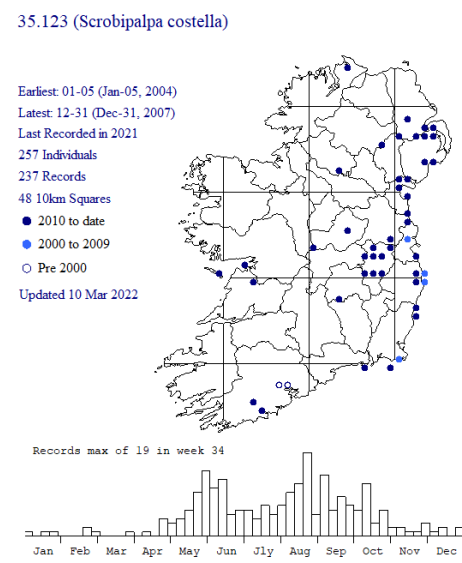
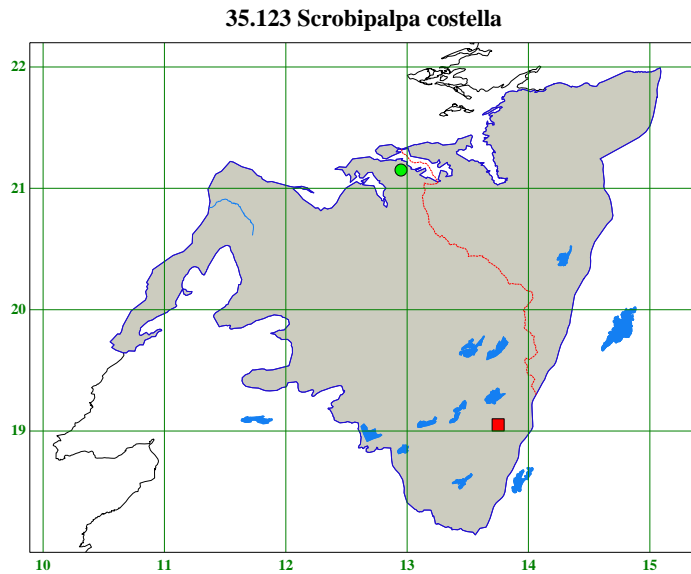
3.1.5 *Acompsia cinerella* 35.026

This appears to be a rare species in Ireland and nearly all the records are coastal. However, it is not coastal in Britain. There are some old records from the Burren, and the single record from Ballyogan in this survey is the first for over 50 years as well as the most inland Burren record. The larval foodplant is unknown but is considered to be mosses on tree trunks which would appear to be at odds with its Irish distribution.



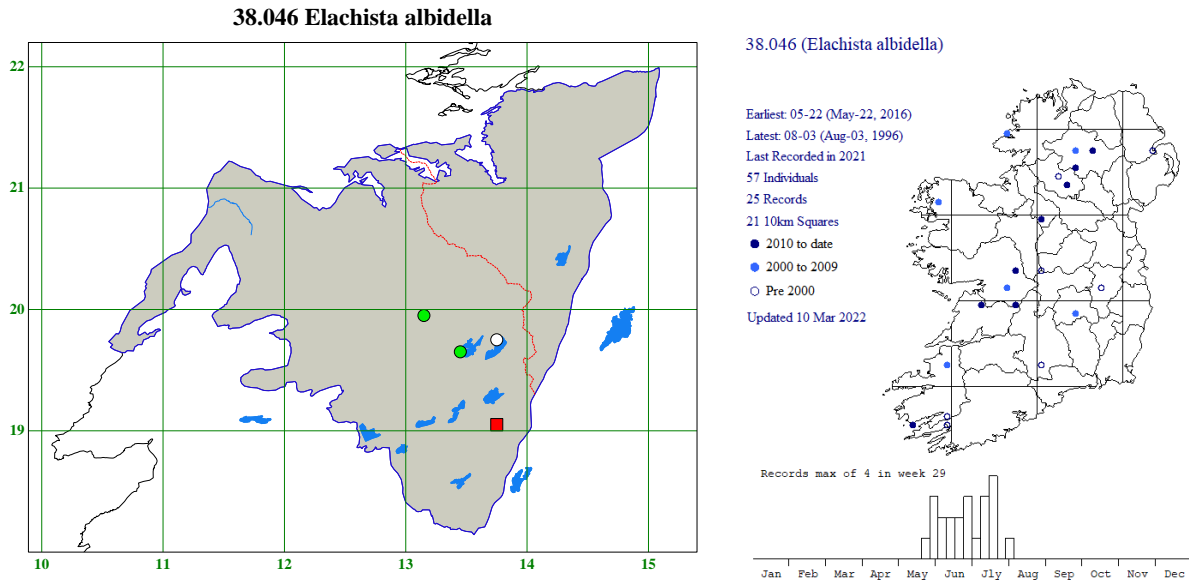
3.1.6 *Scrobipalpa costella* 35.123

This is an eastern species in Ireland but present in the west in the Burren and on the Aran Islands. The larval foodplant is Bittersweet *Solanum dulcamara* and it is found in hedges and wetlands. It was recorded once in our survey, in September 2021, at Ballyogan. This was a new hectad record and only the second Burren record. Adults have been recorded in every month of the year.



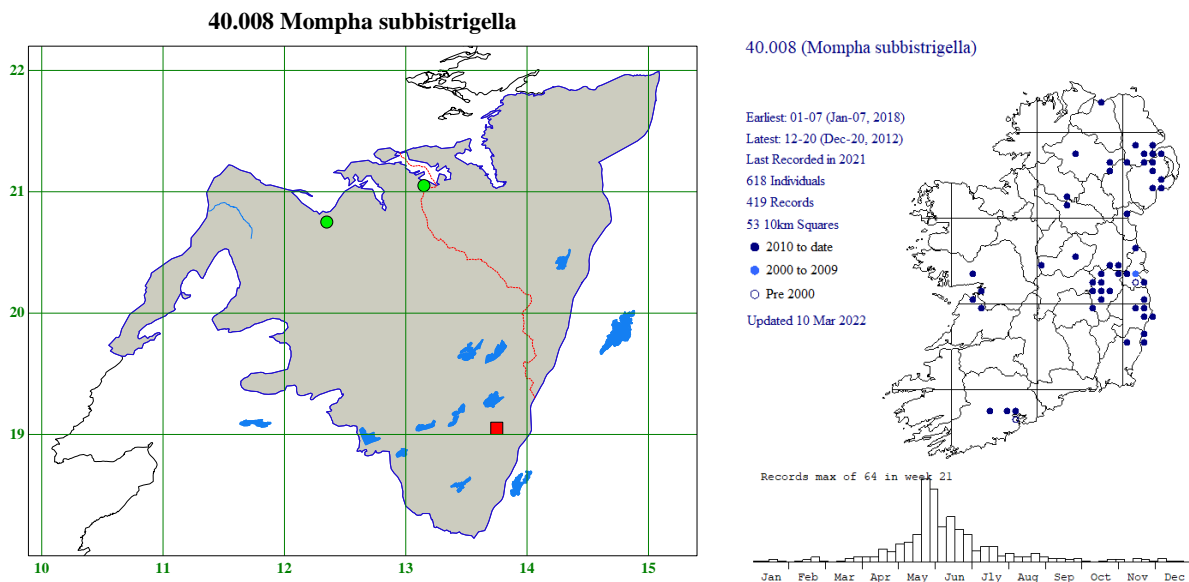
3.1.7 *Elachista albidella* 38.046

Found in wetlands especially wet heaths where it feeds on leaves of sedges *Carex* spp. and cotton-grasses *Eriophorum* spp. The species is known from scattered sites across Ireland and there have been four records from the Burren all associated with wetlands and all from hectad R39.



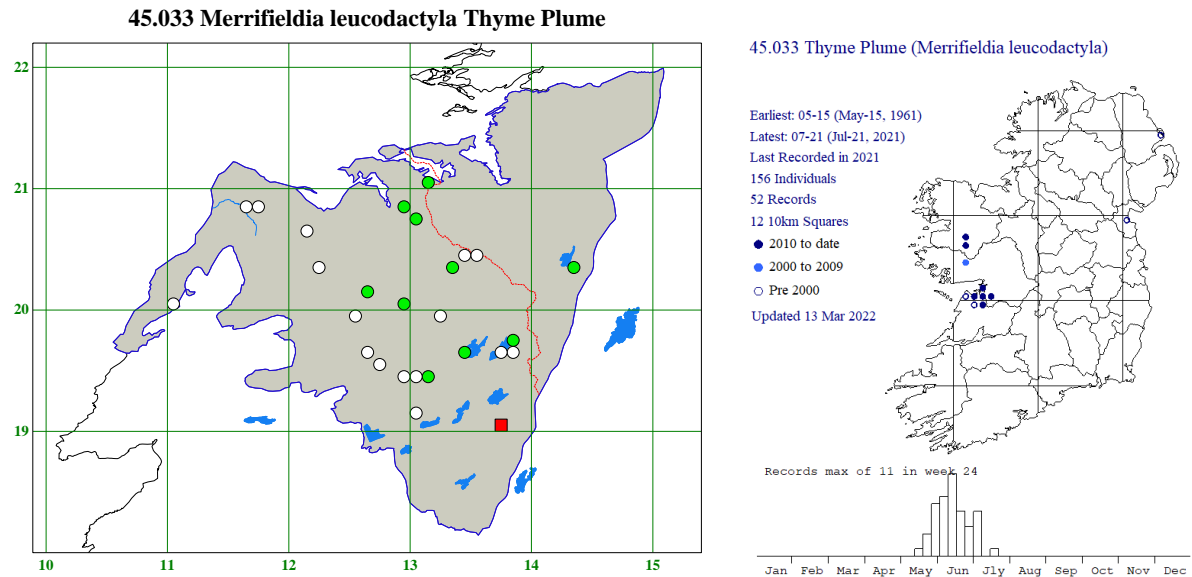
3.1.8 *Mompha subbistrigella* 40.008

Adults of this moth overwinter and can be seen indoors. The larval foodplants are species of willowherb *Epilobium* spp including Great Willowherb *E. hirsutum*. It can be found in wetlands and woodland and is largely eastern in Ireland but also present in the Burren. It was recorded at Ballyyogan in July 2021 by Gareth O'Donnell.



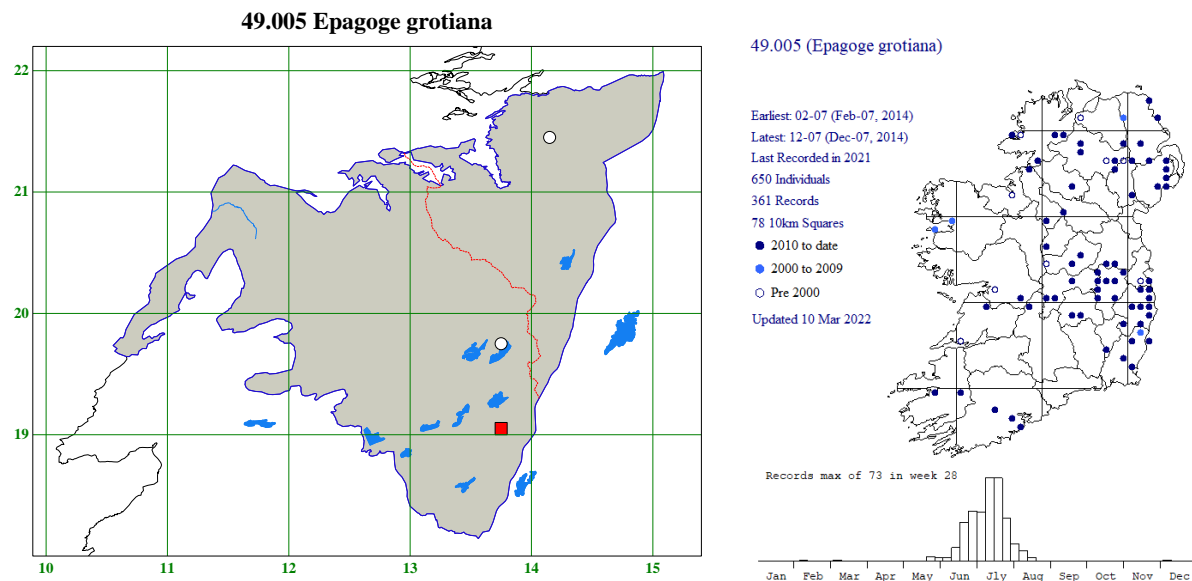
3.1.9 Thyme Plume *Merrifieldia leucodactyla* 45.033

There are two thyme-feeding plume moths found in Ireland, this species and Western Thyme Plume *Merrifieldia tridactyla*. Both have a similar range being restricted to western karst habitats especially the Burren. Apart from two 19th century records from the east coast, Thyme Plume is found only in the Burren (where it is widespread) and the Carra/Mask/Corrib region. Gareth O'Donnell took four specimens at light at Ballyyogan in July 2021 which is a new 1 km record.



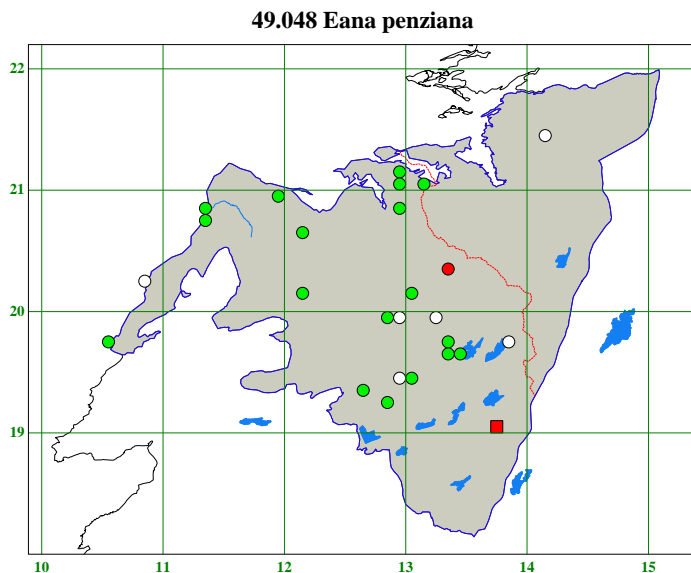
3.1.10 *Epagoge grotiana* 49.005

Epagoge grotiana was recorded at Ballyyogan in July 2021 by Gareth O'Donnell. This is the third Burren record and the first since 1996. The larvae feed on leaves (living and dead) of woody species including Bramble *Rubus fruticosus* and oak *Quercus* spp.



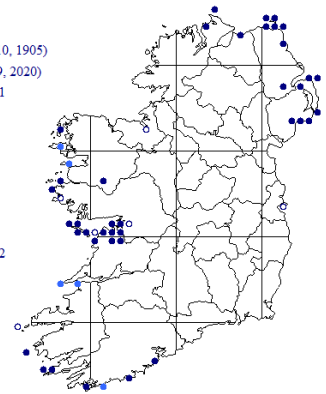
3.1.11 *Eana penziana* 49.048

The range of *E. penziana* is strongly coastal in Ireland but it is also found in some inland localities especially in the Burren. There were two records in this survey from Slieve Carran and Ballyogan. In Britain, *E. penziana* is found in two forms: a more common coastal one; and an inland form. The latter form may be extinct in Britain but it is not known which form is found in the Burren. There are a number of larval foodplants reported for this species including *Festuca ovina*, *Plantago maritima*, *Euphrasia* species and Bird's-foot Trefoil *Lotus corniculatus*. Burren specimens have been reared from *Saxifraga* sp. and *L. corniculatus*.

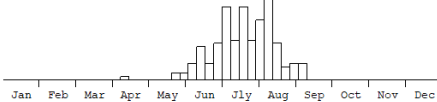


49.048 (*Eana penziana*)

Earliest: 04-10 (Apr-10, 1905)
 Latest: 09-09 (Sep-09, 2020)
 Last Recorded in 2021
 473 Individuals
 182 Records
 50 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre 2000
 Updated 12 Mar 2022

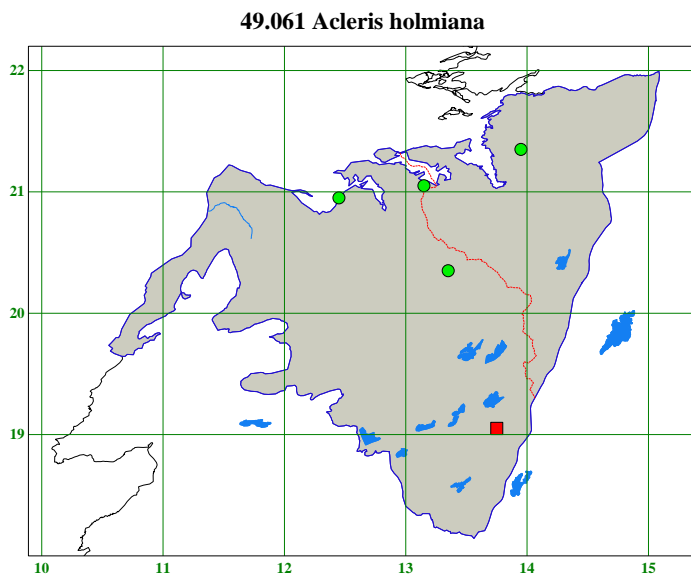


Records max of 25 in week 32



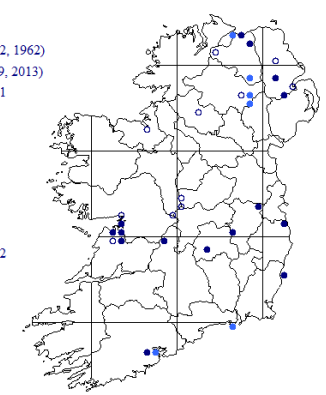
3.1.12 *Acleris holmiana* 49.061

Irish records of this distinctive tortricid moth are mainly eastern from scattered locations with no clear pattern. The range extends to the Burren where it is found in inland sites. The larvae feed on the leaves of Hawthorn *Crataegus monogyna*, apple and wild roses. This was recorded in three separate traps at Ballyogan on 21 July 2021.

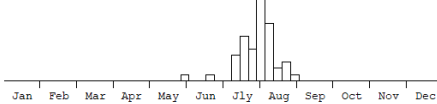


49.061 (*Acleris holmiana*)

Earliest: 06-02 (Jun-02, 1962)
 Latest: 08-29 (Aug-29, 2013)
 Last Recorded in 2021
 67 Individuals
 52 Records
 33 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre 2000
 Updated 12 Mar 2022

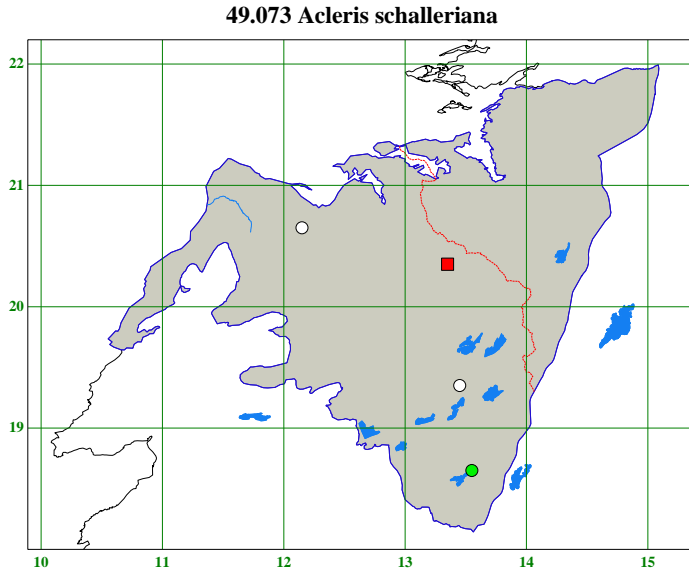


Records max of 13 in week 31



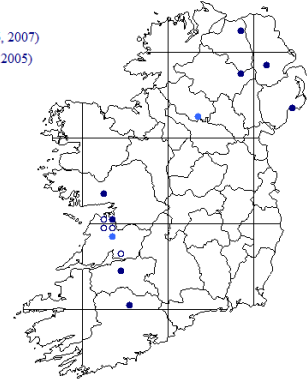
3.1.13 *Acleris schalleriana* 49.073

The recorded distribution of *A. schalleriana* is broadly the same as *A. holmiana* although it appears to be less common and it is only in the Burren that there is a cluster of adjacent occupied hectads. This was trapped at Slieve Carran by Michael O'Donnell in September 2021 which is a new hectad record. The larvae feed on the leaves of Guelder-rose *Viburnum opulus*.

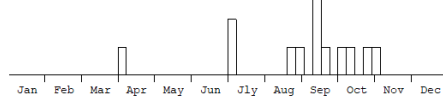


49.073 (*Acleris schalleriana*)

Earliest: 04-06 (Apr-06, 2007)
 Latest: 10-29 (Oct-29, 2005)
 Last Recorded in 2021
 64 Individuals
 22 Records
 14 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre 2000
 Updated 12 Mar 2022

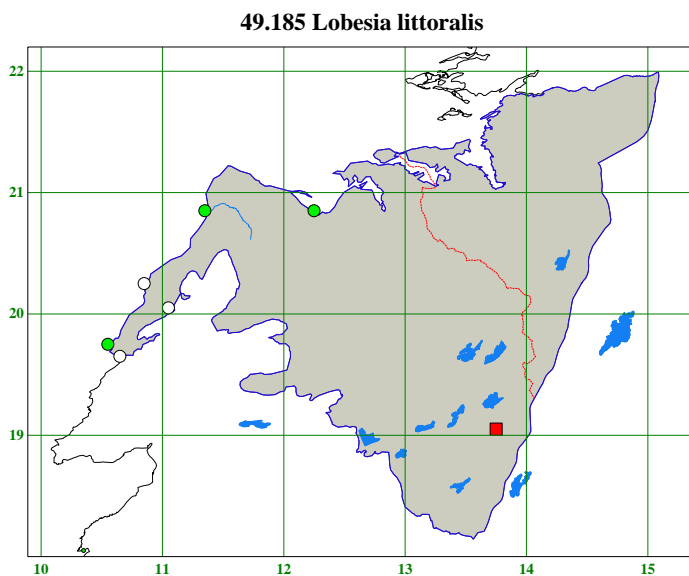


Records max of 3 in week 37



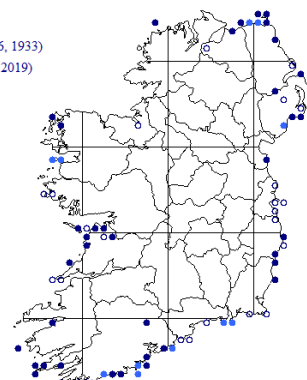
3.1.14 *Lobesia littoralis* 49.185

This is clearly a coastal species in Ireland but with a few inland records. It is found on sea-cliffs, saltmarshes and on vegetated shingle. It is found widely inland in Britain. The larvae feed on Thrift *Armeria maritima* and also Bird's-foot Trefoil *Lotus corniculatus* which is presumably the foodplant used inland. There were two records in the survey, both from Ballyogan, in July 2021 by Gareth O'Donnell and in September 2021 by Michael O'Donnell. These were the first records from the hectad and represent the most inland Burren records.

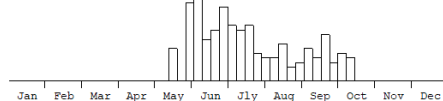


49.185 (*Lobesia littoralis*)

Earliest: 05-16 (May-16, 1933)
 Latest: 10-12 (Oct-12, 2019)
 Last Recorded in 2021
 534 Individuals
 197 Records
 73 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre 2000
 Updated 12 Mar 2022

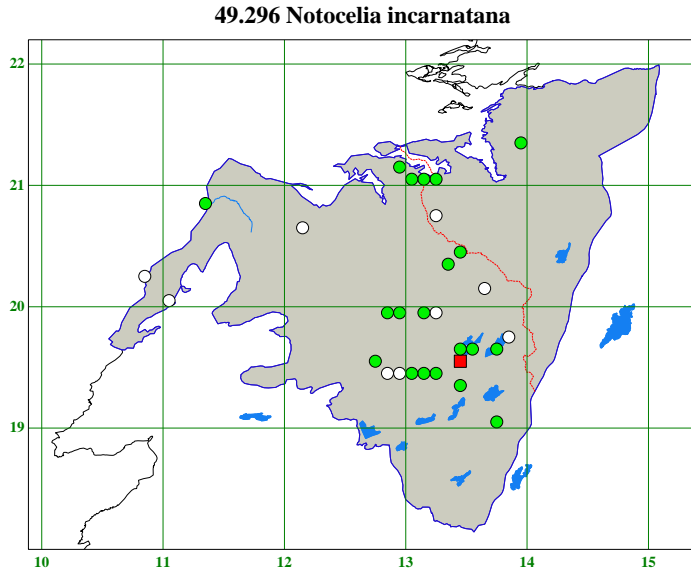


Records max of 18 in week 23

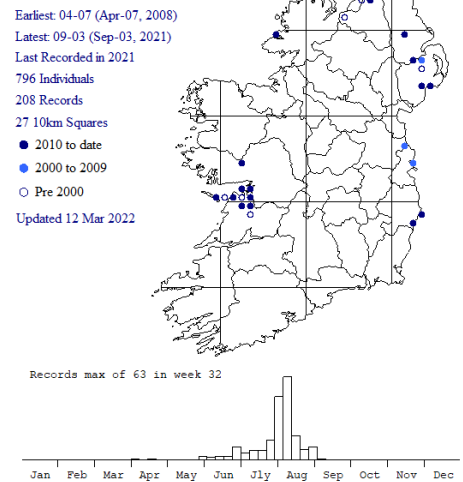


3.1.15 *Notocelia incarnatana* 49.296

The larval foodplants of *N. incarnatana* are species of rose especially Burnet Rose *Rosa pimpinellifolia*. It is found in limestone pavement and grassland and sand dunes where Burnet Rose is common. In Ireland, the moth is found in eastern coastal sites and the Burren where it is widespread especially in the eastern lowland areas.

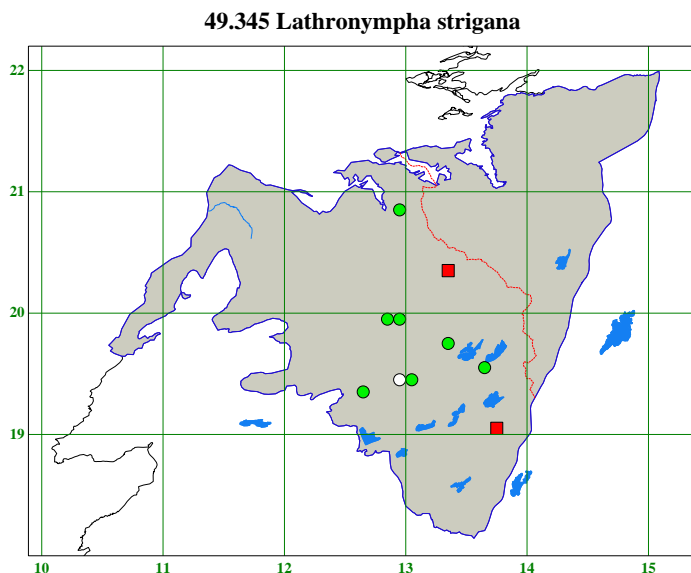


49.296 (*Notocelia incarnatana*)

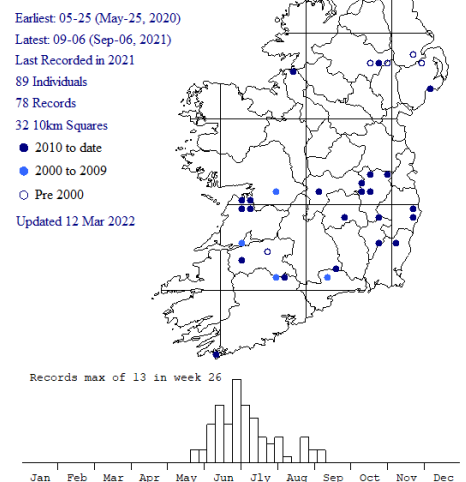


3.1.16 *Lathronympha strigana* 49.345

This has a mainly southern distribution in Ireland. It is found in limestone pavement, open woodland and scrub where larvae feed on species of St. John's-wort *Hypericum* spp. and Bird's-foot Trefoil *Lotus corniculatus*. This was recorded at two sites, Slieve Carran and Ballyogan, for the first time.



49.345 (*Lathronympha strigana*)



3.1.17 Red-tipped Clearwing *Synanthedon formicaeformis* 52.008

Clearwings are day-flying moths that mimic species of Hymenoptera. The larvae feed internally in plants especially trees and shrubs. Those of the Red-tipped Clearwing (Figure 6) feed on willows in wetland. Unlike most other macro-moths, this is recorded using artificial pheromone lures, a relatively recent development which has transformed recording of the family. A single adult was attracted to a lure for the species at Ballyogan in June 2022. The only previous Burren record came from a Malaise trap run by Tom Gittings in the same wetland complex. Targeted lure surveys will likely increase the number of records especially in the eastern Burren wetlands.

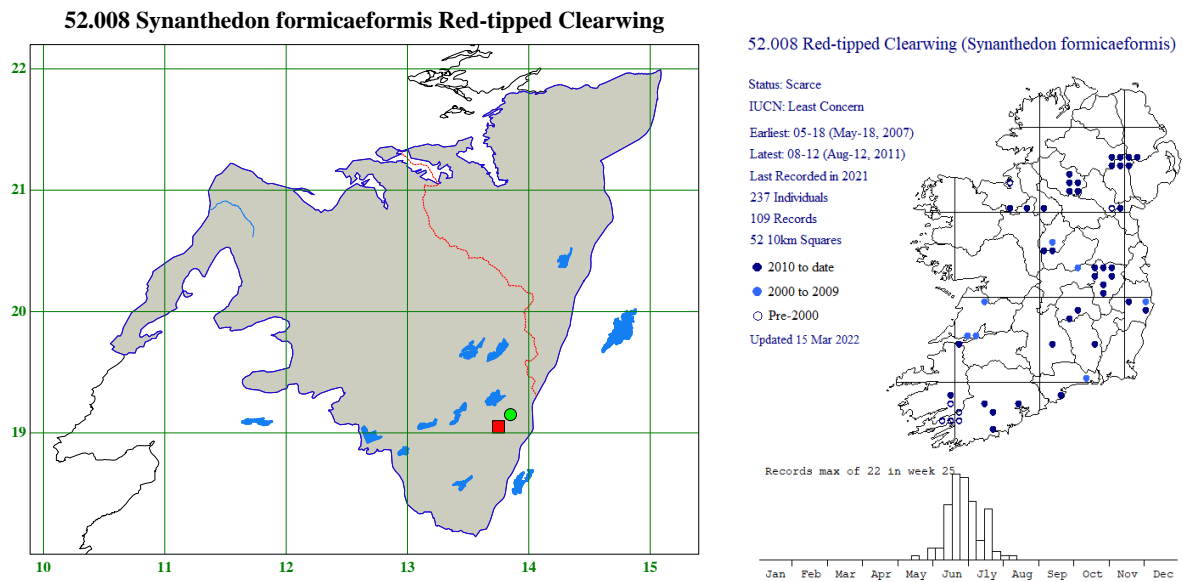


Figure 6 Red-tipped Clearwing *Synanthedon formicaeformis*. attracted to a pheromone lure at Ballyogan, in June 2022. This was the first time a live one had been seen in the Burren. **Brian Nelson.**

3.1.18 Forester *Adscita stactes* 54.002 EN

A day-flying moth of fens and grasslands (Figure 7). The foodplants are species of sorrel *Rumex* spp. Records are relatively restricted in the Burren (and in Ireland in general) and outside the Burren, the species has clearly declined and it was assessed as Endangered on the all-Ireland Red List. A single sighting in 2022 was made of multiple individuals near the Michael Cusack Centre and was a new 1 km square record within its core range.

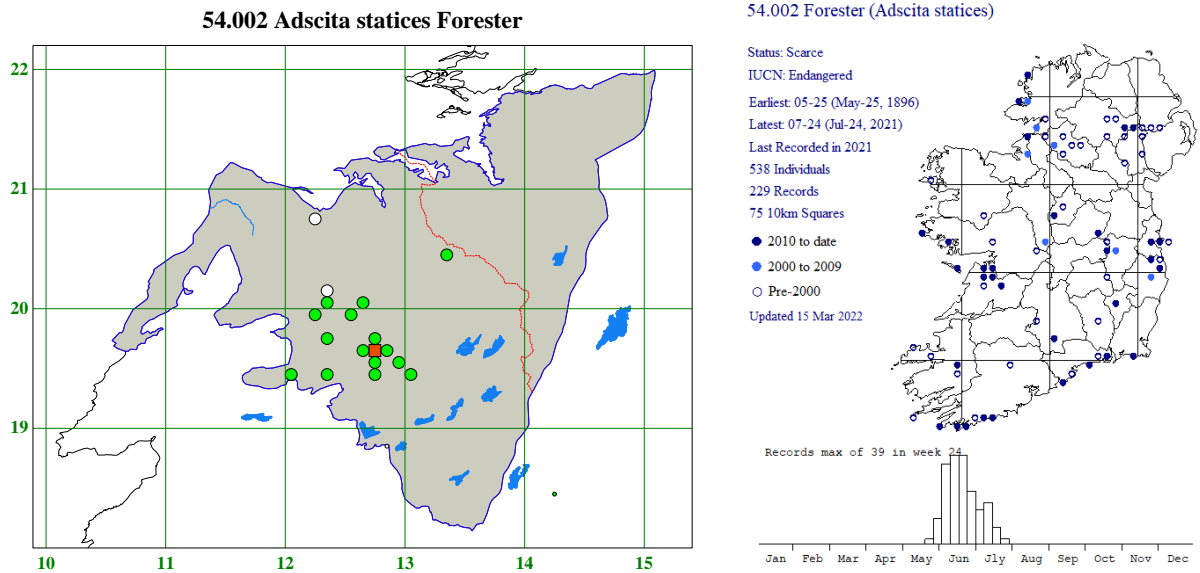
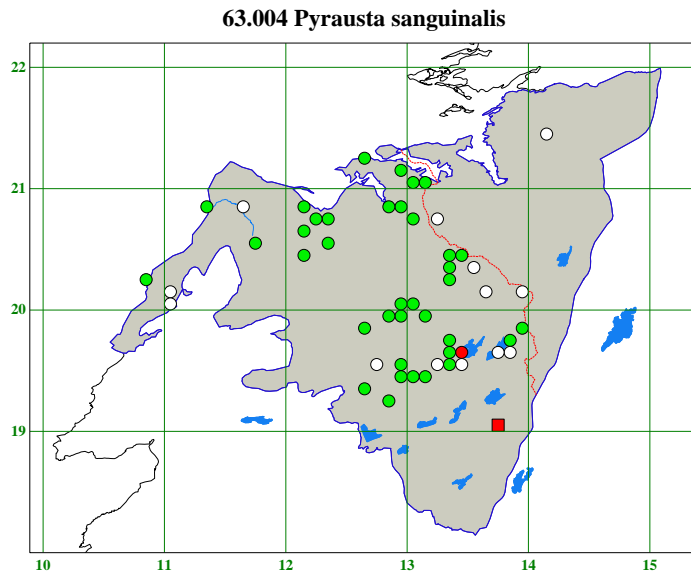


Figure 7 Forester *Adscita stactes* on Bloody Cranesbill *Geranium sanguineum*. Áine O Connor.

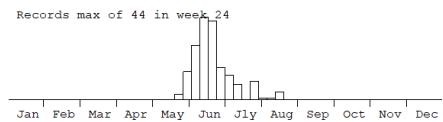
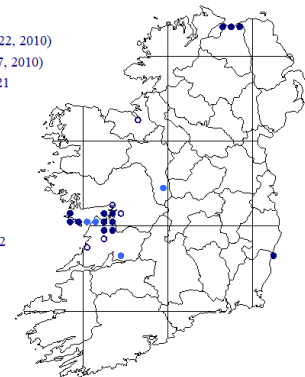
3.1.19 Scarce Crimson and Gold *Pyrausta sanguinalis* 63.004

This is a day-flying moth associated with Wild Thyme *Thymus drucei*. The species is well-recorded in the Burren but this is not a common moth elsewhere in Britain and Ireland. It has been lost from all known mainland British localities and from the Isle of Man and the only extant populations appear to be in Ireland. Site extinctions have been attributed to habitat loss through conversion to golf courses, scrub invasion and impacts of over and under grazing.



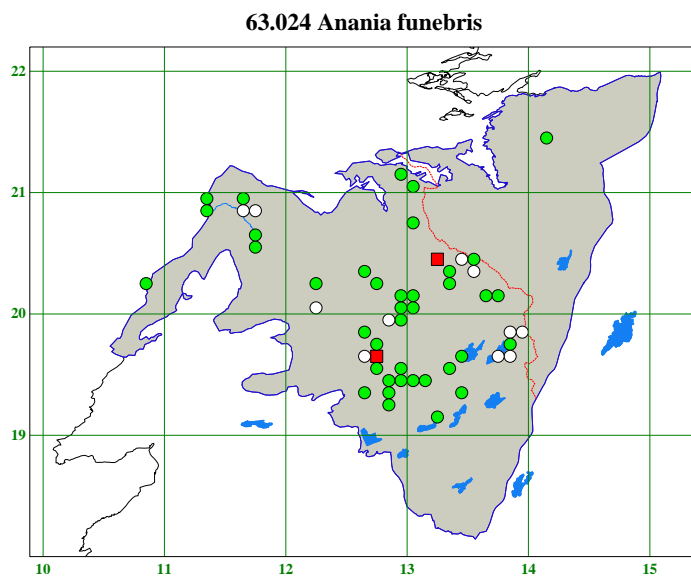
63.004 (*Pyrausta sanguinalis*)

Earliest: 05-22 (May-22, 2010)
 Latest: 08-17 (Aug-17, 2010)
 Last Recorded in 2021
 805 Individuals
 197 Records
 22 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre 2000
 Updated 13 Mar 2022



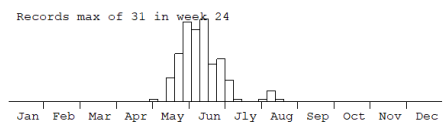
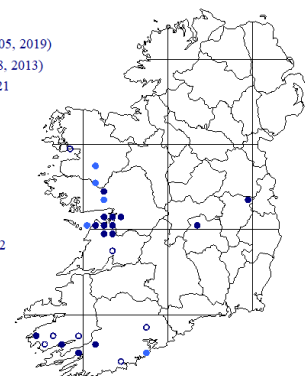
3.1.20 White-spotted Sable *Anania funebris* 63.024

This is a highly distinctive day-flying moth of open scrub, woodland clearings and rides, and rocky calcareous grassland. It feeds on Goldenrod *Solidago virgaurea*. The species is considered to be declining especially in Britain. In Ireland it is found in the Burren, Corrib/Mask/Carra and scattered sites mainly in the south-west. The species is well recorded in the Burren but nevertheless the two records from Slieve Carran and Tullycommon in this survey were new 1 km site records.



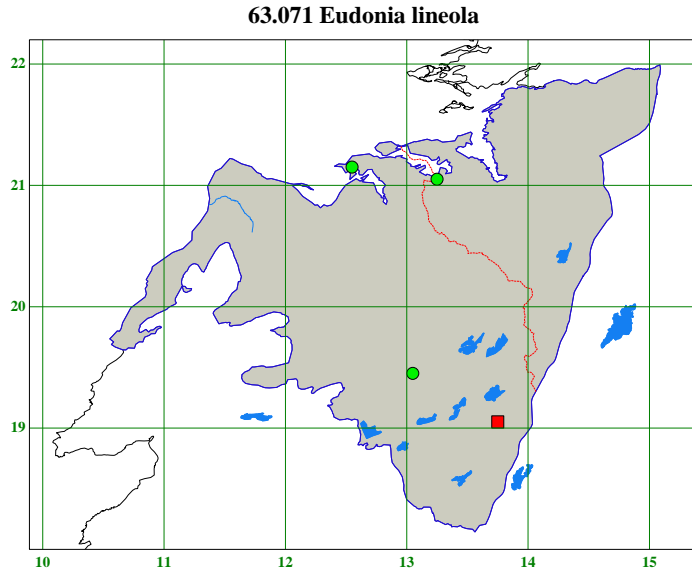
63.024 (*Anania funebris*)

Earliest: 05-05 (May-05, 2019)
 Latest: 08-18 (Aug-18, 2013)
 Last Recorded in 2021
 595 Individuals
 167 Records
 27 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre 2000
 Updated 13 Mar 2022



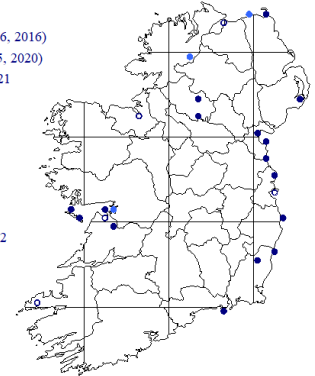
3.1.21 *Eudonia lineola* 63.071

Eudonia is a genus represented in Ireland by seven species. Members of the genus feed on mosses and lichens. This is the least common of the Irish *Eudonia* and is largely coastal in the east but only in the Burren and Aran Islands in the west. The larval foodplant is the lichen *Xanthoria parietina*. The single record from Ballyoghan in July 2021 by Gareth O'Donnell was a new 1 km square record.

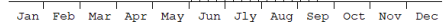


63.071 (*Eudonia lineola*)

Earliest: 06-06 (Jun-06, 2016)
 Latest: 09-15 (Sep-15, 2020)
 Last Recorded in 2021
 88 Individuals
 40 Records
 24 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre 2000
 Updated 13 Mar 2022

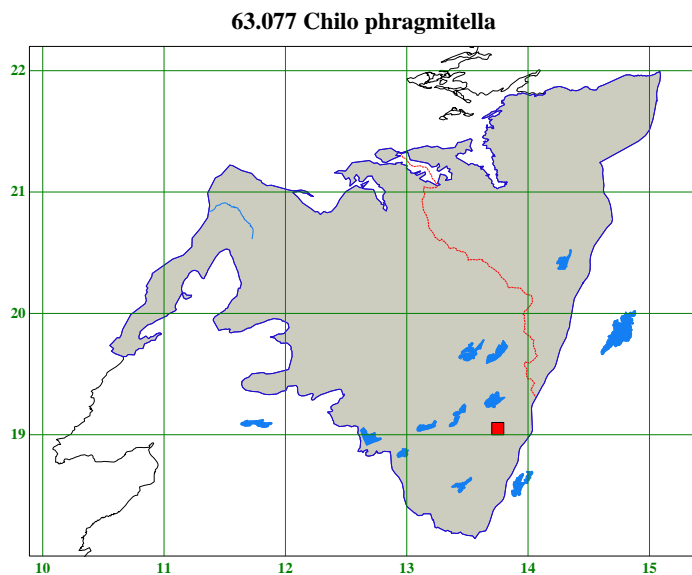


Records max of 7 in week 31



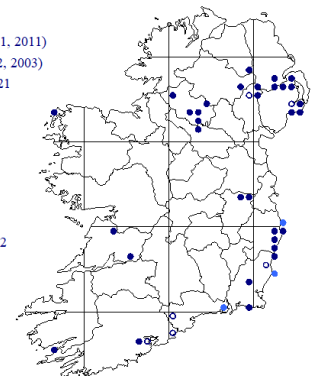
3.1.22 *Chilo phragmitella* 63.077

This is a wetland species with larval foodplants such as Common Reed *Phragmites australis*. The Irish distribution is scattered being found in coastal wetlands along the east and south coasts, in a band inland from Down to Fermanagh. The adult trapped at Ballyoghan in July 2021 by Gareth O'Donnell is the first from the Burren.

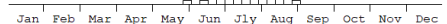


63.077 (*Chilo phragmitella*)

Earliest: 06-01 (Jun-01, 2011)
 Latest: 09-02 (Sep-02, 2003)
 Last Recorded in 2021
 225 Individuals
 111 Records
 41 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre 2000
 Updated 13 Mar 2022



Records max of 21 in week 29



3.1.23 Pale Eggar *Trichiura crataegi* 66.002

A scarce species in Ireland, Pale Eggar (Figure 8) is found only in two areas of western Ireland, in the Burren and west Fermanagh/Leitrim/Sligo. It is associated with open woodland, hedgerows, heath, scrub and gardens, favouring sunny locations and quite why it is so restricted is not easy to explain. Birch is considered the main larval foodplant. Pale Eggar has shown substantial long-term declines in both distribution and abundance in Great Britain. It was recorded from six 1 km squares, five of which were new records including at Slieve Carran, Rockforest Pine Wood and Ballyyogan.

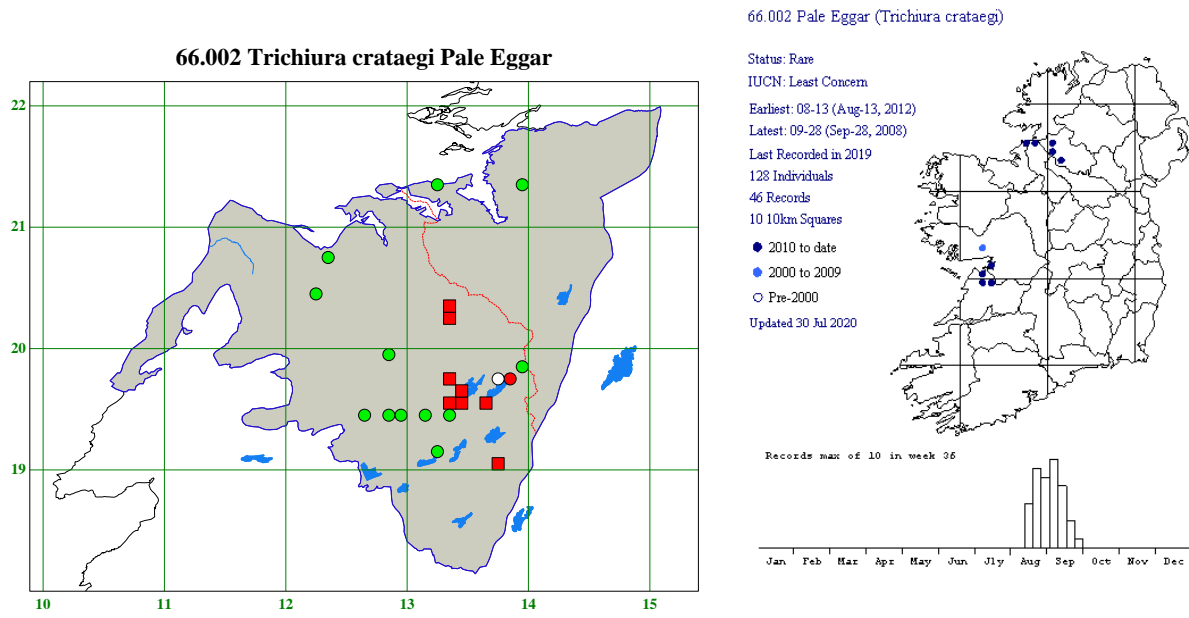
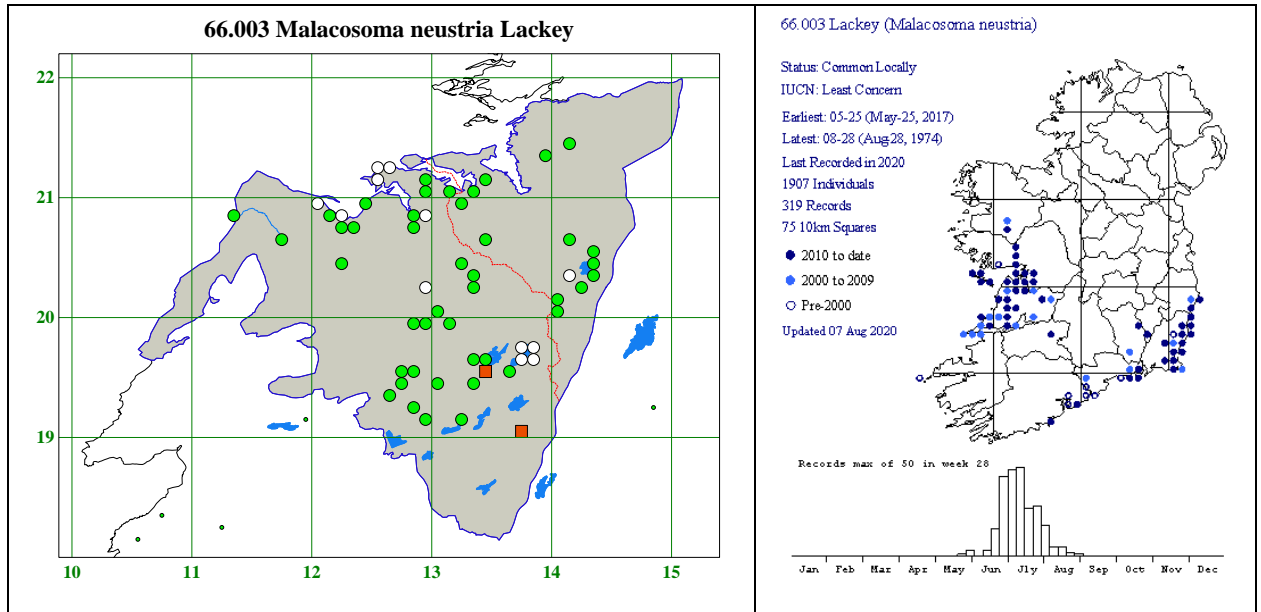


Figure 8 Pale Eggar *Trichiura crataegi*. Brian Nelson.

3.1.24 Lackey *Malacosoma neustria* 66.003

Lackey is locally widespread in the west (especially Co. Clare) and in a separate range on the south and east coasts between mid Cork and north Wexford. It is found in open, sunny, scrub/woodland habitats. Both its distribution and abundance have decreased severely in England since 1970 but the trend in Ireland is unknown. Three individuals were taken at Rockforest Pine Wood on 19 July 2021 and a further three at Ballyogan Nature Reserve on 21 July 2021. The caterpillars feed communally in a larval nest on shrub species such as Blackthorn *Prunus spinosa* and Hawthorn *Crataegus monogyna*.



3.1.25 Small Elephant Hawk-moth *Deilephila porcellus* 69.017

This is associated with open habitats with short vegetation including calcareous grassland, heath and sand-dunes. The larval foodplants are species of bedstraw especially Ladies Bedstraw *Galium verum*. The Small Elephant Hawk-moth (Figure 9) is mainly coastal in Ireland but occurs inland especially in the Burren and western lakes. This species has been expanding its range in Great Britain since the 1970s. Three individuals were trapped at Rockforest Townland in May 2021.

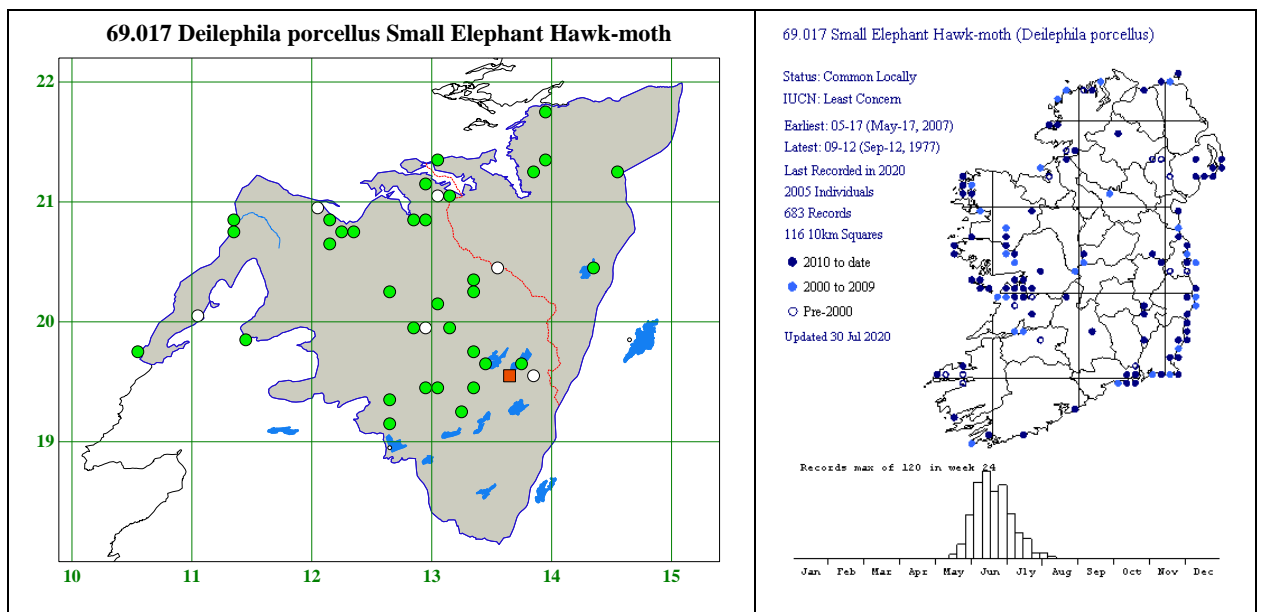
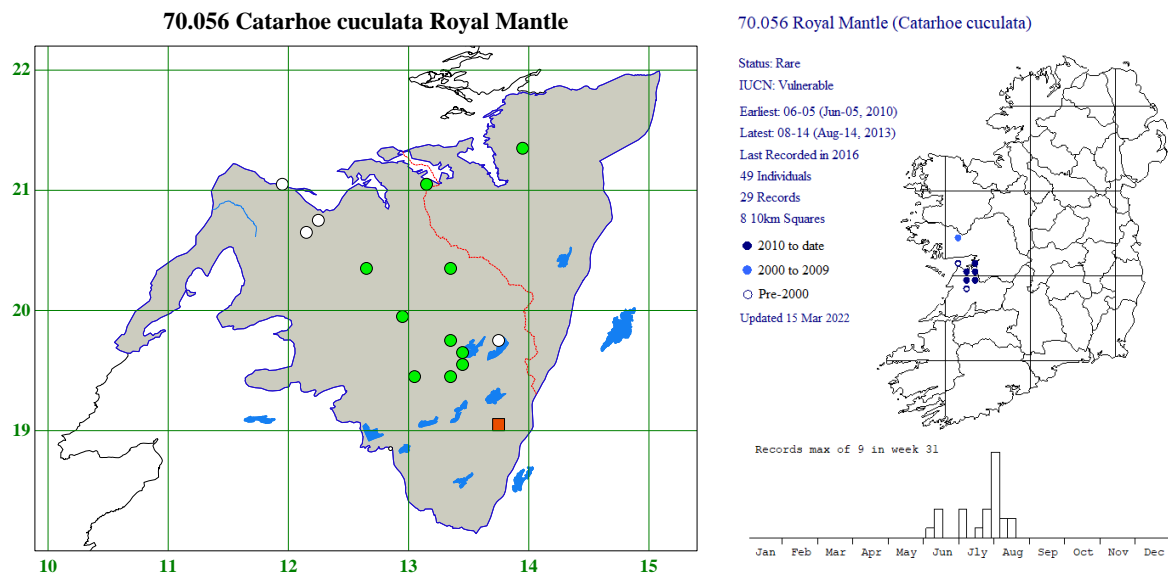




Figure 9 Small Elephant Hawk-moth *Deilephila porcellus*, Áine O Connor.

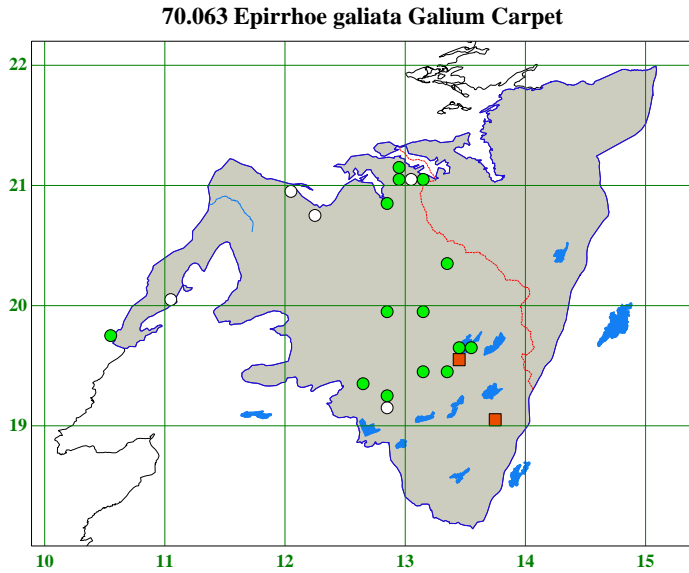
3.1.26 Royal Mantle *Catarhoe cuculata* 70.056 VU

Royal Mantle is associated with dry, calcareous grassland and scrub edge habitats. The larvae feed on bedstraws *Galium* spp. In Ireland it is found on limestone habitats in the Burren and also on the Burren-like habitat on the western side of Lough Corrib. It was assessed as Vulnerable for the Ireland Red List. During the 2021 surveys, it was recorded once (21 July 2021) at Ballyogán Nature Reserve, the first record from the site.



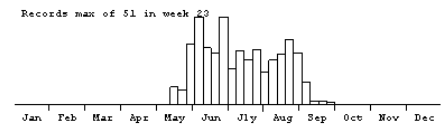
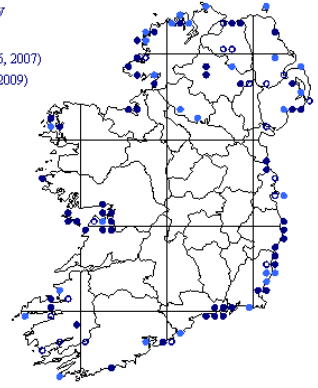
3.1.27 Galium Carpet *Epirrhoe galiata* 70.063

Galium Carpet is found on coastal and calcareous grassland and sometimes on heath and is mainly coastal in Ireland. There are inland occurrences in the north and in the Burren with some evidence of a decline in these inland areas. It has suffered severe long-term declines in central and eastern Great Britain. Single adults were found at Crehaun Townland in July 2021 and in Ballyogan in September 2021 both new 1 km records.



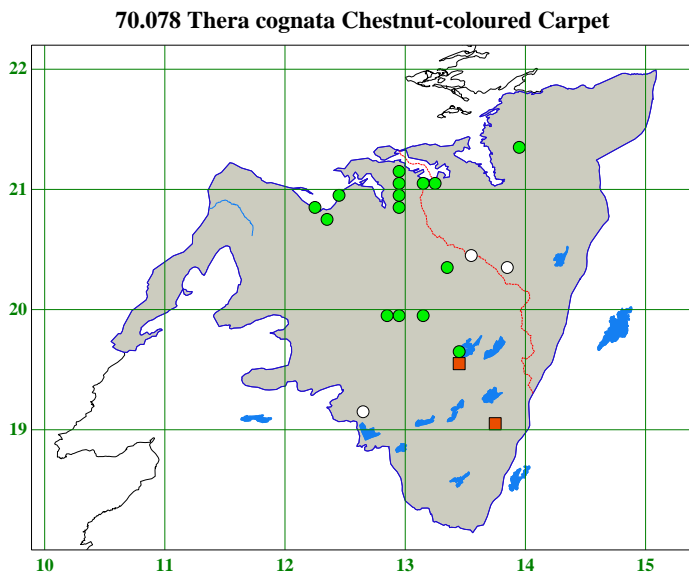
70.063 Galium Carpet (*Epirrhoe galiata*)

Status: Common Locally
 IUCN: Least Concern
 Earliest: 05-16 (May-16, 2007)
 Latest: 09-25 (Sep-25, 2009)
 Last Recorded in 2020
 1231 Individuals
 526 Records
 98 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre-2000
 Updated 30 Jul 2020



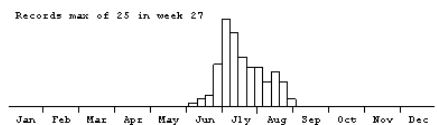
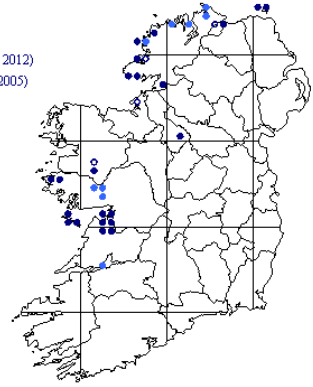
3.1.28 Chestnut-coloured Carpet *Thera cognata* 70.078

The range in Ireland is mainly north-western and coastal between the Shannon estuary and Rathlin Island, Co Antrim. Inland populations exist in the karst of the Burren and Corrib/Mask. Chestnut-coloured Carpet is found on moorland, rocky outcrops and open woodland with its foodplant, Juniper *Juniperus communis*. The species was found at both Ballyogan and Rockforest Pine Wood in July 2021, both new 1 km records. A probable larva was beaten from a Juniper at Rockforest Pine Wood.



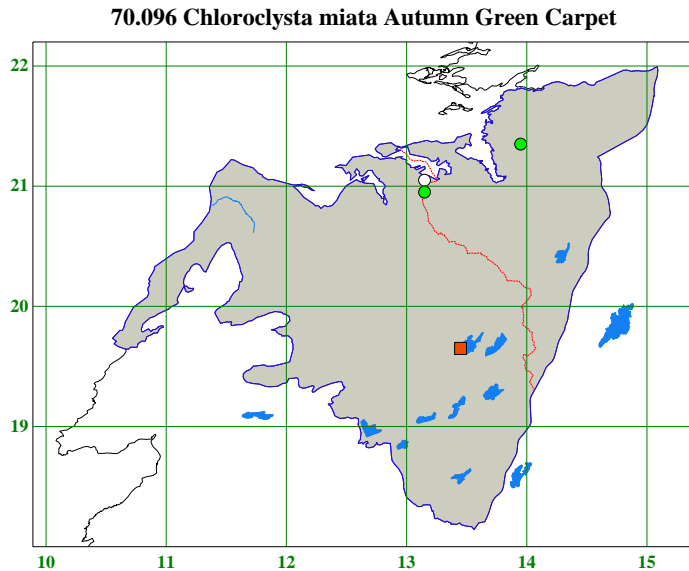
70.078 Chestnut-coloured Carpet (*Thera cognata*)

Status: Scarce
 IUCN: Least Concern
 Earliest: 06-10 (Jun-10, 2012)
 Latest: 09-01 (Sep-01, 2005)
 Last Recorded in 2019
 523 Individuals
 142 Records
 35 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre-2000
 Updated 30 Jul 2020

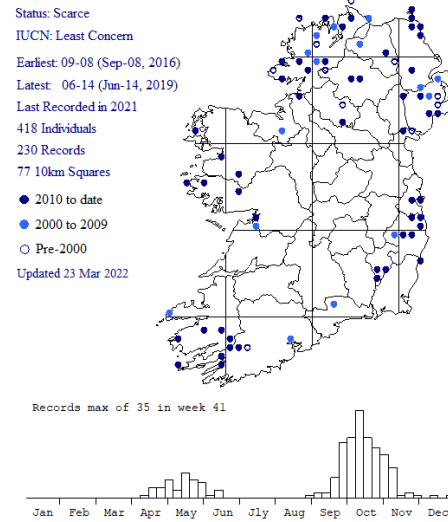


3.1.29 Autumn Green Carpet *Chloroclysta miata* 70.096

As its name suggests, this is a late-flying species but the adults overwinter and appear again in spring and early summer. The larvae feed on various trees and shrubs including Rowan *Sorbus aucuparia* and willows *Salix* spp. There have been few Burren records and the single adult trapped at Cooiloorta in October 2021 was the first record from Co Clare.

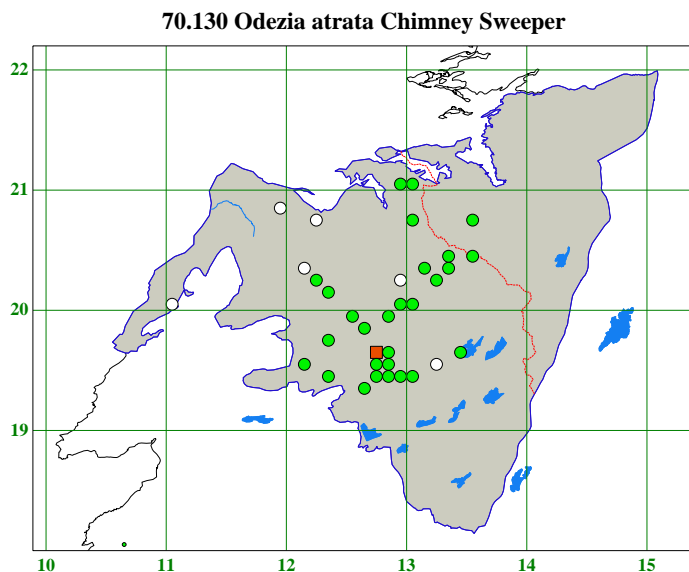


70.096 Autumn Green Carpet (*Chloroclysta miata*)

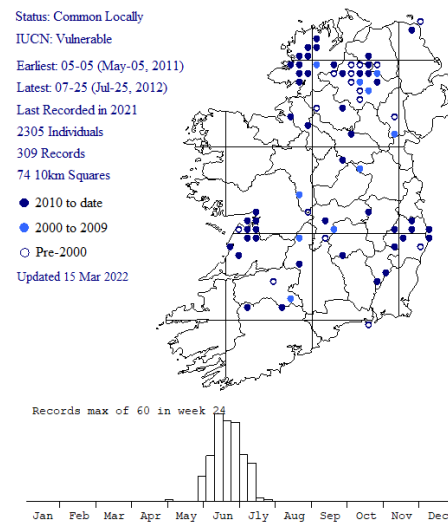


3.1.30 Chimney Sweeper *Odezia atrata* 70.130 VU

This day-flying moth is found in damp sheltered grassland throughout much of the central Burren but is largely absent from the coastal and high Burren in the west and the eastern lowland lake region. The foodplant is Pignut *Conopodium majus*. Adults were seen in typical habitat in a ride through Hazel *Corylus avellana* woodland below Cahercommaun in June 2022. The species has declined in Ireland and was assessed as Vulnerable on the all-Ireland Red List.

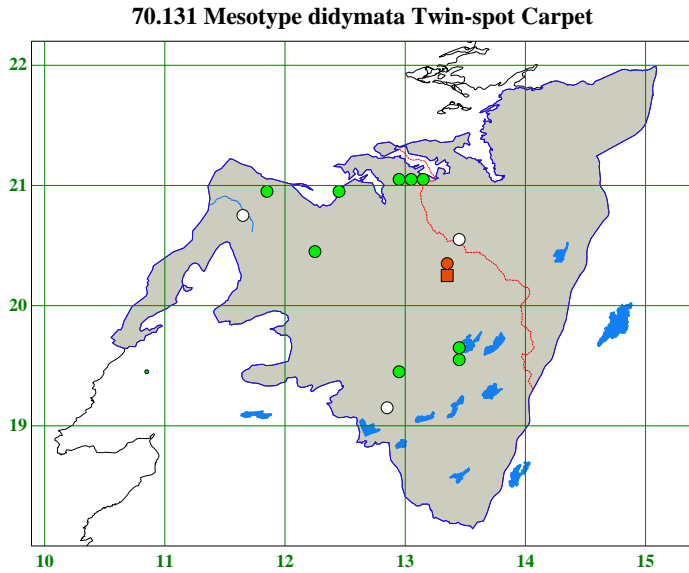


70.130 Chimney Sweeper (*Odezia atrata*)

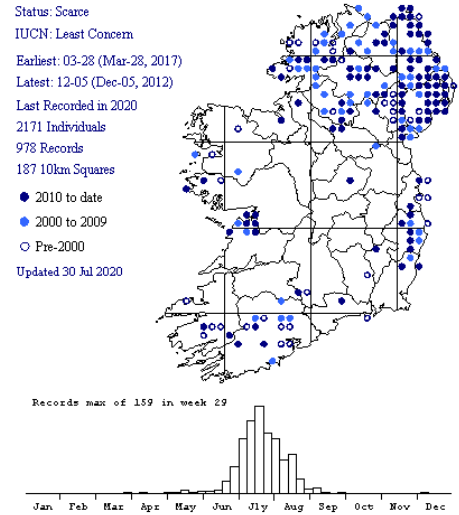


3.1.31 Twin-spot Carpet *Mesotype didymata* 70.131

Well distributed in the northern third of Ireland, but curiously patchy and more local elsewhere. Twin-spot Carpet is associated with a range of habitats including heathland and open woodland. It has shown a significant decline in abundance and loss of range in Britain and this may also have happened in some parts of Ireland. It remains common in Ireland, however, though many of the inland records are old. Six individuals were trapped at Slieve Carran in September 2021.

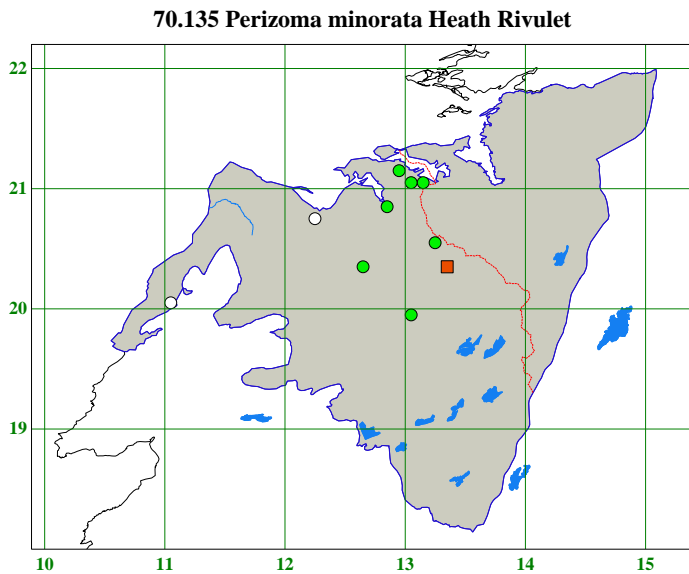


70.131 Twin-spot Carpet (*Mesotype didymata*)

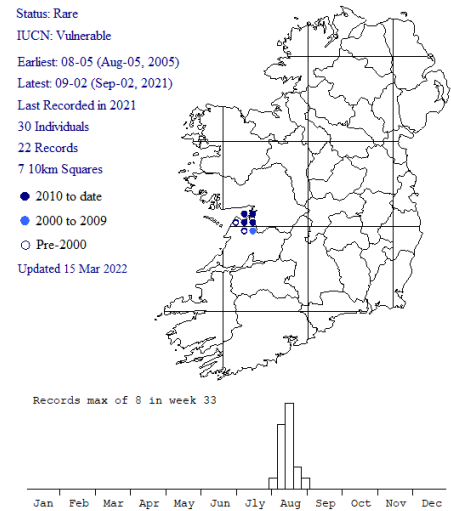


3.1.32 Heath Rivulet *Perizoma minorata* 70.135 VU

Heath Rivulet is entirely confined to the Burren in Ireland where it occurs on calcareous grassland with eyebright *Euphrasia* spp, the larval foodplant. Even within the Burren the range is restricted with most records coming from the north-east of Clare. Owing to a decrease in range within the Burren, the species was assessed as Vulnerable for the all-Ireland Red List. In Britain, it is also considered a declining species. A single record was made of Heath Rivulet from Slieve Carran Nature Reserve on 2 September 2021, representing a new 1 km record.

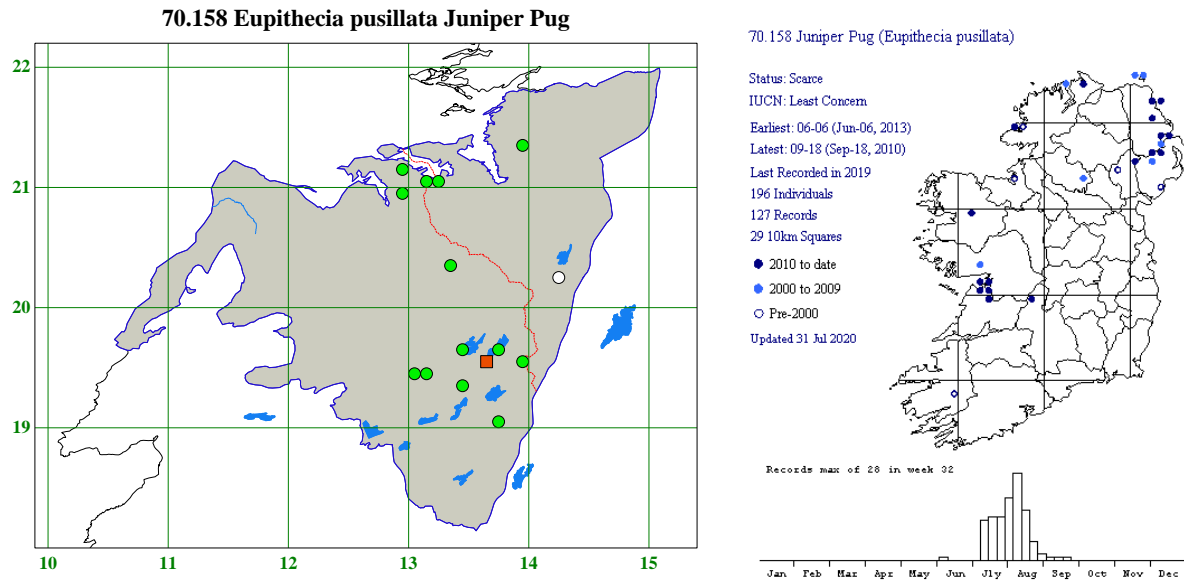


70.135 Heath Rivulet (*Perizoma minorata*)



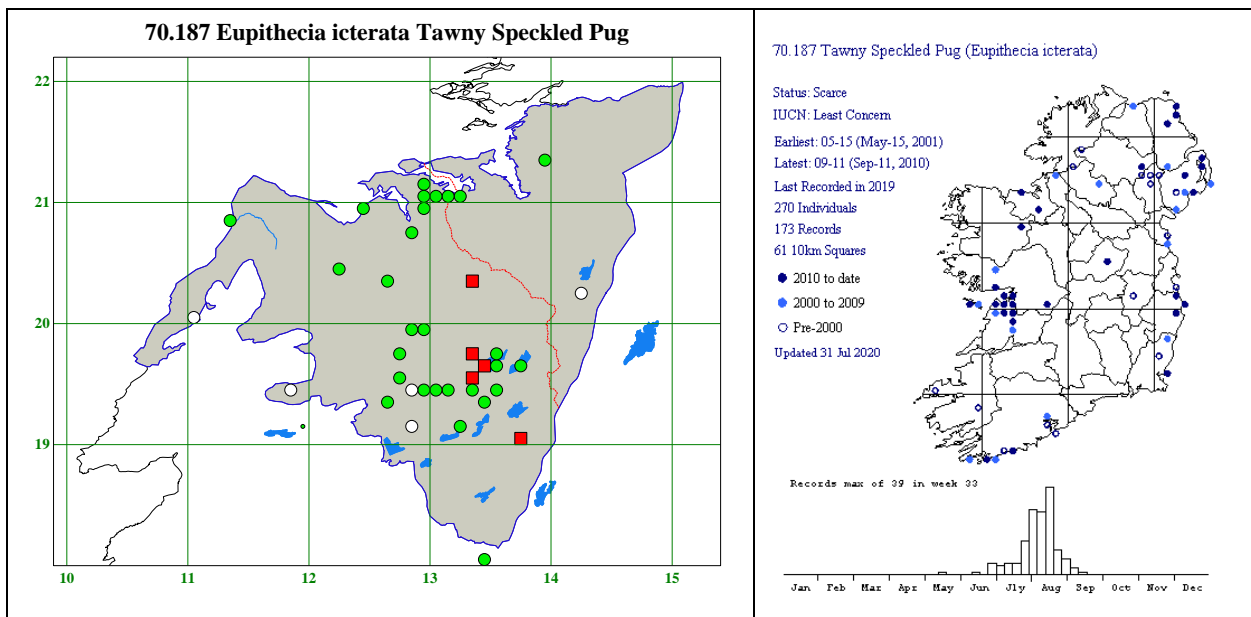
3.1.33 Juniper Pug *Eupithecia pusillata* 70.158

Another species that feeds on native Juniper *Juniperus communis* and cultivated relatives, and which is very local in Ireland. Most Juniper species are showing an increase as they switch to cultivated species, but Juniper Pug has shown a severe long-term decrease in Great Britain. There is no evidence for a similar trend in Ireland. A single adult was trapped at Rockforest Townland on 1 September 2021. Identification was confirmed by Dave Allen.



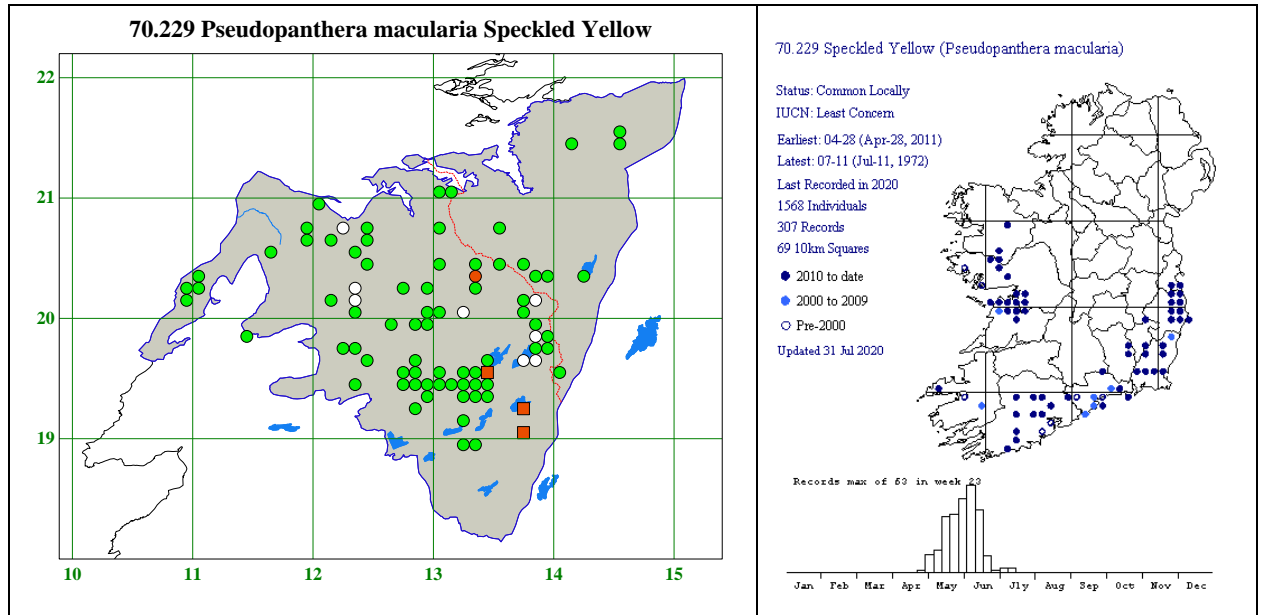
3.1.34 Tawny-speckled Pug *Eupithecia icterata* 70.187

The range of Tawny-speckled Pug is mainly coastal in Ireland with a scattering of mostly pre-2000 records from inland localities. It is widely recorded in the Burren but nevertheless the two records from this survey were new records for both the sites and the 1 km squares. It was found at Ballyogon in July 2021 and Slieve Carran in September 2021. The foodplants are Yarrow *Achillea millefolium* and Sneezewort *Achillea ptarmica*.



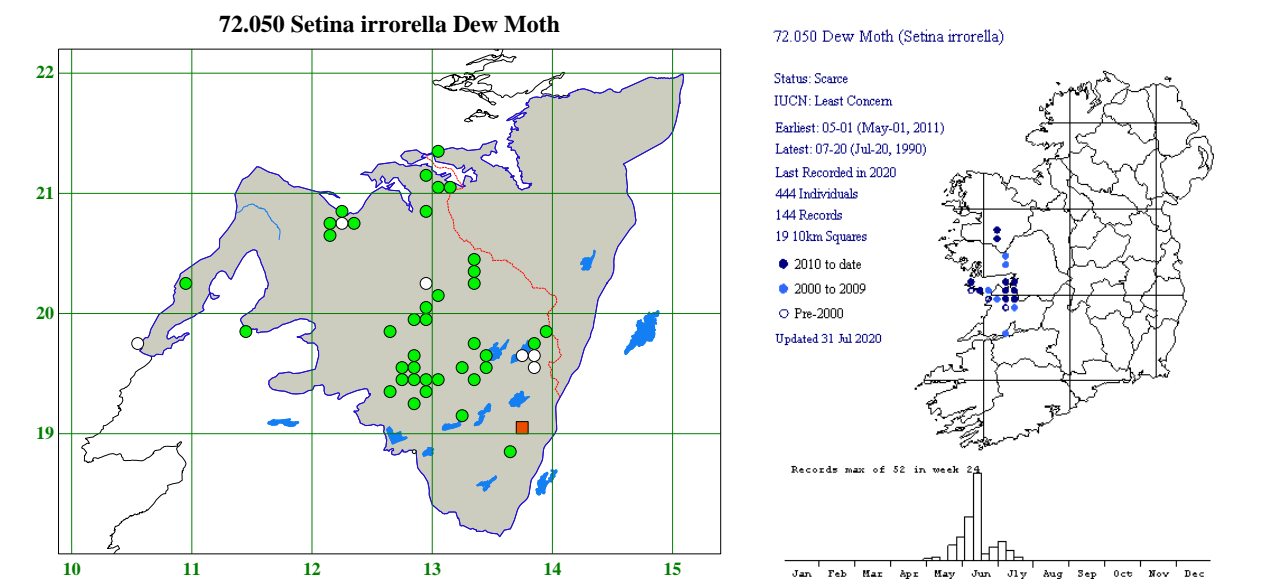
3.1.35 Speckled Yellow *Pseudopanthera macularia* 70.229

This is a species of open wood and scrub. The distribution in Ireland is southern, being found from Co. Kerry to Co. Dublin and a second centre in the karst of the Burren and Loughs Corrib/Mask/Carra. This moth is a daytime flying species and is seemingly well recorded in the Burren. Nevertheless three of the four records in 2021 were from unrecorded 1 km squares at Rockforest, Ballyogon and Muckanagh Lough.



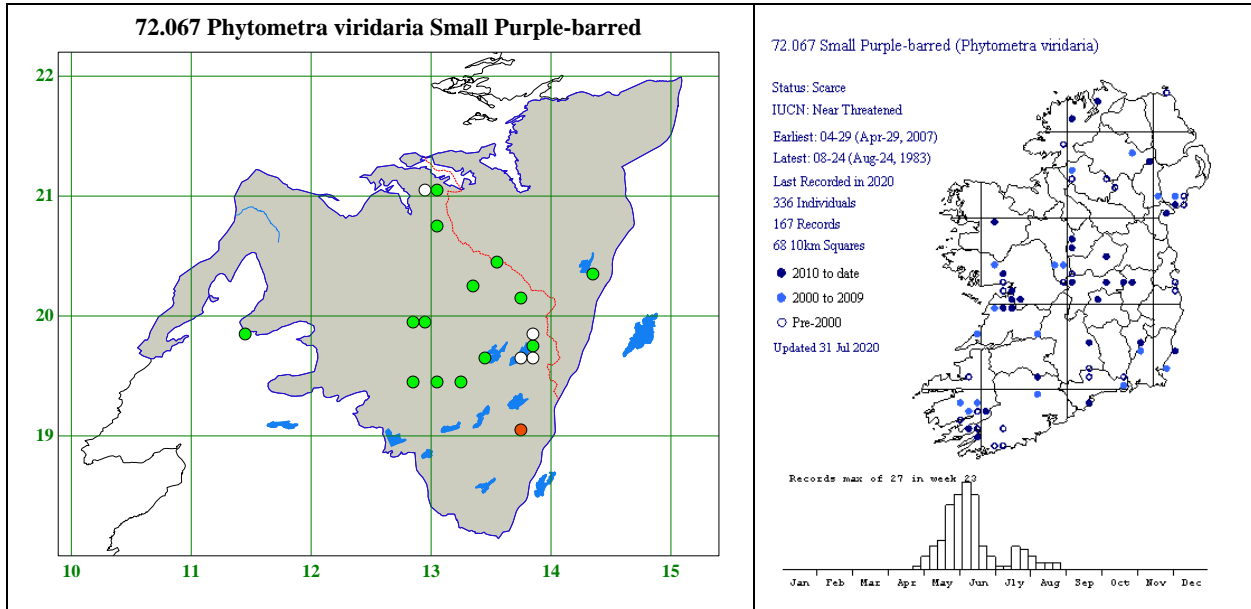
3.1.36 Dew Moth *Setina irrorella* 72.056

Dew Moth is a rare moth of rocky coasts, shingle beaches and calcareous grassland with a range in Ireland restricted to the karst regions of the Burren, Loughs Corrib/Mask/Carra and the Aran Islands. The caterpillars feed on lichens and possibly mosses growing on rocks. The species has declined in parts of Europe due to loss of open rocky habitat through scrub encroachment. Eleven were recorded in Ballyogon on 26 May 2021 through both daytime observation and trapping.



3.1.37 Small Purple-barred *Phytometra viridaria* 72.067 NT

A day-flying moth of unimproved calcareous grassland, limestone pavements and heath, Small Purple-barred is widespread but local in Ireland. It has declined significantly in England and was assessed as Near Threatened in Ireland as there are many hectads where it has not been seen since 1970-1999. It was found at Ballyogan in May and July 2021.



3.1.38 Figure of Eight *Diloba caeruleocephala* 73.033 NT

Figure of Eight (Figure 10) has a scattered distribution in Britain and Ireland and has undergone a severe decrease in abundance and distribution in Britain since 1970. It was assessed as Near Threatened for the Ireland Red List owing to the number of old records. Its habitats include hedgerows, scrub, broadleaved woodland and gardens and the larval foodplant is Blackthorn *Prunus spinosa*. A caterpillar was beaten from Blackthorn *Prunus spinosa* at Ballyogan on 27 May 2021, and later in October adults were trapped at both Ballyogan and Cooiloorta. The importance of the Blackthorn for this and other species such as Brown Hairstreak butterfly, needs to be considered in any scrub control work to protect areas of grassland.

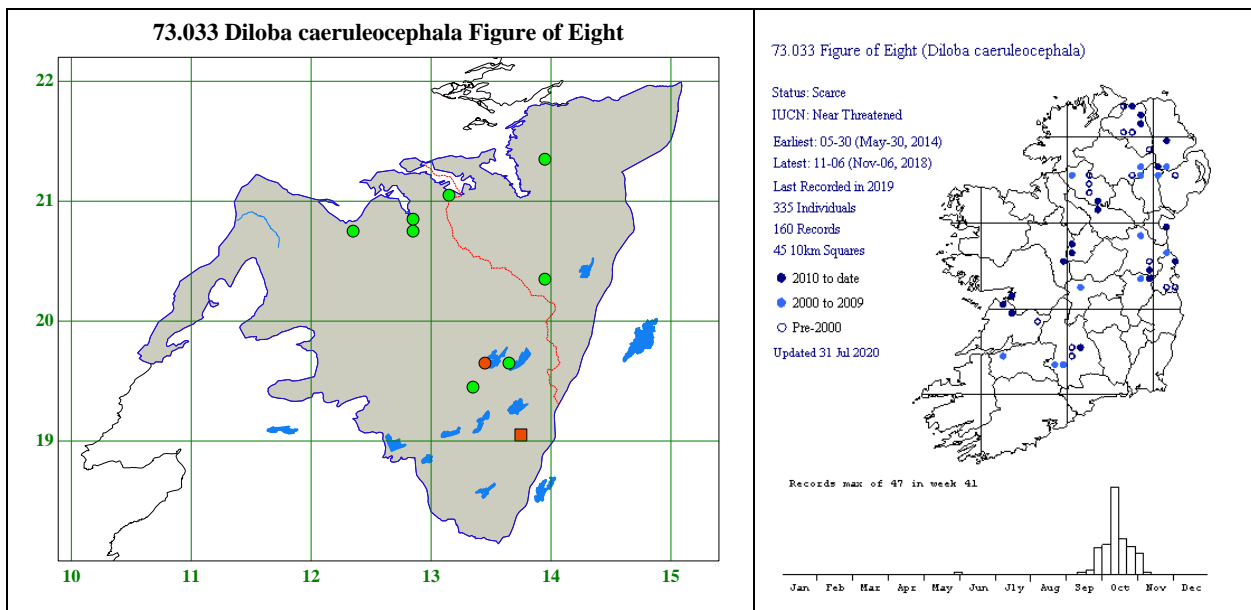




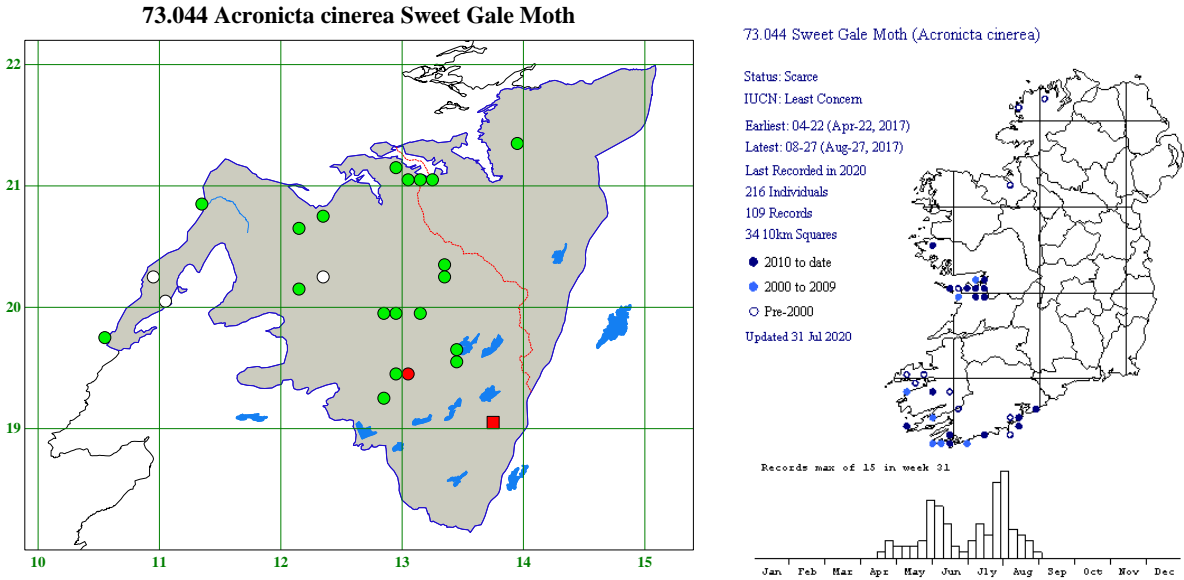
Figure 10 Figure of Eight *Diloba caeruleocephala*. **Brian Nelson.**



Figure 11 Sweet Gale Moth *Acronicta cinerea*. **Brian Nelson.**

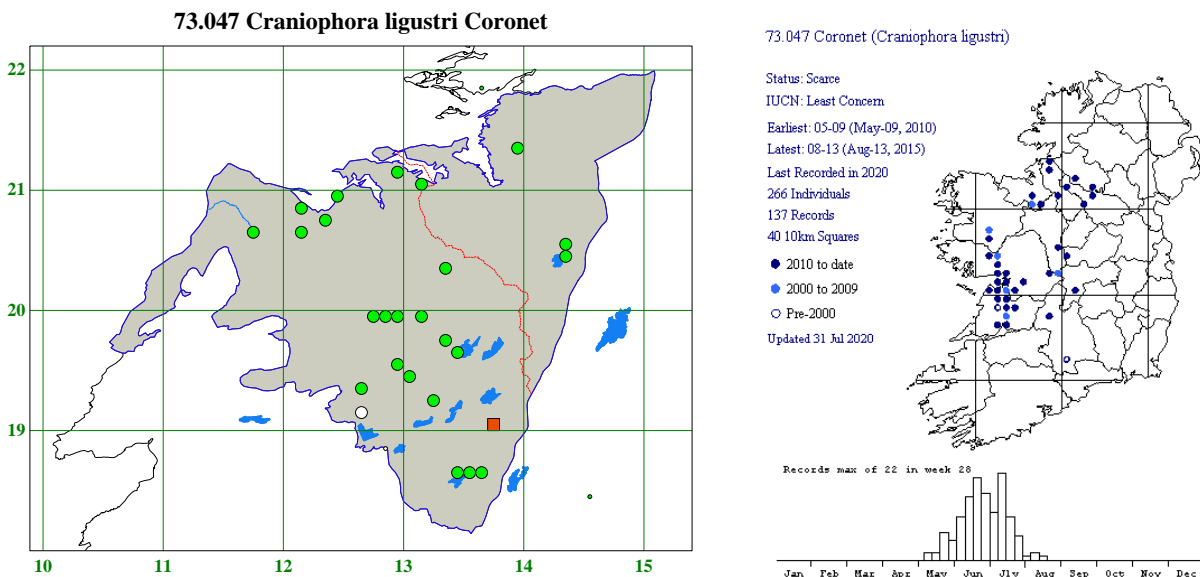
3.1.39 Sweet Gale Moth *Acronicta cinerea* 73.044

Recent Irish records for Sweet Gale Moth (Figure 11) are from the Burren and in the south-west especially coastal areas of Kerry and Cork. A significant number of records are old and the species may have declined. In contrast, the distribution in Europe is strongly northern and in Britain it is only found on moorland in Scotland. The foodplants include Heather *Calluna vulgaris* and Bog Myrtle *Myrica gale*. One individual was taken at Ballyogan in July 2021 and a larva was recorded at Poulnalour in June 2022.



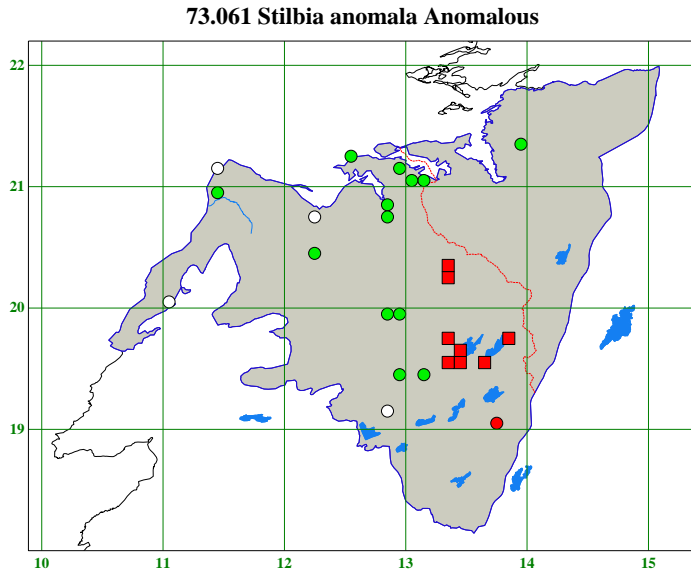
3.1.40 Coronet *Craniophora ligustri* 73.047

Coronet is a local species that appears to be expanding in Great Britain. In Ireland the range includes the karst region from the Burren to Lough Mask/Carra, plus non-karst areas in the Shannon valley and Sligo/Leitrim/Cavan in the north-west. It is perhaps also increasing as it was recently recorded in Co Wexford. Its habitats include woodland and scrub adjacent to calcareous grassland and fens. The foodplants are woody species including Ash, Hazel *Corylus avellana*, Alder and Privet. It is well recorded in the Burren but nevertheless the three individuals trapped at Ballyogan in July 2021 represented a new 1 km record.



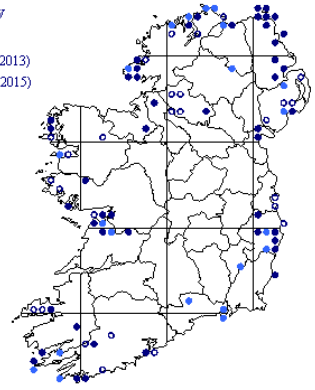
3.1.41 Anomalous *Stilbia anomala* 73.061

The Anomalous is widespread in coastal counties in Ireland but much less common inland and seemingly declining. It is a western and northern species in Britain (so being coastally distributed in Ireland is unusual), and there it has undergone severe decline. Recorded at all sites in September 2021 and at three in September 2022 with a total of eight new 1 km records. The foodplants are the grasses *Deschampsia flexuosa* and *D. cespitosa*.

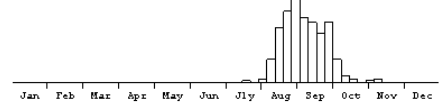


73.061 Anomalous (*Stilbia anomala*)

Status: Common Locally
 IUCN: Least Concern
 Earliest: 07-19 (Jul-19, 2013)
 Latest: 11-11 (Nov-11, 2015)
 Last Recorded in 2019
 867 Individuals
 357 Records
 95 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre-2000
 Updated 31 Jul 2020

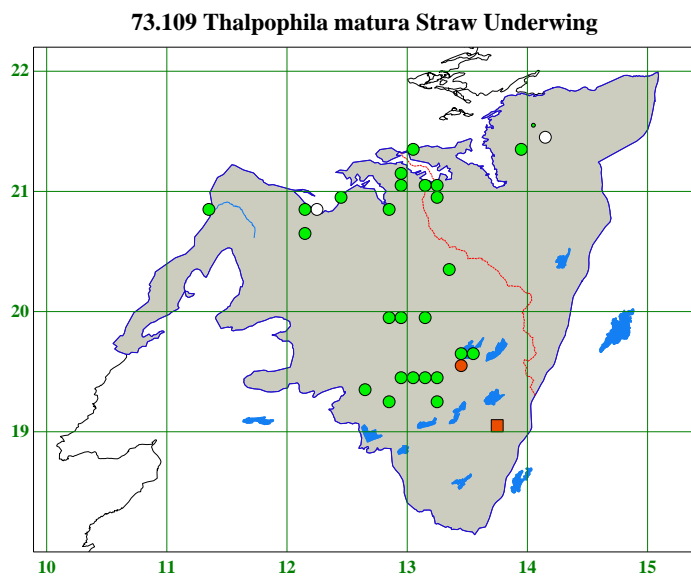


Records max of 54 in week 35



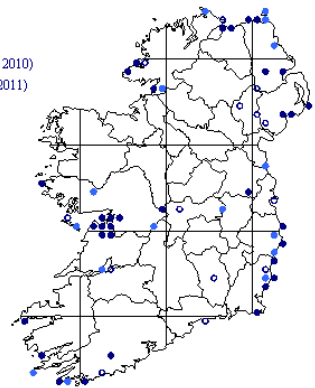
3.1.42 Straw Underwing *Thalpophila matura* 73.109

Straw Underwing can be found in many open habitats, including calcareous grassland, heathland and sand-dunes. It is widespread and common in the southern half of Britain, but is mainly coastal to the north and in Ireland suggesting a requirement for warmth and good drainage. It was found at Ballyogan and Crehaun Townland in July 2021, with 20 individuals trapped at the latter. The larvae feed on grasses especially *Dactylis*.

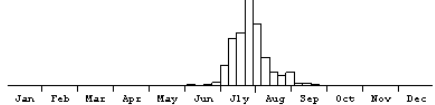


73.109 Straw Underwing (*Thalpophila matura*)

Status: Scarce
 IUCN: Least Concern
 Earliest: 06-05 (Jun-05, 2010)
 Latest: 09-19 (Sep-19, 2011)
 Last Recorded in 2019
 1940 Individuals
 532 Records
 64 10km Squares
 ● 2010 to date
 ● 2000 to 2009
 ○ Pre-2000
 Updated 31 Jul 2020



Records max of 128 in week 20



3.1.43 Burren Green *Calamia tridens* 73.116 NT

This unmistakable green moth (Figure 12) was first found in the Burren in 1949 but is not found anywhere else in Ireland nor is it resident in Britain. The nearest populations are in the Paris region of northern France. It had presumably gone unnoticed before 1949 because of the lack of night time trapping as it is a relatively common species at light. Burren Green is found on calcareous grassland and sand dunes and the larvae feed on Blue Moor-grass *Sesleria caerulea* which also has a restricted range in Britain and Ireland, being confined to calcareous areas. Burren Green was assessed as Near Threatened for the Ireland Red List. It was recorded from six 1 km squares, three of them new square records.

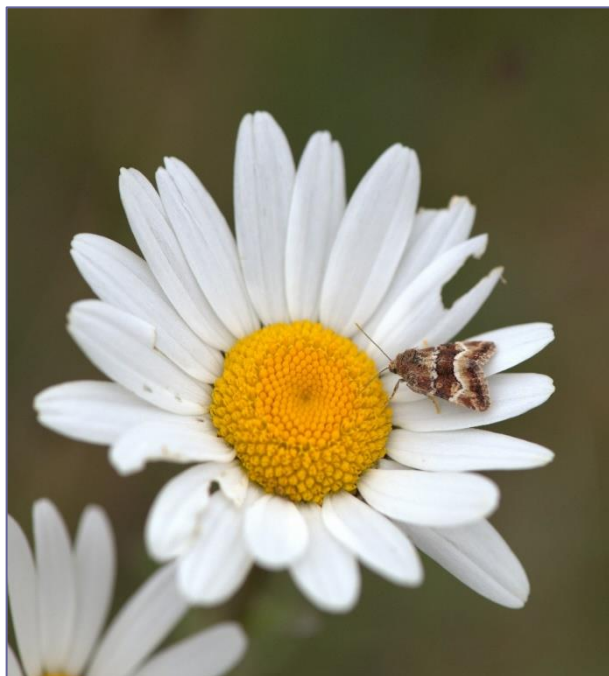
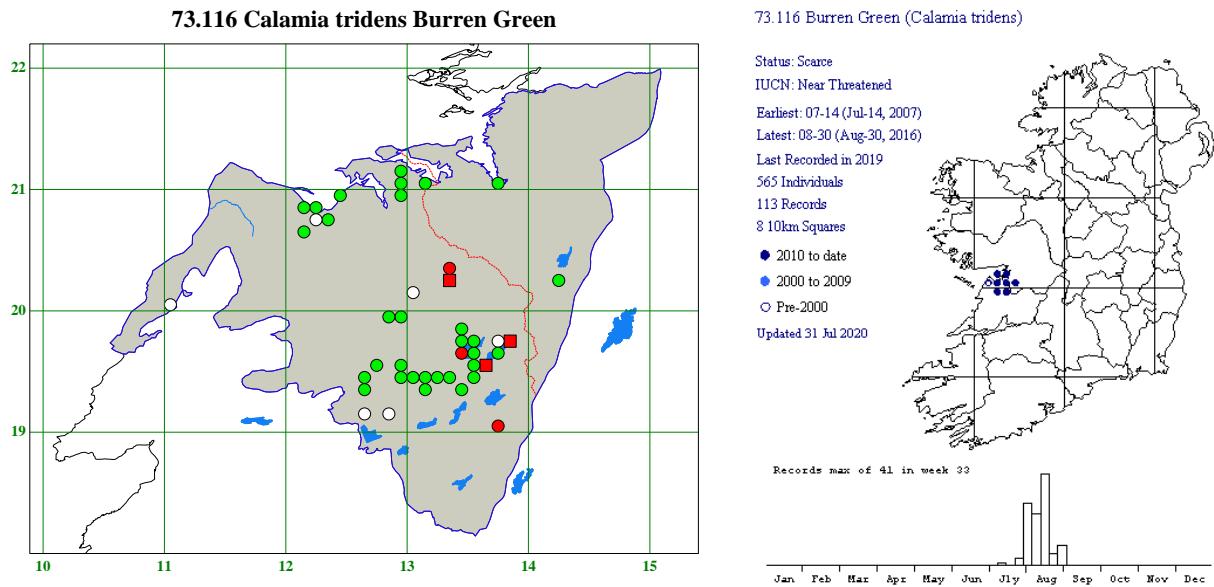
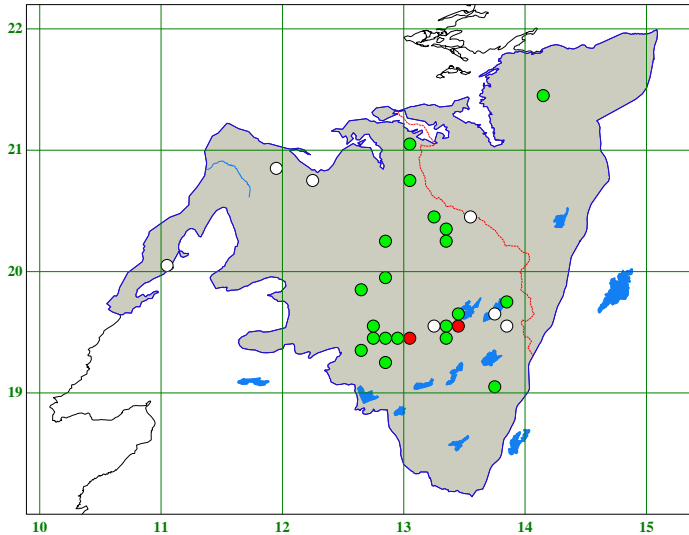


Figure 12 Burren Green *Calamia tridens*, and Least Minor *Photodes captiuncula*. **Brian Nelson.**

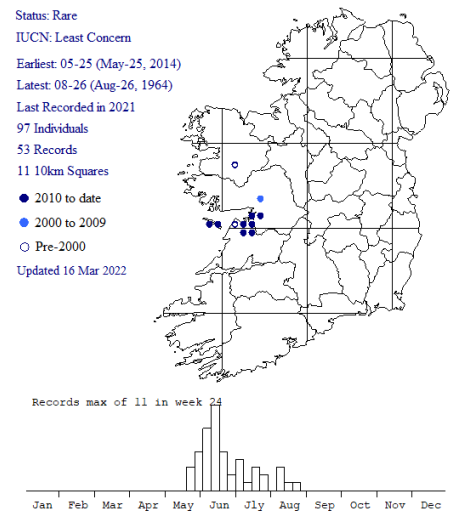
3.1.44 Least Minor *Photedes captiuncula* 73.146

Least Minor is a species of dry calcareous grassland, and has a very restricted range in Britain and Ireland: essentially the Burren (and the Aran Islands) and two areas of northern England. The British population is considered a different sub-species (subsp. *expolita*) to that in Ireland (subsp. *tincta*). The larvae feed on sedges (*Carex flacca*) but Blue Moor-grass *Sesleria caerulea* has also been reported as a foodplant in the Burren. One individual was recorded at Rockforest Pine Wood in July 2021 and BN also found one by day at Poulnalour (BNP) in 2022.

73.146 *Photedes captiuncula* Least Minor



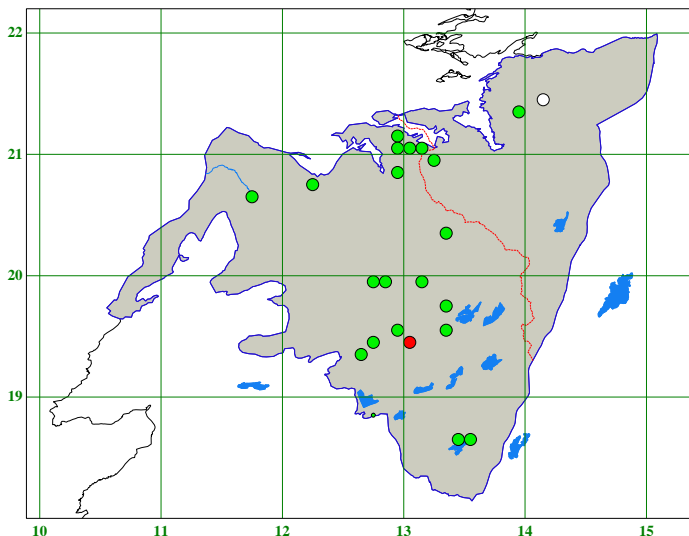
73.146 Least Minor (*Photedes captiuncula*)



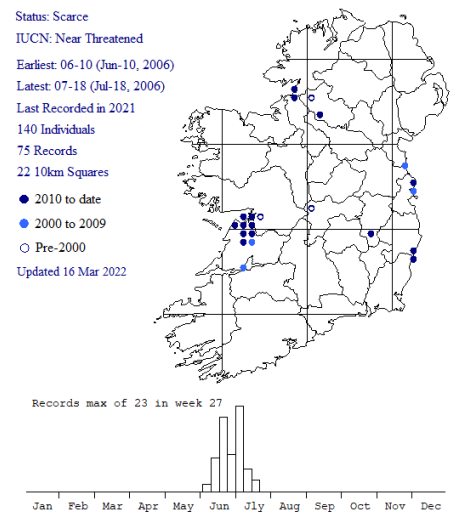
3.1.45 Reddish Light Arches *Apamea sublustris* 73.164 NT

Reddish Light Arches was assessed as Near Threatened on the all-Ireland Red List. It is widespread in the Burren but this contrasts to its very limited range elsewhere in Ireland. The species is found in calcareous and sand dune grasslands. The larvae feed on grasses. It was trapped in June 2022 in the National Park at Poulnalour.

73.164 *Apamea sublustris* Reddish Light Arches



73.164 Reddish Light Arches (*Apamea sublustris*)



3.1.46 Grey Chi *Antitype chi* 73.228

The Grey Chi (Figure 13) is found widely in the northern third of Ireland, the Connemara coast and has a western stronghold in the Burren. It has declined in Britain where it has a north-western distribution. The foodplants are varied herbaceous and woody species and habitats are grassland and heaths. All the records from Slieve Carran, Rockforest Townland, Lough Bunny and Ballyogan Nature Reserve were new 1 km square records.

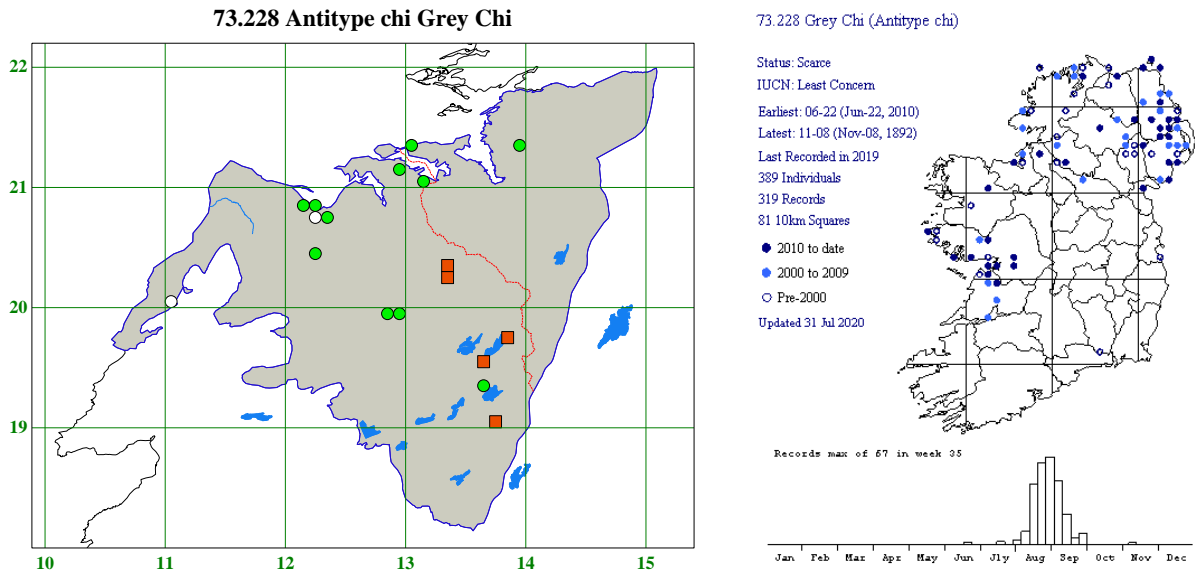
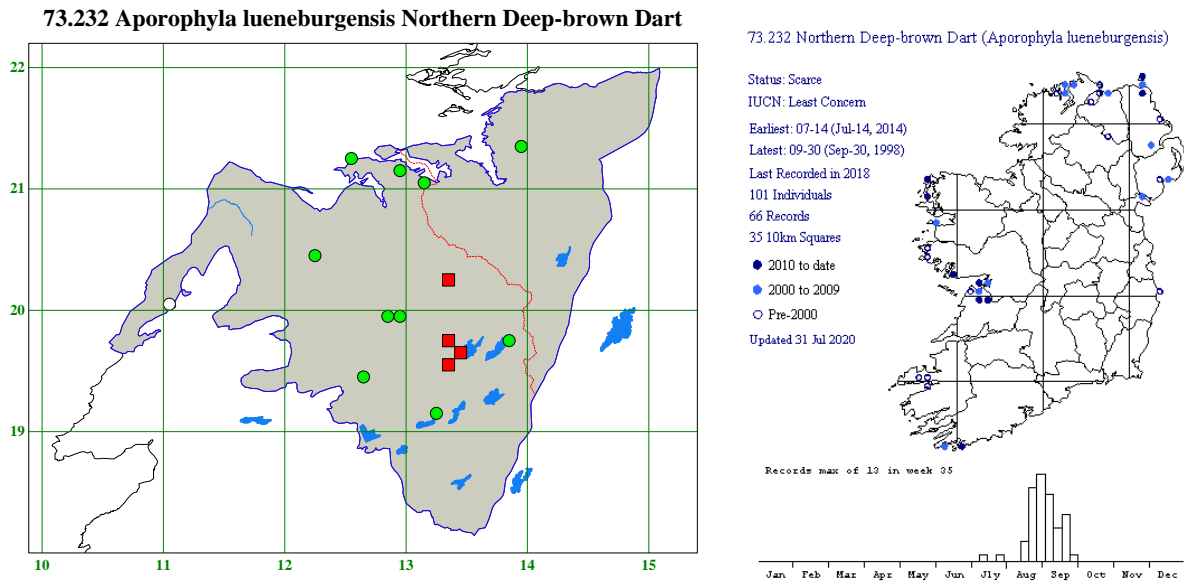


Figure 13 Grey Chi, *Antitype chi*. Áine O Connor.

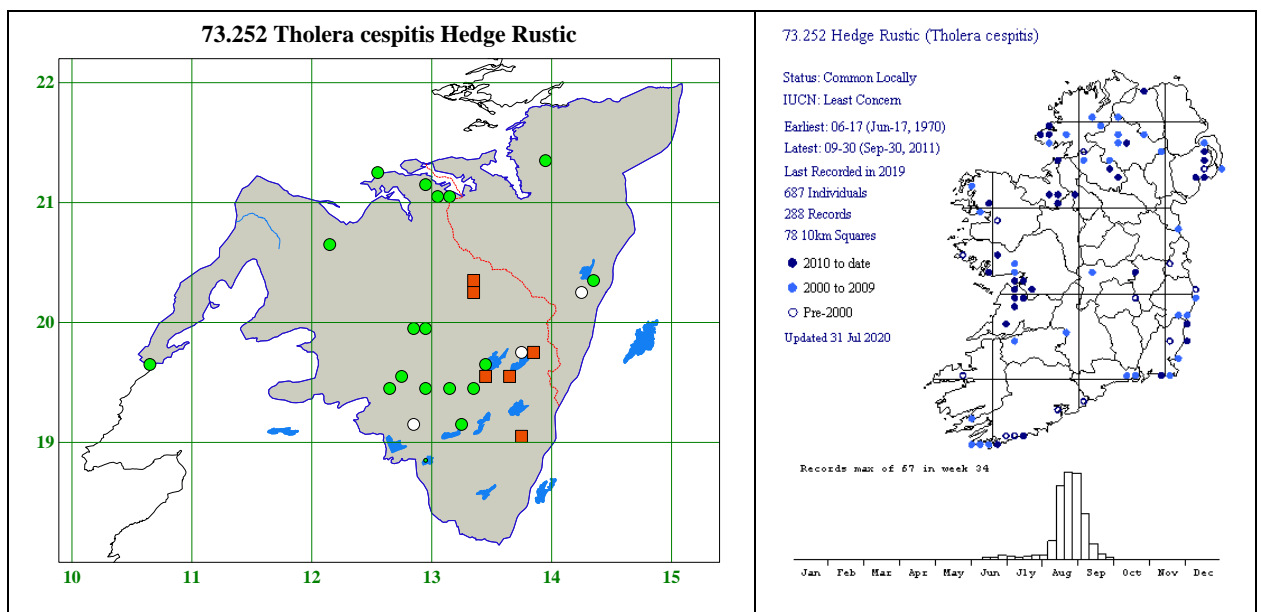
3.1.47 Northern Deep-brown Dart *Aporophyla lueneburgensis* 72.232

Northern Deep-brown Dart is one of a species pair with the more southerly distributed Deep-brown Dart *A. lutulenta*, but the latter is absent from Ireland. The Irish distribution is largely coastal and mainly in the north-east and west but extending inland in the Burren. It is found on heathland and rocky places, and the larvae feed on a number of plants including Heather *Calluna vulgaris* and Bird's-foot Trefoil *Lotus corniculatus*. Three adults were trapped at Slieve Carran in September 2021 and at three sites in September 2022 which were all new 1 km records.



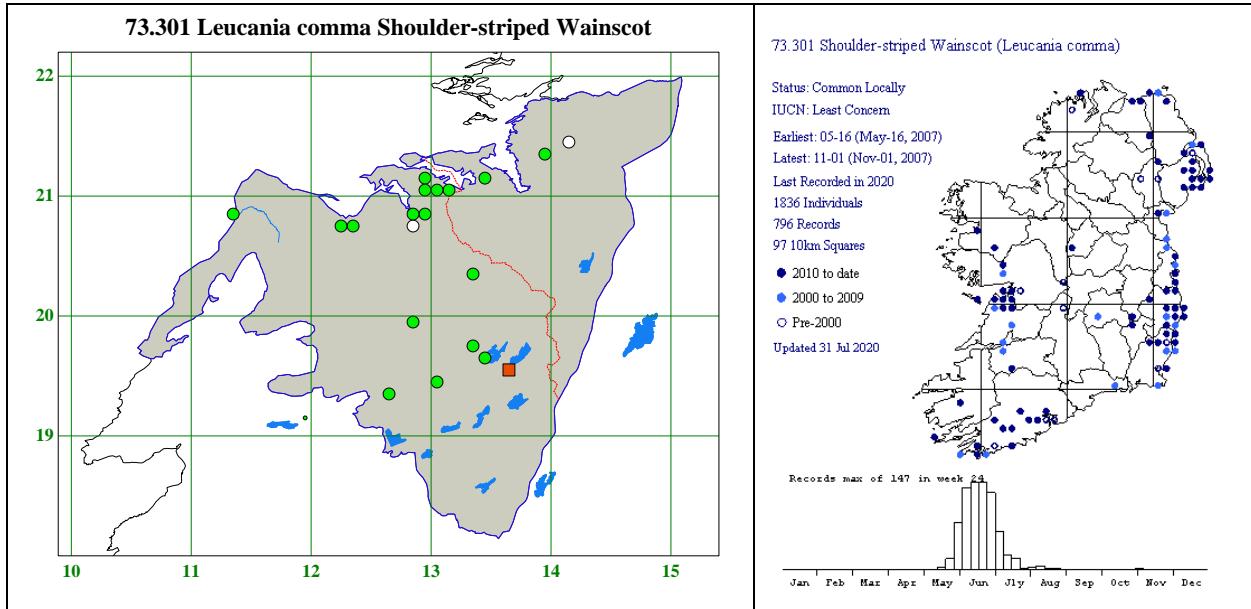
3.1.48 Hedge Rustic *Tholera cespitis* 73.252

This species is mainly coastal in Ireland but it is also known from scattered inland records especially in the north-west and in the Burren. Hedge Rustic is a southern species of open habitats in Britain where it is in severe decline. The foodplants are grasses especially Mat-Grass *Nardus stricta* and Wavy Hair-grass *Deschampsia flexuosa*. Hedge Rustic was recorded at all sites in September 2021, all of which were new 1 km records. Oddly it was not recorded in September 2022.



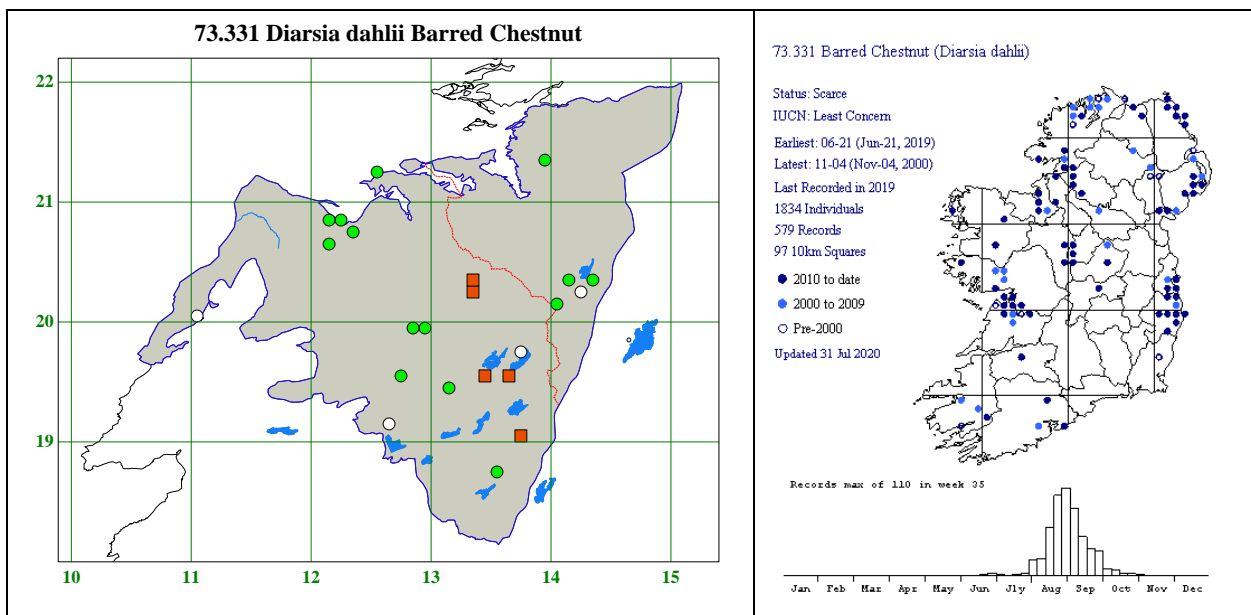
3.1.49 Shoulder-striped Wainscot *Leucania comma* 73.301

Predominantly coastal in Ireland, where it is far scarcer than in Britain, Shoulder-striped Wainscot is found in fens, wet grassland and damp woodland. Its larval foodplants are grasses including *Deschampsia* and *Festuca*. One individual was trapped at Rockforest Lough in May which represents a new 1 km square record.



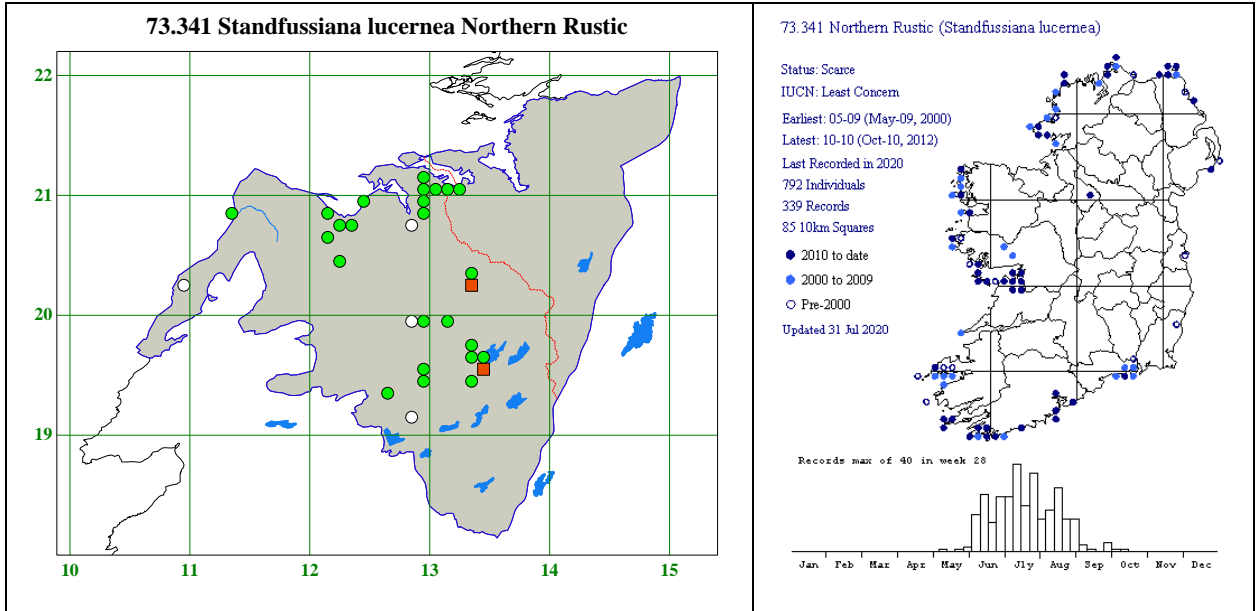
3.1.50 Barred Chestnut *Diarsia dahlia* 73.331

Another species with a stronghold in the Burren, Barred Chestnut is a predominantly northern species that has declined significantly in the southern part of its range in Britain. The Irish range is patchy and mostly coastal and northern. It was taken at Ballyogan and Slieve Carran Nature Reserve, Rockforest Pine Wood and Rockforest Townland in September 2021, all of which were new 1 km records.



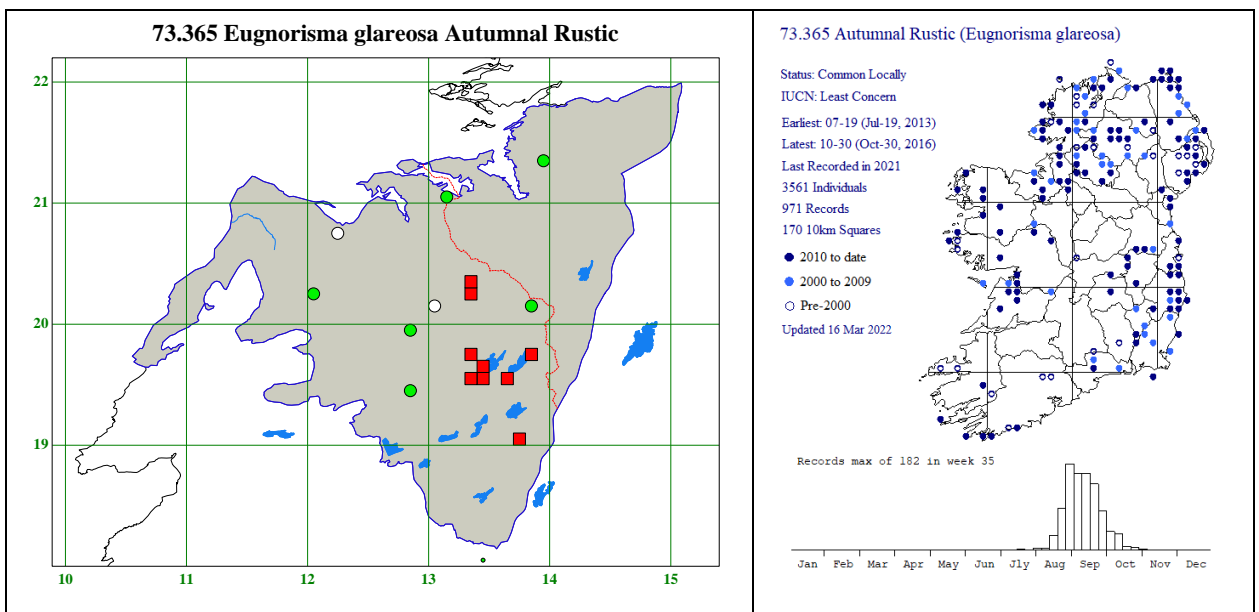
3.1.51 Northern Rustic *Standfussiana lucerneae* 73.341

This species is found in rocky, sparsely vegetated places such as coastal cliffs, mountain scree and limestone pavement. The larval foodplants include low-growing herbaceous species and grasses. The Irish range is essentially coastal though it is absent from the east coast between Down and Wexford. Northern Rustic was trapped in Rockforest Pine Wood and Crehaun Townland in July 2021, and in Slieve Carran in September 2021.



3.1.52 Autumnal Rustic *Eugnorisma glareosa* 73.365

Autumnal Rustic has declined in abundance in Britain but in Ireland it remains widespread especially in eastern counties, the north-west and Northern Ireland. It has been found in the Burren in scattered sites across the region. Good numbers were trapped in all sites in September 2021 and 2022 and the records were all firsts from their respective 1 km squares. This more than doubled the number of occupied squares suggesting under-recording of the species due in part to the late flight period. There are many reported foodplants.



3.2 Site accounts

This section provides an overview of each of the five main areas covered: Rockforest Pine Wood and Turlough; Rockforest Lough and adjacent lands; Ballyyogan and Slieve Carran Nature Reserves; and the Cooloora area. These are all NPWS owned except for Rockforest Lough and adjacent lands, however it is included as it is an area with few previous records.

3.2.1 Rockforest Pine Wood and Turlough

Rockforest Pine Wood is an open woodland on limestone pavement with stunted, mature Scots Pine *Pinus sylvestris*. Roche *et al.* (2018) described the vegetation as species-rich and classified it as the *Corylus avellana–Brachypodium sylvaticum* pinewood type that has affinities with Norwegian basiphilous pinewoods. See Figure 14 for an aerial view of Rockforest Pine Wood. Figure 15 shows an overview of the site and its ground vegetation.

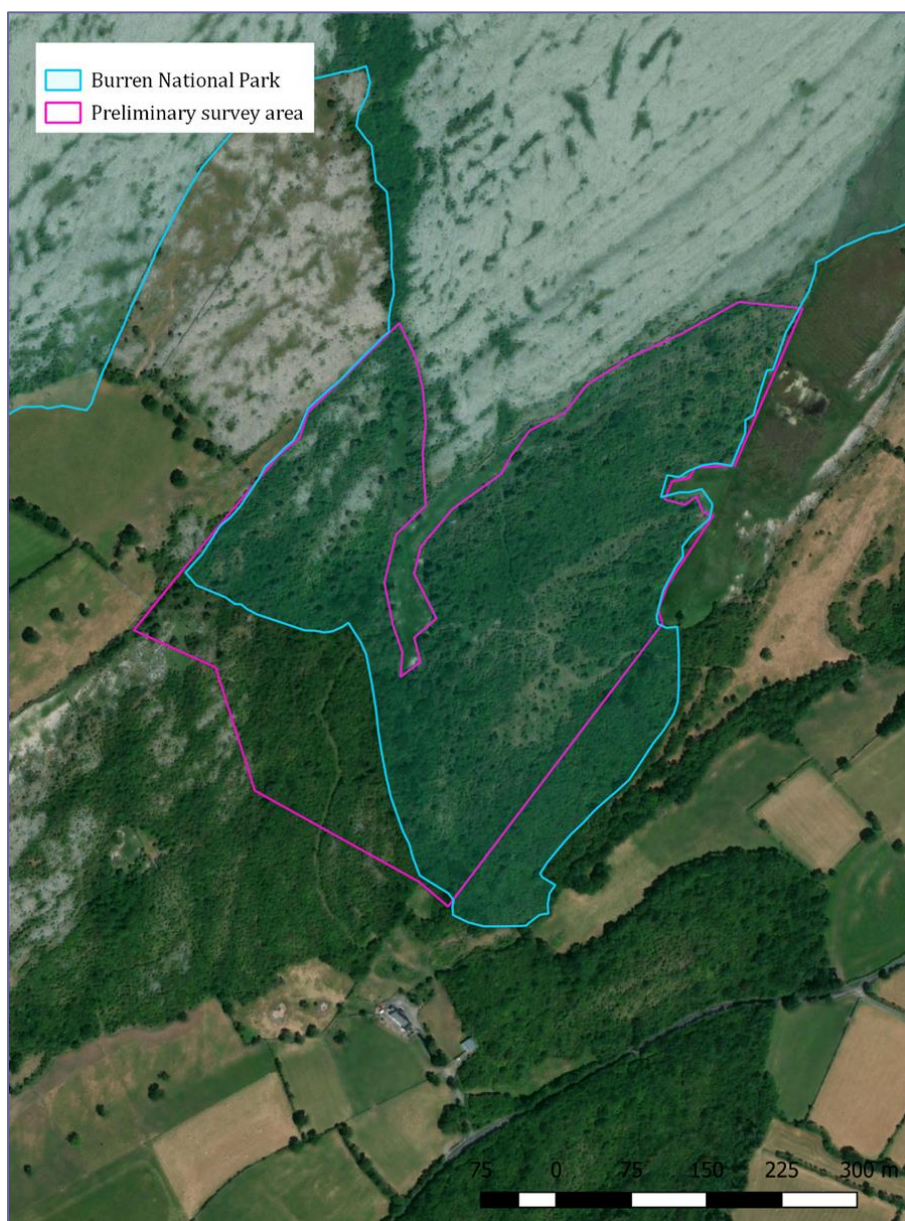


Figure 14 Overview of Rockforest Scots Pine Forest. Map provided by **Jenni Roche**. Preliminary survey area refers to Scots Pine survey.

Moth traps were set at Rockforest Pine Wood on three nights in 2021: 24 May, 19 July and 1 September. Light-weight traps (6w Actinic Heath traps and a 20w compact Skinner) only were used owing to the need to carry them across approximately 500 m of limestone pavement and over/through a number of stone walls to reach the site. Three traps were set in May and September, with the same locations used by each moth trapper on both occasions (Figure 16). Two actinic traps were set in July.



Figure 15 Overview of Rockforest Pine Wood (left) and typical vegetation (right).

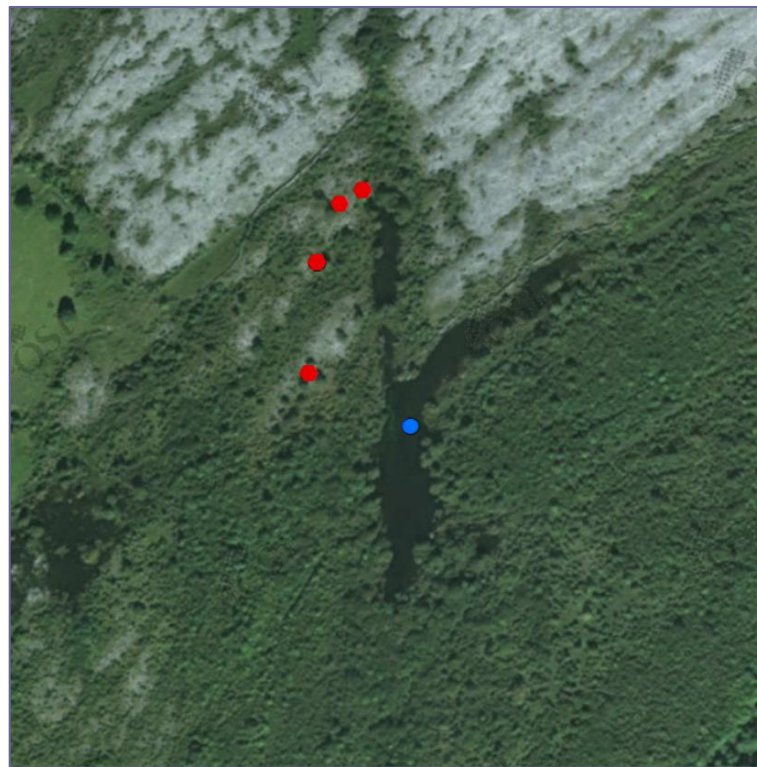


Figure 16 Locations of moth traps locations at Rockforest Pine Wood (red hexagons). The blue disc shows the location of Rockforest Turlough, in flood in this aerial photograph, but dry in Figure 14 above.

May 2021 was a cool and wet month everywhere, with all mean air temperatures below their long term averages¹ and the weather at Rockforest on 24 May was cool, with clear skies and a touch of frost. Met Éireann data for Athenry show the air temperature was 7-9°C for most of the night of 24/25 May. After

¹ <https://www.met.ie/climate/past-weather-statements/past-weather-agrometeorological-bulletins> (May 2021)

a heavy shower on the afternoon of 24 May, it remained dry with low wind speeds. Conditions were not ideal for moth trapping, one of the three traps malfunctioned (probably caused by the low temperatures; Lithium batteries do not operate below 5°C) and only ten species were recorded.

By contrast, the weather in July was very warm reaching heatwave conditions² during the time of the survey. Late afternoon/early evening temperatures on 19 July reached 28°C, and night-time temperatures remained above 15°C at both Athenry and Shannon Airport stations. 48 species were recorded at Rockforest Pine Wood on 19 July.

September conditions were good, with warm, sunny and dry weather, and 42 species were recorded.

In total 92 moth species were recorded at Rockforest Pine Wood in 2021 (Appendix II). Amongst the other interesting species recorded were Least Minor, Pale Eggar, Chestnut-coloured Carpet, Northern Rustic, Anomalous, Hedge Rustic, Autumnal Rustic, Barred Chestnut and Lackey. Overall the moth fauna was not exceptional and notably lacked macro-moth species such as Pine Beauty *Panolis flammea*, Bordered White *Bupalus piniaria* and Barred Red *Hylaea fasciata* that are closely associated with Scots Pine. The one pine-feeding moth species recorded was Grey Pine Carpet *Thera obeliscata* but this is widespread in Ireland and is not considered a conservation priority. However, it should be stressed that trapping effort at Rockforest was limited owing, in part, to the failure of one of the three traps in May 2021 and the general cool temperatures in May 2021 and, perhaps most significantly, the inaccessibility of the site. It was not possible to bring in generators to Rockforest Pine Wood and operate large Robinson traps, which were deployed at all the other main sites. Further survey of the site is therefore recommended, particularly in spring/early summer and with generators.

² <https://www.met.ie/climate/past-weather-statements/past-weather-agrometeorological-bulletins> (July 2021)

3.2.2 Rockforest Lough and adjacent lands

In July and September 2021, 125 w Robinson traps were set in a garden and fields in Rockforest Townland and, on one occasion, a 6 w Actinic Heath trap and a 20 w compact Skinner were set near Rockforest Lough (see Figure 17). Traps were set over four nights in May and two nights in September (see Appendix I) with a total recording effort of 13 trapping nights.



Figure 17 Rockforest Lough and environs. The gold ellipse outlines the areas surveyed for moths and aquatic Coleoptera.

A total of 93 species was recorded from this site in 2021 (Appendix III) including one Red List species, Burren Green. Shoulder-striped Wainscot, another notable species, was recorded at Rockforest Lough on 26 May. Only seven species in total were recorded at Rockforest Lough, all-bar Shoulder-striped Wainscot were also found in the field and/or garden.

3.2.3 Ballyogan Nature Reserve

Ballyogan Nature Reserve is a diverse site, with limestone pavement, heath, fen, swamp, marl lake and scrub habitats. Insect and other invertebrates were surveyed at Ballyogan in 2018 by Mantell and Anderson (2020) who found that the site supported a very rich fauna associated particularly with the diverse wetland and karst habitat mosaic. Moths however were not a main focus of their work so only a few species were recorded though this included some not picked up in our surveys.

In 2021, moth traps were set on five nights: one in May, one in July, two in September and one in October (a total of 12 nights' trapping effort) (Figure 18). In 2022, no trapping was done but the site was visited to record day-flying moths and to use pheromone lures for clearwing moths.

The habitat diversity is reflected in the moth diversity, with a total of 209 species recorded over both years, 206 of these recorded in 2021 (Appendix II). One Red Listed species was recorded, Royal Mantle (VU), and three Near Threatened species, Burren Green, Small Purple-barred and Figure of Eight. Other noteworthy species found at Ballyogan in 2021 and 2022 included *Chilo phragmitella*, Red-tipped Clearwing, Pale Eggar, Galium Carpet, Chestnut-coloured Carpet, Speckled Yellow, Dew Moth, Sweet Gale Moth, Coronet, Straw Underwing, Grey Chi, Hedge Rustic, Barred Chestnut and Autumnal Rustic.



Figure 18 Ballyogan Nature Reserve. Red hexagons show where moth traps were set in 2021.

3.2.4 Slieve Carran Nature Reserve

Slieve Carran Nature Reserve is a large NPWS property in the north-eastern Burren. Part is a statutory nature reserve but the NPWS-owned land extends to the south-east of the nature reserve. The site is well-visited by naturalists and walkers using a network of informal paths.

Mantell and Anderson (2020) give a description of the site and the results of an invertebrate survey carried out in 2018. Moths were not surveyed, but Mantell and Anderson (2020) did include moth records derived from trapping by visiting moth recorders and some daytime observations. This included, most notably, the first record for Shuttle-shaped Dart *Agrotis puta* for Co. Clare.

Slieve Carran Nature Reserve was trapped on one night only, 02 September 2021. Two Actinic Heath traps were set in a mosaic of heath and scrub on limestone pavement to the east of the road, and a Robinson trap was set in woodland beyond the derelict building (Figure 19). On the western side of the road, one Actinic Heath trap was placed in a clearing in scrub, just off the main path, and a Robinson trap was set in limestone pavement (Figure 19). A compact Skinner trap placed within dense, low woodland unfortunately failed and captured no moths. In addition, three records were made on 28 May based on observation of day time flying. A total of 78 species, including one Red List species (Heath Rivulet), was recorded at Slieve Carran in 2021 (Appendix II). Other notable species recorded included *Eana penziana*, *Acleris schalleriana*, Burren Green (NT), Pale Eggar, Speckled Yellow, Grey Chi, Hedge Rustic, Barred Chestnut, Autumnal Rustic, White-spotted Sable, Twin-spot Carpet, Tawny-speckled Pug and Northern Deep-brown Dart. Two main habitats supported these species: calcareous grassland and scrub.

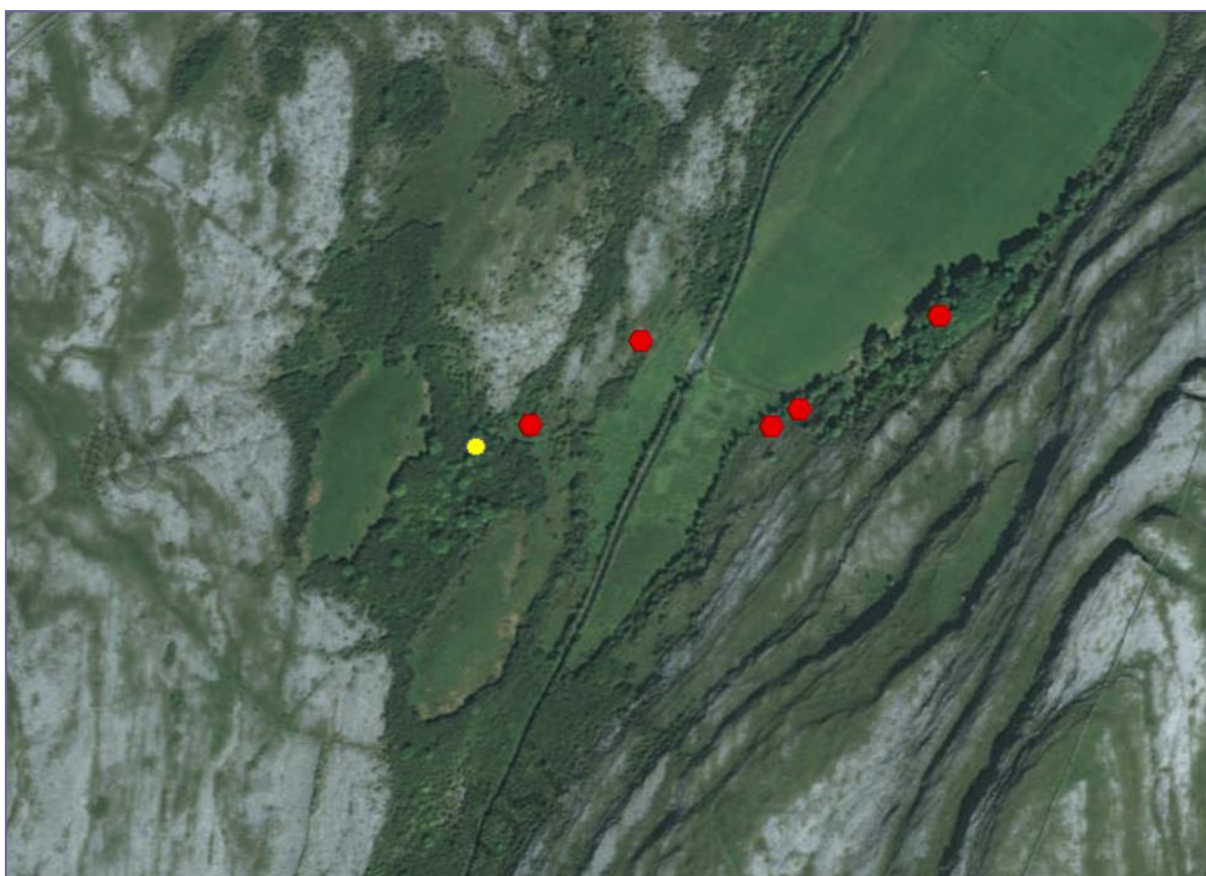


Figure 19 Locations of moth traps at Slieve Carran Nature Reserve on 02 September 2021 (red hexagons). The yellow disc shows the approximate location of the Skinner trap that did not light.

3.2.5 Cooloora area

The area centred on the Cooloora layby (R3418996656), one of the access points to the National Park, is one of the most diverse parts of the Burren containing a varied mosaic of habitats including calcareous grassland, scrub of several types, semi-natural grasslands and limestone pavement. It also has some of the extremely oligotrophic base rich lakes, turloughs and fen. Much of the area is limestone pavement which appears from a distance to be devoid of vegetation. However, a walk over it reveals that there are numerous stunted shrubs especially of Purging Buckthorn *Rhamnus cathartica* and small patches of grassy vegetation.

We trapped here at a number of sites on both NPWS and non-NPWS land in Cooloora and adjacent townlands of Crehaun and Leitra (Figure 20). Our base in September 2022 was a house on the border of Cooloora and Leitra townlands.

Perhaps the principal moth interest of this area is Irish Annulet *Gnophos dumetata* which is a *Rhamnus cathartica* feeding species that is known only from the Burren population for Britain and Ireland. It was subject to a NPWS-commissioned survey that clarified the species requirement for particular types of *Rhamnus* bushes (stunted shrubs growing on bare pavement) (Woodrow *et al.*, 2018). However, we failed to trap or observe any adults in 2021 and 2022. There is, however, no immediate reason to be concerned about this, and it was probably bad luck. A walk over the pavement on the eastern side of the road towards Cooloora Lough revealed there were many *Rhamnus* shrubs of the correct type suggesting that there should be robust population at least in that area. More work in this area would be helpful for managing the species.

A total of 100 species were identified from the traps in the Cooloora area. This included two Near Threatened species, Burren Green and Figure of Eight, and one species new to Co Clare (Autumn Green Carpet).

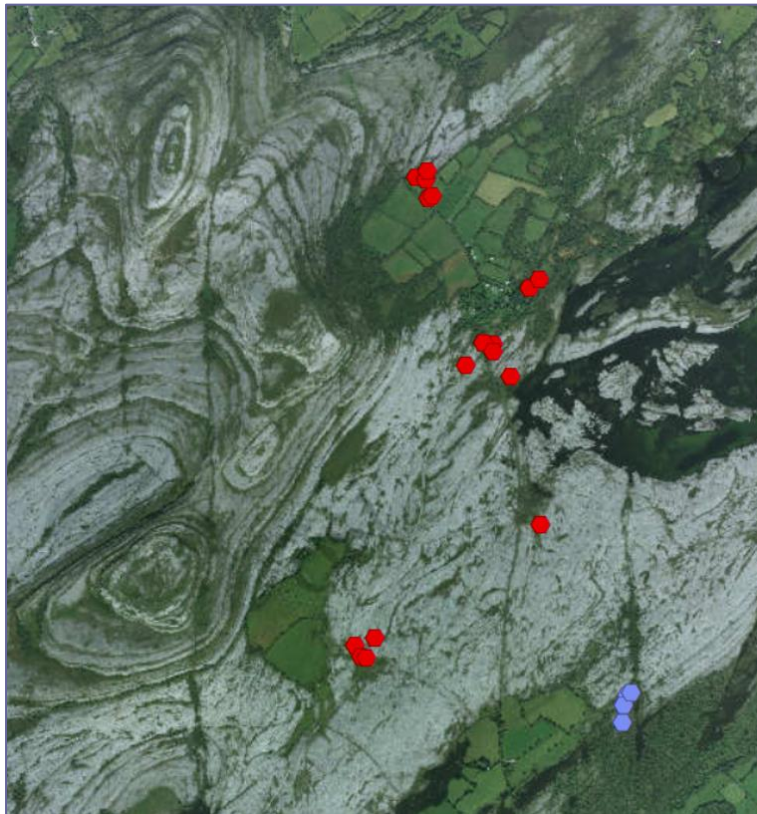


Figure 20 The Cooloora Area. Red hexagons show where moth traps were set in 2021 and 2022. Blue Hexagons show Rockforest Pine Wood.

4. DISCUSSION

The Burren is well-known to support a rich and remarkable insect fauna across many orders. The Lepidoptera are perhaps the best recorded of these (Figure 21). Nevertheless, recording has been sporadic and reliant to a large extent on visiting naturalists from outside of the Burren. Recording of the Burren moths only started in earnest in 1950 following the discovery of the Burren Green *Calamia tridens*. Light traps came into use at this period, previous recording mainly concentrating on larval rearing and collection of pupae. Nevertheless, it is difficult even with hindsight to understand why the Burren did not attract much notice from early Irish entomologists.

The number of Lepidoptera recorded in the Burren region is just over 970 species of which 937 are moths. Our recording in 2021 and 2022 therefore provided records of just over one third of the species list. Many of our records came from unrecorded squares. We also significantly increased the number of records of a few species such as Autumnal Rustic. Coverage in the Burren is still extremely patchy both geographically and temporally. Early and late season species have been overlooked as trapping has concentrated in the summer period when the most desirable species are on the wing. Many sites have been poorly covered as visiting moth recorders visit known sites rather than exploring new ones. Over-trapping in some localities is undesirable in terms of survey effort and data gathering, but is not considered a conservation issue at present. However, the Burren National Park may want to monitor this as part of the overall visitor pressure at some key locations.

With regard to the initial aim of trapping in Rockforest Pine Wood, our assessment is that there is little evidence of a relict pine fauna associated with the trees. There is a caveat in that our recording was impacted by the cold temperatures in 2021 and so more trapping is recommended in better conditions. Rockforest Pine Wood is relatively inaccessible and carrying generators into the site was not attempted given the distance from the road. This will also have reduced catches and use of more powerful traps is desirable.

Ballyogan stands out as an important site for Lepidoptera, adding to the findings of Mantell and Anderson (2020). The diversity of habitats on the site undoubtedly contribute to this but it also reflects the work efforts, with multiple traps set on multiple nights and assistance provided by expert recorders. Similar effort on other sites would probably produce comparable results (see Table 5). This natural intricate mosaic of habitats is a very important feature of the Burren and should be retained and encouraged whenever possible.

Slieve Carran is still under-recorded but is, nevertheless, important for moth species as evidenced by the 78 species recorded from five traps on one night in September 2021. More effort is needed to document the species on this site. More effort is also needed in the Cooiloorta area, given its habitat diversity.

Table 5 Moth trapping effort at the main sites surveyed in the Burren region in 2021 and 2022.

	Number of nights	Number of traps	Number of 125 W Robinson traps	Number of species
Ballyogan (National Park)	5	12	7	209
Cooiloorta area total (minus Rockforest)	6	20	4	100
Slieve Carran (National Park)	1	5	2	78
Rockforest Lough and Townland	6	12	10	93
Rockforest Pine Wood	4	9	0	92

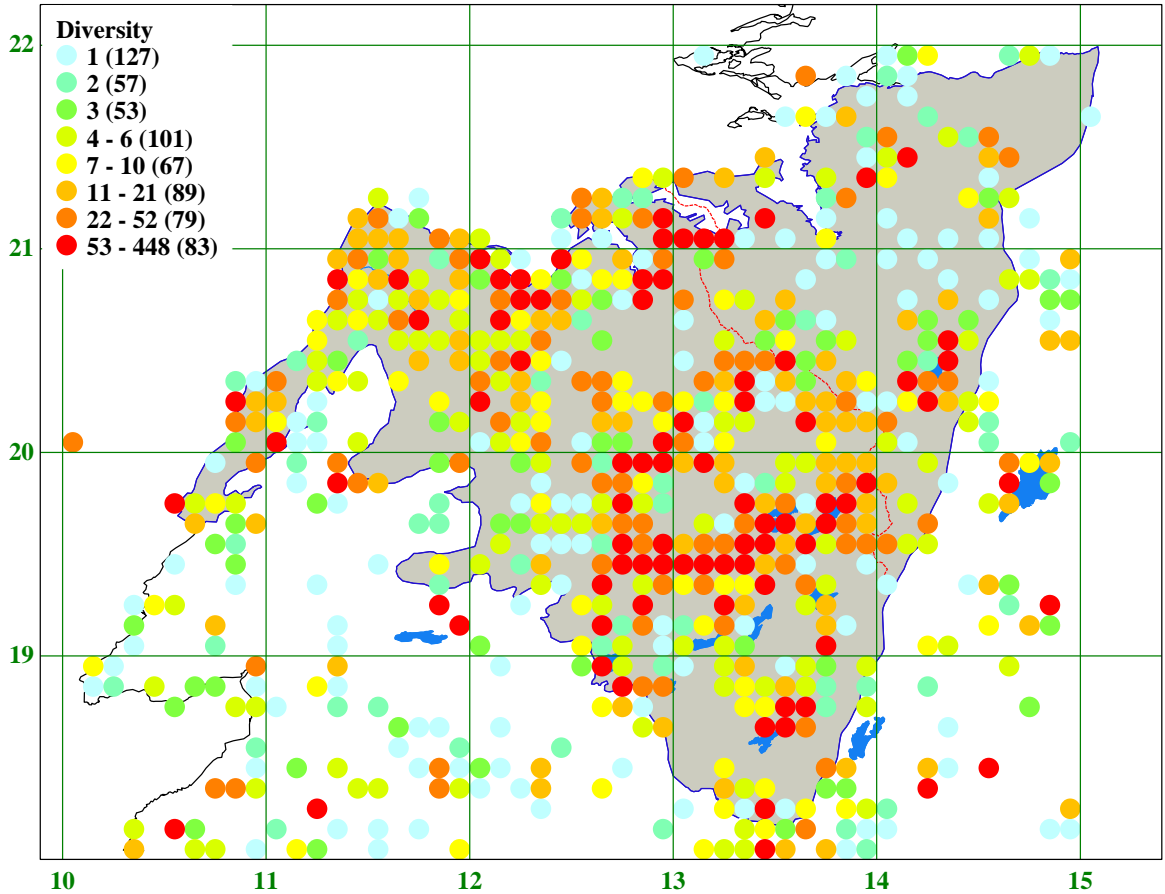


Figure 21 Map showing recording coverage of Lepidoptera in the Burren and surrounding areas by 1 km grid squares. The number of species recorded per grid square is indicated by the colour. Most squares have between 0 and 50 species. Areas of high diversity are apparent in the Burren National Park and along the north coast.

4.1 Recommendations

1. Organise more trapping in Rockforest Pine Wood, the wider Cooiloorta area and Slieve Carran.
2. Get baseline data on landholdings at Lough George, Ballyeighter and Fingall Lough.
3. Encourage visiting moth trappers to survey less-recorded parts of sites and outside of popular summer month periods. Providing recorders with maps of the National Park holdings with licences or other consents could be a way of encouraging this.
4. Maximise habitat mosaics on all sites.
5. Complete a Catalogue of Burren Lepidoptera. Information is needed to encourage more recording especially of poorly recorded species.

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APPENDIX I MOTH RECORDING EFFORT IN THE BURREN 2021 AND 2022

Moth recording effort. Survey dates (night trap set), sites surveyed, surveyors, trap type and location. FM = Ferdia Marnell; BN = Brian Nelson; ÁOC = Áine O Connor; MOD = Michael O'Donnell

Date	Site	Personnel	Traps in use	Grid Refs	Comments
24/05/2021	Rockforest Pine Wood (National Park)	FM, BN, ÁOC	1x 6 W Actinic Heath, 1x 20 W compact Skinner	R3477695118; R3477195401	No moths were found in Skinner trap. Malfunction suspected
24/05/2021	Rockforest Td., Ballyeighter	FM, BN, ÁOC	2x 125 W Robinson	R3614295466; R3613095506	
25/05/2021	Rockforest Lough	FM, BN, ÁOC	1x 6 W Actinic Heath, 1x 20 W compact Skinner	R3604095606; R360957	in pavement/wetland habitat at edge of lake below AirBnB
25/05/2021	Rockforest Pine Wood (National Park)	FM, BN, ÁOC	2x 6 W Actinic Heath, 1x 20 W compact Skinner	R3477695118; R3480895168; R3477195401	One Actinic malfunctioned; cool night
25/05/2021	Rockforest Td., Ballyeighter	FM, BN, ÁOC	2x 125 W Robinson	R3614295466; R361955	
26/05/2021	Ballyogan (National Park)	BN, FM	1x 20 W compact Skinner	R377909	
26/05/2021	Rockforest Td., Ballyeighter	BN, FM	2x 125 W Robinson	R3613095506; R361955	
27/05/2021	Rockforest Td., Ballyeighter	BN	1x 125 W Robinson	R3613095506	
19/07/2021	Rockforest Pine Wood (National Park)	BN	2x 6 W Actinic Heath	R3479295159; R3480895168	Very warm spell of weather, very warm nights
20/07/2021	Crehaun Townland (non NPWS)	BN	1x 6 W Actinic Heath	R3441995886	Limestone pavement. Very warm spell of weather
21/07/2021	Ballyogan (National Park)	BN, Gareth O'Donnell, Cindy Kingston	1x 6 W Actinic Heath; 1x Heath Trap (2x2 W LED); 1x 125W MV Skinner	R37779083; R379908; R377909	Records pooled from two traps which were close together on limestone pavement; Very warm spell of weather
01/09/2021	Ballyogan (National Park)	FM, BN, ÁOC, MOD	1x 6 W Actinic Heath; 1x 125 W Robinson; 1x 125w Skinner	R3782290898; R3769390837; R3772590941	Warm, sunny and dry weather; warm nights
01/09/2021	Rockforest Pine Wood (National Park)	FM, BN, ÁOC	2x 6 W Actinic Heath; 1x 20 W compact Skinner	R3477695118; R3480895168; R3477195041	
01/09/2021	Rockforest Td., Ballyeighter	FM, BN, ÁOC, MOD	2x 125 W Robinson	R3613095506; R361955	
02/09/2021	Rockforest Td., Ballyeighter	FM, BN, ÁOC, MOD	1x 125 W Robinson	R3613095506; R360956	
02/09/2021	Slieve Carran (National Park)	FM, BN, ÁOC, MOD	3x 6 W Actinic Heath; 1x 20 W compact Skinner; 2x 125 W Robinson	M3356302981; M3376802980, M3379202994; R335029; M3365803052, M3391203074	BN's 2 in scrub/heath mosaic to east of road and south of track; FM's failed to light (hazel woodland west of road); ÁOC 's in scrub to west of road
03/09/2021	Lough Bunny (National Park)	MOD	2x Skinner Traps (2x2 W LED)	R3818597048, R3830897310	
03/09/2021	Ballyogan (National Park)	MOD	2x 125 W Robinson	R3769190752, R3770990832	
11/10/2021	Ballyogan (National Park)	BN	2x 6 W Actinic Heath	R3782890870, R3782190899	
12/10/2021	Cooloorta (National Park)	BN	1x 6 W Actinic Heath	R3429296513	
07/06/2022	Garryland Nature Reserve	BN	1x 6 W Actinic Heath	M41460370	Broad-leaved woodland
08/06/2022	Ballyogan (National Park)	BN	Daytime observation, pheromones	Whole site	

Date	Site	Personnel	Traps in use	Grid Refs	Comments
08/06/2022	Cartron Townland	BN	1x 6 W Actinic Heath	M3932410886	Disturbed heavily grazed calcareous grassland
13/06/2022	Poulnalour Townland (National Park)	BN	1x 6 W Actinic Heath	R3011294321	Calcareous grassland/scrub/pavement mosaic
14/06/2022	Tullycommon Townland (National Park), below Cahercommaun	BN, ÁOC	2x 6 W Actinic Heath	R2800896747; R2799696754	Sheltered tracks with scrub, pavement, grassland
09/08/2022	Michael Cusack Centre, Poulaphuca Townland	FM, BN, ÁOC	2x 125 W Robinson	R2729897058; R272971	
10/08/2022	Cooloorta (National Park)	FM, BN, ÁOC	3x 6 W Actinic Heath	R34229665, R34109656, R341966	
19/09/2022	Cooloorta, NPWS fields (National Park)	FM, BN, ÁOC	2x 6 W Actinic Heath	R3437096890, R3441496925	
19/09/2022	Cooloorta Leitra Townland	FM, BN, ÁOC	2x 125 W Robinson; 1x 20 W Heath	R3389397363, R3393497354, R3394397272	
19/09/2022	Cooloorta (National Park)	FM, BN, ÁOC	2x 6 W Actinic Heath	R3421696618, R3417796655	
20/09/2022	Coole Park	FM, BN, ÁOC	1x 125 W Robinson	M4385704914	Woodland/parkland; trap placed in yard of depot
20/09/2022	Cooloorta Leitra Townland	FM, BN, ÁOC	1x 125 W Robinson; 1x 6 W Actinic Heath; 1x 20 W Heath	R3393197353, R3394097390; R3394397272	
20/09/2022	Creehaun Townland, famine road (National Park)	FM, BN, ÁOC	3x 6 W Actinic Heath; 1x 20 W compact Skinner	R3365995323, R3368095319; R3371495405; R3363095371	
21/9/2022	Cooloorta Leitra Townland	BN	1x 125 W Robinson	R3395797284	Very wet night; catch included 2 frogs!

APPENDIX II MOTH SPECIES LISTS - NPWS-OWNED SITES IN THE BURREN

The table lists the moth species recorded at NPWS owned sites in the Burren in 2021 and 2022. Species are listed in the number order of the British and Irish checklist (Agassiz *et al.* 2013). Some specimens were not determined to species and these are listed as 'agg.' and denoted with an 'x' after the number.

The columns give species lists for each of the main sites. The abbreviations in the header row are the following: B = Ballyogan; C-BNP = Cooiloorta (Burren National Park); C-PK = Coole Park; CRE = Crehaun townland; GNR = Garryland Nature Reserve; LB = Lough Bunny; K = Knockaunroe (daytime observation only); PT = Pollnalour Townland; RPW = Rockforest Pine Wood; SC = Slieve Carran and TC = Tullycommon Townland and Cahercommaun. See Table 1 for trapping date(s) for each site.

Species	B	C-BNP	C-PK	CRE	GNR	LB	K	PT	RPW	SC	TC
3.003 <i>Korscheltellus fusconebulosa</i> Map-winged Swift								■			■
3.004 <i>Phymatopus hecta</i> Gold Swift									■		
3.005 <i>Hepialus humuli</i> Ghost Moth											■
11.012 <i>Psyche casta</i>									■		
16.001 <i>Yponomeuta evonymella</i> Bird-cherry Ermine	■										
16.007 <i>Yponomeuta plumbella</i>									■	■	
16.019 <i>Paraswammerdamia albicapitella</i>	■										
17.005 <i>Ypsolopha scabrella</i>									■	■	
32.016 <i>Agonopterix propinquella</i>				■							
32.017 <i>Agonopterix arenella</i>										■	
32.036 <i>Depressaria radiella</i> Parsnip Moth										■	
32.038 <i>Depressaria badiella</i>				■							
35.010 <i>Aproaerema anthyllidella</i>	■										
35.017 <i>Neofaculta ericetella</i>									■		
35.018 <i>Hypatima rhomboidella</i>									■		
35.026 <i>Acompsia cinerella</i>	■										
35.058 <i>Metzneria metzneriella</i>	■										
35.123 <i>Scrobipalpa costella</i>	■										
35.159 <i>Exoteleia dodecella</i>	■										
38.025 <i>Elachista atricomella</i>	■									■	
38.037 <i>Elachista canapennella</i>										■	
38.046 <i>Elachista albidella</i>	■										
40.008 <i>Mompha subbistrigella</i>	■										
41.002 <i>Blastobasis adustella</i>	■									■	
45.013 <i>Stenoptilia bipunctidactyla</i> Twin-spot Plume										■	
45.033 <i>Merrifieldia leucodactyla</i> Thyme Plume	■										
49.005 <i>Epagoge grotiana</i>	■										
49.013 <i>Archips podana</i> Large Fruit-tree Tortrix	■										
49.024 <i>Pandemis corylana</i> Chequered Fruit-tree Tortrix									■	■	
49.026 <i>Pandemis heparana</i> Dark Fruit-tree Tortrix	■										
49.037 <i>Clepsia spectrana</i> Cyclamen Tortrix	■										
49.038 <i>Clepsia consimilana</i>	■										
49.039 <i>Epiphyas postvittana</i> Light Brown Apple Moth			■								
49.048 <i>Eana penziana</i>	■									■	
49.061 <i>Acleris holmiana</i>	■										
49.066 <i>Acleris laterana</i>	■									■	
49.070 <i>Acleris rhombana</i> Rhomboid Tortrix	■	■								■	
49.073 <i>Acleris schalleriana</i>										■	
49.077 <i>Acleris variegana</i> Garden Rose Tortrix	■									■	
49.083x <i>Acleris ferrugana/notana</i> agg.						■					
49.097 <i>Cochyliomorpha straminea</i>	■					■				■	
49.109 <i>Agapeta hamana</i>									■		
49.110 <i>Agapeta zoegana</i>	■	■									
49.115 <i>Aethes piercei</i>										■	

Species	B	C-BNP	C PK	CRE	GNR	LB	K	PT	RPW	SC	TC
49.127 <i>Aethes cnicana</i>	■										
49.139 <i>Cochylis atricapitana</i>	■									■	
49.154 <i>Orthotaenia undulana</i>	■										
49.164 <i>Celypha cespitana</i>	■										
49.166 <i>Celypha lacunana</i>	■		■			■			■	■	
49.185 <i>Lobesia littoralis</i>	■										
49.194 <i>Bactra lancealana</i>	■									■	
49.214 <i>Ancylis badiana</i>	■									■	
49.223 <i>Rhopobota naevana</i> Holly Tortrix										■	
49.230 <i>Epinotia trigonella</i>									■		
49.248 <i>Epinotia tenerana</i> Nut Bud Moth										■	
49.259 <i>Zeiraphera ratzeburgiana</i> Spruce Bud Moth										■	
49.265 <i>Eucosma cana</i>	■										
49.292 <i>Notocelia cynosbatella</i>									■		
49.296 <i>Notocelia incarnatana</i>									■		
49.345 <i>Lathronympha strigana</i>	■									■	
52.008 <i>Synanthedon formicaeformis</i> Red-tipped Clearwing	■										
54.004 <i>Zygaena purpuralis</i> Transparent Burnet	■						■				
54.008 <i>Zygaena filipendulae</i> Six-spot Burnet							■				■
62.001 <i>Aphomia sociella</i> Bee Moth	■										
62.012 <i>Matilella fusca</i>						■					
62.015 <i>Delplanqueia dilutella</i>	■	■							■	■	■
62.028 <i>Dioryctria abietella</i>											
62.035 <i>Acrobasis advenella</i>	■								■		
62.058 <i>Phycitodes binaevella</i>	■								■		
63.004 <i>Pyrausta sanguinalis</i> Scarce Crimson and Gold	■	■									
63.005 <i>Pyrausta despicata</i>	■	■								■	
63.007 <i>Pyrausta purpuralis</i>	■	■									
63.016 <i>Anania fuscalis</i>	■										
63.022 <i>Anania crocealis</i>	■										
63.024 <i>Anania funebris</i> White-spotted Sable										■	■
63.025 <i>Anania hortulata</i> Small Magpie	■										
63.034 <i>Udea prunalis</i>	■										
63.037 <i>Udea olivalis</i>	■										
63.038 <i>Patania ruralis</i> Mother of Pearl						■					
63.060 <i>Evergestis pallidata</i>	■										
63.062 <i>Scoparia subfusca</i>	■								■		
63.067 <i>Eudonia lacustrata</i>								■			■
63.069 <i>Eudonia angustea</i>		■	■	■							
63.071 <i>Eudonia lineola</i>	■										
63.072 <i>Eudonia delunella</i>	■										
63.073 <i>Eudonia truncicolella</i>	■									■	
63.074 <i>Eudonia mercurella</i>	■									■	
63.075 <i>Eudonia pallida</i>	■										
63.077 <i>Chilo phragmitella</i>	■										
63.080 <i>Chrysoteuchia culmella</i> Garden Grass-veneer	■										
63.081 <i>Crambus pascuella</i>	■										
63.088 <i>Crambus perllella</i>	■										
63.089 <i>Agriphila tristella</i>	■	■									
63.090 <i>Agriphila inquanatella</i>		■									
63.093 <i>Agriphila straminella</i>	■										
63.095 <i>Agriphila geniculea</i>	■	■									
63.114 <i>Elophila nymphaeata</i> Brown China-mark	■	■				■					
63.117 <i>Parapoynx stratiotata</i> Ringed China-mark	■								■		
63.118 <i>Nymphula nitidulata</i> Beautiful China-mark	■								■		
63.122 <i>Donacaula mucronella</i>	■								■		
65.007 <i>Cilix glaucata</i> Chinese Character	■	■							■		

Species	B	C-BNP	C PK	CRE	GNR	LB	K	PT	RPW	SC	TC
65.008 <i>Thyatira batis</i> Peach Blossom	■			■					■		
65.009 <i>Habrosyne pyritoides</i> Buff Arches	■			■					■		■
65.013 <i>Ochropacha duplaris</i> Common Lutestring					■						■
66.002 <i>Trichiura crataegi</i> Pale Eggar	■	■		■		■			■	■	
66.003 <i>Malacosoma neustria</i> Lackey	■								■		
66.007 <i>Lasiocampa quercus</i> Oak Eggar	■										
66.008 <i>Macrothylacia rubi</i> Fox Moth											
66.010 <i>Euthrix potatoria</i> Drinker	■	■		■					■		
68.001 <i>Saturnia pavonia</i> Emperor Moth	■										
69.003 <i>Laothoe populi</i> Poplar Hawk-moth	■								■		■
69.016 <i>Deilephila elpenor</i> Elephant Hawk-moth	■								■		
69.017 <i>Deilephila porcellus</i> Small Elephant Hawk-moth											
70.011 <i>Idaea dimidiata</i> Single-dotted Wave	■			■					■		
70.013 <i>Idaea biselata</i> Small Fan-footed Wave	■	■							■	■	
70.016 <i>Idaea aversata</i> Riband Wave	■								■		
70.025 <i>Scopula immutata</i> Lesser Cream Wave	■										
70.037 <i>Cyclophora linearia</i> Clay Triple-lines			■		■					■	
70.041 <i>Scotopteryx luridata</i> July Belle										■	
70.045 <i>Scotopteryx chenopodiata</i> Shaded Broad-bar	■	■		■					■	■	
70.046 <i>Orthonama vittata</i> Oblique Carpet	■			■		■			■		
70.049 <i>Xanthorhoe fluctuata</i> Garden Carpet			■			■			■	■	
70.052 <i>Xanthorhoe ferrugata</i> Dark-barred Twin-spot Carpet	■	■									
70.053 <i>Xanthorhoe designata</i> Flame Carpet	■										
70.054 <i>Xanthorhoe montanata</i> Silver-ground Carpet											■
70.056 <i>Catarhoe cuculata</i> Royal Mantle	■										
70.061 <i>Epirrhoe alternata</i> Common Carpet	■	■			■	■			■	■	
70.063 <i>Epirrhoe galiata</i> Galium Carpet	■			■							
70.068 <i>Mesoleuca albicillata</i> Beautiful Carpet											■
70.074 <i>Hydriomena furcata</i> July Highflyer	■								■	■	
70.078 <i>Thera cognata</i> Chestnut-coloured Carpet	■								■		
70.079 <i>Thera britannica</i> Spruce Carpet	■		■			■			■		
70.081 <i>Thera obeliscata</i> Grey Pine Carpet									■		
70.085 <i>Cidaria fulvata</i> Barred Yellow	■			■							
70.087 <i>Cosmorhoe ocellata</i> Purple Bar	■	■		■		■			■	■	
70.090 <i>Eulithis testata</i> Chevron	■	■		■		■			■		
70.093 <i>Gandaritis pyraliata</i> Barred Straw	■	■							■		
70.094 <i>Ecliptopera silaceata</i> Small Phoenix	■								■	■	■
70.095 <i>Chloroclysta siterata</i> Red-Green Carpet	■	■									
70.096 <i>Chloroclysta miata</i> Autumn Green Carpet		■									
70.097 <i>Dysstroma truncata</i> Common Marbled Carpet	■	■	■			■			■	■	■
70.098 <i>Dysstroma citrata</i> Dark Marbled Carpet											
70.100 <i>Colostygia pectinataria</i> Green Carpet	■		■	■	■	■			■		■
70.107x <i>Epirrita dilutata</i> agg November moth agg.		■									
70.123 <i>Triphosa dubitata</i> Tissue				■							
70.130 <i>Odezia atrata</i> Chimney Sweeper											■
70.131 <i>Mesotype didymata</i> Twin-spot Carpet										■	
70.135 <i>Perizoma minorata</i> Heath Rivulet										■	
70.141 <i>Gymnoscelis rufifasciata</i> Double-striped Pug	■	■							■	■	
70.142 <i>Chloroclystis v-ata</i> V-Pug	■										
70.144 <i>Pasiphila rectangulata</i> Green Pug									■		
70.161 <i>Eupithecia virgaureata</i> Golden-rod Pug	■									■	
70.168 <i>Eupithecia nanata</i> Narrow-winged Pug	■	■									
70.173 <i>Eupithecia centaureata</i> Lime-speck Pug										■	
70.179 <i>Eupithecia absinthiata</i> Wormwood Pug		■									
70.187 <i>Eupithecia icterata</i> Tawny Speckled Pug	■	■		■						■	
70.192 <i>Aplocera plagiata</i> Treble-bar	■	■		■		■			■	■	
70.199 <i>Pterapherapteryx sexualata</i> Small Seraphim			■								
70.200 <i>Acasis viretata</i> Yellow-barred Brindle	■										

Species	B	C-BNP	C PK	CRE	GNR	LB	K	PT	RPW	SC	TC
70.205 <i>Abraxas grossulariata</i> Magpie Moth	■										
70.207 <i>Lomaspilis marginata</i> Clouded Border	■								■		
70.222 <i>Petrophora chlorosata</i> Brown Silver-line								■	■		
70.226 <i>Opisthograptis luteolata</i> Brimstone Moth	■	■	■	■		■			■	■	
70.227 <i>Epione repandaria</i> Bordered Beauty	■										
70.229 <i>Pseudopanthera macularia</i> Speckled Yellow	■								■	■	
70.233 <i>Ennomos quercinaria</i> August Thorn										■	
70.237 <i>Selenia dentaria</i> Early Thorn	■								■	■	
70.240 <i>Odontopera bidentata</i> Scalloped Hazel									■		
70.241 <i>Crocallis elinguaris</i> Scalloped Oak									■		
70.243 <i>Ourapteryx sambucaria</i> Swallow-tailed Moth	■										
70.248 <i>Lycia hirtaria</i> Brindled Beauty	■										
70.252 <i>Biston betularia</i> Peppered Moth	■										■
70.258 <i>Peribatodes rhomboidaria</i> Willow Beauty	■		■								
70.265 <i>Alcis repandata</i> Mottled Beauty	■				■			■	■		■
70.270 <i>Ectropis crepuscularia</i> Engrailed	■								■		
70.277 <i>Cabera pusaria</i> Common White Wave	■								■		
70.278 <i>Cabera exanthemata</i> Common Wave	■										
70.283 <i>Campaea margaritaria</i> Light Emerald	■										
70.284 <i>Hylaea fasciaria</i> Barred Red				■							
70.297 <i>Pseudoterpna pruinata</i> Grass Emerald	■										
70.299 <i>Geometra papilionaria</i> Large Emerald	■										
70.305 <i>Hemithysa aestivaria</i> Common Emerald	■										
71.012 <i>Notodonta dromedarius</i> Iron Prominent	■										
71.013 <i>Notodonta ziczac</i> Pebble Prominent	■	■		■							
71.018 <i>Pheosia gnoma</i> Lesser Swallow Prominent	■										
71.020 <i>Pterostoma palpina</i> Pale Prominent	■										
71.021 <i>Ptilodon capucina</i> Coxcomb Prominent	■								■		■
71.025 <i>Phalera bucephala</i> Buff-tip	■								■		
72.002 <i>Rivula sericealis</i> Straw Dot	■								■		
72.015 <i>Calliteara pudibunda</i> Pale Tussock	■								■		
72.019 <i>Spilosoma lutea</i> Buff Ermine	■							■	■		■
72.020 <i>Spilosoma lubricipeda</i> White Ermine	■				■			■		■	■
72.022 <i>Diaphora mendica</i> Muslin Moth	■										
72.026 <i>Arctia caja</i> Garden Tiger	■			■							
72.031 <i>Tyria jacobaeae</i> Cinnabar	■										■
72.036 <i>Nudaria mundana</i> Muslin Footman	■			■					■		
72.037 <i>Thumatha senex</i> Round-winged Muslin	■										
72.041 <i>Lithosia quadra</i> Four-spotted Footman	■		■								
72.043 <i>Eilema depressa</i> Buff Footman	■										
72.045 <i>Eilema lurideola</i> Common Footman	■										
72.050 <i>Setina irrorella</i> Dew Moth	■							■			
72.053 <i>Herminia tarsipennalis</i> Fan-foot									■		
72.055 <i>Herminia grisealis</i> Small Fan-foot					■						
72.061 <i>Schrankia costaestrigalis</i> Pinion-streaked Snout	■	■	■						■		
72.067 <i>Phytometra viridaria</i> Small Purple-barred	■										
72.083 <i>Euclidia glyphica</i> Burnet Companion	■						■				■
72.273 <i>Hada nana</i> Shears	■							■			
73.002 <i>Abrostola triplasia</i> Dark Spectacle	■										
73.012 <i>Diachrysis chrysis</i> Burnished Brass	■					■					
73.015 <i>Autographa gamma</i> Silver Y											
73.017 <i>Autographa jota</i> Plain Golden Y	■										
73.022 <i>Plusia festucae</i> Gold Spot	■					■					
73.032 <i>Colocasia coryli</i> Nut-tree Tussock					■				■		■
73.033 <i>Diloba caeruleocephala</i> Figure of Eight	■	■									
73.044 <i>Acronicta cinerea</i> Sweet Gale Moth	■							■			
73.045 <i>Acronicta rumicis</i> Knot Grass									■		

Species	B	C-BNP	C PK	CRE	GNR	LB	K	PT	RPW	SC	TC
73.047 <i>Craniophora ligustri</i> Coronet	■										
73.052 <i>Cucullia umbratica</i> Shark	■										
73.061 <i>Stilbia anomala</i> Anomalous	■	■		■		■			■	■	
73.062 <i>Amphipyra pyramidea</i> Copper Underwing	■	■								■	
73.068 <i>Allophyes oxyacanthae</i> Green-brindled Crescent	■	■									
73.096 <i>Hoplodrina octogenaria</i> Uncertain	■										
73.097 <i>Hoplodrina blanda</i> Rustic	■										
73.102 <i>Rusina ferruginea</i> Brown Rustic								■			■
73.109 <i>Thalpophila matura</i> Straw Underwing	■	■		■							
73.113 <i>Phlogophora meticulosa</i> Angle Shades	■		■			■			■	■	
73.116 <i>Calamia tridens</i> Burren Green	■	■				■				■	
73.118 <i>Celaena haworthii</i> Haworth's Minor	■					■			■	■	
73.119 <i>Helotropha leucostigma</i> Crescent	■	■				■			■		
73.121 <i>Gortyna flavago</i> Frosted Orange	■										
73.123 <i>Hydraecia micacea</i> Rosy Rustic	■	■	■			■				■	
73.127 <i>Amphipoea lucens</i> Large Ear											
73.128x <i>Amphipoea oculea</i> agg. Ear Moth agg.	■					■				■	
73.131 <i>Luperina testacea</i> Flounced Rustic		■									
73.134 <i>Rhizedra lutosa</i> Large Wainscot	■					■					
73.136 <i>Nonagria typhae</i> Bulrush Wainscot	■										
73.144 <i>Denticucullus pygmina</i> Small Wainscot	■					■				■	
73.146 <i>Photodes captiuncula</i> Least Minor								■	■		
73.154 <i>Apamea remissa</i> Dusky Brocade								■			■
73.156 <i>Apamea crenata</i> Clouded-bordered Brindle	■										
73.162 <i>Apamea monoglypha</i> Dark Arches	■			■					■		
73.163 <i>Apamea lithoxylaea</i> Light Arches	■								■		
73.164 <i>Apamea sublustris</i> Reddish Light Arches								■			
73.169x <i>Mesapamea secalis</i> agg. Common Rustic agg.	■	■							■	■	
73.173x <i>Oligia strigilis</i> agg. Marbled Minor agg.	■										
73.181 <i>Xanthia togata</i> Pink-barred Sallow	■	■	■							■	
73.182 <i>Cirrhia icteritia</i> Sallow	■					■					
73.186 <i>Agrochola lychnidis</i> Beaded Chestnut			■								
73.188 <i>Agrochola helvola</i> Flounced Chestnut		■		■							
73.189 <i>Agrochola lota</i> Red-line Quaker	■	■	■								
73.190 <i>Agrochola macilenta</i> Yellow-line Quaker		■									
73.219 <i>Atethmia centrago</i> Centre-barred Sallow	■									■	
73.228 <i>Antitype chi</i> Grey Chi	■			■		■				■	
73.232 <i>Aporophyla lueneburgensis</i> Northern Deep-brown Dart		■		■						■	
73.233 <i>Aporophyla nigra</i> Black Rustic	■			■							
73.252 <i>Tholera cespitis</i> Hedge Rustic	■					■			■	■	
73.254 <i>Cerapteryx graminis</i> Antler Moth	■										
73.257 <i>Anarta myrtilli</i> Beautiful Yellow Underwing				■							
73.261 <i>Polia nebulosa</i> Grey Arches	■										■
73.264 <i>Lacanobia thalassina</i> Pale-shouldered Brocade									■		
73.267 <i>Lacanobia oleracea</i> Bright-line Brown-eye	■										
73.270 <i>Melanchnra persicariae</i> Dot Moth	■										
73.276 <i>Sideridis rivularis</i> Champion	■										
73.293 <i>Mythimna impura</i> Smoky Wainscot	■	■									
73.298 <i>Mythimna ferrago</i> Clay	■	■		■					■		
73.317 <i>Agrotis exclamationis</i> Heart and Dart	■										
73.327 <i>Agrotis ipsilon</i> Dark Sword-grass	■										
73.328 <i>Axylia putris</i> Flame	■										
73.329 <i>Ochropleura plecta</i> Flame Shoulder	■	■				■			■	■	
73.331 <i>Diarsia dahlia</i> Barred Chestnut	■		■						■	■	
73.333 <i>Diarsia mendica</i> Ingrailed Clay	■										
73.334 <i>Diarsia rubi</i> Small Square-spot	■	■	■			■			■	■	
73.338 <i>Lycophotia porphyrea</i> True Lover's Knot	■	■		■					■		

Species	B	C-BNP	C PK	CRE	GNR	LB	K	PT	RPW	SC	TC
73.341 <i>Standfussiana lucernea</i> Northern Rustic				■					■	■	
73.342 <i>Noctua pronuba</i> Large Yellow Underwing	■	■		■		■			■	■	
73.343 <i>Noctua fimbriata</i> Broad-bordered Yellow Underwing	■					■			■	■	
73.345 <i>Noctua comes</i> Lesser Yellow Underwing	■	■				■			■	■	
73.346 <i>Noctua interjecta</i> Least Yellow Underwing	■										
73.348 <i>Noctua janthe</i> Lesser Broad-bordered Yellow U'wing	■	■							■	■	
73.351 <i>Graphiphora augur</i> Double Dart	■								■		
73.353 <i>Xestia baja</i> Dotted Clay	■	■							■		
73.355 <i>Xestia castanea</i> Neglected Rustic										■	
73.356 <i>Xestia agathina</i> Heath Rustic										■	
73.357 <i>Xestia xanthographa</i> Square-spot Rustic	■	■	■	■		■			■	■	
73.359 <i>Xestia c-nigrum</i> Setaceous Hebrew Character	■										
73.361 <i>Xestia triangulum</i> Double Square-spot	■								■		
73.365 <i>Eugnorisma glareosa</i> Autumnal Rustic	■	■		■		■			■	■	
Total identified taxa 287 (282 species and 5 agg.)	209	60	21	37	8	38	3	13	92	78	26

APPENDIX III MOTH SPECIES LISTS - NON NPWS SITES IN THE BURREN

Moth species recorded at **non** NPWS sites in the Burren in 2021 and 2022. Species are listed in the number order of the British and Irish checklist (Agassiz *et al.* 2013). Some specimens were not determined to species and these are listed as 'agg.' and denoted with an 'x' after the number.

The columns give species lists for the following sites (abbreviations in the header row): Car Td. = Cartron townland; C-LT = Cooloora-Leitra townland; MCC = Michael Cusack Centre and surrounds; ML = Muckanagh Lough (daytime observation only) and RT = Rockforest Lough and Townland. See Table 1 for the date(s) on which traps were set at each site.

Species	Car Td.	C-LT	MCC	ML	RT
3.003 <i>Korscheltellus fusconebulosa</i> Map-winged Swift			■		
12.048 <i>Psychoides filicivora</i>			■		
15.015 <i>Aspilapteryx tringipennella</i>					■
17.005 <i>Ypsolopha scabrella</i>					■
17.010 <i>Ypsolopha parenthesesella</i>		■			
32.016 <i>Agonopterix propinquella</i>		■			
32.017 <i>Agonopterix arenella</i>		■			
38.025 <i>Elachista atricomella</i>					■
38.037 <i>Elachista canapennella</i>					■
45.013 <i>Stenoptilia bipunctidactyla</i> Twin-spot Plume		■			
49.066 <i>Acleris laterana</i>					■
49.070 <i>Acleris rhombana</i> Rhomboid Tortrix		■			■
49.073 <i>Acleris schalleriana</i>					
49.077 <i>Acleris variegana</i> Garden Rose Tortrix		■			■
49.166 <i>Celypha lacunana</i>		■			■
49.194 <i>Bactra lancealana</i>					■
49.214 <i>Ancylis badiana</i>			■		■
49.345 <i>Lathronympha strigana</i>					■
54.002 <i>Adscita statices</i> Forester			■		
62.012 <i>Matilella fusca</i>					■
62.028 <i>Dioryctria abietella</i>		■			
63.005 <i>Pyrausta despicata</i>					■
63.025 <i>Anania hortulata</i> Small Magpie	■				
63.033 <i>Udea lutealis</i>					■
63.038 <i>Patania ruralis</i> Mother of Pearl		■			■
63.057 <i>Evergestis forficalis</i> Garden Pebble					■
63.067 <i>Eudonia lacustrata</i>		■			
63.069 <i>Eudonia angustea</i>		■			
63.074 <i>Eudonia mercurella</i>			■		
63.114 <i>Elophila nymphaeata</i> Brown China-mark		■			
65.008 <i>Thyatira batis</i> Peach Blossom			■		
66.002 <i>Trichiura crataegi</i> Pale Eggar		■			■
66.008 <i>Macrothylacia rubi</i> Fox Moth					■
69.003 <i>Laothoe populi</i> Poplar Hawk-moth					■
69.016 <i>Deilephila elpenor</i> Elephant Hawk-moth					■
69.017 <i>Deilephila porcellus</i> Small Elephant Hawk-moth					■
70.013 <i>Idaea biselata</i> Small Fan-footed Wave			■		■
70.037 <i>Cyclophora linearia</i> Clay Triple-lines					■
70.045 <i>Scotopteryx chenopodiata</i> Shaded Broad-bar			■		
70.049 <i>Xanthorhoe fluctuata</i> Garden Carpet		■			
70.052 <i>Xanthorhoe ferrugata</i> Dark-barred Twin-spot Carpet			■		■
70.053 <i>Xanthorhoe designata</i> Flame Carpet		■			■
70.054 <i>Xanthorhoe montanata</i> Silver-ground Carpet	■				■
70.061 <i>Epirrhoe alternata</i> Common Carpet		■	■		■
70.065 <i>Euphyia unangulata</i> Sharp-angled Carpet			■		■

Species	Car Td.	C-LT	MCC	ML	RT
70.068 <i>Mesoleuca albicillata</i> Beautiful Carpet					■
70.074 <i>Hydriomena furcata</i> July Highflyer			■		
70.079 <i>Thera britannica</i> Spruce Carpet		■			
70.085 <i>Cidaria fulvata</i> Barred Yellow					
70.087 <i>Cosmorhoe ocellata</i> Purple Bar	■		■		■
70.090 <i>Eulithis testata</i> Chevron		■			
70.093 <i>Gandaritis pyrallata</i> Barred Straw			■		
70.094 <i>Ecliptopera silaceata</i> Small Phoenix			■		
70.097 <i>Dysstroma truncata</i> Common Marbled Carpet	■	■			■
70.098 <i>Dysstroma citrata</i> Dark Marbled Carpet			■		
70.102 <i>Coenotephria salicata</i> Striped Twin-spot Carpet			■		
70.100 <i>Colostygia pectinataria</i> Green Carpet	■	■			■
70.131 <i>Mesotype didymata</i> Twin-spot Carpet			■		
70.133 <i>Perizoma alchemillata</i> Small Rivulet			■		
70.158 <i>Eupithecia pusillata</i> Juniper Pug					■
70.179 <i>Eupithecia absinthiata</i> Wormwood Pug			■		
70.183 <i>Eupithecia vulgata</i> Common Pug					■
70.184 <i>Eupithecia exiguata</i> Mottled Pug					■
70.187 <i>Eupithecia icterata</i> Tawny Speckled Pug		■	■		
70.192 <i>Aplocera plagiata</i> Treble-bar		■			■
70.200 <i>Acasis viretata</i> Yellow-barred Brindle			■		
70.205 <i>Abraxas grossulariata</i> Magpie Moth			■		■
70.207 <i>Lomaspilis marginata</i> Clouded Border			■		■
70.222 <i>Petrophora chlorosata</i> Brown Silver-line					■
70.223 <i>Plagodis pulveraria</i> Barred Umber					■
70.224 <i>Plagodis dolabraria</i> Scorched Wing					■
70.226 <i>Opisthograptis luteolata</i> Brimstone Moth		■			■
70.227 <i>Epione repandaria</i> Bordered Beauty					
70.229 <i>Pseudopanthera macularia</i> Speckled Yellow				■	
70.233 <i>Ennomos quercinaria</i> August Thorn		■	■		■
70.234 <i>Ennomos alniaria</i> Canary-shouldered Thorn					■
70.237 <i>Selenia dentaria</i> Early Thorn			■		■
70.238 <i>Selenia lunularia</i> Lunar Thorn					■
70.240 <i>Odontopera bidentata</i> Scalloped Hazel					■
70.241 <i>Crocallis elinguaris</i> Scalloped Oak			■		
70.252 <i>Biston betularia</i> Peppered Moth					■
70.265 <i>Alcis repandata</i> Mottled Beauty	■				
70.270 <i>Ectropis crepuscularia</i> Engrailed					■
70.295 <i>Perconia strigillaria</i> Grass Wave	■				
70.297 <i>Pseudoterpna pruinata</i> Grass Emerald			■		
71.003 <i>Cerura vinula</i> Puss Moth					■
71.017 <i>Pheosia tremula</i> Swallow Prominent					■
71.021 <i>Ptilodon capucina</i> Coxcomb Prominent					■
72.002 <i>Rivula sericealis</i> Straw Dot			■		
72.015 <i>Calliteara pudibunda</i> Pale Tussock					■
72.020 <i>Spilosoma lubricipeda</i> White Ermine	■				■
72.022 <i>Diaphora mendica</i> Muslin Moth					■
72.031 <i>Tyria jacobaeae</i> Cinnabar					■
72.043 <i>Eilema depressa</i> Buff Footman			■		
72.061 <i>Schrankia costaestrigalis</i> Pinion-streaked Snout			■		■
72.273 <i>Hada nana</i> Shears	■				■
73.012 <i>Diachrysia chrysis</i> Burnished Brass			■		
73.015 <i>Autographa gamma</i> Silver Y					■
73.045 <i>Acronicta rumicis</i> Knot Grass					■
73.061 <i>Stilbia anomala</i> Anomalous		■			■
73.101 <i>Charanyca trigrammica</i> Treble Lines	■				■
73.113 <i>Phlogophora meticulosa</i> Angle Shades		■			■
73.116 <i>Calamia tridens</i> Burren Green					■

Species	Car Td.	C-LT	MCC	ML	RT
73.118 <i>Celaena haworthii</i> Haworth's Minor		■			■
73.119 <i>Helotropia leucostigma</i> Crescent					■
73.121 <i>Gortyna flavago</i> Frosted Orange		■			■
73.123 <i>Hydraecia micacea</i> Rosy Rustic		■	■		■
73.127 <i>Amphipoea lucens</i> Large Ear					■
73.134 <i>Rhizedra lutosa</i> Large Wainscot					■
73.144 <i>Denticucullus pygmina</i> Small Wainscot					■
73.156 <i>Apamea crenata</i> Clouded-bordered Brindle	■				■
73.162 <i>Apamea monoglypha</i> Dark Arches			■		
73.169x <i>Mesapamea secalis</i> agg. Common Rustic agg.			■		■
73.181 <i>Xanthia togata</i> Pink-barred Sallow		■			■
73.182 <i>Cirrhia icteritia</i> Sallow					■
73.186 <i>Agrochola lychnidis</i> Beaded Chestnut		■			
73.188 <i>Agrochola helvola</i> Flounced Chestnut		■			
73.206 <i>Lithophane leautieri</i> Blair's Shoulder-knot		■			
73.216 <i>Cosmia trapenzina</i> Dun-bar			■		
73.219 <i>Atethmia centrargo</i> Centre-barred Sallow					■
73.228 <i>Antitype chi</i> Grey Chi		■			■
73.232 <i>Aporophyla lueneburgensis</i> Northern Deep-brown Dart		■			
73.233 <i>Aporophyla nigra</i> Black Rustic		■			
73.252 <i>Tholera cespitis</i> Hedge Rustic					■
73.254 <i>Cerapteryx graminis</i> Antler Moth					■
73.264 <i>Lacanobia thalassina</i> Pale-shouldered Brocade					■
73.267 <i>Lacanobia oleracea</i> Bright-line Brown-eye			■		
73.271 <i>Ceramica pisi</i> Broom Moth					■
73.293 <i>Mythimna impura</i> Smoky Wainscot			■		
73.301 <i>Leucania comma</i> Shoulder-striped Wainscot	■				■
73.320 <i>Agrotis clavis</i> Heart and Club	■				
73.329 <i>Ochropleura plecta</i> Flame Shoulder					■
73.331 <i>Diarsia dahlia</i> Barred Chestnut		■			■
73.334 <i>Diarsia rubi</i> Small Square-spot		■	■		■
73.338 <i>Lycophotia porphyrea</i> True Lover's Knot			■		
73.342 <i>Noctua pronuba</i> Large Yellow Underwing	■	■	■		■
73.343 <i>Noctua fimbriata</i> Broad-bordered Yellow Underwing					■
73.345 <i>Noctua comes</i> Lesser Yellow Underwing			■		■
73.346 <i>Noctua interjecta</i> Least Yellow Underwing					
73.348 <i>Noctua janthe</i> Lesser Broad-bordered Yellow U'wing			■		■
73.351 <i>Graphiphora augur</i> Double Dart	■				
73.353 <i>Xestia baja</i> Dotted Clay			■		■
73.355 <i>Xestia castanea</i> Neglected Rustic		■			■
73.356 <i>Xestia agathina</i> Heath Rustic		■			
73.357 <i>Xestia xanthographa</i> Square-spot Rustic	■	■			■
73.359 <i>Xestia c-nigrum</i> Setaceous Hebrew Character		■			
73.365 <i>Eugnorisma glareosa</i> Autumnal Rustic		■			■
Total identified taxa 147 (146 species and 1 agg.)	16	44	45	1	93

APPENDIX IV DEFINITION OF BURREN BOUNDARY USED IN THIS REPORT

There is no universally accepted definition of the Burren. This is hardly surprising as although it is known where the area is located, the Burren is essentially defined by geology and that boundary is not marked on the ground by easily seen physical or artificial structures. The definition of the area used here will be used in the catalogue of Burren Lepidoptera that is in preparation.

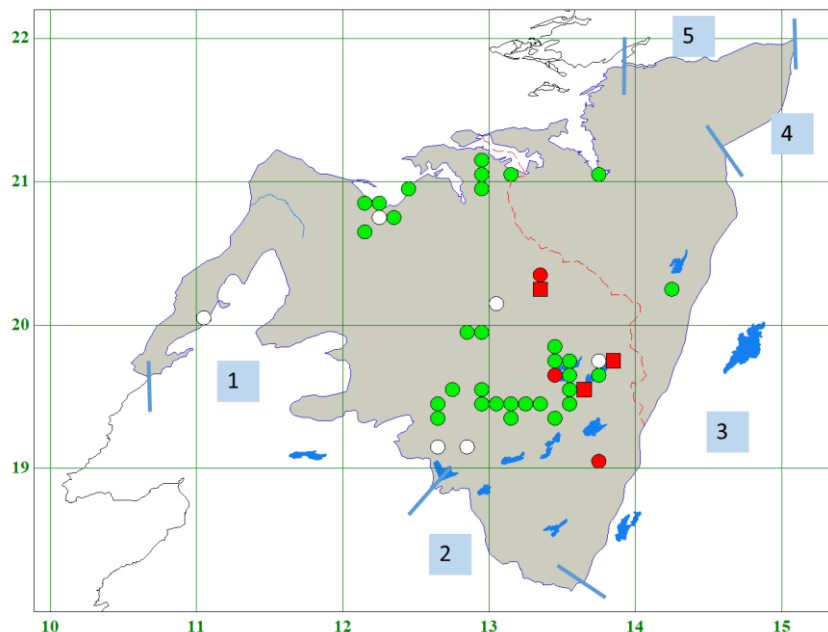
Historically the Burren was defined by the barony boundary that bears its name, baronies being subdivisions of Irish counties that are no longer in use as a political division. The barony boundary is therefore not marked on modern maps but is the boundary of Tim Robinson's Burren map.

D.A. Webb proposed a boundary for use in a British Ecological Society in the 1960s (Webb, 1961). Webb's boundary was used by botanists and other naturalists in the 1960s as natural history and ecological surveys commenced. His boundary is easy to follow except on its eastern side where it follows what he called 'arbitrary lines' but without any information on what they followed. This line separated the karst of the Burren from the adjoining country which was mainly drift covered and lacking large areas of karst. There are however some significant areas of karst habitat outside Webb's Burren and the boundary proposed here reflects this.

Our inland boundary is shown below and it is defined as follows

1. The line in this zone follows the geological boundary from the mouth of the Aille River to the south-west corner of Lough Inchiquin at Clifden.
2. The boundary follows minor roads from Clifden through Corrofin and then in a roughly south-easterly direction to the Barefield junction of the M18.
3. The line follows the M18 north from the Barefield junction to Gort and then the N18 from Gort to Ardrahan.
4. From Ardrahan the line follows the railway line from just north of the village to where it crosses the Dunkellin River at Craughwell.
5. The boundary follows the Dunkellin River from Craughwell to the sea near Kilcolgan.

73.116 *Calamia tridens* Burren Green



Reference

Webb, D.A. (1961). Noteworthy plants of the Burren: a catalogue raisonné. *Proceedings of the Royal Irish Academy*. **62B**, 117-134.