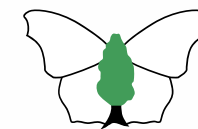


Supporting Science and recruiting verifiers

Zoë Randle

recording@butterfly-conservation.org



**Butterfly
Conservation**

Saving butterflies, moths and our environment

Background

Butterfly Conservation Data Review conducted from 2018 – 2020 to improve:

- Data access for BC staff
- Data management
- Dataflow

County Recorder Surveys in 2020 and 2022 to:

- Discover the challenges and opportunities in the digital environment



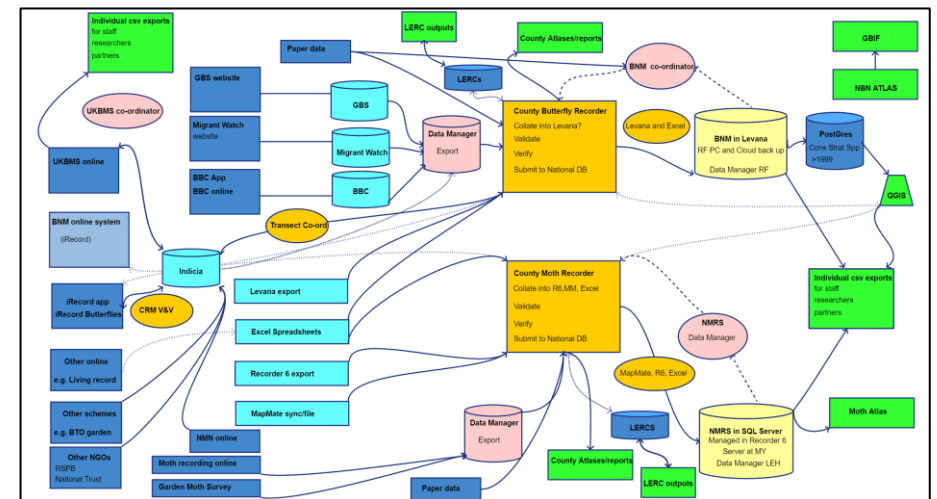
Elephant Hawk-moth (Bob Eade)

Key findings

Smoother, more streamlined dataflows were required

Need for increased training and support for the County Recorder (CR) networks

CRs were concerned about workload & succession planning



Supporting Science



Made possible with

Heritage
Fund



Department for
Digital, Culture,
Media & Sport



The **Digital Skills for Heritage Initiative** helped the heritage sector move into a more resilient, creative future by developing use of digital technology.

This project aimed to improve data flow and better support recorders and volunteers. Improved access to natural heritage and grow digital skills by developing tools and collaboration.



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Marbled White,
recorded on iRecord, photo: CC0

UK Recording Schemes



Butterflies for the New Millennium

“BNM” Established in 1995

UK, Isle of Man & Channel Islands

> **17 million** verified butterfly records

1690 earliest record

**MOTHS
COUNT**



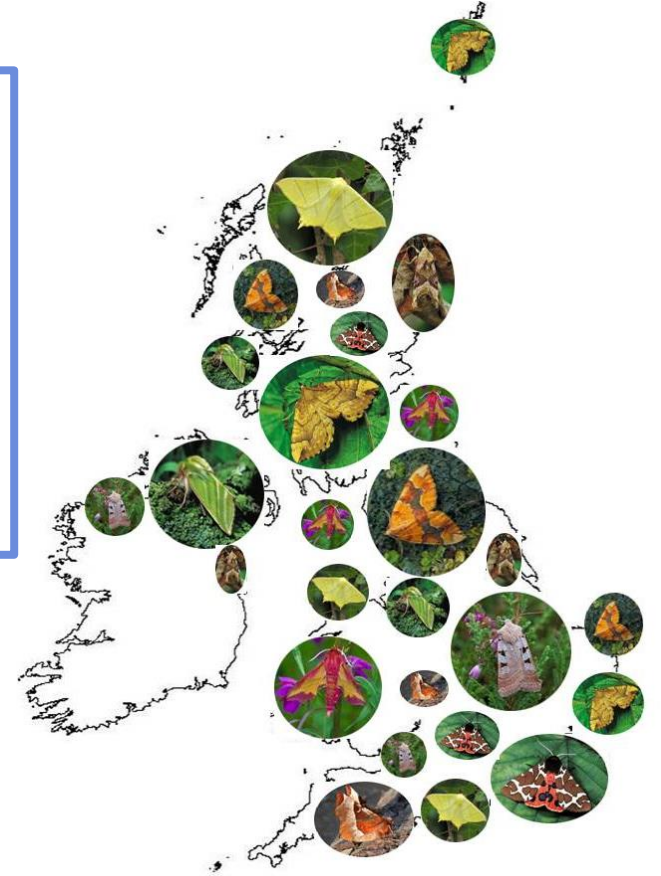
National Moth Recording Scheme

“NMRS” Established in 2007

UK, Isle of Man & Channel Islands

> **41 million** verified moth records

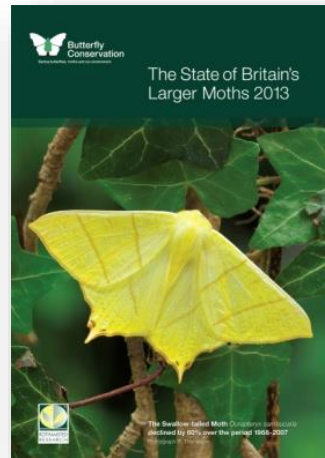
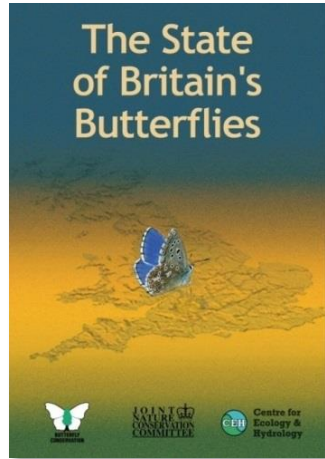
1741 earliest record



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BNM and NMRS Data Use: State of reports & Atlases



Data Use: DECIDE- Targeted recording in under-recorded areas



Version: 1.1.1

[Give feedback](#)

Remember - keeping safe and legal when recording is [your responsibility](#). For more information on the DECIDE score and the map tool: [further info](#)

Help: hidden

Species & season

Butterflies

Day-flying moths

Night-flying moths

Month

July ⁻

DECIDE score layer

Opacity:

Filter:

100%

Fog map: off

DECIDE suggestions

Maximum suggestions: 20

Access layers

Rights of Way: hidden

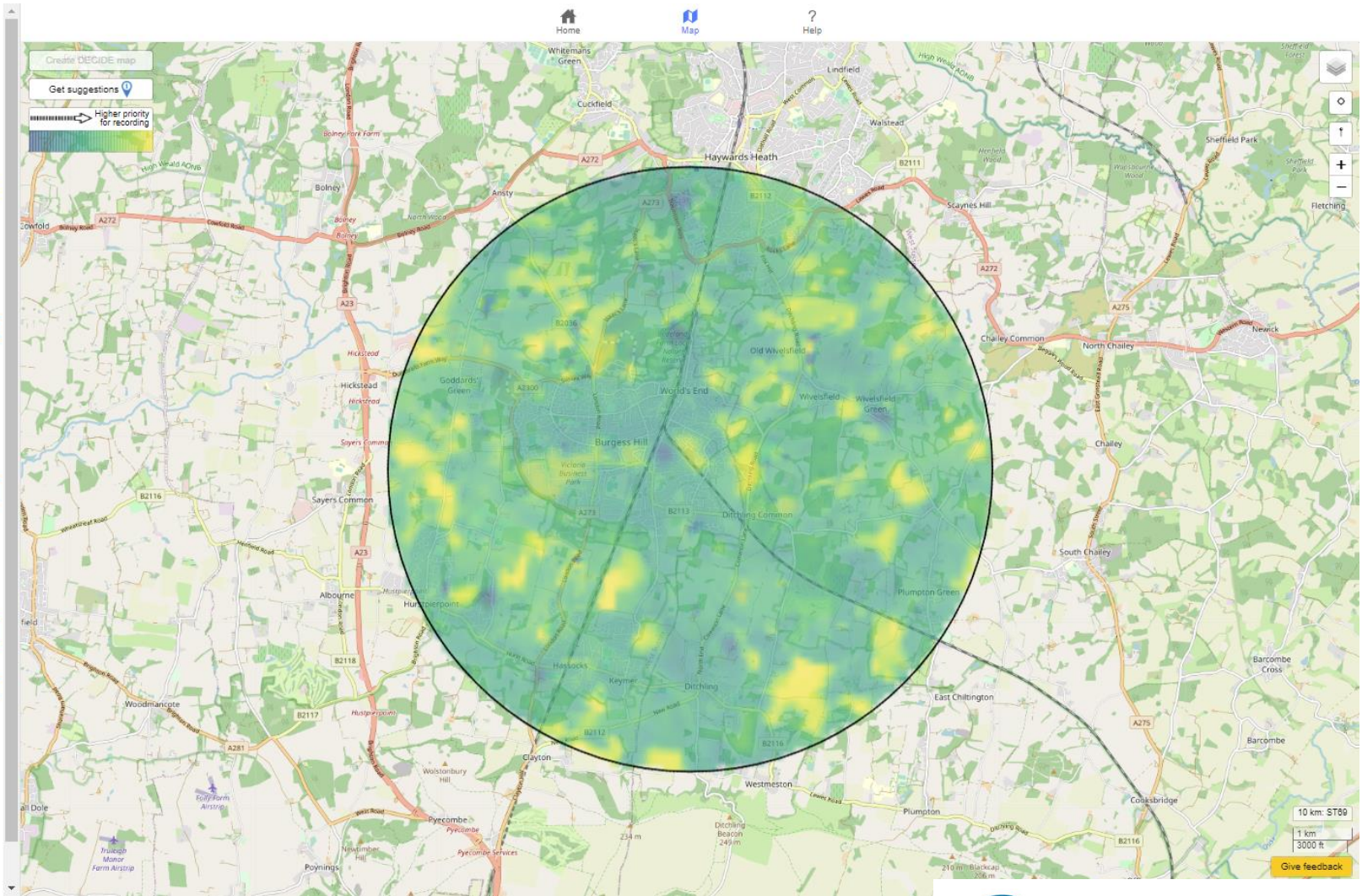
Access points: hidden

Greenspace: hidden

Open access: hidden

National Trust: hidden

London access: hidden

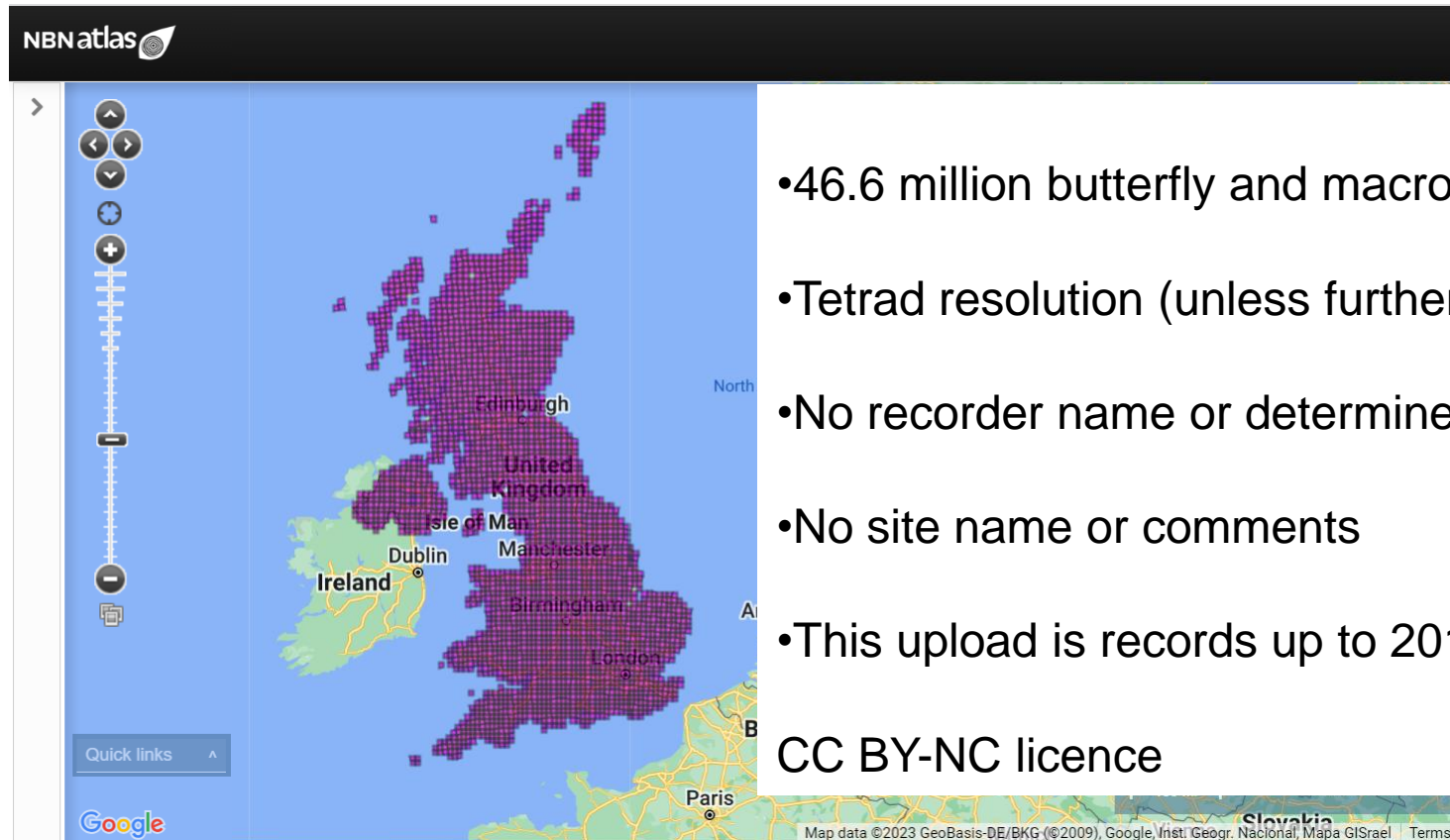


https://decide.ceh.ac.uk/info/decide_info



UK Centre for Ecology & Hydrology

BNM & NMRS: derived datasets on the NBN Atlas



- 46.6 million butterfly and macro-moth records
- Tetrad resolution (unless further blurred to 10km)
- No recorder name or determiner name
- No site name or comments
- This upload is records up to 2019

CC BY-NC licence



BNM and NMRS data users



Cyfoeth Naturiol Cymru
Natural Resources Wales



Forestry and
Land Scotland
Coilltearachd agus
Fearann Alba



NatureScot

Scotland's Nature Agency
Buidheann Nàdair na h-Alba



Forestry Commission



www.daera-ni.gov.uk

Northern Ireland
Environment
Agency



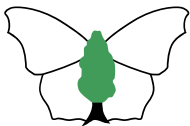
JNCC

Joint Nature Conservation Committee



defra

Department for Environment
Food and Rural Affairs



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BNM and NMRS datasets inform all that we do!



RESEARCH ARTICLE

Global Change Biology WILEY

Where and why are species' range shifts hampered by unsuitable landscapes?

Jenny A. Hodgson¹ | Zoë Randle² | Chris R. Shortall³ | Tom H. Oliver⁴



Butterfly Conservation

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ECOLOGY LETTERS

LETTER | Open Access | CC BY

Precipitation buffers temperature-driven local extinctions of moths at warm range margins

Lisbeth A. Hordley | Richard Fox, Andrew J. Suggitt, Nigel A. D. Bourn

First published: 22 March 2023 | <https://doi.org/10.1111/ele.14195>

Editor: Andrew David Barnes



County Recorder Networks

Volunteers

Local experts

Encouraging recording

Promotion of butterflies or moths

Feedback to recorders

Collation of local datasets

Verification of records

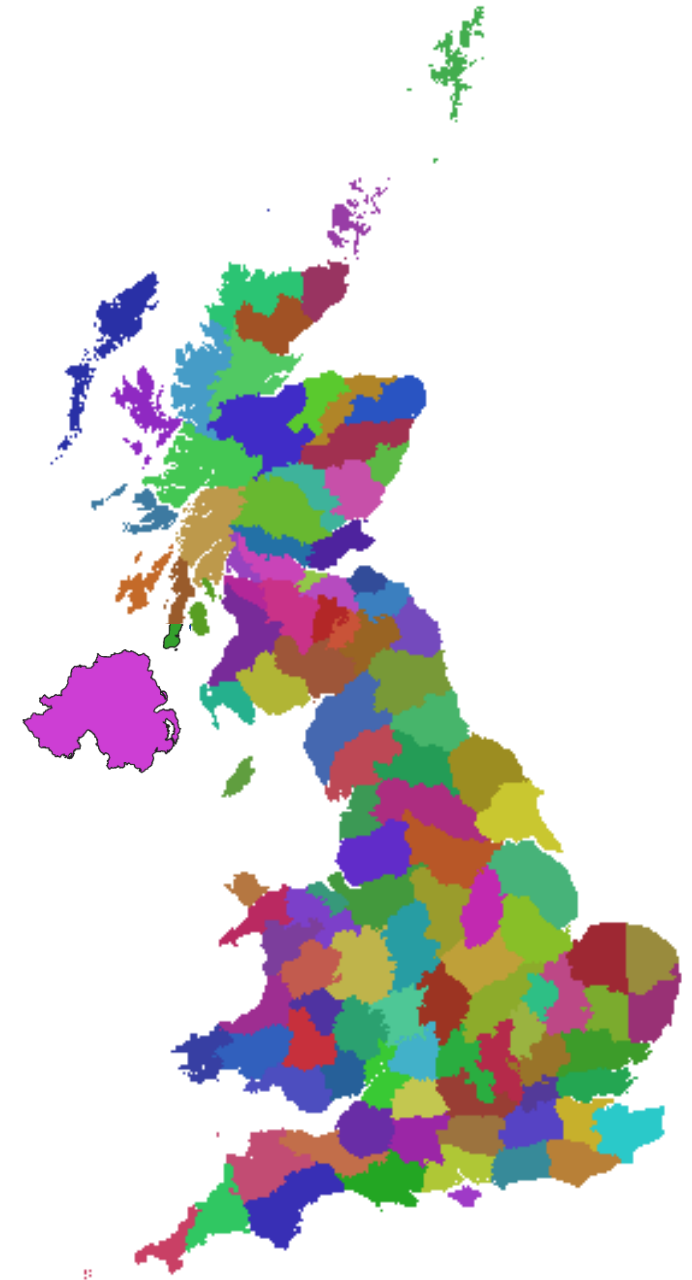
Submission of records to UK-wide Recording Schemes

.....and often loads more...!

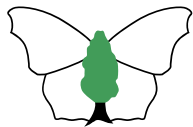
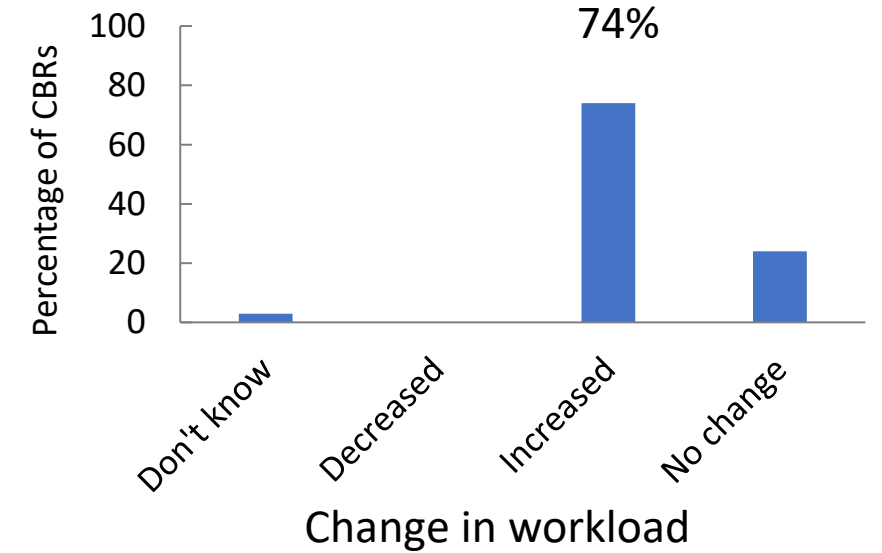
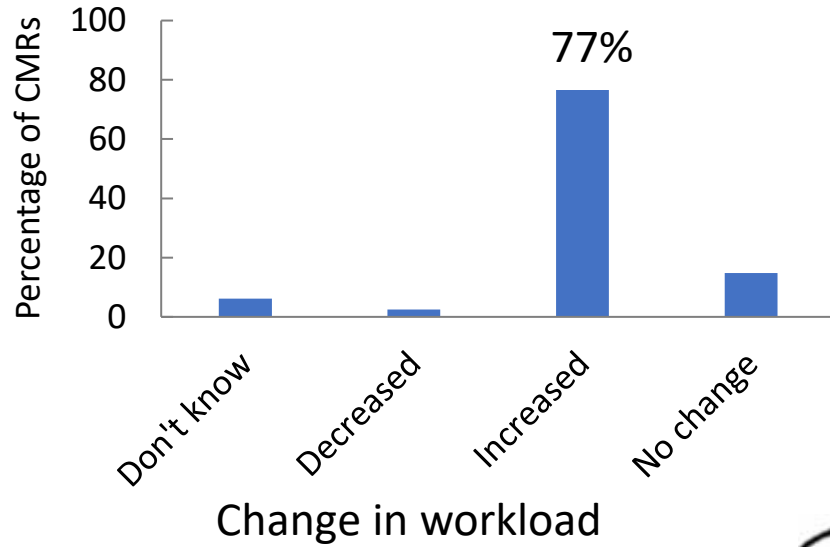


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County Recorder workload and record submission



**Butterfly
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County Recorder Tool-kit needs – challenging!

Collaborative approach - workshops

Complexity of needs – different people needed different things

Long list of wants, needs and requirements

Ambitions too big for this project alone!

Worked with Martha Henson from **Tech Works For Us** - User Research

- Martha interviewed a range of County Recorders
- Key themes
- Prioritised simple and useful solutions – balance between time and resources
- Road map for future developments



County Recorder Toolkit

County Recorder Toolkit			
Garden Butterfly Survey National Moth Recording Scheme County Recorder Toolkit	<h2><u>1. Introducing the role</u></h2> <p>How to become a County Recorder, what it involves, skills and resources required, timing and examples.</p>	<h2><u>2. Team working</u></h2> <p>Why we love team working; tips for collaborating on verification to share the workload.</p>	<h2><u>3. Principles of validation and verification</u></h2> <p>The theory behind verification, different stages and our view on best practice in this area.</p>
1. Introduction 2. Team working 3. Principles of validation and verification 4. Validation process and tools 5. Verification process 6. Verification: using available tools 7. Verification: determining species ID 8. Communicating with recorders 9. Database management 10. Sharing data and reporting 11. FAQs	<h2><u>4. Validation process and tools</u></h2> <p>How to check record data is correct and use available resources.</p>	<h2><u>5. Verification: process</u></h2> <p>How to confirm an identification with or without a photo.</p>	<h2><u>6. Verification: using available tools</u></h2> <p>Guidance and links to recommended resources and tools for verification.</p>
QGIS Online Training Health & Safety	<h2><u>7. Verification: determining species ID</u></h2> <p>Recommended resources for supporting identification.</p>	<h2><u>8. Communications</u></h2> <p>Guidance and links to recommended resources and tools for verification.</p>	<h2><u>9. Database management</u></h2> <p>Storage systems and software, preferred import/export processes, GDPR compliance, and maintenance.</p>
Science	<h2><u>10. Sharing data and reporting</u></h2> <p>Principles and practice for sharing data and reporting, including recommended tools.</p>	<h2><u>11. FAQs</u></h2> <p>Answers to common questions about verification and the County Recorder role.</p>	
Conservation projects			
Habitat management			
Reserves			
Policies and statements			
Wellbeing			
Reports and factsheets			
How we use your donations			
Our successes			

County Recorder Toolkit

Best practice for validating and verifying records

Excel Tools for cleaning data

ID resources:

Moth grading guidance

Field guides

Guide to difficult species

Moth dissection website

Signposting to online data capture:

iRecord butterflies app

BNM Online

NMRS Online

Spreadsheet template

Setting up iRecord activities

Guidance – importing and exporting data to/from iRecord

GDPR guidance

Database options

How to query and or redetermine records in iRecord

QGIS training links

Communicating with recorders in iRecord using templated responses

County Recorder Toolkit

6. Verification: using available tools

Guidance and links to recommended resources and tools for verification.



Record Validation Spreadsheets – developed by Mark Cubitt

Validate and verify records in spreadsheets

Potentially erroneous records colour coded

Data reformatting for onward import to other databases e.g. iRecord and MapMate

Useful for recorders to use **prior** to submitting their records to their County Recorders to help reduce workload

Validate Spreadsheet

Clear Form

Validation options:
 General
 Record
 MapMate

Verification options:
 Flight period
 New to VC
 Rare in VC
 New to 10k square
 with 10k buffer
 Rare for 10k square
 with 10k buffer
 Identification grading

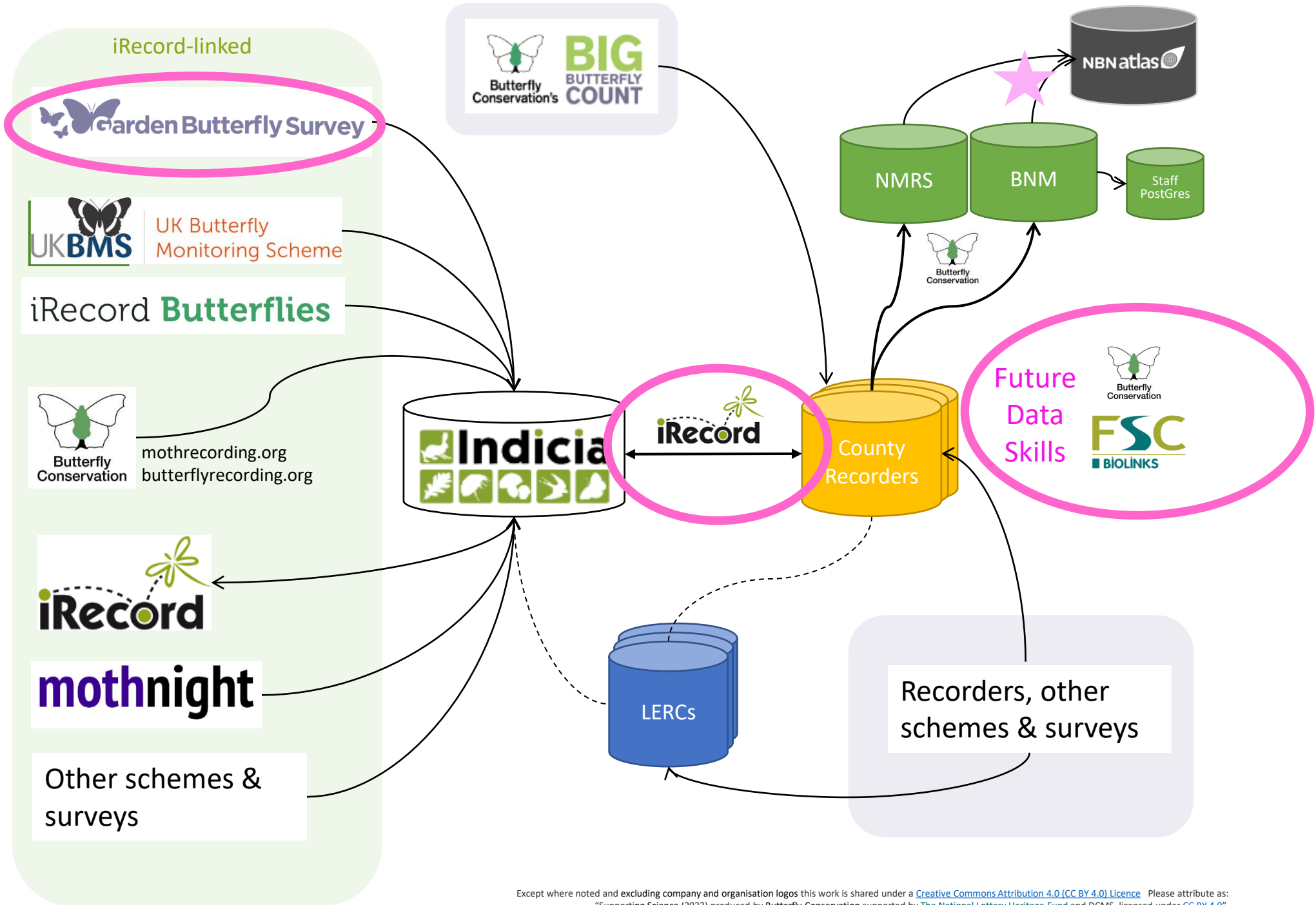
Advanced:
 Add Lat/Long to output
 Add TVK to output
 Limit empty field warnings

Output column name	Input column name
ABH Code	ABH
Common Name	Vernacular
Taxon*	Taxon
Recorder name*	Collector
Identified by	Determined by
Quantity*	Number
Sex	Sex
Stage	Stage
Method	Method
Site name*	Location name
Grid ref*	Grid reference
Vice County	VC
Date*	Date
Status	
Sample comment	Comments

Messages: Input file: C:\Moths\Submissions\Moth records for CMR 2021.xlsx
Worksheet name: Records
Warning messages are prefixed with the worksheet row number of the record

- 9:Dingy Dowd (*Blastobasis adustella*); Adult: Spec/photo may be needed cf. *B. vittata* & *B. lact*
- 27:Golden Argent (*Argyresthia goedartella*) recorded fewer than five times previously since 2
- 28:Sharp-winged Drill (*Dichrorampha acuminatana*) recorded fewer than five times previously
- 28:Sharp-winged Drill (*Dichrorampha acuminatana*); Adult: Gen det may be normally required
- 29:Small Birch Bell (*Epinotia ramella*) recorded fewer than five times previously since 2000 fro
- 30:Maple Button (*Acleris forsskaeana*) recorded fewer than five times previously since 2000 f
- 34:Golden Argent (*Argyresthia goedartella*) recorded fewer than five times previously since 2
- 39:Barred Fruit-tree Tortrix (*Pandemis cerasana*); Adult: Spec/photo may be needed cf. *Pande*
- 40:Dark-triangle Button (*Acleris laterana*) recorded fewer than five times previously since 200
- 40:Dark-triangle Button (*Acleris laterana*); Adult: Usually distinctive but cf. *A. caledoniana* & *A*
- 41:Garden Rose Tortrix (*Acleris variegana*) recorded fewer than five times previously since 20
- 56:Dark Chestnut (*Conistra ligula*) recorded fewer than five times previously since 2000 from h
- 83:Dark Neb (*Bryotropha affinis*) not recorded previously from VC82
- 83:Dark Neb (*Bryotropha affinis*); Adult: Gen det normally required, cf other *Bryotropha* spp. (
- 86:White-shouldered House Moth (*Endrossia sarcitrella*) recorded fewer than five times previo
- 104:White-shouldered House Moth (*Endrossia sarcitrella*) recorded fewer than five times previ
- 108:Yellow-faced Bell (*Notocelia cynosbatella*) recorded fewer than five times previously sin
- 126:Chequered Grass-veneer (*Catoptria falsella*) recorded fewer than five times previously sin
- 127:Taxon needed space(s) trimmed
- 128:Marbled Orchard Tortrix (*Hedya nubiferana*) recorded fewer than five times previously sin
- 128:Marbled Orchard Tortrix (*Hedya nubiferana*); Adult: Spec/photo may be needed cf. *H. prur*
- 130:Barred Fruit-tree Tortrix (*Pandemis cerasana*); Adult: Spec/photo may be needed cf. *Pande*
- 131:Yellow-spot Tortrix (*Pseudargyrotoza conwagana*) recorded fewer than five times previou
- 136:Taxon needed space(s) trimmed
- 145:London Dowd (*Blastobasis lacticolella*) recorded fewer than five times previously since 20
- 146:Chequered Grass-veneer (*Catoptria falsella*) recorded fewer than five times previously sin
- 147:Common Marble (*Celypha lacunana*); Adult: Distinctive when fresh but cf. *Orthotaenia un*
- 148:Shark (*Cucullia umbratica*) not recorded previously from NTS7
- 149:Broad-blotch Drill (*Dichrorampha alpinana*) not recorded previously from VC82
- 149:Broad-blotch Drill (*Dichrorampha alpinana*) not recorded previously from NTS7
- 149:Broad-blotch Drill (*Dichrorampha alpinana*); Adult: Gen det normally required cf. *D. flavid*
- 151:Bramble Shoot (*Notocelia uddmanniana*) recorded fewer than five times previously since
- 152:Barred Fruit-tree Tortrix (*Pandemis cerasana*); Adult: Spec/photo may be needed cf. *Pande*
- 149:Broad-blotch Drill (*Dichrorampha alpinana*) not recorded previously from VC82
- 149:Broad-blotch Drill (*Dichrorampha alpinana*) not recorded previously from NTS7
- 149:Broad-blotch Drill (*Dichrorampha alpinana*); Adult: Gen det normally required cf. *D. flavid*
- 151:Bramble Shoot (*Notocelia uddmanniana*) recorded fewer than five times previously since
- 152:Barred Fruit-tree Tortrix (*Pandemis cerasana*); Adult: Spec/photo may be needed cf. *Pande*

<https://butterfly-conservation.org/our-work/recording-and-monitoring/county-recorder-toolkit>



Improve systems...

Photo verification page displays photos at larger size on main page – each record is displayed in a 'card'

If you click on a card the record is highlighted on the map, and the details are shown below

Verification - photo based

Search: Context: Moths; Berkshire; Harvey, Martin

Status: Pending Photos: -no filter-

Filter: Select filter... Apply Reset Create a filter

The interface displays a grid of seven moth records. Each record consists of a photograph of the moth and a text card with the following information: species name, common name, recorder name, and date. The record for *Biston strataria* (Oak Beauty) by Clark, Bernard on 12/03/2023 is highlighted in blue. To the right, a map shows the distribution of records with blue circles. Below the map, a details panel for the selected record is shown.

ID	status	checks	Accepted name	Common name (as entered)	Location	Vice County	Grid ref	Date seen	Recorder	Determiner	Dataset	Sample comment
29633092			<i>Biston strataria</i> (Hufnagel, 1767)	Oak Beauty	North Maidenhead	Berkshire	SU89168185	12/03/2023	Clark, Bernard	Clark, Bernard	iRecord :: iRecord Moths :: Enter a list of moth records	-

Develop teams and strengthen the pool of volunteers



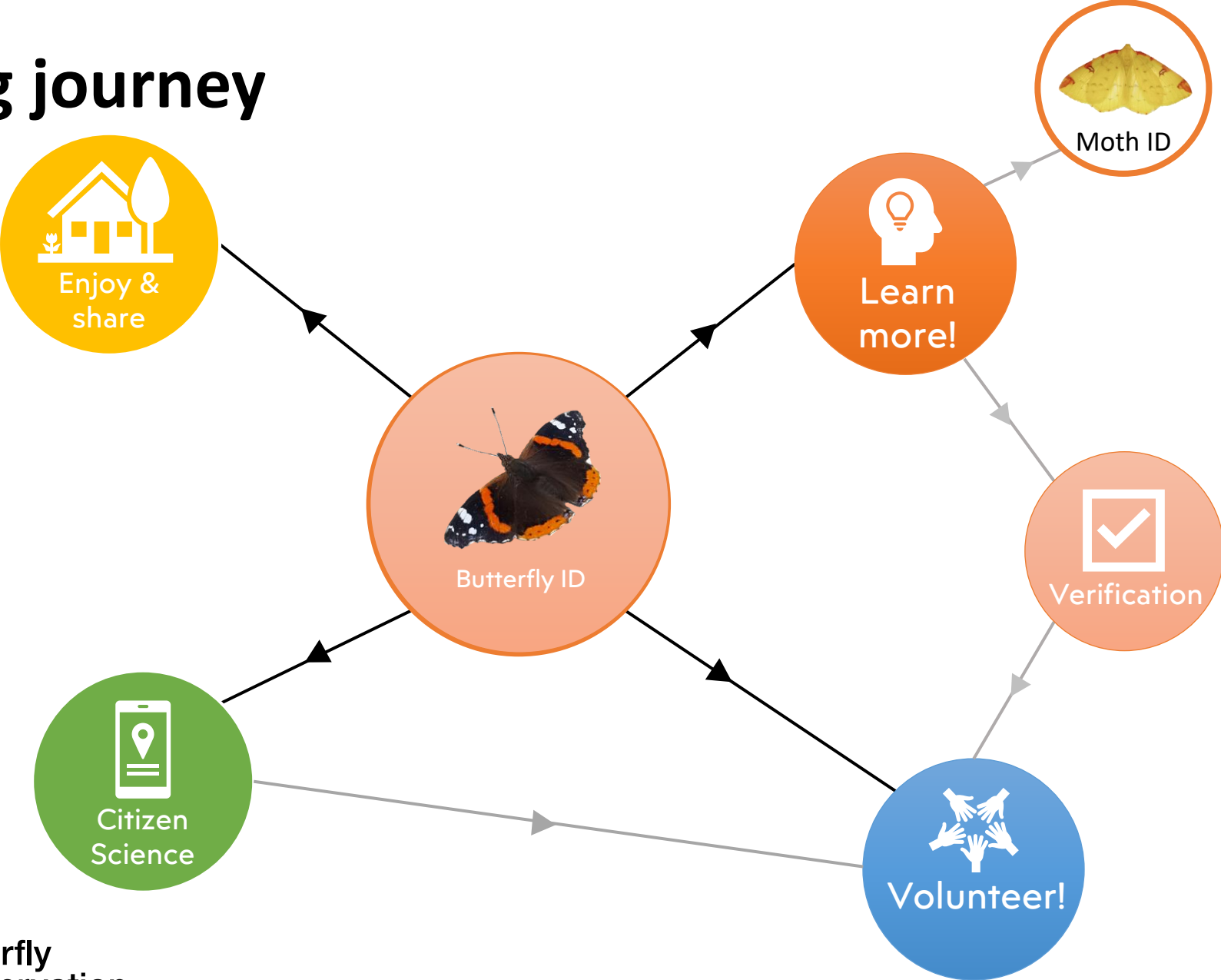




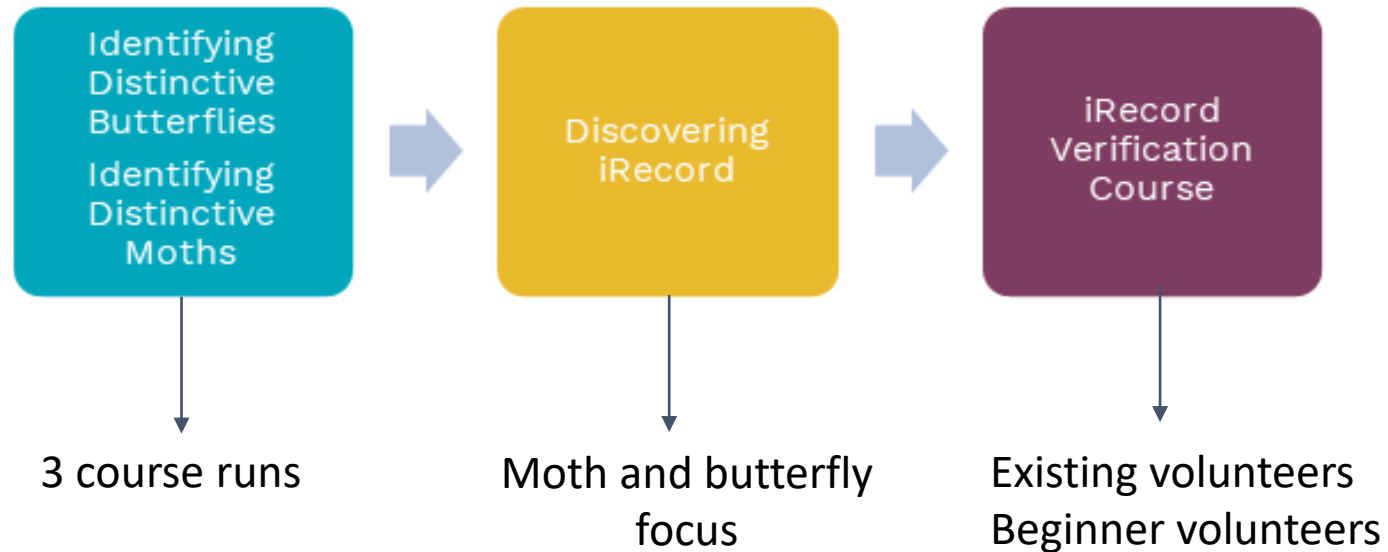
Training and learning about lepidoptera and data systems

1. Quality of data improves
2. More people and skills in the network

Learning journey



Online training pathway



Courses: format and content



Moodle Course: FSC - Butterfly & Moth Recording. Summary of data use. The use of data to help moth communities can be used to assess the impact of using BT treatment on non-target moths and inform the use of treatment at specific sites where Dole Processory Moth.

Video: Moths and habitats
Mothing Masterclass

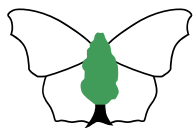
YouTube: MOTHS (AND BUTTERFLIES) ARE GREAT!
Chris Packham explains why #MothsMatter!

Magpie Moth: *Abraxas grossulariata*
At Rest
Labels: White base wing colour, Strongly contrasting dark markings, Orange abdomen with black markings.

Small Magpie Moth: *Anania hortulata*
At Rest
Labels: Grey wing markings, Grey abdomen with paler highlights.

Online identification training: Which species?













- Reasonably widespread
- Easy to ID from a photo
- Assistant Verifiers can help
















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Our “Distinctive” Moths

 <p>CC-BY 4.0 Mark Fordyce</p>	 <p>CC0</p>	 <p>CC-BY 4.0 Benjamin Weston</p>	 <p>CC-BY 4.0 Mark Welfare</p>
<p>Angle Shades</p>	<p>Brimstone Moth</p>	<p>Buff-tip</p>	<p>Burnished Brass</p>
 <p>CC0</p>		 <p>CC0</p>	 <p>CC0</p>
<p>Cinnabar</p>	<p>Elephant Hawk-moth</p>	<p>Hebrew Character</p>	<p>Jersey Tiger</p>
 <p>CC0</p>	 <p>CC0</p>	 <p>CC-BY 4.0 Alan Kenworthy</p>	 <p>CC0</p>
<p>Magpie Moth</p>	<p>Poplar Hawk-moth</p>	<p>Setaceous Hebrew Character</p>	<p>Small Magpie</p>

Our “Distinctive” Butterflies

 <p>Mike Bailey CC-BY 4.0</p> <p>Brimstone (male)</p>	 <p>CC0</p> <p>Common Blue</p>	 <p>Sam Ellis</p> <p>Green Hairstreak</p>	 <p>CC0</p> <p>Holly Blue</p>	 <p>CC0</p> <p>Marbled White</p>
 <p>Sam Ellis</p> <p>Orange-tip (male)</p>	 <p>CC0</p> <p>Painted Lady</p>	 <p>CC0</p> <p>Peacock</p>	 <p>CC0</p> <p>Red Admiral</p>	 <p>Sam Ellis</p> <p>Scotch Argus</p>
	 <p>CC0</p> <p>Small Copper</p>	 <p>CC0</p> <p>Small Tortoiseshell</p>	 <p>Sam Ellis</p> <p>Speckled Wood</p>	

Promotion of distinctive species identification courses



FSC Eventbrite subscribers

Discovering iRecord:
Butterflies & Moths
course participants

FSC
Biodiversity
newsletter

Social media of
BC and FSC incl.
twitter and
instagram

BC Branch
newsletter

Biolinks in-person
events subscribers

University Moth
Challenge course
leaders

London Friends of
Greenspaces
Network newsletter

BioLinks Discovering
iRecord participants



Stepney City Farm

BC staff
newsletter

FSC quarterly
newsletter
listings

Greenpace Information for
Greater London CIC

Online identification training: what worked well?

Magpie Moth

Abraxas grossulariata

This large moth has white wings with well-defined black spots and vivid orange stripes across the forewings. The head and thorax are black with orange scales. The abdomen is orange, matching the colour of the wing markings and sports a central line of solid black spots.



Images: left: Gail Hampshire CC BY 2.0 Centre: Ben Sale CC BY 2.0 Right: Ben Sale CC BY 2.0

Identification Features

Wing span

36 - 50mm

Wing colour

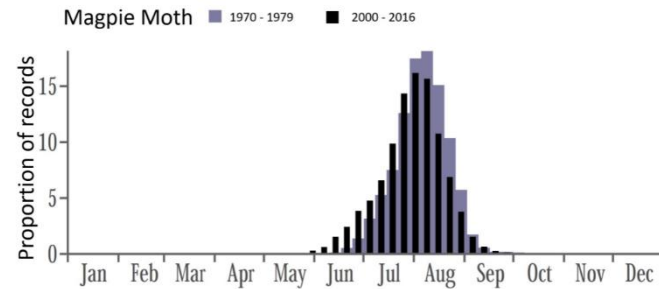
Clean, white base colour with two stripes of orange across the wing, one at the base and one just below the centre line. All wings are marked with clearly defined black spots with some merging creating the appearance of a black stripe across the forewings. Both the fore and hindwings are bordered with black spotted markings.

Antennae

Long, black, threadlike antennae.

Flight period and life cycle

The moths fly in July and August and are frequently attracted to light.



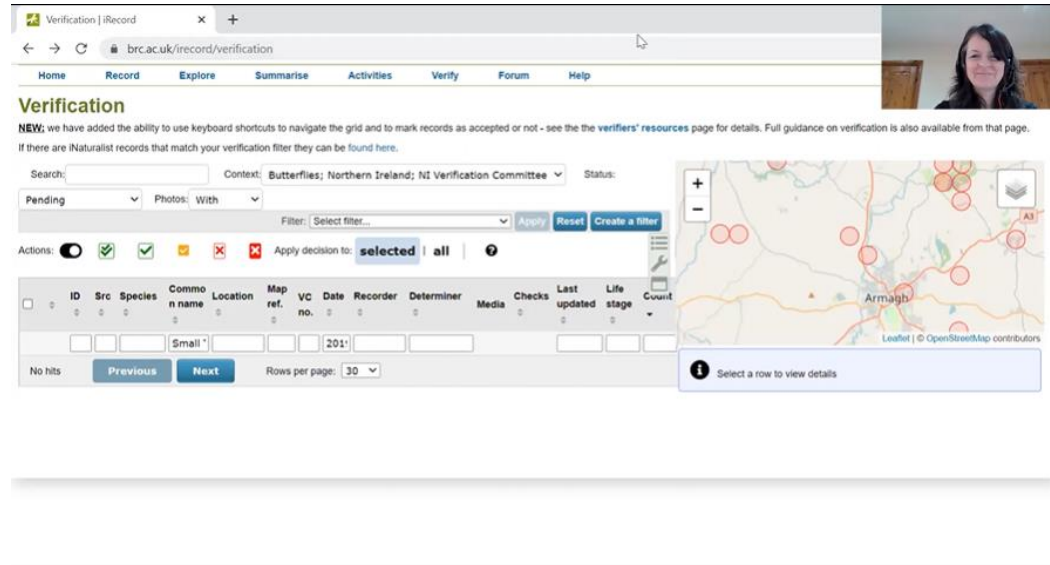
“Ability to go at own pace.”

“I liked how you focussed on a few species rather than a lot.”

“The quizzes were useful learning tools.”

“Comparisons with confusion species.”

Online verification training: what worked well?

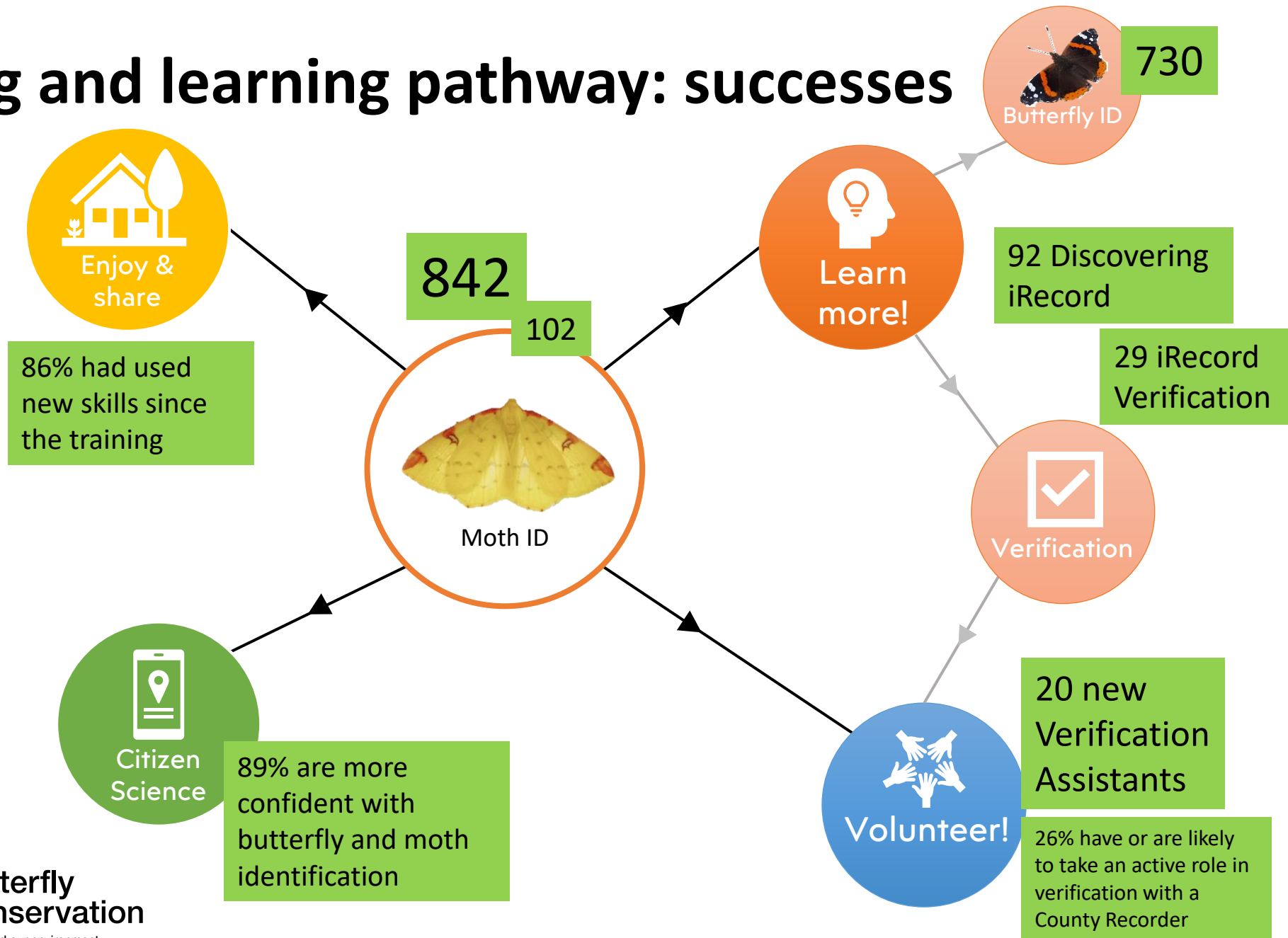


“Webinars and actual verification assignments.”

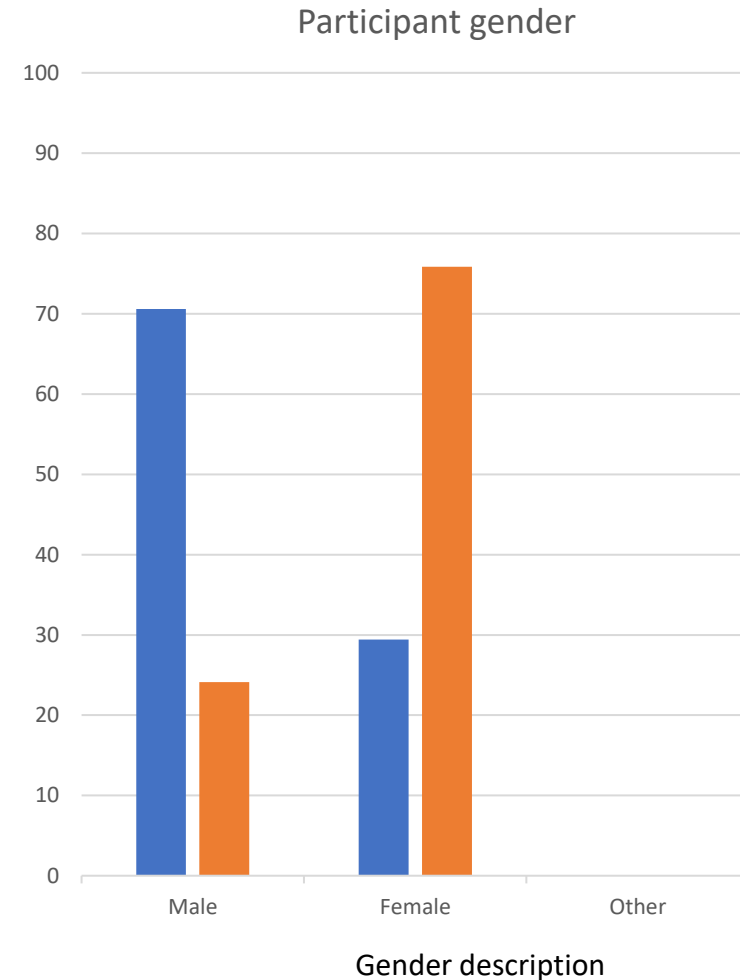
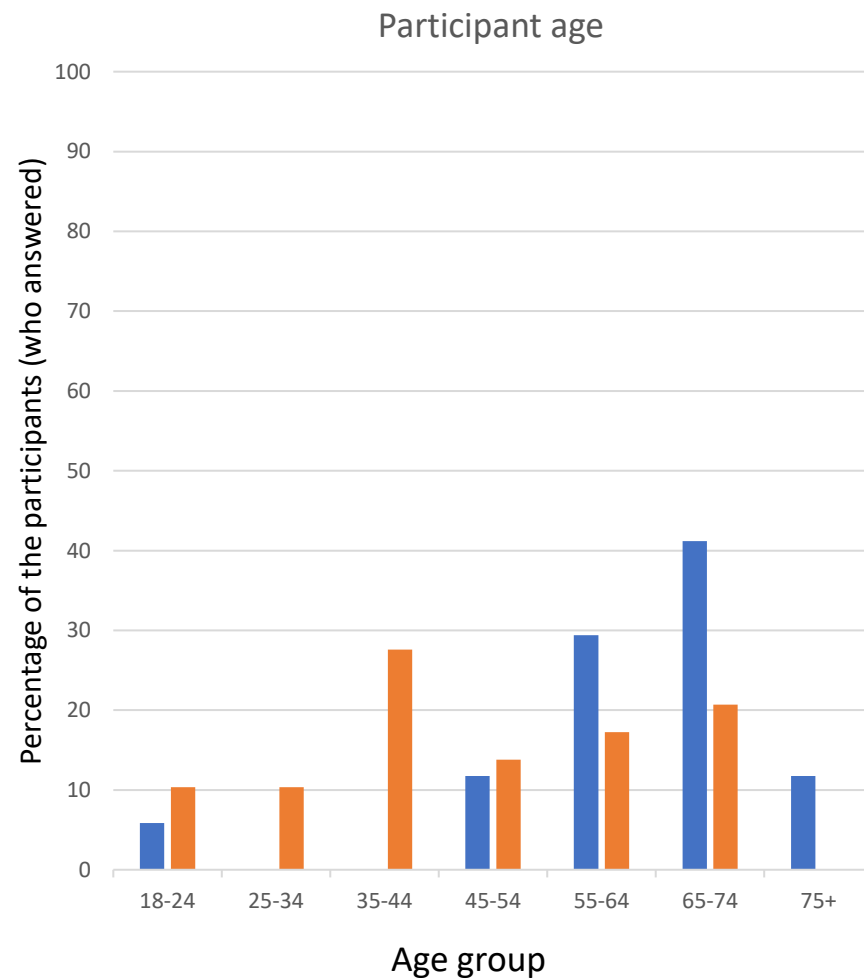
“I liked being monitored on the assignment.”

“I really loved getting to look at real data.”

Training and learning pathway: successes



Who took part in the verification courses?



What did we learn?

- Many people love recording butterflies and moths!
- More people and skills are needed:
 - Keep the critical data flowing
 - Support County Recorder workload
 - Strengthen skills within the network
- You can learn beginner moth and butterfly identification & verification online!
- Online training pathways complement traditional entry routes

Thank you

- Rachael Conway, Keiron Brown, Dan Asaw
- FSC and BioLinks
- UK Centre for Ecology & Hydrology
- Current volunteers
- Our funders
- Everyone who took part!



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