



Mobilising diverse data using Indicia

Biodiverse IT



About Indicia

- Toolbox for building wildlife recording solutions
- Many implementations
 - iRecord
 - NatureSpot
 - Capturing our Coast
 - data.mnhn.lu
 - Lots more
- Open source and free as in both speech and beer



Pros and cons

Good news...

- It's flexible

Bad news...

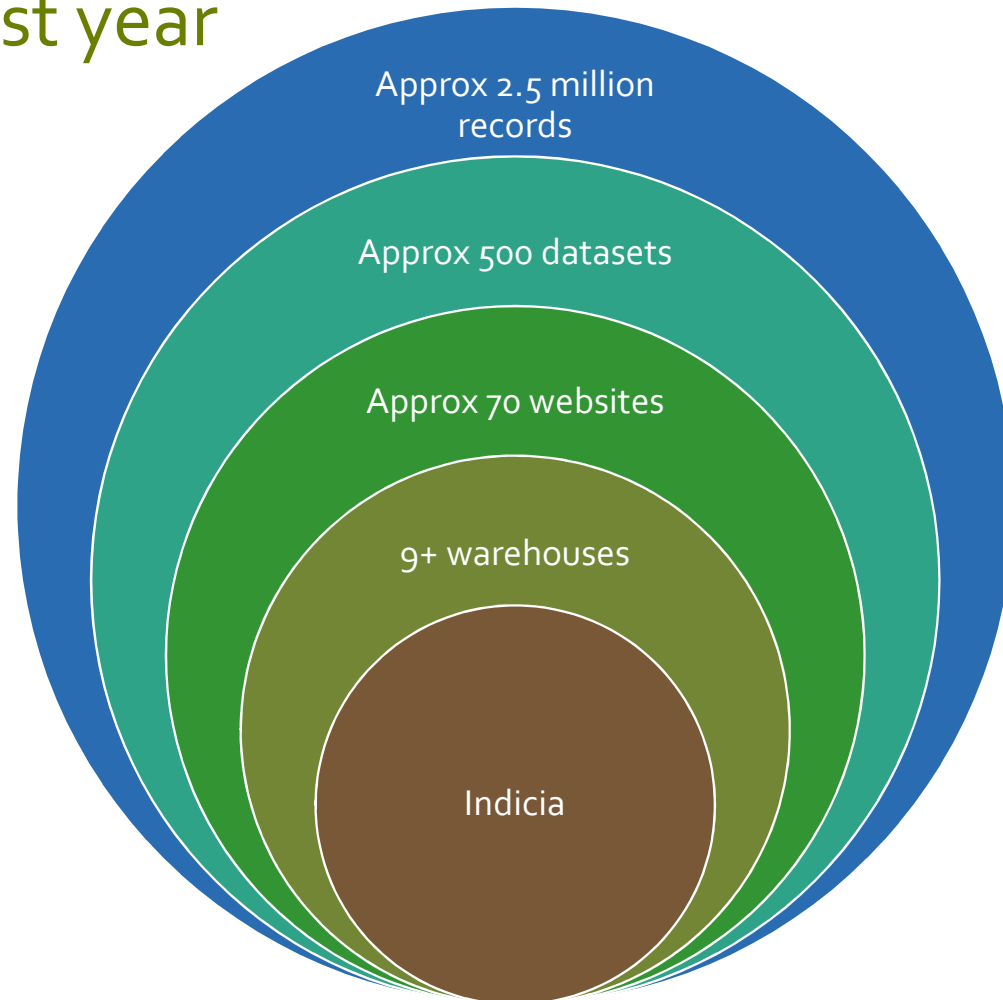
- It's flexible

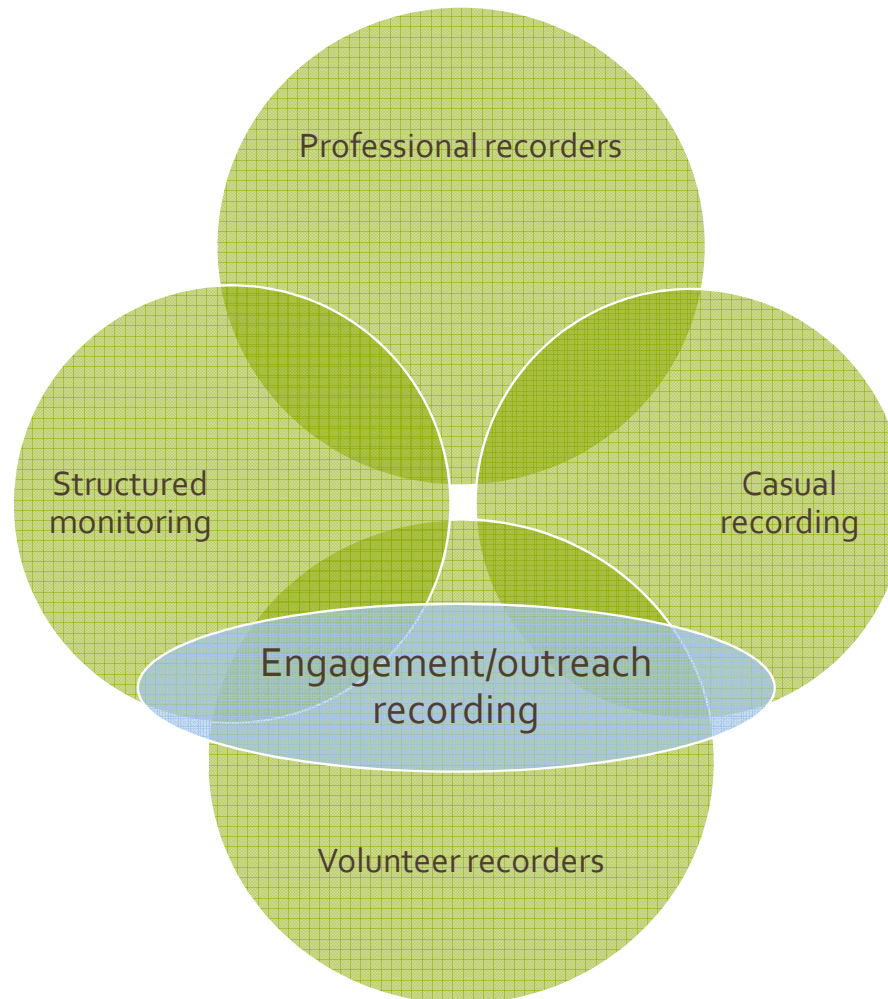






Activity over last year







UK ladybird
survey

BBC
breathing
places

1 your
details

2 place
seen

3 sighting
details

4 which
species

5 your
photos

survey
submitted

Which species? How many?

Narrow down your choice by selecting options in the Interactive Key. To set the number seen, click +/- buttons. For more details about any ladybird, point at its picture.

Interactive Key [Show all](#)

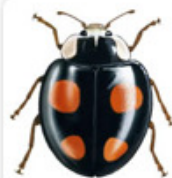
Select options that match:

Main colour
(wing case) ☐ ☐ ☐ ☐ ☐

Spot colour ☐ ☐ ☐



Harlequin ladybird
f. succinea



Harlequin ladybird
f. spectabilis



Harlequin ladybird
f. conspicua



2-spot ladybird
f. typica






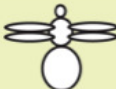



2-spot ladybird
f. sexpustulata



2-spot ladybird
f. quadrimaculata



WINGS		BODY PARTS AND OVERALL SHAPE AT A GLANCE																																																																		
		1. Apparently one body part	2. Three body parts																																																																	
A. No obvious wings.	 <p>Apparently one body part and no obvious wings</p>	 <p>Three body parts, each bit roundish and of regularly increasing size and no obvious wings.</p>																																																																		
	<p>Ladybirds (a type of beetle):</p> <table border="1"> <tr> <th>None</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10+</th> </tr> <tr> <td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td> </tr> </table>	None	1	2	3	4	5	6	7	8	9	10+	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<p>Beetles:</p> <table border="1"> <tr> <th>None</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10+</th> </tr> <tr> <td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td> </tr> </table> <p>  Three body parts, the last bit much longer than the other two and no obvious wings. </p> <p>Ants:</p> <table border="1"> <tr> <th>None</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10+</th> </tr> <tr> <td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td> </tr> </table>	None	1	2	3	4	5	6	7	8	9	10+	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	None	1	2	3	4	5	6	7	8	9	10+	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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B. Two obvious wings	 <p>Two obvious wings, usually clear; wings held out from or held along body. Antennae usually short</p>																																																																			
	<p>Flies:</p> <table border="1"> <tr> <th>None</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th><th>17</th><th>18</th><th>19</th><th>20+</th> </tr> <tr> <td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td> </tr> </table>	None	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																									
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C. Four wings	 <p>Four wings, usually clear; wings held out or held along body. Antennae usually long</p>																																																																			
	<p>Butterflies (wings not see-through):</p> <table border="1"> <tr> <th>None</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10+</th> </tr> <tr> <td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td> </tr> </table>	None	1	2	3	4	5	6	7	8	9	10+	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																																													
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Add a casual record

[View](#) [Edit](#) [Manage display](#) [Delete](#)

Date:

[Click here](#)

Select the date of the record.

Species:

Enter the species name using * as a wildcard

Quantity:

Provide an indication of the abundance

Sex:

not recorded

Please indicate the sex of the organism, if recorded.

Photos

[Add photo](#)

Sensitivity

Is the record sensitive? ☐

Blur record to:

none

This is the precision that the record will be shown at for public viewing

Location:

Provide the name of the site, ideally using one that is recognisable from an OS map. Do not enter a postal address as the information you provide will be visible to others.

Enter a spatial reference:

WGS84 (decimal lat,long)

Or search for a place on the map:

[Search](#)

Or simply click on your rough position on the map.

Habitat:

Comment:

Recorder Name:

van Breda, John

Please add the recorder's name, if it is not already shown, using the format "Surname, First name"

Certainty:

Certain

How certain of this identification are you?

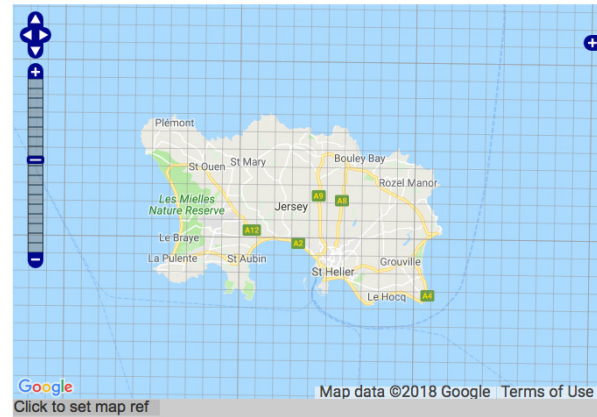
Identified By:














If anyone helped with the identification please enter their name here

Stage:

not recorded

Please indicate the life stage of the organism, if recorded.



Species 	Abundance	Confidence	Identified By	Comment	Add photos
 Grey Dagger  [Acronicta psi] Moths  *1	1	Certain 			Add images
 Common Rustic  [Mesapamea secalis] Moths  *2	1	Certain 			Add images
 Large Black Slug  [Arion ater sensu stricta] Slugs & Snails *3	1	Certain 			Add images
<input type="text"/>	1	Certain 			Select a species first


- *1** Adults of Grey and Dark Dagger can only be separated by genital determination though caterpillars can however be told apart more easily. If you are recording an adult you must provide an explanation of how it was identified, otherwise record it as Grey/Dark Dagger agg.
If you are recording a caterpillar or other non-adult stage, please specify this in the comment box.
- *2** If you are recording a caterpillar or other non-adult stage, please specify this in the comment box.
- *3** This slug belongs to a species complex that are very difficult to separate, usually requiring dissection. Detailed proof of identification is needed. Failing this records should be submitted as Arion ater agg.

Enter a NARRS amphibian visit

[View](#) [Edit](#) [Manage display](#) [Delete](#)

Select pond:
<Please select>

Spatial Ref:
49.19132N 2.08588W
WGS84 (decimal lat,long)



Method:
☐ Visual searching
☐ Netting
☐ Torchlight survey

Date:
Click here

Start Time (hh:mm):

End Time (hh:mm):

Air temperature:
 °C

Water temperature:
 °C

Water clarity:

Score 1-3

Rain:

Score 0-3

☐ Wind disturbing water:

☐ Bright moonlight:

% shoreline surveyed:
 %

Species	Adu	Imm	Larva/tadpole	Egg/spawn	Comment	Add photos
Agile Frog - <i>Rana dalmatina</i>	2					Add images
Common toad - <i>Bufo bufo</i>				3		Add images
Palmate newt - <i>Lissotriton helveticus</i>						Add images
						Select a species first


Please provide any photographs of the pond or surroundings taken during this visit. Images of the species themselves can be added to the records in the table above.


Photos of the environment


Add photo


Submit

Survey**Add Occurrence****Occurrence List**


Transect: 062_106  *


Walk started at end:  *

Reliability of this data:  *


Visit number in year: 1  *

Date: 05/06/2018 *

Wind Force:  *

Precipitation:  *

Temperature: 18 * °C

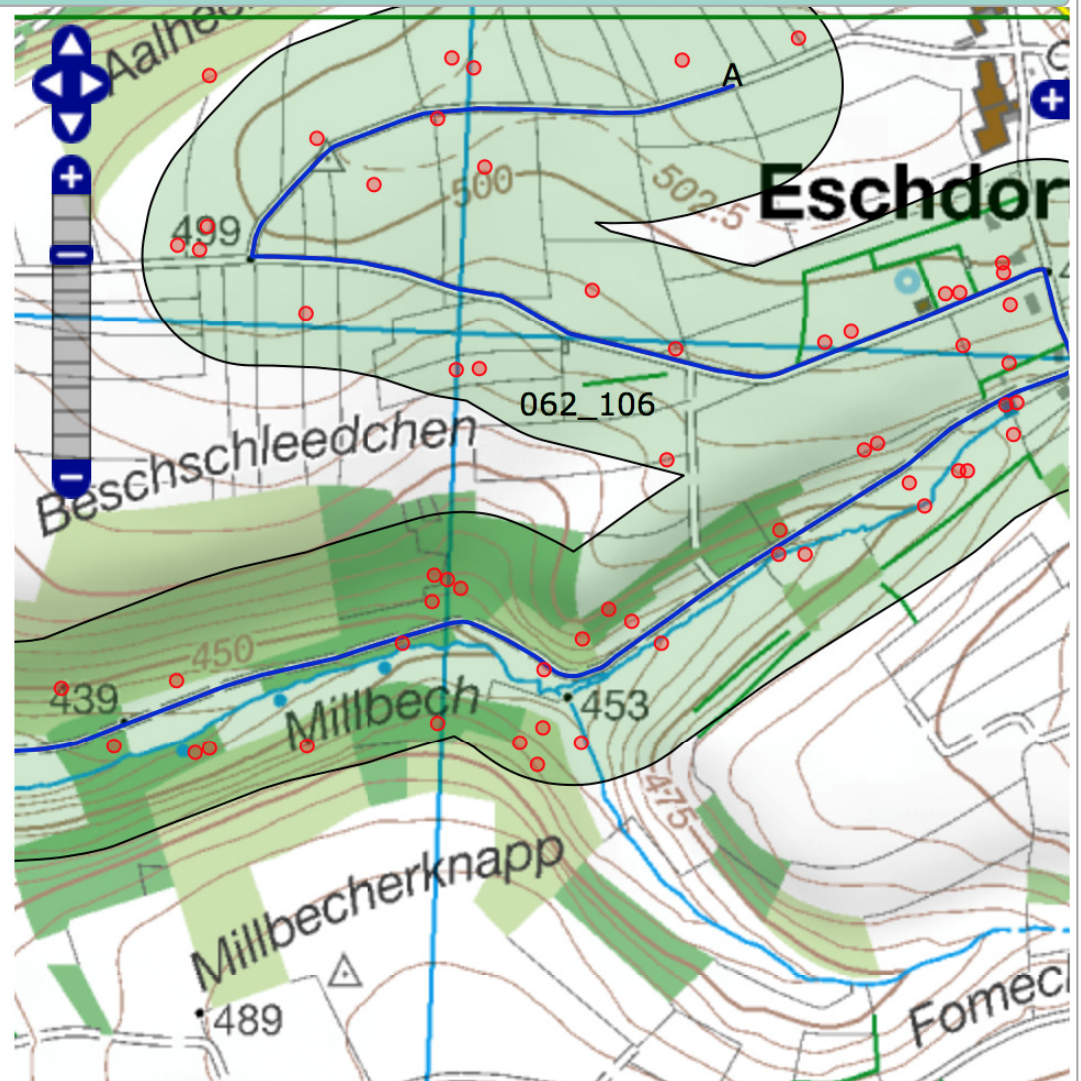
Cloud Cover: 25%  *

Start time: 09:00 * hh:mm

End time: 10:10 * hh:mm

Closed: ☐

Deleted: ☐

[Save Survey Details](#)[Return to main survey selection screen](#)

Site

Choose a square (5x5km) by either picking it from the drop down list, or clicking it on the map. This square will then be highlighted on the map, along with all existing sites associated with that square.

Square (5x5km): **078_109**

To choose a site, either click the relevant site on the map (ensuring that the select tool on the map is active) or pick it from the drop down list (then the selected site is highlighted in blue on the map).

You may add a new site: ensure a square has been selected, click the 'Start a new site' button on the map, select the map tool for the type of item you wish to draw, and draw on the map, clicking on each point. Double click on the final point of a line or polygon to complete it. At this point you will notice some small red circles appear around the newly drawn feature: you can change the boundary by dragging these circles. To delete a point (purple circle) or shape vertex (red circle), place the mouse over the circle and press the 'Delete' button.

Selecting an existing site, re-clicking the 'Start a new site' (tick) button or clicking the 'Remove the selected new site' (red cross) button will remove any new site.

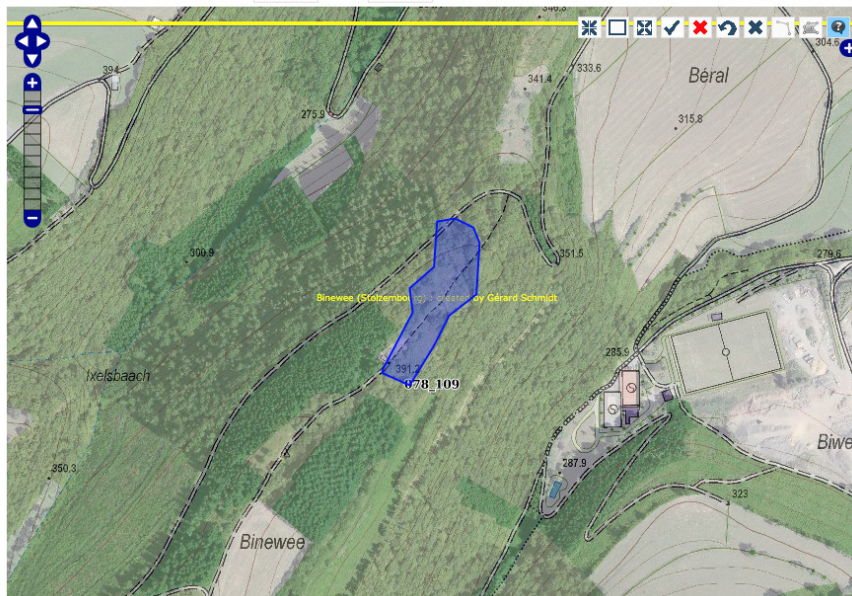
It is not possible to change a site name or boundary on this form once it has been saved - this can be done by an Admin user using their special tool.

Site: **Binewee (Stolzembourg) : created by Gérard Schmidt**

Site name: **Binewee (Stolzembourg)**

Creator: **Gérard Schmidt**

Site centre coordinates: X: **79934** Y: **11372** (LUREF geographical system, in metres)



Grid-based species records

Transect: 069_107

Date: 16/05/2017

Add Species:

Observations along the transect and inside the virtual box ("X"), observations along the transect and outside the virtual box ("/") and casual observations ("O").

Note: when a species record is associated with multiple codes for the same grid, please consider this order of priority (1) "X", (2) "/" and (3) "O".

Lycaena phlaeas

Pieris napi/rapae

08:	28:	48:	68:	88:	08:	28:	48:	68:	88:
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input checked="" type="text"/>	<input type="text"/>	<input type="text"/>
06:	26:	46:	66:	86:	06:	26:	46:	66:	86:
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
04:	24:	44:	64:	84:	04:	24:	44:	64:	84:
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02:	22:	42:	62:	82:	02:	22:	42:	62:	82:
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Pieris napi

Polyommatus icarus

08:	28:	48:	68:	88:	08:	28:	48:	68:	88:
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Pieris rapae

08:	28:	48:	68:	88:
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input checked="" type="text"/>	<input type="text"/>
06:	26:	46:	66:	86:
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02:	22:	42:	62:	82:
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< Prev step

Next step >

Cancel

TESCO

21:10

<

Edit

Banded Demoiselle
Calopteryx splendens

>

Location

SY9997
Name missing

>

Date

Today

>

Comment

>

Site type

>

Adults

>

Cop. pairs

>

Ovip. females

>

Larvae

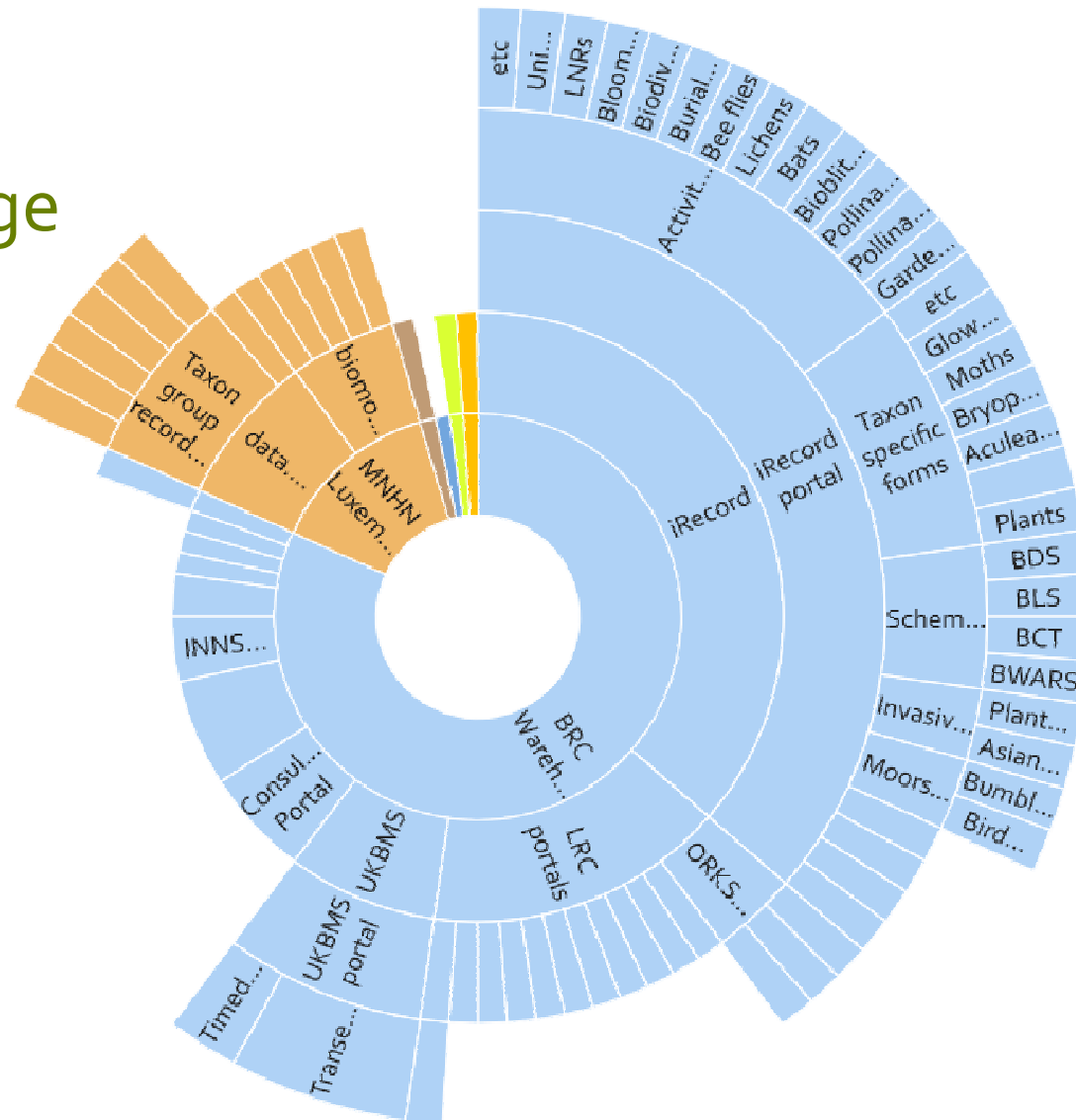
>

Exuviae

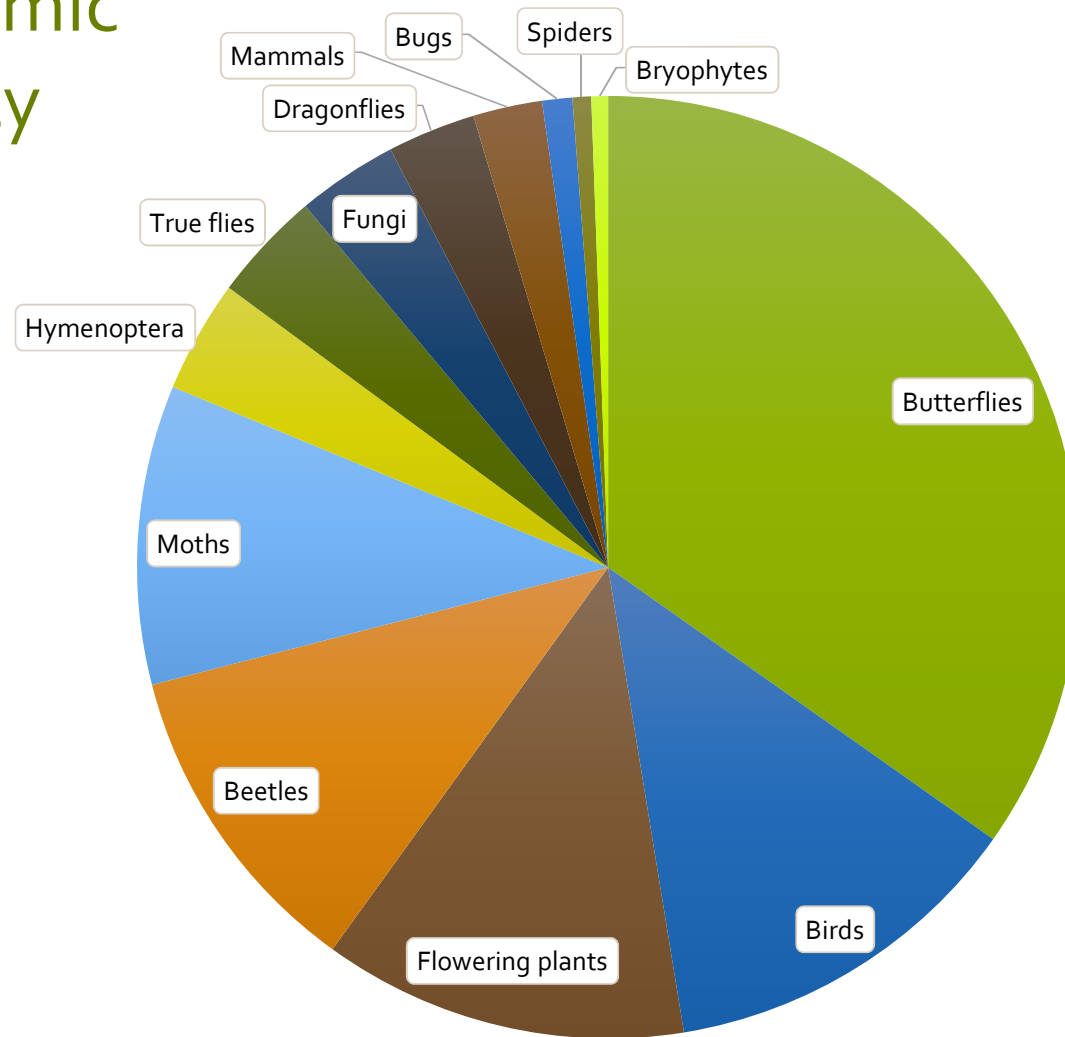
>

No photo has been added

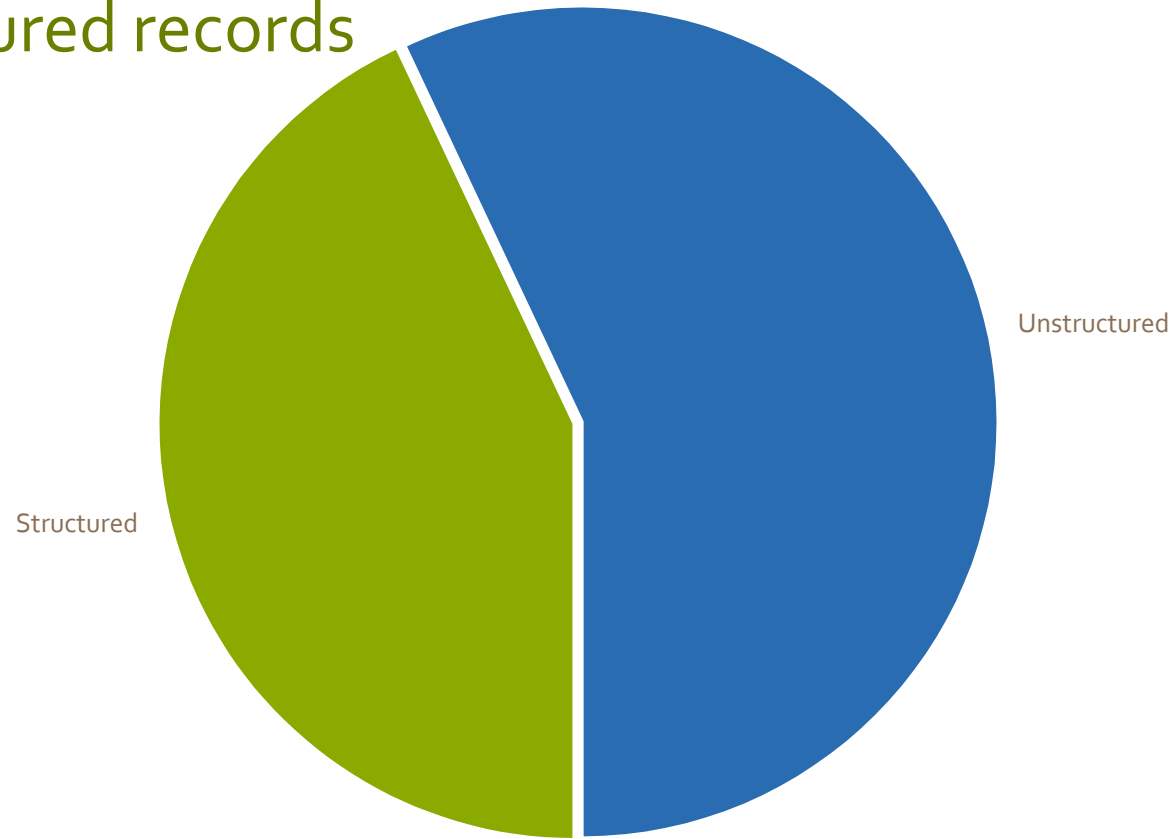
Indicia usage



Taxonomic diversity



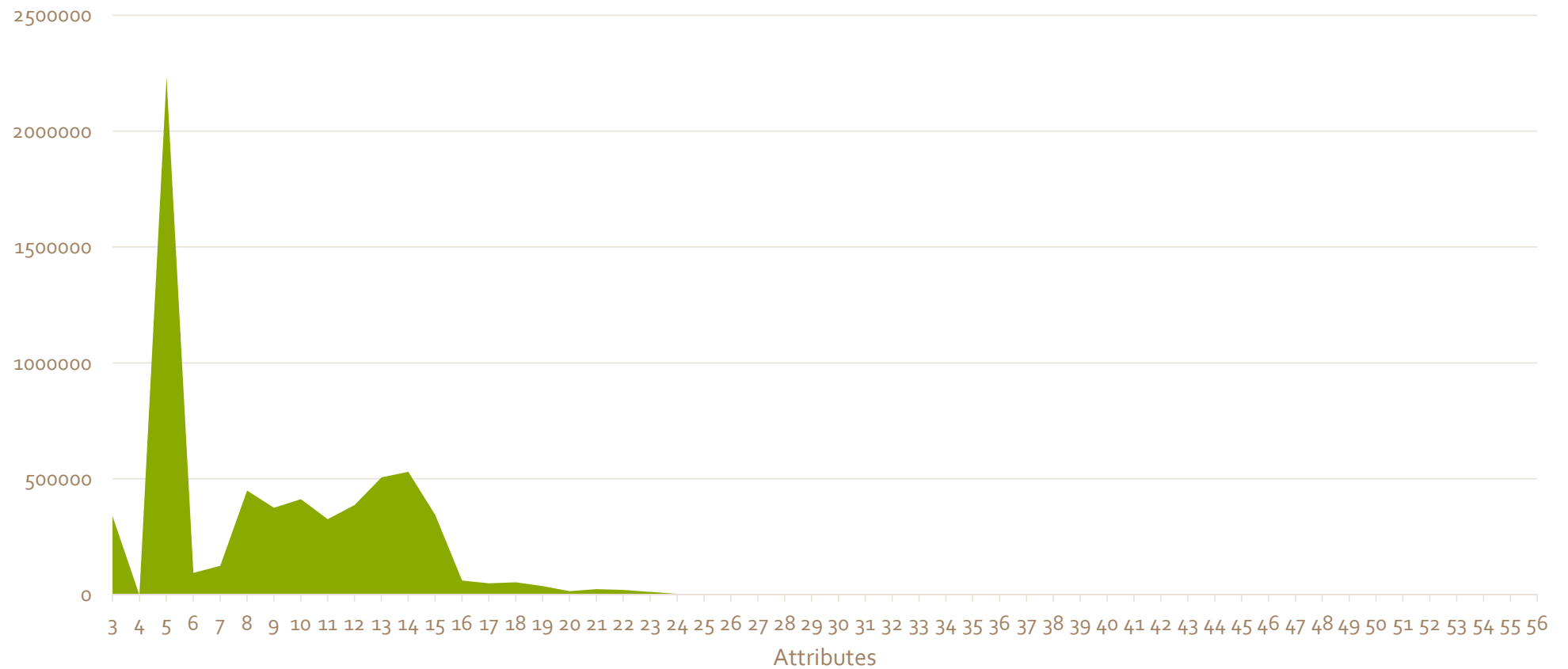
Structured vs unstructured records



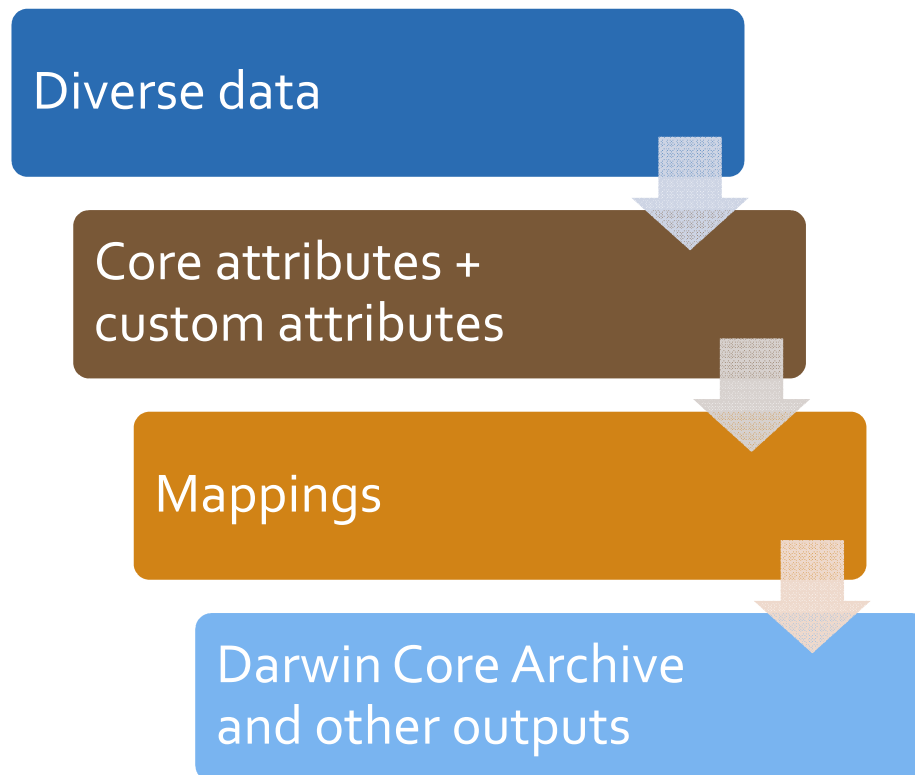
How does the database handle this?


- Core attributes (what, where, when) in a traditional schema
- Dataset administrator can add custom attributes for everything else
- Attributes tables store label, description, validation rules etc.
- Values tables store the data
- Cache tables simplify reporting

Attributes assigned to each record



Records can always be simplified down



Key facts 	
Species	Coccinella septempunctata
Record status	Not reviewed
Recorder	Brown, Peter
Map ref.	52.5474168, 0.0882735
Output map ref.	TL416964
Site Name	March
Locality	Cambridgeshire
Date	2017-06-24
Record	
ID	6917525
Comment	Pupa on holly
Submitted on	2018-06-10 23:21:40
Last updated on	2018-06-10 23:21:40
Survey	iRecord App
Record attributes	
Abundance	1
Stage	pre-adult
Sample attributes	
Application version	3.1.1.2
Data Source	android
Data Source Version	5.1.1
Gridref_calculated	TL416964
Location source	gps
Location accuracy	42
Altitude	55

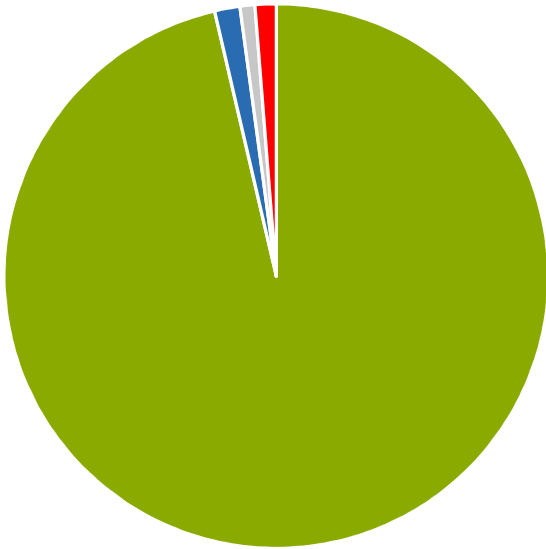
A potential verification bottleneck?

- 541 people have verified at least 1 record on the BRC warehouse
- 94 recording schemes on the BRC list
- 152 vice counties

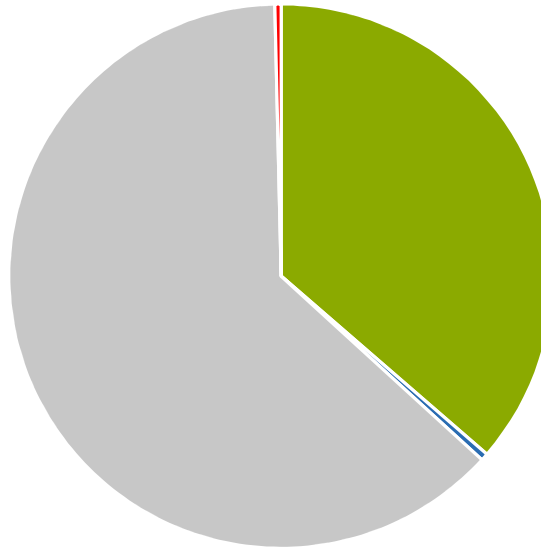
>14,000 county recorders needed for complete coverage?
Do experts want to verify engagement and outreach data?

BRC warehouse verification stats

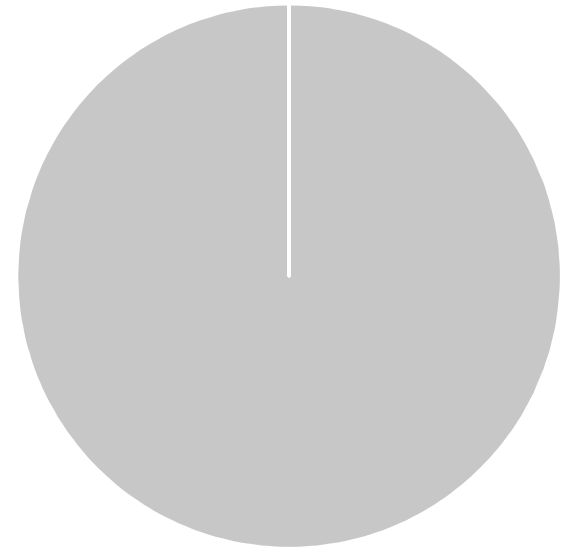
NatureSpot

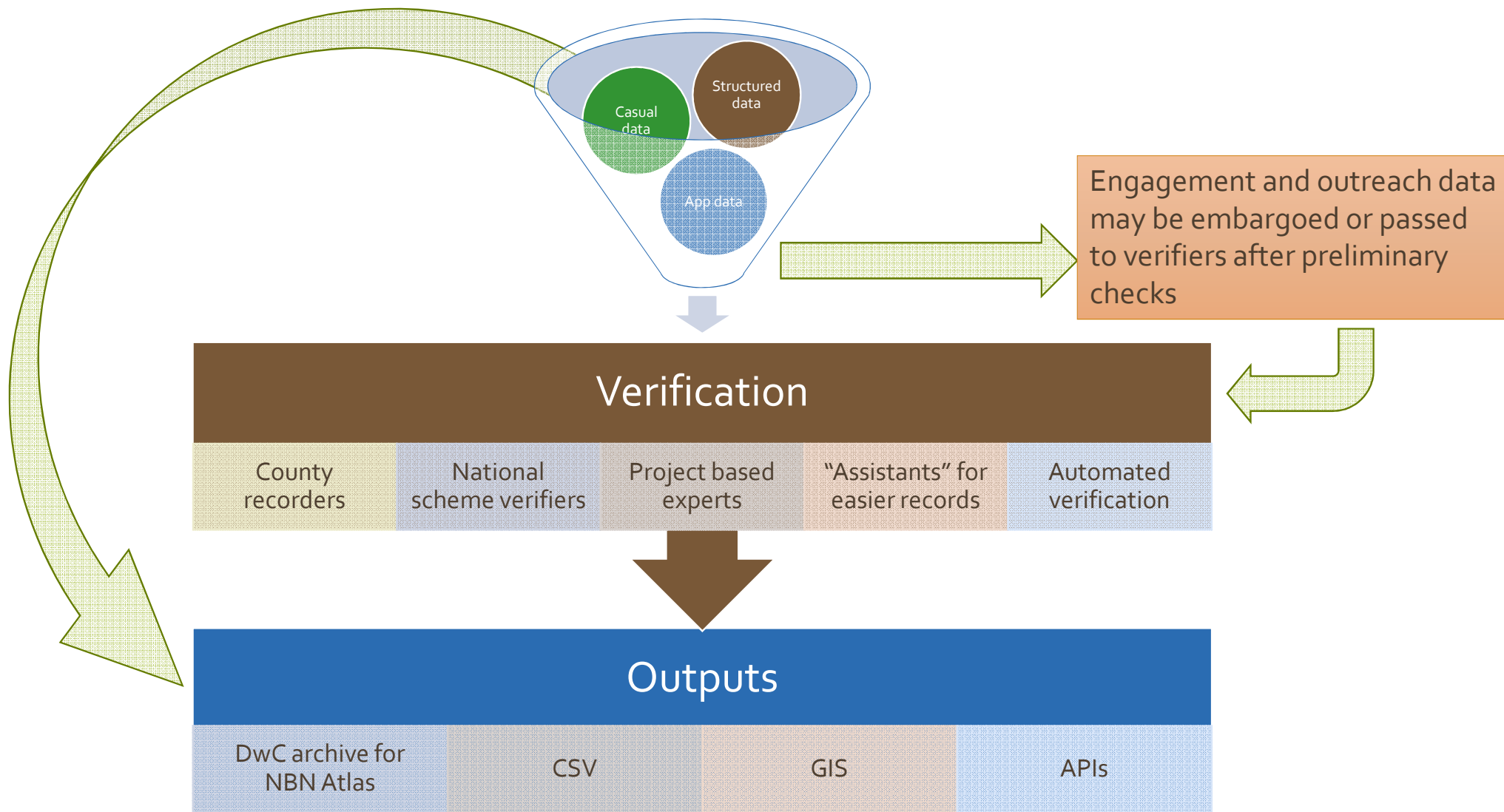


iRecord



Worst case...












Context: Ladybird (7-spot) with photos; van Breda, John Filter: Select filter... Apply Reset Create a filter

Review grid Review tick list

Records Log

ID	Source ID	Species	Common name	Site name	Original grid ref	Date	Last updated	Recorder	Images	Auto check
6926139	23 42	Coccinella septempunctata	7-spot Ladybird	Urpeth Grange	NZ25205453	11/06/2018	12/06/2018 10:47	Carpenter, Allison		<input checked="" type="checkbox"/>
6924518	23 374	Coccinella septempunctata	7-spot Ladybird	Keith Mains/Duncrahill	55.877N, 2.885W	11/06/2018	11/06/2018 22:52	Wilson, Ellen		<input checked="" type="checkbox"/>
6924278	23 42	Coccinella septempunctata	7-spot Ladybird	Blaencaerau Farm, Caerau	SS86629462	11/06/2018	11/06/2018 22:02	Hnatiuk, Martyn		<input checked="" type="checkbox"/>
6923552	23 63	Coccinella septempunctata	7-spot Ladybird	therfield	TL33243963	10/06/2018	11/06/2018 20:12	Hows, Mark		<input checked="" type="checkbox"/>
6923546	23 63	Coccinella septempunctata	7-spot Ladybird		NT27407247	25/05/2018	11/06/2018 20:09			<input checked="" type="checkbox"/>
6917525	23 374	Coccinella septempunctata	7-spot Ladybird	March	52.547N, 0.088E	24/06/2017	10/06/2018 23:21	Brown, Peter		<input checked="" type="checkbox"/>
6917522	23 374	Coccinella septempunctata	7-spot Ladybird	Ely	52.399N, 0.277E	10/06/2018	10/06/2018 23:19	Brown, Peter		<input checked="" type="checkbox"/>

first prev 1 next last Showing records 1 to 7 of 7

Map of the United Kingdom showing the location of the record (red dot) in the North Sea region. The map includes labels for the United Kingdom, Ireland, Isle of Man, North Sea, Netherlands, and Belgium. The map data is attributed to GeoBasis-DE/BKG (©2009) and Google Imagery (©2018 TerraMetrics).

Set status: [less] ☒ ☒ ☒ ☐ ☐ ☐

Other actions: Query Send to expert Redet. Edit

Details Experience Phenology Media Comments

Key facts

Species	Coccinella septempunctata
Record status	Not reviewed
Recorder	Brown, Peter
Map ref.	52.5474168, 0.0882735
Output map ref.	TL416964
Site Name	March
Locality	Cambridgeshire
Date	2017-06-24
Record	
ID	6917525
Comment	Pupa on holly
Submitted on	2018-06-10 23:21:40
Last updated on	2018-06-10 23:21:40
Survey	iRecord App
Record attributes	
Abundance	1
Stage	pre-adult
Sample attributes	
Application version	3.1.1.2
Data Source	android
Data Source Version	5.1.1
Gridref_calculated	TL416964
Location source	gps
Location accuracy	42
Altitude	55

Mapping data to outputs

- Most outputs are “flat”, e.g. Comma Separated Values/spreadsheet files or Simple Darwin Core.
- Core attributes and selected custom attributes can be mapped to the columns required for each of these outputs.
- Outputs can be provided as
 - Direct downloads
 - Scheduled pre-prepared files (e.g. for NBN Atlas)
 - APIs for other systems to access

And that is how we mobilise diverse data using Indicia.

We've looked at how flexibility results in a wide range of data and the burdens this diversity places on the verification process, as well as some potential ways forward.

We've also looked at how the diverse datasets can be mapped down to common structures for reporting and mobilisation.

Thank you for listening!

