6 Dipterists Forum Technical Guide

Biodiversity Data Management 1: Records collection & verification

Darwyn P. Sumner

Organiser of the UK Stilt & Stalk Fly Recording Scheme (Micropezids & Tanypezids)

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Summary

A guide to the processes involved in the collation of records submitted in spreadsheet format by recorders through to uploading to the NBN Atlas and GBIF.

Initially intended as personal guide notes, outlining the author's methods for handling incoming datasets for Dipterists Forum's Field Weeks. Audience may now include other Recording Scheme organisers, county recorders, collators of records from expeditions and those wishing to submit non-UK records to GBIF

Audience

Part 1: Recorders, data managers, verifiers, photographers, collectors, surveyors

Part 2: Recording Scheme organisers, county recorders, dataset compilers, validators, verifiers

Part 3: Non-UK recorders, researchers, biogeographers, phenologists, distribution modellers

Introduction

Specifications for GBG uploads have changed over the years, methods employed to meet these have changed accordingly, and continue to change. The techniques outlined here use sound principles to suggest paths to achieve that objective, tools available may differ.

Principles

Collection, collation, management & dissemination.

These are the four principles of the management of wildlife records. They are detailed in published documents related to Local Environmental Records Centres (Running a Local Records Centre Volume 2, parts 1, 2 & 3) and Recording Schemes (James, 2007;

They are not quite sequential processes, though clearly collection is at the start and dissemination to a publicly accessible format is at the other. Collation and management are intertwined and cover a variety of processes, at points addressing both validation and verification.

A. Collection

Much of the information regarding the initial collection is covered in the notifications and reports (see Bulletins) related to the arrangements for each Field Week.

During the course of the event, a person is designated to act as a combined collector, collator, manager and disseminator.

Though some participants additionally utilise online systems (iRecord) to upload records directly, the method requested is that participants submit records in spreadsheet format to the designated person as an attachment in an email by a specified date.

The following is the process by which these were managed:

A.1. Managing emails

1. Set up an email folder to store incoming emails related to the Event
2. Devise an email filter based upon subject title which will redirect incoming emails to that folder.
3. Use email tagging system to indicate any processes carried out on those messages.

B. Collation

B.1. Managing incoming data

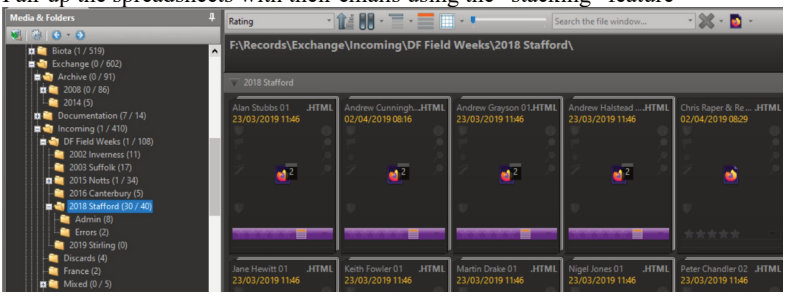
Set up an appropriately named folder to store incoming data (and another for outgoing data). If you have no other document management system then manage through subfolder hierarchy.

Into the appropriate folder place the following:

1. Download the spreadsheet attachments from the email
2. Save the email text as an .html file ([participant name][email sequence].html)

The following illustrates the use of a **digital asset management** system (iMatch) to facilitate management (particularly with respect to archives and backups):

3. Pair up the spreadsheets with their emails using the “stacking” feature



C. Management

C.1. Verification

Contributors providing datasets are presumed to have or have obtained the necessary expertise to ensure that taxa were correctly identified.

C.2. Validation - taxa

The datasets can now be subjected to the following validation checks:

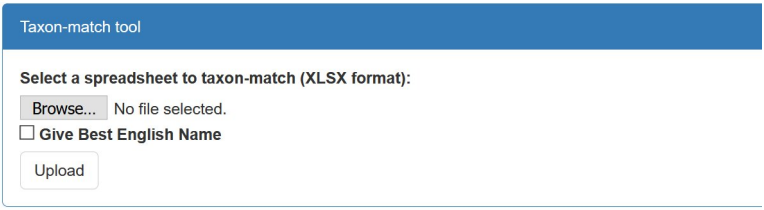
Taxon- match tool

The following methodology was provided by Chris Raper:

1. Create a copy of the spreadsheet. [original name] [copy].xlsx
2. Add a new sheet, naming it “taxon-match”
3. Make “taxon-match” the first sheet
4. Name the sheet containing the original data “raw-data”
5. Copy/paste the species name column from your data into column B on the new sheet
6. If they provided an authority then copy/paste it into column C
7. Copy any record ID number and paste it in column A on the new sheet (not essential but it allows you to quickly look-up the row in the original data)

Note that if an ID column was not present then it will be created.

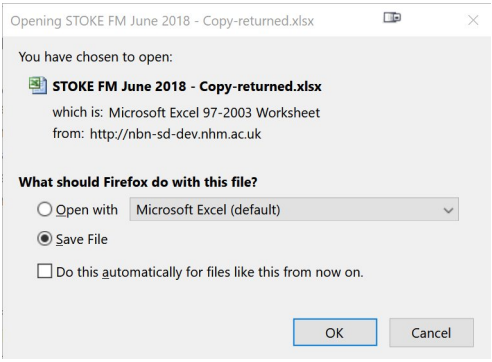
8. Open the utility at http://nbn-sd-dev.nhm.ac.uk/taxonmatch.php



- Pass this script an XLSX format spreadsheet with the following columns:
  - A - Your ID code (optional - used to help you relate the returned information to your records)
  - B - Taxon name (mandatory - e.g. "Tachina fera")
  - C - Taxon authority (optional - e.g. "(Linnaeus, 1761)")
- It will process the names and then return the above PLUS:
  - D - The number of matches found in the UK Species Inventory
  - E - Type of match (exact, name, subgenus, gender or none - see below)
  - F - TAXON_VERSION_KEY (TVK)
  - G - Matched rank
  - H - Matched name
  - I - Matched authority
  - J - Matched attribute
  - K - Language (la=Latin, en=English, gd=Gaelic, cy=Welsh)
  - L - Group name (e.g. bird, flowering plant, insect - butterfly)
  - M - the most appropriate English name
  - If your name is a synonym or we have a better version of your name then we also give:
    - N - Recommended TVK
    - O - Recommended name
    - P - Recommended authority
    - Q - Recommended attribute

9. Browse to your prepared spreadsheet
10. Upload and wait - it will take a while to return the data. There is no progress bar so try it out on shorter lists first.

Eventually the following appears:



10. Save this file and move it to the correct folder.

C.2.1. Interpreting the returned file

The maximum is set to 5000 rows at the moment - if it takes longer than an hour then something is wrong so abort and try a smaller upload.

The "taxon-match" sheet now has rows coloured as follows:

Red	totally unfound names
Purple	possible gender ending differences
Beige	name correct, authority different
Green	perfect match

The main interest are the RED & PURPLE names which require amending.

C.2.2. Managing the returned file

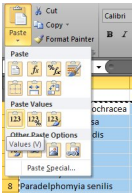
Ideally the contributor will have performed the above check prior to submitting the spreadsheet to the collator. Details were published in Dipterists Forum Bulletin #88 (Autumn 2019.) The collator may now choose either to contact the contributor for clarification regarding any errors or simply exclude those errors. Making verification judgements is not an option for the collator.

Amend the returned spreadsheet as follows in order to exclude errors:

1. Add a new sheet named "amend"
2. Copy row 1 (the header row) from "raw-data" to "amend" (Tip: there's a paste option which preserves the column widths = "keep column widths")
3. Format the date column to date format
4. Use formulae to replicate the first row in "amend" from "raw-data" thus: ='raw-data'!A2 (in cell A2 of "amend")
5. After the last column in "raw-data" add the following header taken from "taxon-match": TAXON_VERSION_KEY (optionally other useful fields may be added but just this one will suffice to sort the good from the bad).
6. Into the first non-header cell in the TAXON_VERSION_KEY column add the formula ='taxon-match'!F2
7. The sheet should now look something like this:

	A	B	C	D	E	F	G	H	I
1	SPECIES	DATE	LOCALITY	VC	GRID REF	COLLECTO	DETERMIN	NOTES	TAXON_VERSION_KEY
2	Austrolimnophila ochracea	23/06/2018	Dimminsc	39	SJ054428	A E Stubbs	A E Stubbs	woodland	NBNSYS0000008140

8. Copy those formulae in row 2 of “amend” down the rows until the end of the records is reached. Note that as you do so, some of the cells in the TAXON_VERSION_KEY column read “0”
9. Highlight the entire dataset from A2 to the last TAXON_VERSION_KEY reading
10. Select Copy (or ctrl C)
11. Select Paste values:



Note that each cell now contains the value rather than the formula. It’s now safe to sort the records on sheet “amend”. **Do not carry out any sorting on the other two sheets at any time**.

12. Select the entire dataset on sheet “amend”, including the headers.
13. Select Data | Sort and ensure that the box “My data has headers” is ticked
14. In the Column | Sort by dropdown box select TAXON_VERSION_KEY and select OK. All the records in which the TAXON_VERSION_KEY could not be resolved have now risen to the top and read “0”
15. Delete all rows in which TAXON_VERSION_KEY = “0” (if this is your own spreadsheet then of course there won’t be any like this after you’ve made corrections and run the utility again)
16. Make a note of how many were deleted, the contributor will surely enquire. Further sorting and deleting (no grid references for example) may be carried out; also replace all the spurious “0”s with blanks
17. Finally, sort the remaining by Date and Locality (or other desired sequence) and Save

C.3. Validation - Record cleaner

Download **NBN Record Cleaner** at https://nbn.org.uk/tools-and-resources/nbn-toolbox/nbn-record-cleaner/ and install it.

Download the **User Guide** too.

This tool validates your data – checking the format against a set of built-in rules. This includes spotting bad dates (e.g. 31st February) or spatial references (e.g. TL123) and checking the spelling of items like species and vice county names. You can correct any problems on screen or change the original source and reload before proceeding.

It dates from 2013 so is not as current as the UKSI checker above.

The validation checks that it carries out are sequential, thus if it detects errors concerned with Scientific name then it will not be able to progress to check dates and spatial references.

See https://forums.nbn.org.uk/viewforum.php?id=23 for the latest developments regarding this tool.

Preparing datasets

The formats of datasets will differ according to the chosen method of dissemination (see D. below)

Metadata

Whichever format is chosen, it is advisable to maintain a personal record of metadata describing the particular dataset submitted. This will have the value both of providing metadata descriptions required by the GBG and of keeping your own historic records of work that you have carried out. GBGs do not keep such historic records once a dataset has been updated.

See Appendix 1 for example

D. Dissemination

The methods available for dissemination are varied.

For submission to the UK's NBN Atlas, two methods are available:

1. direct submission of an appropriately formatted dataset, complete with metadata describing that dataset,
2. iRecord methodology.

For submission to GBIF the following are available:

3. iNaturalist methodology (only in cases where images are available)
4. submission of dataset and metadata via endorsing organisation, this method is specifically aimed at non-UK species occurrences

Each of the above methods requires a different means of dataset preparation. Full details of Methods 1. & 4. are to be found in Part 2 of this guide.

Method 3. is detailed in **Stilt & Stalk Fly newsletter 2.** Method 2. was developed by BRC's Martin Harvey and is currently being implemented by Dipterists Forum Secretary Jane Hewitt.

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Resources

- Running a Local Records Centre Volume 2: 01 to 02
- Running a Local Records Centre Volume 2: 03 to 10
- Running a Local Records Centre Volume 2: 11 to 15

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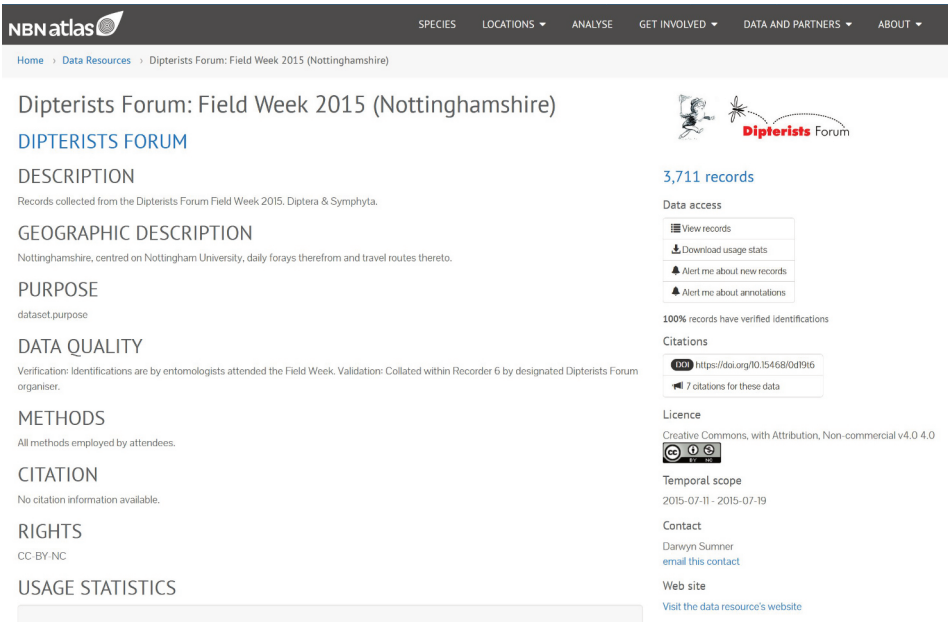
Appendix 1: Metadata

The basic set of information is shown on a typical NBN data resources page:



the above information needs to be provided by the person submitting the dataset.

NBN Guidance and a spreadsheet to enter the information are located at https://docs.nbnatlas.org/share-species-occurrence-records-with-the-nbn-atlas/

The current number of fields required is 21, the old Gateway one I got up to 44.

Their spreadsheet format is a good place to start in order to set an additional one up for your own reference. It's only a start though, for your own use it is valuable to add the following fields:

Version	to locate older versions that you submitted
Periodicity	how frequently you propose to update the dataset
Dataset key	[after upload] a unique reference to the dataset
Date uploaded	[after upload]
Number of records	[after upload]
Number of species	[after upload]
DOI	[after upload] see above

Setting up one's own spreadsheet well in advance of the preparations of the datasets is a good practice. When it comes time to submit the data one can simply copy and paste into the NBN metadata spreadsheet.

Use one spreadsheet sheet per dataset.