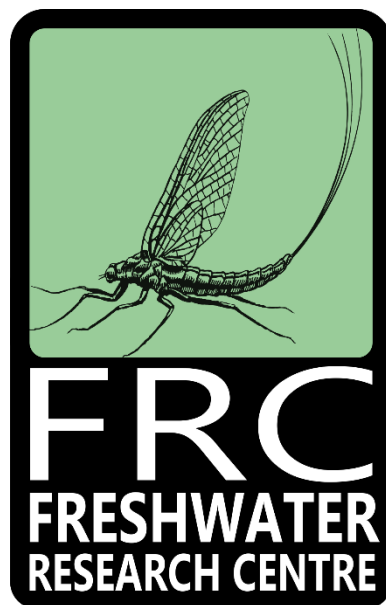


Administration guidelines for the Rwanda Biodiversity Information System (RBIS)

Helen Dallas



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Prepared for the Center of Excellence in Biodiversity and Natural
Resource Management, University of Rwanda

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1 Introduction

This document serves as a guideline for the administration of biodiversity data in the Rwanda Biodiversity Information System (RBIS). The sections outlined in this document are intended to serve as a guide for RBIS administrators and biodiversity data administrators to mobilise and ingest biodiversity data into RBIS. The steps outlined are sequential and each provides details on the process and key considerations. It is the intention to include each of these steps in the online administration in RBIS.

Only registered users with **super user status**, typically the site administrators, are able to view the administration sections in RBIS and undertake the following steps related to the mobilisation and ingestion of biodiversity data into RBIS.

The sections covered include:

- Preparing and checking a Master List of Taxa before uploading to RBIS
- Preparing and checking an Occurrence Data File before uploading to RBIS
- Uploading a new Taxon Group (Module) and adding a Master List of Taxa for the Taxon Group
- Uploading Occurrence Data
- Harvesting GBIF Data
- Managing taxa in Taxon Management

2 Preparing and checking a Master List of Taxa before uploading to RBIS

A taxonomic Master List is a list of all species and /or taxa within a particular group such as birds, fish, invertebrates, wetland plants, algae, etc. The purpose and details of the Master list have been outlined in the Data Management Guidelines (Dallas 2020a), and this section is intended to highlight issues specific checks to improve accuracy of the Master List. The format of the Master List is important to ensure consistency for ingestion of data into the information system. The columns included in the Master Lists are detailed in the Data Management Guidelines (Dallas 2020a).

To ensure the Master list is accurate, several steps should be taken before uploading taxonomic data to RBIS. After consolidating the master list, you should check the following:

Apply filters for checking the data by highlighting the header row, clicking Data, Filter. All columns should be checked for consistencies and typos. Systematically work from column A to W. In particular, check consistency of the Taxon Rank and taxonomic hierarchy (Kingdom, Phylum, Class, Order, Family, Genus, Species, SubSpecies, Taxon).

The screenshot shows an Excel spreadsheet titled "RBIS Bird Master List 2020_10_02 Final for RBIS V1.xlsx". The spreadsheet has columns labeled A through O. Column A is "On GBIF", B is "GBIF Link", C is "Count", D is "Comm", E is "Source", F is "Taxon Rank", G is "Kingdom", H is "Phylum", I is "Class", J is "Order", K is "Family", L is "Genus", M is "Species", and N is "Taxon". The "Taxon" column contains a list of bird species names. A filter menu is open over the "Taxon" column, showing a list of species names with checkboxes next to them. The filter menu also includes options like "Sort A to Z", "Sort Z to A", and "Filter by Color".

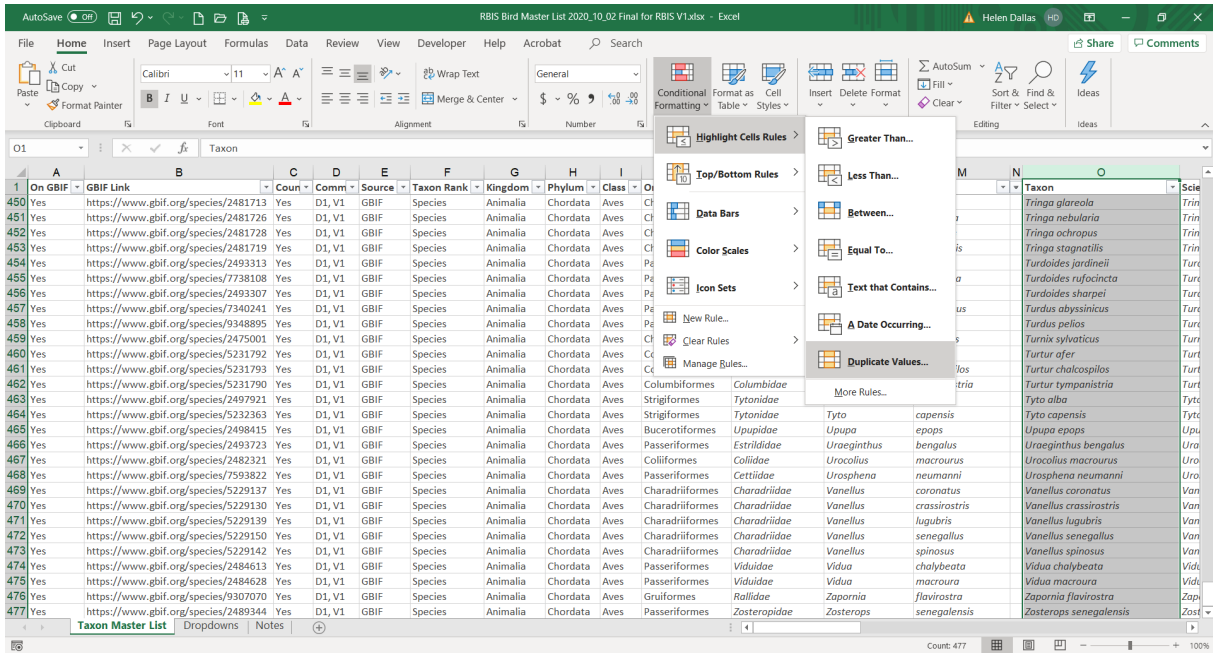
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
On GBIF	GBIF Link	Count	Comm	Source	Taxon Rank	Kingdom	Phylum	Class	Order	Family	Genus	Species	Taxon	Sci
Yes	https://www.gbif.org/species/2480610	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Accipiter	badius	Acci	
Yes	https://www.gbif.org/species/2480631	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Accipiter	melanoleuc	Acci	
Yes	https://www.gbif.org/species/2480594	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Accipiter	minullus	Acci	
Yes	https://www.gbif.org/species/2480635	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Accipitriformes	Accipitridae	Accipiter	tachiro	Acci	
Yes	https://www.gbif.org/species/5231319	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Passeriformes	Acrocephalidae	Acrocephalus	baeticatus	Acro	
Yes	https://www.gbif.org/species/5231329	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Passeriformes	Acrocephalidae	Acrocephalus	gracilirostris	Acro	
Yes	https://www.gbif.org/species/2493136	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Passeriformes	Acrocephalidae	Acrocephalus	palustris	Acro	
Yes	https://www.gbif.org/species/5231331	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Passeriformes	Acrocephalidae	Acrocephalus	rufescens	Acro	
Yes	https://www.gbif.org/species/2493129	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Passeriformes	Acrocephalidae	Acrocephalus	schoenoba	Acro	
Yes	https://www.gbif.org/species/2493118	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Passeriformes	Acrocephalidae	Acrocephalus	schpaeus	Acro	
Yes	https://www.gbif.org/species/2481800	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Charadriiformes	Scalopidae	Actitis	hypoleucos	Acti	
Yes	https://www.gbif.org/species/2481853	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Charadriiformes	Jacaniidae	Actophilornis	aficanus	Acti	
Yes	https://www.gbif.org/species/2498252	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Alopochen	aegyptiaca	Aloy	
Yes	https://www.gbif.org/species/2474736	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Gruiformes	Rallidae	Amaurornis	flavirostra	Ami	
Yes	https://www.gbif.org/species/2494005	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Passeriformes	Plocidae	Anabyspiza	albifrons	Ami	
Yes	https://www.gbif.org/species/2494106	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Passeriformes	Plocidae	Anaplectes	rubriceps	Ami	
Yes	https://www.gbif.org/species/2498112	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas	acuta	Ana	
Yes	https://www.gbif.org/species/2498156	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas	crecca	Ana	
Yes	https://www.gbif.org/species/2498064	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas	erythrorhyn	Ana	
Yes	https://www.gbif.org/species/2498071	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas	hottentota	Ana	
Yes	https://www.gbif.org/species/2498083	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas	querquedul	Ana	
Yes	https://www.gbif.org/species/2498156	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Anseriformes	Anatidae	Anas	undulata	Ana	
Yes	https://www.gbif.org/species/5229411	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Ciconiiformes	Ciconiidae	Anastomus	lamelligerus	Ana	
Yes	https://www.gbif.org/species/2482080	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Suliformes	Anhingidae	Anhinga	rufa	Anh	
Yes	https://www.gbif.org/species/2487391	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Passeriformes	Remizidae	Anthoscopus	caroli	Anti	
Yes	https://www.gbif.org/species/2490276	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Passeriformes	Motacillidae	Anthus	cinnamomeus	Anti	
Yes	https://www.gbif.org/species/2490245	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Passeriformes	Motacillidae	Anthus	leucophrys	Anti	
Yes	https://www.gbif.org/species/2490292	Yes	D1, V1	GBIF	Species	Animalia	Chordata	Aves	Passeriformes	Motacillidae	Anthus	similis	Anti	

It is important to **check the GBIF taxonomy for accepted names and synonyms**. For example, in the avian master list, *Ardea alba* - is the accepted name, whereas *Casmerodius albus* is the synonym. Preferably only accepted names should be included in the Master List of Taxa.

Accepted name
Species *Ardea alba* Linnaeus, 1758

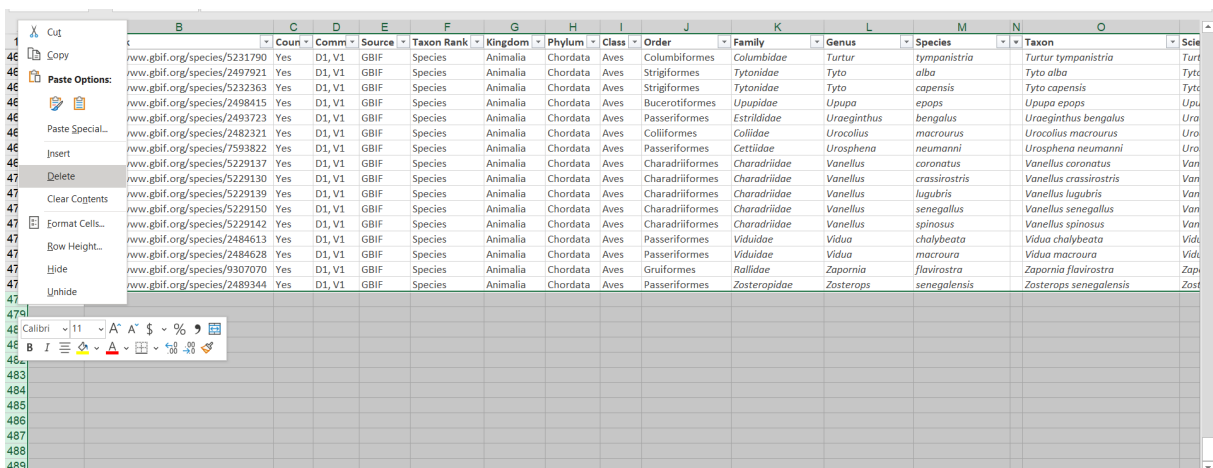
Synonym
≡ *Casmerodius albus* (Linnaeus, 1758)

Taxa should be checked for duplicates by highlighting the Taxon column, and from the Home Menu, selecting **Conditional Formatting, Highlight Cells Rules, Duplicate Values**.



Note: All taxa can be updated after ingestion into RBIS through the Taxon Management section (see section 7 in this document).

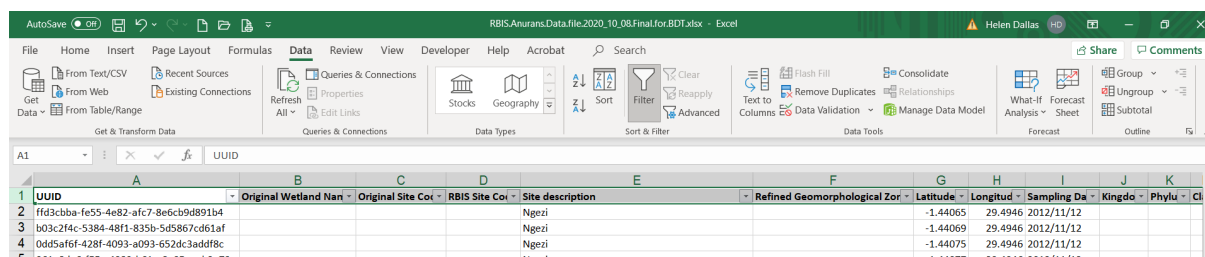
Delete blank rows and columns. Lastly, ensure that there are no extra blank rows or columns, by deleting them.



3 Preparing and checking an Occurrence Data File before uploading to RBIS

To ensure that data are accurate, several steps should be taken before uploading occurrence data to RBIS. After consolidating the occurrence data in the data file, you should check the following:

Apply filters for checking the data by highlighting the header row, clicking **Data, Filter**

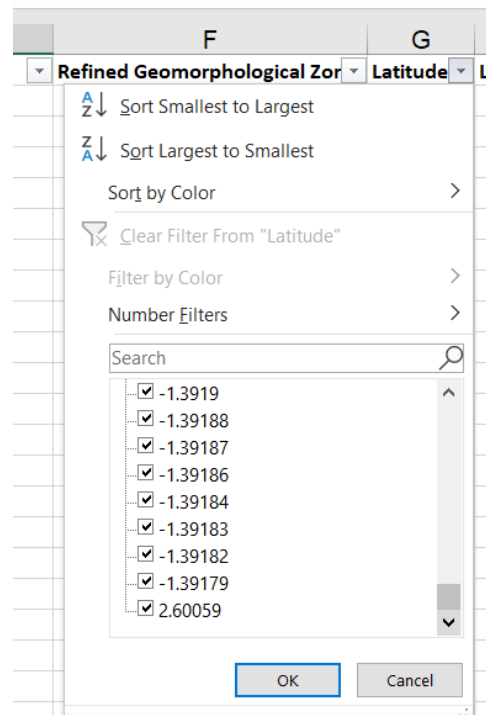
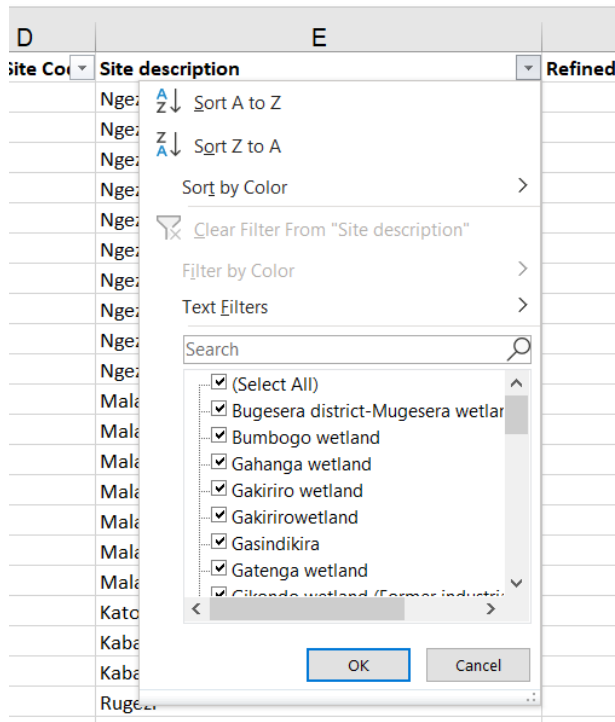


1	UUID	Original Wetland Name	Original Site Code	RBIS Site Code	Site description	Refined Geomorphological Zone	Latitude	Longitude	Sampling Date	Kingdom	Phylum	Class
2	ff93c3ba-fe55-4e82-afc7-8e6cb9d891b4				Ngezi		-1.44065	29.4946	2012/11/12			
3	b03c2f4c-5384-48f1-835b-5d5867cd61af				Ngezi		-1.44069	29.4946	2012/11/12			
4	0dd5af6f-428f-4093-a093-652dc3addf8c				Ngezi		-1.44075	29.4946	2012/11/12			
5	0c1e8d4c-f5c4-4080-b61e-8a0fae83a70				Ngezi		-1.44077	29.4946	2012/11/12			

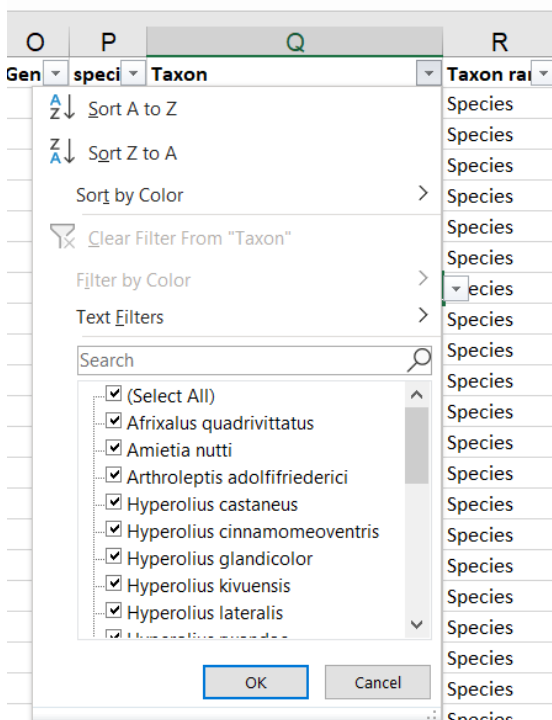
UUID. This is a unique identifier for each occurrence record. It needs to be copied and pasted so that the formula used to generate it is saved as a number. See below for guidance.

<https://docs.rbis.kartoza.com/batch-importing-taxon-occurrence-data-bims/dealing-unique-identifiers/>

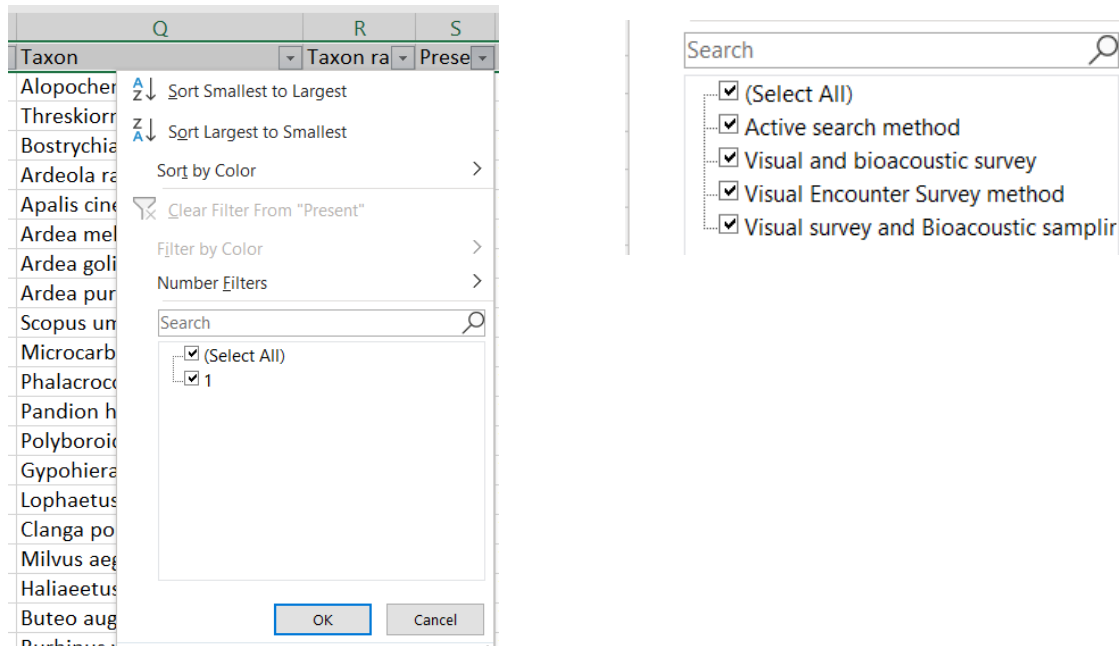
Systematically check each column using the dropdown arrows, and look for inconsistencies. Some common issues include, #num in UUID column instead of the UUID, incorrect spelling in the **Site description** column (e.g. Gakiriro wetland, Gakirirowetland), latitude with missing “-” (e.g. 2.60059 as latitude is incorrect – should be -2.60059), longitude.



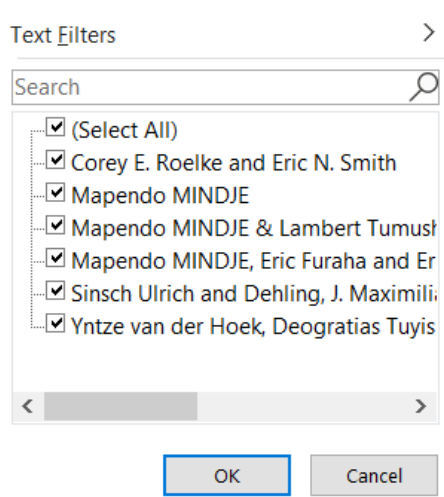
Check that all taxa are correct and are present in the Master List. If the dropdown of master taxa list was used then this should not be an issue. Check that the Taxon rank is correct.



Check presence is all "1", check **sampling method** is correct.



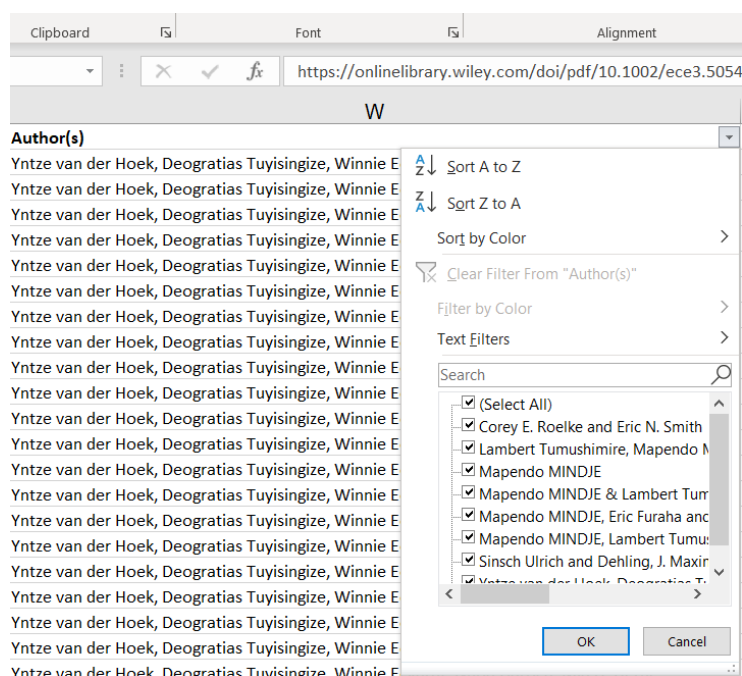
Check Collector/Owner and Collector/Owner Institute. Ideally CAPITALS should not be used, First name Surname if known. Do not use middle initial and punctuation.



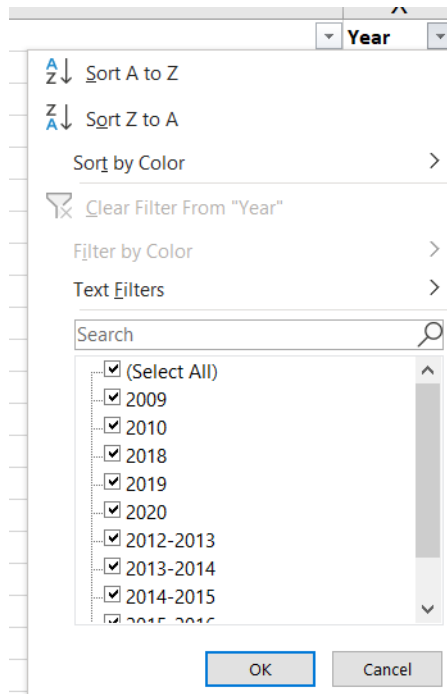
Check the metadata (Author(s), Year, Source, Title, Reference category, URL, DOI, Document Upload Link). For each study reference type, you need to populate the following columns:

- Peer-reviewed scientific article (Collector/Owner; Collector/Owner Institute; Author(s); Year; Source; Title; DOI or URL (if DOI is not available). For Peer-reviewed scientific article the Source is the Journal, For Peer-reviewed scientific article the Title is the title of the article.
- Published report (Collector/Owner; Collector/Owner Institute; Author(s); Year; Source; Title; URL or Document Upload Link). Note the Document Upload Link is obtained after the report is added to RBIS.
- Thesis (Collector/Owner; Collector/Owner Institute; Author(s); Year; Source; Title; URL or Document Upload Link)
- Database (Collector/Owner; Collector/Owner Institute; Author(s); Year; Source)
- Unpublished data (Collector/Owner; Collector/Owner Institute; Author(s); Year; Source)

Check format of Author(s). It needs to be: Surname + Initials, no punctuation. (e.g. Tumushimire L, Mindje M, Sinsch U & Dehling JM not Lambert Tumushimire, Mapendo MINDJE, Prof. Ulrich Sinsch & Julian Maxmillian Dehling). It is important to get the authors correct (e.g. Sinsch Ulrich and Dehling, J. Maximilian, Lümekemann Katrin, Rosar Katharina, Christiane Schwarz should be Sinsch U, Lümekemann K, Rosar K, Schwarz C & Dehling M as per the doi).

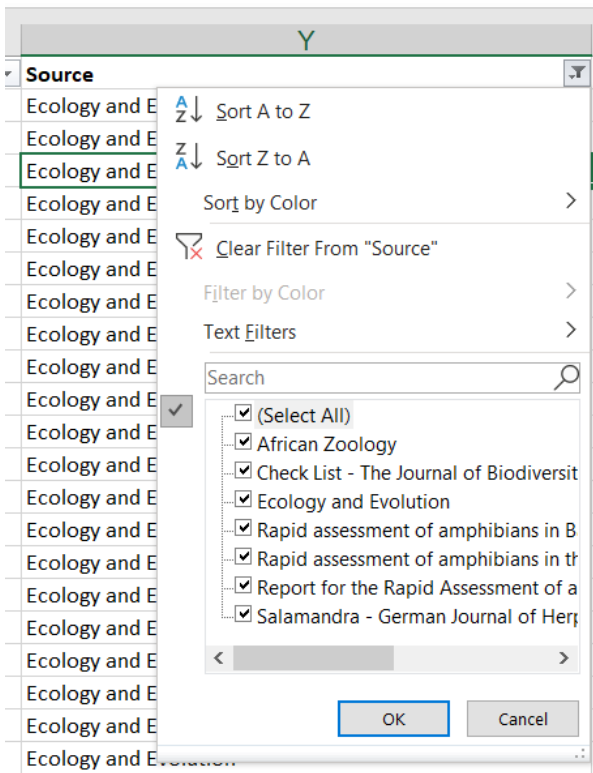


Check the Date: This is the publication date (so 2012-2013 should be 2019 as this is when the article was published - Ecology and Evolution. 2019. Same with all other data from this study).

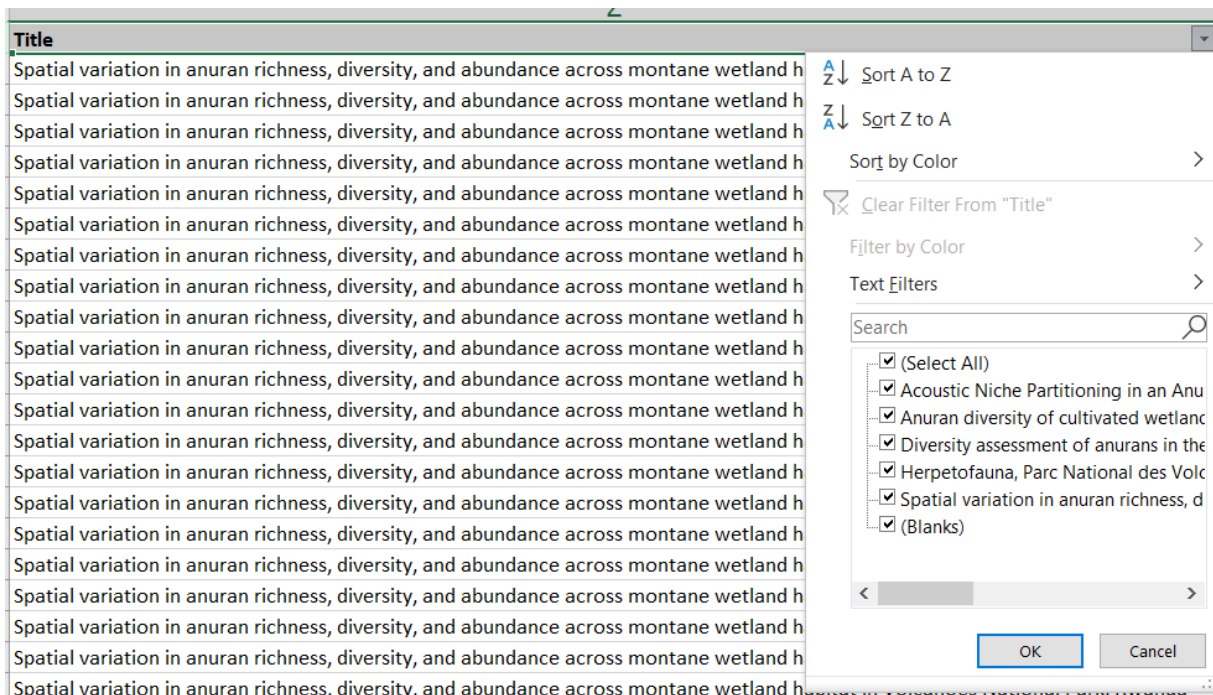


Check the Source. Please note when to include source or not, and what to include. (e.g. Mindje, M., Tumushimire, L., & Sinsch, U. (2020). Diversity assessment of anurans in the Mugesera wetland (eastern Rwanda): impact of habitat disturbance and partial recovery. Salamandra, 56, 27-38. Should be **Salamandra**)

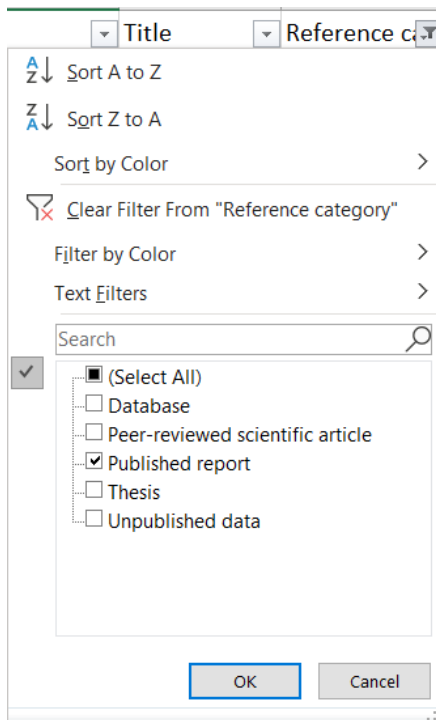
- For Peer-reviewed scientific articles - the Source is the Journal.
- For Published Reports and Theses - the Source is the publisher of the Report.
- For Unpublished Data - the source is the title of the study.



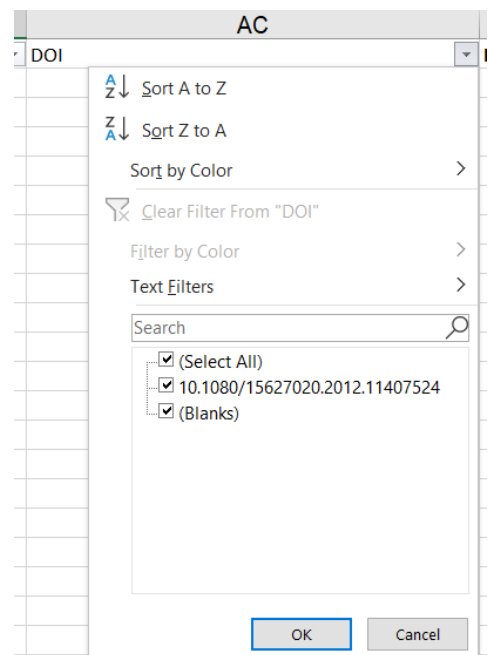
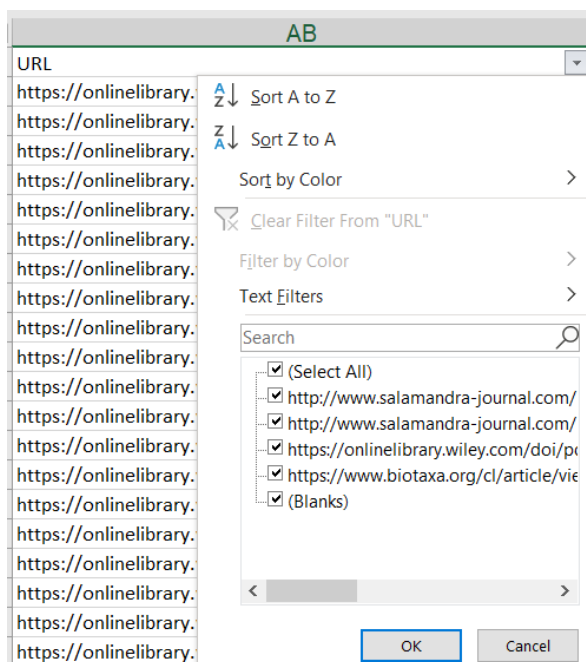
Check the Title. For Peer-reviewed scientific article the Title is the title of the article, for Published reports or theses, it is the title of the thesis. Unpublished data don't need a title.



Check all Reference Categories are correct: options include:



Check URL and DOI. Use a DOI if it is available, URL – only needed for Peer-reviewed scientific article if there is no DOI. For the DOI you only need to include the number part, so 10.1080/15627020.2012.11407524, not <https://doi.org/10.1080/15627020.2012.11407524>.

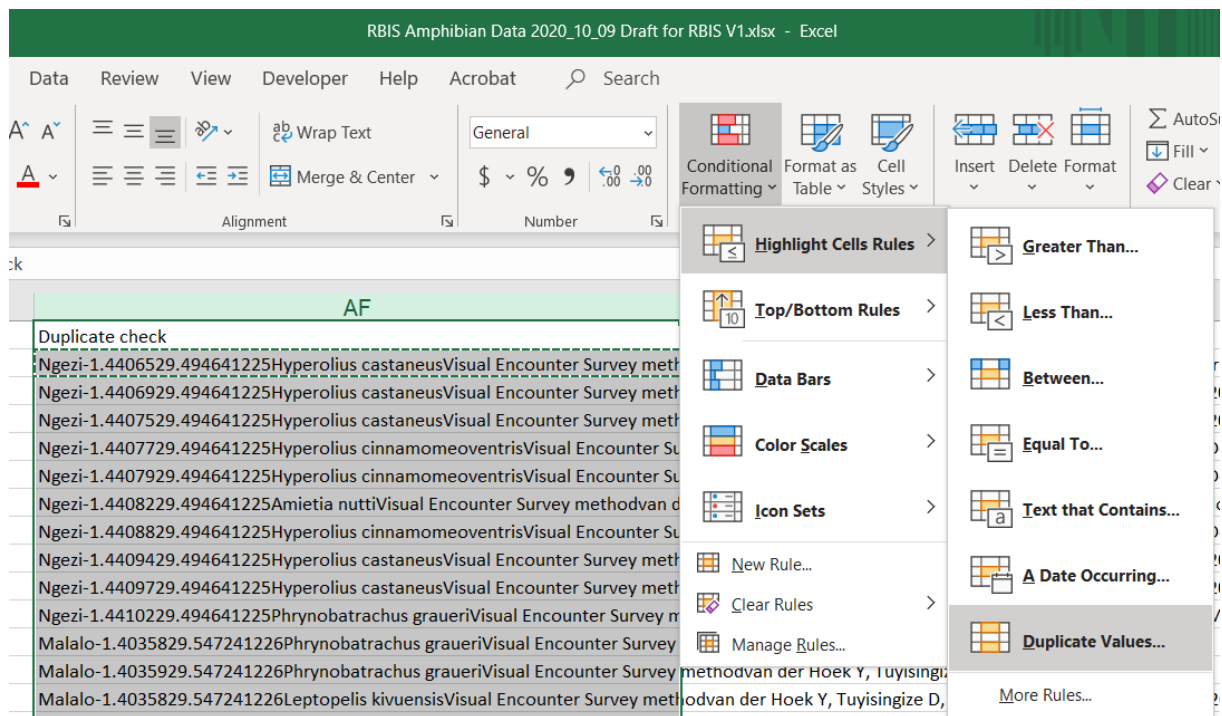


Check the document upload link is correct. Note the Document Upload Link is obtained after the report is added to RBIS. Reports are only uploaded when there is no DOI or URL to link the data to.

Checking for duplicate occurrence records. Use this formula for checking for duplicates. This is a combination of Site description, latitude, longitude, sampling date, Taxon, sampling method, author, year, source and title. Copy and paste the formula below into a new column at the end and name it “Duplicate check”.

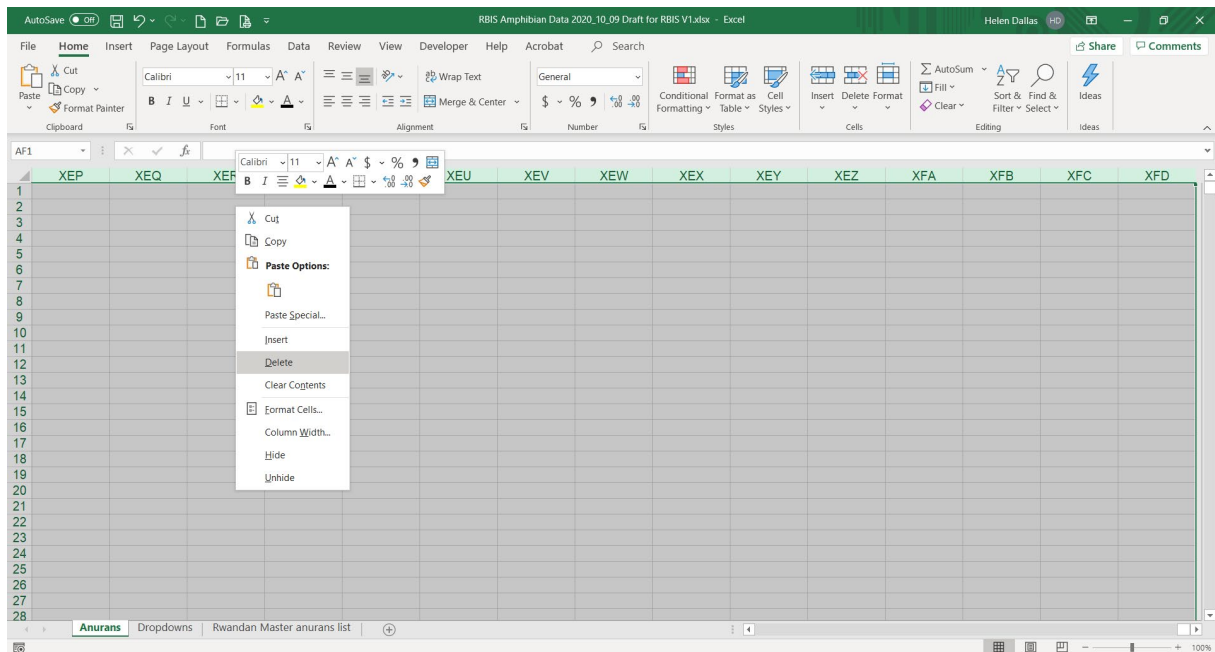
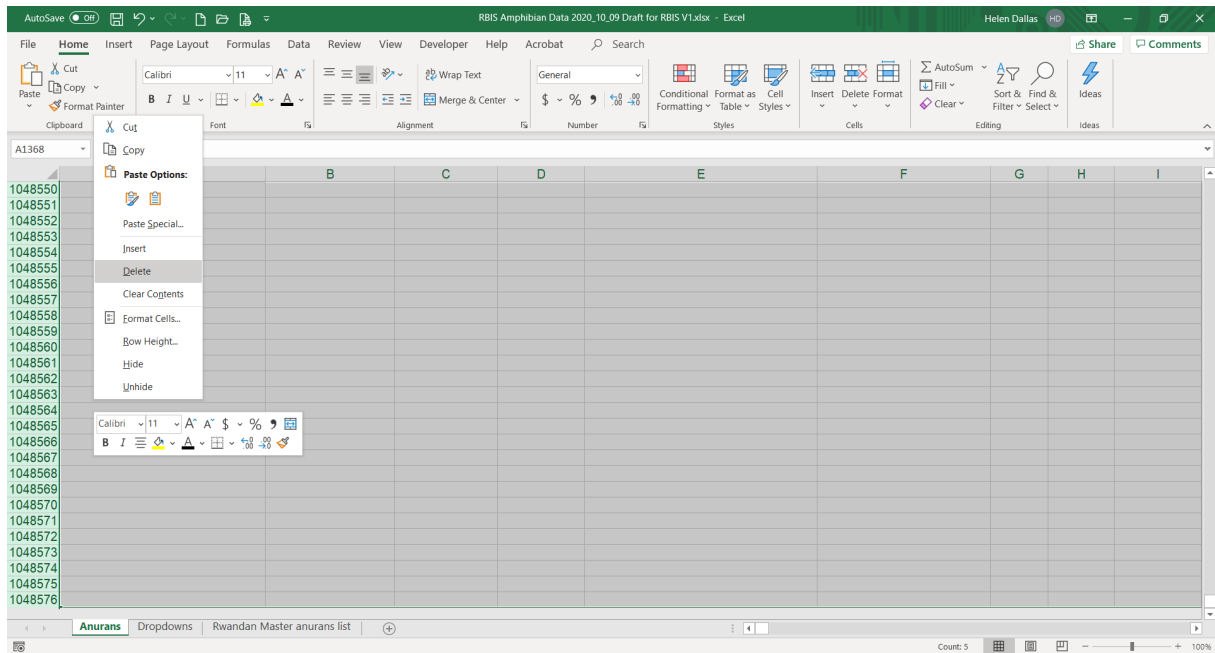
=CONCATENATE(E2,G2,H2,I2,Q2,T2,W2,X2,Y2,Z2)

Then copy and paste the formula down to the end of the data rows. Then Highlight the column, and from the Home menu, select **Conditional Formatting, Highlight Cells Rules, Duplicate Values.**

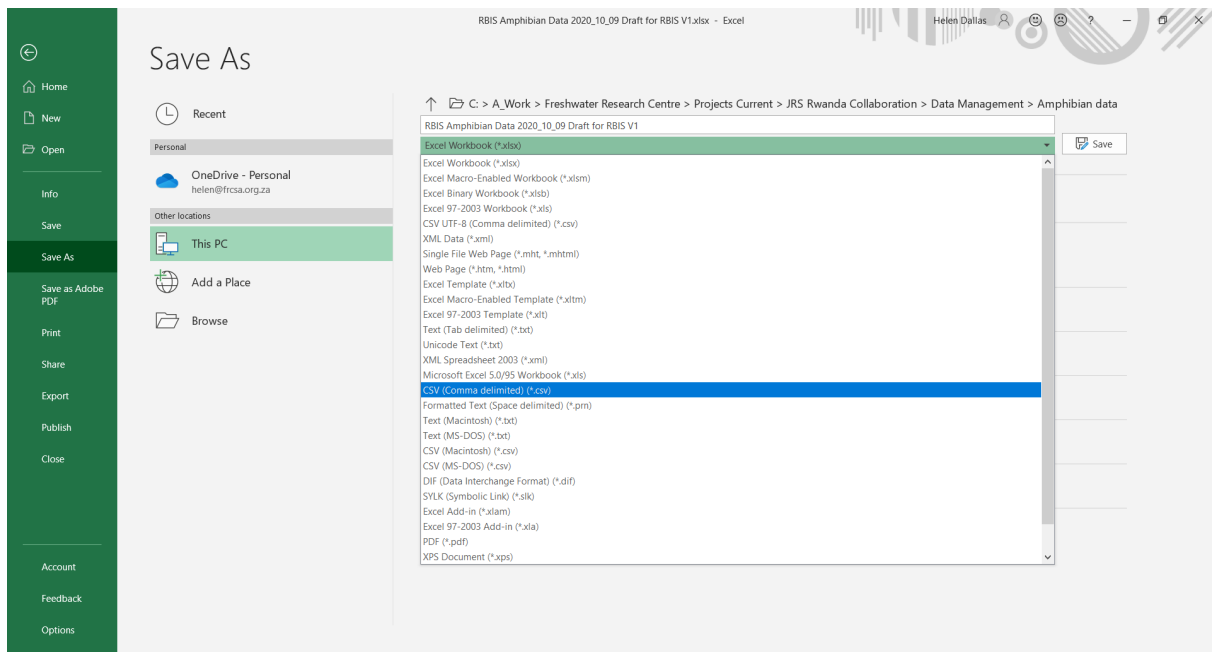


Any duplicates will be highlighted. Check and delete duplicate occurrence records. Then delete the Duplicate Check column.

Delete blank rows and columns. Lastly, ensure that there are no extra blank rows or columns, by deleting them.



Remove the data filter, save the file in excel, and save the file as csv file.



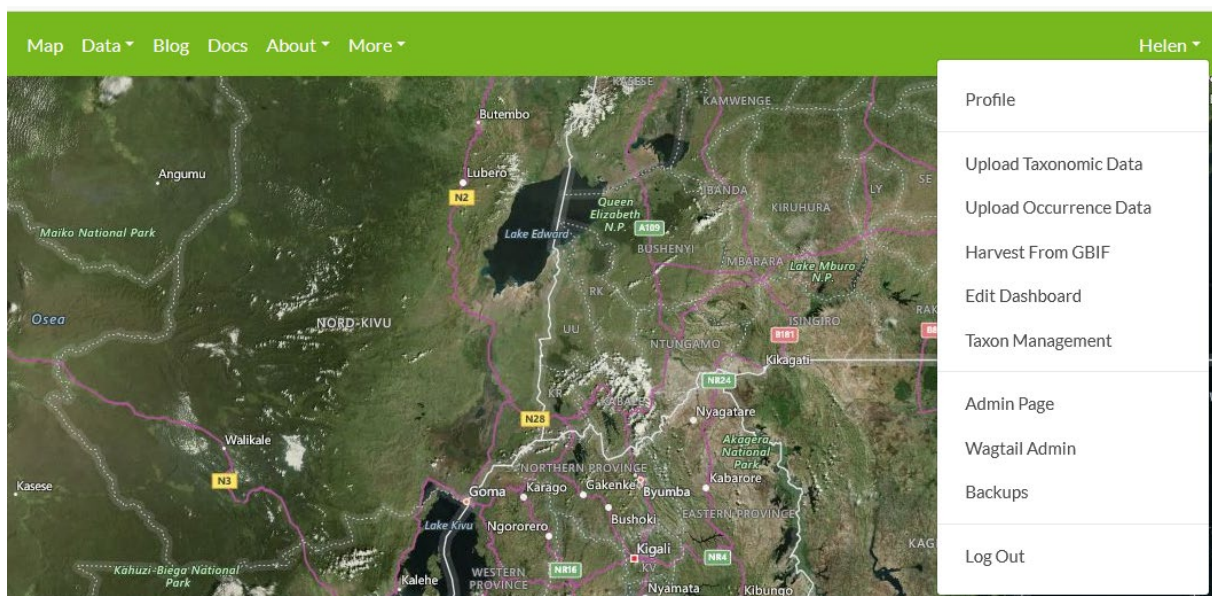
Data are always first uploaded to the RBIS Staging Site to make sure it is all working, and to check for errors.

4 Uploading a new Taxon Group (Module) and adding a Master List of Taxa for the Taxon Group

Only registered users with **super user status** are able to do this, typically the site administrators .

Steps:

Click on your name and select **Upload Taxonomic Data**



Click Add new – to add a new Taxon Group

Upload Taxonomic data

You can download the template here : [Download Template](#)

Note : Duplicates will be detected and update the existing data

Taxon Group [Link to taxa management](#) [Add new](#)

Upload csv here No file selected. [Upload](#)

Add the new taxon group by adding the Taxon Group name and selecting the logo using the “Browse”

Add new taxon group

Name

Logo Amphibian logo RBIS 2.jpg

[Close](#) [Add](#)

Select the new Taxon Group using the dropdown and browse to the file containing the Master List of Taxa for the Taxon Group, click upload

You can download the template here : [Download Template](#)

Note : Duplicates will be detected and update the existing data

Taxon Group [Add new](#)

Upload csv here

- Avian
- Avian
- Odonata Adults
- Amphibians

Note: The Excel file needs to be saved as a csv using the following option:



You can download the template here : [Download Template](#)


Note : Duplicates will be detected and update the existing data

Taxon Group [Link to taxa management](#)

Upload csv here RBIS Bird Master List 2020_10_02 Final for RBIS V1.csv

You can download the template here : [Download Template](#)

Current progress :


CSV file taxa-file/RBIS_Bird_Master_List_2020_10_02_Final_for_RBIS_V1.csv 

Uploaded at Oct. 2, 2020, 8:37 a.m.

Progress : 145/479

A **Success** file will indicate taxa uploaded to the system. An **Error** file will give details of taxa not uploaded. The last column in this csv file provides an indication of the reason the taxon was not uploaded. The administrator then needs to check the data and correct before uploading again.

Finished upload sessions :

CSV file taxa-file/RBIS_Bird_Master_List_2020_10_02_Final_for_RBIS_V1.csv 

Uploaded at Oct. 2, 2020, 8:37 a.m.

Result : Finished

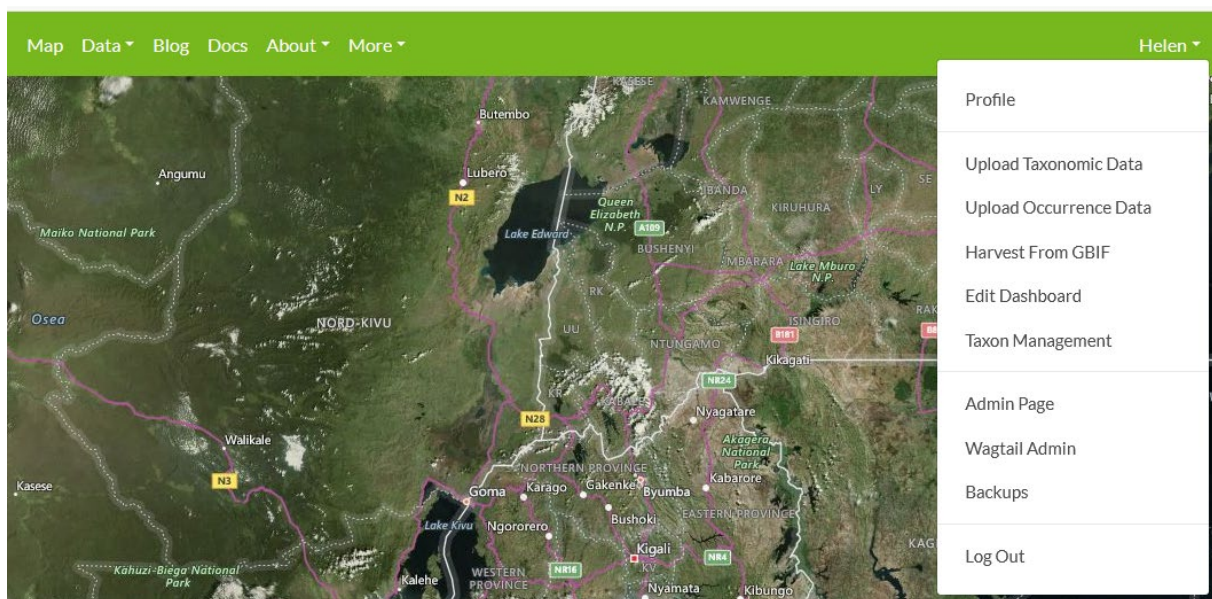
Once the Master List of Taxa has been added it can be viewed in the Taxon Management section.

New taxa may be added individually using the **Taxon Management** (see section 7 in this document), or if there are multiple new taxa to be added, then the steps from (4) can be repeated, to upload the additional new taxa for the Taxon Group.

5 Uploading Occurrence Data

Steps:

Click on your profile and select **Upload Occurrence Data**



Select the Taxon Group using the dropdown and browse to the file containing the occurrence data for the taxon group, click upload

Upload Occurrence Data

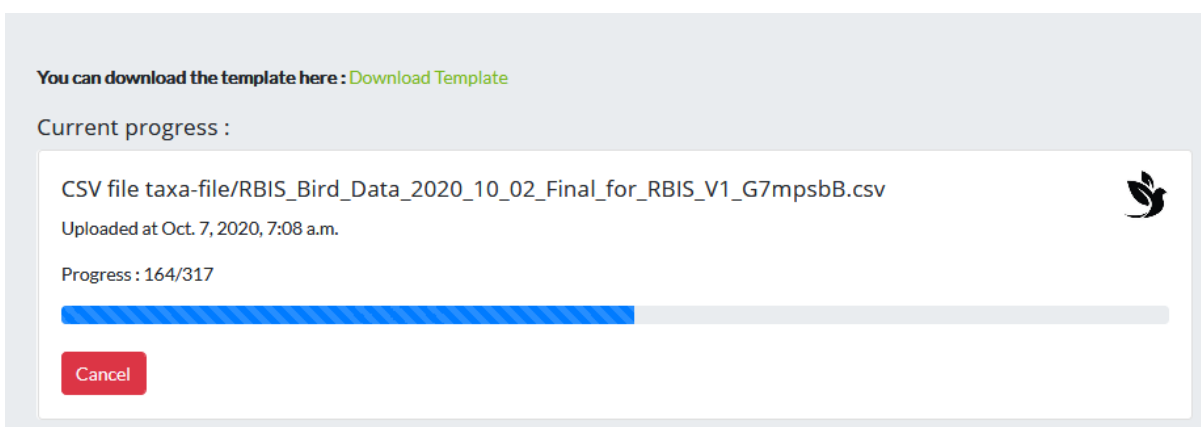
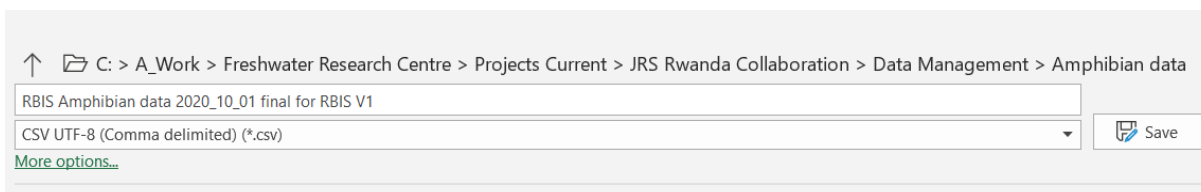
You can download the template here : [Download Template](#)

Note : Duplicates will be detected and update the existing data

Taxon Group ▼ [Add new](#)
Link to taxa management

Upload csv here No file selected.

Note: The Excel file needs to be saved as a csv using the following option:



A **Success** file will indicate occurrence records uploaded to the system. An **Error** file will give details of occurrence records not uploaded. The last column in this csv file provides an indication of the reason the occurrence record was not uploaded. The administrator then needs to check the data and correct before uploading again.

Common errors:

- Taxon not in Master list
- Taxon Rank incorrect

Occurrence records may be updated by uploaded corrected records in the csv file. As long as the UUID is the same then the old occurrence record will be updated.

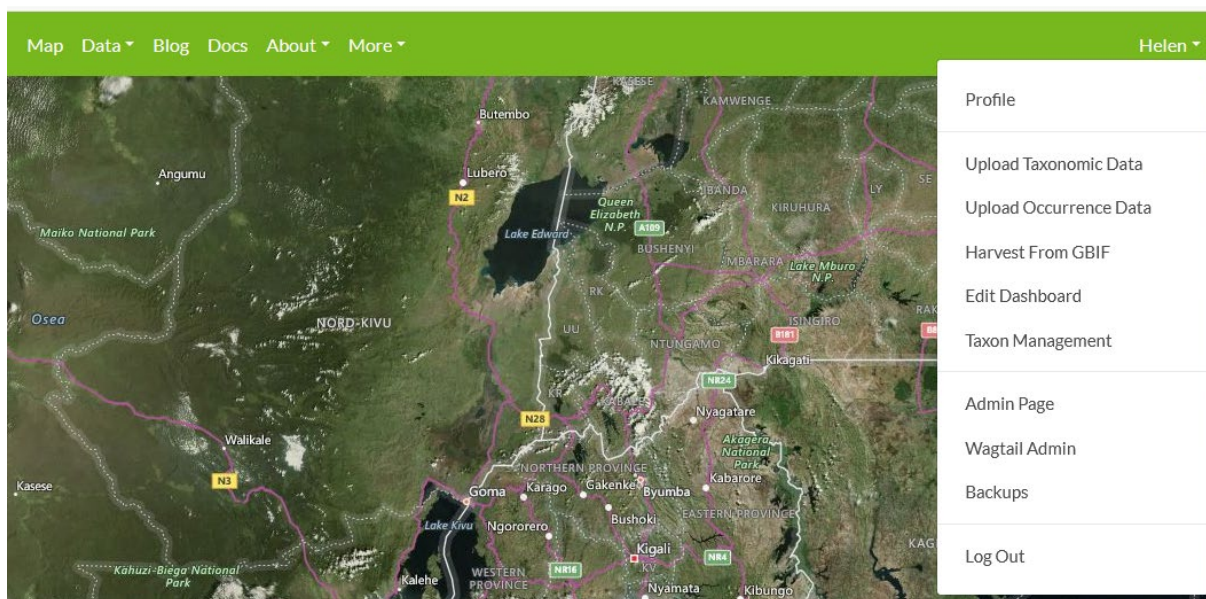
New occurrence records may be added by repeating the steps from (4), to upload the additional occurrence records for the Taxon Group.

Note that once the occurrence data has been uploaded, geocontext data (i.e. information about the site such as province, catchment etc.) are automatically populated for each site. This takes time and it is recommended that the next step (i.e. harvesting from GBIF), is done at least 24 hours after uploading occurrence data.

6 Harvesting GBIF Data

Steps:

Click on your profile and select **Harvest from GBIF**



Select the Taxon Group using the dropdown and click Start harvesting.

Harvest GBIF data

Note: Duplicates will be detected and update the existing data

Taxon Group

Amphibians

Add new

[Link to taxa management](#)

Start harvesting

You can keep track of progress. The more taxa in the master list, the longer the time needed for harvesting data from GBIF. You can keep it running in the background and continue with other work as it harvests the data.

Current process :

Module group Amphibians



Start time 2020-10-09 11:55:32.270647+00:00

Status : Fetching gbif data for Callixalus pictus (43/54)

```
-- Total occurrences 0 - offset 0 :  
-----  
Fetching : Hemisus marmoratus  
URL : http://api.gbif.org/v1/occurrence/search?taxonKey=2423019&offset=0&hasCoordinate=true&hasGeospatialIssue=false&country=RW  
-- Total occurrences 0 - offset 0 :  
-----  
Fetching : Cardioglossa cyaneospila  
URL : http://api.gbif.org/v1/occurrence/search?taxonKey=2429642&offset=0&hasCoordinate=true&hasGeospatialIssue=false&country=RW  
-- Total occurrences 1 - offset 0 :  
--- Collection record created with upstream ID : 1324192066
```

Cancel

You can view the GBIF data harvested via the **Download Logs**.

Finished upload sessions :

Download logs






Started at Oct. 9, 2020, 11:55 a.m.

Result : Finished

7 Managing taxa in Taxon Management

TAXON MANAGEMENT


 Avians Total taxonomy : 476 Edit	 Odonate adults Total taxonomy : 96 Edit	 Amphibians Total taxonomy : 54 Edit
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The label for the module and the logo may be updated, by clicking **Edit**:

Edit Module ✕


Label:

Logo:


 No file selected.

Individual taxa may be edited using the Taxon Management section. The module is selected, which is then highlighted and all taxa in the module are served alphabetically. The rank and import date are shown for each taxon. The search button is used to search for specific taxa.


TAXON MANAGEMENT



Avians
Total taxonomy : 476
[Edit](#)



Odonate adults
Total taxonomy : 96
[Edit](#)



Amphibians
Total taxonomy : 54
[Edit](#)

[Search](#) [Add A Taxon](#) [Download As Csv](#)

Taxon Name	Rank	Import date	Action
Accipiter badius	SPECIES	2020-10-07	Remove From Group Edit
Accipiter melanoleucus	SPECIES	2020-10-07	Remove From Group Edit
Accipiter minullus	SPECIES	2020-10-07	Remove From Group Edit
Accipiter tachiro	SPECIES	2020-10-07	Remove From Group Edit
Acrocephalus baeticatus	SPECIES	2020-10-07	Remove From Group Edit
Acrocephalus gracilirostris	SPECIES	2020-10-07	Remove From Group Edit
Acrocephalus rufescens	SPECIES	2020-10-07	Remove From Group Edit
Acrocephalus schoenobaenus	SPECIES	2020-10-07	Remove From Group Edit

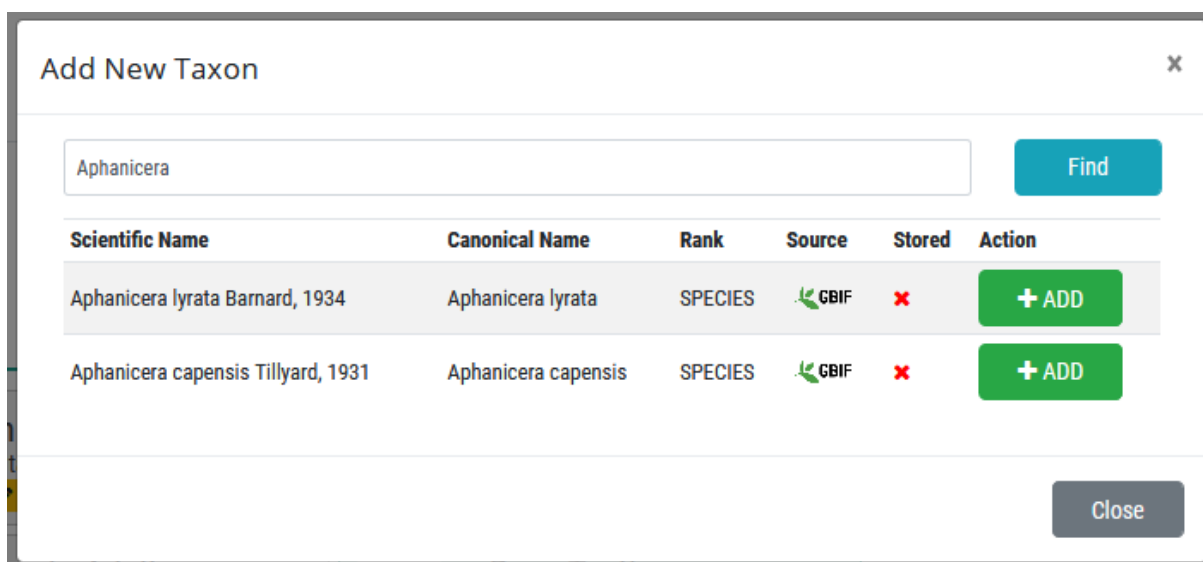
You can also Download a Master List of Taxa for a Group using the **Download As CSV** button.



You can add a new taxon using the **Add A Taxon** button.



This functionality still needs to be finalised, but for now you type in the taxon name and it links to GBIF to provide options, which you then Add.



8 References

Dallas HF. 2020. Data management guide for developing the Rwanda Biodiversity Information System (RBIS) for housing and serving freshwater biodiversity data. Prepared for the Center of Excellence in Biodiversity and Natural Resource Management, University of Rwanda