

# Mapbatcher

The Mapbatcher is a tool which uses data driven pages to produce individual maps as PNG images for each species in a shapefile (or feature class) that contains multiple species. Each image is zoomed in to the area containing the extent of that particular species.

The following types of map can be created:

- Polygon only
- Point only
- Polygons and points

The process is limited to the number of species it can process in one batch due to memory issues (see [Species Data](#) and [Troubleshooting](#)).

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## Preparation

### Download the Mapbatcher if not already present

The Mapbatcher download is available from the [GIS Tools, Software and Recommended Base data](#) page of the Red List website. It consists of a zipped folder containing:

- template map documents (mxds)
  - ArcMap 10.7 documents
  - ArcMap 10.5 documents in a subfolder, for users still on an earlier version of ArcMap
- mapbatcher\_default geodatabase (for use if wanted)
- scripts
  - mapbatcher python script
  - fillLegendField python script
  - compiled code of utilities used in Mapbatcher script
- ToolData
  - Polygon symbology layer
  - Point symbology layer
  - Dissolved country layer for display in thumbnail.
  - Images folder (containing the images used by the tool in displaying the Red List category)
- Instructions for using the Mapbatcher (this document)

This instruction document is also available as a separate download.

Unzip the zip file and place the unzipped Mapbatcher\_2020 folder where you would like it.

## Data Preparation

### Species Data

Merge all species data into one shapefile or feature class of polygons and/or one shapefile or feature class of points.

Note: it is advisable not to have more than about 500 species in one mapbatch, due to memory constraints. If working on a slow computer, keep the number under 250 species. The program is liable to run out of memory if there are too many species. This may cause the process to crash before completing all species maps. Alternatively, the basemap may not have caught up with the species extent and the data will be displayed in the wrong location.

The data required for the Mapbatcher is:

#### Polygon only

- A shapefile or feature class with the species polygons.
- An [index polygon layer](#). (Only required if there is more than one polygon for any one species, otherwise the polygon layer itself can be used.)

#### Point only

- A shapefile or feature class with the species points.
- An [index polygon layer](#). This is likely to be a shapefile or feature class of the species' EOOs generated from the species points.

#### Polygon and point

- A shapefile or feature class with the species polygons.
- A shapefile or feature class with the species points.
- An [index polygon layer](#). (Only required if there is more than one polygon for any one species, otherwise the polygon layer itself can be used.)

#### Legend (optional)

If the Red List legend symbology is to be used and the legend field is not present, or may not be up to date, use the "Fill Legend Field" tool (included in the Mapbatcher toolbox and also in the IUCN Red List ToolBox) to ensure that the "legend" field is present and correctly filled. The "presence", "origin" and "seasonal" fields in the species data provide the information required to populate the "legend" field.

#### Category (optional)

If the Red List Category graphic is to be shown on the maps, there must be a field in the polygon species data containing the Red List Category. (Valid values are: 'EX', 'EW', 'CR', 'EN', 'VU', 'NT', 'LC', 'DD', 'NA', 'NE')

For maps with points only, the category must be included in the [index layer](#).

#### Citation (optional)

If the maps are to show a citation ("Compiled by: "), there must be a field in the polygon species data containing the text to be shown. Only a single value of the citation can be shown per species.

For maps with points only, the citation must be included in the [index layer](#).

## Index Layer

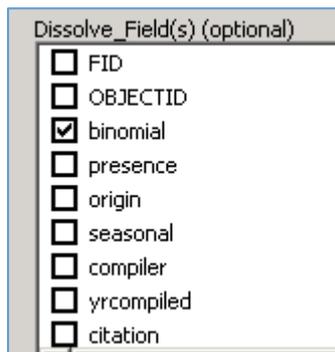
An index layer is required for the Data Driven Pages (see [ArcMap information on Data Driven Pages](#) for more explanation). This needs:

- A single polygon for each species;
- The field containing the species name must have the same field name as in the species data layers (polygons and/or points). E.g. all species names are in a field called “binomial”.

## Maps with species polygons

If there is only one polygon per species, the polygon layer can be used as the index layer.

Otherwise, use the Dissolve tool (available in the Mapbatcher toolbox or from the ‘Geoprocessing’ option on the main ArcMap toolbar). Select only the “binomial” field to ensure one polygon per species.



## Maps without polygons (i.e. points only)

The point EOO polygons should be used as the index layer. These can be created using the EOO calculator (available to download from the [GIS Tools, Software and Recommended Base data page of the Red List website](#)).

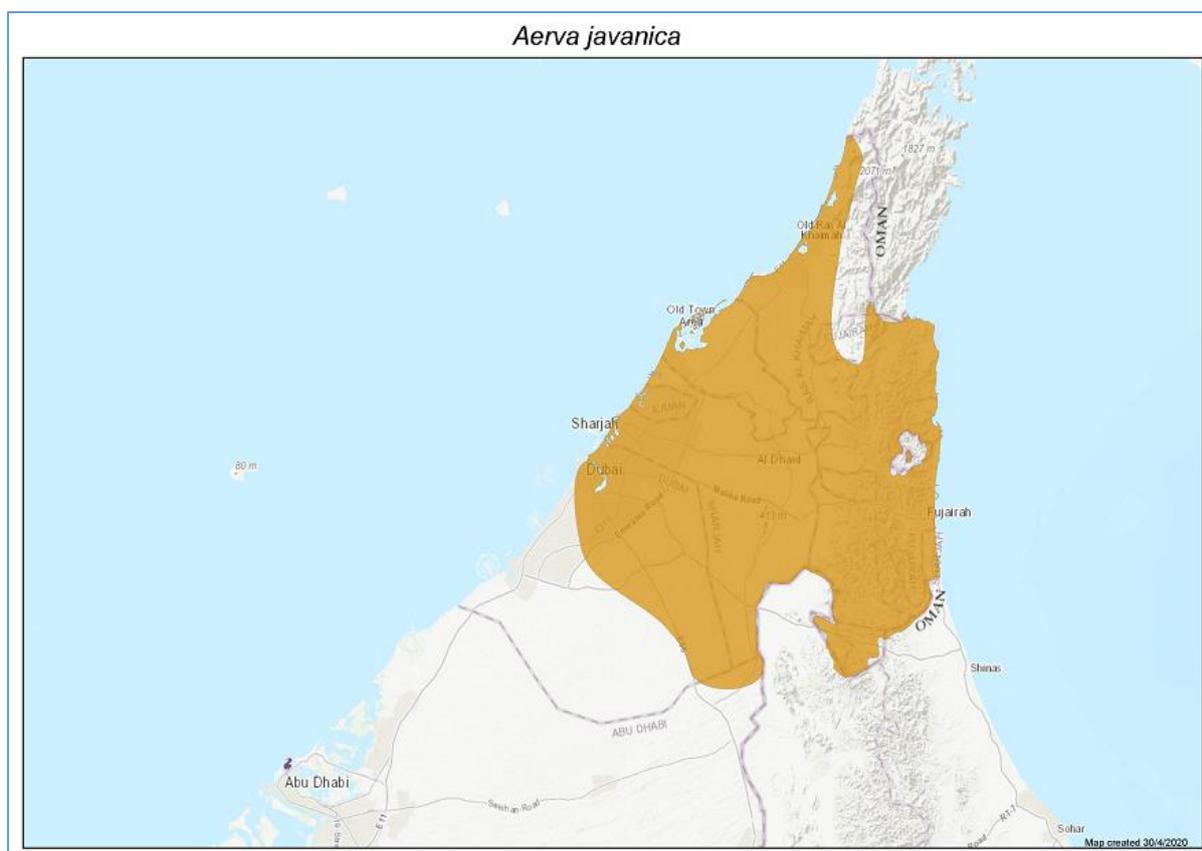
If the Red List Category and/or a citation is to be shown on the maps, the required field(s) must be added to the EOO polygon file.

# Map Documents

There are 5 Mapbatcher documents:

- Mapbatcher\_Full\_Page\_landscape
- Mapbatcher\_Full\_Page\_portrait
- Mapbatcher\_with\_Legend\_landscape
- Mapbatcher\_with\_Legend\_portrait
- Mapbatcher\_with\_Thumbnail

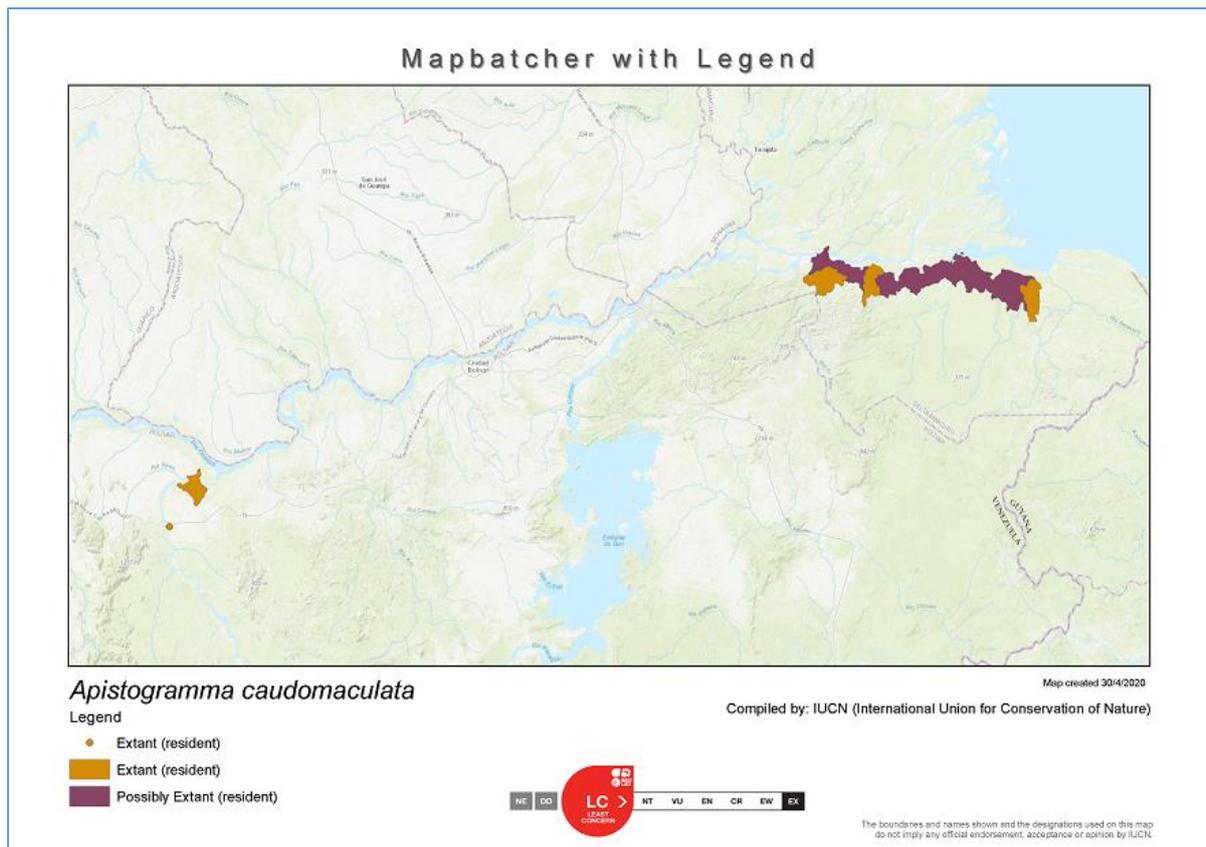
## Mapbatcher\_Full\_Page



- Full page map below heading
- Binomial heading above map
- Date at bottom right of map within map frame
- No legend, RL category or citation

A landscape and a portrait version are provided.

## Mapbatcher\_with\_Legend

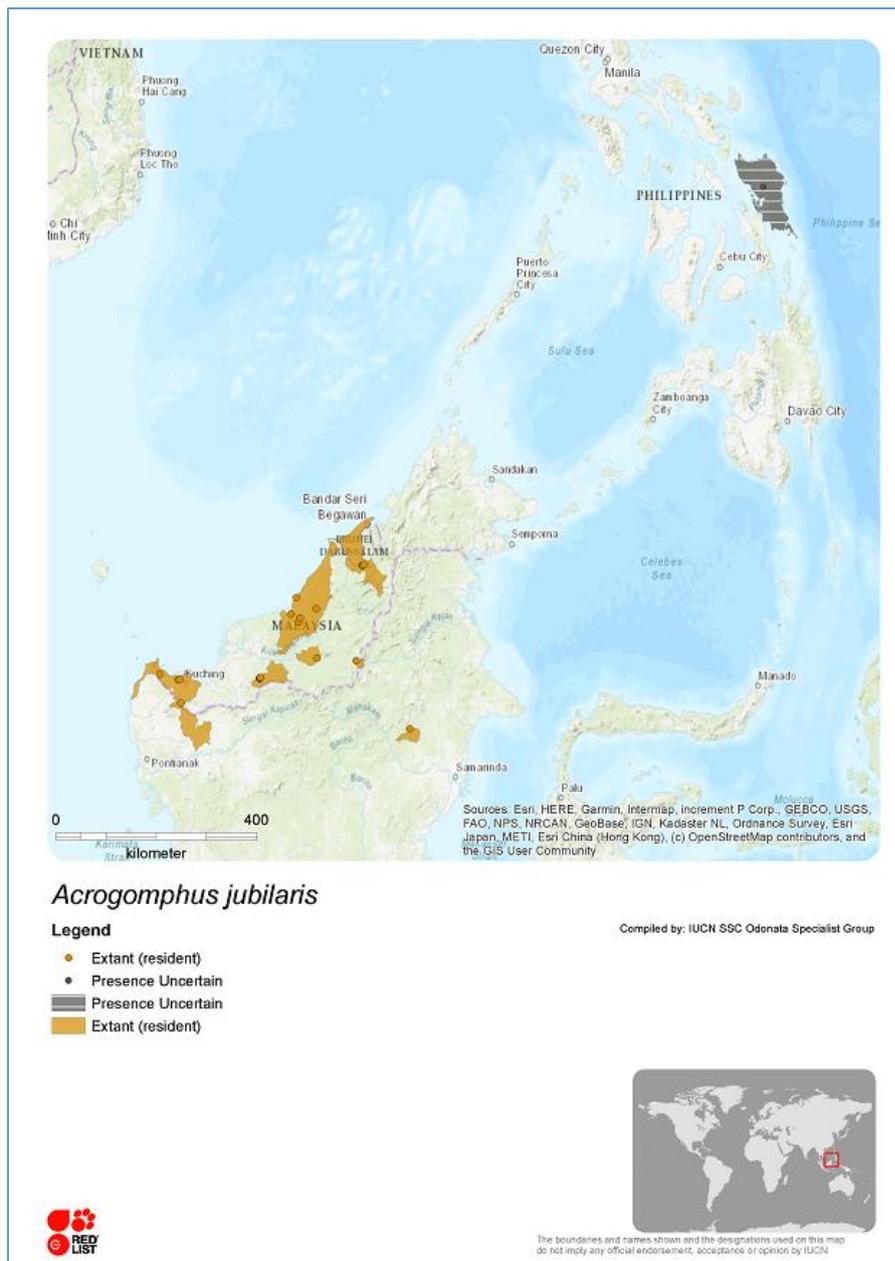


- Title at top
- Binomial below map
- Legend
- 'Compiled by' text (optional)
- RL category graphic (optional)
- Date below map frame

This version is designed to show the legend symbology for the polygons and/or points.

A landscape and a portrait version are provided.

## Mapbatcher\_with\_Thumbnail



- No title
- Binomial below map frame
- Scale bar
- Legend
- 'Compiled by' text (optional)
- RL category graphic (optional)
- Thumbnail showing global position of main map

This version is similar to Mapbatcher\_with\_Legend, but also contains a thumbnail image showing the location of the species extent on a world map.

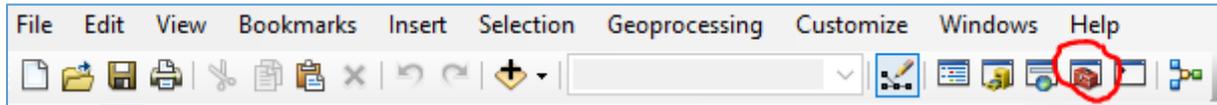
This version is only provided in portrait format as the map frame itself is relatively square.

## Setting up the Map Document

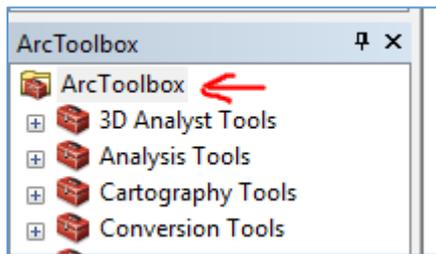
Add the toolbox (if not already in the ArcToolbox for the map document)

If Mapbatcher\_2020 is not already in the list of Toolboxes:

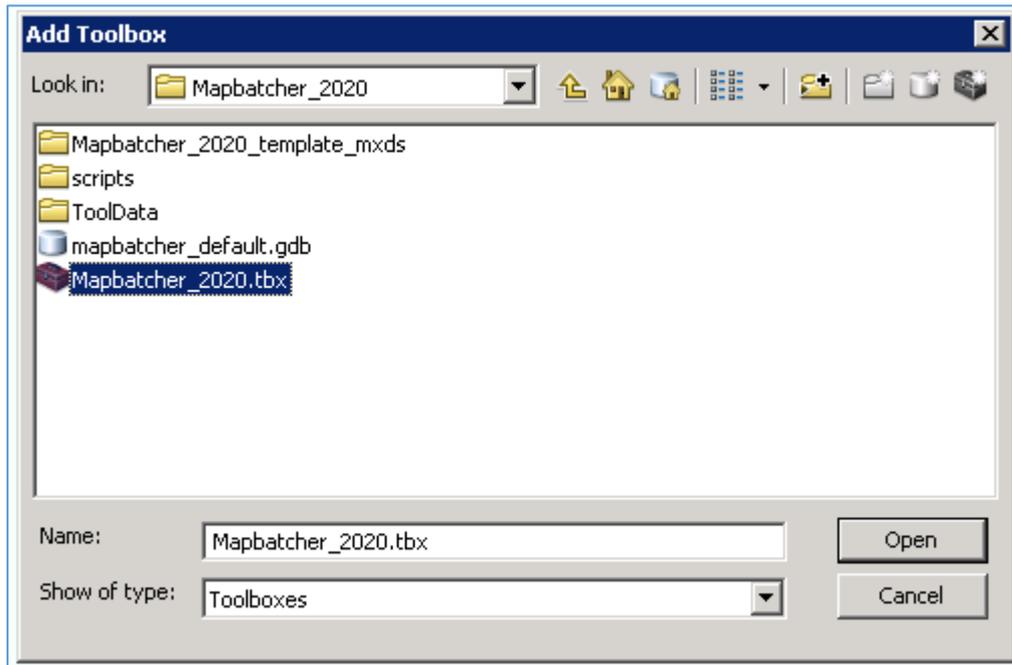
- If the ArcToolbox window is not open, click on the 'Arc Toolbox' icon in the standard toolbar;



- Right click on the ArcToolbox list heading;



- Select 'Add Toolbox';
- Navigate to the location where you saved the unzipped Mapbatcher folder and select the Mapbatcher\_2020.tbx;



- Click on 'Open' to add the toolbox to the ArcToolbox window.

### Add the species data

Add the spatial data to the chosen ArcMap Mapbatcher document within the Layers Group. This may be either or both of:

- Polygon species data
- Point species data

### Add or create the index layer (if necessary)

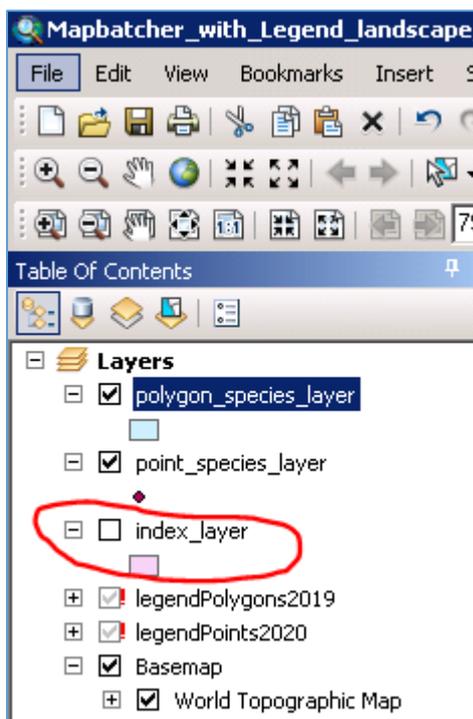
As described [above](#), this is a polygon layer consisting of one polygon per species and must be located within the Layers Group.

A separate index layer is required if there is not a polygon species data layer or if any species within the polygon species layer has more than one polygon.

It may be:

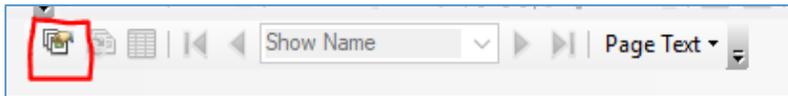
- Dissolved polygon species data layer (if any species have more than one polygon)
- Point EOOs if maps are points only

If a separate index layer is being used, untick it in the table of contents so that it will not be displayed in the maps.

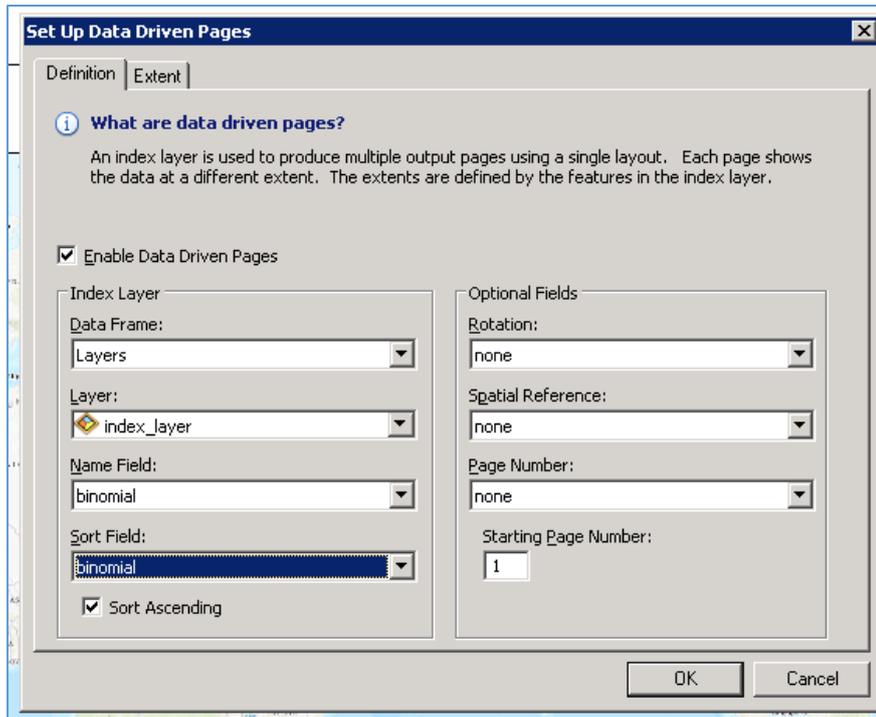


## Set up Data Driven Pages

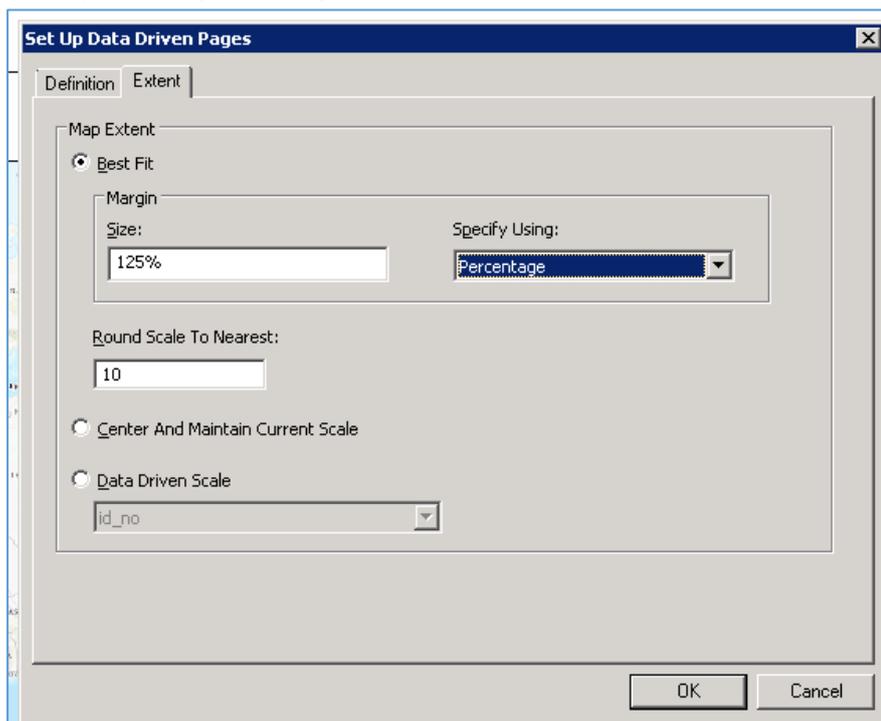
- Select the Data Driven Page Setup from the Data Driven Pages toolbar.



- Set the 'Layer' in the 'Definition' tab to the [index layer](#).
- Set the 'Name Field' to the field containing the species name. The field name must be the same as the 'Species Name Field' specified in the tool parameters when running the Mapbatcher script.



- The 'Extent' tab can be used to round the map scale and to specify how much the map is zoomed out beyond the species range extent.



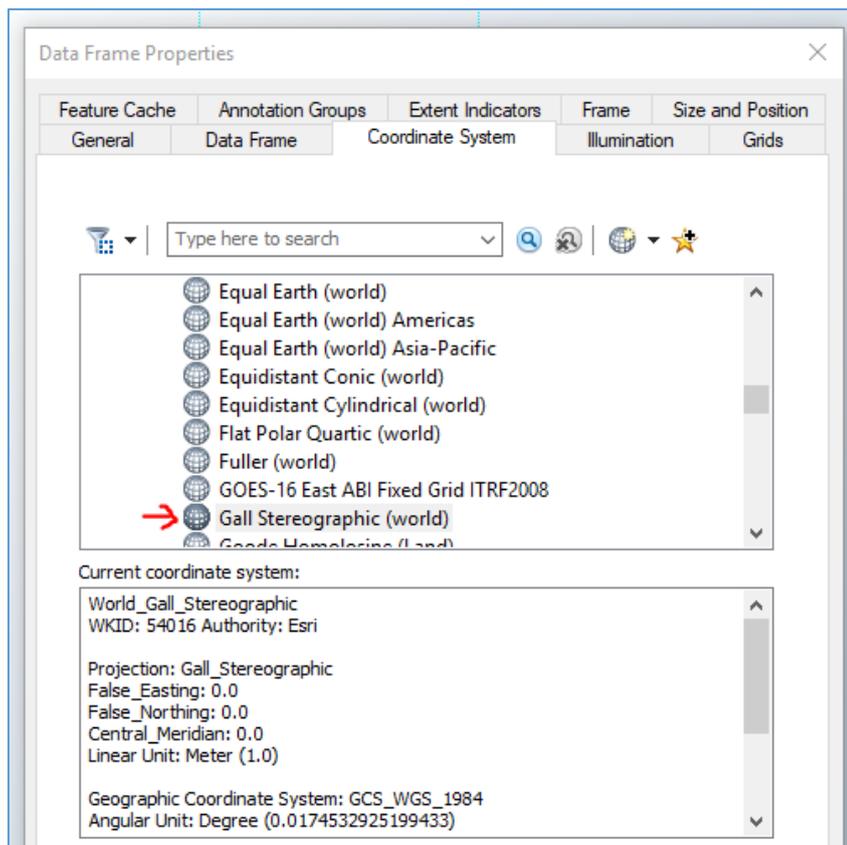
## Basemaps

It is possible to personalise and add other basemaps to the Layers group and also to select other basemaps.

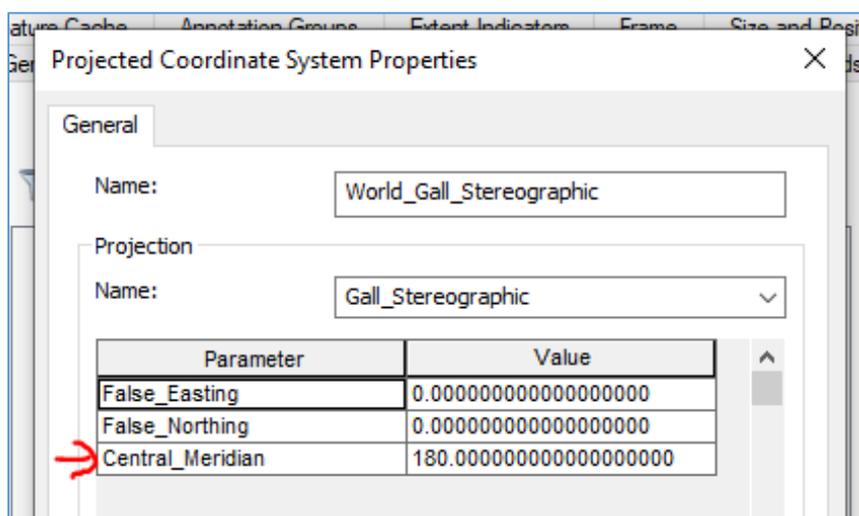
To use the ESRI online basemaps, like the World Topographic Map currently in the document, select the arrow next to the “Add data” button and go to “Add Basemap...”

When mapping species centred within the pacific, it is possible to change the meridian:

- Right-click the ‘Layers’ and/or ‘thumbnail’ group (data frames) in the Table of Contents, depending on which you want centred on the antemeridian;
- Select ‘Properties...’;
- Select the ‘Coordinate System’ tab;
- Double click on the current coordinate system (highlighted in the list);



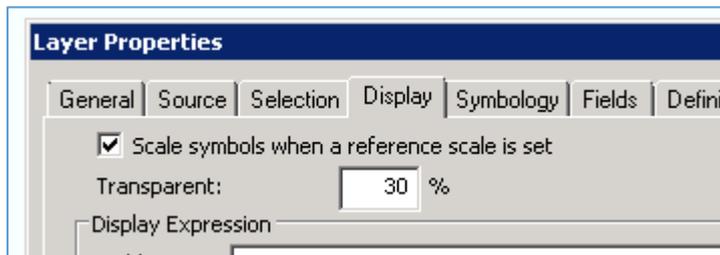
- Change the Central\_Meridian to 180 and click ‘OK’.



## For polygon species data

Set the transparency to the desired level (e.g. to let the basemap be visible underneath).

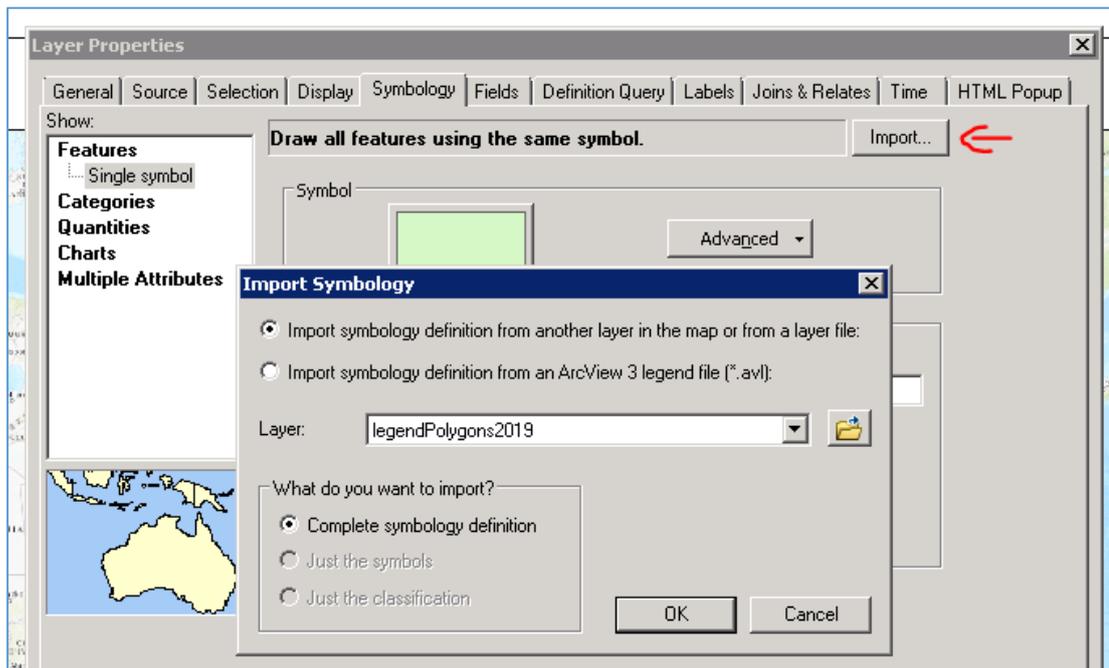
- Right-click on the polygon layer.
- Select the 'Properties...' option at the bottom of the list.
- Select the 'Display' tab.
- Set 'Transparent:' to the required transparency:



## Symbology

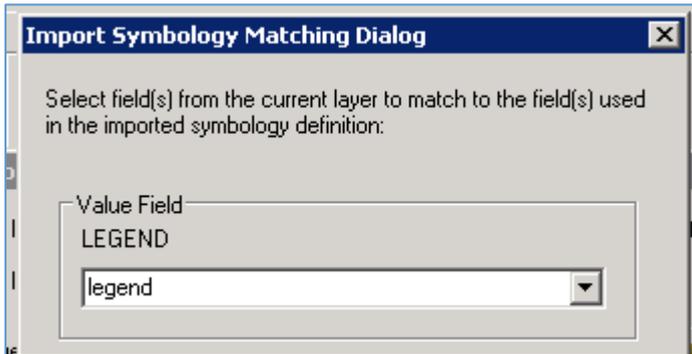
To import the IUCN Red List symbology for a polygon or point layer:

- Right-click on the species layer;
- Select the 'Properties...' at the bottom of the list;
- Go to the 'Symbology' tab;
- Select 'Import' ;

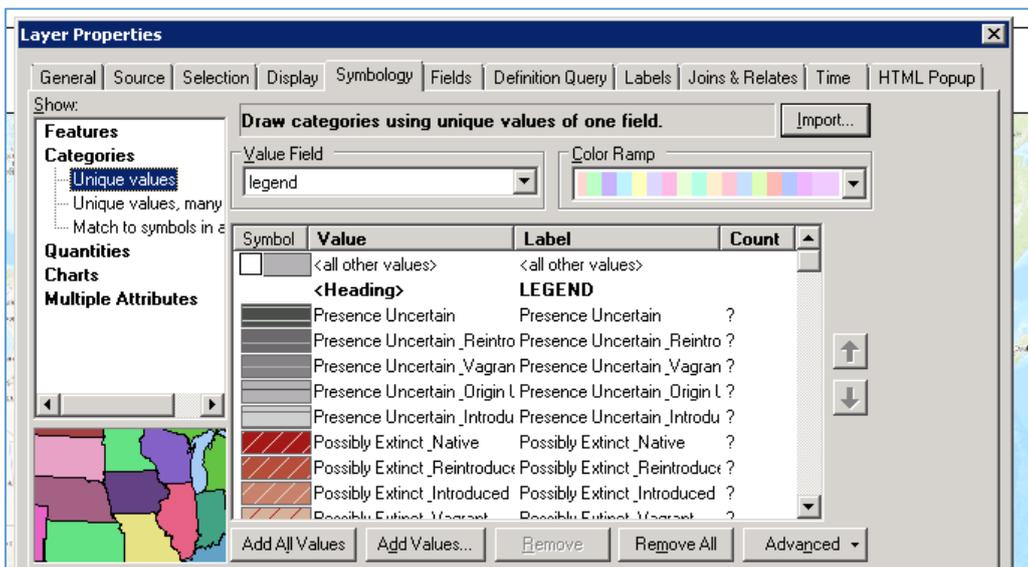


- In 'Import Symbology' 'Layer:', use the drop down list (if necessary) to select:
  - "legendPolygons2019" for a polygon layer
  - "legendPoints2020" for a point layer

- Click on 'OK' and in the 'Import Symbology Matching Dialog' select the name of the field containing the legend – normally this would be "legend";



- After clicking on 'OK', the Symbology tab should be populated with the imported symbology (here showing polygons):

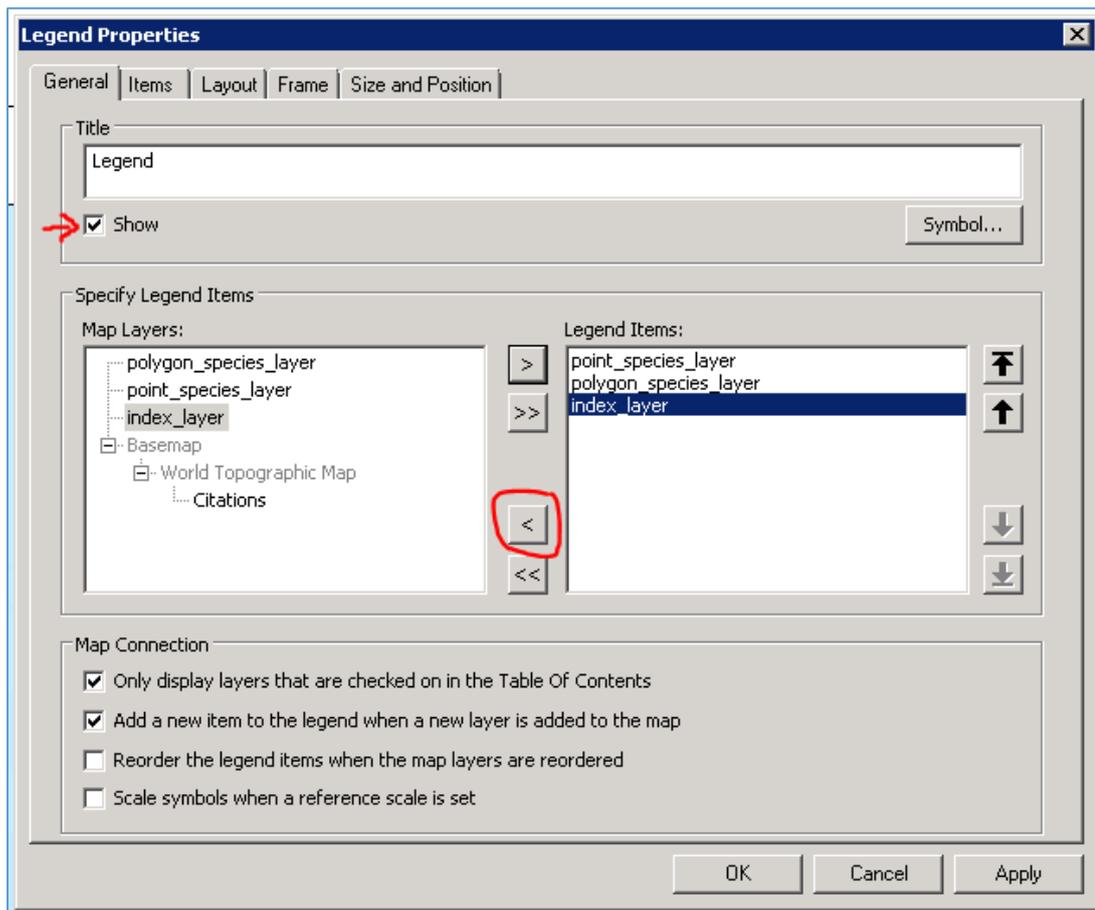


## Legend (Mapbatcher\_with\_Legend and Mapbatcher\_with\_Thumbnail only)

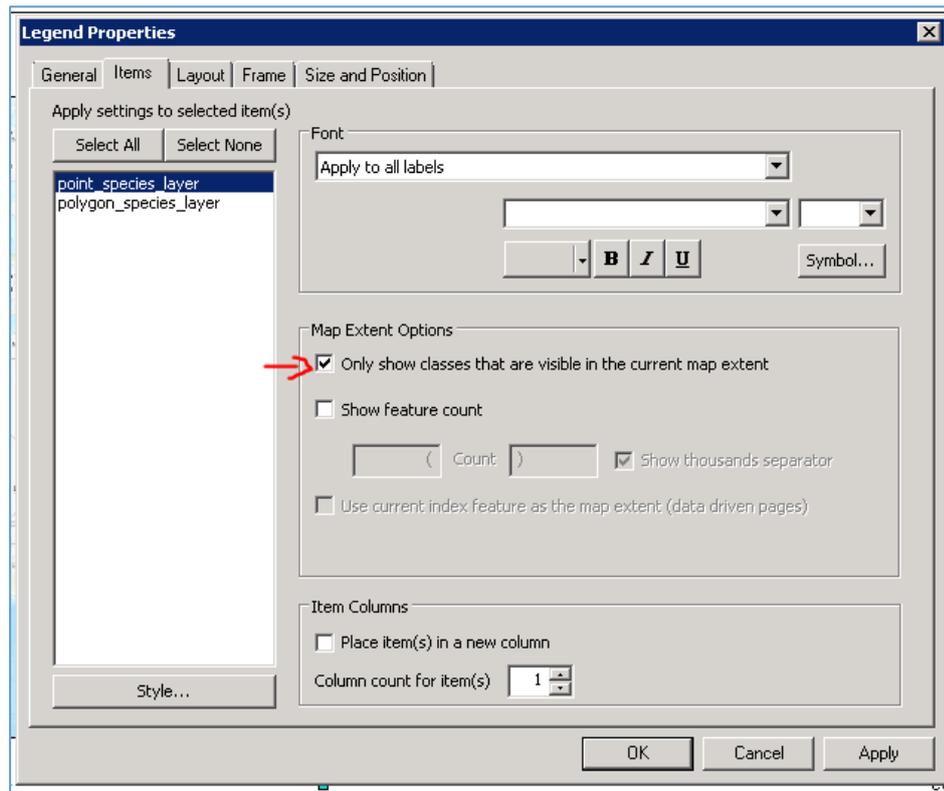
These instructions show setting up a legend containing the symbology for the polygon and point species layers with no basedata.

It is, of course, possible to show other layers in the maps (such as protected areas, administrative areas or infrastructure) and to add these to the legend. In this case, it may be necessary to make some adjustments to the legend and/or map frame size if the legend contents do not fit into the allocated space.

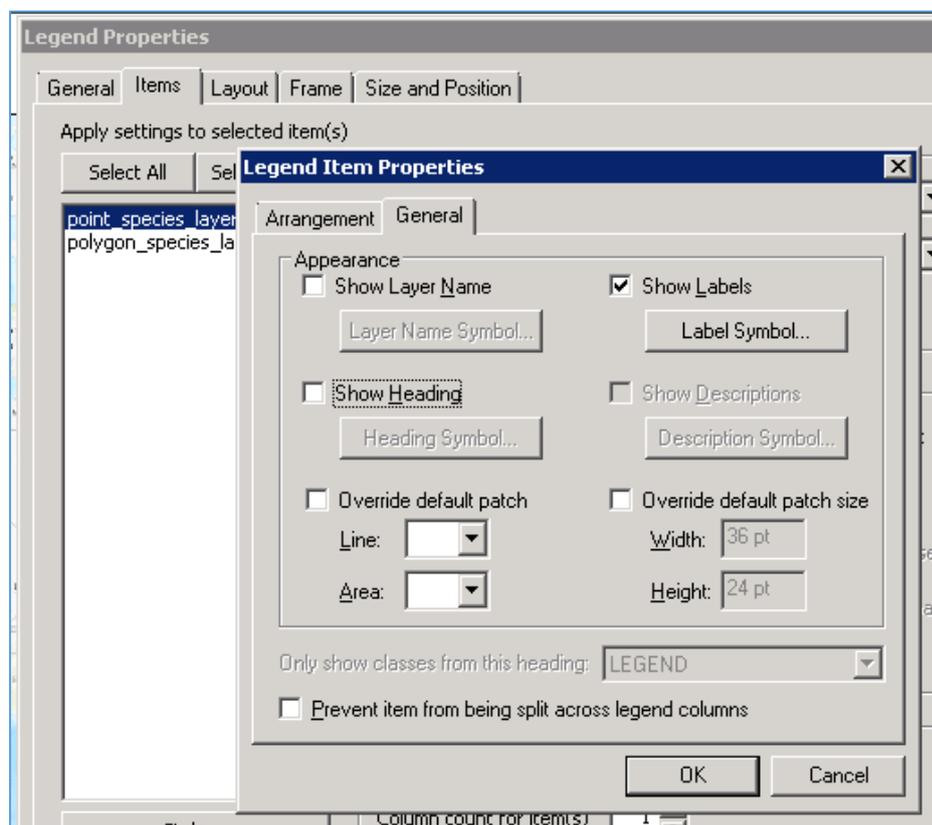
- Right click on the legend in the document and choose 'Properties...';
- In the 'General' tab, remove all layers not required in the legend using the back arrow button '<';
- If you want a different heading for the legend, change the 'Title' text;
- If you do not want a heading at the top of the legend, untick the 'Show' box;



- In the 'Items' tab, for **each** species layer if there are both polygons and points;
  - Make sure that 'Only show classes that are visible in the current map extent' is checked



- Right click on the species layer(s) and select 'Properties...' to bring up 'Legend Item Properties'
- Uncheck all boxes except 'Show Labels:'



- Click 'OK' to save the 'Legend Item Properties'
- Click 'OK' to save the 'Legend Properties' after all the required settings have been set.

# Running the Mapbatcher Tool

## Setting the Mapbatcher to run

Once the map document is ready, **Pause** the display window using the Pause button on the bottom left.



It is also advisable to **save the map document now**, if you haven't done so already.

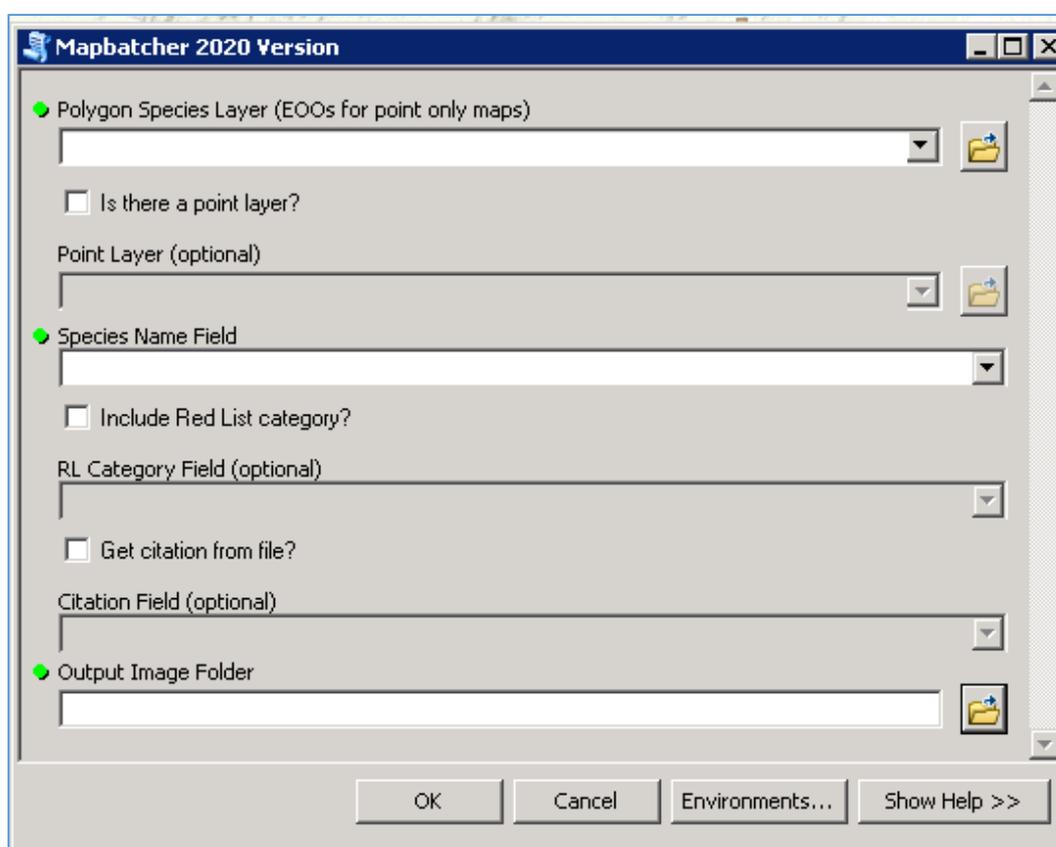
## Tool location

The Mapbatcher tool is located in the Mapbatcher\_2020 toolbox



The required parameters are:

- Range layer (for a points only map this is the Index layer)
- Species Name Field (selected from a drop-down list of fields in the Range layer)
- Output Image Folder (the location for the output maps)
  - Note that any maps in the output folder with the same name as the maps being produced (i.e. for the same species) will be overwritten by the new map. Create a new folder if you want to keep previous versions of the maps.



The [optional parameters](#), selected by checking the respective check boxes are:

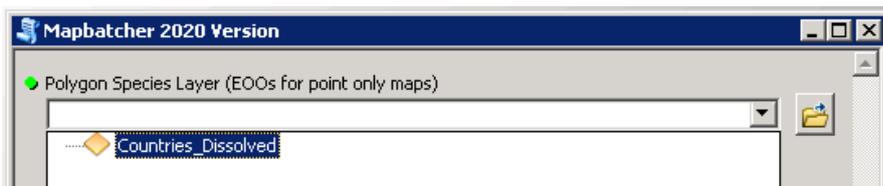
- Point layer (for point only maps and for maps with points and polygons)
- Red List Category (not applicable to Mapbatcher\_Full\_Page, so leave unchecked in this version)
- Citation (not applicable to Mapbatcher\_Full\_Page, so leave unchecked in this version)

The default for all of these is unselected.

When one of the options is selected, the list of fields to choose from is those of the Polygon Species Layer (or EOO layer for point-only maps). This is why, for point-only maps, the category and citation must be added to the EOO layer if they are to be displayed.

### Mapbatcher\_with\_Thumbnail only

If the layers listed in the drop-down box are those in the 'thumbnail' group:



- 'Cancel' the tool;
- Right-click on the 'Layers' group and select 'Activate' (last but one to the bottom of the list).

## Output Maps

Once a few maps have been produced, go to the output folder and check the first couple of maps to check whether they have been produced as you required. Try not to select a map that is currently being processed as this can confuse the programming and you may have to [start the Mapbatcher again](#).

## Warning messages

[Citation](#) (if selected). A warning message will be given if the citation is blank or null for a species.

[Red List category](#) (if selected). A warning message will be given if:

- The Red List category for a species is blank, null or not one of the allowed categories (incorrect code or no graphic available);
- The 'images' folder is missing from the 'ToolData' folder. The 'images' folder supplied with the tool contains the graphics for the Red List Categories. If this is missing, the Red List category cannot be displayed.

## Troubleshooting

### Process stopping before completing

The program is liable to run out of memory if there are too many species in a batch. This may cause the process to crash before completing all species maps. Try to keep the number of maps per mapbatch to a maximum of 500 and reduce this to 250 species or fewer if you know your computer is quite slow.

### Basemap showing incorrect location

This is likely to be due to memory constraints caused by too many species in the batch. If there are memory problems, the basemap may not catch up with the species extent and the data will be displayed in the wrong location. Try to keep the number of maps per mapbatch to a maximum of 500 and reduce this to 250 species or fewer if you know your computer is quite slow.

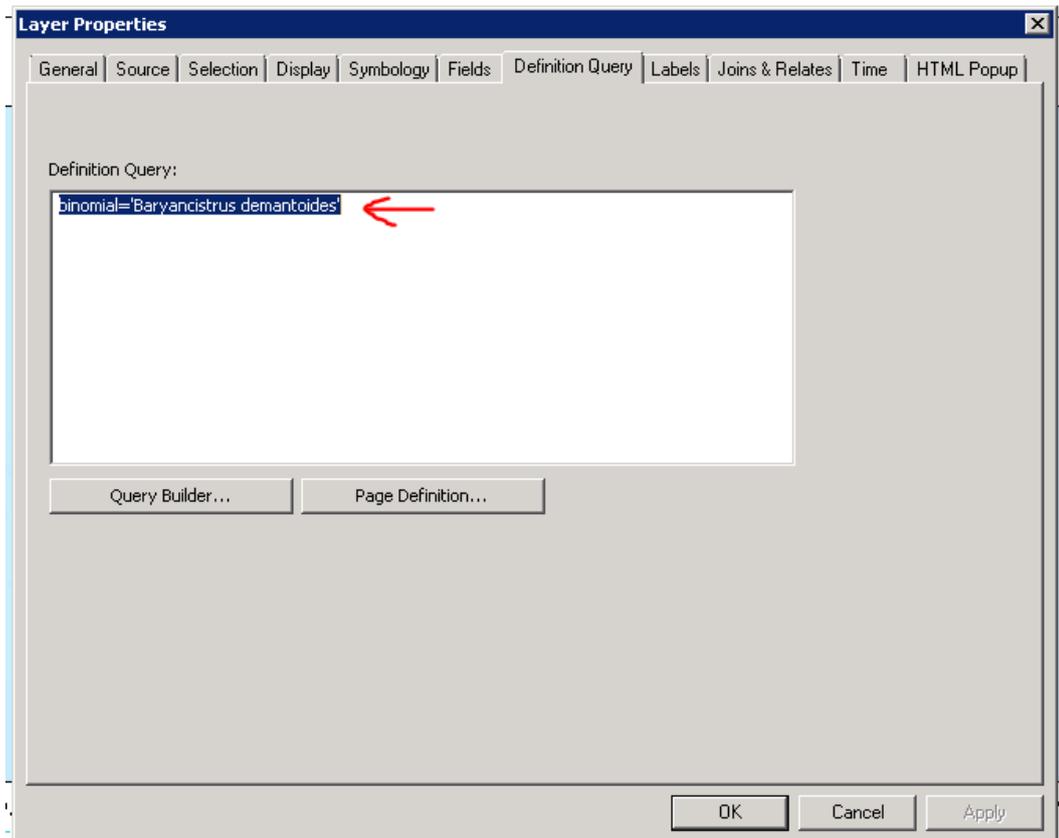
### No map displayed for a species and legend is empty

Check that the species has a valid legend.

### After cancelling the tool or the process stopping for some other reason

If the Mapbatcher is cancelled or has crashed, it is possible that the species layers will have Definition Queries which need to be cleared before the tool can be run again. For each species layer (polygons and/or points):

- Right-click on the layer and choose 'Properties...';
- Select the 'Definition Query' tab;
- Delete any text in the 'Definition Query:' box;



- Click 'OK' to exit.