Assessing the Conservation Status of Habitats types and Species in European Union

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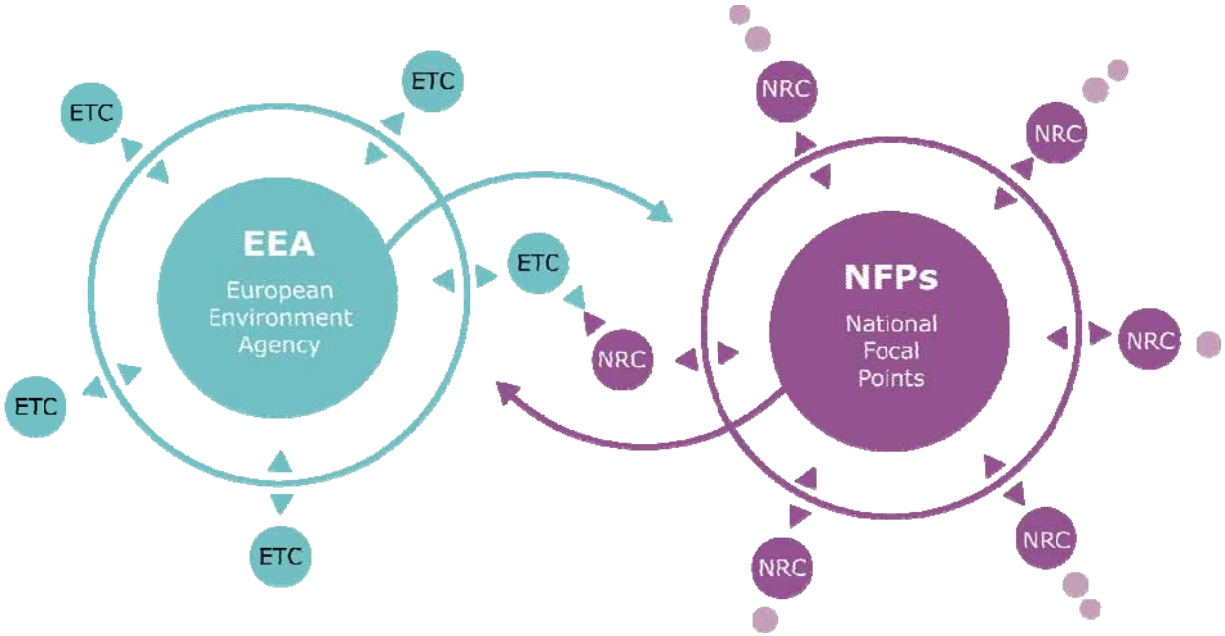
ETC/BD and the EEA

We are an international consortium of 9 organisations across Europe, coordinated by the French **National Museum of Natural History** (MNHN).

Working for the **European Environment Agency (EEA)** in the field of biodiversity



Main activities

To support the implementation of **European biodiversity policies**

provide scientific and technical expertise to EU and countries

To support the production on **biodiversity related indicator**

Streamline the production of biodiversity indicators

To support biodiversity-related **assessments and reporting**

Contribute to regular reports and messages, carry out thematic assessments

To support the development of a **Biodiversity Information System for Europe**

Organise the data flow of biodiversity information

European Union:

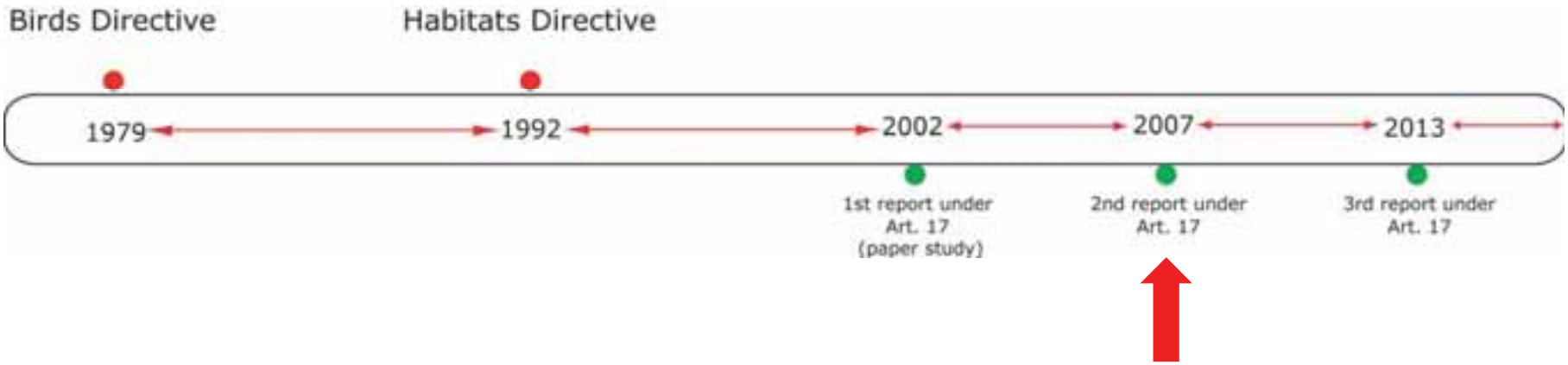
An economic and political union of 27 countries.

Common legislation on a number of topics including Nature conservation

Nature protection in EU

In EU the most important pieces of legislation for the protection of nature are the Habitats Directive and the Birds Directive.

Within the Habitats Directive there are a series of Articles one of which Article 17 requires that every 6 years countries report on the implementation of the Directive, specifically on the "**conservation status**" of the approx. **230** habitat types and **1 200** species listed in the Directive. This reporting is know as "Article 17 reporting".



Nature protection in EU

The aim of the Directive

- all habitat types and species will have a **“favourable conservation status”,**

In 2007 under the 2nd Art. 17 reporting we collected data from

- 25 countries

with

- 8 820 assessments
- 16 000 maps (which were initially deemed to be of minor importance)

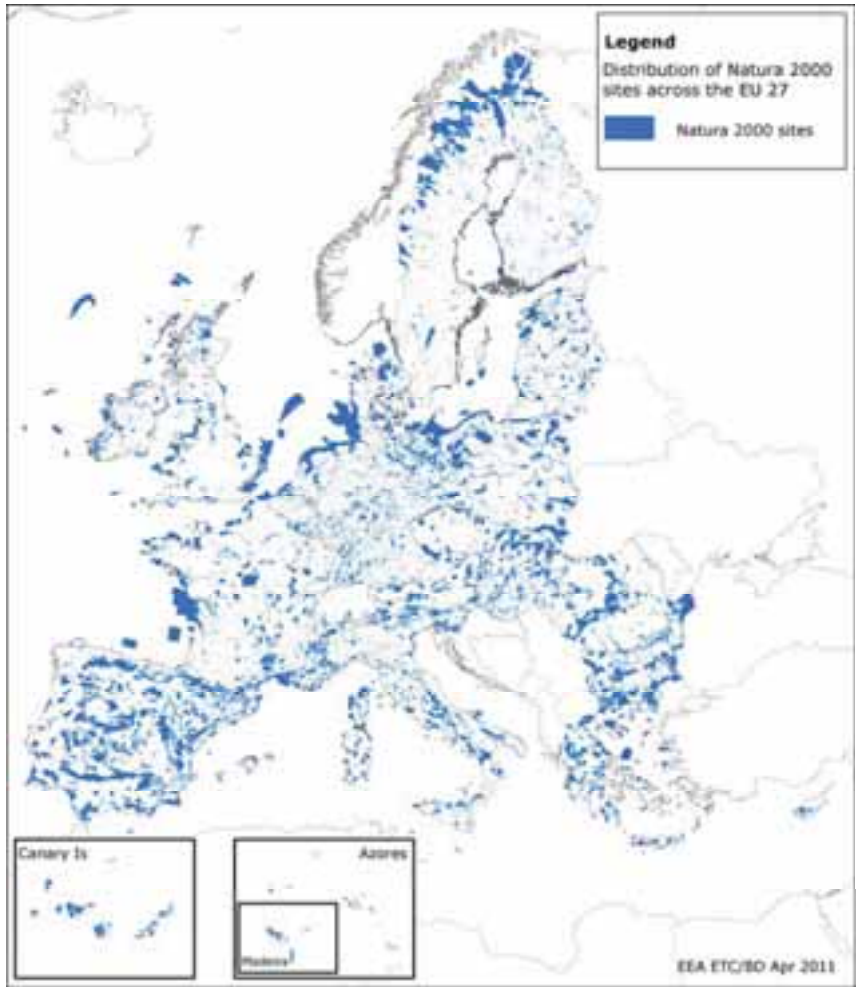
It is this reporting process that is the focus of this presentation.

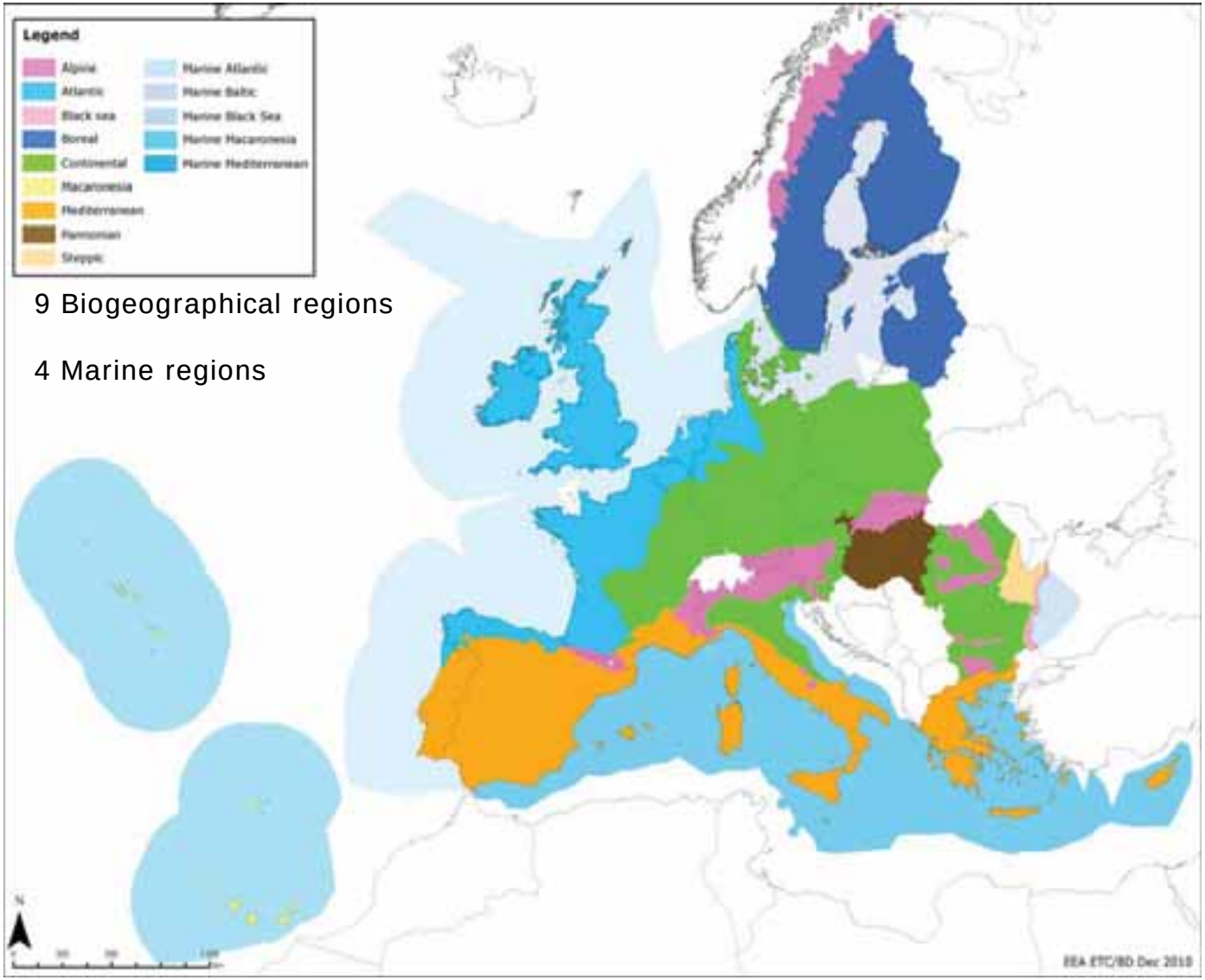
One of the principal tools to achieve a favourable conservation status is the Natura 2000 network of protected sites.

Natura 2000 is a pan European network of important ecological sites.

26 600 sites

4 300 000km² = 17.5% of the EU



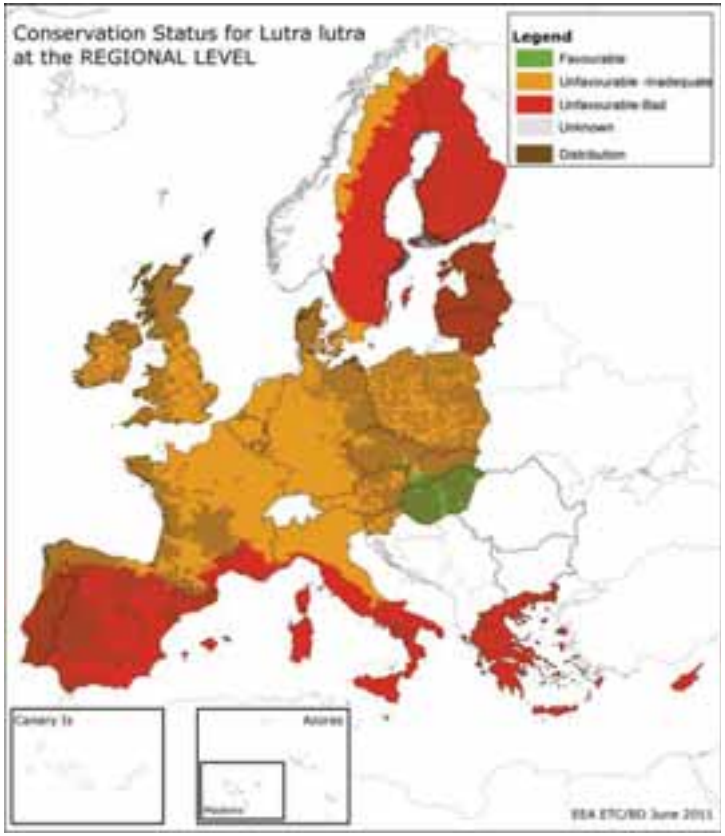

Legend
Alpine
Atlantic
Black sea
Boreal
Continental
Macaronesia
Mediterranean
Pannonian
Steppic
Marine Atlantic
Marine Baltic
Marine Black Sea
Marine Macaronesia
Marine Mediterranean
9 Biogeographical regions
4 Marine regions
N
EEA ETC/BD Dec 2010

Nature protection in EU

Conservation status is calculated at the biogeographical level per country and for the entire biogeographical region

Initially: 8 820assessments, 16 000 maps

we produced….2 941 assessments ,2 800 maps



Nature protection in EU

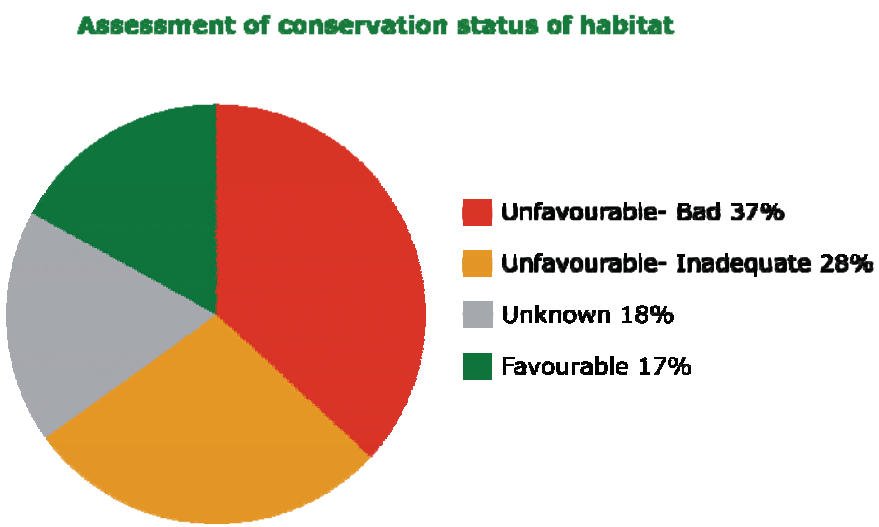
Conservation status is calculated at the biogeographical level per country and for the entire biogeographical region

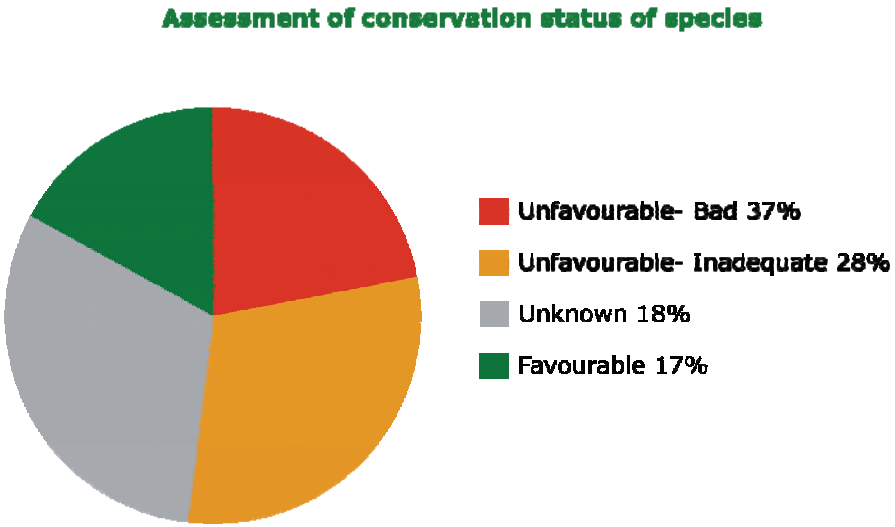
10 country assessments **become** **1 regional assessment**

Conservation Status

Findings:

17% of assessments were deemed Favourable





How did we get these figures?

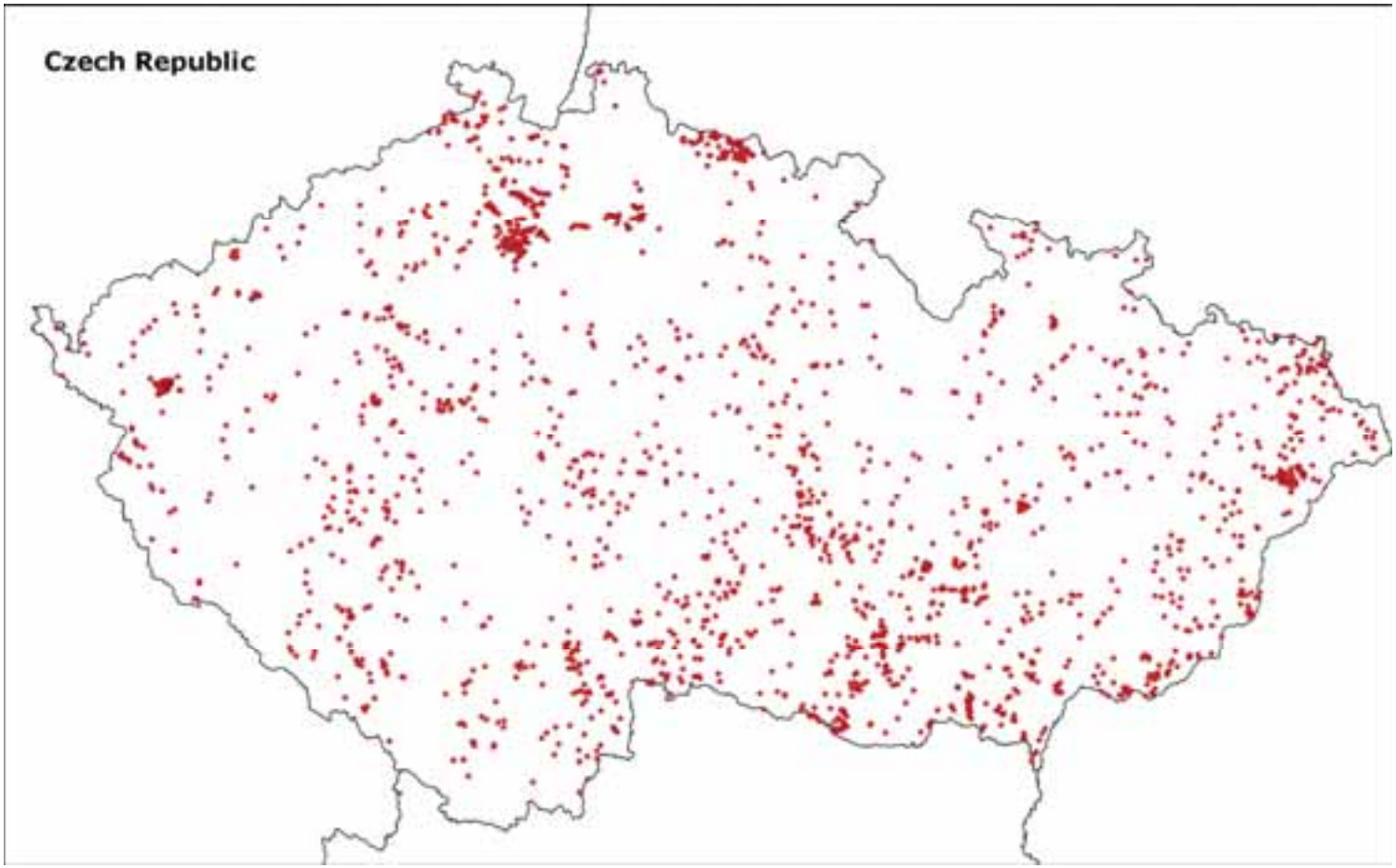
It planned that the individual country assessments would be merged into a European assessment by weighing them by parameters such as Habitat size, species population...

However the data was incomplete or not compatible. This necessitated the use of area of the distribution from the spatial data.

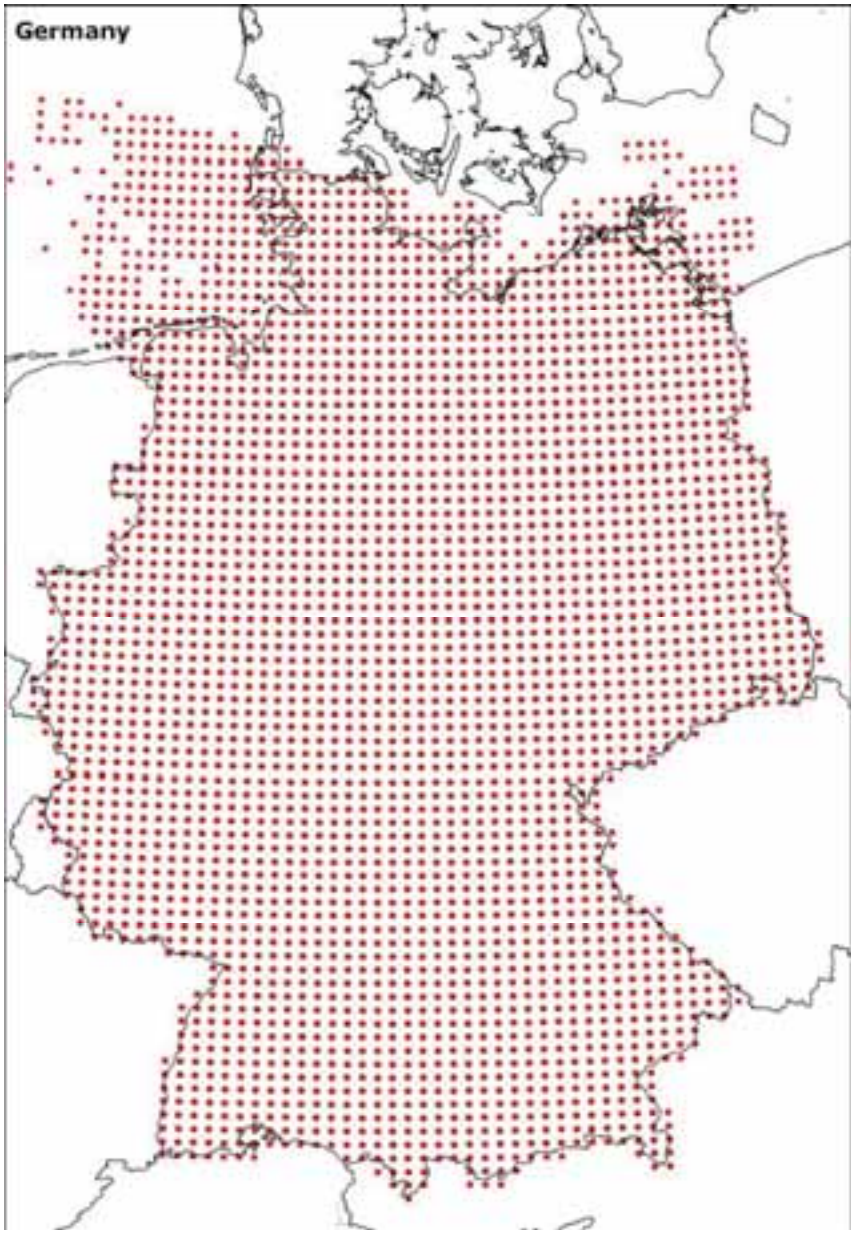
To do this the spatial data needed to be subject to a series of QA/QC routines.

To further complicate matters the standards set out for the spatial data were very vague which resulted in a wide variety of data types being submitted……..

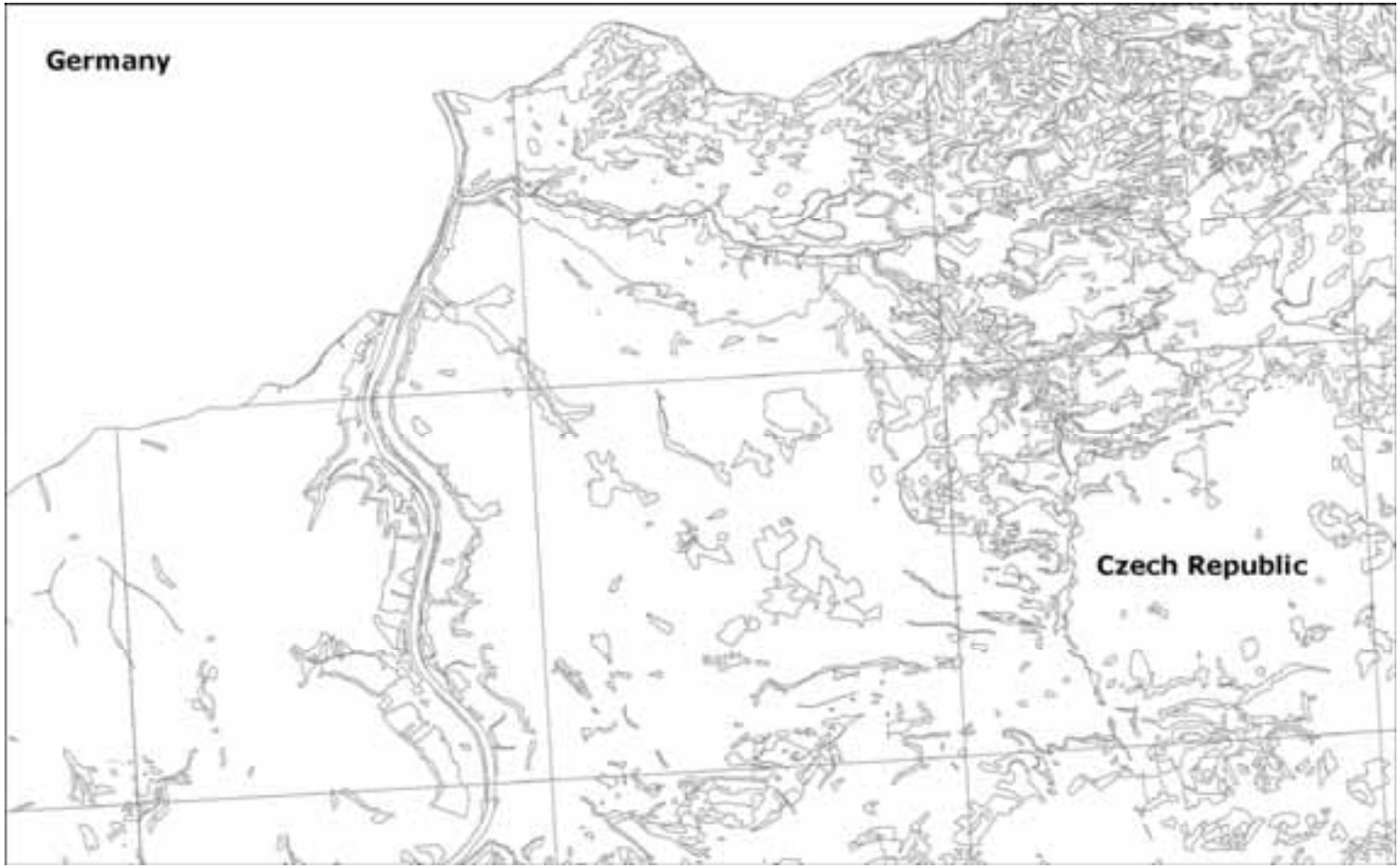
Points,
As locations.....e.g. Czech Republic



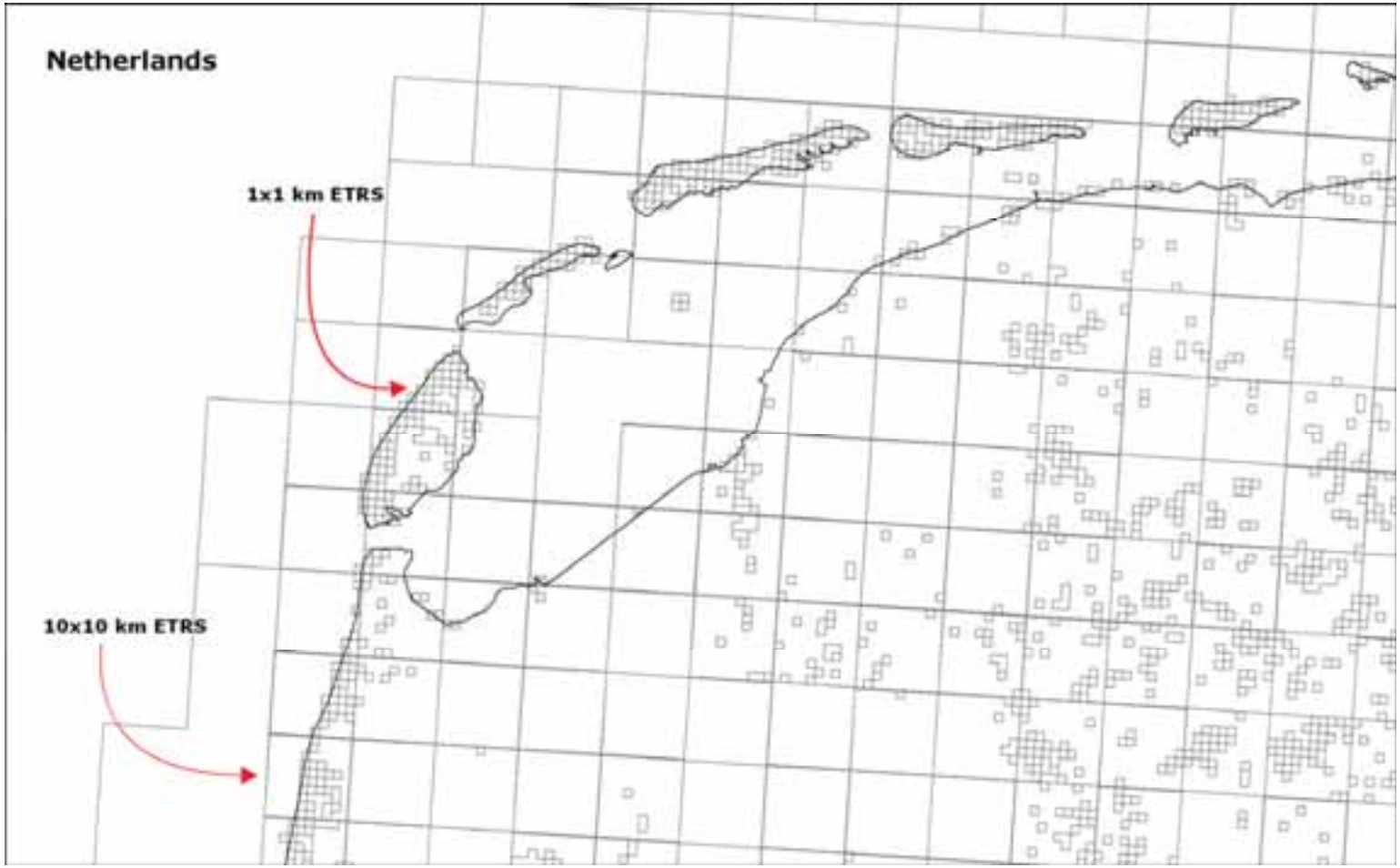
Points,
As centroids……e.g. Germany



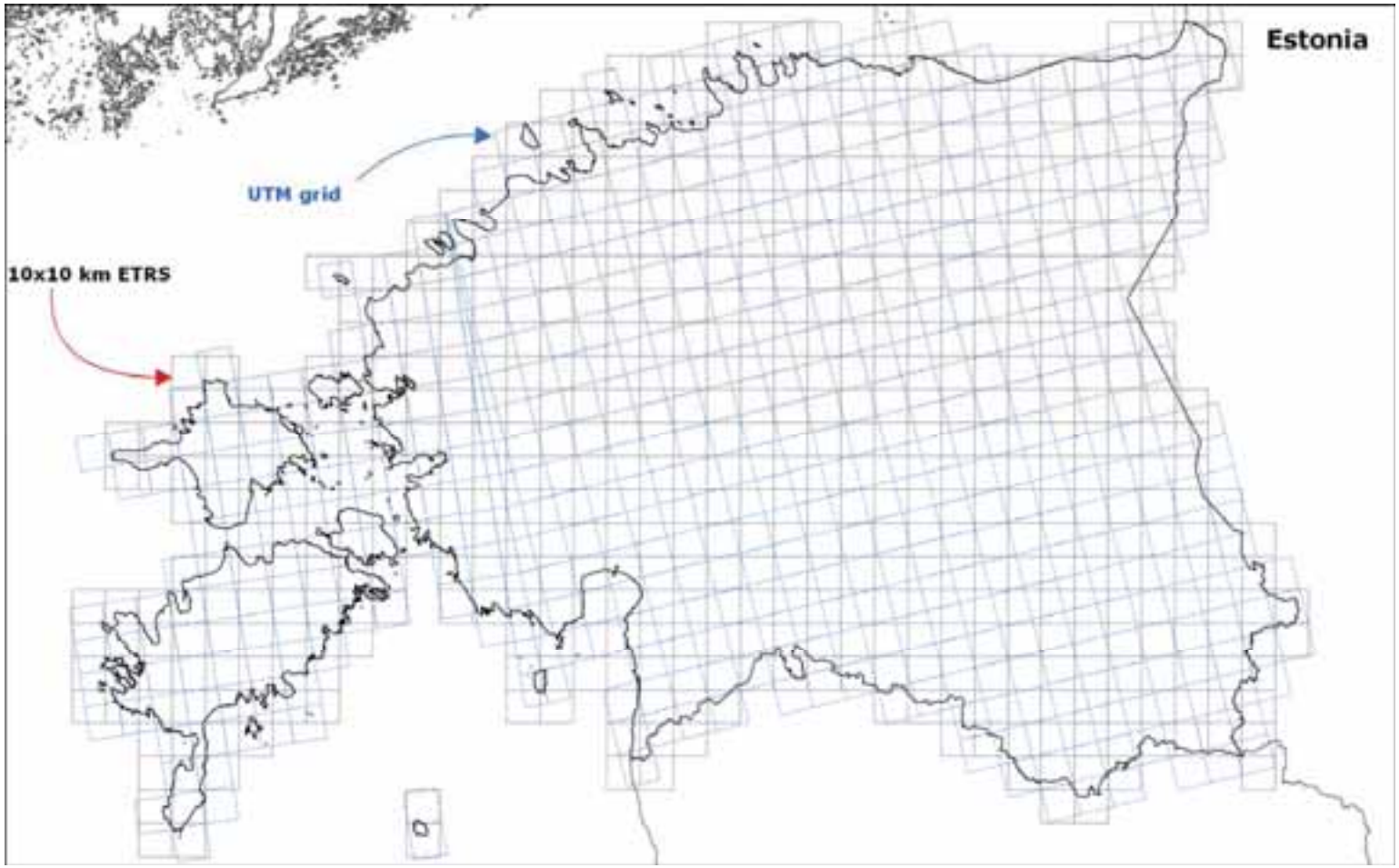
Polygons,
Detailed polygons……..e.g. Czech Republic



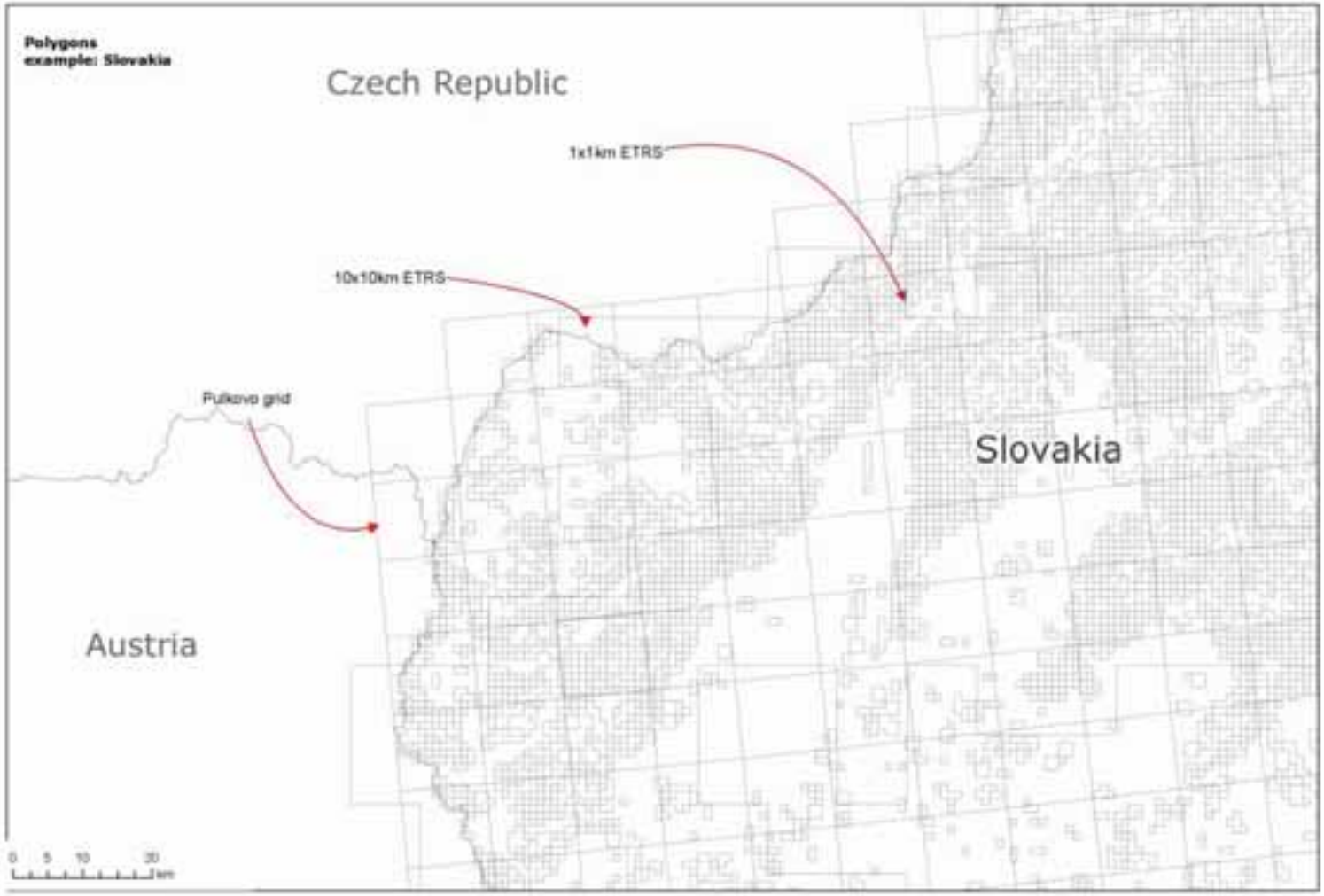
Polygons,
Grids of various sizes……..e.g. Netherlands



Polygons,
Grids of various types……e.g. Estonia



Polygons,
Grids of various types & sizes.....e.g. Slovakia



Main Issues

- Multiple types of spatial objects delivered

- Multiple sized grid cells used, often in the same country

- Different projections used to map the data: 31 projections used for 25 countries

- Countries did not add the projection file to the data

- empty files were uploaded which couldn't been processed, which necessitated manual inspection of the files to see if the data could be repaired or not:
"Number of shapes does not match the number of table records", "Cyclic redundant error"

QA/QC - Model Builder

In order that the spatial data could be used for the assessments we needed to ensure the quality of the data.

We needed to design a robust QA/QC system and chose **Model Builder** to do this.

- Easy to design (graphical programming)
- Did not need programming skills
- Easy to use
- Robust
- Easy to modify
- Vast array of tools to use in the models
- Automated a lot of repetitive tasks

QA/QC - Model Builder

Once we designed our QA/QC on paper we then used Model Builder to technically realise it at every step

Step 1: Prepare data for QA/QC

generate a number of base data sets using available data and **Model builder**

Step 2: QA/QC

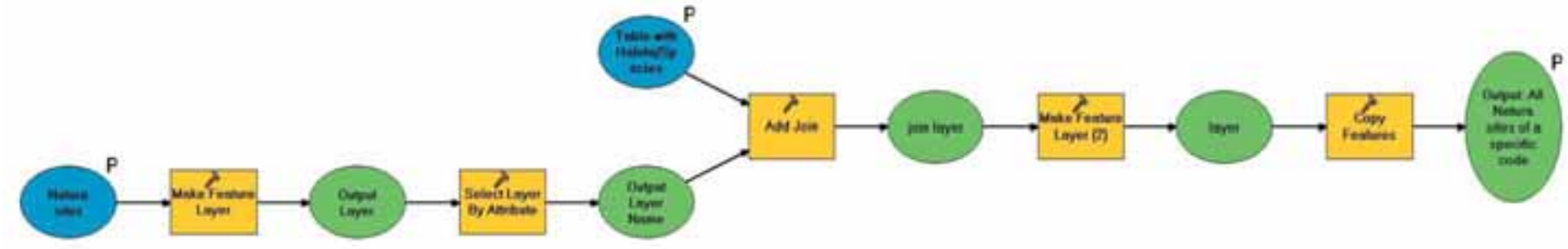
Identify the QA/QC routines and design them in **Model Builder**

Step 3: Merge the data using **Model Builder**

This ultimately took over 2 000 hours of computing

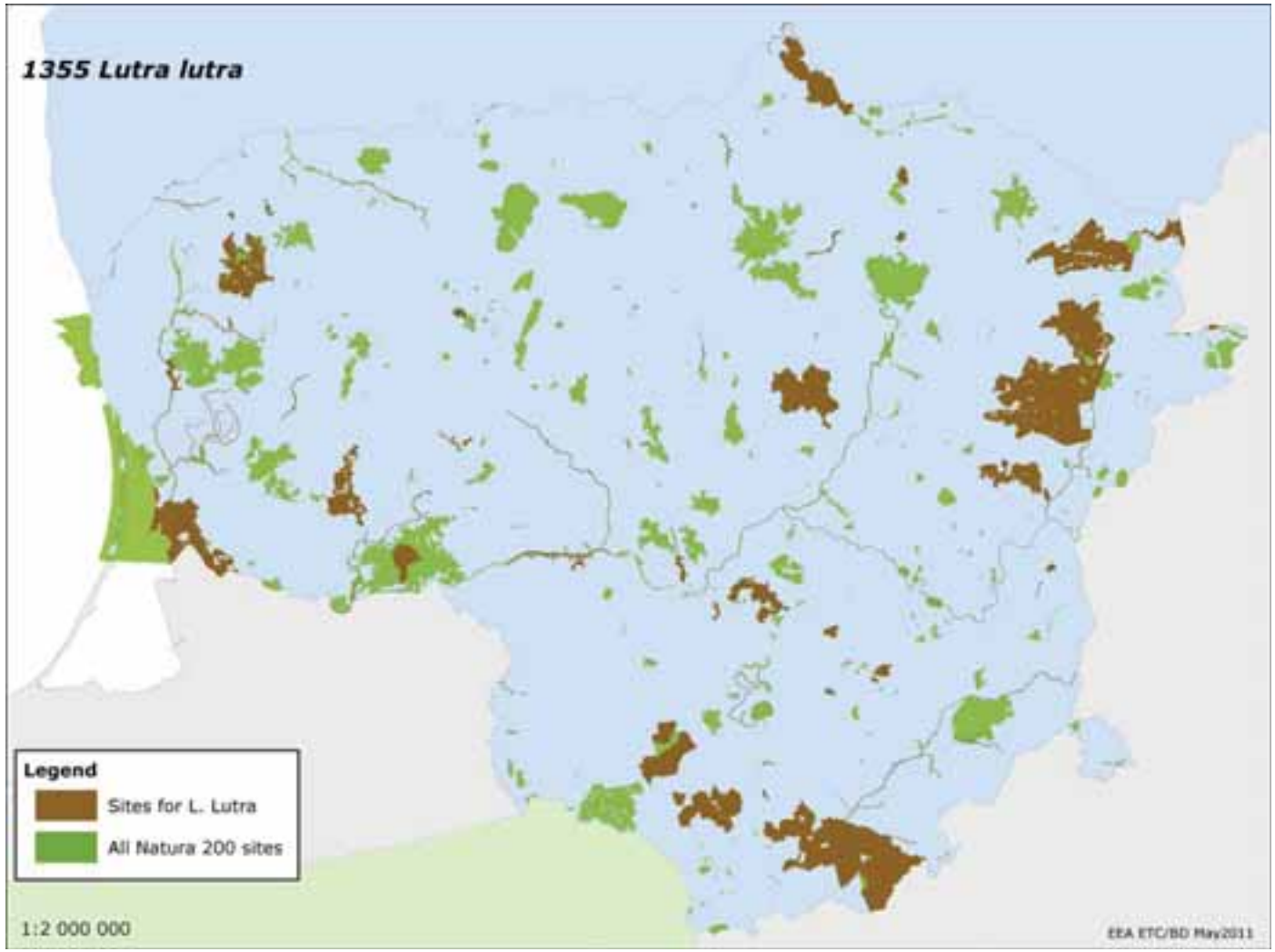
QA/QC Model Builder

One example of how we used Model Builder was to split the network of protected areas for the species or habitats they are designated for. This acts as a proxy for the distribution.



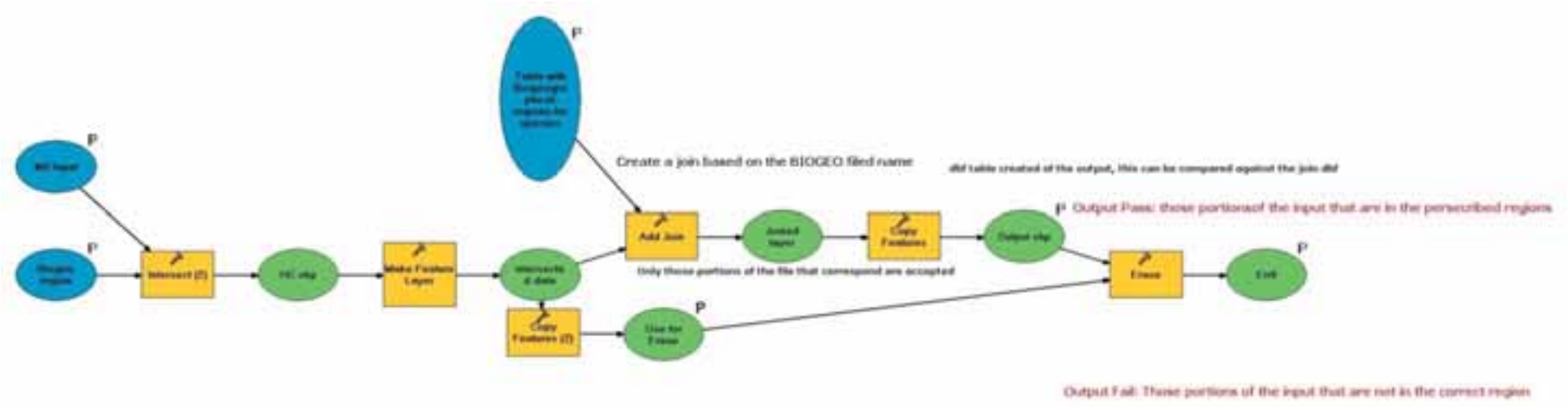
Fast, effective, reliable

Output of the model.

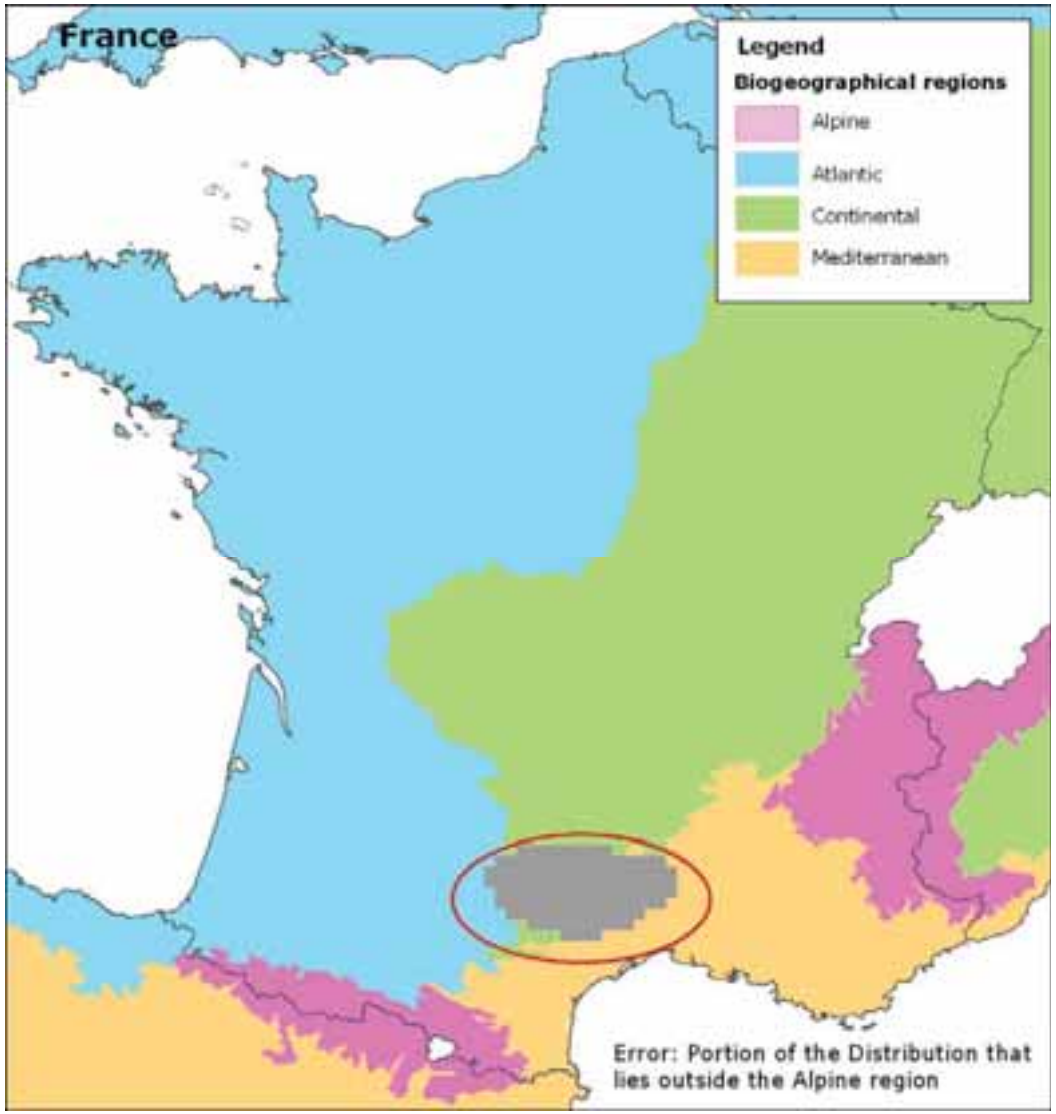


QA/QC Model Builder

We needed to check if the data was suitable for analysis, this model checks if the Distribution is in the correct region…and if not tell us where it i.

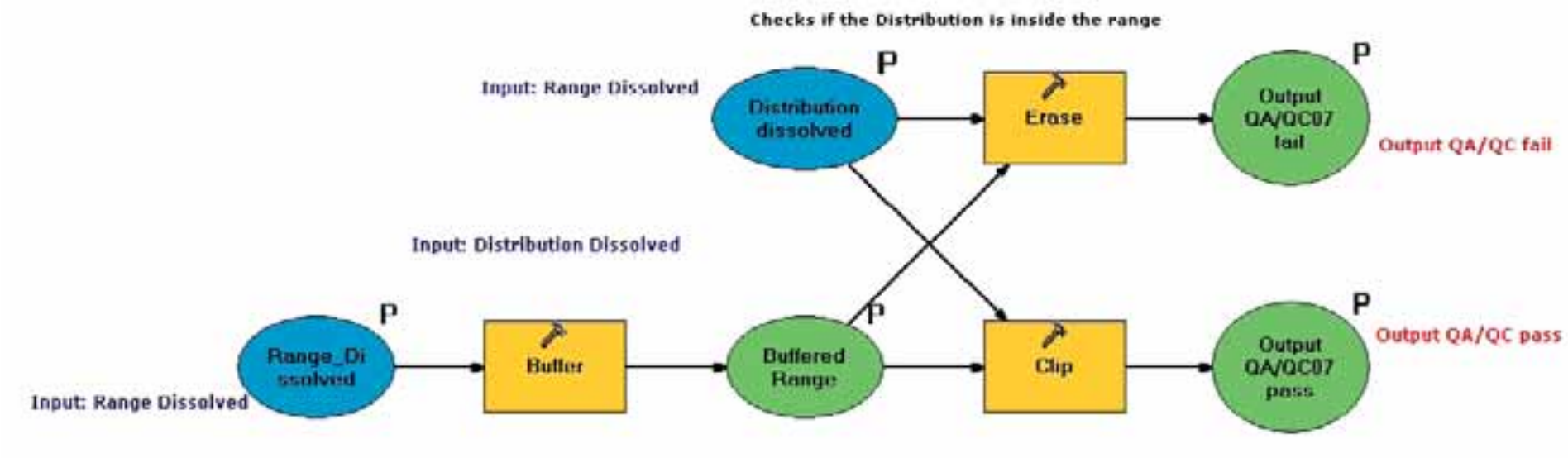


An example of an error flagged up by this model



QA/QC Model Builder

One of the 2 data sets we used to check the quality of the Distribution data was the Range of the habitat or species. This model checks for consistency between these two datasets



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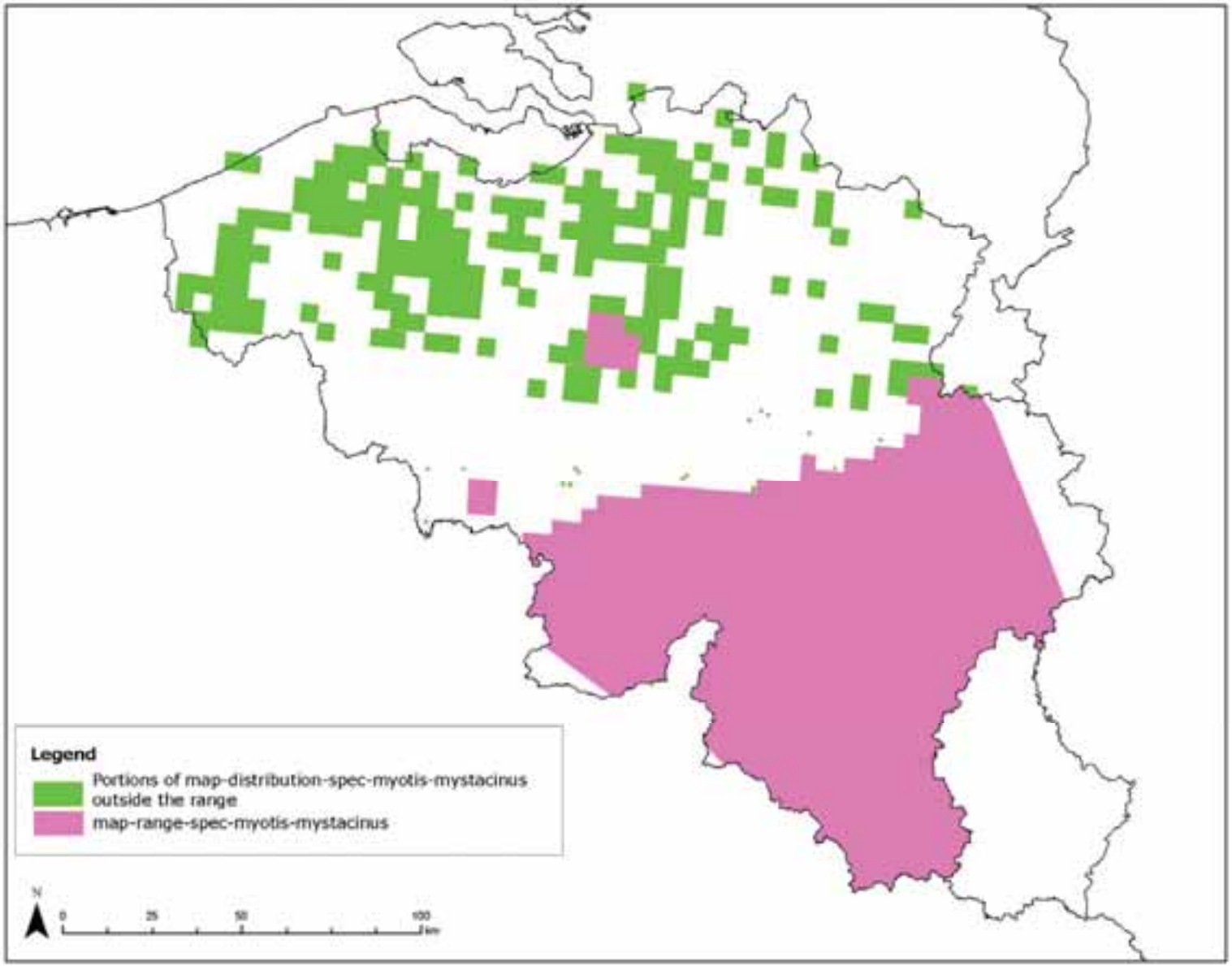
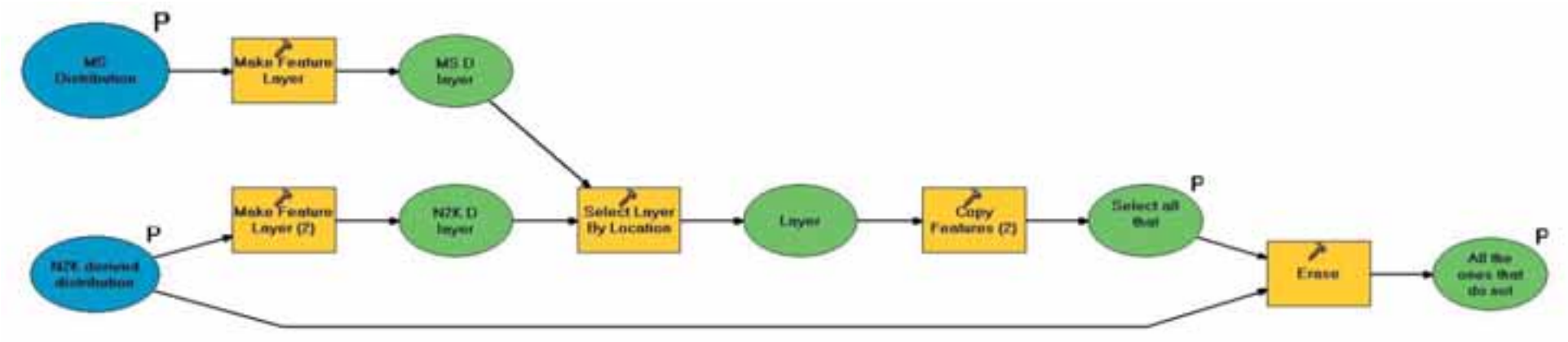
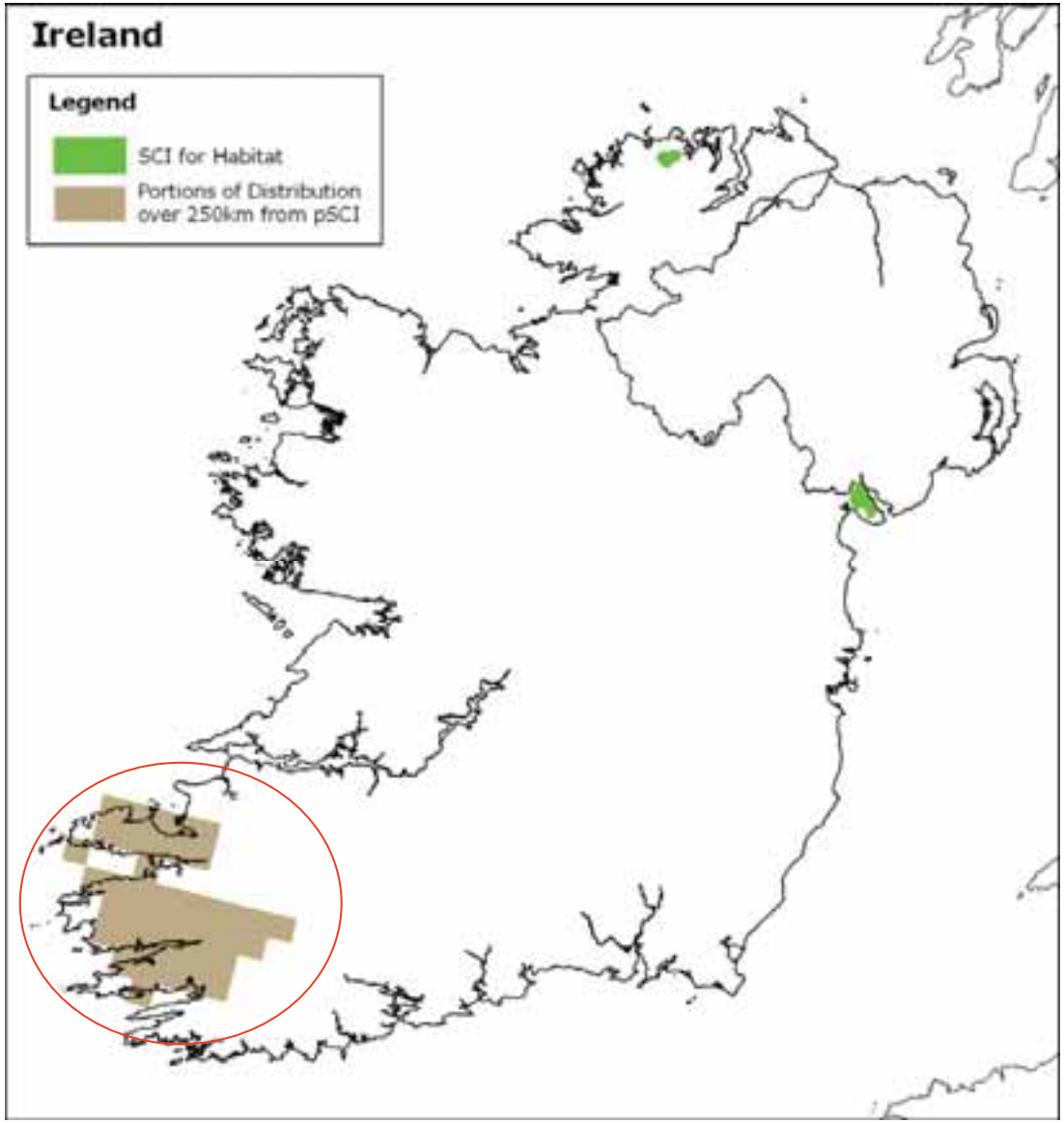


QA/QC Model Builder

The 2nd dataset we used to check consistency were the protected area sites designated for a habitat or species. This model checks the consistency between these datasets.



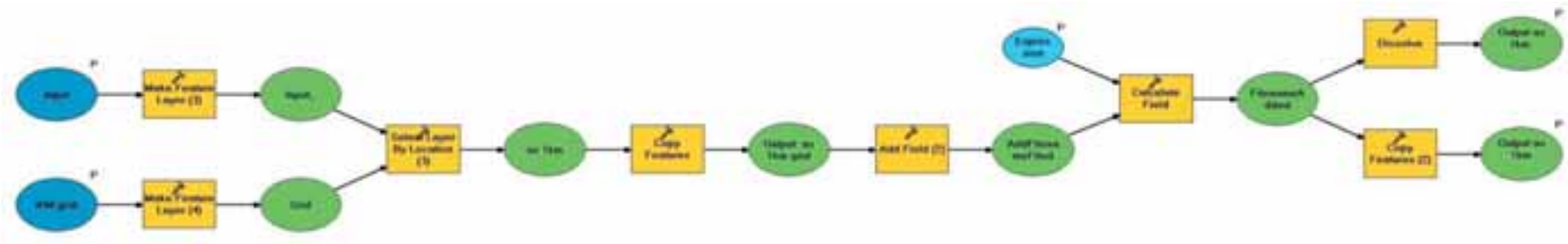
An example of an error flagged up by this model



Merging the data Model Builder

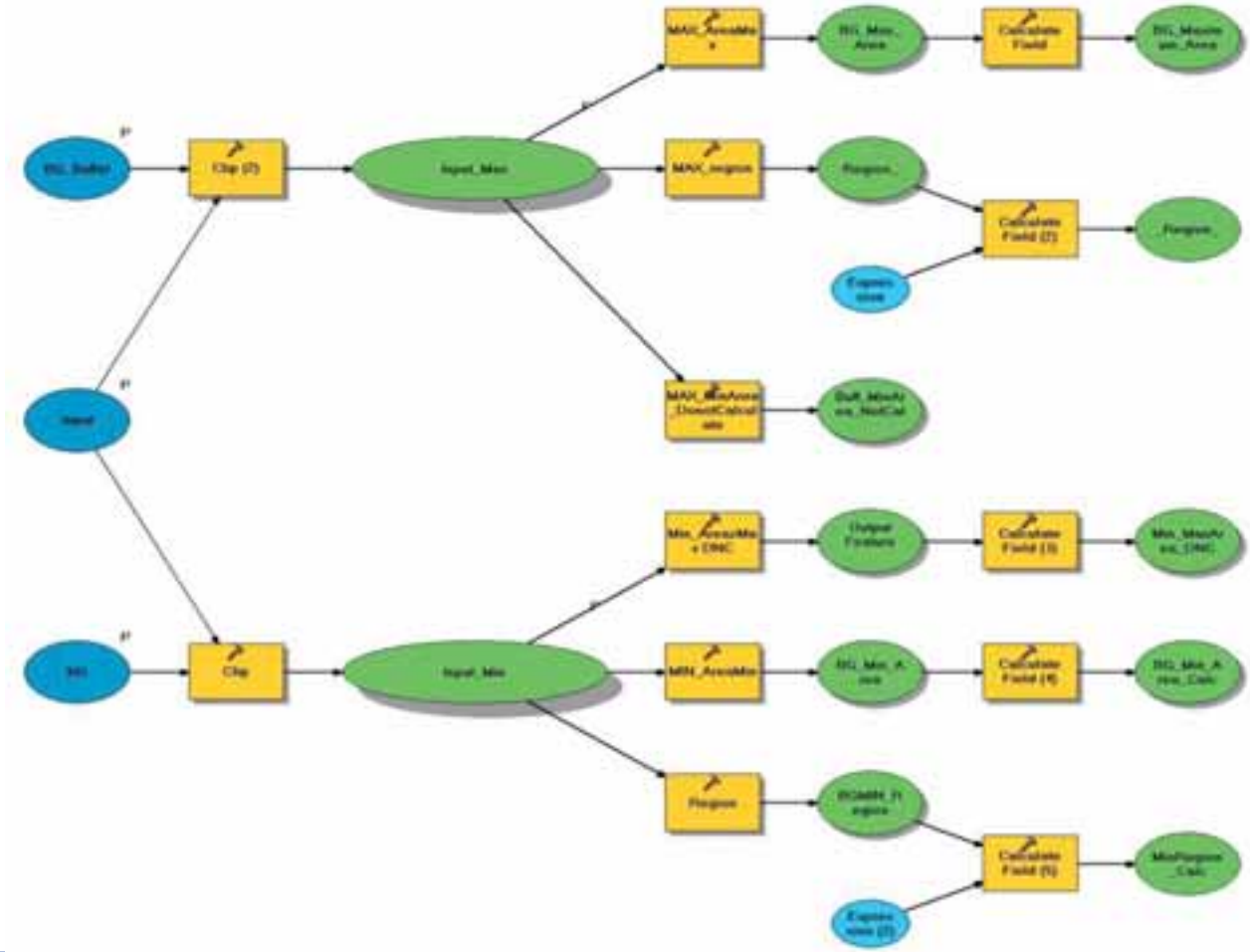
In order to merge the variety of datasets we received and calculate an area to use in the assessments we decided to grid all the data into 10x10km (or equivalent) grid cells in the native projection of each country or in the 10km grid cells of LAEA ETRS 5210.

We turned to Model Builder to realise this.



Merging the data Model Builder

Model Builder was next used to derive all the areas needed



Conclusion

We were faced with a significant problem….how to use the variety of spatial data in order to do the assessments of conservation status- a legal requirement.

At every step of the process we were able to use Model Builder to help us achieve this goal.

With out the availability of such a tool – which is easy to use and doesn't require extensive knowledge of programming –we would not have achieved our goal.

Thanks to this work we were able to calculate meaningful assessments and help influence the protection of biodiversity in the EU. The next delivery of data is in 2 years, time to dust off my python book and get back into model builder!

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