

ATLAS OF EUROPEAN AMPHIBIANS AND REPTILES

SEH'S MAPPING COMMITTEE

The current Atlas of European amphibians and reptiles is based on data collected in the 80's and early 90's and published in 1997. In the meantime, several national atlases at higher resolution (UTM 10x10 km instead of 50x50 km) and based on most recent datasets were available. Current threats to European herpetological diversity, or phenomena like global warming, could have influenced the distribution of many European species recently. The availability of up to date distribution maps at greater spatial resolutions would allow the execution of global studies at larger scales and the application of suitable conservation measures for all Europe. This situation claims for an update of the European Atlas, for which a mapping committee has been created within the Societas Europaea Herpetologica.

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MEMBERS OF THE MAPPING COMMITTEE

The Mapping Committee is formed for the time being by six researchers:

- **Neftalí Sillero** (Chair): Centro de Investigação em Ciências Geo-Espaciais (CICGE), Universidade do Porto, Departamento de Matemática Aplicada, Rua do Campo Alegre, 687, 4169-007 Porto, Portugal; neftali.pablos@fc.up.pt
- **Sergé Bogaerts**: Honigbijenhof 3, NL-6533 RW Nijmegen, The Netherlands; serge.bogaerts@rws.nl
- **Pierre-André Crochet**: CNRS-UMR 5175 Centre d'Ecologie Fonctionnelle et Evolutive, 1919, route de Mende 34293 Montpellier cedex 5, France; pierre-andre.crochet@cefe.cnrs.fr
- **Roberto Sindaco**: Istituto per le Piante da Legno e l'Ambiente, corso Casale, 476 I-10132 Torino, Italia; rsindaco@gmail.com
- **Bert Toxopeus**: International Institute for Geo-Information Science and Earth Observation (ITC), P.O. Box 6 7500 AA Enschede, The Netherlands; toxopeus@itc.nl
- **David R. Vieites**: Museum of Vertebrate Zoology and Department of Integrative Biology, 3101 Valley Life Sciences Bldg, University of California at Berkeley, CA 94720-3140, USA; vieites@berkeley.edu
- **Raymond Creemers**: RAVON, Postbus 1413, 6501 BK Nijmegen (The Netherlands); r.creemers@ravon.nl

NETWORKS OF COLLABORATORS

One of the goals of the mapping committee is to establish a network of collaborators from each European country. The 14th European Congress of Herpetology provided an opportunity for contacting people representative of national societies of different countries interested in becoming part of this network. So far, at least one collaborator is available from the next 18 countries: Austria; Belgium; Bulgaria; Croatia; Czech Republic; Denmark; Estonia; France; Greece; Hungary; Macedonia; Portugal; Romania;

Serbia; Slovenia; Spain; Switzerland; Ukraine.

Name of collaborator (Country)

Andreas Maletzky (Austria)

Mathieu Denoël (Belgium)

Nikolay Tzankov (Bulgaria)

Marija Kuljeric (Croatia)

Ivan Rehak (Czech Republic)

Antigoni Kakintzopolou (Greece)

Petros Lymberakis (Greece)

Yannis Ioannidis (Greece)

Lars Briggs (Denmark)

Riinu Rannap (Estonia)

Pierre-Andre Crochet (France)

Miklos Puky (Hungary)

Judit Vörös (Hungary)

Edoardo Razzetti (Italy and San Marino)

Roberto Sindaco (Italy and San Marino)

Andris Ceirans (Latvia)

Bogoljub Sterijovski (Macedonia)

Claudia Delgado (Portugal)

Raquel Ribeiro (Portugal)

Pedro Tarroso (Portugal)

Ioan Ghira (Romania)

Xavier Santos (Spain)

Anna Perera (Spain)

Ajtic Rastko (Serbia)

Ljiljana Tomovic (Serbia)

Jelka Crnobrnja-Isailovic (Serbia)

Katja Paboljsaj (Slovenia)

Benedikt Schmidt (Switzerland)

Tatiana Kotenko (Ukraine)

Collaborators from different countries are not available yet: Albania; Andorra; Belarus; Bosnia & Herzegovina; Finland; Georgia; Germany; Ireland; Kazakhstan; Latvia; Liechtenstein; Lithuania; Luxembourg; Malta; Moldova; Montenegro; Monaco; Netherlands; Norway; Poland; Russia; Slovakia; Sweden; Turkey; United Kingdom.

Every effort will be undertaken in the next future to expand the network of collaborators and, especially, to make sure to include from each countries representatives of those societies or organizations that hold current national databases of amphibian and reptile distribution, to make sure these societies take part in the discussions of implementation of the project.

DESCRIPTION OF THE PROJECT

The project of the new Atlas of amphibians and reptiles of Europe is based on the consideration that the most important part of the project is the database. Consequently, the maps are not more than an ephemeral product in constant updating. The database should be a lasting and permanent product, which allows the periodic production of a compilation of maps (published in the shape of book, for example) on a relatively fast and simple way.

The project should consider the following requirements:

1. The geographical errors in the location of new chorological records will be accounted for, and curated in records from previous databases, discriminating between records with major associated uncertainty and the rest.

There always will be an error, bigger or smaller (and we want it small), so old data with large associated errors can be discarded for analysis (but should still remain in the database) and only data with small geographic uncertainty should be used where available.

2. The database should be actualized easily.

3. The taxonomy and systematic of the species should be easily modified and actualized.

4. The species distribution maps and the maps of species richness should be produced automatically.

Briefly, the Mapping Committee proposes to make a network of *distributed on-line national databases* (Fig. 1).

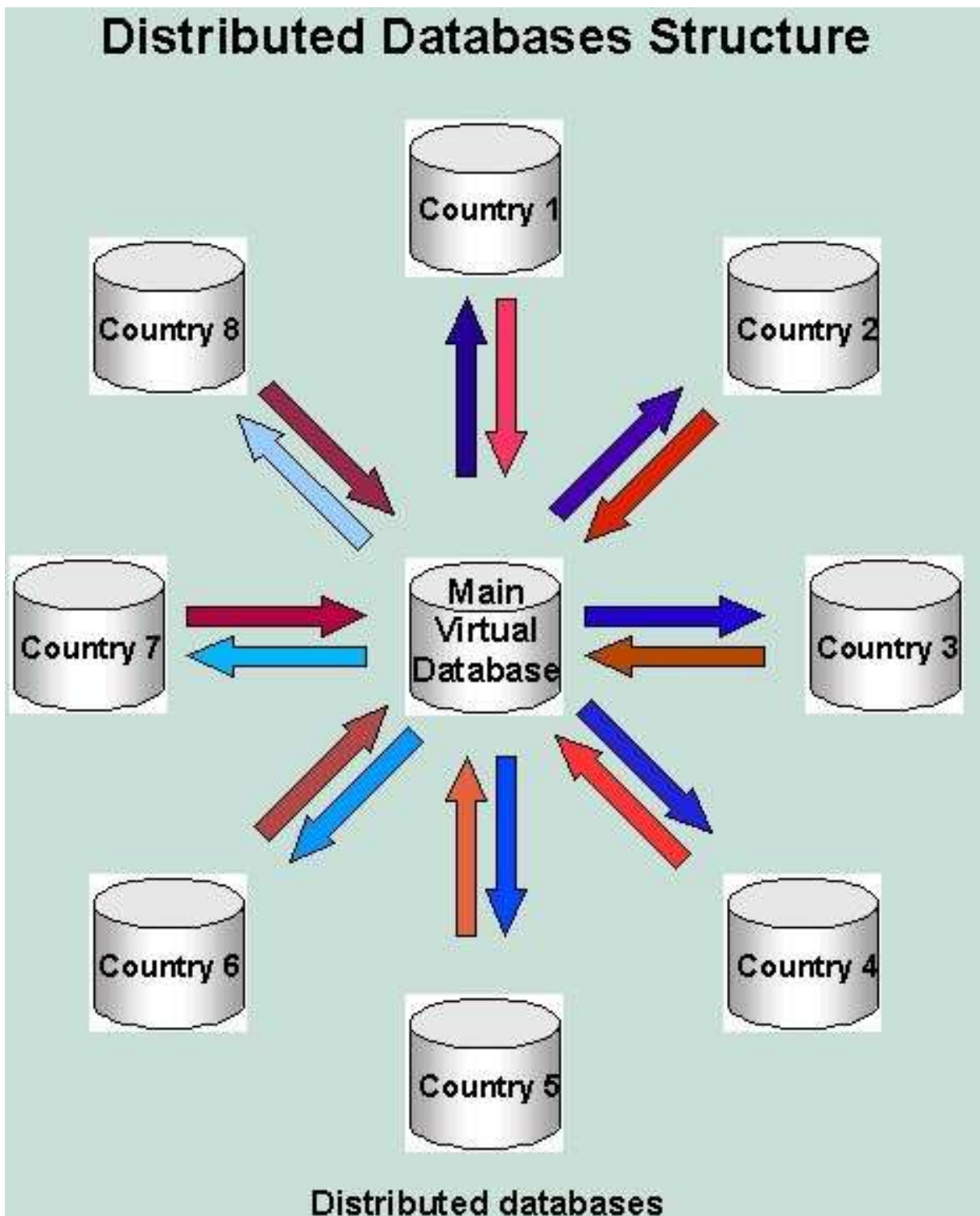


Fig. 1. Distributed databases structure.

The Atlas of Europe will be a *virtual database* in a website. Each National Database will be implemented in an on-line network allowing the communication among them and the sharing of data. Thus, when a user connect to the European Atlas Website and ask for a specific species map, the website will connect to all the on-line national databases and

look for that particular species (Fig. 2 and 3), creating virtually a database with the most recent records, and then a map will be displayed (Fig. 4).

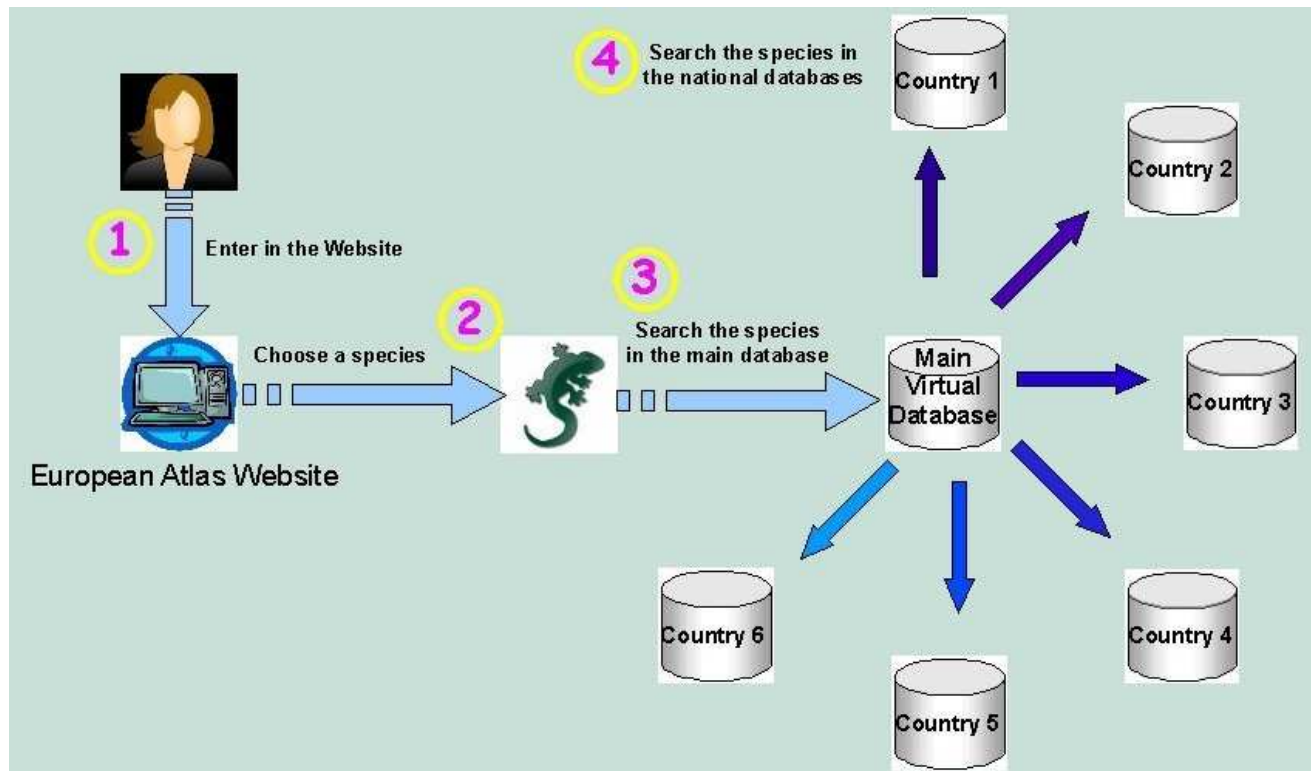


Fig. 2. The user connects to the European Atlas Website and searches for a particular species.

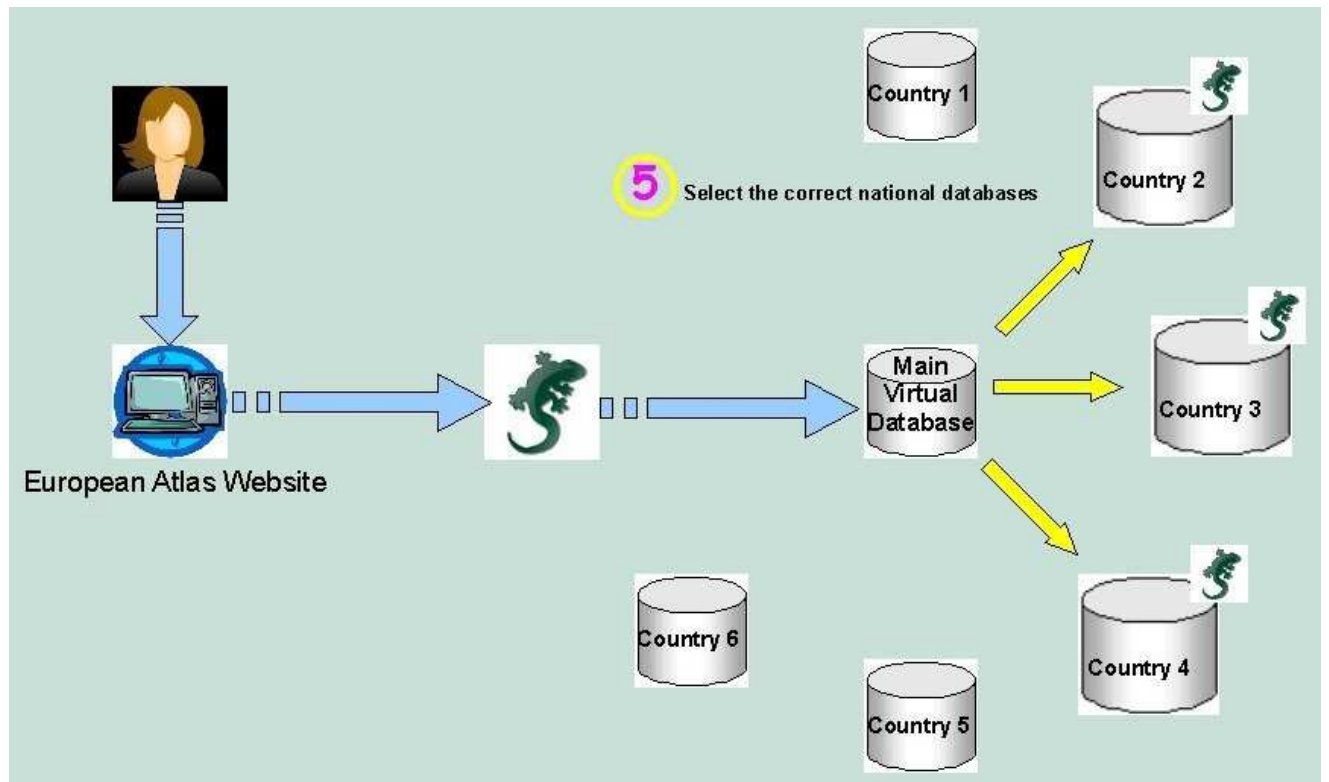


Fig. 3. The national databases including records for that species are selected.

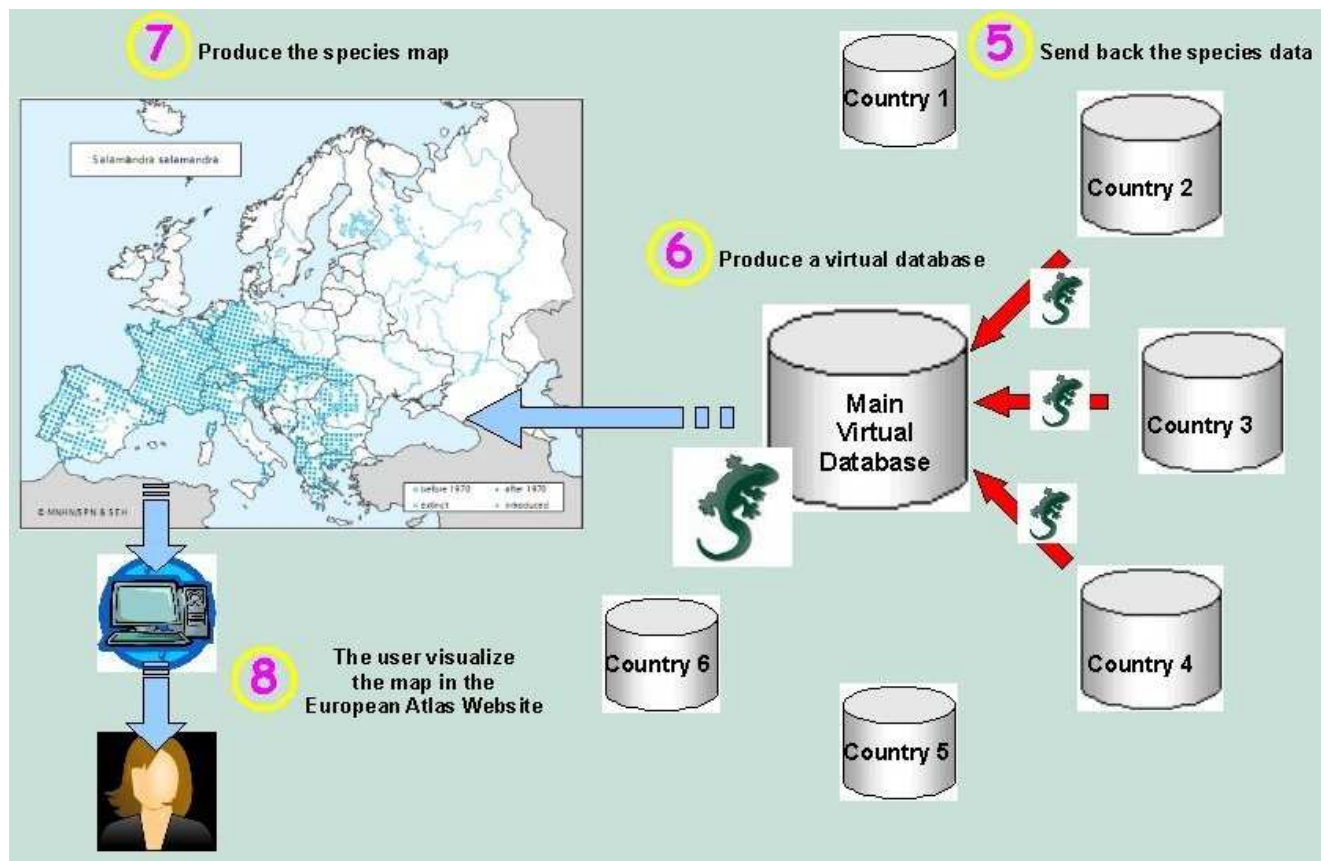
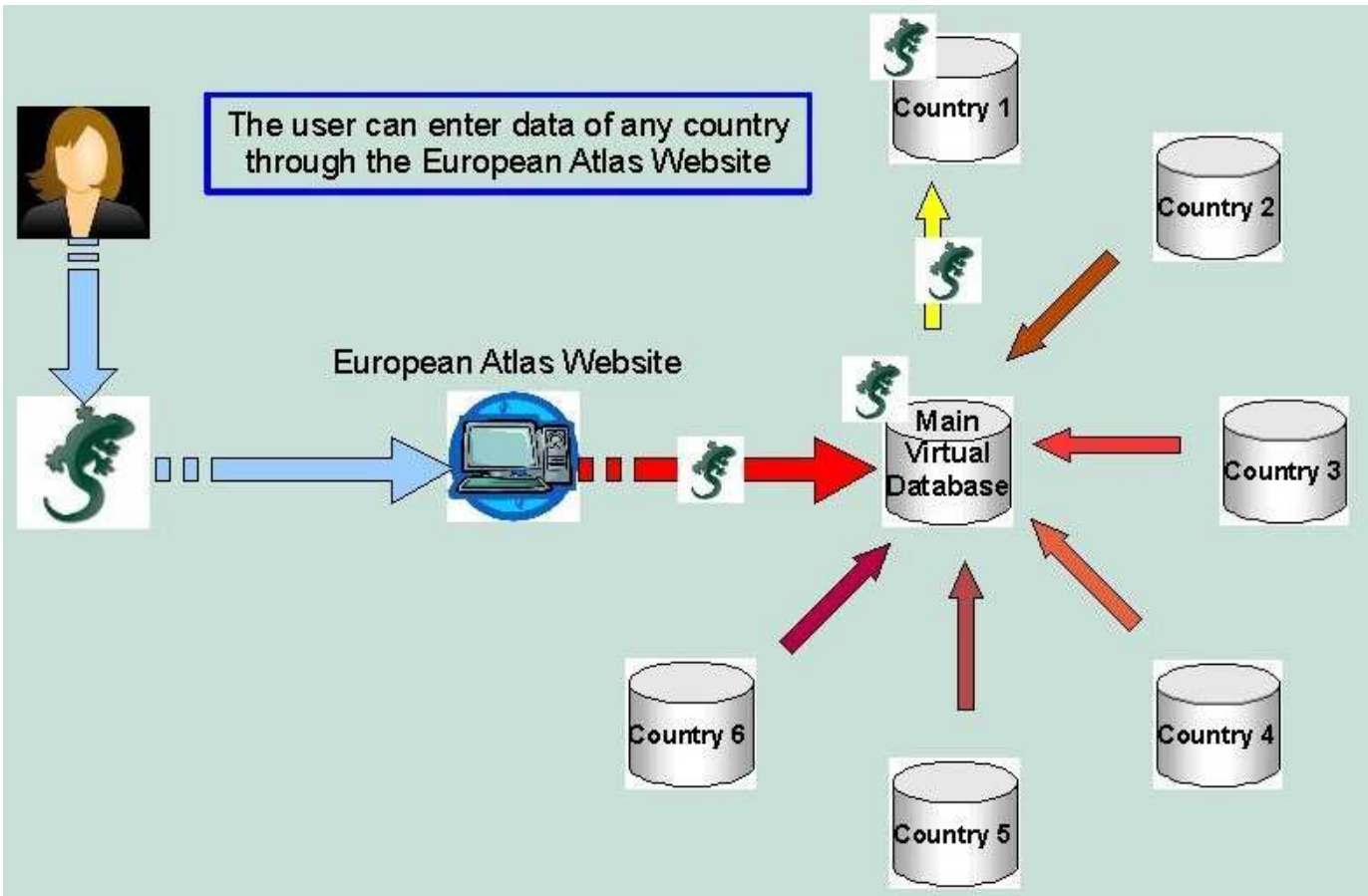


Fig. 4. A virtual database is created with the selected records from the national databases to produce the map.

This methodology can actualize easily the records, as well as the taxonomy and systematics (if all national databases agree with a single taxonomic list). Under this approach, the duplication of databases is avoided and the control of the national databases will remain in the own country. Data will be collected directly through Internet or send to the national committees (Fig. 5 and 6). The virtual database could be built with different levels of data, then, it is independent of data availability. Data can be filtered following the owner's requirements. The database will be controlled by an administrator that receives and filters the data.



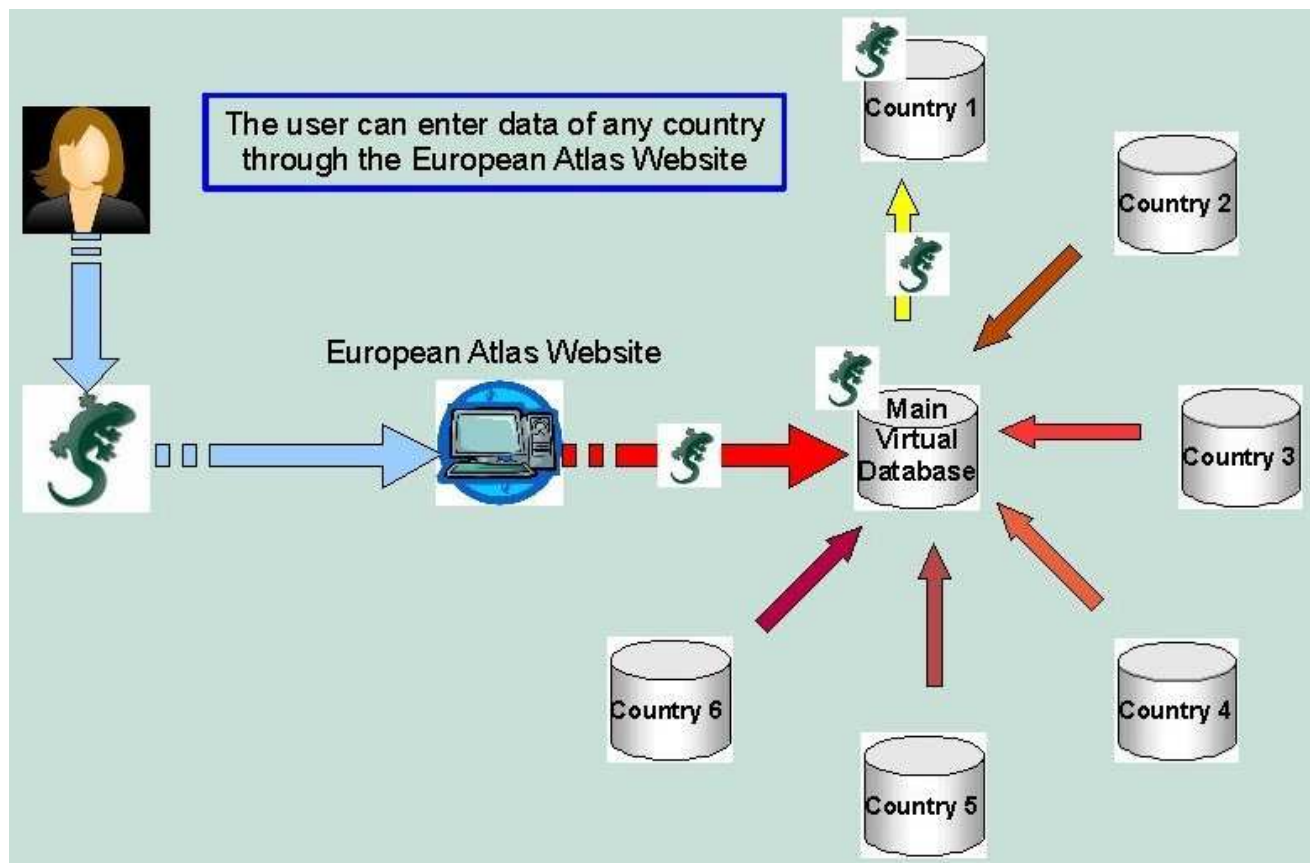


Fig. 5. Data can be send to the national databases through the European Atlas Website.

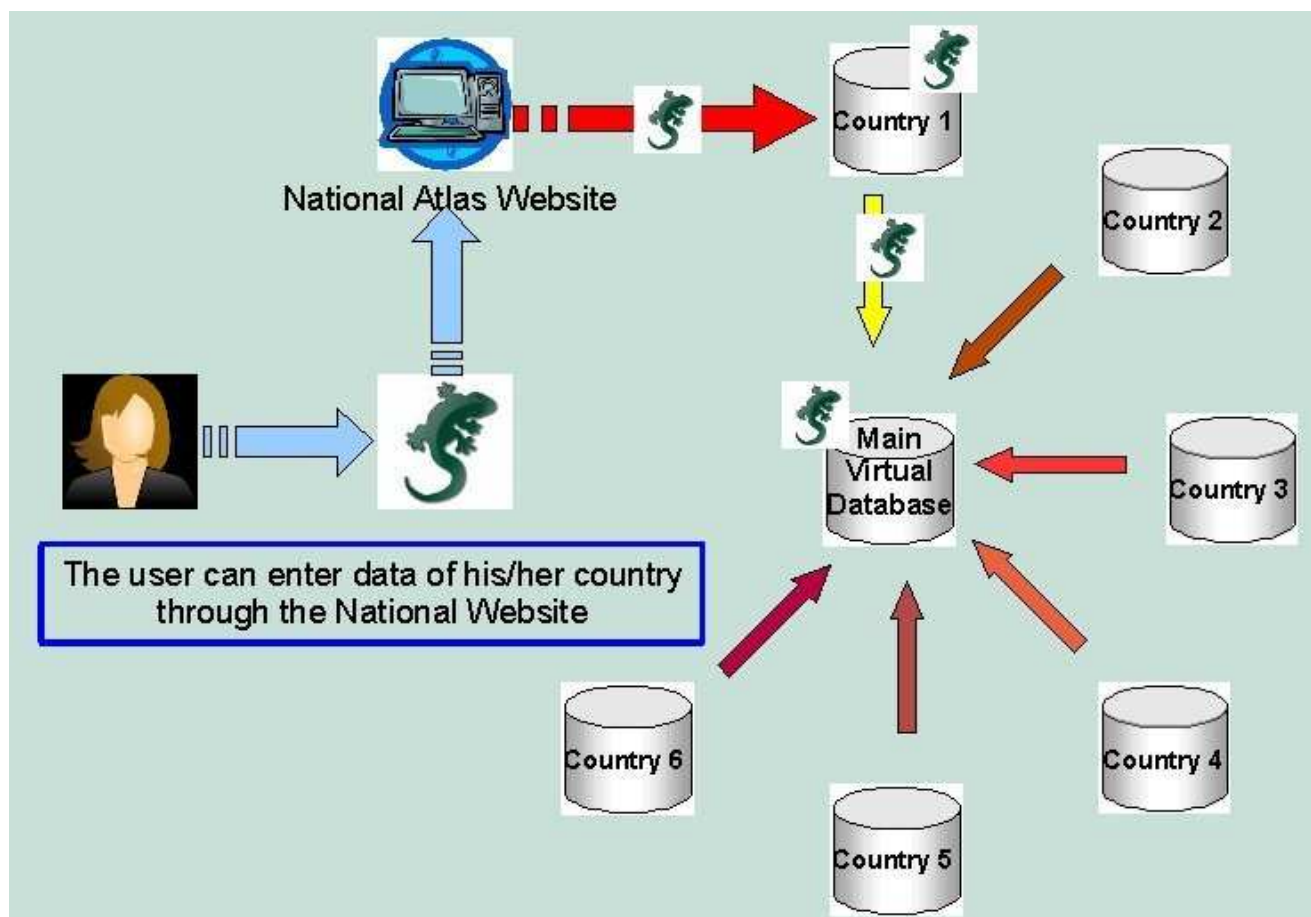


Fig. 6. Data can be send directly to the national databases.

NETWORK OF WEBSITES WITH NATIONAL DATABASES

The network of national on-line databases will avoid the duplication of records if a European database exists parallel to the national databases. This situation would force to actualize all the databases at the same time whenever new records are incorporated, not only in the national databases but also in the European. Hence, the Atlas of Europe would be a virtual database connected to a network of real databases. This system allows to actualize the data in real-time with the most updated records incorporated in the national databases. The records will not be duplicated, remaining the control in each country and/or society responsible for the national databases. Moreover, the taxonomy and the systematic can be modified easily and quickly (if a single “official” taxonomic list will be

adopted by all countries). With this system, it should be easy to produce a compilation of maps periodically.

EUROPEAN ATLAS WEBSITE

Through the website of the European Atlas, the user will be able to visualize the virtual species and richness maps, and introduce new data. The new records will be sent automatically to the chair of the corresponding national database for validation. After this validation, the record will be incorporated to that national database, and visualized in the European species maps. This process does not prevent to introduce records directly in the national databases. The aim of the European Atlas website will be to facilitate the opportunity of introducing data to people working out of their own country.

PROTECTION OF THE WEBSITE: REGISTRATION PROCESS

The user will have to register for accessing to the websites. The websites will ask to give a real e-mail address and to fill an application form. After the acceptance of the application form, a confirmation e-mail will be sent to the user for completing the registration process. The Mapping Committee does not recommend another system of registration, namely based on the user's name, provenance or recommendation by a recognized researcher. The ultimate control remains in the validation and acceptance of records by the National Database chairs (see below). This system allows the participation of all researchers and other volunteers.

INTRODUCING RECORDS

The data will be sent directly on-line through the website of the European Atlas or through the corresponding country website (Fig. 5 and 6). The data will remain in quarantine until they are confirmed by the responsible for the maintenance of the national databases. The validation process will be similar to the publication of chorological records

in a journal The database will support several levels of spatial resolution (10x10 km UTM squares, 1x1 km UTM squares, and GPS points). The data could be introduced also by picking in a map on-line (Google Earth). The website will encourage and accept submission of voucher photographs for each record, which will much facilitate the validation of these records.

VALIDATING DATA

The data will be sent to the website of the corresponding national database. The chair of that database will validate the records. Then, these records will be incorporated to the national database, and in that moment, it will be possible to visualize them in the European maps (Fig. 7).

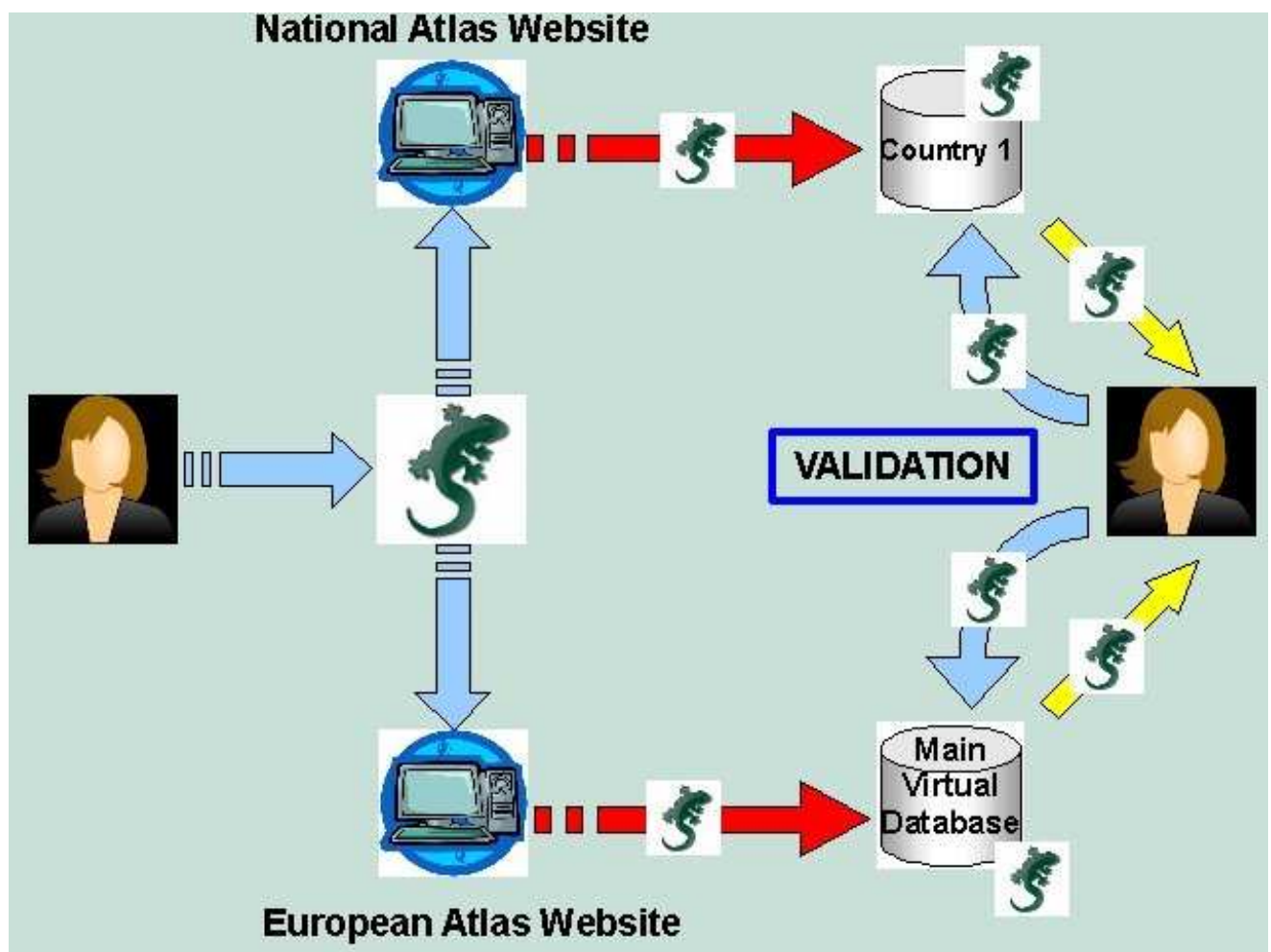


Fig. 7. Record validation process.

VISUALIZING DATA: MAP REPRESENTATION

The data will be visualized after their validation. Using Geographical Information Systems is possible to transform any spatial resolution to the graphic resolution used in the representation of the distribution maps; it is impossible to represent a complete European maps with grids of 10x10 km. Nevertheless, it will be possible to visualize larger spatial resolution (1x1 km UTM squares and GPS points) through a zoom function, in the cases that the data are available by the owners of the national databases.

DOWNLOADING DATA

The data could be filtered according to each national interest for downloading purposes, whether for motives of conservation or by restrictions in the diffusion of the data.

Therefore, this system is independent of the resolution of the data that each country decides to show. The filters could be applied to a particular spatial resolution (e.g. GPS points) or to specific species. However, the possibility to use greater spatial resolutions would allow the execution of global studies at larger scales and the application of suitable conservation measures for all Europe.

FIELDWORK: ACTUAL SITUATION OF CHOROLOGICAL KNOWLEDGE IN EUROPE

It is necessary to decide if fieldwork in the Atlas of Europe will be carried out, especially in those countries that do not have sufficient chorological data and in those areas not yet sampled. This part of the project will depend on funding availability.

STUDY AREA OF THE ATLAS

The Mapping Committee considers that Europe is bounded to the North by the Arctic Ocean, to the West by the Atlantic Ocean, to the South by the Mediterranean Sea, to the

South-east by the Caucasus Mountains and the Black Sea and the water-seas connecting the Black Sea to the Mediterranean. To the East, Europe is generally divided from Asia by the water division of the Ural Mountains, the Ural River and by the Caspian Sea.

Therefore, Europe includes the next countries (47; Fig. 8):

Albania, Andorra, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom, Vatican City, and the NW part of Kazakhstan and the N of Azerbaijan.

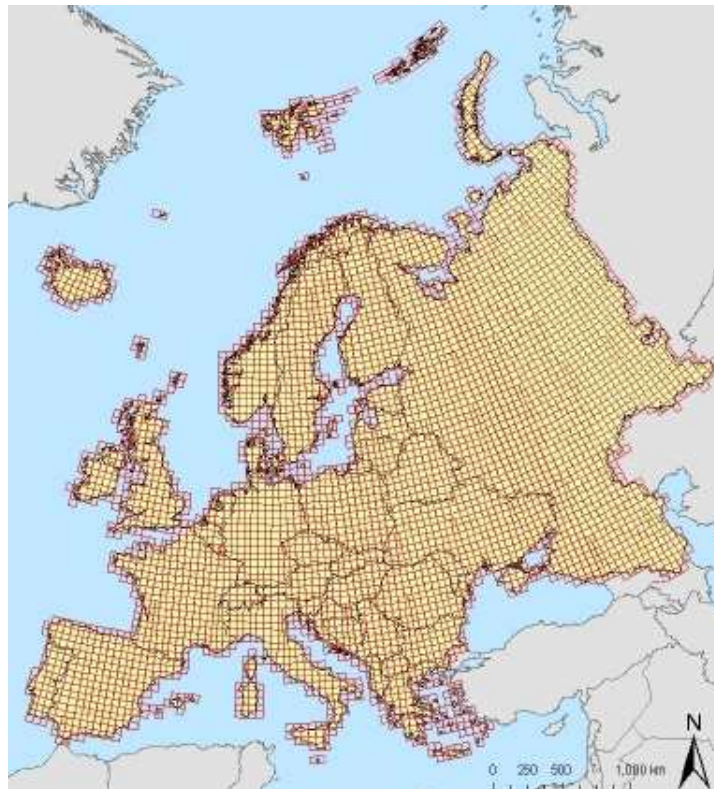


Fig. 8. The European countries considered in the Atlas Project. The UTM 50x50 km is represented.

SPECIES LIST OF REFERENCE

To establish a common species list for all the countries in Europe is a difficult task. For this reason, the Mapping Committee proposes to create a Taxonomical Committee for

discussing and defining a species reference list.

CONTRACT WITH THE NATIONAL SOCIETIES

The Societas Herpetologica Europaea and its Mapping Committee will propose a contract with each National Database in order to establish the cession of the data to the European Atlas, and the conditions of use, collection, validation and sharing of records.

MEETING WITH NATIONAL COLLABORATORS

A meeting of the Mapping Committee and the National Collaborators is planned for 2008, to discuss the actual situation of the European Atlas Project and the participation of the national societies/countries.

EUROPEAN ATLAS BOOK AUTHORSHIP

The editors of the European Atlas book will be the members of the Mapping Committee and a person from each country responsible to the SEH for implementing and supervising the network system.