

Process Book

IUCN Red List



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Motivations

Our website aims to provide a visually engaging and informative platform for users to explore and understand the data from the IUCN Red List. We believe that data visualization is a powerful tool for translate complex information in an intuitive and accessible manner.

One of our key motivations is to raise awareness about the state of global biodiversity and the urgency of conservation efforts. By presenting the IUCN Red List Index on a world map, we provide a comprehensive overview of the conservation status of different countries. The interactive features allow users to explore individual countries and learn more about their specific Red List Index values, as well as the distribution of species across different categories. This empowers users to understand the global picture while also gaining insights into specific regions.

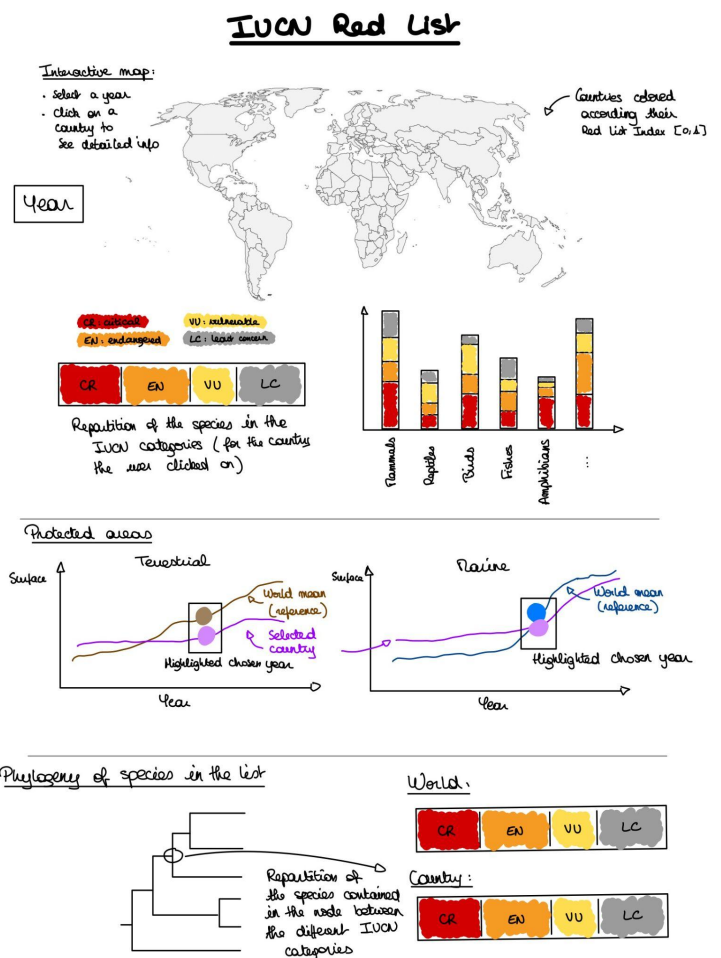
Another motivation behind our website is to highlight the importance of protected areas in biodiversity conservation. By including line charts depicting the evolution of terrestrial and marine protected areas over time, we showcase the efforts made to safeguard vulnerable ecosystems. This visual representation not only demonstrates the progress made but also emphasizes the need for continued conservation actions. By tracking the changes in protected areas, users can gain a better understanding of the impact of conservation initiatives on biodiversity preservation.

Additionally, we are motivated to promote a deeper understanding of the interrelationships between species within a given country. Through the phylogenetic tree and the corresponding bar chart, we enable users to explore the diversity of species present and their conservation status. This feature facilitates the identification of areas that may require greater attention and resources for effective conservation planning.

Overall, our motivations for creating this website stem from the belief that data visualization can play a crucial role in promoting awareness, understanding, and action towards conserving our planet's biodiversity. By making complex information visually appealing, interactive, and easily digestible, we hope to inspire users to engage with the IUCN Red List data and contribute to the collective effort to protect our natural heritage.

Workload split

In accordance with Milestone 2, we have divided the website into three distinct components. Consequently, it became apparent that the website development process should also be divided into three separate parts. While each module can be independently developed, it is crucial to ensure seamless integration among them. This involves establishing a harmonious interconnection with the selected country, which can be changed on the world map, as well as accommodating the selected year, which will dynamically affect the visual representation of certain graphs.



Walkthrough first component

Ludovic Burnier

The first component of our website required extensive data processing. We began by obtaining a geojson file for the world map, which served as the foundation for our visualizations using d3js. However, matching the country names in the geojson with the corresponding IUCN Red List Index values posed a challenge, requiring us to ensure consistent matching.

Next, we focused on creating two JSON files for the graphs showing the distribution of species in the IUCN categories. This involved careful formatting of the data to ensure seamless integration into the visualizations.

The map visualization presented its own set of challenges. One particular hurdle was achieving a bold border display in the foreground when a country is selected, highlighting its importance. Additionally, we implemented a non-linear coloration scheme to enhance visualization, opting for a more nuanced representation rather than a uniformly red map to we would had with a linear scale. To provide further context, a legend with a detailed scale was included, enhancing the understanding of the colored countries informations.

While the two graphs below the map were relatively less complex to implement compared to the map visualization, the main challenge lied in meticulously formatting the data to facilitate easy integration and seamless interaction between different components.

Walkthrough second component

Colin Hofmann

The second component also starts with some data processing/cleaning. We first have to match the countries to those on the map so we can display the data corresponding to the selected country. Sadly, due to the data itself, not all countries can be matched. Next, we have to make sure that the whole data makes sense as a percentage (i.e. values above 100%). We export this data as a JSON so we can get it for the website. This is done twice, once for the terrestrial data and once for the marine data.

Once we access the JSON on the website we need to display the charts. We draw the line corresponding to the selected country above. We also choose to display the world mean at all time to give some comparison point to the data of each country. We do that for both graphs.

Finally we also add little circles to display the selected year above. This is useful to select a given year on the line chart that corresponds to the year displayed on the map. Once again, due to a lack of data, not all years can be displayed. We made the choice to simply remove the circles in such a case.

Walkthrough last component

Perrine Kergoat

The last element of the website is a phylogenetic tree that display taxa (group of species) by taxa its threat level. The first step was to create the JSON file that regrouped the hierarchy of the species and their threat level, and add to this the taxonomic groups that are not present on the dataset but are essential to understand the phylogenetic tree. It first consisted in using NCBI phylogenetic reference tree, then we add scores to this hierarchy to reflected the proportion of critically endangered, endangered and vulnerable species contained in each group.

From the initial idea to display the threat levels for each taxa, it appeared to be impossible to do because of the poor data quality accessible for some of the taxa. Indeed, uncommon, microscopic or barely studied species don't have reliable data in term of number of species threatened. Besides, it creates disequilibrium with well documented species and comparing them would be biased.

When considering the example of the *Asteroidea* also called Sea Stars, only 1 species is taken into account for the database and a very few of them are register in the full IUCN database. In reality, biologists identified thousand of species but because of criteria of IUCN organisation and requirement, deeper knowledge is required to be of the IUCN list. This why comparing taxa for which knowledges are very different would give a distorted vision of the reality.

To display as clearly as possible the rather complex and large data, it was chosen to create a tree that would expand when clicking on the parietal nodes. This way, the tree would display a reasonable amount of data and once understood by the viewer, he could dig in the details and understand the following nodes of the tree.

Unfortunately, due to a wrong way of coding this part, it created a d3.js versioning problems that could only be solved by using an iframe. The raw code for this part is available at : https://gavinkaa.github.io/dataviz_iframe/.