

# Heuristic Evaluation Report

Findings and Insights for **GLANSIS** website

Prepared for

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## Executive Summary

Using the ten Nielsen Heuristics, we evaluated the GLANSIS site, focusing on the species generator and Ed Hub. The purpose of heuristics is that they are broad and can provide a framework to make recommendations to improve a website's usability. These heuristics and their importance can be found in appendix 4.

To complete this analysis, we looked through the site individually, looking for exceptions and compliance with the heuristics and identifying improvement methods. Given the constraint that the website is split between different servers, some of the recommendations may not be feasible at this time and could take inter-agency cooperation to complete. Based on our investigation, small changes could be implemented to improve the usability and follow the heuristics:

- lessening the cognitive load on users by providing auto-complete on the species generator search
- Making the clickable area of the species generator results clear
- Ensuring that internal links open in the same tab
- Providing keys for the map features and color overlays
- Providing breadcrumbs through the website to ease and remediate errors will greatly improve its usability of the site.

## Introduction

When evaluating the GLANSIS site for heuristics, we are specifically looking to see if the website follows a similar framework as what is considered the norm and make recommendations to help improve the usability through this framework. This method of investigation works well in this situation because it offers us a list of “rules” to follow and check that the website is following. Abiding by these “rules” can provide insight into making small changes that significantly impact the site's usability. This will specifically help provide a framework to ensure the site's usability for citizen scientists, students, and teachers. While also ensuring that features that primarily focus on biologists are discoverable and have a clear path to use.

## Methods

We decided to utilize Nielsen's heuristics(see Appendix 3). We established the focus of the evaluation beforehand to target the Education Hub, Species List Generator, and Contribute page, which the client had marked as critical. The evaluation process involved each team member conducting a comprehensive audit of the three pages and noting ten heuristic issues or benefits in a shared Google sheet. We then convened as a group and presented our respective findings. Finally, to consolidate the outcomes, we selected the most critical discoveries from our individual evaluations and merged them into four main points.

To determine the priority and severity of each discovery, we put ourselves in the shoes of a first-time user of the GLANSIS website and consider whether this issue would be critical for the users to leave the site and choose a competitor of GLANSIS. Below are our criteria:

	<b>Severity Level</b>	<b>Description</b>
<b>1</b>	Minor Issue	Does not affect the usability of the site, but could improve the aesthetic of the website design
<b>2</b>	Moderate Issue	Does not impact the realistic usability of the site but does reduce the ease of use and breaks standard
<b>3</b>	Major Issue	Makes the site difficult to navigate and use
<b>4</b>	Extreme Issue	Impacts the usability of the site and is critical to affecting the user's choice of product.

## Findings and Recommendations

### Summary Results

Based on Nielsen's 10 Usability Heuristics and our severity criteria, we identified four key findings that cover all heuristics regarding the overall website design, the "Contribute" Pages, and the "Species List Generator" pages.

#### **Finding 1: Lack of constraints and aids for input fields.**

The input fields for the genus, species, and common names on the Species List Generator page do not impose any restrictions on numbers and special characters. However, this lack of constraints violates the heuristic of error prevention as it does not prevent users from entering incorrect types of characters. Additionally, the search query can only generate results if users can accurately recall and enter the exact name of the species, thereby violating the heuristic of recognition rather than recall.

#### **Recommendations:**

We recommend that GLANSIS limit the input fields only to accept Latin/English alphabets to prevent users from mistyping numbers and special characters. Additionally, we suggest adding search recommendations or an autofill feature to enable users to recognize instead of recall the species' names.

#### **Finding 2: Breaking Consistency of Internal Linking**

The majority of the GLANSIS site opens internal links in the same tab and external links in a new tab. There are times when this is broken, specifically the information link that takes you to the data dictionary in a new tab. When testing this on multiple web pages, issues were discovered of links being broken. I found that approximately 74 links need to be fixed.

#### **Recommendations:**

Ensure that all internal links present open in the current tab and external links open in a new tab. Further ensuring that all links on the site are usable and current will help to further the accessibility of GLANSIS resources. A table of dead links found on the site can be found in Appendix A.

#### **Finding 3: The Contribute Page has too much text and is not clear enough**

There is no design for the "Contribute" Page of the GLANSIS website, it only provides a list of text and links to the users without information hierarchy. Even though this is only an issue that violates the heuristic of aesthetic and minimalist design, the contribute page is one of the major functions of the website that requires user interaction and contribution. If the instruction on the "Contribute" Page is not straightforward and attention-catching enough, it is very common for users to neglect this function.

### Recommendations:

To catch users' attention and provide straightforward contribution requirements, we recommend the GLANSIS website reduce the text on the Contribute Page and provide an image example of the requirement. It will also be very helpful if the website provides a template for users to interact with.

### Finding 4: The map on the Species Generator Filter page could be more informative

The current idea of having a map that visualizes the selected water area for users is very helpful and user-friendly. However, the orange patch on the map does not have a key to indicate what it represents. It covers most of the blue area on the map, and it is common for users not to pay attention to the blue color code. Users have to click around and test the filter function to discover that the map visualizes user input. For those who are not familiar with geography and watershed names, finding the name of the wanted watershed without any hint could also be time-consuming. This function could be improved if it follows the Heuristic of Recognition rather than Recall and the Heuristic of Help and Documentation to provide more information as cues to help people understand the meaning of the map.

### Recommendations:

To provide help and documentation to the map and explain the color code of the image, we recommended the GLANSIS website add a legend for it. To avoid the gray created by the overlapping of blue and orange colors and increase the aesthetic of the design, we suggest representing the selected region using a hatch with a thick outline. To assist users in recognizing the map's content, adding the name of the lake on the map and creating a mutual selection system between the map and filter input will be helpful. If the users are able to select the watershed they are interested in by clicking on the map instead of going through a long drop-down list, the search efficiency will increase.

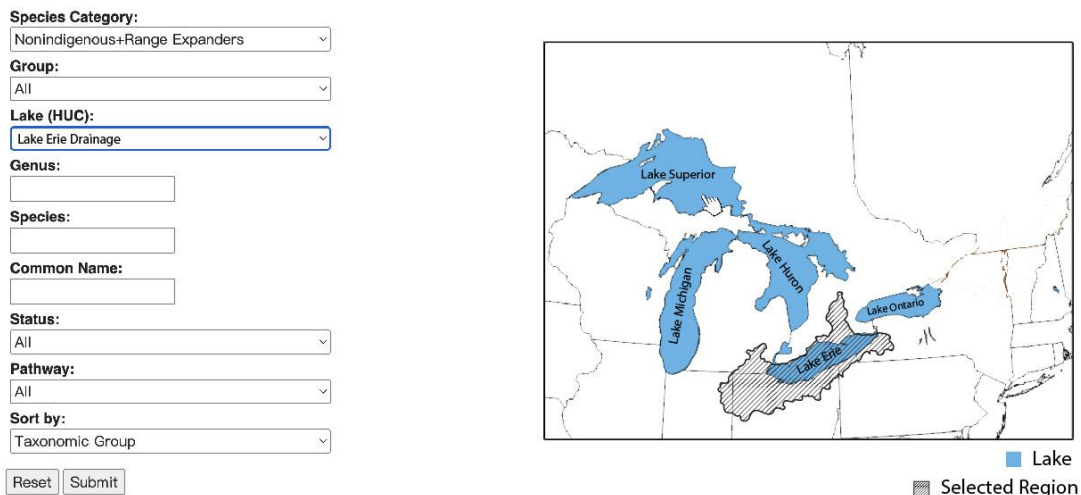


Figure 1: Search Input Page Redesign

### Finding 5: Species generator results sheet can have a more intuitive layout

The heuristic “Aesthetic and Minimalist Design” advises prioritizing content and features to support users. However, the same font size in the header and content sections can cause a loss of priority. The table's excessive width and small font size result in loose text and slow reading speed. Additionally, the two lines of reminder text in the upper left corner of the table are not conspicuous enough, leading to user confusion about downloading and sorting columns by clicking on headers. Moreover, the "click for species profile" text is not visible enough and not positioned strategically, causing uncertainty about clickable links. The header of the species list not remaining on the page as scrolling can impact the user's ability to find needed information, violating the recognition over recall heuristic.

### Recommendations:

In the wireframe, I increased the font size of the header to make it more noticeable. I narrowed the table for more compact text, enabling faster browsing. "Click to open profile" was moved to the "OPEN" button in the first column for more intuitive navigation. The header now sticks to the top when scrolling, and the "sort" and "download" buttons are placed with other functional buttons. Additionally, I located the filter search at the top of the table to improve efficiency and prevent the need to go back to the previous page.

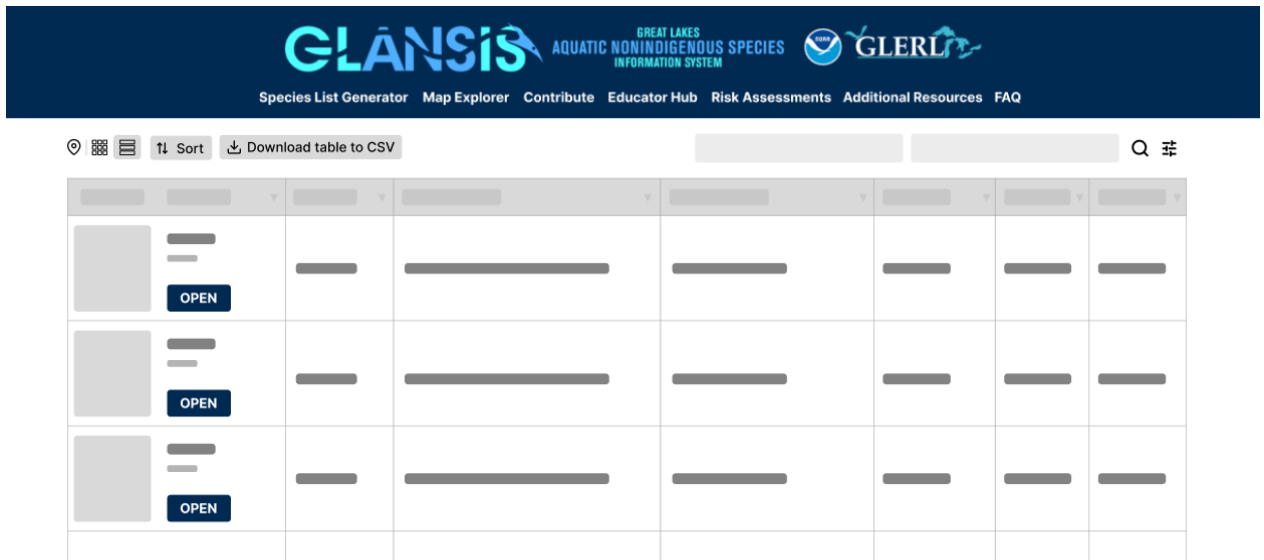


Figure 2: Search Result Page Redesign

## Discussion

While a heuristic evaluation provides insight into general rules and traditional guidelines, it can fall short for niche user groups. Given that a large user group is professional field biologists, some of the recommendations may not consider what is commonplace for these individuals. Furthermore, since none of the evaluators have professional experience as a scientist, the likelihood of misjudged vernacular is present. GLANSIS also has an additional constraint of not being housed all in one server so suggested pathways and solutions may prove to be difficult to implement. To further our recommendations and understanding of needed improvements a usability test with field biologists should be conducted with specific tasks given for using the species list generator and Ed Hub.

## Conclusion

Through heuristic evaluation, we determined that lessening the cognitive load on users by providing auto-complete on the species generator search, making the clickable area of the species generator results clear, ensuring that internal links open in the same tab, providing keys for the map features and color overlays, and providing breadcrumbs through the website to ease and remediate errors will all greatly improve the usability of the site.



## Appendices

### 1. GLANSIS Heuristic Evaluation Sheet Final

### 2. GLANSIS Broken Links

### 3. Interpretation of the heuristics

- Visibility of System Status
  - Communication with the user regarding where they are in the system and the results of their actions on the system. Helps to build trust between the users and the product.
- Match between the system and the real world
  - Using vernacular language that is what the user would use in the world, as well as presenting the information in a logical formation
- User Control and Freedom
  - Providing the user with an easy “out” if an error occurs if they would like to return to a previous page. Prevents user frustration.
- Consistency and Standards
  - Website follows the same guidelines within its own site as well as the industry standard. This helps to limit the cognitive load of the user.
- Error Prevention
  - Messages and other communications with the user to limit the likelihood of mistakes.
- Recognition rather than Recall
  - Minimizes users’ cognitive load by allowing them to see all of the options and possible actions they can take.
- Flexibility and Efficiency of Use
  - Multiple pathways to the same goal, helping to cater to both novice and experienced users
- Aesthetic and Minimalist Design
  - Ensure that visual elements of the interface support the user’s primary goals
  - Given the guidelines and recent UI makeover of this site, this heuristic was minimally examined
- Help users recognize, diagnose, and recover from errors
  - Messages regarding errors should be specific and easily understandable by the users
- Help and Documentation
  - The system should be easily understood without explanation. If documentation is needed, it is easily accessible.

4.  UXtacular\_HeuristicDeck.pdf