

# Usability Testing Report

Findings and Insights for **GLANSIS** website

Prepared for

Rochelle Sturtevant

[rochelle.sturtevant@noaa.gov](mailto:rochelle.sturtevant@noaa.gov)

**UXtacular**

Liwen Wu, Qianzi Li, Rosalie Morrissey, Ziyang Zhou

[uxtacular@umich.edu](mailto:uxtacular@umich.edu)

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## Executive Summary

For our final evaluation of the GLANSIS site, we focused on the site's usability by individuals in the desired demographic and employees at local management agencies. After repeated contact with a variety of individuals within the Great Lakes region, we were still having issues getting a high enough quantity of participants. To accommodate this, we had biology students participate in testing. The tasks used were designed to look at the ability of users to quickly find information regarding individual species introduction and management in the lakes, as well as finding resources within the Educator Hub and utilizing the Contribute functionality. Some information was found quickly and efficiently throughout testing. The scalability and information architecture of an individual species page repeatedly performed well in tasks when looking for specific information on the profile page. We did identify possible solutions for the issues that arose during testing, including the following:

- Modifying the search function on the home page to be a general search function for the entire website
- Aiding in error prevention by allowing the user to add an “s” to the end of a common species name
- Ensuring discoverability of the sort features on the species generator list by adding a filter section below the text and above the table
- Modifying navigation bar to include more functionality from the website, including the contribute page
- Providing clear expectations for individuals regarding how their invasive species data will be used and shared by GLANSIS.

## Introduction

Evaluating the GLANSIS site for usability required our team to recognize the demographic of desired users and create tasks that asked users to identify a variety of information from different parts of the website. We focused on finding individuals that had some formal education in biology at the college level and usability of the Species List Generator, Contribute, and Educator Hub. We had users look for the year of a fish's introduction to the Great Lakes and its impact on the Great Lakes ecosystem. We had individuals look for posters and videos within the Educator Hub and find directions to contribute to GLANSIS. Using usability testing to answer these questions allows us to identify issues for a niche group of users, and biologists, giving us insight into how to improve the GLANSIS site for a valuable user demographic. Through this study, we were able to identify a variety of discoverability issues regarding some of the functionalities and ways to improve the user experience within the site.

## Methods

We conducted usability tests with five individuals asking them to complete five different tasks regarding information searching on the GLANSIS website.

To complete the task, we divided the procedure into six steps:

1. Recruit Participants
2. Develop Usability Test Protocol
  - a. Preamble
  - b. Consent Form
  - c. Tasks and Criteria
  - d. Debrief Notes
  - e. Post-Test Questionnaire
3. Design Test Setting
4. Pilot Testing
5. Usability Testing
6. Testing Result Analysis

## Recruitment

The recruitment process for the usability test was difficult. The ideal participants are workers at various local invasive species management agencies, but we were not able to recruit enough responses from the ideal user group. We sent out a total of fifteen emails to different agencies but only received two responses, and one of them was not available within the time frame of the project. Thus, we settled for our second option: people with a biology background. Three of the participants were randomly selected and recruited from the Biology Building at the University of Michigan.

A brief of the participant information:

	State	Role
Participant 1	MI	Employee at Local Management Agency
Participant 2	NY	Former Biology Student
Participant 3	MI	Biology Student
Participant 4	MI	Biology Student
Participant 5	IN	Enthusiast

Due to the time and location limit, biology students and Michigan is over-represented in the participants. Nonetheless, all of them provide helpful insights about the navigation, usability, and visual design of the GLANSIS website.

### Usability Testing Protocol

The Usability Test Protocol contains four main sections: Preamble, Consent Form, Task and Criteria, Debrief Notes, and Post-test Questionnaire (See complete Protocol in the [Appendix](#)). In the Preamble, we explained the purpose of the testing and the method of “thinking out loud” to the participants. We also made sure that the participants understood they were not being evaluated.

The tasks of the usability testing target the “Species List Generator,” “Contribute,” and “Educator Hub” of the GLANSIS website. The tasks ask participants to find a specific piece of information on the web, starting from the home page. We evaluate the usability of each function based on the level and time of completion from the participants.

The debrief notes ask users about their general experience and thoughts about the website. The post-test questionnaire collects the participants’ information regarding their familiarity with the invasive species, technology, and database websites.

### Test Setting

Three of the tests were completed online via Zoom with one facilitator and one note-taker. During the test, we used screen sharing and screen recording to record and observe the moment of the user’s cursor. The facilitator would read through the task first and then share the task in the chat box as a visual reference for the participants.

Two of the tests were completed in person in the Biology Building at the University

of Michigan. The facilitator and participant would complete the test while sitting down in a quiet space, the note-taker would sit behind the participant to observe the action. The participant will complete the task on a laptop with screen recording, and an iPad with the task description will be placed on the right for reference.

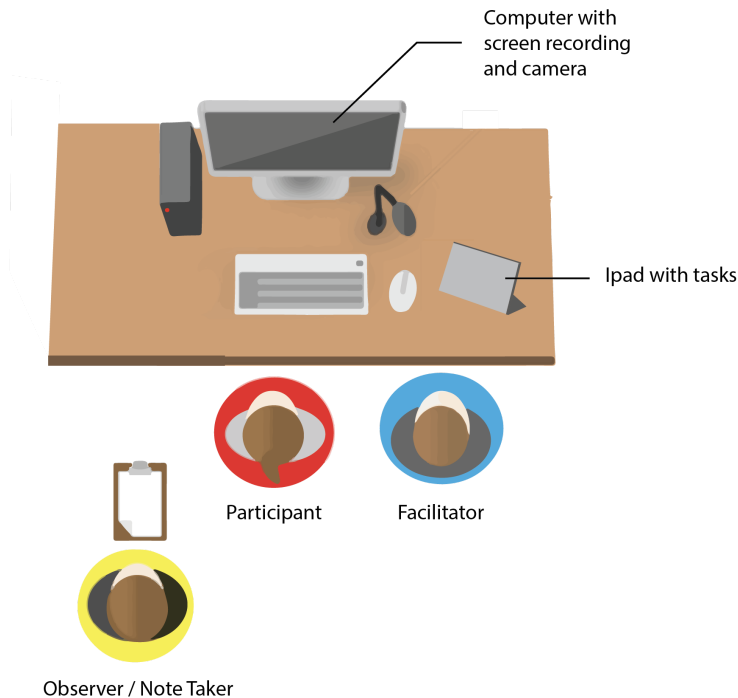


Fig 1. In-Person Usability Test Setting

### Pilot Testing

The pilot testing helped us to catch possible flaws in the protocol. We conducted a pilot test with a graduated biology student via Zoom. We observed the completion and followed up with questions as needed. Overall, we received positive feedback on the protocol, but the wording and instruction of the task could be improved to be less prompting.

### Testing Result Analysis

To quantify the testing result, we give each step of the task a score of 1-3 based on the completion level and time. A score of 3 means that the participant completed the task within the time limit, and 1 indicates that the task failed. After the test, we created a data logging form (see complete form in [Appendix](#)) and calculated the average of each score to identify the section of the website that needs the most improvement.

## Findings and Recommendations

### Summary:

Based on the data gathered from these tests, we have identified four key findings that cover search features, sorting functionality, navigation, and content presentation.

### Finding 1. Improvable Search Feature on the Home Page

Throughout all testing sessions, participants experienced some difficulties while attempting to locate the necessary information, particularly in Tasks 4 and 5, which required searching for posters and videos. The current search feature on the home page only allows the input of precise gene and species names, thus failing to accommodate user search queries for common names and other pertinent resources. As a result, users experienced frustration and decreased efficiency during data gathering.

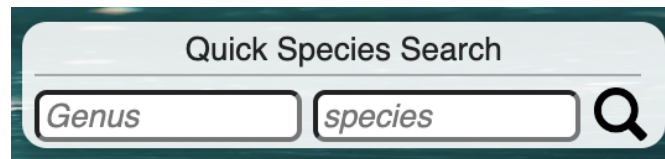


Fig 2. Search Feature on Homepage

### Recommendation:

Substituting the existing search bar on the homepage with a more versatile and generic search bar capable of searching for all types of information on the website would enable users to locate the desired information with ease, thereby eliminating the frustration often associated with the search process. Additionally, implementing search recommendations or an autofill feature would further enhance the search experience, allowing users to find the information they need efficiently and effectively.

### Finding 2: Low Discoverability of the Sorting Feature on Species List

While there are text directions at the top of the page telling users they can click the column header to sort the list by that value, we found during testing that users constantly made workarounds to find the longest existing invasive species in the list. Users would scroll through the list and use keyboard shortcuts to verify their findings.

### Recommendation:

To lower user cognitive load and increase the discoverability of the sort feature on the species list page, we recommend adding a filter bar on the page between the text directions and grid of species information, using filter icons commonly used on web

search features will help to communicate with users visually.

### Finding 3: Difficulties of navigation

We discovered that the navigation bar lacks the "Contribute" option. Additionally, on the result page of the species generator and profile, there is no straightforward way to return to the homepage, as the top logo is not linked, and the navigation bar is absent. Besides the navigation bar, The main tabs on the home page also lack "Educator Hub".

### Recommendation:

Based on the findings, we recommend the following actions to improve the user experience: Add the "Contribute" option to the navigation bar, link the top logo at the result page of the species generator and profile to the homepage, and include "Educator Hub" in the main tabs on the homepage.

### Finding 4: The Contribute Page Needs to Be More Informative and Less Text-heavy

Besides the difficulties of finding the Contribute Page, the content on the page could also be improved with clearer information architecture to earn the trust of the users. The current Contribute Page only directs users to a personal email address or a form to share their data, it does not explain how GLANSIS would use the data or the preferred format. It could be difficult for researchers to share their findings without knowing the person of the email address or how the data will be used.

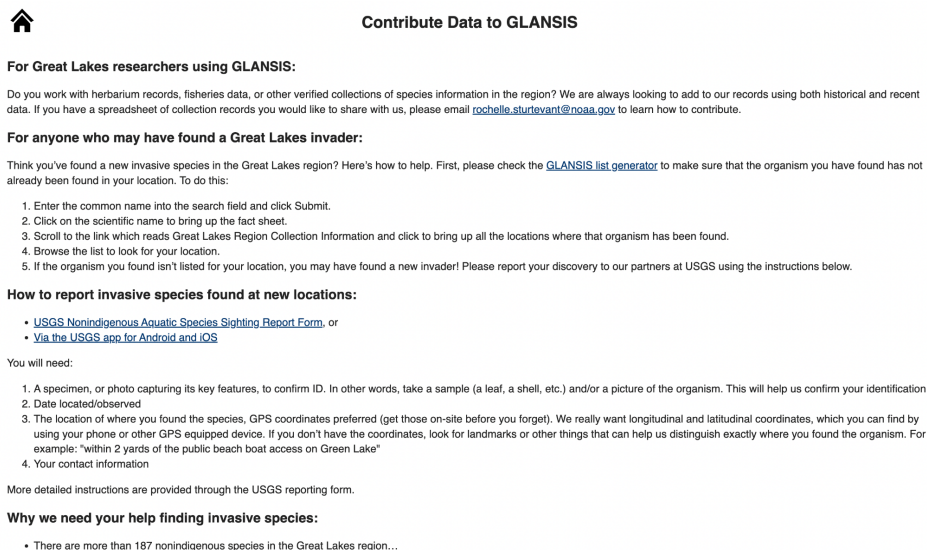


Fig 3: Contribute Data Page of GLANSIS Website

### Recommendation:

We suggest GLANSIS provide more information regarding the data usage and data format before directing users to different portals of contribution. The current page is also text-heavy, more images or white spaces could be added to the design to



separate the three methods of sharing for different user groups.

## Discussion

We recognize that our testing has limitations. Primarily, we faced challenges in recruiting enough participants from client-provided contacts, leading to a testing group of one local management staff and several biology students. This could have caused biased results, as these students are not the target users and lack practical experience in invasive species management.

We also found that factors like exposure to database websites significantly affected task performance. To address this, we should collect more information during post-testing debriefs, focusing on participants' education level, experience with invasive species, and familiarity with databases to minimize bias during data analysis.

Lastly, our testing revealed areas for task instruction improvement. In task 2, complex instructions misdirected participants toward watershed information instead of species data. For tasks 4 and 5, participants only used the educator hub when prompted as teachers. We intend to clarify instructions in future tests to ensure participants understand the intended objectives.

## Conclusion

Through usability testing, we were able to identify current UI structures that may be impacting the ability of users to navigate and quickly find the information they are looking for. By broadening the search field for the search bar on the homepage to search through both the site attributes and the species generator, users will be able to navigate to desired resources much more quickly, especially if they are unsure where to look. GLANSIS also currently has great functions and helps the user immensely but has low discoverability, such as the sort function on the species list page. Adding a filter bar or arrows on the column header would help to increase the discoverability of this function.

## Appendices

### 1. Recruiting messages

📄 GLANSIS USABILITY TESTING CONSENT FORM.pdf

### 2. Test script: intro/preamble and Task instructions

Hello, I am \_\_\_\_\_. I am a graduate student at the University of Michigan's School of Information. I am currently collaborating with GLANSIS, an arm of NOAA, regarding the overall usability of their website, including the usability testing session you will be participating in today.

We are working to understand how GLANSIS works and needs to improve! I know that while I am writing and observing, it may feel like I am evaluating you, but you are helping me to evaluate GLANSIS. You can't perform anything wrong or give any wrong answers throughout this process.

Please let us know if you are stuck or would like to move on from the current task we are working on. If there is any point in time today when you would like to stop, need a break, or feel uncomfortable, please let us know, and we will stop the study.

While we are working on the tasks, please feel free to act naturally and ignore me. However, if you are able to explain out loud what you are doing and thinking as you complete the task, that would be great!

Any data recorded will be anonymous, and please remember that this is voluntary, and we can stop at any point. We greatly appreciate your time today, is there anything we can clear up or answer before we begin today?

Do you have any questions before we begin?

### 3. Usability Tasks

#### **TASK 1: Navigate and find information about a specie using Species List**

##### **Generator**

Scenario:

If you want to know about “zebra mussel”, use the GLANSIS site access information on “zebra mussel” and find the year that the species was first introduced to the Great Lake region. Please think out loud while completing the task

Steps:

[Start from the Home Page]

1. Click on the Species List Generator (20s)
2. Type in “zebra mussel”(10s)
3. Click on the “submit”(5s)
4. Find “ Scientific Name” and click on it to open the profile(optional)
5. Read through the profile and find the year(90s)

Criteria:

- Complete the task successfully
  - Find the year of “zebra mussel”
  - And complete the task in time
- Complete the task with some difficulty
  - Find the year but
  - Complete the task with a few errors
    - On the search filter page, submit the wrong information and come back to search again.
    - On the table page, instead of clicking on the “Scientific Name”, the user clicks on other links.
  - Complete the task exceed the time limitation
- Fail to complete the task
  - Not able to find the Species List Generator Page
  - Not able to find the profile page
  - Not able to find the year

Follow-ups:

- How do you think the search filter and the layout of the table and profile could be improved to find the desired information faster? Tell three main points.

## **TASK 2: Navigate and find information on a watershed using Species List Generator**

### **Scenario:**

You just got assigned to [Lake Erie] for aquatic invasive species research. Before going out to the field, you'd like to do a quick research about the area and the invasive species. Find the first invasive fish in the area [the year it was introduced and one of the means of introduction.]

### **Steps:**

[Start from the Home Page]

1. Click on Species List Generator (10s)
2. Select the watershed information at the filter (20s)
3. Select 'fish' for the group input (20s)
4. Click submit (10s)
5. Click "Year first Collected" to rearrange the list (15s)
6. Click on the first item on the list for detailed information (10s)
7. Read through the page and find the information needed (90s)

### **Criteria:**

- Complete the task successfully
  - Find the species[*Anguilla rostrata*/American Eel], the year [1817], and identify one of the means of introduction [ ]
  - And complete the task on time
- Complete the task with some difficulty
  - Find the needed information but
  - Complete the task with a few errors
    - Did not input the correct filter of species group
    - Did not use the list-rearrangement function to find the earliest year
  - Complete the task exceed the time limitation
- Fail to complete the task
  - Not able to find the Species List Generator Page
  - Not able to specify the region before submitting the search
  - Not able to specie/year/impact on the watershed

### **Follow-ups:**

- What do you think about the filter page for the Specie List Generator?
- What do you think about the sorting feature on the Species List Generator?

### **TASK 3: Navigate the Contribute section of the website and find useful information regarding the contribution process and method**

Scenario:

Your organization wants to distribute compiled data of invasive species logged in 2022, now find a way to share it with NOAA.

Steps:

[Start from the Home Page]

1. Click on Contribute (20s)
2. Click on Contribute Data (10s)
3. Read through the instructions and find NOAA's email address (1 min)

Criteria:

- Complete the task successfully
  - Find the email address
  - Complete the task on time
- Complete the task with some difficulty
  - Complete the task with a few errors
    - Navigated to the report form
    - Navigated to the list generator
  - Complete the task exceed the time limitation
- Fail to complete the task
  - Navigated to the report form and report
  - Not able to find the Contribute Page

Follow-ups:

- What section of the page catches your attention first?
- I noticed that you went to X page at first. What made you go there?
- If you needed to share your information at this point, do you believe you would be able to? Why or why not?

#### **TASK 4: Find the Lake St. Clair Food Web poster**

Scenario: You are looking for a poster of Lake St. Clair Food Web to hang up in the office. Find this poster on the GLANSIS site.

Steps:

[Start from the Home Page]

1. Click on Educator Hub (20s)
2. Click on Printables (20s)
3. Scroll to the right of the "Great Lakes Food Web Fact Sheets" section to find the poster (30s)
4. Click on the Lake St. Clair Food Web and print (optional)

Criteria:

- Complete the task successfully
  - Find the correct poster
  - Complete the task on time
- Complete the task with some difficulty
  - Complete the task with a few errors
    - Navigate to other pages, such as Additional Resources
  - Fail to complete the task on time
- Fail to complete the task
  - Do not go to Educator Hub for printables
  - Fail to notice that the "Great Lakes Food Web Fact Sheets" section is scrollable

Follow-ups:

1. What is the first place you think to find a poster?
2. What was a large point of frustration when trying to find the poster? Was there any part of the process that felt intuitive to you?

**TASK 5: Find a video explaining the management of Lampreys in the Great Lakes**

Scenario: You are interested in showing a group of volunteers a **video** that explains how Lampreys were introduced to the Great Lakes and managed since. Find a **video** that would fit this criterion on the GLANSIS site.

Steps:

[Start from the Home Page]

1. Navigate to the Ed Hub using the header navigation bar (20s)
2. Click on "AIS Video Content" (10s)
3. Click on the "Sea Lamprey" Video card(10s)

Criteria:

1. Complete Task Successfully
  - a. Find Correct Video
  - b. Complete the task within the time frame (30s)
2. Complete the Task with some difficulty
  - a. Complete the task with some errors
  - b. Fail to complete the task within 30s
3. Fail to complete the task
  - a. Fail to navigate to the Ed Hub
  - b. Do not go to the AIS Video Content tab

Follow-ups:

- How did you feel when x happened?
- Why did you follow up that step with x behavior?
- I noticed that you clicked here when looking for x. Why?

#### 4. Post-test questionnaire + Questionnaire responses

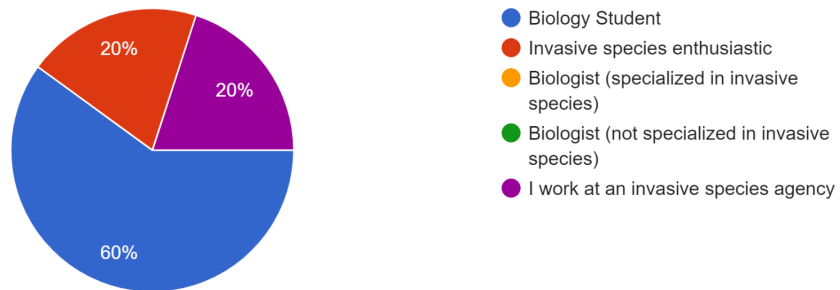
Questionnaire:

<https://forms.gle/cHnUzP1yLT8mj9Kj6>

Responses:

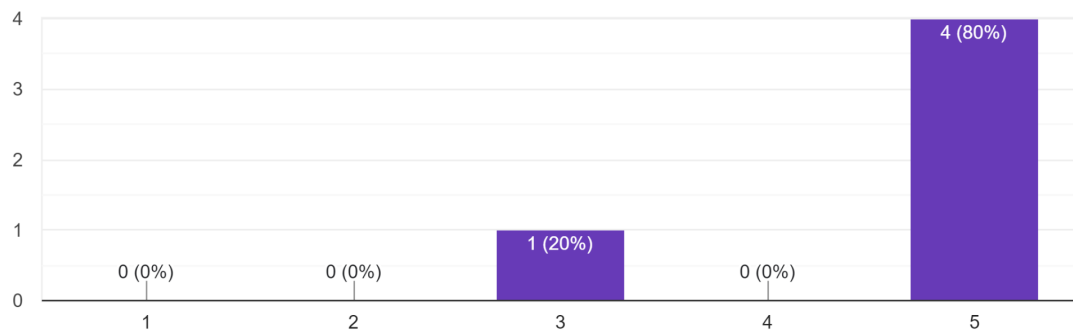
How would you identify yourself?

5 responses



On a scale of 1 to 5, how comfortable/familiar are you with using online tools/technology to search for information?

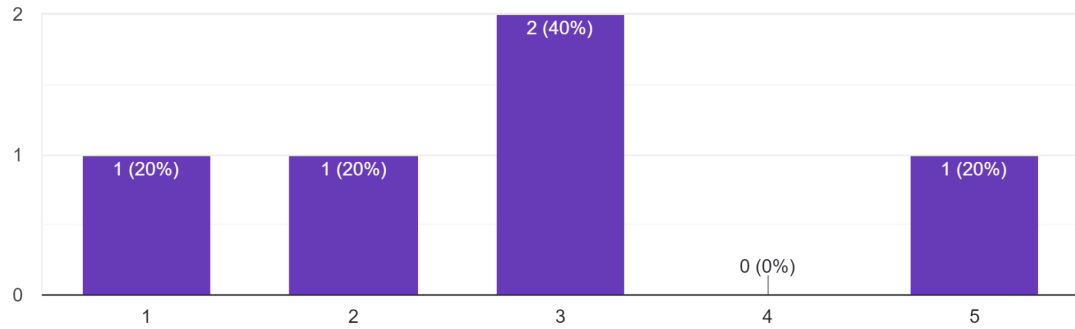
5 responses





On a scale of 1 to 5, how familiar are you with aquatic invasive species?

5 responses



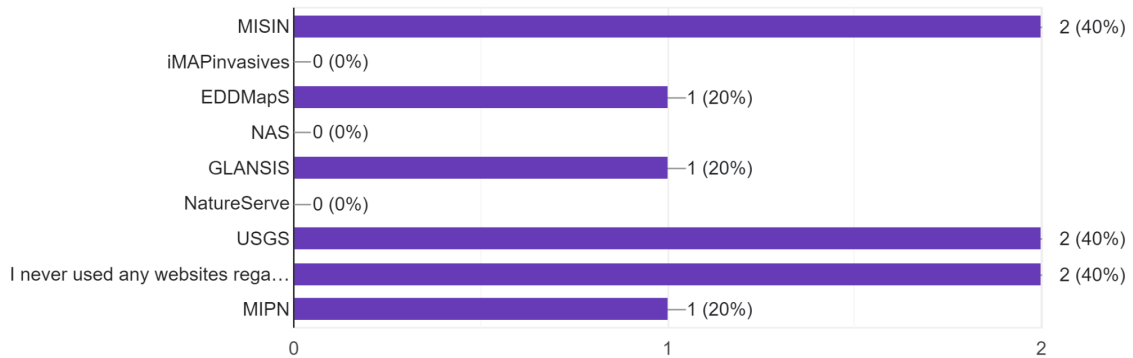
How familiar are you with GLANSIS website?

5 responses



Please choose all the invasive species websites and tools you've heard of and used before.

5 responses




## 5. Debrief notes

Thank you for participating, I will ask you some follow-up questions.

- Briefly summarize your thoughts on this product and whether you would recommend it to others
- What do you think it does well, please state the three main points
- What do you think it does not do well, please state the main three points
- How do you think it can be improved for negative aspects of this product?
- Are there any alternative suggestions you'd like to say?
- Do you have any questions for me?

We appreciate your assistance today! Should you have any further comments or questions in the future, don't hesitate to reach out via email at [uxtacular@umich.edu](mailto:uxtacular@umich.edu)

## 6. Data logging forms

 Data Logging Form

## 7. Data Analysis

Score: 1 - 3

3 - Understand and task and complete it quickly and smoothly

2 - Complete the Task with difficulties or exceed the expected time

1 - Not able to complete the task

	P1	P2	P3	P4	P5	Average Score	Related Page
Task 1	2	3	3	2	2	2.4	Species List Generator
Task 2	2	2	1	2	2	1.8	Species List Generator
Task 3	1	2	1	1	2	1.4	Contribute
Task 4	2	3	1	2	1	1.8	Ed Hub
Task 5	3	3	1	3	2	2.4	Ed Hub

## 8. Slide Deck

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