The Parks at 150 – *CS171 Final Project*

Table of Contents

Project Title

The Parks at 150 — Celebrating, Exploring, and Supporting the U.S. National Parks

Abstract

The U.S. National Park system has long been a hallmark of the nation's public resources, preserving natural and cultural environments and experiences for the enjoyment, education, and inspiration for generations of Americans and International visitors. The U.S. National Parks celebrated their 150th anniversary in March 2022, and given the park's significant role in championing biodiversity and conservation — especially amidst the fight against climate change — we are interested in synthesizing and sharing data stories about the U.S. Parks' geological features, varied ecosystems, and recreational experiences over time. Around the world, we are seeing climate catastrophes that have been unparalleled in recent times: flooding in South Asia, Australian wildfires, and severe droughts. As frequent visitors to the National Parks — and individuals who are concerned with the role of human activity in catalyzing

climate change — these personal experiences motivate our group to understand the Parks from a data-driven perspective.

To conceptualize how the U.S. Parks have changed over time, we plan to explore and share data visualizations about the people, animals, plants, and landscapes that define the National Parks. Some of the datasets that we would initially hope to explore are: visitor populations, temperature records, water quality records, and data on species within parks.

Likewise, our goals for this project are: [1] to understand the diversity within (and between) the parks, [2] to highlight visitor experiences and demographics, and [3] to interpret the impact of climate change within the Parks. Through these stories, we hope to raise awareness about the Parks, understand how these natural resources may be affected by climate change, and explore demographic trends across these regions.

To craft these data stories, we plan to acquire and incorporate datasets provided by the U.S. Department of the Interior for Public Use (accessible via https://irma.nps.gov/Portal/ and https://public-nps.opendata.arcgis.com/). Some of our initial planned datasets for exploration include: STATS (on Park Visitor Use Statistics), AQWebPortal (on Water Quality/Quantity Data), NPSpecies (providing species lists). Through our project work, we also expect to revise this list of datasets, as needed.

Team Agreement

Attribution: *Extended and Revised from Example Agreement, provided by CS171 Staff (link)*

- We will communicate via our iMessage Groupchat, and connect via weekly meetings (either in-person or over Zoom, depending on group member availability) on Tuesdays and Saturdays
- Although code will be written by individuals, all team members should be involved with the technical aspects of the project. All code should be documented well.
- Final design decisions will be discussed among all members; fair compromises should be made when necessary.
- Work hours should be split as evenly as possible (actual task output may differ based on an individual's ability / previous experience). This ensures not only fairness but also learning opportunities for everyone. We will keep each other accountable so that one person does not work too much / too little.
- We will use a Git workflow to aid our progress as a team and help us split up the work of coding.
- Work will not necessarily be done together in person, but good communication via iMessage is expected in a timely manner. Work may be done remotely as long as collaboration and communication are done well.
- In case of conflicts or unavailability, group members will try their best to communicate ahead of time

Signatures: Christopher Cheng, Ishaan Prasad, Omar Shareef
Date: 10/19/22

Detailed Project Plan

Basic Info

Project Title (as written above): *The Parks at 150 — Celebrating, Exploring, and Supporting the U.S. National Parks*
Names: Christopher Cheng, Ishaan Prasad, Omar Shareef
Email Addresses: christophercheng@college.harvard.edu, ishaanprasad@college.harvard.edu, omarshareef@college.harvard.edu
Team Name: The Park Rangers

Background and Motivation

Discuss your motivations and reasons for choosing this project, especially any background or research interests that may have influenced your decision.

Our motivation for deciding to focus on U.S. National Parks was driven by our backgrounds exploring these parks in person over family vacations and cross country roadtrips with friends. From these personal experiences — coupled with our shared interests in computer science, data analysis, and climate studies — the three of us were deeply interested in understanding and visualizing the data that defines the U.S. National parks. To better understand the scale and impact of the parks, our group is interested in learning more about the biodiversity and demographics of visitors; furthermore, to comprehend the impact of human-induced climate change on the park, our group seeks to explore climate-related data from within the parks.

Related Work

Anything that inspired you, such as a paper, a website, visualizations we discussed in class, etc.

While the primary inspiration for this project stemmed from our personal interactions with the U.S. National Parks (via trips and academic study), our interactions with the CS171 "Hall of Fame" visualizations[1] — namely the 2021 winner, "Is it Getting Hot in Here? Global Changes in Extreme Weather"[2] — served as an important catalyst for our decision to consider climate-specific data. Following up on this climate-specific focus, our subsequent research on the effects of climate change in the National Parks (via the U.S. Government's National Park Service website[3]) presented a clear body of research that highlighted widespread change in the parks due to human-induced increases in greenhouse gas emissions. Consequently, we are excited to be able to study, explore, and present this data story to our project audience.

Data

From where and how are you collecting your data? If appropriate, provide a link to your data sources.

[1] https://www.cs171.org/2022/fame/
[2] https://climate-crew.github.io/d3-climate-visualization/
[3] https://www.nps.gov/subjects/climatechange/index.htm

We plan to center our project around 3 datasets. For our stories about biodiversity, we will be using the NPSpecies dataset, which contains species occurrence data for over 300 national parks. We will be using the NPS STATS dataset for visitor data over time at the national parks. Finally, we will be using AQWebPortal for continuous water quality data, which we hope to use to understand climate change data over time. Note: see Map section for updated details on which datasets we used; notably, we ended up selecting data on park, species, and visitation information.

Data Cleanup

Do you expect to do substantial data cleanup? What quantities do you plan to derive from your data? How will data processing be implemented? Try to minimize the amount of cleanup you have to do by finding cleaned and ready-to-go data sources whenever possible.

We do not expect substantial data cleanup. For biodiversity data and visitor data, the quantities we need are either readily available or require very minimal manipulation. To tell our stories about biodiversity, we want to look at the number of different species in the various parks, broken down by region and type of species. With regards to visitors, we want to explore the trends in numbers of and types of visitors over time, broken down by region. The water data may require more data processing and cleanup because AQWebPortal consists of many datasets per water collection site. Our plan for cleaning water data is to (1) choose a selection of bodies of water and download the data for each of them, (2) derive averaged water level, temperature, and quality data per month for each body of water, and (3) combine each of the cleaned datasets into a single aggregated dataset.

Map

*Who is your audience? Come up with **at least three** options and pick one target audience.*

We have identified three possible audiences.

1. People who are potentially interested in visiting national parks
2. People who frequently visit national parks
3. Researchers trying to understand distribution of parks

We are selecting (1), people who are potentially interested in visiting national parks, as our target audience, because we believe this represents the largest group of people and we want our visualizations to be as accessible as possible.

Describe your target audience in more detail. What do they know? What are their interests? What visualization literacy do they have? At what level of detail will you present information to them?

Our target audience is people who are potentially interested in visiting national parks but may have not yet visited one, or have only visited a few parks. They know generally what the national parks are, but they do not have a detailed appreciation for what the parks have to offer. Our audience is interested in learning more about national parks, especially about the biodiversity at the parks.

What questions about your data will be interesting for your audience? Come up with a list of interesting questions that your audience may have about your data. The more, the better, but your team should come up with ***at least ten questions****.*

List of questions that will be interesting for our audience.

1. Which parks have the greatest biodiversity?
2. How many species are endangered?
3. Do some parks have a higher concentration of endangered species?
4. What kinds of biodiversity can I see at different parks?
5. How many species are native to the park they live in?
6. Which parks have the most rare species?
7. How many species that appear at each park actually live in that park? (e.g. birds migrating)
8. Which species are the most common at the parks?
9. Which species are the most rare at the parks?
10. How does biodiversity vary by geographic region (or state)?
11. How does biodiversity vary by size of park?
12. How do visitation numbers vary amongst the parks and by month/season?
13. How do visitation numbers vary by biodiversity within parks?

What data do you have? Download the data you picked from the website linked in the PDF that describes the data (available on Canvas, week 2). Take a look at it in Excel or Google spreadsheet and give a brief description of each attribute and its data type (categorical, ordinal, or quantitative) in your process book. It's OK if you are not sure about the data type for some attributes - you can simply describe them (e.g., geographic location).

We are currently focusing on biodiversity data in the national parks. We are joining three datasets, one for park data, one for species data, and one for visitation data. We note that our data contains primarily categorical and quantitative data.

For the park data, we have the following attributes for each observation:

- Park Code (categorical): The 4-letter code corresponding to each park, e.g. YOSE
- Park Name (categorical): The name corresponding to each park, e.g. Yosemite National Park
- State (categorical): The 2-letter state code that a particular park is in
- Acres (quantitative): The number of acres of a particular park
- Latitude (quantitative): The latitude of the park's location
- Longitude (quantitative): The longitude of the park's location

For the species data, we have the following attributes for each observation:

- Species ID (categorical): The ID for each observation, corresponding to a unique combination of species and park
- Park Name (categorical): The park in which the species appear
- Category (categorical): Category of species, e.g. Mammal
- Order (categorical): Scientific order of the species, e.g. Carnivora
- Family (categorical): Scientific family of the species, e.g. Canidae

- Scientific Name (categorical): Scientific name of the species, e.g. Canis lupus
- Common Names (categorical): List of common names associated with species, e.g. Gray Wolf
- Record Status (categorical): Whether the record has been approved or in review
- Occurrence (categorical): Whether the species presence in the park has been confirmed
- Nativeness (categorical): Whether the species is native to the area
- Abundance (categorical): Commonality of sightings
- Seasonality (categorical): When the species can be found in the park, blank if year-round
- Conservation Status (categorical): IUCN species conservation status

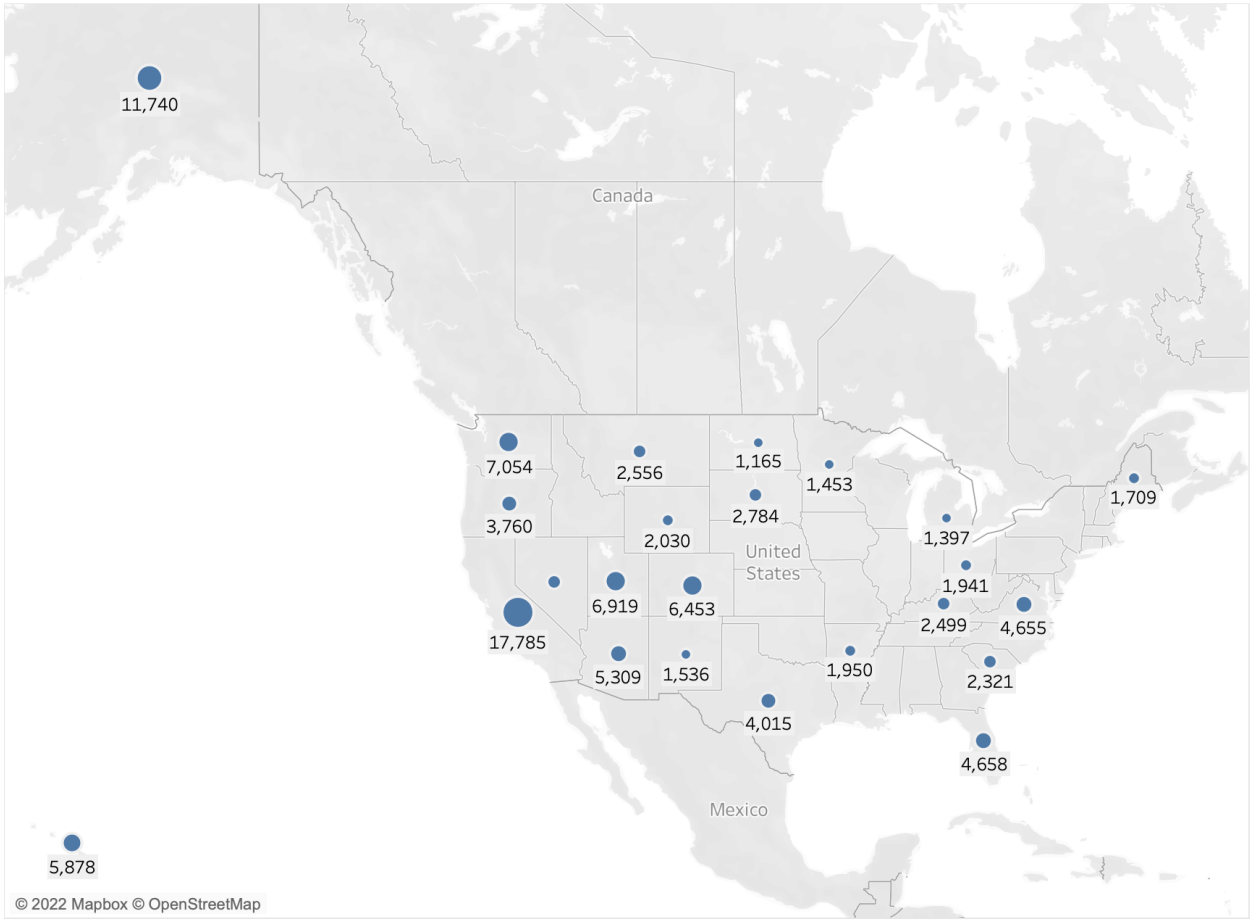
For the visitation data, we have the following attributes for each observation [Note: we decided to include this data after completing our Sketch section of the process book]:

- Park Name (categorical): The park for which visitation data is being provided
- Year (quantitative): The year for which visitation data is being provided
- Months (quantitative): The number of visitors present in each month (Jan-Dec) of a specified year
- Total (quantitative): The number of visitors present within a specified year

Tableau Visualizations

Chris

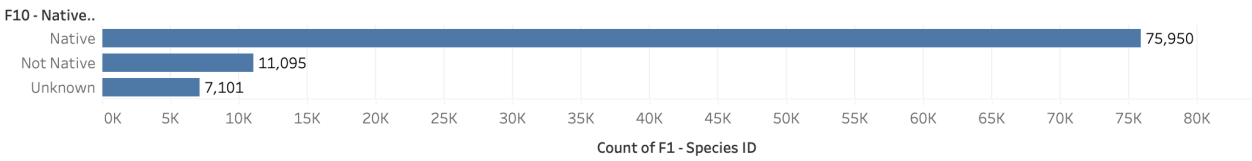
Which states are home to the most number of species in national parks?



Map based on Longitude (generated) and Latitude (generated). Size shows distinct count of F1 - Species ID. Details are shown for State.

Figure 1.

How many identified species are native to their parks?



Count of F1 - Species ID for each F10 - Nativeness. The view is filtered on F10 - Nativeness, which keeps Native, Not Native and Unknown.

Figure 2.

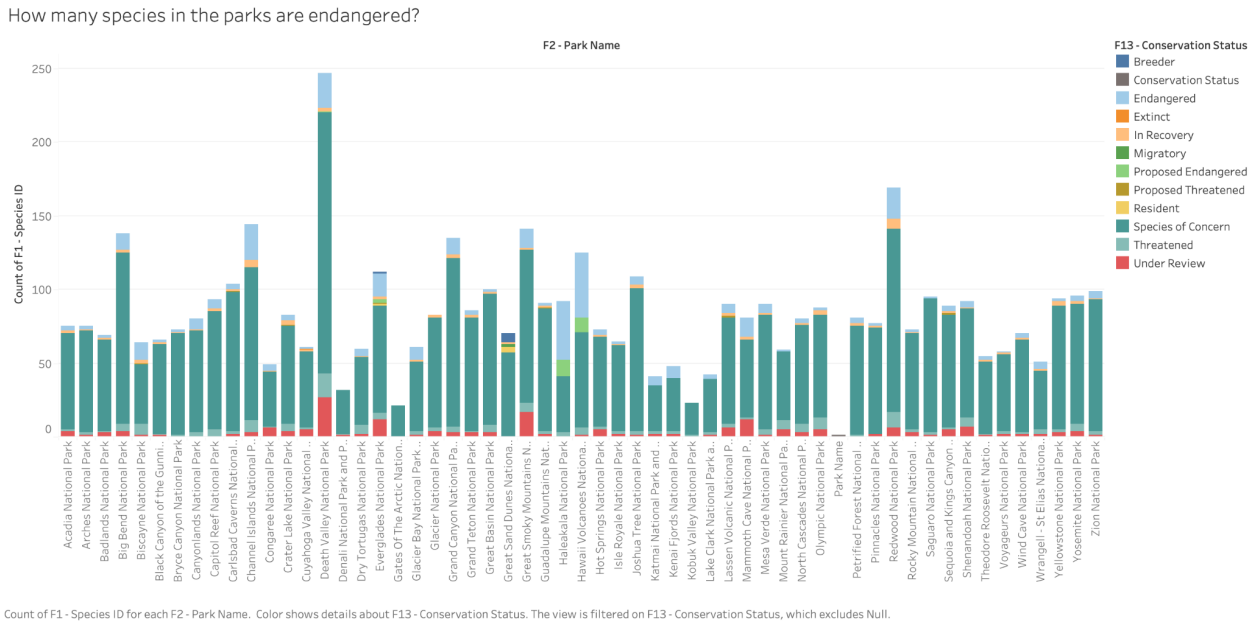
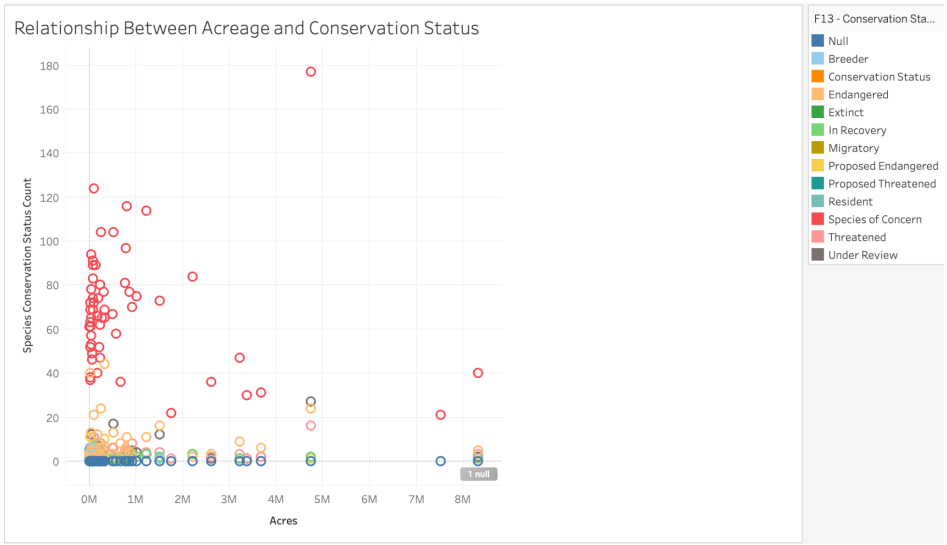


Figure 3.

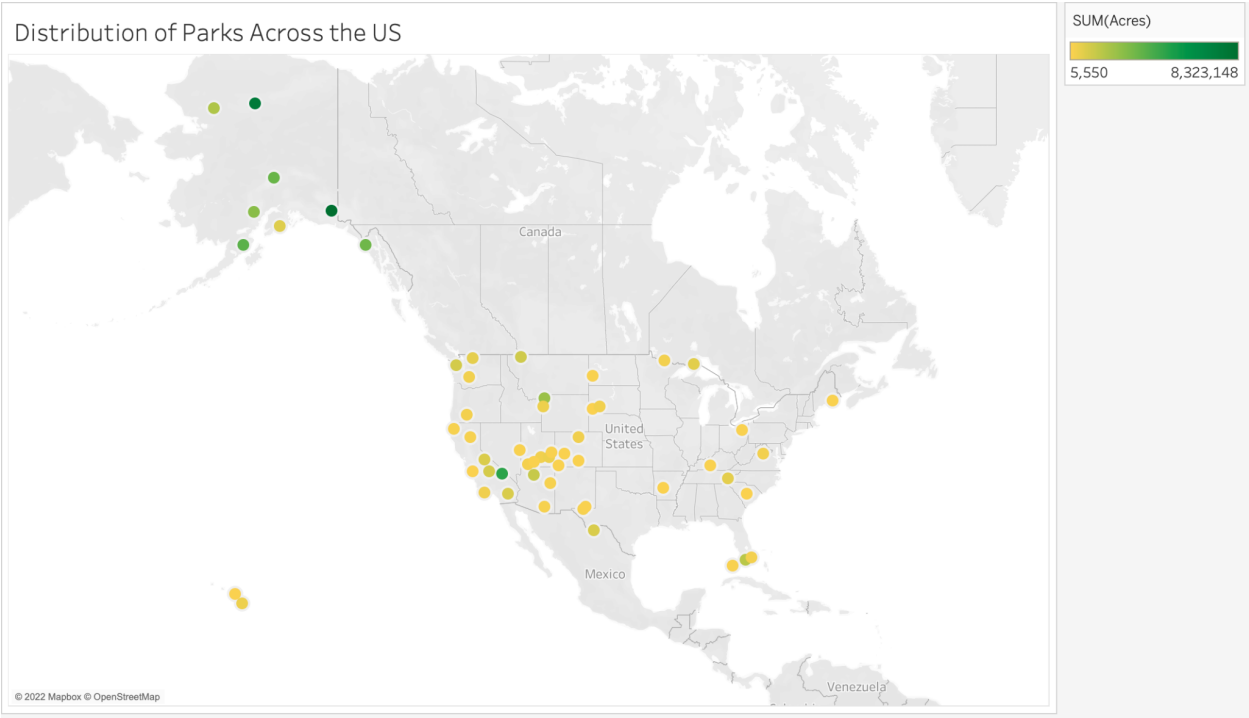
My questions are almost identical to the ones that our team came up with. I noticed that any changes I did make to questions were made in order to narrow down the question, i.e., make the question more specific to the visualization being created. For example, I changed "How does biodiversity vary by geographic region (or state)?" into "Which states are home to the most number of species in national parks?". The change here was to make the question more specific, so that the new question corresponds to a subset of the original question. In summary, in spirit, the questions our team came up with corresponded really well to the dataset, but in some cases questions needed to be narrowed down in order to effectively correspond with a single visualization.

Omar

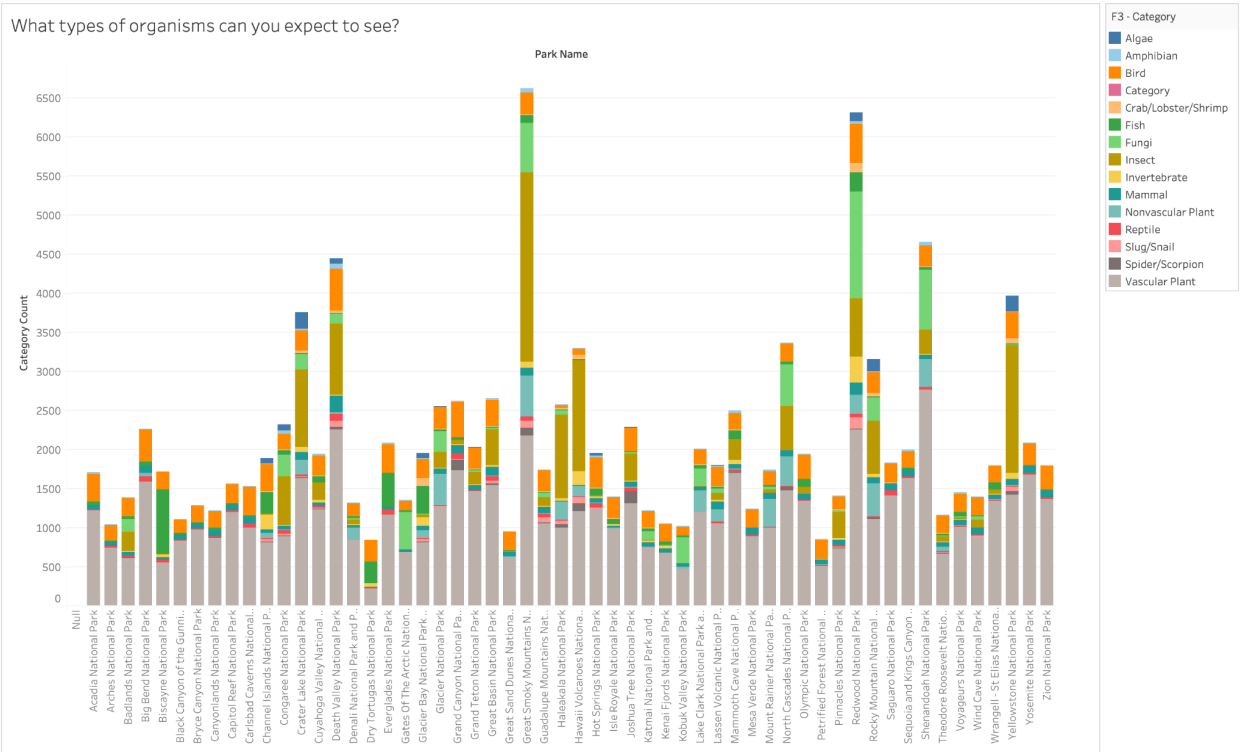
Relationship between acreage and species conservation count



What is the distribution of national parks in the US and which one's have the most acreage?



What types of organisms can you expect to see at each park?



I began with one of the questions we originally came up with, “How does biodiversity vary by size of park?”. I then had to narrow this question down as biodiversity could mean many different things. So, I settled on conservation status. In which I explored with the first visualization. Since I was exploring acreage, I began wondering where exactly the highest acreage parks were located and how the parks were distributed across the US, so I explored this question with my second visualization which was not really a question we came up with before. And then going back to the original topic of biodiversity and acreage, I wanted to broaden my question. So I went to a different question: “What kinds of biodiversity can I see at different parks?”. Again, since biodiversity can be defined in many ways, I was curious what the organism breakdowns were for each of the parks which was the topic of my third visualization. I realize that once you start with a question, you are naturally led to other related questions which you may not have thought about prior and this helps further understand the original topic or contextualize it by giving background if the original question was too narrow. These questions may be different from the original ones we came up with, but I believe they help fill in gaps regarding explorations we may not have originally thought of.

Ishaan

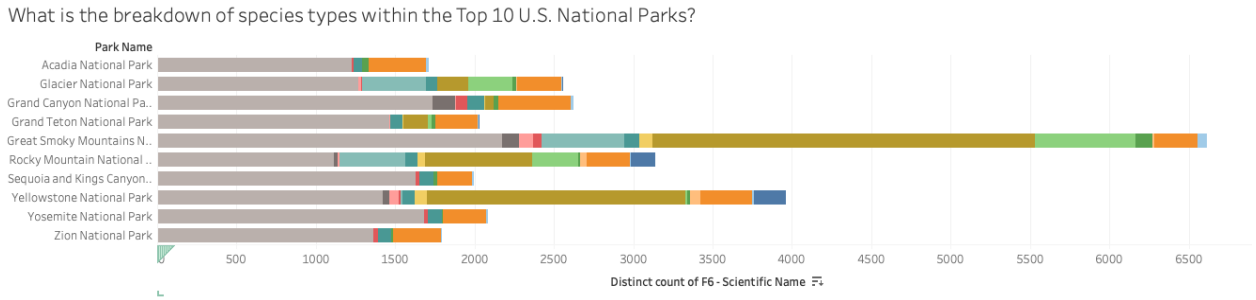


Figure 7

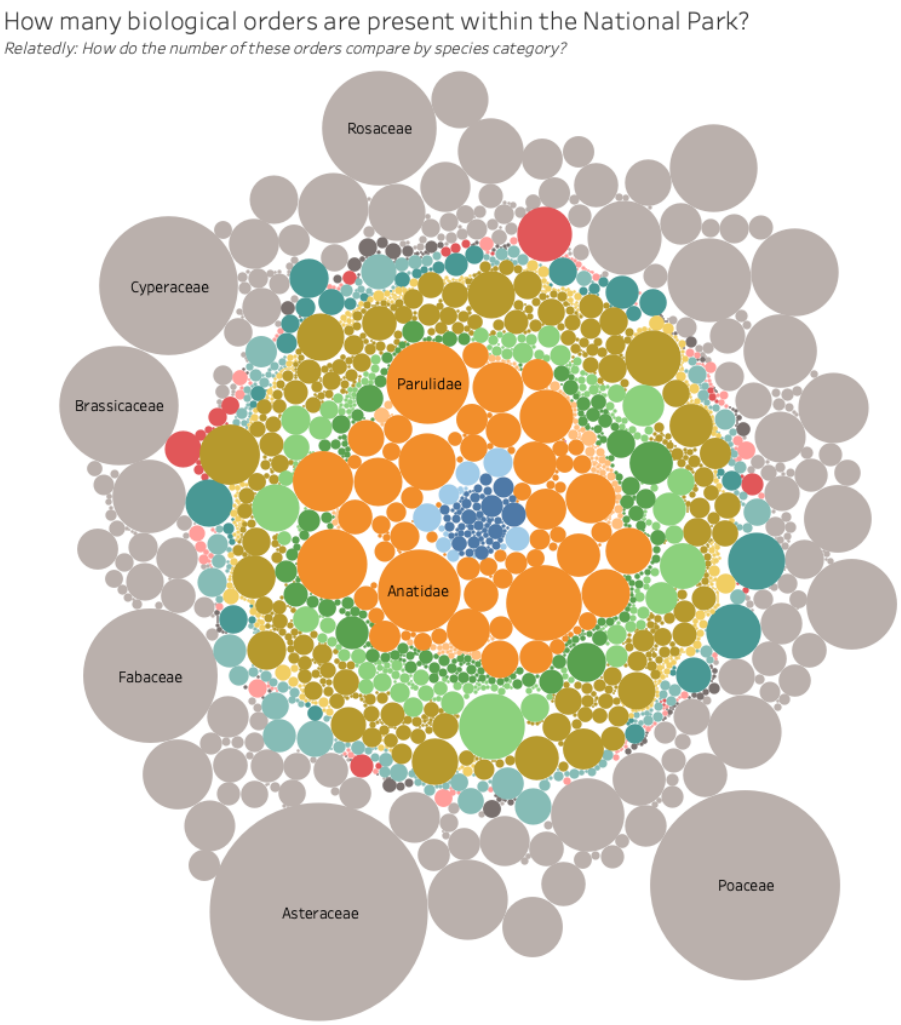

How many biological orders are present within the National Park?
Relatedly: How do the number of these orders compare by species category?
Rosaceae
Cyperaceae
Brassicaceae
Parulidae
Anatidae
Fabaceae
Asteraceae
Poaceae

Figure 8

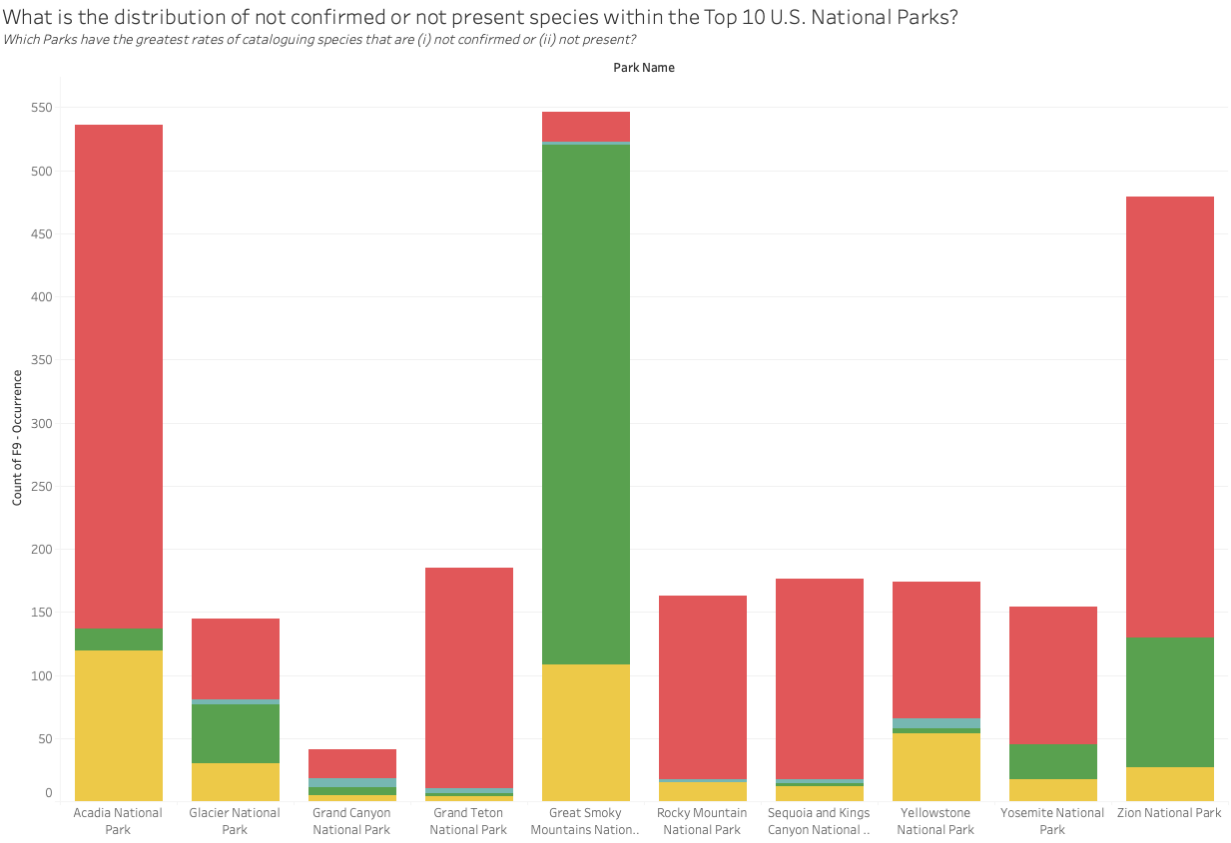


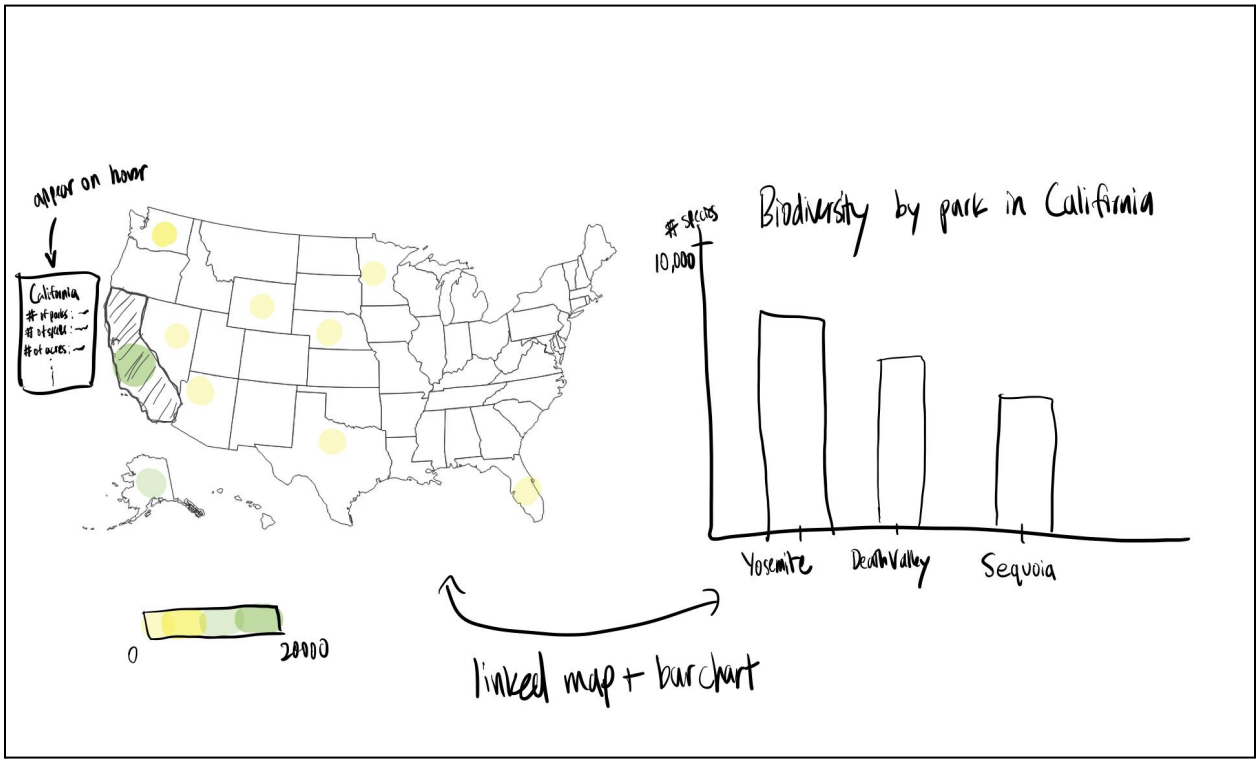
Figure 9

Although I began my data visualization and exploration activity with the original questions that my group posed, the questions that I answered within Tableau were ultimately derivations of these initial thoughts — further filtered and tailored around the data that was present. Thus, I'd characterize these deviations between the original questions and the above visualizations as pragmatic decisions. In particular, for Figures 7 and 9, exploring the species and the occurrence of unconfirmed or not present species within the Parks, respectively, I filtered our visualizations on the ten most visited parks in 2021, in order to present more digestible information to the audience.

Sketch

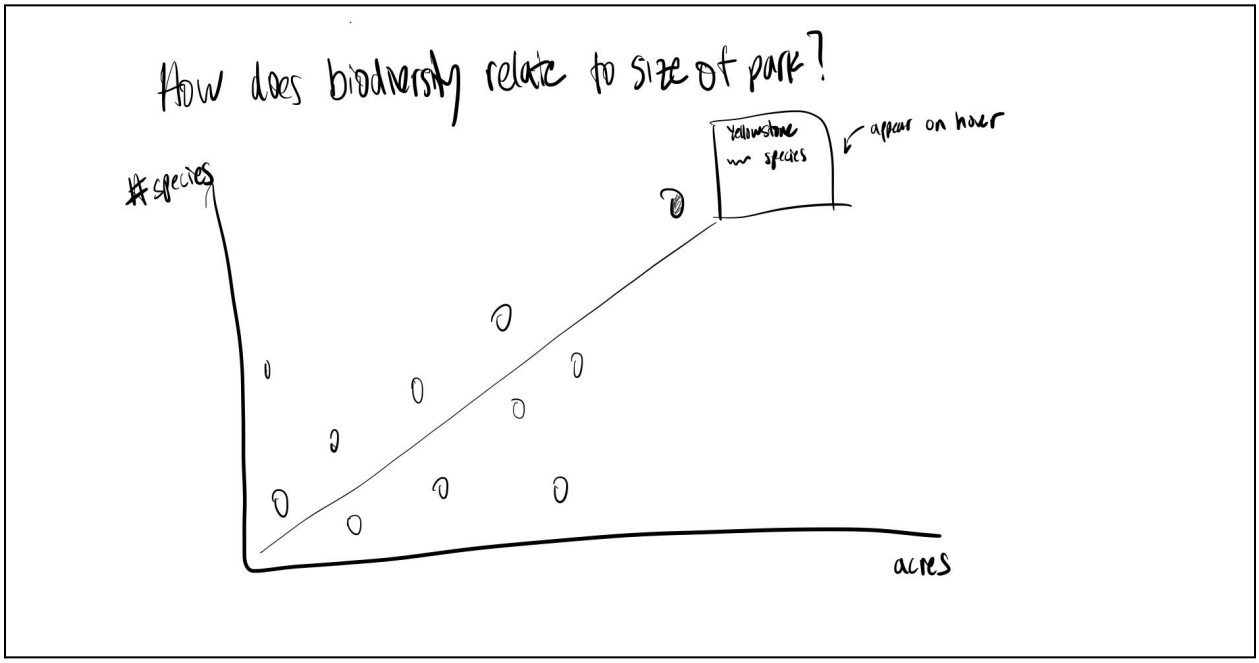
Chris

Answering questions 1 and 10. Which parks have the greatest biodiversity? How does biodiversity vary by geographic region (or state)?



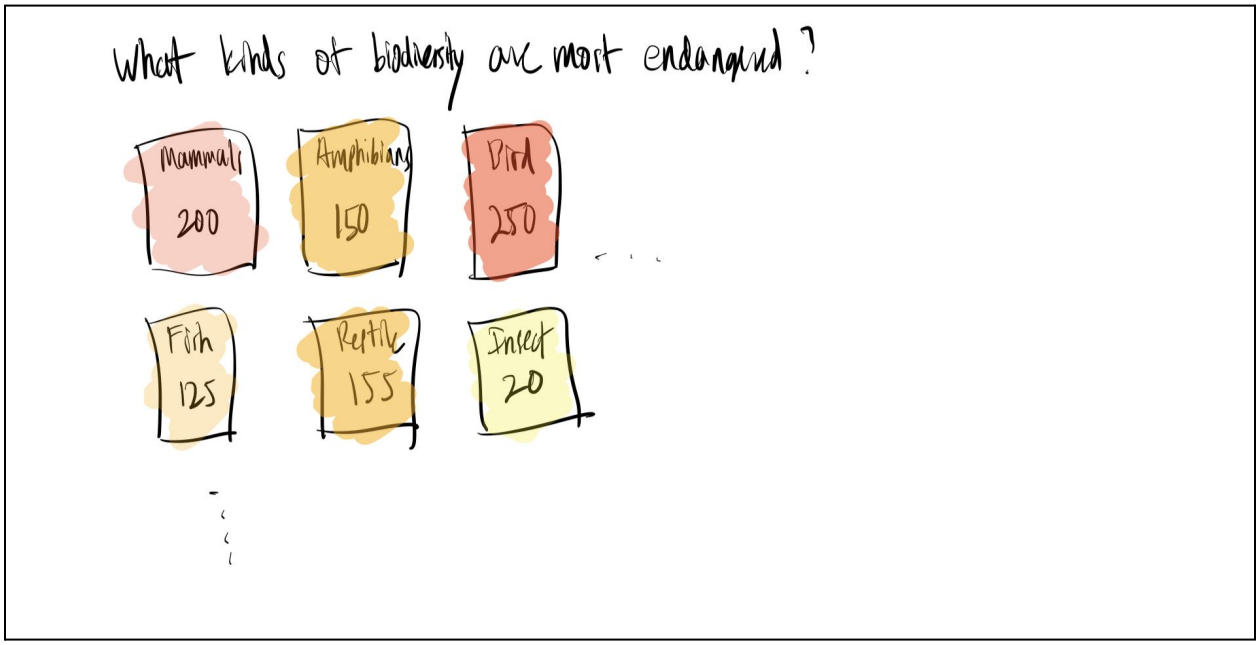
Sketch 1.

Answering question 11. How does biodiversity vary by size of park?



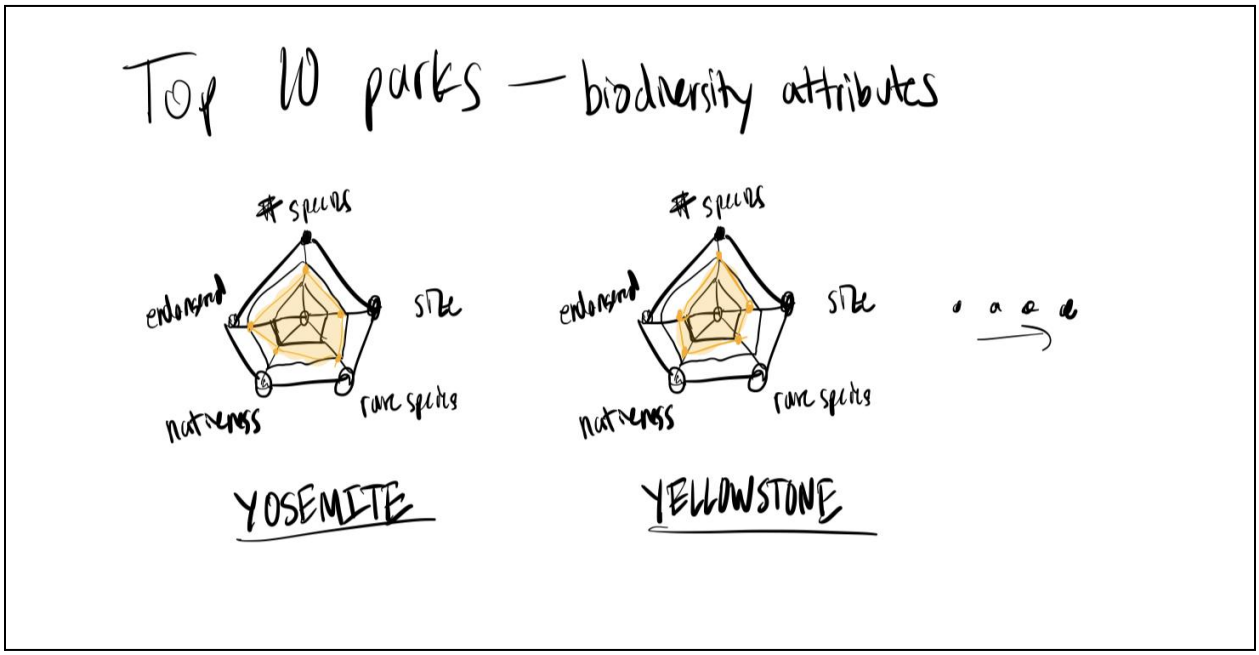
Sketch 2.

Answering question 2. How many species are endangered?



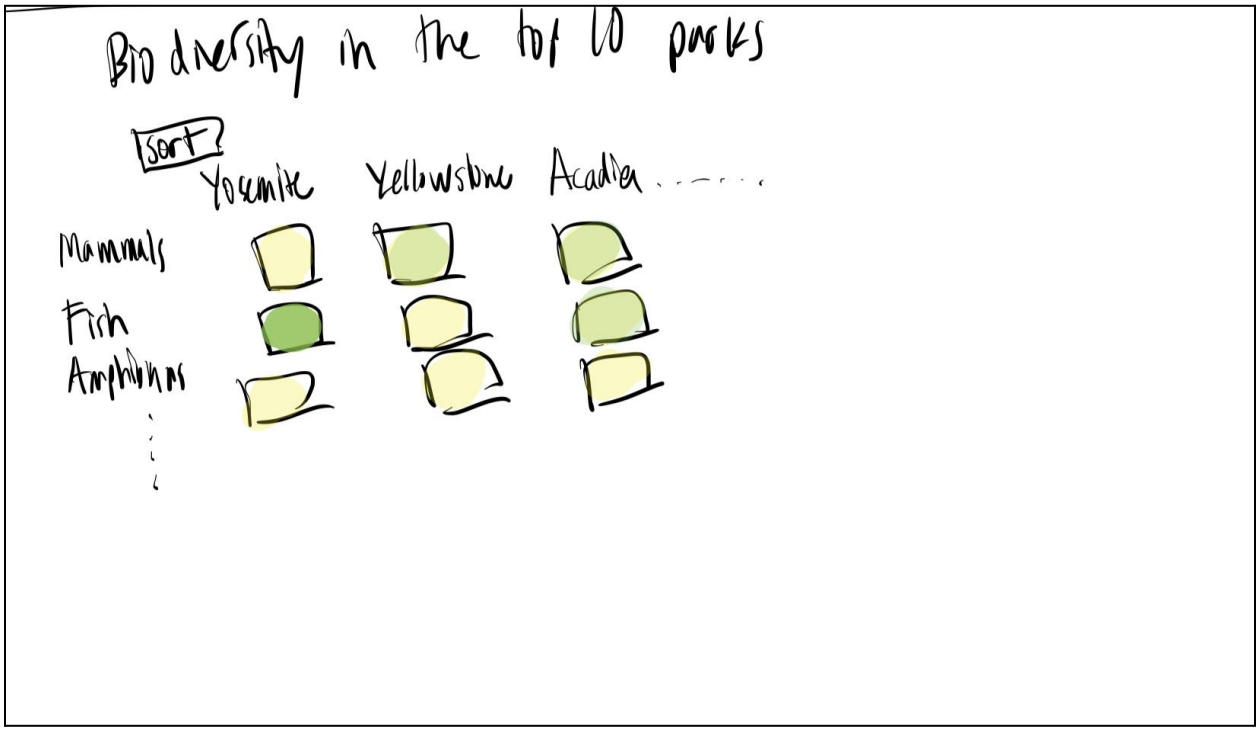
Sketch 3.

Answering questions 1, 3, 5, 6, and 7. Which parks have the greatest biodiversity? Do some parks have a higher concentration of endangered species? How many species are native to the park they live in? Which parks have the most rare species? How many species that appear at each park actually live in that park?



Sketch 4.

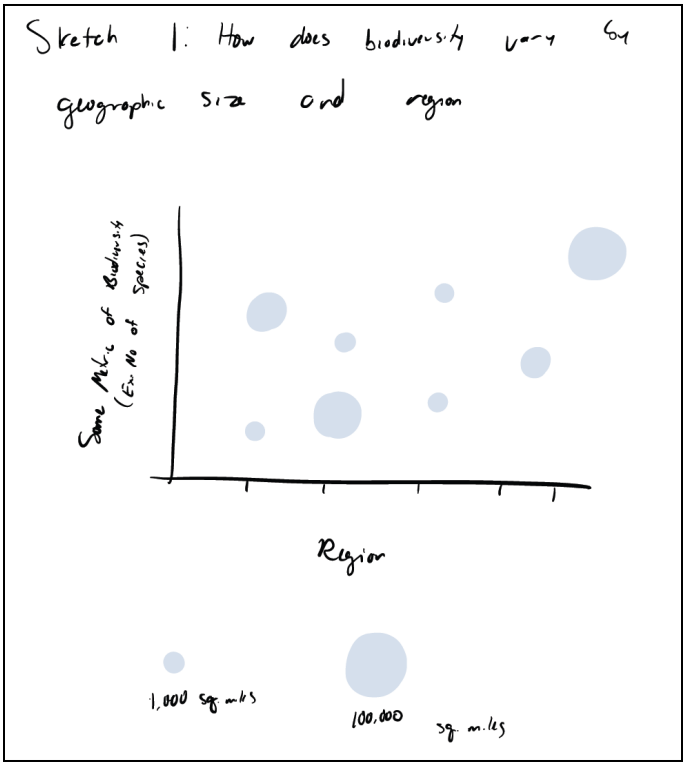
Answer question 4. What kinds of biodiversity can I see at different parks?



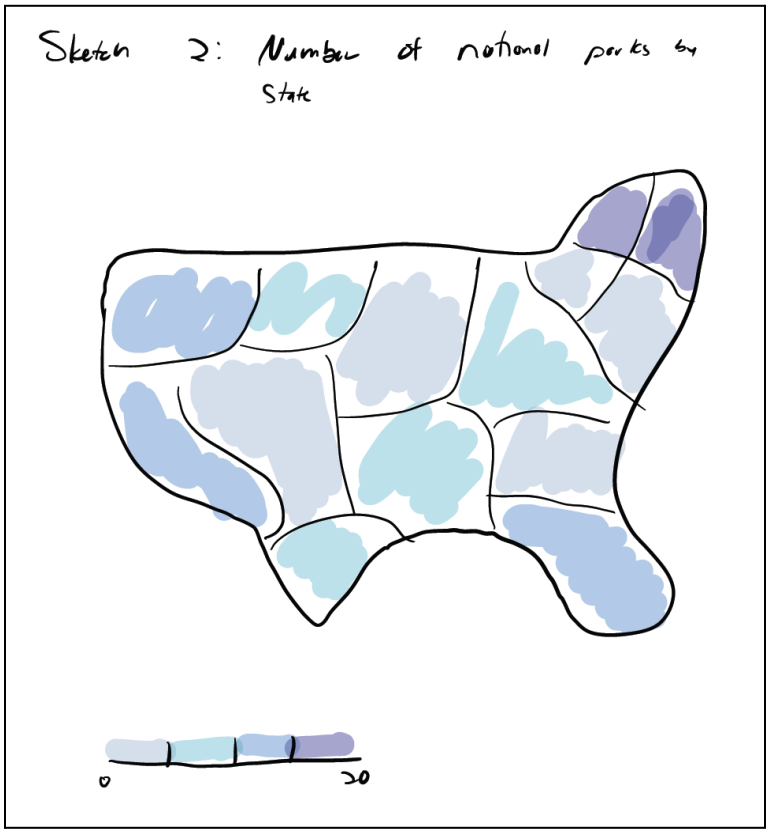
Sketch 5.

Omar

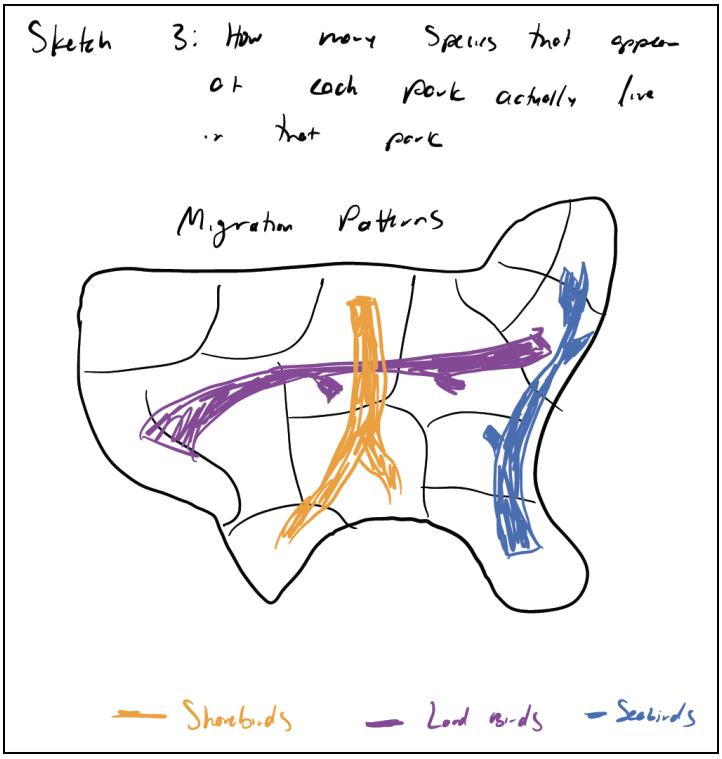
Sketch ID: 6



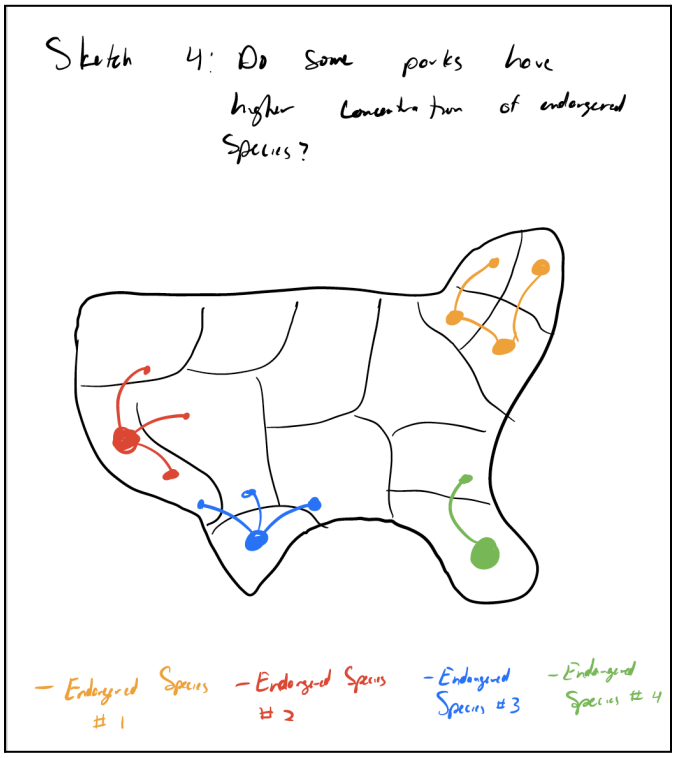
Sketch ID: 7



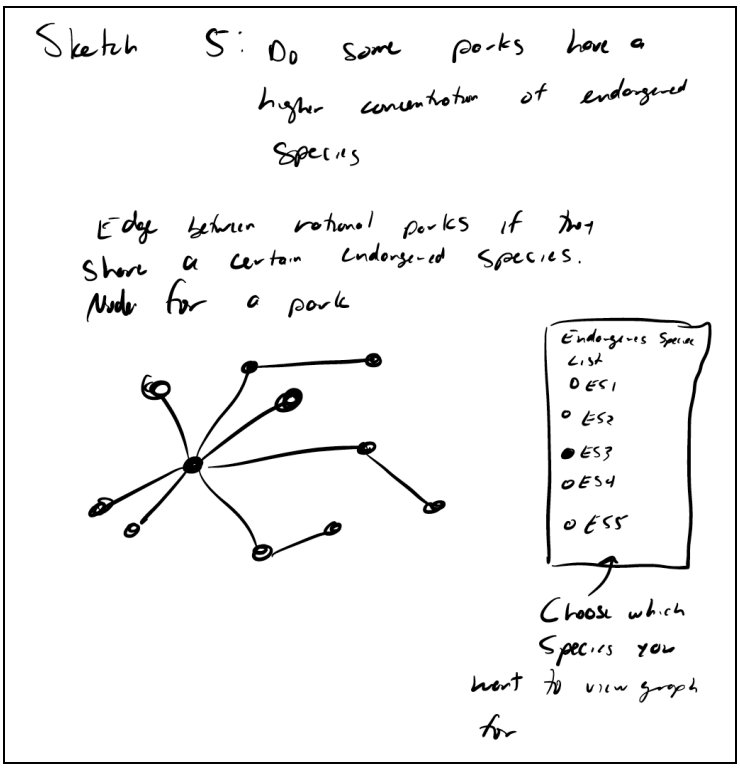
Sketch ID: 8



Sketch ID: 9

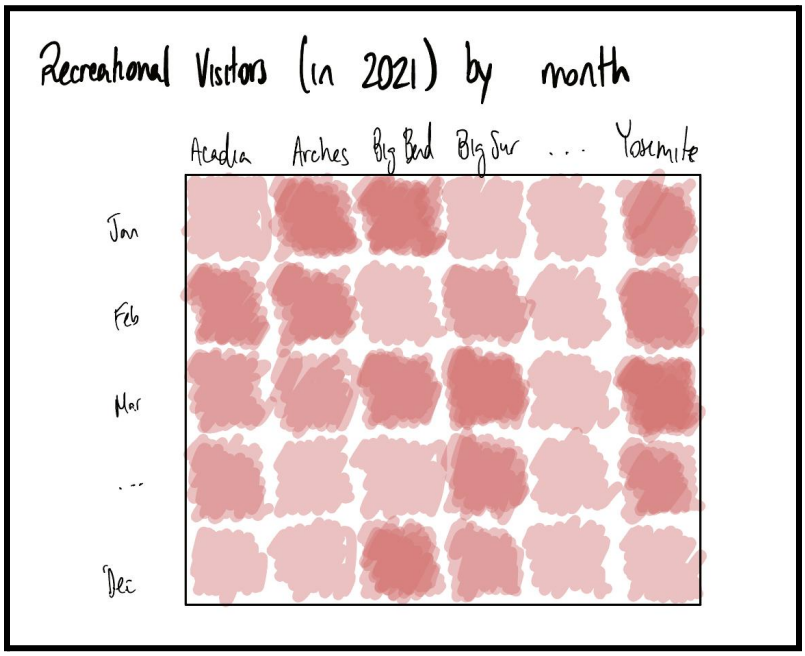


Sketch ID: 10



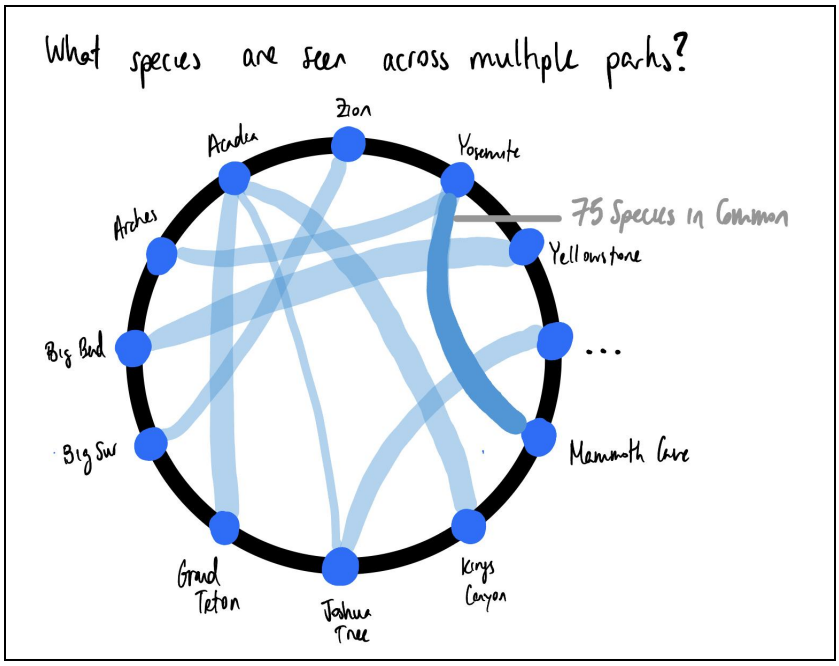
Ishaan

Answering Question 12



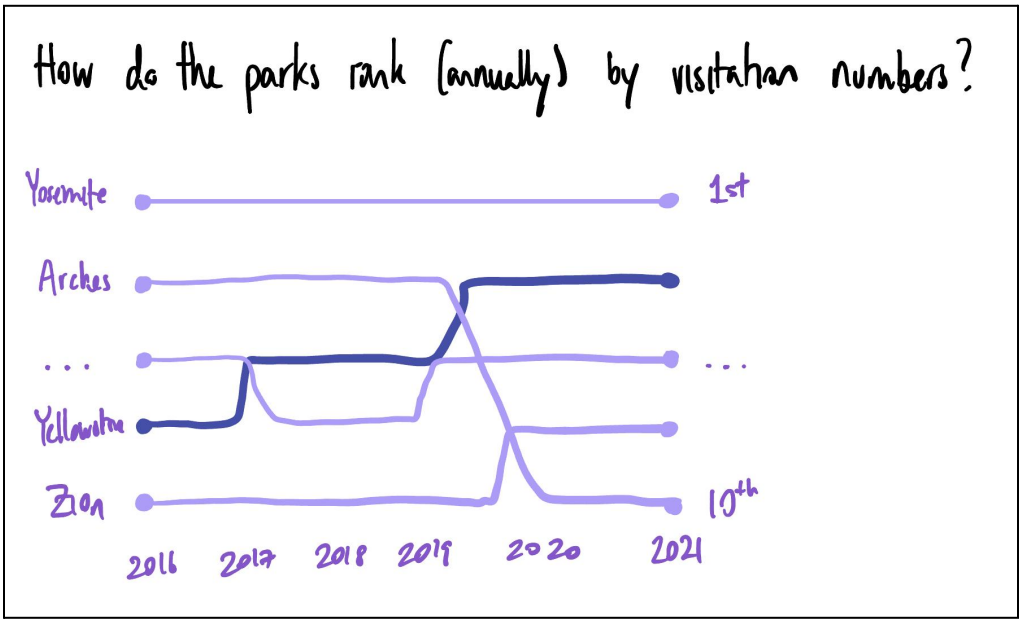
Sketch ID: 11

Answering Questions 1, 4, and 8



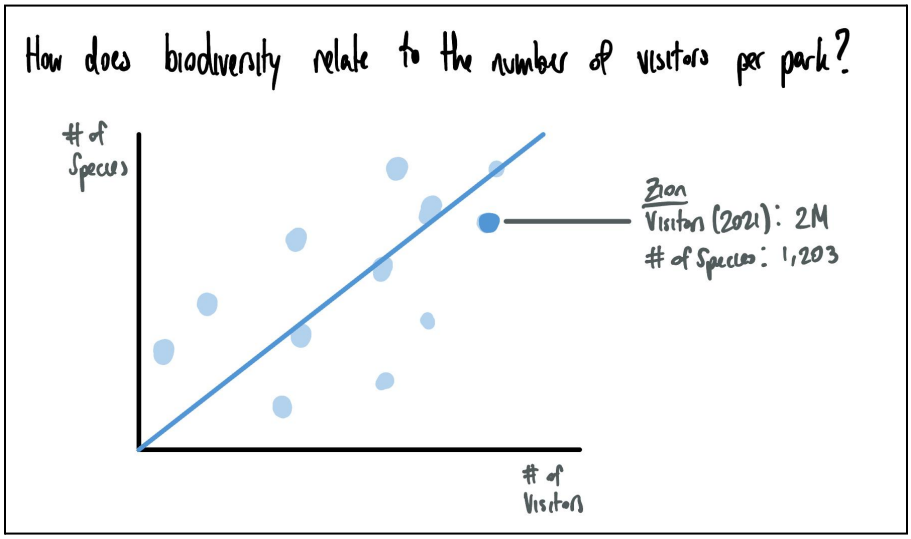
Sketch ID: 12

Answering Question 12



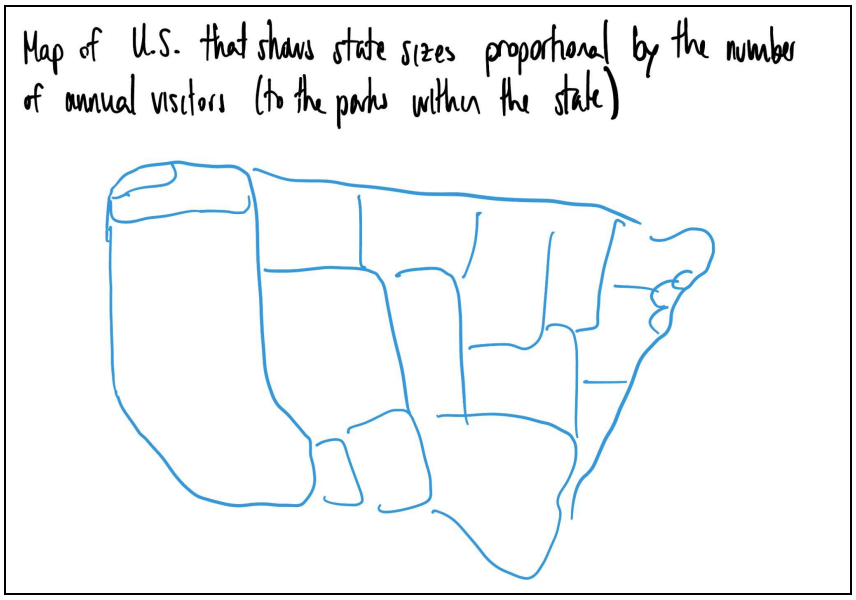
Sketch ID: 13

Answering Question 13



Sketch ID: 14

Answering Question 12



Sketch ID: 15

Decide

In this step, you will work with your group to decide which sketches to implement in D3 during the prototype phase. You should pick between 4-6 of your sketched ideas.

List of questions that will be interesting for our audience.

1. Which parks have the greatest biodiversity?
2. How many species are endangered?
3. Do some parks have a higher concentration of endangered species?
4. What kinds of biodiversity can I see at different parks?
5. How many species are native to the park they live in?
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11. How does biodiversity vary by size of park?
12. How do visitation numbers vary amongst the parks and by month/season?
13. How do visitation numbers vary by biodiversity within parks?

Sketch ID	Question ID	Author	Votes
1	1, 10	CC	III
2	11	CC	
3	2	CC	

4	1, 3, 5, 6, 7	CC	III
5	4	CC	
6	21, 22	OS	
7	21	OS	
8	14, 15, 16,	OS	
9	14, 15, 16, 17	OS	II
10	13, 14, 15, 16, 18	OS	
11	12	IP	II
12	1, 4, 8	IP	III
13	12	IP	I
14	13	IP	I
15	12	IP	

Decision Summary — *Why did we pick the above sketches?*
Our group's collective decision to choose Sketches 1, 4, 9, 11, 12, and 13 was driven by the desire to find a diverse set of visualizations that would come together to form one cohesive data story. In particular, Sketch 13 serves as our introduction: through an ordered ranking of the U.S. National Parks by annual visitation number, we can explain to our audience that this project will solely focus on the ten most visited parks. From there, Sketch 11 provides a useful visualization to further contextualize visitation numbers and understand the seasonality of each of the 10 selected parks. With this framework for understanding the visitation numbers for each of the 10 parks, we then turn to exploring biodiversity. In particular, Sketches 1 and 4 provide initial introductions and definitions for biodiversity within the parks, and Sketch 12 shows how these species relate across parks. Finally, we end with Sketch 9, providing a deeper look into endangered species within the parks.

Selected sketches:

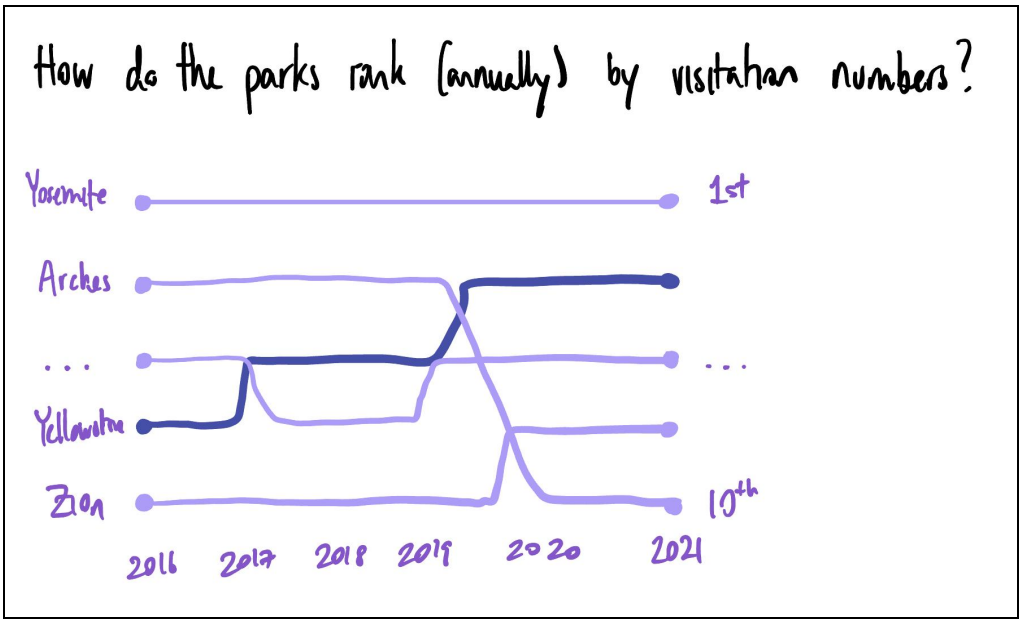


Figure 1; Sketch ID: 13

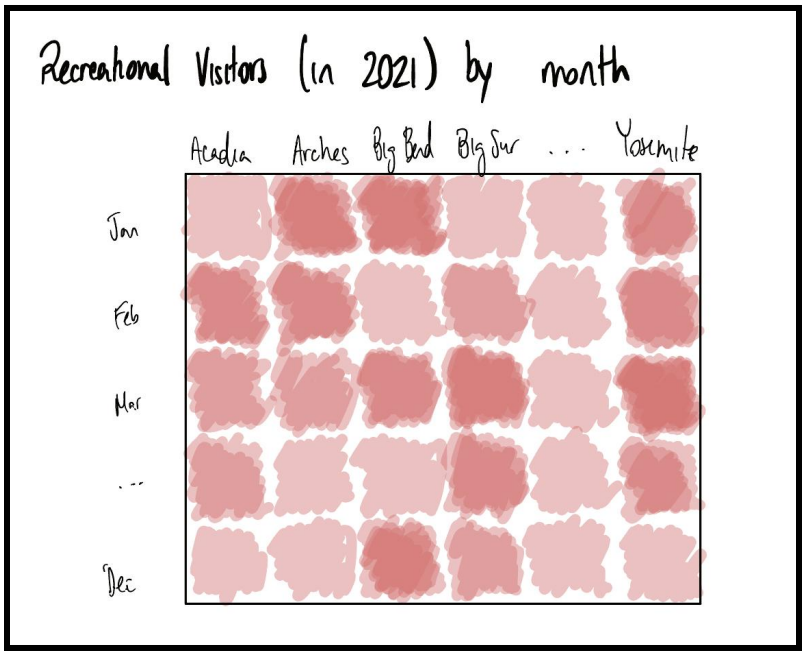


Figure 2; Sketch ID: 11

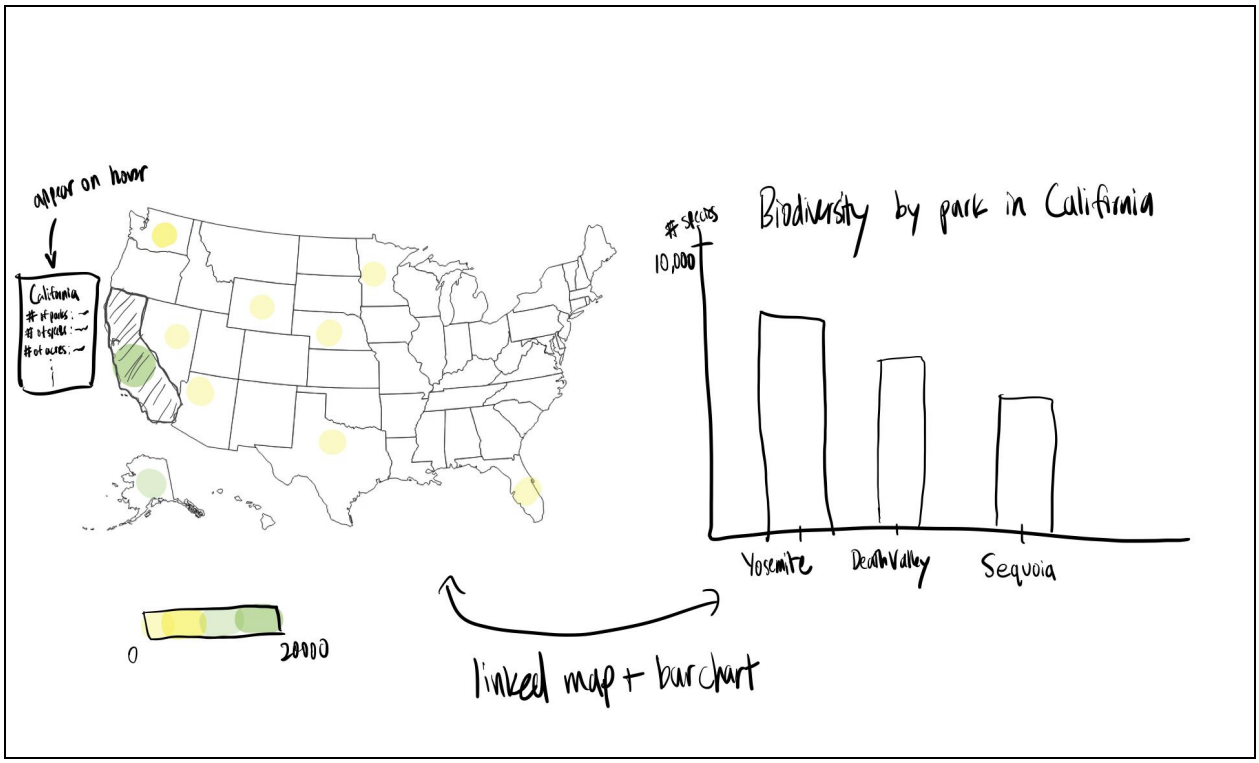


Figure 3; Sketch ID: 1

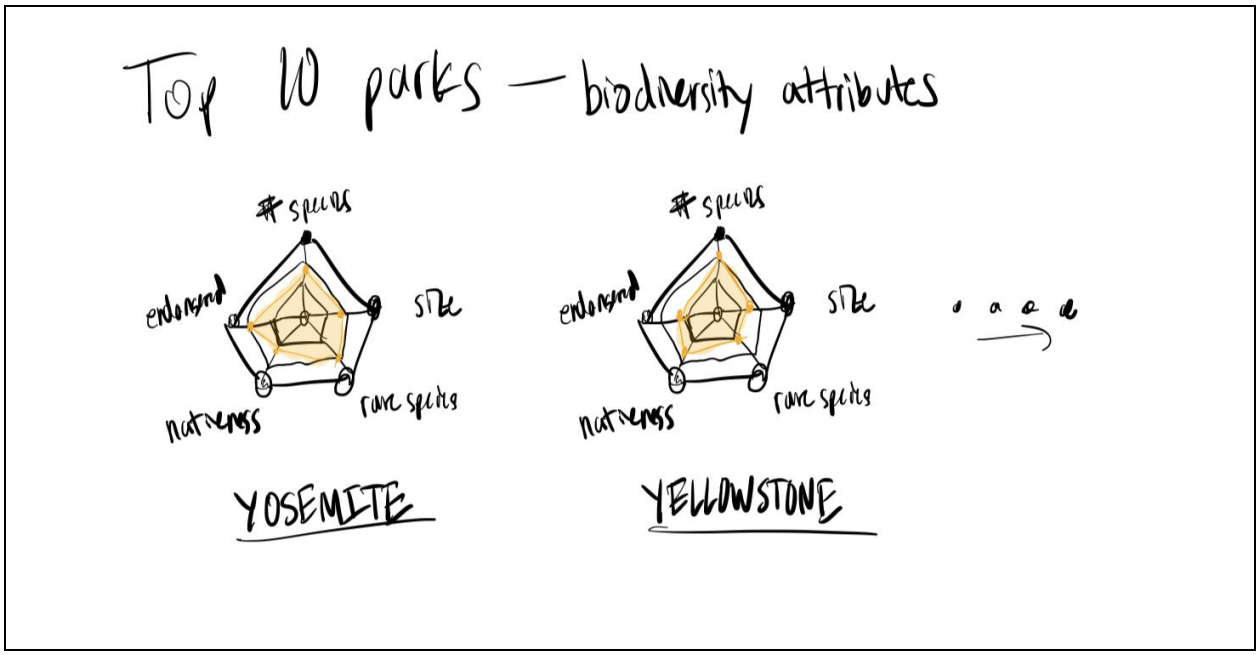


Figure 4; Sketch ID: 4

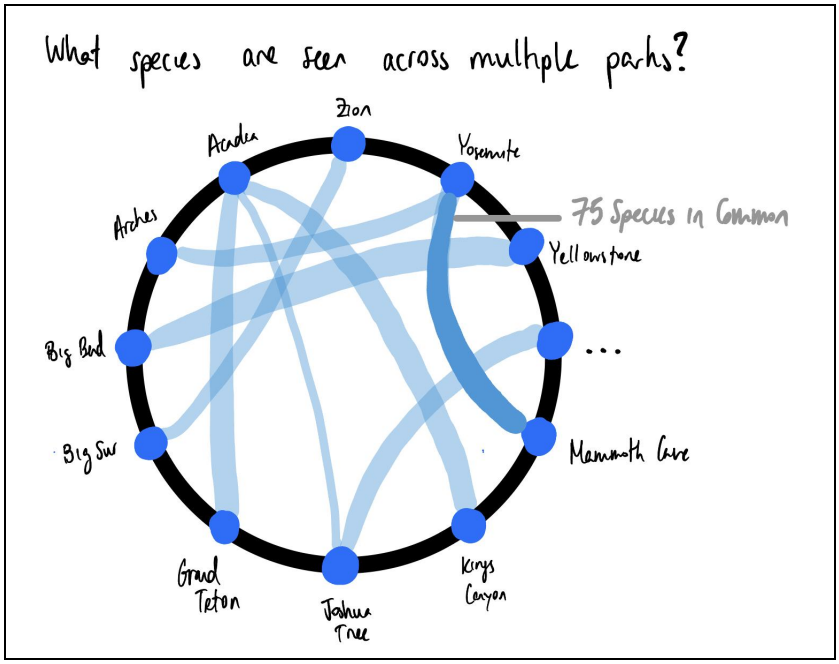


Figure 5; Sketch ID: 12

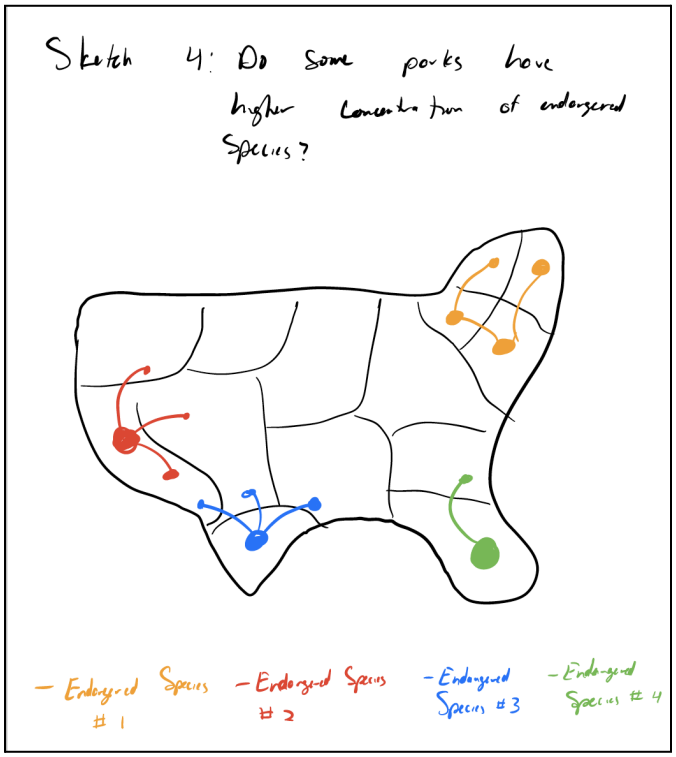


FIgure 6; Sketch ID: 9

Storyboard

Main Message

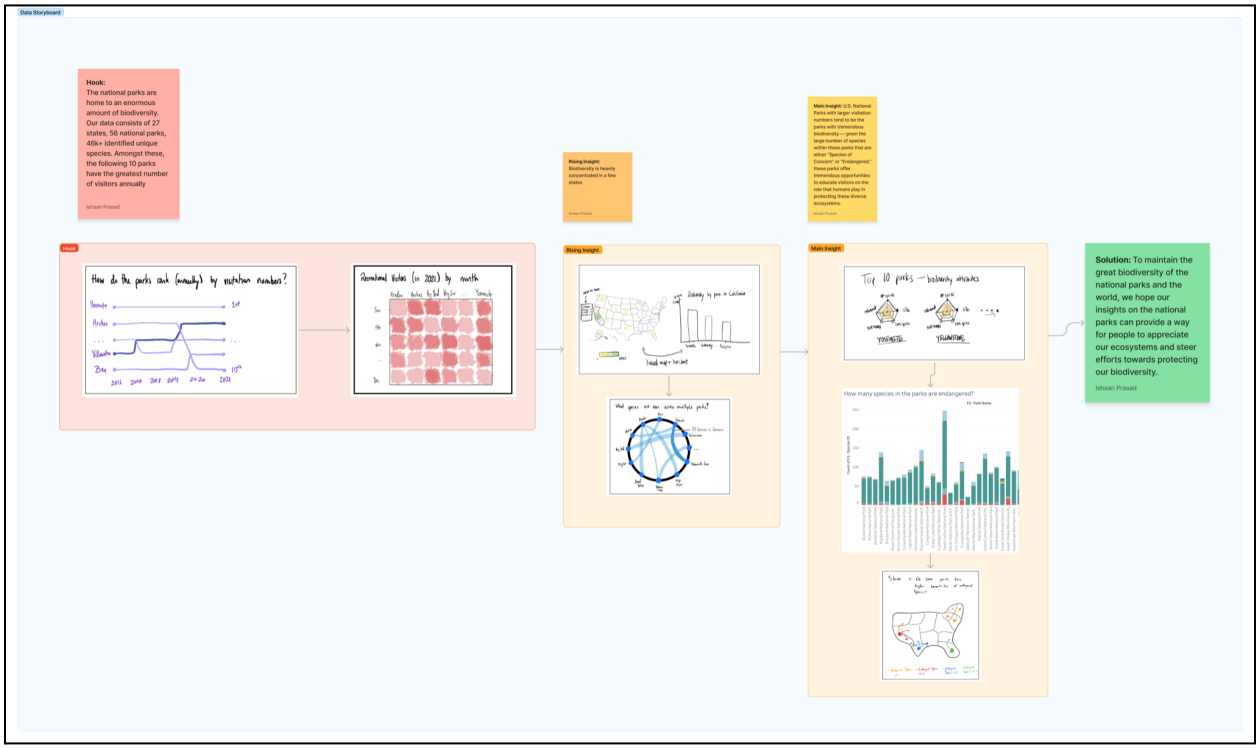
Insights:

1. A few states account for the majority of biodiversity in the national parks **(CC)**
2. Excluding vascular plants (i.e., which are most prevalent across all U.S. Parks), biodiversity varies tremendously from park to park — furthermore, the park with the most annual visitors (Great Smoky Mountains) has the greatest distinct number of species categories **(IP)**
3. Species commonly seen across the greatest number of parks are birds **(OS)**
4. Many of the species seen across many parks are species of concern or endangered **(CC)**
5. Vascular plants, birds, and insects account for the vast majority of distinct species **(IP)**
6. Largest national parks appear to be in California and Alaska **(OS)**
7. The majority of species are native to their parks **(CC)**

Main insight:
U.S. National Parks with larger visitation numbers tend to be the parks with tremendous biodiversity — given the large number of species within these parks that are either "Species of Concern" or "Endangered," these parks offer tremendous opportunities to educate visitors on the role that humans play in protecting these diverse ecosystems.

Decision summary – *Why did we choose this message?*
Our decision to choose the insight above was driven by our interest in providing a proactive message to our audience: i.e., to grow awareness of the endangered species within the parks, and to determine strategies for the conservation and protection of these populations. As frequent visitors to the parks, our original intention with this data exploration was to understand how to better protect the parks against Climate Change — however, from our data, we grew extremely interested in exploring biodiversity within the parks, and the ways in which humans can better protect these ecosystems.

Data Storyboard – (FigJam URL)



Hook: The national parks are home to an enormous amount of biodiversity. Our data consists of 27 states, 56 national parks, 46k+ identified unique species

Rising Insight: Biodiversity is heavily concentrated in a few states.

Main Message: U.S. National Parks with larger visitation numbers tend to be the parks with tremendous biodiversity — given the large number of species within these parks that are either “Species of Concern” or “Endangered,” these parks offer tremendous opportunities to educate visitors on the role that humans play in protecting these diverse ecosystems.

Solution: To maintain the great biodiversity of the national parks and the world, we hope our insights on the national parks can provide a way for people to appreciate our ecosystems and steer efforts towards protecting our biodiversity.

Think-Aloud Study

Interview 1

Tester Name: Yao Yu
Tester Email: yaodongyu@college.harvard.edu

General Observations from the think-aloud study:

- Makes sense that summer months are most visited for most parks
- Chart 3: interesting that some of the states don't have any parks
- What is being looked at gets confused over the course of the website
    - Are we looking at visitation or species? How do they relate?
- The formatting is off in a lot of places (responsiveness)

What does the tester like about your data story?

- Tester likes the plots and the interactivity of them
- Tester likes the format of the website

What improvements does the tester point out?

- Chart 6: Could be filtered more
- Chart 1: Could include tooltip for number of visitors as comparative metric
- Chart 3:
    - Fix the case when there are no parks in states
    - Fix the case when there is only one park in state
    - Click vs. Hover - explanation needed
    - Fix the width of the bars (i.e., for states with just one or two bars)
    - Provide additional explanation for this linked view; easy to figure it out once you mouse around, but providing an explanation would make things more efficient
- Chart 4:
    - Select 3 in dropdown menu to limit the comparisons that can be made
    - Too many checkboxes
    - Issues with size formatting
- Chart 6:
    - Fix visuals

Was the intended key message clear to the tester? Why or why not?

- Story follows a logical pattern
- Chart 2: "Are the recreational visitors different from other types of visitors"
- Chart 5: Disconnect about what is being asked; perhaps more explanation needed

Did the tester get your next steps or call to action? Why or why not?

- Yes, they did get the next steps and the "solution" paragraph really helps bring the point home

Interview 2

Tester Name: Hope Neveux
Tester Email: hopeneveux@g.harvard.edu

General Observations from the think-aloud study:

- Chart 1
    - Really liked fullPage.js

    - Likes the highlighting
    - Axes numbers are a bit smaller
- Chart 2
    - Calling out that we picked 2021 since it's the most recent full year of data

What does the tester like about your data story?

- Good flow - everything behaved pretty much as expected
- Text is a little small at places

What improvements does the tester point out?

- Chart 3:
    - Perhaps add more explanation on how to interact with the visualization
    - Replace states that have an "undefined" value with 0
    - Don't show the linked view bar chart for states with no parks
- Chart 4:
    - Expected behavior is that it automatically updates when you select
    - Legend gets cut off
    - Use Dropdowns instead of checkboxes
- Chart 5:
    - Show the most recognizable species

Was the intended key message clear to the tester? Why or why not?

- Story follows a logical pattern

Did the tester get your next steps or call to action? Why or why not?

- Solution page really helps tie everything together

Interview 3

Tester Name: Isha Agarwal
Tester Email: ishaagarwal@college.harvard.edu

General Observations from the think-aloud study:

- Sometimes you get hit with a LOT of information
- Is there a better way of formatting things to make it easier to parse
- Additional explanation for charts

What does the tester like about your data story?

- Likes a lot of the plots that we used
- Likes the general template of our website

What improvements does the tester point out?

- Chart 1: Could add a hover feature

- Chart 3: Fix the formatting and the edge cases
    - Providing some explanation around how to interact with this visualization would be helpful
- Chart 4: Lots of problems with formatting and make the general point of the visualization more clear
- Chart 5 + 6: Both charts seem pretty similar. Maybe combine the two somehow
- Chart 6: could be filtered more

Was the intended key message clear to the tester? Why or why not?

- Story follows a logical pattern
- The insights help to clarify things
- Could improve the flow between different sections of the website

Did the tester get your next steps or call to action? Why or why not?

- The final section really helped the user understand the call to action

Group Questions

- **Based on the results of your 'think aloud' study, what would you improve in your data story?**
    a. From the results of our 'think aloud' studies, we believe that we could improve our data story by: [i] providing more detailed explanations for each visualization, [ii] removing points of ambiguity within visualizations, and [iii] improving overall web page responsiveness. With respect to [i], all three of our testers highlighted instances where providing additional explanation (i.e., for Chart 3) would be helpful. With respect to [ii], we believe that we can remove ambiguity (as highlighted by some of our testers) via improvements such as revised wordings. Finally, with respect to [iii], we hope to improve our website responsiveness on both mobile and desktop devices, improving legibility by specializing our views for different platforms (e.g., by increasing or decreasing font size for captions based on platform type)
- **Are there any additional insights and visualizations you would use? Would you amplify or change your message? Did your narrative work? Did the tester get your takeaways?**
    a. Based on our user studies, we believe that we had a fairly comprehensive set of visualizations. With respect to additional insights and/or visualizations, we may consider either (a) linking Charts 5 and 6 together, or (b) adding another linked visualization to either Chart 5 or Chart 6 to augment the interactive experience for an audience member.
    b. From our studies, we also believe that our project's message is sound. It seems as though users understood the point we were trying to convey. At this point, we believe that [i] fixing the formatting on the visualizations and [ii] tidying up loose ends (i.e., with respect to ambiguities and explanations) will be crucial to improving the user experience and making the narrative as clear as possible.
    c. We believe that our narrative worked quite well. From user studies, it seems as though users were able to parse the message we were trying to convey. Likewise, the "insights"

and "solutions" sections of our website helped our testers grasp our takeaways with great ease.

- **Decide as a team which of these improvements you will implement and write down your decisions and why you made them in your process book as a numbered list. Implement the intended changes and check them off your list (e.g., adding "done"). You can distribute the tasks among your team members. If you are unable to implement specific changes, please explain why and describe the expected results in your process book.**
    1. **Chart 1:** Adding a tooltip to the Bump Chart
        - **a.** Blocked Show ranking via tooltip (on mouse hover)
            - i. We ended removing this feature, because when implemented, it cluttered our bump chart; likewise, we found that users could easily determine a ranking by looking at the y-axis
    2. **Chart 2:** Adding more filters to the Heatmap
        - a. DONE Provide dropdown to view visitation data by year
            - i. Originally only showed 2021 data
    3. **Chart 3:** Cleaning up the Choropleth
        - a. DONE Fix undefined messages for states with no parks (i.e., shows 0 instead of undefined)
        - b. DONE Hiding of chart when no parks are in a state
        - c. DONE Added explanation of how to use visualization
    4. **Chart 4:** Fixing the Spider Chart Visualization – *We found that the spider chart showed a lot of potential as a really interesting visualization but ran into the most usability/design problems out of all of our visualizations.*
        - a. DONE Implement drop downs
            - i. Instead of selecting from a cumbersome list of all the U.S. National Parks, users will be presented with 3 dropdowns, from which they can pick the U.S. Parks that they want to view on the Spider Chart
            - ii. This follows from our Tester's feedback: in particular, having more than 3 parks on the chart makes it hard to interpret the visualization
        - b. DONE Fix the legend spacing
            - i. The legend was originally overlapping with the spider chart visualization
        - c. DONE Add units to each park's Spider Chart mapping
    5. **Charts 5 and 6:** Increasing interactivity
        - a. DONE Per our answer for the previous question, we are still deciding whether we want to (a) link Charts 5 and 6 together, or (b) add another linked visualization to either Chart 5 or Chart 6 to augment the interactive experience for an audience member.
            - i. Through our reworking of the narrative to be focused on: exploring the characteristics of these protected areas, raising awareness of the species within them, and highlighting opportunities for action, we reworked our charts and created a new linked view to view details on the vulnerable species that each of the ten parks are protecting