

Final Project Report: SOS

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Project goals



Our overarching project goal was to create an animal conservation narrative to educate and inspire the general population to become more aware of how our actions directly affect those around us. We created a visually engaging website showcasing the stories of three endangered species, each of which illustrate specific examples of human activities that are driving them to extinction (“human drivers”). The website is not meant to be a comprehensive source of all endangered species, but rather a source to engage people of diverse backgrounds on the topic of animal conservation and the consequences of our anthropocentric actions.

To summarize, our main goals are:

1. Develop an engaging medium for people to learn more about animal conservation
2. Educate people on how human activities impact animal species

Discussion of related work

- The [IUCN Red List](#) is a comprehensive data source of animal, plant, and fungus species that are threatened, endangered, or extinct. Each species profile provides information about the species' habitat, population size, geographics range, and extinction status, in addition to information about why it became listed (i.e. the human and non-human drivers). We began our project by selecting three unique human drivers of species endangerment and used this resource during our exploration phase to brainstorm animals that would best help illustrate each driver.






Leatherback



Dermochelys coriacea

CITATION

Wallace, B.P., Tiewari, M. & Girondot, M. 2013. *Dermochelys coriacea*. *The IUCN Red List of Threatened Species* 2013. e.T6494A4326147. <https://doi.org/10.2305/IUCN.LIJK.2013.2.2.RLTS.T6494A4326147.en>. Downloaded on 15 May 2020.

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LAST ASSESSED
21 June 2013

SCOPE OF ASSESSMENT
Global


[Skip to Assessment in detail](#)
[Skip to Text summary](#)

LC	NF	DD	NT	LC	DD	NT	LC	DD	NT	LC	DD	NT	LC	DD	NT

< VULNERABLE > 

ENDANGERED  **CRITICALLY ENDANGERED**  **EXTINCT** 

POPULATION TREND

 **Decreasing**


NUMBER OF MATURE INDIVIDUALS


Population in detail


HABITAT AND ECOLOGY

**Marine Oceanic,
Marine Intertidal,
Marine
Coastal/Supratidal**

GEOGRAPHIC RANGE



 **Leaflet** | Powered by [Esri](#) | [PUGG](#), [Esri](#), [FOA](#), [NOAA](#), [AARC](#), [NINCAN](#)

 **EXTINCT (RESIDENT)**

- National Geographic's [Drivers of Extinction](#) provided a good starting point for the angle we wanted to take for our website. Although the website is an activity, we adapted the idea of using human drivers to tie into a more personal narrative as shown in Activity 1. One aspect that this website does well is separate the environmental and human factors, of which we wanted to make a distinction.

Activity 1: Causes and Effects of Extinction

⌚ 1 hr 15 mins



Students explore drivers of extinction, human and environmental, found within specific ecosystems of Earth's major biomes by investigating habitat destruction caused by forces like climate change, parasites, greenhouse gases, and natural disasters. Teams seek solutions to mitigate habitat loss and prevent extinction, and incorporate key findings into their culminating conservation pamphlets.

DIRECTIONS

- World Wildlife Day's (March 3) [guidelines](#) on how to take action and get involved in animal conservation. Although it is difficult and not very feasible to directly work in animal conservation for most people, a lot of their suggestions revolve around spreading awareness in innovative ways. For instance, one of the suggestions says: **"Use your talent** to show your support to wildlife and biodiversity conservation and inspire the world." Using the visualization skills we learned in class, we developed our website in support of these guidelines.
- [The Shape of the Story](#) from our course readings was referenced when we created the first iteration of our species narratives for the infographic assignment. We used principles from this reading to help us form an engaging story framework to share across our species narratives for this project. Specifically, we wanted to establish the problem clearly early on, add detail and nuances through a timeline and additional visualization as applicable to each species, and end on an impactful note sharing what progress, if any, has been made today to help.



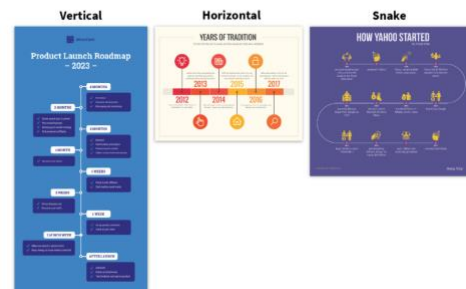
- Disney World's attraction, [The Animation Experience at Conservation Station](#), gave us the idea to implement interactive components with our website. The audience is led through a drawing tutorial of a Disney character and then visit some exhibits relating to Disney's conservation

efforts, which immerses them into the world of animal conservation. Although we couldn't exactly replicate this, we liked the idea of the audience relating more with our message through interactive pieces.

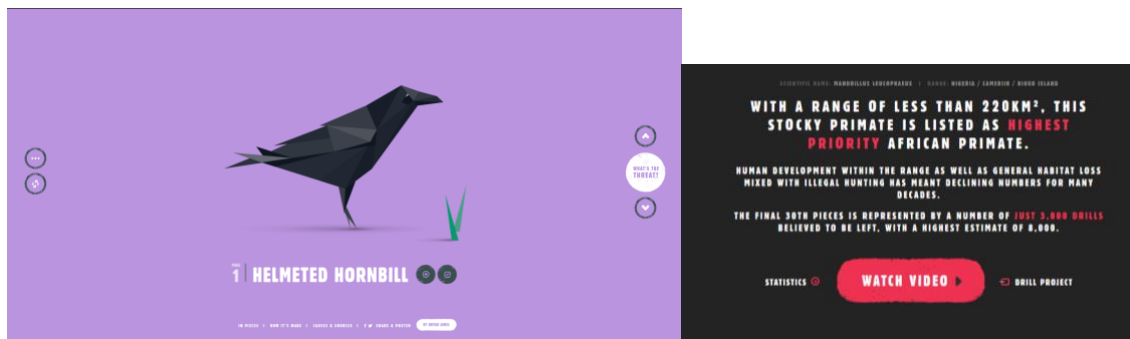
- [Venngage](#) provides some blogs that we referenced to design our timelines. Each timeline was created custom for each species so that it properly conveyed the information unique to each story. [This](#) and [this](#) were referenced to help provide initial ideas for how to organize information, including layout design, balancing text and visual aspects, and comparing two different timelines in a single visual.

There are 3 common timeline infographic layout designs:

1. Vertical
2. Horizontal
3. Snake



- [Species in Pieces](#)



This is a site that curates the current status of endangered animals by species much like we're doing in a low poly visual style (in pieces). The concept is something we liked right off the bat, although there isn't much detail: each species has its own summary of facts, with a link to an official conservation site.

We thought the idea of showcasing a species individually, instead of making a generic infographic about extinction or endangerment was fantastic - it allows for a larger canvas to discuss animal-specific problems in depth, which results in greater impact.

- [Worldbank on climate change](#)

considering for our centerpiece narratives and used as d3 inspiration during our coding journeys.

Project description

Our visualization took shape as a website that first introduces the idea of human activities driving extinction and endangerment, then explaining the three specific human activities that would be the focus of our infographics. Each of us took one driver, with an animal that we felt exemplified the dreadful state of conservation with respect to that driver.

The drivers we focused on were:

1. Policy: Policy can help or hurt species populations, whether it's protecting an animal from extinction or enabling the decline of an animal by destroying its habitat. This section of the infographic explores how policies created to support sport fishing hurt the Sierra Yellow-legged frog population by introducing a predatory species in their habitats.
2. Medicine: Many advancements in human health are thanks to animals, from laboratory research to extraction of animal parts for their medicinal value. This section focuses on how the demand for Saiga antelope horns, as a proxy for rhino horns, is drastically reducing the antelope population.
3. Art/culture: Animals are often exploited in the name of culture, including commercialization of animal parts and domestication. This section features how the demand for ivory to make aesthetically appealing art pieces decimated the African elephant population.

The following walks through the main sections of the website and some of our most prominent visualizations.

The landing page

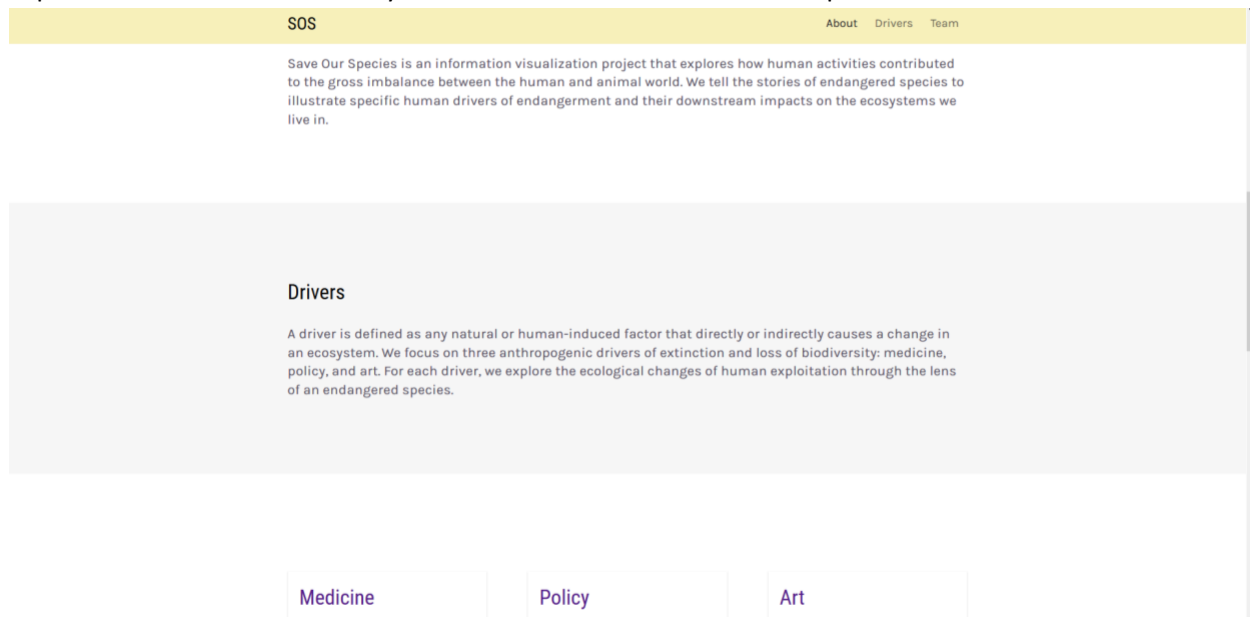
Navigating to the website will show the following screen. It is meant to set context for the main idea behind the site and incite interest to continue engaging with the site. In conjunction with the statement, the photo was chosen to represent the delicate connection between human's relationship with the earth and biodiversity.

The audience can easily navigate the landing page using the three links at the top: About, Drivers, and Team. Clicking on each will bring them to the respective section.



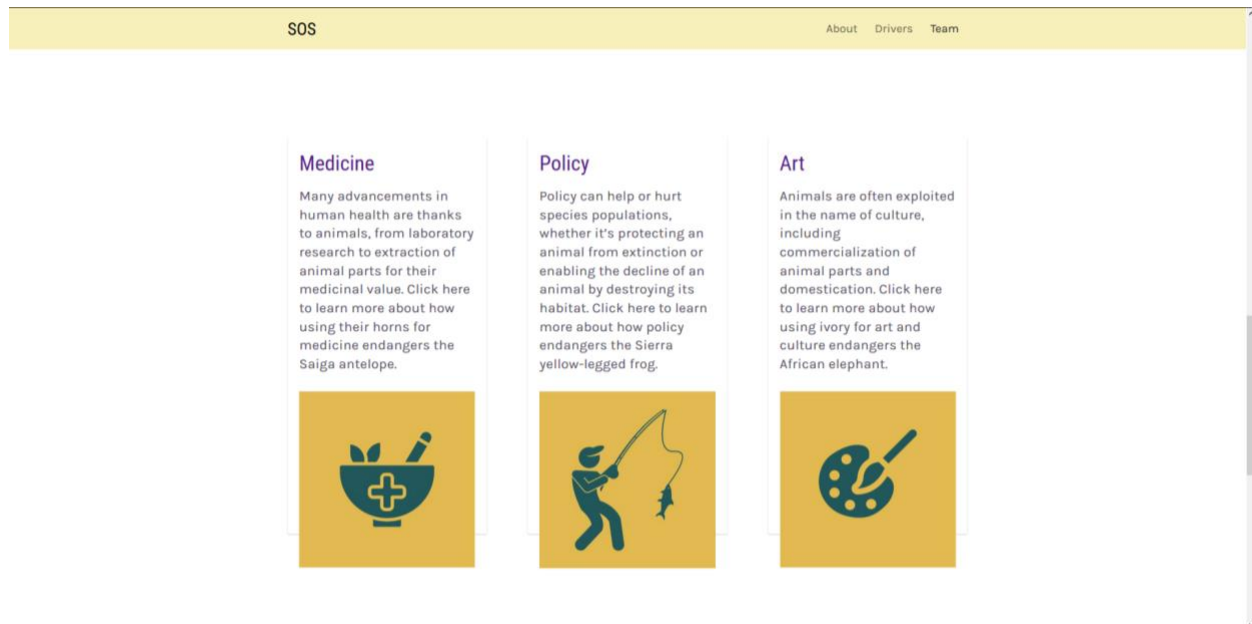
Human drivers

The drivers statement is the first explicit connection we make between the human drivers and the specific species we selected to tell their story. We define “driver” more broadly since there are hundreds of drivers that are moving species to extinction, some of which are directly or indirectly human caused. The primary drivers we address in through the narratives are intentionally anthropocentric, but we also explain some of those secondary human and non-human drivers deeper into the narratives themselves.



Below the driver statement is where the user can link to the specific driver and species pages. We first describe the human driver in general terms to elicit a sense of understanding for the broader scope of

each driver -- how far reaching medicine, policymaking, and the arts and culture stretch in the human species as it relates to the animal world. We then ask the user to find out more about the driver through reading about how it impacts the particular species to make that continuity of this connection very clear before entering the species narrative. These three cards hyperlink to the narrative pages and have a shadow box to nudge the user to click forward.



Quick facts for species

The quick facts page is the first thing the viewer sees when clicking on a species and driver narrative. The following is an example of the Yellow-legged Frog. Each is meant to provide a high level overall of the species, including geography, habitat, size, and year listed as endangered. From there the user can scroll down to learn the full story. This front layout also presents the three different color palettes that are specific to each narrative.

Driver: Policy // Yellow-Legged Frog



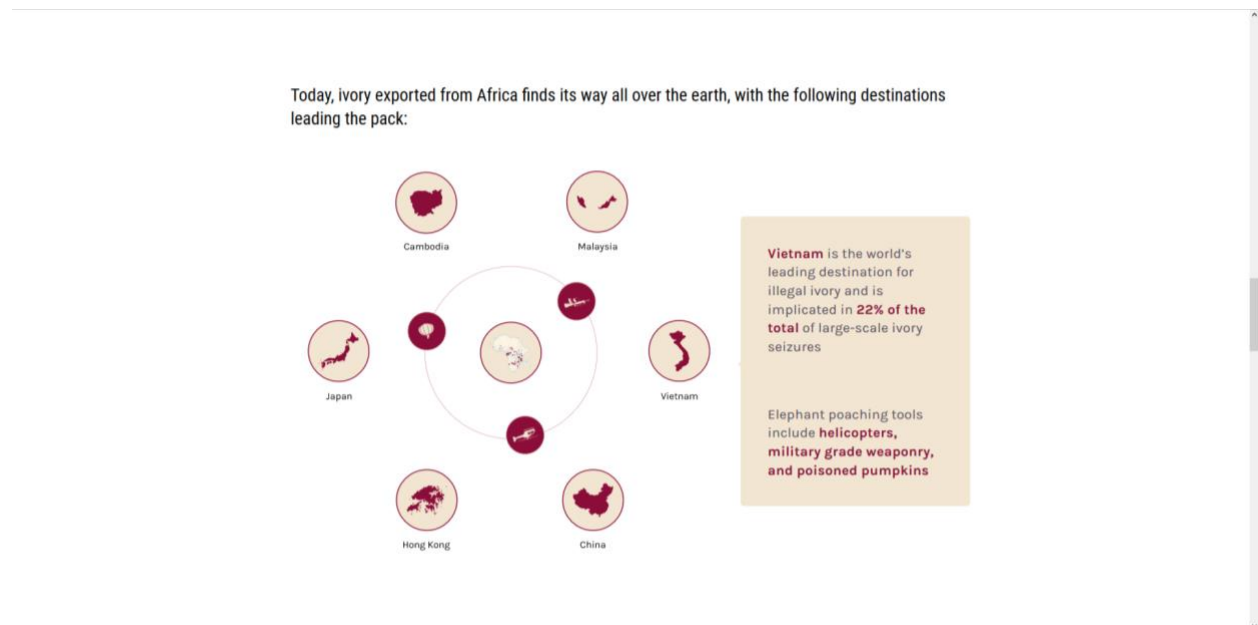
Timelines

Each narrative contains a timeline of the animal's story as it relates to its human driver of endangerment. The following is an illustrated timeline of the Saiga population, charting its decline through modern day. Each timeline is organized and designed differently to best reflect the message and purpose of the specific species -- that is to demonstrate how the human driver impacts the species population health through time. Two timelines have a vertical layout and one has a snake layout, one shows a dual-timeline of the driver and species health, and each shares the style, font, and color consistent with the overall narrative page.



Driver visualizations

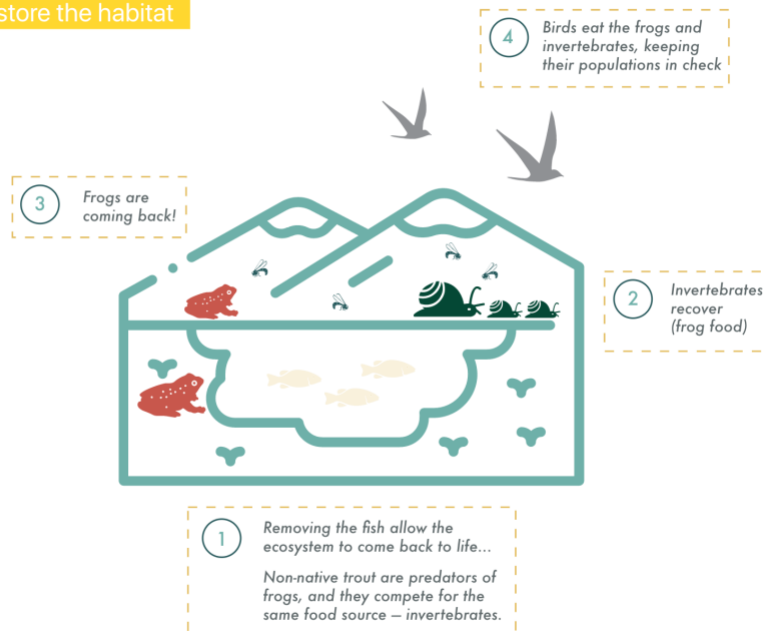
Each driver also details the sources or human activities that motivate habitat loss or animal poaching. Animal and driver specific data is included over multiple sections, as appropriate to the species in question. The Saiga section includes the fact that Saiga poaching is a direct result of the dwindling availability of rhino horns, in addition to secondary drivers that are contributing to their endangerment. The frog section highlights the Yellow-legged frog's role as a keystone species in the ecosystem, and the butterfly effects of its disappearance. Pictured below is an animated infographic part of the elephant section detailing major ivory markets and a sampling of the poaching techniques used to deliver ivory to these markets.



Interactive habitats

The antelope and frog featured two interactive and animated visualizations to show how their respective habitats change as a result of human activities. Both habitats were animated in Illustrator and animated with D3. The frog habitat asks the user to click on a single button, which then initiates an animation showing how the habitat and food chain changes when you remove non-native fish from the wetland. Unfortunately we had issues embedding the Observable notebook on the site, so we included gifs in their place for now. Links to the Observable notebooks can be found in Appendix D.

click to restore the habitat



The antelope habitat asks the user to click on each antelope to remove them, which initiates an animation of predators and plants disappearing as a result of the antelope's endangerment. Clicking on the "Save the Saiga!" button brings back the antelope, predators, and plants that disappeared. This is a basic simulation of the effects of a declining Saiga population.



Future Directions/Actions

All three species provide an overview of the current conservation status. Each is conveyed from slightly different perspectives. On one end, we have the Sierra Nevada Yellow Frog, which currently has a positive outlook due to recovering population numbers and species adaptation to biological drivers such as chytrid fungus resistance. On the other end, we have the African Elephant's outlook, which comes

from a slightly more foreboding angle. The number counter updates and increases throughout the day and ends with a call to action. The Saiga antelope falls more in the middle, with details about current conservation efforts, population numbers, and legislation. Although the outlook for Saiga is not as positive, it is not as foreboding as it is for the African Elephant which is reflected in the content.

What's Next?

Recently, there has been a greater movement towards conserving the Saiga antelope species. However, due to deep cultural and traditional beliefs, poaching for medicinal uses still needs to be carefully addressed.

Conservation efforts



Organizations such as **Wildlife Conservation Society (WCS) of China** and **Saiga Conservation Alliance** are spearheading the recovery of the Saiga antelope population. WCS China has identified a five-point framework to balance Saiga conservation and the use of traditional eastern medicine.

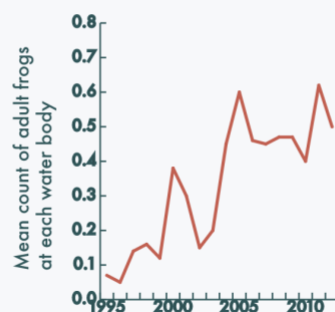
1. Trade monitoring and management

Testing traditional medicine for traces of Saiga horn

GOOD NEWS! In 2008, the frog was listed on the Endangered Species List, enacting safeguards to protect the species' habitat and population from further decline.

Early results of habitat restoration efforts indicate that not only do removing trout have a positive impact on frog populations, but the **frogs may also be more resistant to the chytrid fungus** having evolved from the population's final survivors.

Yellow-Legged Frog population is **growing at a rate of 11%** per year after restoration efforts.



Dire straits

Elephants are disappearing from the face of this planet at an alarming rate. The number of elephants that have been killed today:

62

If we don't do something, and fast, we'll be losing an intelligent, empathetic, captivating species.

Sources of data and information

The project was not built around a full dataset, but a series of informational resources that we used to construct unique visualizations within each species narrative. The following provides a summary of those information and data sources.

Saiga Antelope

- IUCN's Saiga antelope [web page](#), which provided general information such as geography, drivers for endangerment, and rough population numbers.
- Animal Diversity Web's [page](#) on the biological characteristics of the Saiga antelope.
- [National Geographic article](#) on the plight of the Saiga antelope. This provided the structure for the narrative, particularly the timeline and secondary drivers.
- A [recent article](#) on a study written about the Saiga antelope horn trade in Asia, which is the first paper to discuss the current state of the trade.
- [A rapid assessment of the trade in Saiga Antelope horn in Peninsular Malaysia](#), which is another scientific paper that goes more into the logistics of the Saiga horn trade as well as gaps and targets for interventions.
- Wildlife Conservation Society China's [web page](#) detailing their efforts in helping to conserve the Saiga antelope.

Yellow-Legged Frog

- [Large-scale recovery of an endangered amphibian despite ongoing exposure to multiple stressors](#) is the scientific paper on the effects of habitat restoration on the frog population. Information and data was used to construct the final section to inform and visualize the results of the study.
- The Sierra Nevada Ecosystem Project's report on [Non-Native Trout in Natural Lakes of the Sierra Nevada: An Analysis of Their Distribution and Impacts on Native Aquatic Biota](#) by Roland A. Knapp at the Sierra Nevada Aquatic Research Laboratory provided information for the timeline.

- The National Park Service page on the [Sierra Nevada Yellow-Legged Frog](#) provided general information about the frog and its history at the park, including data for the population loss visualization.

African Elephant

- These two articles about [extinction tourism](#) from the WTM Global Hub and the NYTimes elaborate on recreational activities, specifically tourism, affecting the native fauna in an area; this provided background on the idea of recreational activities affecting animal habitats and habits.
- Poaching, specifically, as a factor where human recreation directly influences extinction influenced the choice of animal and most of the infographic, and information was sourced from this [story](#) about elephant poaching across countries.
- This [Infographic](#) showcasing migrating elephant families was another reference
- [This](#) paper provided data on the decrease in elephant tusk occurrences and sizes
- [This](#) repository supplied information on ivory trade and commerce, and [this article](#) from ThoughtCo provided information on the history of the ivory trade
- This [data](#) from OpenAfrica provided information on elephant population
- [This](#) NCBI paper on elephant demographics contributed to information on elephant populations in general

Tools

Descriptions of which tools were used on each page and for what purpose.

- Illustrator
 - Develop website visualizations
- Javascript (React, D3)
 - D3: implement animations
 - React: build website
- HTML, CSS
 - Build website
 - Implement animations

User Testing and Results

Overview

We conducted our usability study with three participants that we selected from our own networks.

1. A woman in her early 20s, who has a background in biochemistry and public health.
2. A woman in her mid 20s; professional graphic designer/illustrator
3. A woman in her 30s; wildlife conservation biologist

We did not have strict criteria for selecting our participants, but wanted to make sure we selected participants from a variety of backgrounds with a range of knowledge and interest levels in conservation. In doing so, we were selecting for people who could represent the broad population, who is the target audience for our website.

The study was conducted virtually through Zoom/phone calls and collected feedback through a pre-post test with multiple choice questions gauging their interest and knowledge of animal conservation, and more open-ended questions to collect feedback on the usability of the site, visual design, and effectiveness of our communication methods. See Appendix A for a full list of pre- and post-test questions, collection methods, and rationale.

Results

For the pre-post tests, responses were converted to a likert scale to be able to see a quantitative change as a result of engaging with the site. 1 suggests strong disinterest, 3 is neutral, and 5 is strong interest.

What is your current interest level in animal conservation?

	User 1	User 2	User 3
Pre-test	4	5	4
Post-test	4	5	4

I am aware of issues relating to animal conservation.

	User 1	User 2	User 3
Pre-test	2	5	4
Post-test	4	5	4

I believe that animal conservation is important.

	User 1	User 2	User 3
Pre-test	4	5	5
Post-test	4	5	5

Responses from the pre- and post-test showed that all users have interest in animal conservation and believe it is important, but it did not change their level of interest after engaging with the site. Only one user experienced a change in her perspective after interacting with the site, which was an increase in awareness of issues relating to animal conservation. Other users already had a higher level of awareness and the site did not change their level of awareness provided the new information.

The following are summaries of qualitative measures from the usability study, gathered through open-ended questions from the post-test feedback and through observational data and comments as the users were reviewing the site.

Understanding of primary messages

Connection between human activity and conservation

All users understood that the site was intended to show the connection between how human activity influences wildlife and the importance of conservation from that perspective. This was further observed by users suggesting changes about how to make this connection more explicit through design changes.

Inspiration from reading species narratives

In addition to quantitative measures illustrating a slight change in animal conservation interests, users appeared to generally enjoy reading the species narratives and learning how they illustrate the drivers of endangerment. One user noted that she would have liked to have seen more links to learn more about the information presented. This engagement with the narrative pages in conjunction with their high interest in animal conservation shows that users felt this medium of visual communication was successful.

One user noted, “when I’ve learned or talked about biodiversity in classes or among friends, it’s usually as this big, abstract concept that I feel pretty disconnected from. Being able to concretely look at three examples and how we have decimated some of those populations was most memorable for me. Understanding the important role these animals play in their natural habitats and what we would lose purely because of our human actions was pretty impactful.”

Design

Layout and visual engagement

All users suggested changing the visible screen when you first see the landing page to provide more written content and visuals about the site.

One user noted that the colors were nice and the text was easily digestible. Specific changes to colors to the narrative pages were minor.

Navigation

Users noted that it was intuitive to navigate around the pages, but wanted to see more navigation to go back and forth between the pages.

Appropriate illustrations

Users noted that the visualizations effectively conveyed pertinent information and that there was a good variety of different types of visualizations.

Learnings from feedback

Based on usability testing results, we found that there is an audience for the content that we're curating. Users' perspectives on animal conservation did not change greatly, but the user with a lower amount of knowledge before interacting with the site had a much higher knowledge after. This suggests that the site can have a net positive impact on animal conservation knowledge for people who know little about conservation, but not for people who already feel aware prior to interacting with the site. Additionally, we validated that users enjoyed the overall learning experience and learning about species that they were not aware of before. Lastly, we learned that presenting esoteric information using a story-driven narrative is well received by both laypeople and people in the scientific community.

We made the following changes to our visualization based on feedback from user testing. These changes were prioritized by their level of difficulty and level of importance to implement. Considerations for level of importance were relevance to the primary messages of the project topic and the relevance to the phase of the project. Several changes considered are slated for additional phases in future work when there are additional animals that illustrate new or existing drivers on the site.

General concepts

1. Add navigation. Since the page structure isn't too complex, we only added a navigation link back to the landing page from each species narrative. We did not want to add a navigation menu between species pages because we want the user to navigate back to the landing page to read more about the driver featured in the species narrative prior to reading about the species.
2. Clarify the connection between the primary human driver and species story before reading the species narrative. We added an about statement and clarifying copy in the driver definition statement to explain how the site is laid out. We also added text relics in the driver cards on the landing page and at the top of the species narratives to remind the user which driver and species they're reading. Originally we planned to have an interactive visualization to map these connections, but decided it was an excessive way to explain this concept.

Landing page

3. Add a descriptive statement about the site. An "about" statement describes who made the site and our motivations behind it.
4. Make enhancements to the banner/logo/title to make it visually striking. We selected an appropriate photo to portray the ecological connection with human influence and pulled up the text explaining the site.

Saiga Antelope

5. Change the color of the text
6. Add a couple more sections to improve the flow of the narrative
7. Add padding to the sections
8. Implement animation
9. Include some numbers -- #s in terms of population decline, how much Saiga horn is sold for

Sierra Nevada Yellow Legged Frog

10. Updated color and font inconsistencies.
11. Add an interactive visualization of the frog habitat. The original habitat visual used in user testing was static and there were issues rendering the full image before the study. Given the poor feedback on the habitat illustration and the shift to reducing the level of visualizations on the landing page, we thought that making the visual animated and interactive would enhance the overall user experience and knowledge of how ecosystems can change.
12. Add more contextualization about policy as a driver to endangerment for the frog in the first paragraph. This was accomplished through changes expressed in item 2.

African Elephant

13. Updated CSS where some of the text was being clipped by color blocks that follow
14. Added more context about culture, and included the idea of “art”; tried to better quantify what “art” and “culture” means before elaborating on ivory
15. Added narrative on history of ivory trade

Visualization

Link to site:

<https://sharanya204.github.io/sos>

Work distribution

The following table provides a summary of work completed by each team member by percentage contribution.

Project Component	Subcomponent	Mia	Phoebe	Sharanya
Background research	Elephant	0%	0%	100%
	Saiga antelope	0%	100%	0%
	Sierra Nevada Yellow-Legged Frog	100%	0%	0%
Content and visualizations	Species narratives	33%	33%	33%
	Landing page	33%	33%	33%
Website Implementation	Website structure	0%	33%	66%

User Testing and Others	User Testing	33%	33%	33%
	Report Writing	50%	25%	25%

Appendix

Appendix A: Usability test questions

Pre-test questions:

1. What is your current interest level in animal conservation?
 - a. Rationale: Gauge current interest level in animal conservation - a Likert scale for interested they were in learning about animal conservation in general
 - b. Multiple choice: Very uninterested, Uninterested, Neutral, Interested, Very interested
2. I am aware of issues relating to animal conservation.
 - a. Rationale: Raise wider awareness about the importance of conservation, both for niche species (saiga, frog) and already popular species (elephant)
 - b. Multiple choice: Strongly disagree, Disagree, Neutral, Agree, Strongly Agree
3. I believe that animal conservation is important.
 - a. Rationale: Stance on animal conservation in general
 - b. Multiple choice: Strongly disagree, Disagree, Neutral, Agree, Strongly Agree

Post-test questions:

1. What is your current interest level in animal conservation?
 - a. Same as pre-test question
2. I am aware of issues relating to animal conservation.
 - a. Same as pre-test question
3. I believe that animal conservation is important.
 - a. Same as pre-test question
4. What they learned:
 - a. Rationale: Were they more interested in learning about human activities affecting animal populations - other drivers
 - b. Verbal

Feedback for usability of site/visual design/effectiveness of communication:

1. Does our portrayal of animal conservation issues (i.e., framing issues within the drivers) make sense?
 - a. Rationale: Did the structure of the website make sense that we have drivers/are looking through the lens of three drivers
 - b. Free response

2. Was the information included with each driver/animal relevant and cohesive?
 - a. Rationale: Specific to species: was background information about the animal relevant?
People know about elephants, but people don't know about saiga antelopes
 - b. Free response
3. Was the animal a good proxy for the driver?
 - a. Rationale: Did [species] exemplify endangerment via this driver? Long term goal might be covering more species, but in the interest of brevity/this project, we wanted to make sure that we had found a species that was most apt
 - b. Free response
4. How would you describe your experience navigating around the pages?
 - a. Multiple choice: Intuitive, Pleasant, Frustrating, Confusing, Indifferent, Other (please describe)
5. What did you think about the layout for each narrative (color, structure, visualizations, etc)?
 - a. Rationale: Website was conducive to assimilating knowledge; visually pleasing experience
 - b. Free response
6. What was the most memorable nugget of knowledge from SOS that you walked away with?
 - a. Rationale: To evaluate what parts of the website were the most effective in conveying our message
 - b. Free response
7. Did they understand that this is three drivers of possibly fifty million?
 - a. Rationale: To assess whether the audience understood the scope of the project-- it's not meant to be encompassing the entirety of reasons animals go extinct
 - b. Verbal
8. Anything else you want to tell us?
 - a. Rationale: To give participants an opportunity to give further feedback if our questions were not comprehensive
 - b. Verbal
9. What are other animals they thought could fit each driver → fully optional
 - a. Rationale: Ideas! Funsies.
 - b. Verbal

Appendix B: Code referenced

[Manipulating attached SVG files in Observable](#)

All icons were downloaded from [The Noun Project](#)

Banner image was a photo by [Bill Oxford](#) on [Unsplash](#)

Appendix C: Screenshots

DRIVERS OF POPULATION DECLINE

Primary driver



Policies that prioritize human interests, including fishing and recreational activities

Secondary driver



Chytrid fungus runs rampant among frogs, attacking their skin. Frogs' skin is not only their outer layer, but also their respiratory and excretory systems

Chytrid fungus causes Chytridiomycosis, an infectious disease that affects amphibians worldwide. The equivalent disease in humans would single-handedly destroy the lungs, kidneys, and skin all at once!

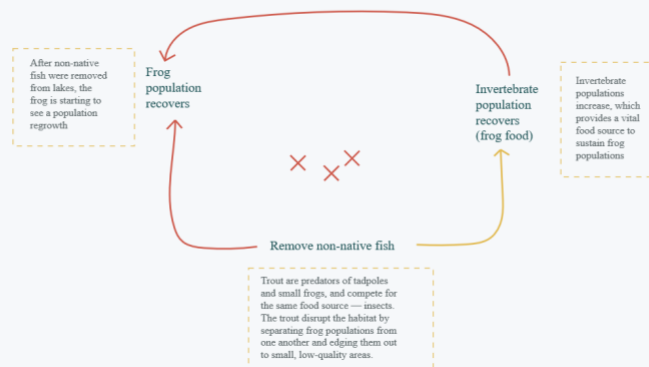


Secondary drivers that cause a decline in frog population

A KEYSTONE SPECIES IN THE WETLAND ECOSYSTEM

The Yellow-Legged Frog plays a vital role in the food chain, serving as predators of insects and prey for native birds, snakes, and mammals.

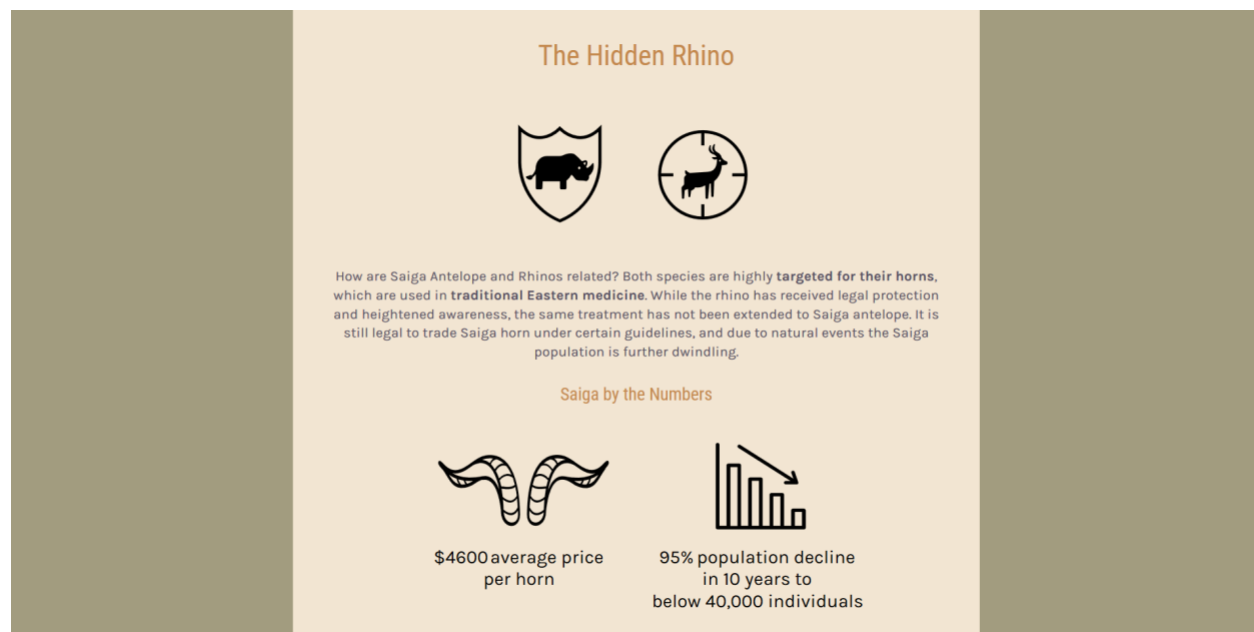
While it's too late to protect them from the chytrid fungus, experimental habitat restoration efforts in Yosemite are allowing the frogs to make a comeback.



Illustrating the Yellow-legged frog's role as a keystone species



A timeline of the yellow-legged frog's conservation journey



The relationship between saiga poaching and rhino numbers, and the saiga's decline in population

Secondary Drivers

Other than poaching, the Saiga are also threatened by several other factors.



Secondary drivers that cause a decline in antelope population

Current population trends



Saiga population patterns have adapted and population numbers are slowly recovering. For instance, females sexually mature faster and start reproducing at 1 year of age. Saiga also now have mass birthing events over a week rather than spread out through a season to maximize offspring survival.

Experts now estimate that Saiga antelope have a population of around 120,000 individuals, which is an improvement from 40,000. However, without further interventions to protect the species, population numbers will remain low.

Recent legislation



- A 1.2-million acre swath in the Altyn Dala (Golden Steppe) region was declared a saiga reserve
- The Association for the Conservation of Biodiversity of Kazakhstan (ACBK) has been tasked with monitoring Saiga by catching and tagging them, as well as weighing calves
 - Countries in which Saiga reside have implemented hunting bans
- Saiga Conservation Alliance (SCA) put together an action plan for the Saiga's preservation, in which the countries Saiga antelope exist have signed

Current status of saiga antelope conservation

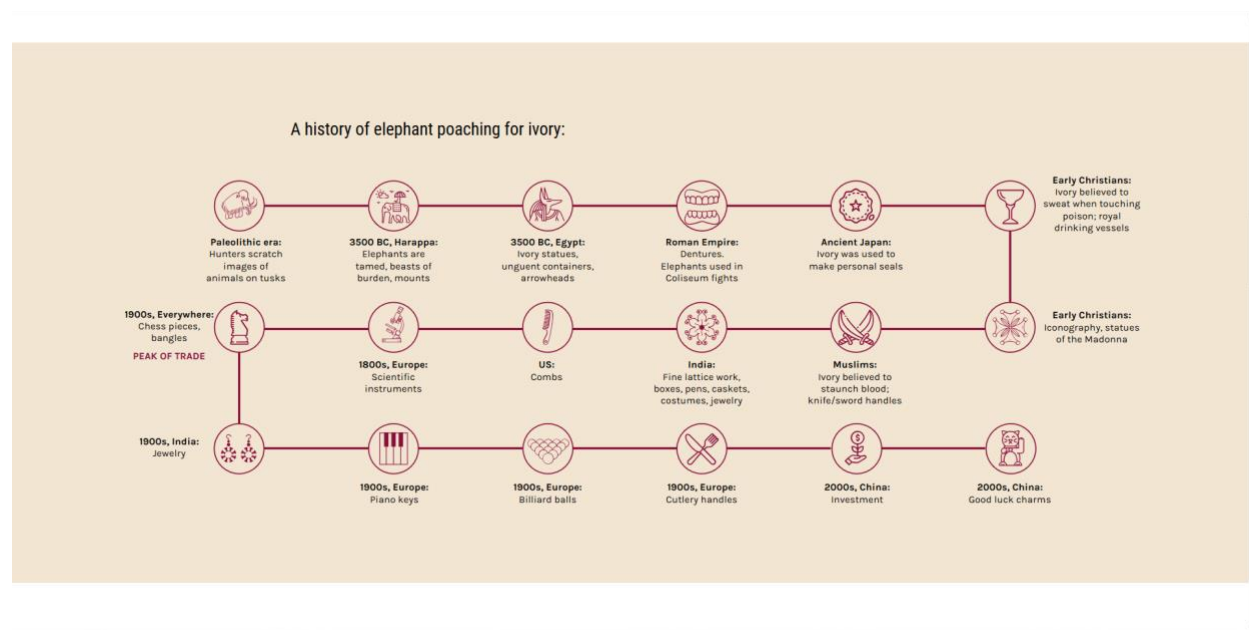
Animal sources of ivory

Sources of ivory are primarily the two modified incisors of living and extinct members of the Proboscidea family: Asian and African elephants and extinct mammoth from Alaska and Siberia. However, since their chemical structure is identical to elephant tusks, other mammals with large enough teeth to be carvable are used instead (hover on each animal for more information).

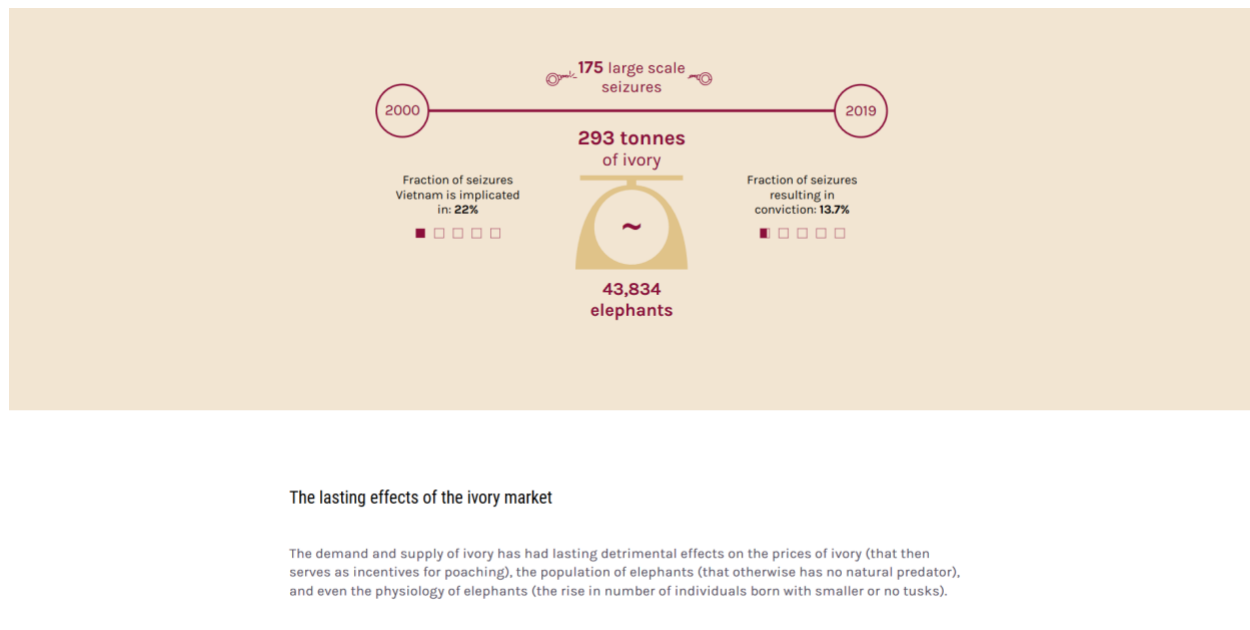


Scrimshawing is the art of carving intricate designs on whale bones or teeth (ivory), generally sourced from sperm or killer whale teeth. It was originally practiced by sailors working on whaling ships out of New England as a means of passing time while idle at sea.

Other sources of ivory from the elephant infographic



The elephant ivory poaching timeline



Information on ivory seizures

Appendix D: Additional material

- Thumbnail of SOS, SOS.png



- Save Our Species
- [Google Drive](#) link with Illustrator files
- Observable notebooks:
 - [Saiga antelope animation](#)
 - [Frog habitat animation](#)