



Quieting Yellowstone

My Yellowstone Experience

I went to Yellowstone with an interest in the natural sounds that exist within the park. I took a microphone and recorded every unique sound I heard, from mud pots, to bison grunting and wolves howling. As I played back each recording I took each one was a mix of the natural sounds and human made noise. I wasn't able to get a single recording of pure natural sounds uninhibited by human noise. From this experience I decided to approach the problem of sound pollution in YNP.



Natural Sounds and Noise

Natural sounds are any sounds produced by non-human organisms as well as those generated by natural, non-biological sources within their normal soundscapes. This is a recording of a bison grunting, uninhibited by human noise.

In the context of the NPS noise is defined as any human made sound. ([nps.gov/sound](https://www.nps.gov/sound)) This recording is of multiple people talking at the same range as the bison.

Over laying the two recording you quickly see that each are still audible but defining which is which can be difficult.



Effects of Sound Pollution

Wildlife

Sound, just like the availability of nesting materials or food sources, plays an important role in an animal's ecosystem. Activities such as finding desirable habitat and mates, avoiding predators, protecting young, and establishing territories are all dependent on the acoustical environment.

([nps.gov/sounds/wildlife](https://www.nps.gov/sounds/wildlife))

Humans

Parks are experiencing on-going acoustic challenges, from increases in visitation to air tours and maintenance equipment. Such noise affects visitors' perceptions of solitude and tranquility and may interfere with how people rate landscapes in national parks

(Weinzimmer et al. 2014).

Plant Life

When noise covers up natural sounds, the entire natural ecosystem shows the effects. Human noise sources stress this system, which creates a domino chain of effects for both animals and humans.

([nps.gov/sounds/wilderness](https://www.nps.gov/sounds/wilderness))

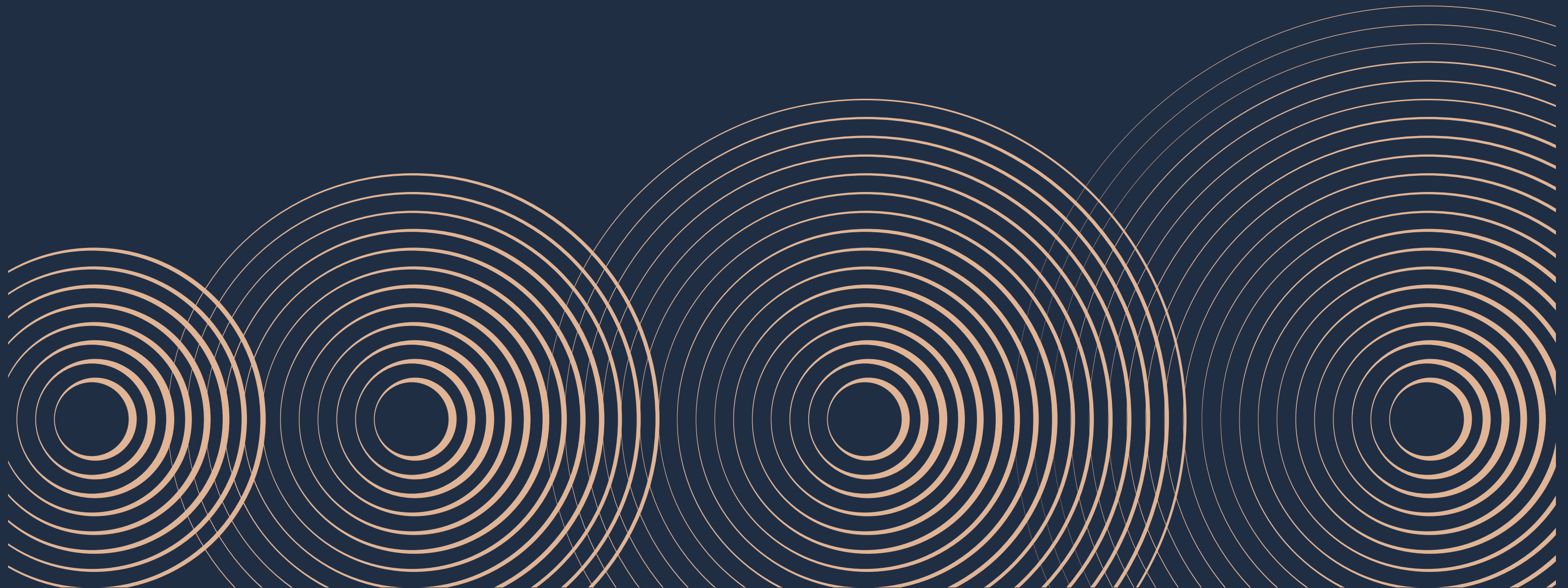


*“Natural sounds
are part of a web
of resources vital to
park ecosystems.”*

-NPS 2019

Rising Noise Levels

Because soundscapes are categorized as a vital sign by Yellowstone they have been monitoring the parks soundscape for over two decades. Each year the median sound levels have followed the trend in visitation. As more people visit the park each year the louder it becomes. (The State of Yellowstone Vital Signs and Select Park Resources; 2017)



Goals

Connection

Help connect users to the ecosystem and to each other.

Protection

Protect the natural soundscape for the benefit of the fauna and flora.

Education

Help visitor become aware of the problem of noise and show them change can be made.



Photo by Taran Egner



[nps.gov/media/photo/gallery](https://www.nps.gov/media/photo/gallery)

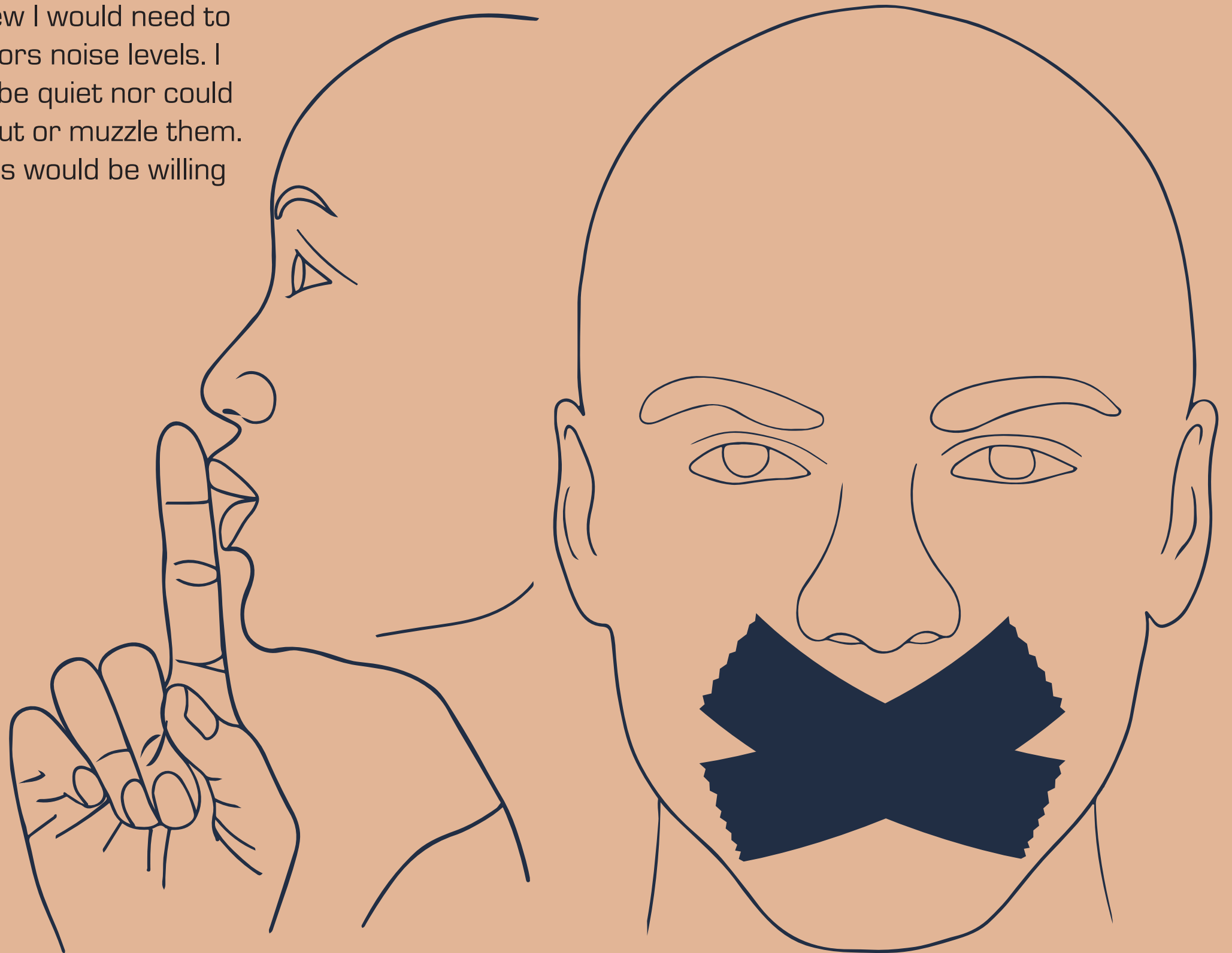
Scope

The road system is the source of the most prevalent noise in YNP. The infrastructure, policy, and time needed to fix this is extensive. I wanted to focus more on something that can cause change here and now. The noise levels created by individuals also affects the experience of others especially along high traffic areas such as boardwalks. By starting at a smaller scale my hope is to be able to create change sooner and help visitors become more invested in the bigger problem of the high traffic levels in YNP.



Faciliatating Quiet

In order to accomplish my goals I knew I would need to design a solution that restricted visitors noise levels. I knew I couldn't simply ask visitors to be quiet nor could I force people to tape their mouth shut or muzzle them. I had to design a covering that visitors would be willing and hopefully want to wear.



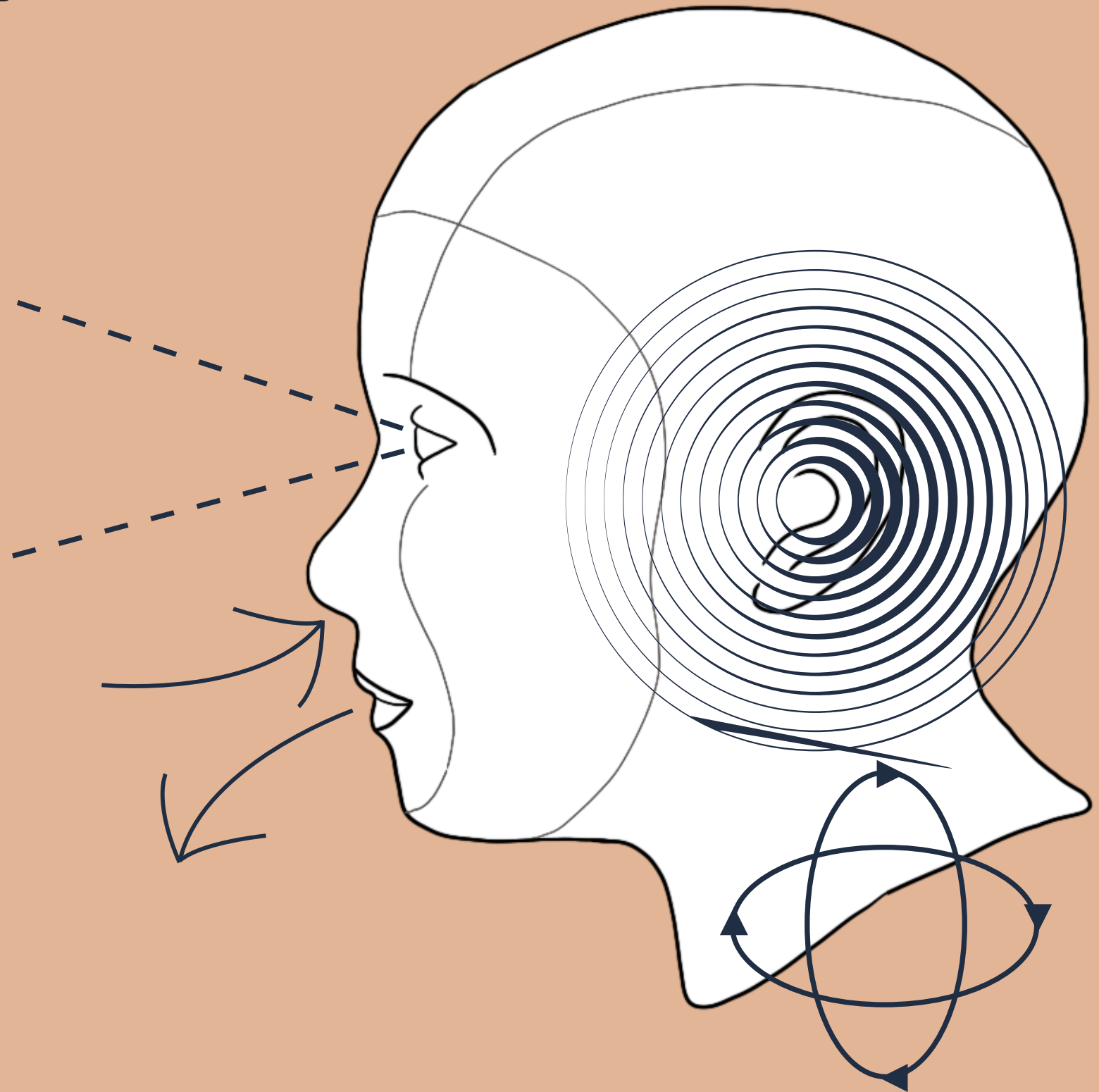
Willingness to Cover Face

I looked at different ways in which people are willing to cover their face. I drew heavily from coverings worn for filtration, protection, and style. Because this cover would exist in the outdoors I focused heavily on the outdoor industry in particular.



Meeting Users Needs

I didn't want the covering it's self to detract from the experience in any significant manner. My users still needed to be able to hear the natural sounds, see clearly, able to move, and breathe freely.

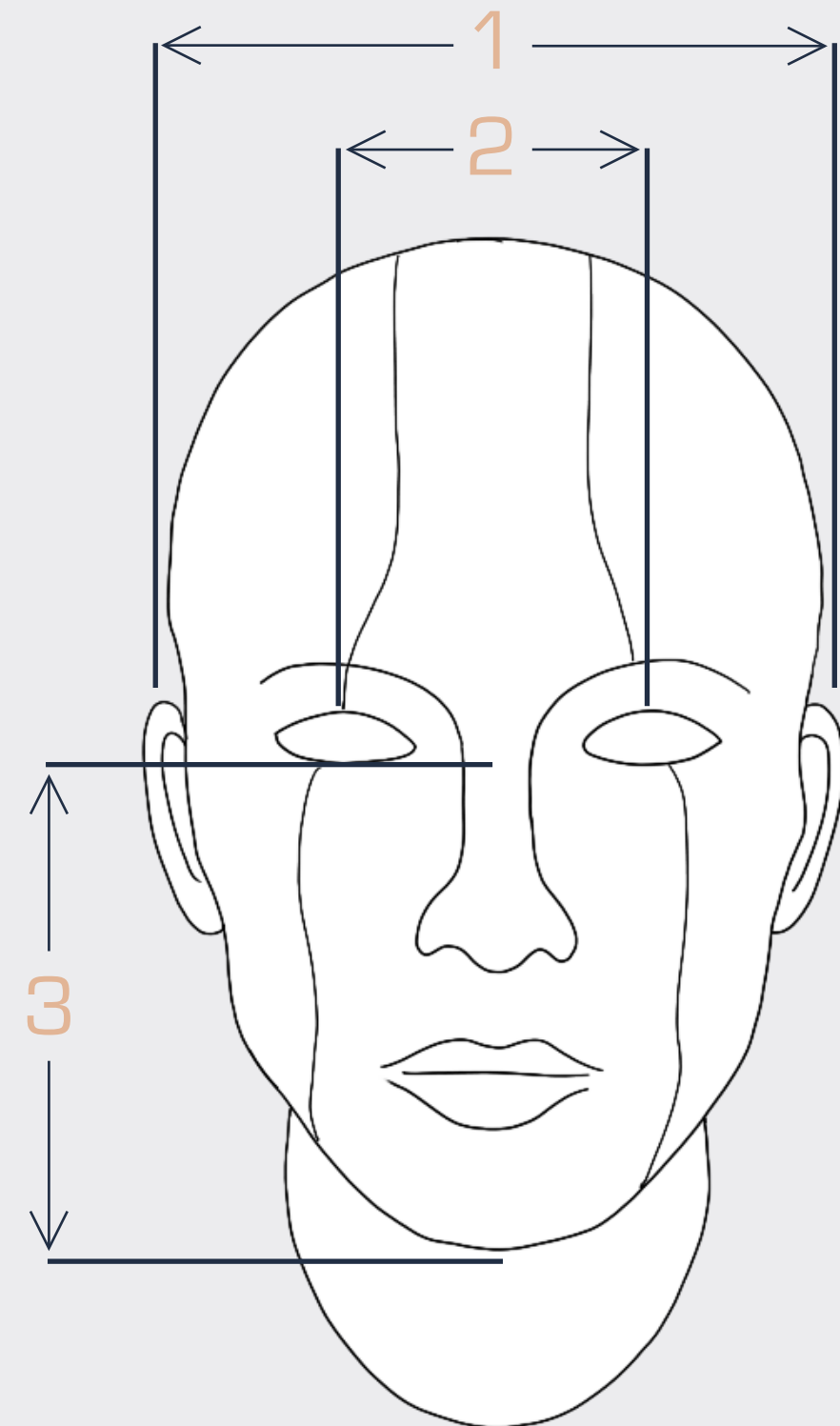


Anthropometric Sizing Data

I turned to anthropometric data to get average sizes of heads and facial features that would interact with the covering.

(Data from Alvin R. Tilley ; Henry Dreyfuss Associates The Measure of Man and Woman : Human Factors in Design. New York :Wiley, 2002.)

		Measurements in inches				
Percentiles		1st	5th	50th	95th	99th
1	Head Breadth. The maximum breadth of the head. Usually above and behind the ears.					
	Women	5.2	5.4	5.7	5.9	6.2
	Men	5.5	5.6	6.0	6.3	6.5
2	Interpupillary Breadth. The distance between the centers of the pupils.					
	Women	2.2	2.3	2.6	2.8	2.9
	Men	2.2	2.2	2.4	2.7	2.8
3	Menton- Sellion. The vertical distance between the tip the chin to the deepest point of the nasal root depression.					
	Women	4.0	4.1	4.4	4.9	5.1
	Men	4.3	4.4	4.8	5.2	5.4

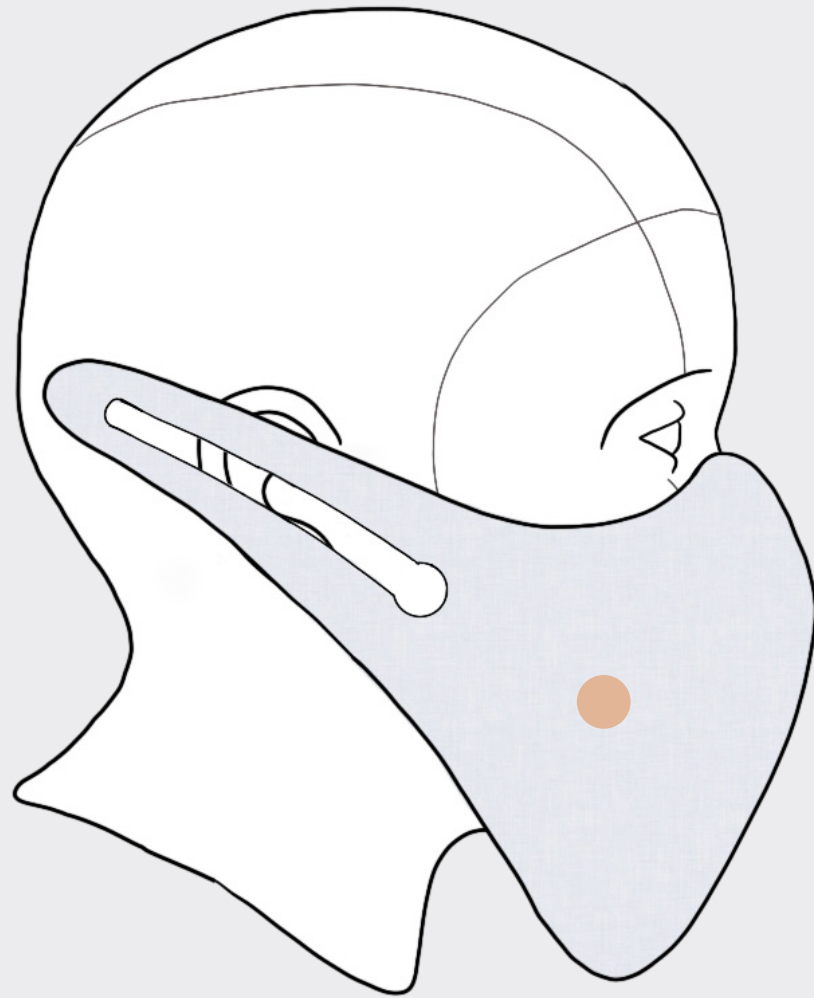


Allowing Communication

In an effort to encourage users to keep the covering on I needed to find a way for visitors to still communicate with one another while wearing the covering. I looked to headsets used in the outdoors that were durable and covered large distances.

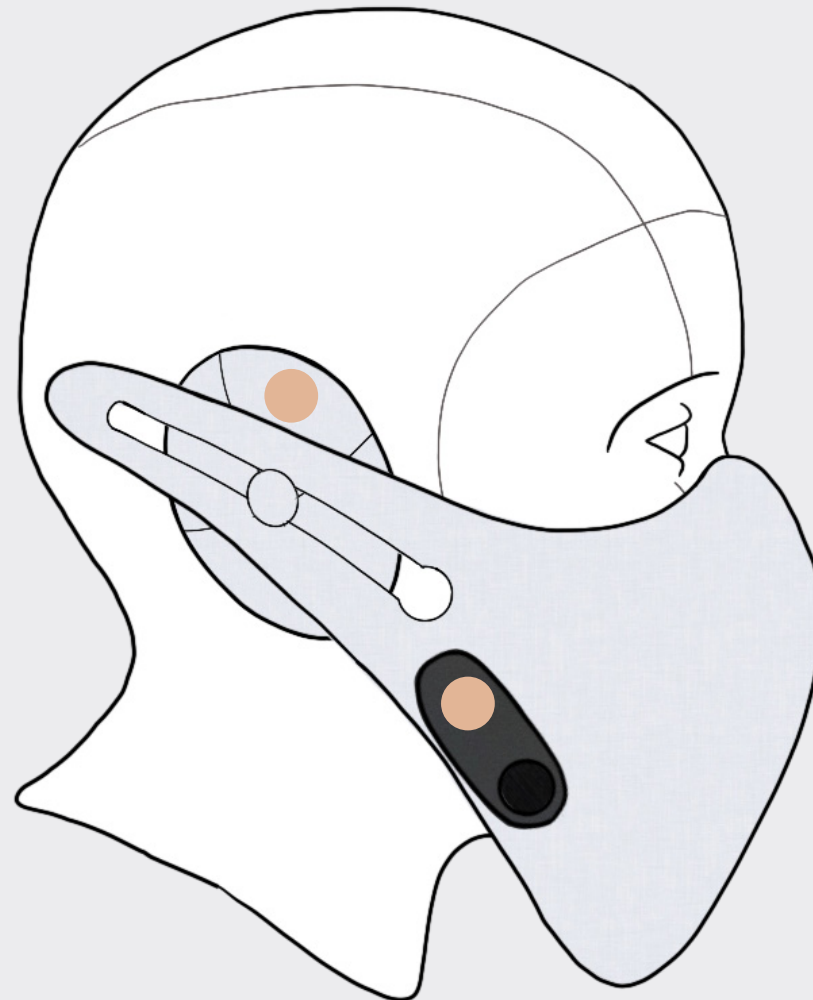


Components



Mouth Covering

- Retains sound
- Holds microphone
- Still allows user to breathe



Control Module and Ear Piece

- Volume Control
- Connects to other masks
- Holds speaker



Cover

- Gives the mask a more outdoor vibe
- Less aggressive than a hard exterior
- Customization options

Function of the Mask

Reduce Noise Levels

The hard shell of the mask coupled with the fabric covering is designed to muffle the noise of the user speaking.

Supply Information

Blue-tooth capabilities opens the possibilities for podcasts specific to area. More in depth guide information. Additional history of the park and safety information.

Allow Communication

Through blue-tooth each headset will be able to link to one another, thus enabling groups of people to still communicate while all the noise is contained in the mask.

Visitor Experience

With the lowered presence of visitors noise users will be able to have a closer connection to the natural sounds.



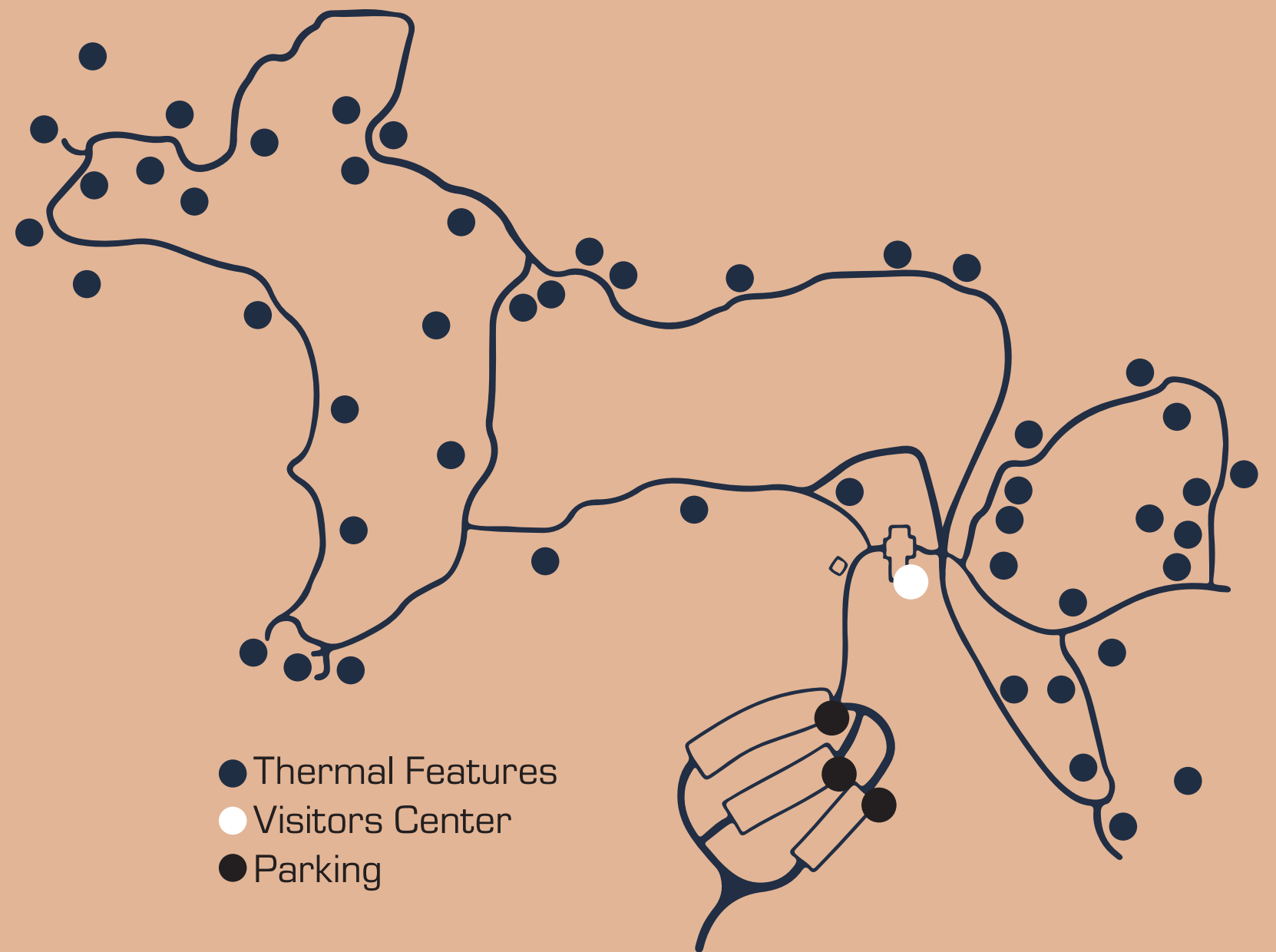




Placement

This experience will first be implemented in Norris Geyser Basin. It has multiple features which make it an ideal place to start.

- Features two board walk loops that are 3/4 mile and 1.5 mile long.
- Has a large number of thermal features and wildlife.
- Infrastructure of a visitors center already present
- Relatively accessible
- Limited Parking- 143 Spaces



User Journey



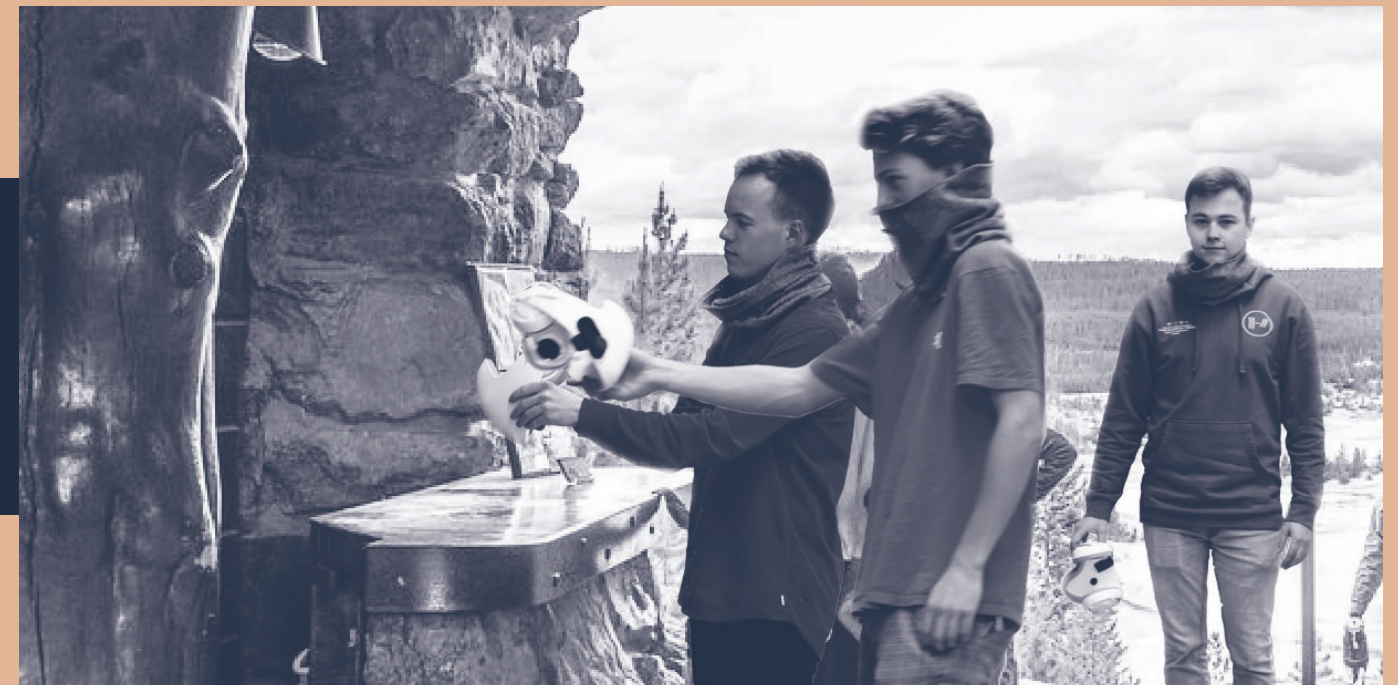
Enter through the museum.



Pick up mask, cover and connect to your group.



Safely enjoy the geyser basin.



Return your mask as you leave. You can keep the cover.

“72% of Americans say one of the most important reasons for preserving national parks is to provide opportunities to experience natural peace and the sounds of nature”

-Haas and Wakefield 1998

Fulfilling Goals

Connection

The experience allows visitors to connect with the ecosystem because of the reduction of noise while still maintaining a connection with one another.

Protection

The mask will help reduce the amount amount noise and help protect the natural soundscape.

Education

By going through this experience users will be more aware of the noise they produce and will get a chance to see what the park might be like with absence of noise.



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