

*seeing sounds*

# Visitor Experience

crowd management  
visitor behaviors

## TYPES OF EXPERIENCES

\* "Prayer Map"

In searching for a quiet + private space to pray at Canyon Visitor Center, I realized something a cashier expressed wearily, "you can't find quiet anywhere around here."

visual

aural



# Soundscapes

What is Yellowstone's Sound?

casual tourist

outdoor enthusiast

\* Grand Loop

Old Faithful's unique visitor diversity and density made me wonder: if it isn't anything like this at other sites, how much of the park experience is the average visitor missing?

The Yellowstone ecosystem requires a delicate balance that has been tested by people over centuries. Our presence in the park has forced us to understand our responsibility to the land that we inherit. Of all the resources that we have placed under our protection, sound remains among the most neglected. As the living breath of the park, the soundscape tells the story of the wildlife, geography, and the human all in one exhale. This space is an opportunity for the common visitor to hear that story that is otherwise buried beneath our own noise.

## *The Soundscape*

...an acoustic environment composed of both natural & cultural sounds, isolated by three sources

*geophony* non-biological sounds

*biophony* wildlife sounds

*anthrophony* human sounds

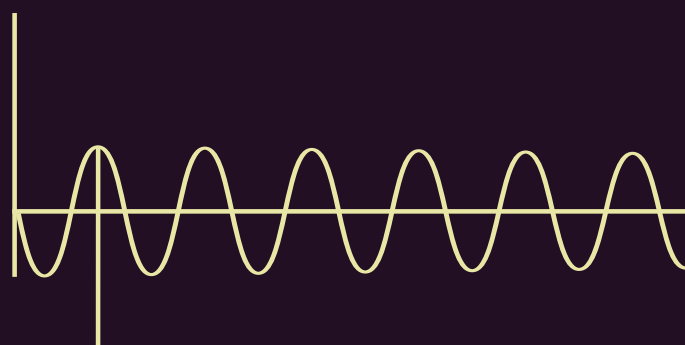
How do we protect the soundscape if we can't see it?

Acoustic biologist Emma Brown thinks we need to start by recognizing that “sound is a resource, just like clean air or clean water...it's our job to make sure future generations can have those experiences.”<sup>1</sup>

● soundscape timeline

1872

Yellowstone becomes the world's first National Park, welcoming visitors arriving on wagons and horseback

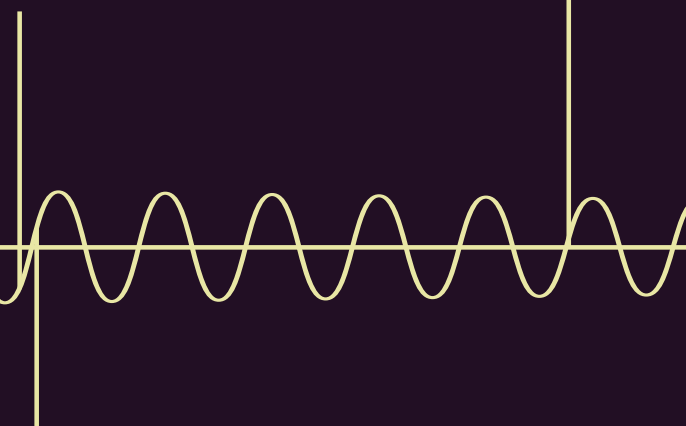


The major overhaul of a practically non-existent road system begins, commencing the construction that would carry on through the decades

1877

1915

Automobiles allowed in the park with reluctance from park rangers

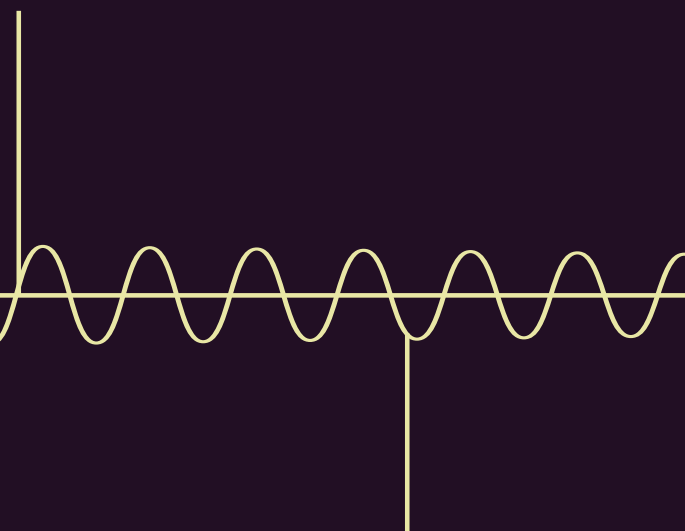


The Organic Act is passed to preserve the park "in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

1916

1932

A proposal is made for the plowing of roads in winter

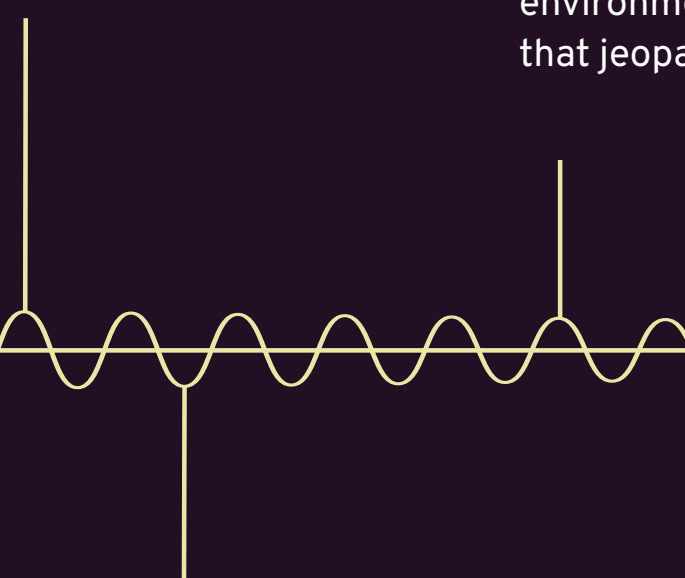


Snow planes take flight as the first winter vehicles to be used in the park

1948

1963

Snowmobiles introduced

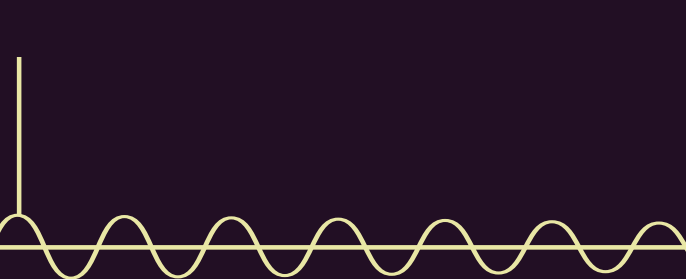


Oversnow Vehicle (OSV) usage is adopted as an alternative to plowing

1968

1972

*The Noise Control Act* is signed "to promote an environment for all Americans free from noise that jeopardizes their health or welfare."



# 1990

NPS models an extensive winter-use plan to prepare for growing visitor interest in the colder months.

# 2000

NPS attempts to ban the snowmobile in fear of its environmental impacts and disturbance to visitor experience but is sued for the decision, forcing a revision of their plan

# 2004

A revised NPS winter-plan restricts snowmobile use to groups with “best available technology” behind a guide

# 2006

“Soundscape Management” (Policy 4.9) instated to prevent or minimize human caused noises exceeding the park’s acceptable range

The National Parks Overflights Act passed for preservation of “natural quiet” and “safety of park visitors.”

Director’s Order #47: “Soundscape Preservation and Noise Management” initiated to identify noises inconsistent with the park mission and set “acoustic management goals.”

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“Cultural Soundscape Management” (Policy 5.3.1.7) initiated to “preserve soundscape resources” and “cultural and historic sounds”

# 1987

# 2000

# 2004

# 2006

small tour aircraft at 4000 ft **55 dB**  
commercial aircraft at 30,000 ft **40 dB**  
running creek **40 dB**  
backcountry **25 dB**

anthroponic

biophonic + geophonic

construction site + motorcycle traveling 35 mph from 50 ft **90 dB**

watercraft at 50 ft traveling at 35 mph **85 dB**

snowmobile traveling 35 mph from 50 ft **75 dB**

automobile traveling 35 mph from 50 ft **65 dB**  
conversation at 3 ft **60 dB**  
mud pot + distant wolf howl **60 dB**  
porcupine hill geyser **65 dB**  
nearby elk bugle **70 dB**

every +10 dB is twice  
as loud to our ears

sound radar



*An ecosystem relies on the sound. Any changes to that resource can be disruptive, even fatal.*



1



2



3



4



5



6



7



8

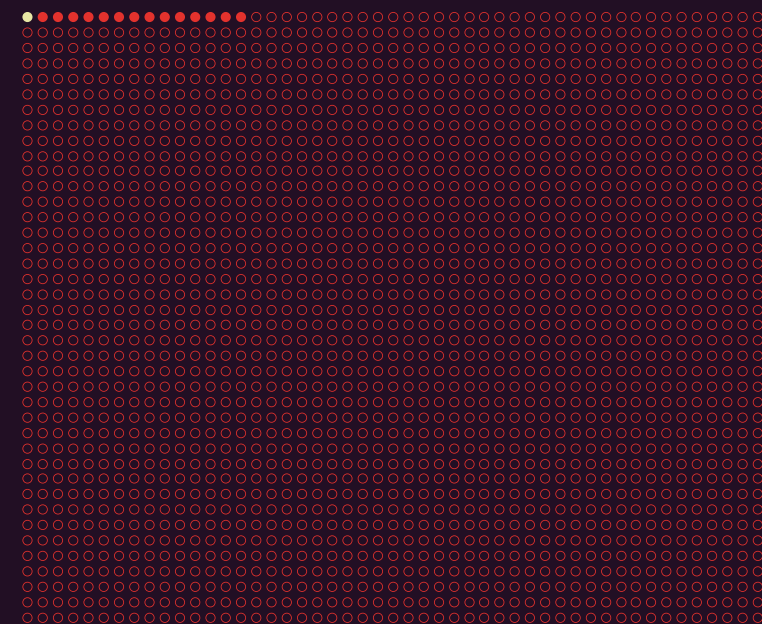
- 1. communication
- 2. establishing territory
- 3. searching for habitat
- 4. reproduction

- 5. rearing offspring
- 6. avoiding predators
- 7. foraging
- 8. health

*“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).”<sup>2</sup>*



“Across many National Parks, noise from traffic and aircraft is audible at individual sites **over 50% of the time** (Lynch et al., 2011). Remote wilderness areas are not immune, because high traffic corridors generate substantial noise that propagates over many kilometers.”<sup>3</sup>



When Bernie Krause started recording natural sounds in the 1970s backcountry, it would take 15 hours to capture an hour of usable audio. It now takes Krause **2,000 hours**.<sup>4</sup>

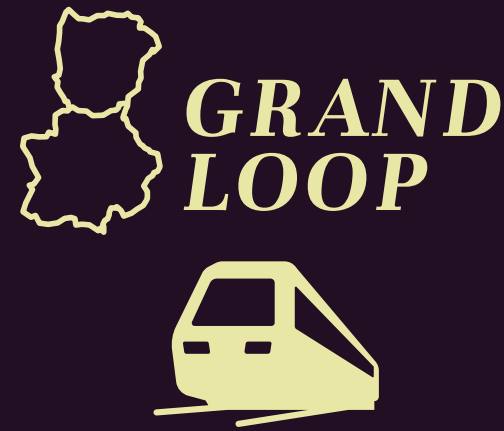
“In a noise reduction study, researchers at Muir Woods National Monument asked visitors to be quieter in one zone of the park, i.e., talk quietly and turn off cell phones...The sound level in that zone decreased 3 dBA, which equates to a reduction of approximately 1200 people. No people were actually limited from entering...”<sup>5</sup>





*“Silence is not the absence of something, but the presence of everything.”*

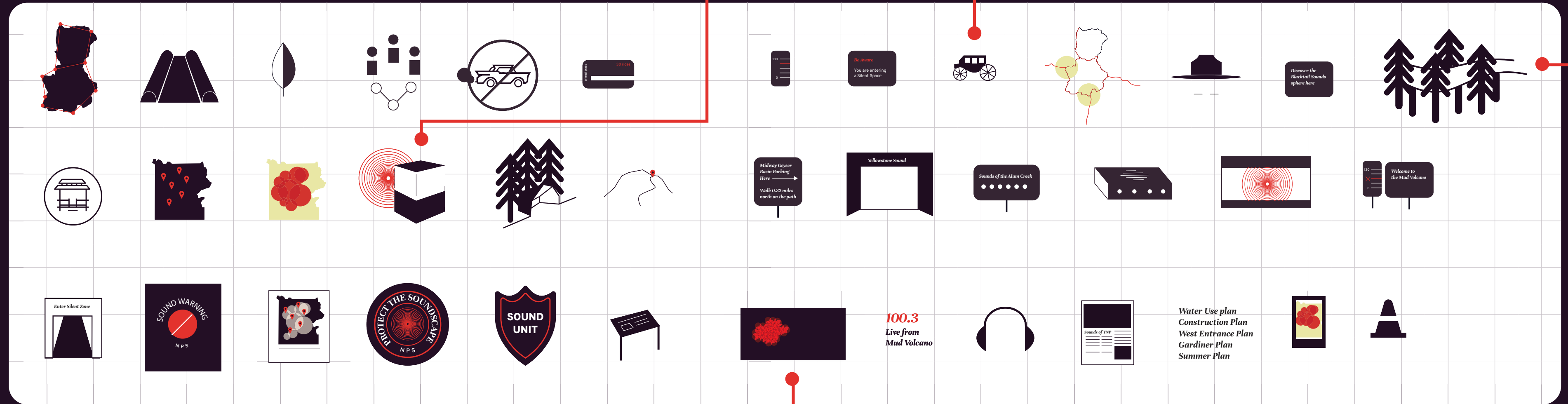
*How can we provide common access to this resource that is only being enjoyed by a select group of visitors ?*



# concepts

Isolate the visual and aural experiences to juxtapose then offer a taste of a complete experience, Take a location with a special view, build a fully encased room with sound insulation and play audio that simulates what it would have sounded like pre 1800s – 1900s – 1950s – 2000s – walk outside to experience the noise pollution today.

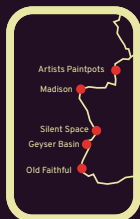
Preserve a car free period (maybe one week). No visitor vehicles enter the park, only NPS / shuttle. Traditional wagon experiences offered. Good opportunity for research to look at human impact



Art installation that only works if it is quiet enough – it keeps building until the environment pulls out of the acceptable range at which point it restarts. It keeps a record of the previous record becoming an amusing + informative tool expressing the frustration in holding onto a moment of silence in the park.

\* selected How might someone from a city who is unlikely to hike a trail want to explore the park? A long approachable walkway for city tourists. A sampling of the park. Think about the NYC Highline. Encourage walking over driving. No photo opportunities, just an aural experience.

## Discover



map



quiet sign



word of mouth / geo-tagging

## Arrive



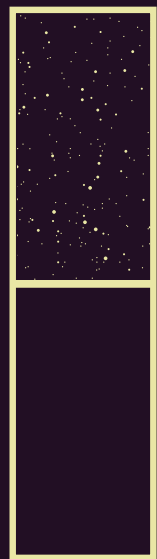
limited parking

crunchy dirt path

0.25 mile walk from parking

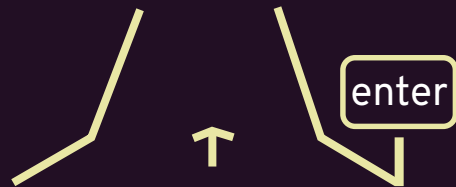


## Enter



transition from gravel to smooth surface – the gradual erasure of human sound

threshold to mark a change in space = change in behavior



decling walls to pull in a visitor

## Acclimate

curves disrupt line of sight

forced to use sense of hearing for orientation



closed walls isolate the experience of sound

## Absorb

opportunity to pause and take it in



an ampitheatre funnels sound down to center

## Interact

select viewing windows

personal coves

interactive



## Exit

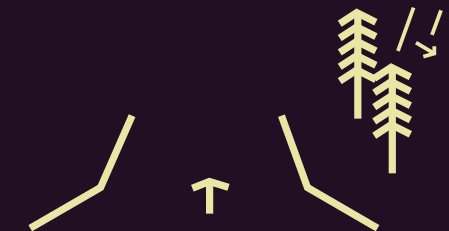
less prominent to differentiate from a grander entrance



dropped off by trail to continue exploring



exit hidden behind entrance to prevent people entering to maintain the 1 way traffic for reducing disturbances



● *spatial exploration*

**(Closed)**



car

**Open**



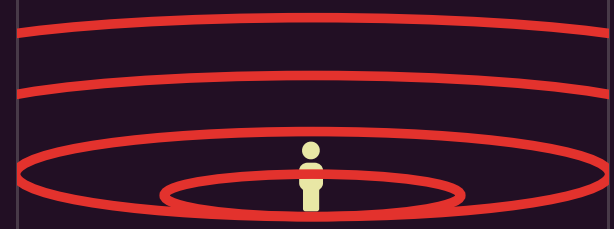
transition

**(Closed)**



entrance - walkway

**Open**



amphitheatre

**(Closed)**



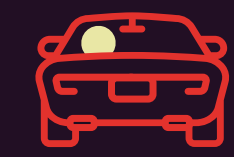
walkway - exit

**Open**

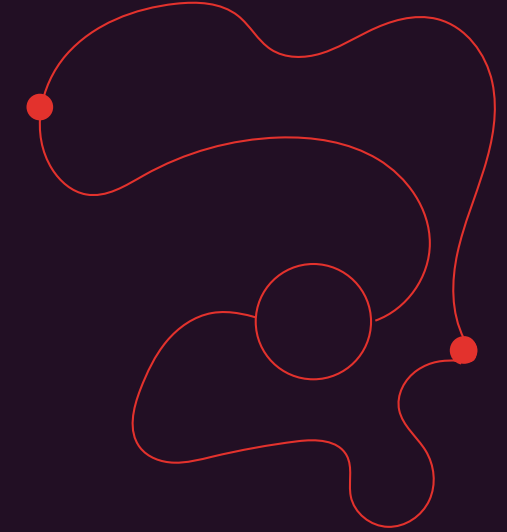
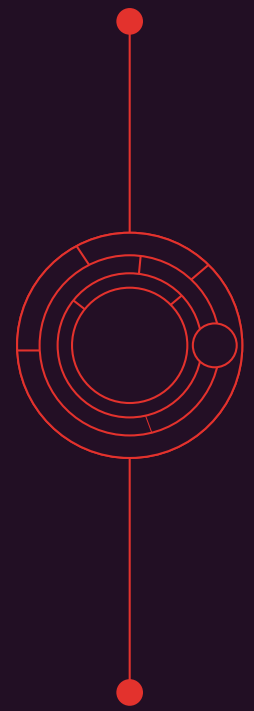
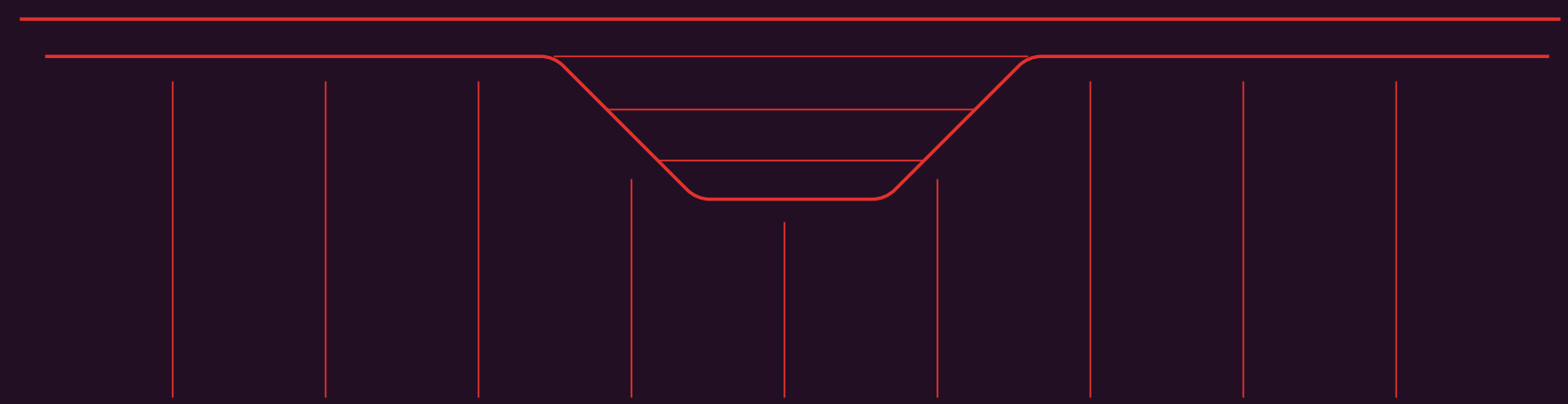


transition

**(Closed)**



car

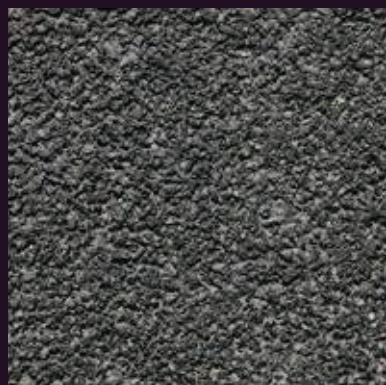


sound monitor

# sound experience



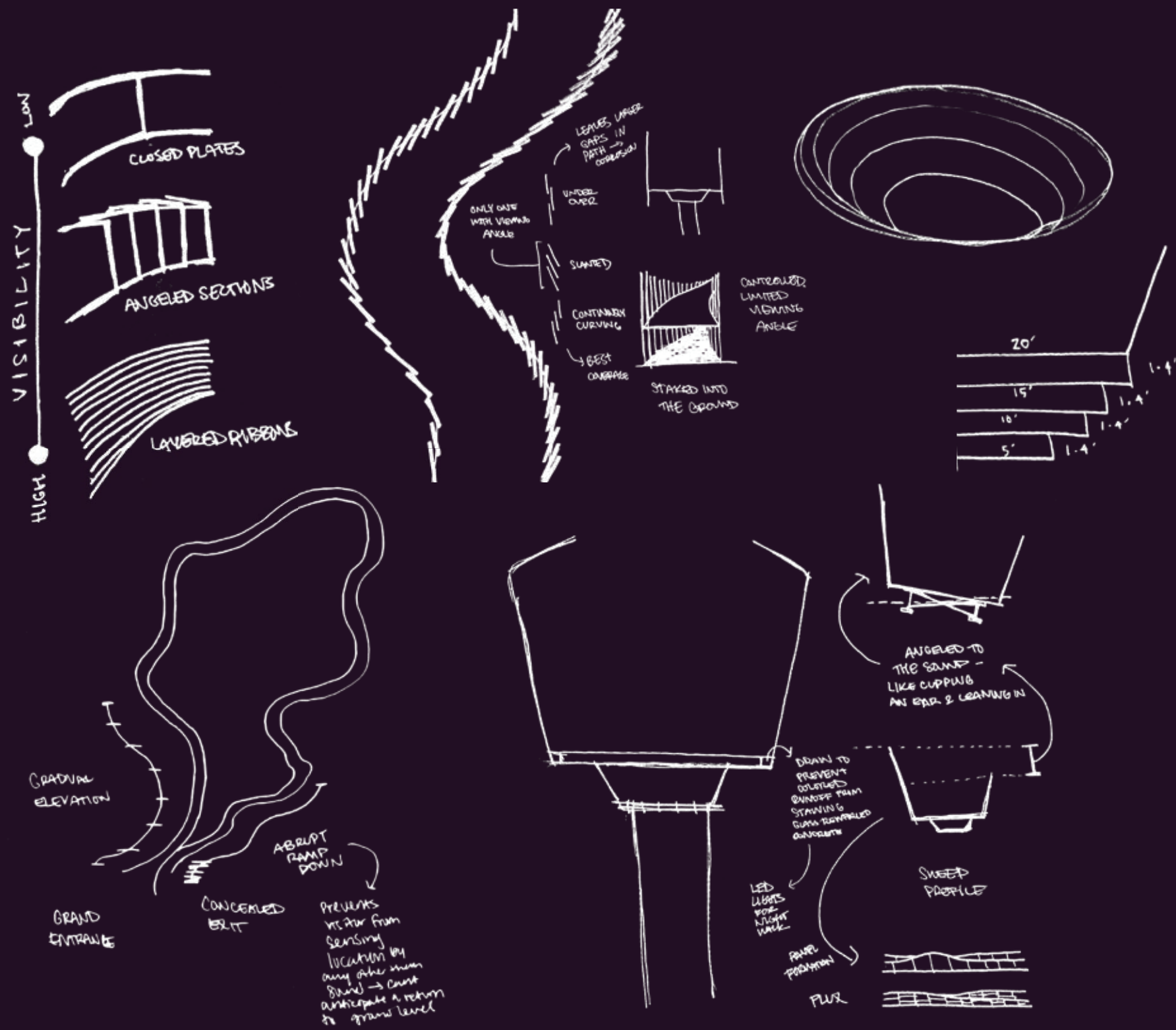
Pavement



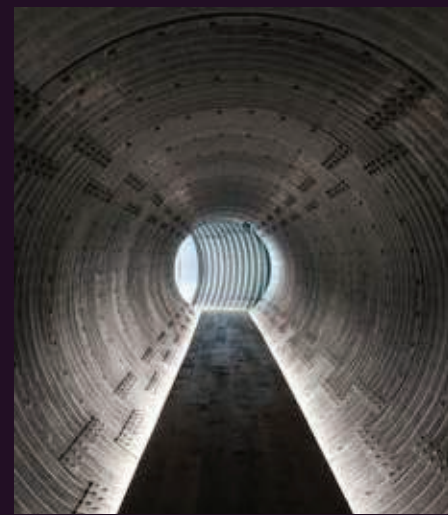
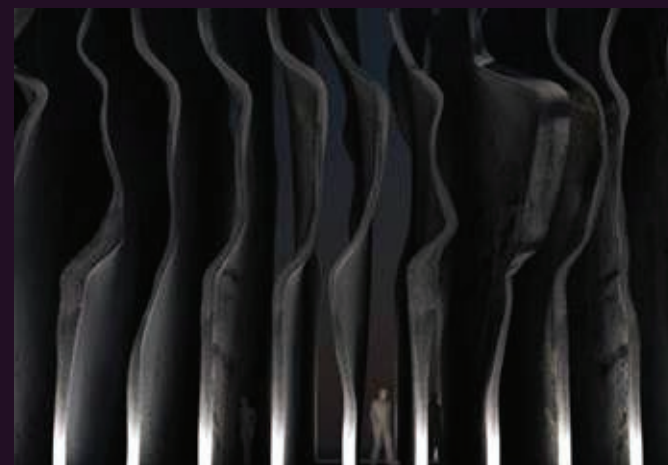
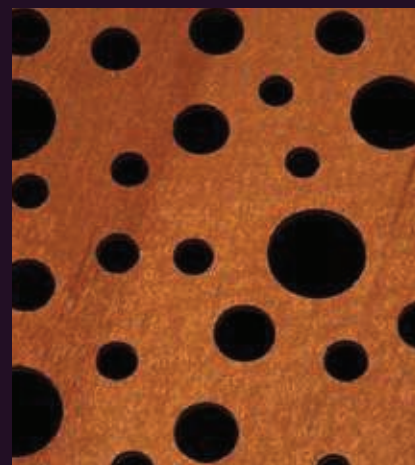
Dirt & Gravel



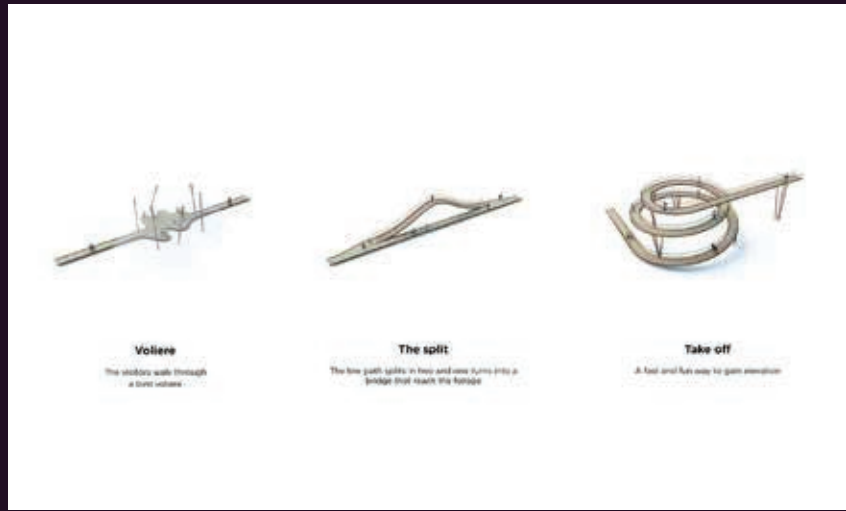
Boardwalk



● form & materials



potential application

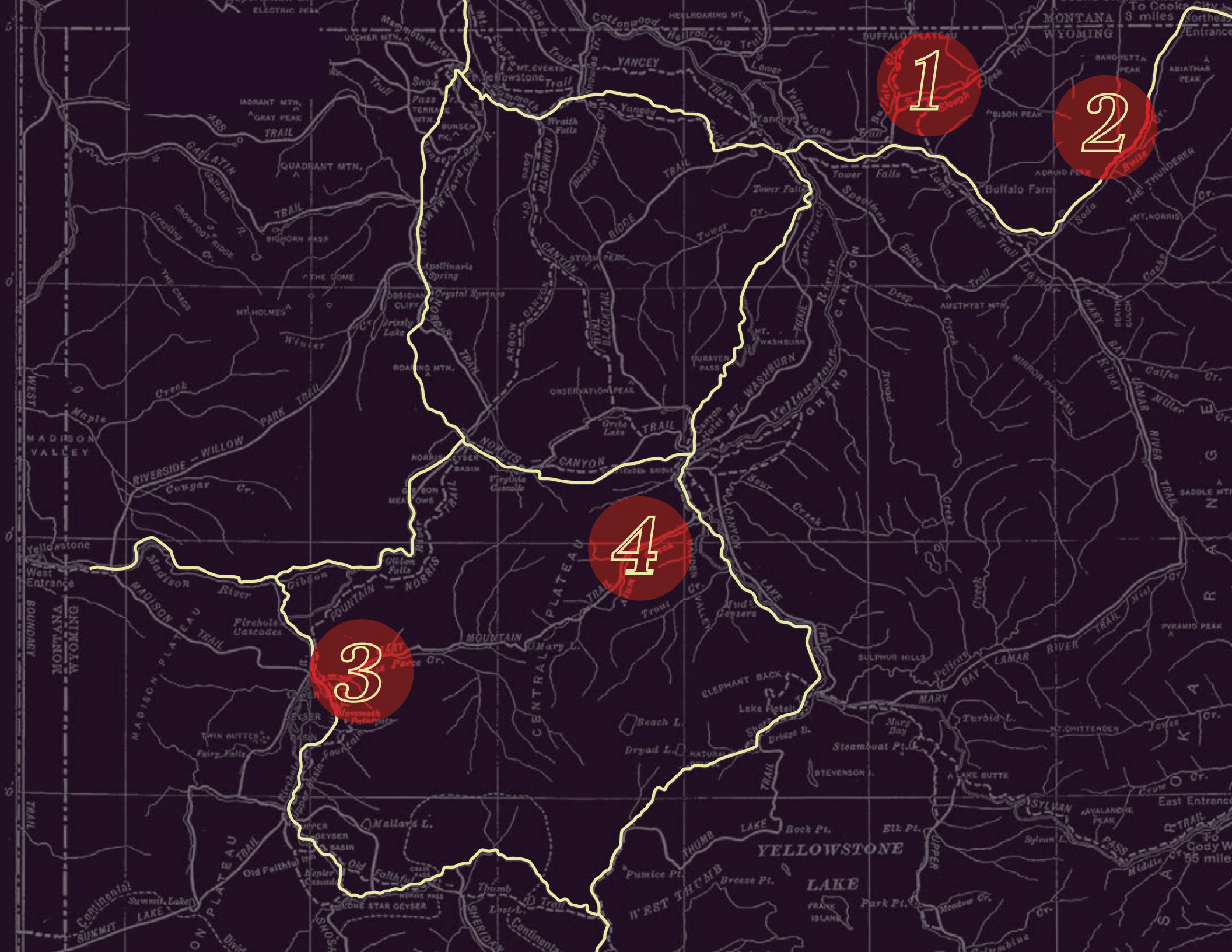




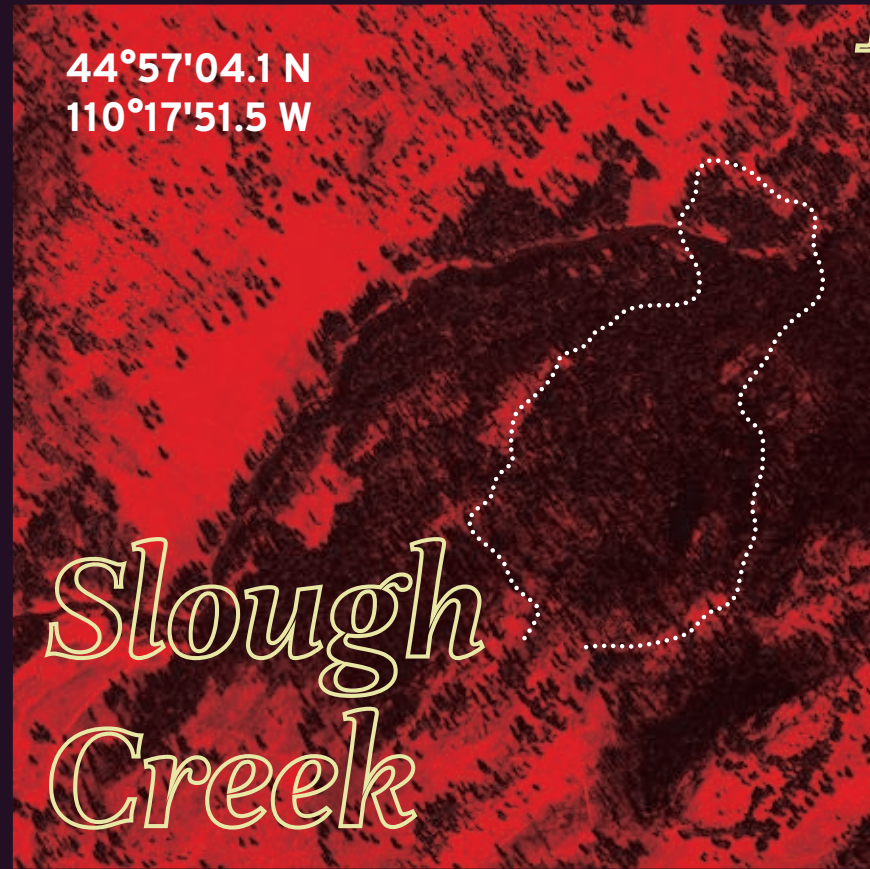
● potential sites

As extensions of the Yellowstone circulatory system, these four creeks are centers of life. They offer ideal sound through a balance of water, wildlife, foliage, isolation, access, quiet, and activity.

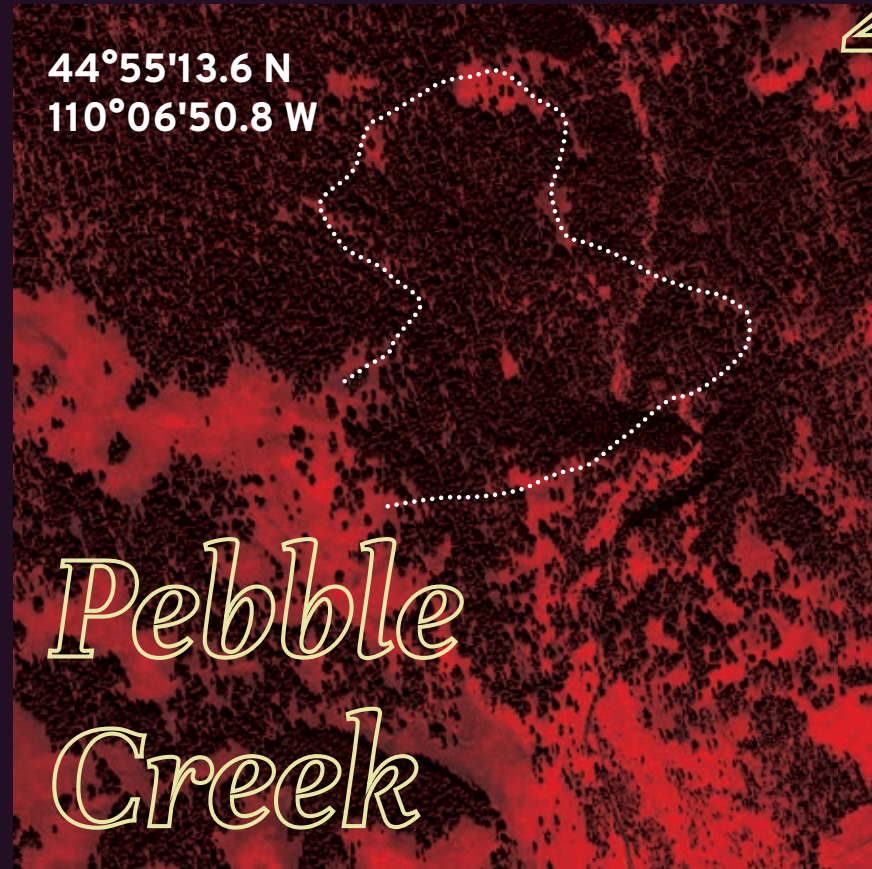
- 1 *Slough Creek*
- 2 *Pebble Creek*
- 3 *Nez Perce Creek*
- 4 *Alum Creek*



● *site analysis*



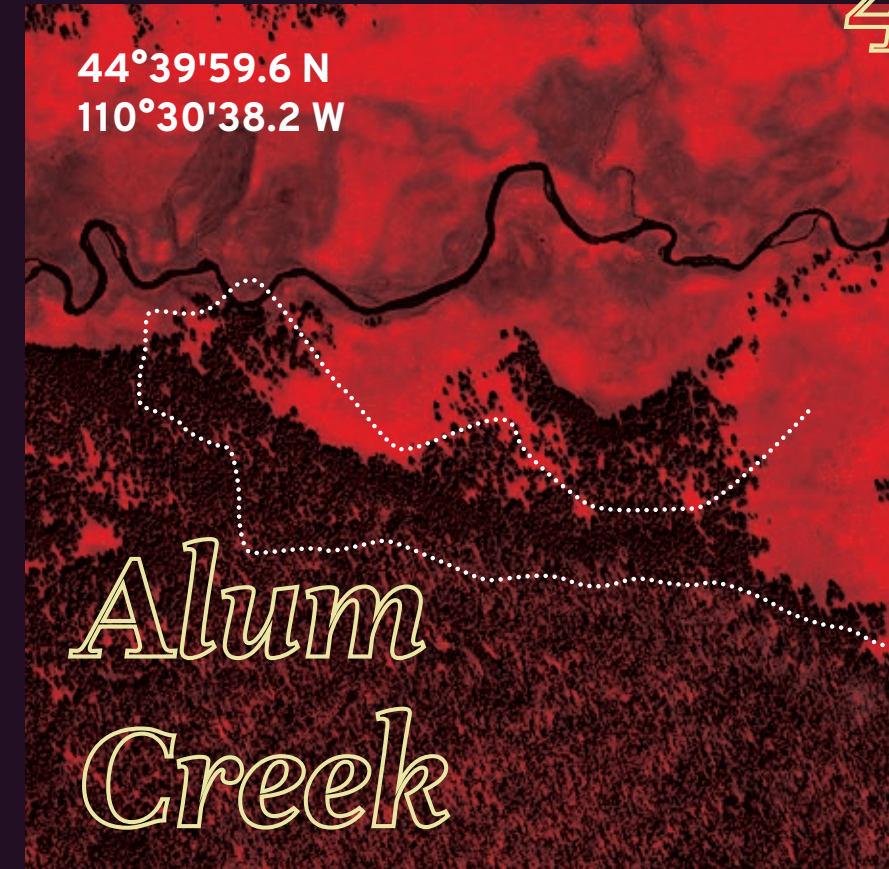
- + abundant wildlife, excellent foliage, accessible by existing trail, balance of isolation and access
- potentially invasive to existing visitor activity, some elevation changes, harder to find



- + diverse wildlife, superb foliage, excellent isolation, most preservable soundscape quality
- difficult elevation changes, far off the Grand Loop road, smaller creek, less diverse features



- + thermal features, proximity to west entrance, accessible by existing trail, variety of spaces
- possibly too close to the main road, average foliage, average wildlife interaction

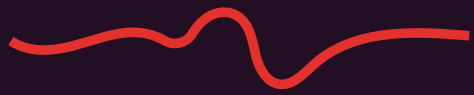


- + excellent foliage, level grounds, most flexible path, no previous use, easy to access, isolated
- potential invasion of landscape, not a go-to for wildlife spotting. lack of diverse features

● Nez Perce features



Nez Perce Creek



Bison + Elk + Coyote + Grizzlies



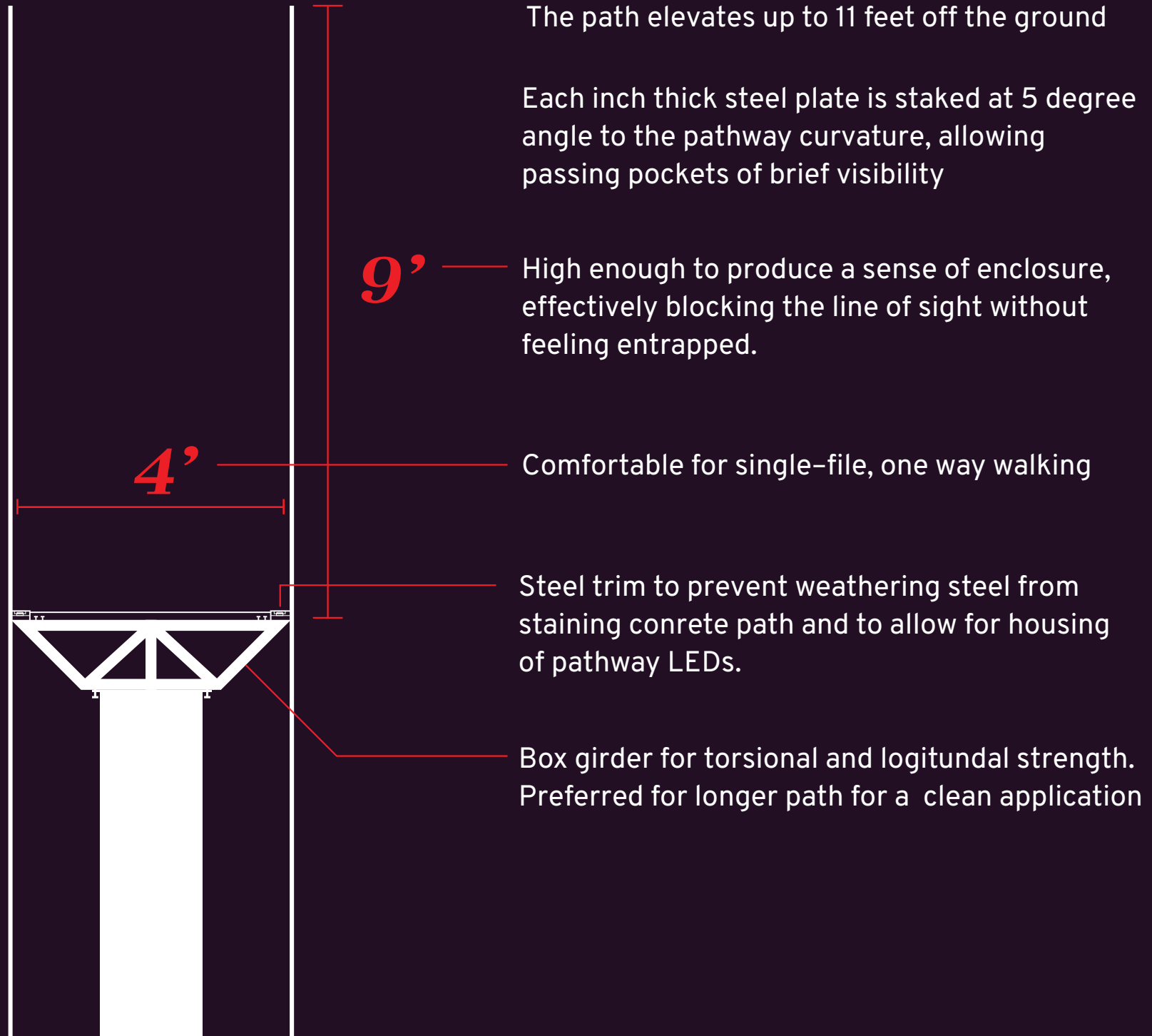
Diverse Foliage



Porcupine Hill Geyser + Morning Mist Springs



# the walkway



## *Gravel*

Providing an unpaved parking lot discourages major growth in the area as a measure against overcrowding. The audible crunching primes the visitor for a transition of spaces as they approach the entrance.



## *GRC*

In an instant, the crunching is quelled with a soft step towards sound isolation. Glass Reinforced Concrete offers structural advantages in weight and extreme weather resistance in a natural sandstone finish.



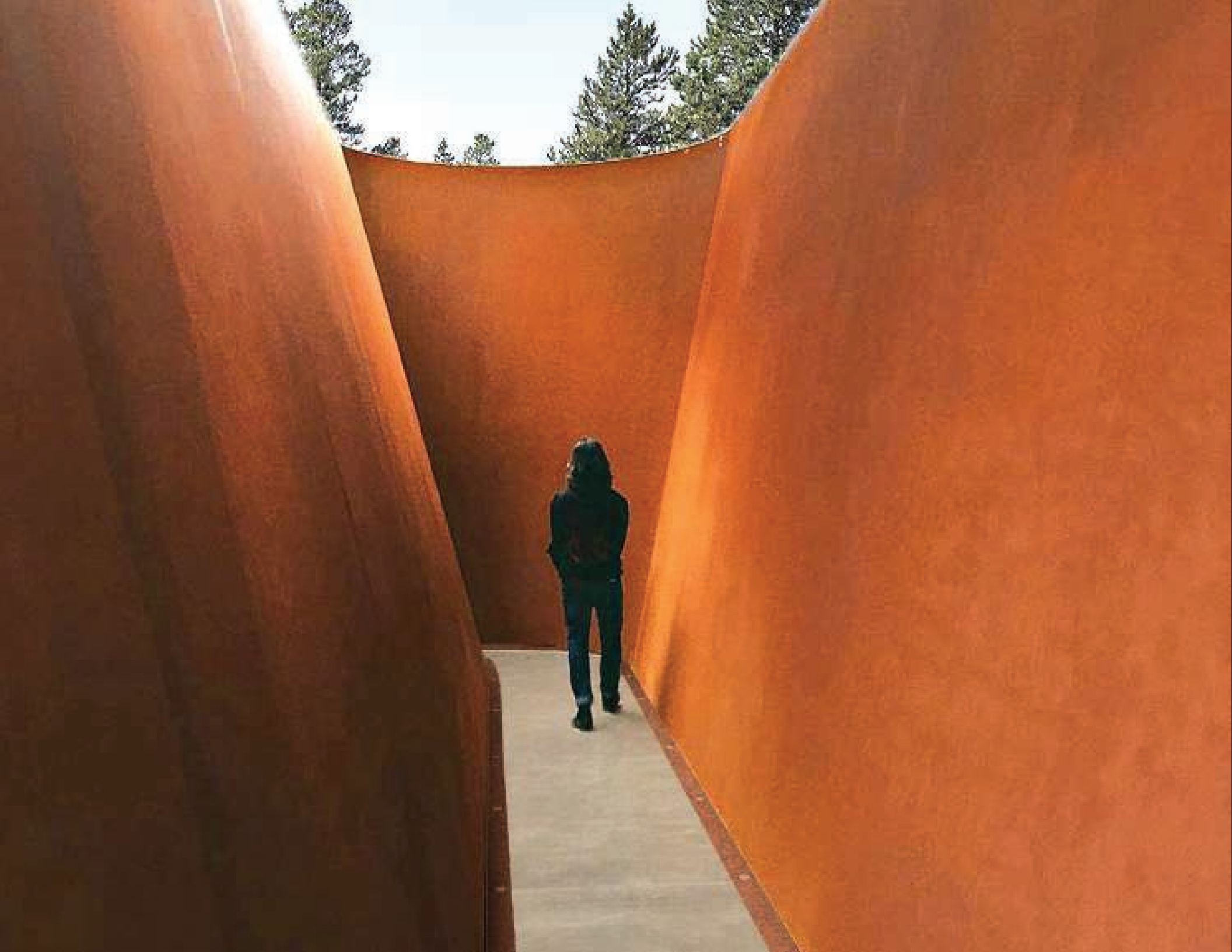
## *Corten*

Blending into the surrounding landscape, this weathered steel forms a self-protecting layer through oxidation. When exposed to moisture, the patina protects it from further corrosion and produces a vibrant finish.



# *Porcupine Hills Geyser*









# *amphitheatre*

An expansive 50 feet in diameter produce a space to sit and take in the running creek that reverberates from below a perforated steel base.





# *megaphone*

A hexagonal shell produces comfortable sitting positions. The perforated corten screen lets in only the sounds.



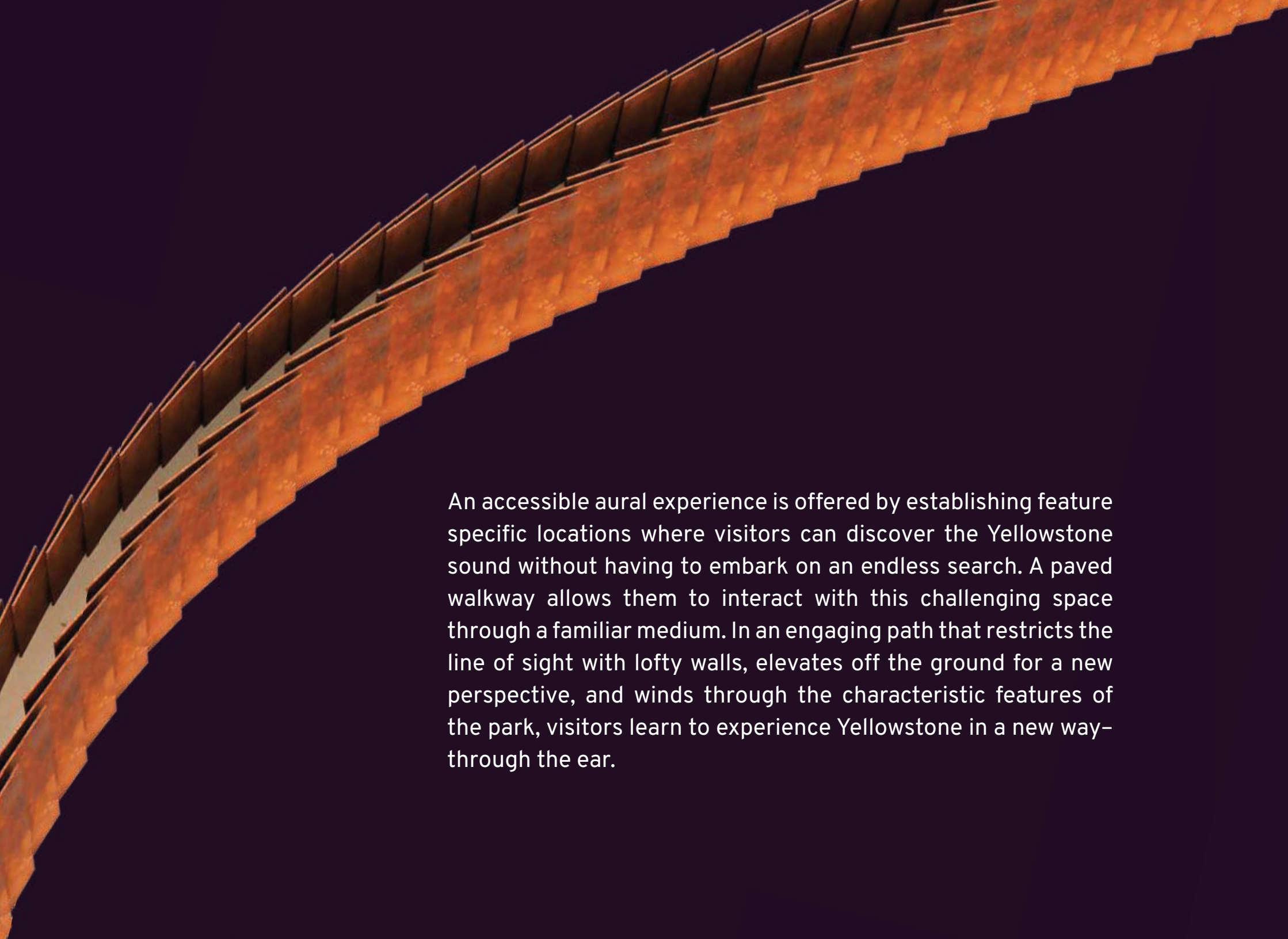


*cove*

An isolated sanctuary  
among the treetops.







An accessible aural experience is offered by establishing feature specific locations where visitors can discover the Yellowstone sound without having to embark on an endless search. A paved walkway allows them to interact with this challenging space through a familiar medium. In an engaging path that restricts the line of sight with lofty walls, elevates off the ground for a new perspective, and winds through the characteristic features of the park, visitors learn to experience Yellowstone in a new way—through the ear.

## Citations

- 1.** Colorado Public Radio. (2017, December 31). How CSU students fight noise pollution in national parks. Retrieved from <https://www.denverpost.com/2017/12/30/colorado-state-univerisity-students-fight-noise-pollution-in-national-parks/>
- 2.** Haas, G. E., and Wakefield, T. J. (1998). National Parks and the American Public: A National Public Opinion Survey on the National Park System (National Park Conservation Association and Colorado State University, Washington, D.C., and Fort Collins, CO).
- 3.** Lynch, E., Joyce, D., Fristrup, K., 2011. An assessment of noise audibility and sound levels in US National Parks. *Landsc. Ecol.* 26, 1297e1309.
- 4.** Krause, Bernie. 2003. Personal communications regarding natural soundscape recordings. Retrieved from <http://www.georgewright.org/211jensen1.pdf>
- 5.** Stack, D. W., Newman, P., Manning, R. E., & Fristrup, K. M. (2011). Reducing visitor noise levels at Muir Woods National Monument using experimental management. *Journal of Acoustical Society of America*, 129(3), 1375-1380.

UNIVERSITY OF UTAH | MDD | ZERYAB SIAL







*seeing sounds*