



TUOLUMNE MEADOW

CONSERVATION OF YOSEMITE'S MEADOWS THROUGH RECREATIONAL & EDUCATIONAL PLANNING

GRETCHEN HINZ | THESIS 2016

**WHAT INSPIRED
THIS THESIS?**

MY FAMILY



MORE ACCURATLY OUR
YEARLY FAMILY ROAD TRIPS
TO NATIONAL PARKS.



THESE TRIPS HAVE
CULTIVATED A PASSION
FOR THESE PRESERVED
AREAS AND A LONGING
TO KEEP THEM FOR
FUTURE GENERATIONS
TO ENJOY.



ONE OF THESE
HAPPEN TO BE

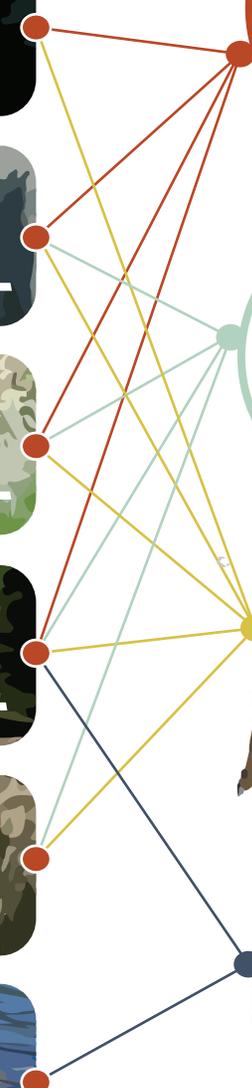
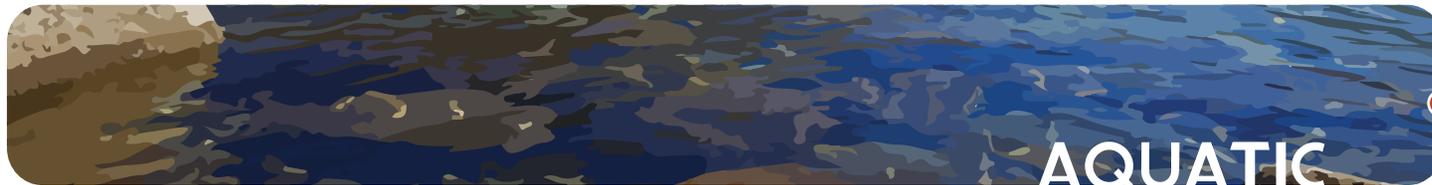
YOSEMITE

national park



YOSEMITE

ecological zones



SUB-ALPINE MEADOW



SUB-ALPINE MEADOW

ecological zones

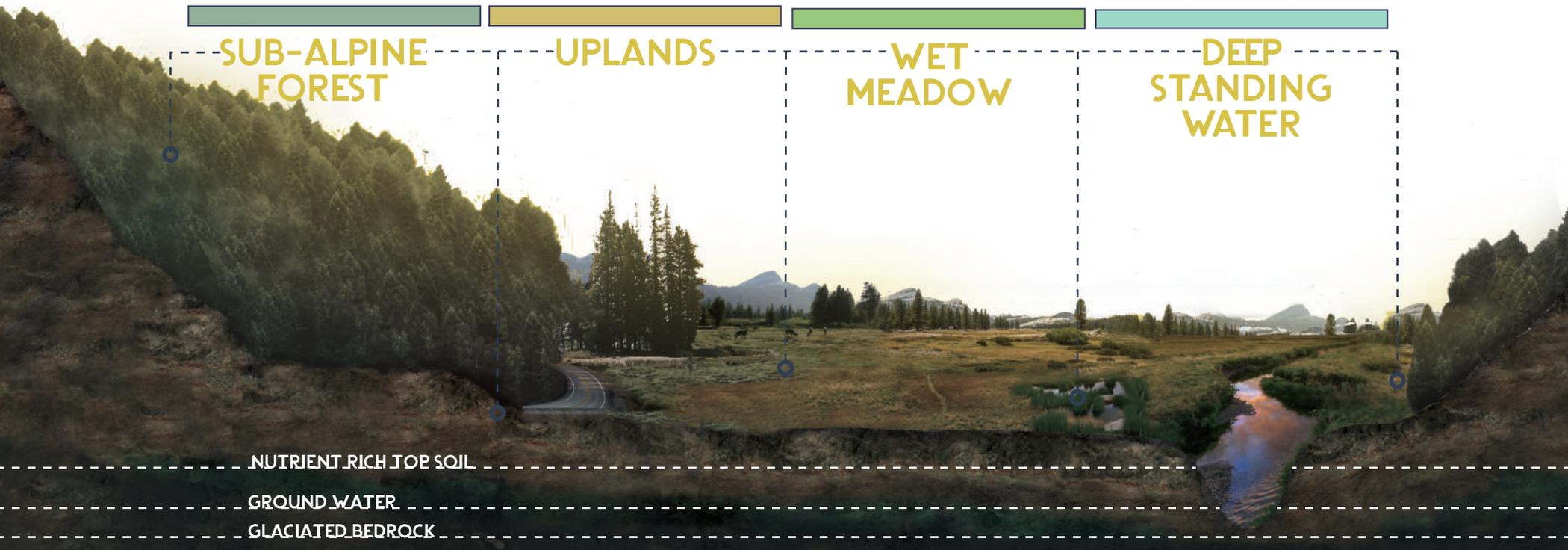


SUB-ALPINE FOREST

UPLANDS

WET MEADOW

DEEP STANDING WATER



NUTRIENT RICH TOP SOIL

GROUND WATER

GLACIATED BEDROCK

UPLAND

WATER TABLE DEPTH
0-10 INCHES

Meadow
Pussytoes



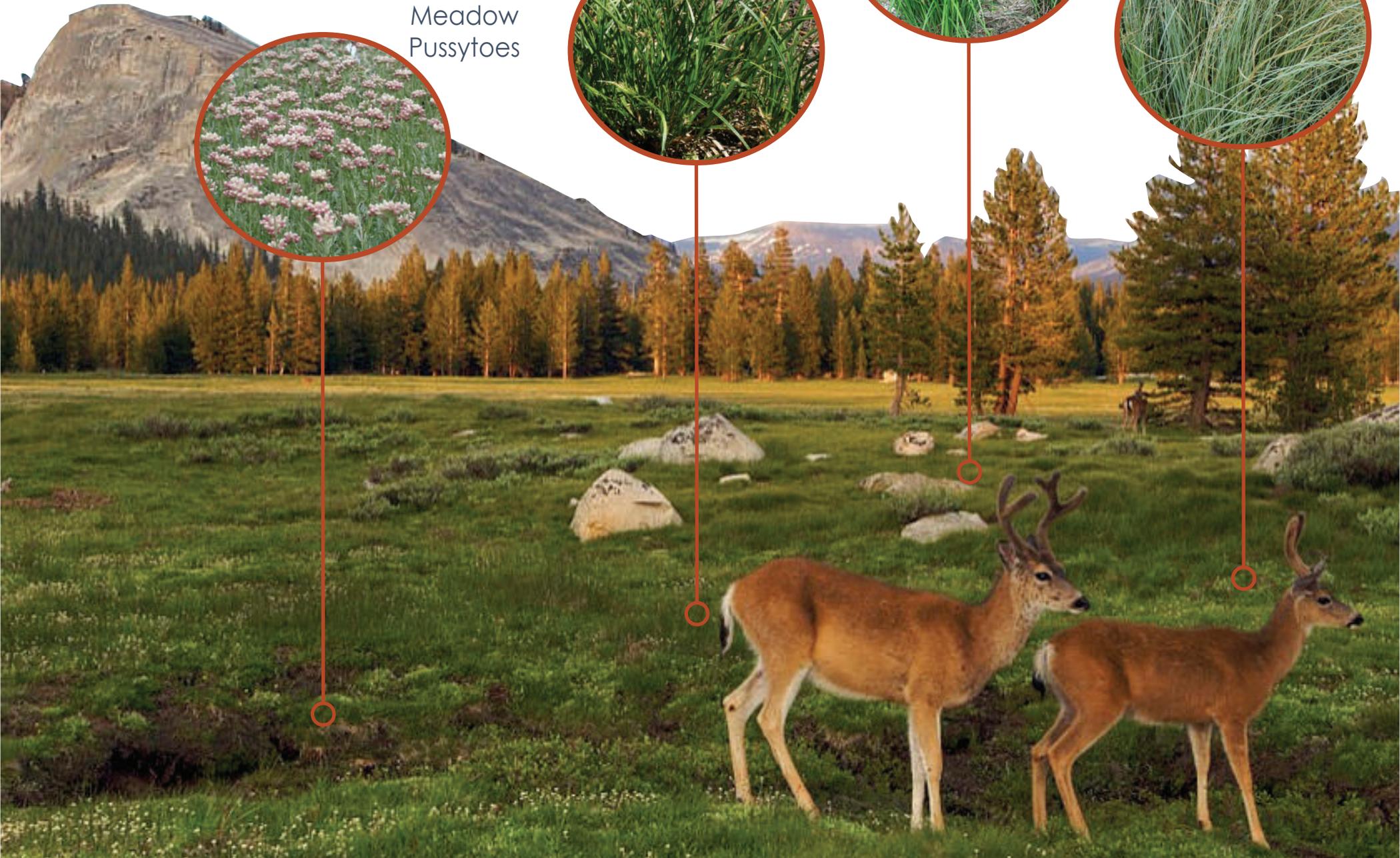
Ross Sedge



Narrow leaved Sedge



Thread leaved Sedge



WET MEADOW

WATER TABLE DEPTH
10-36 INCHES

Dwarf Bilberry



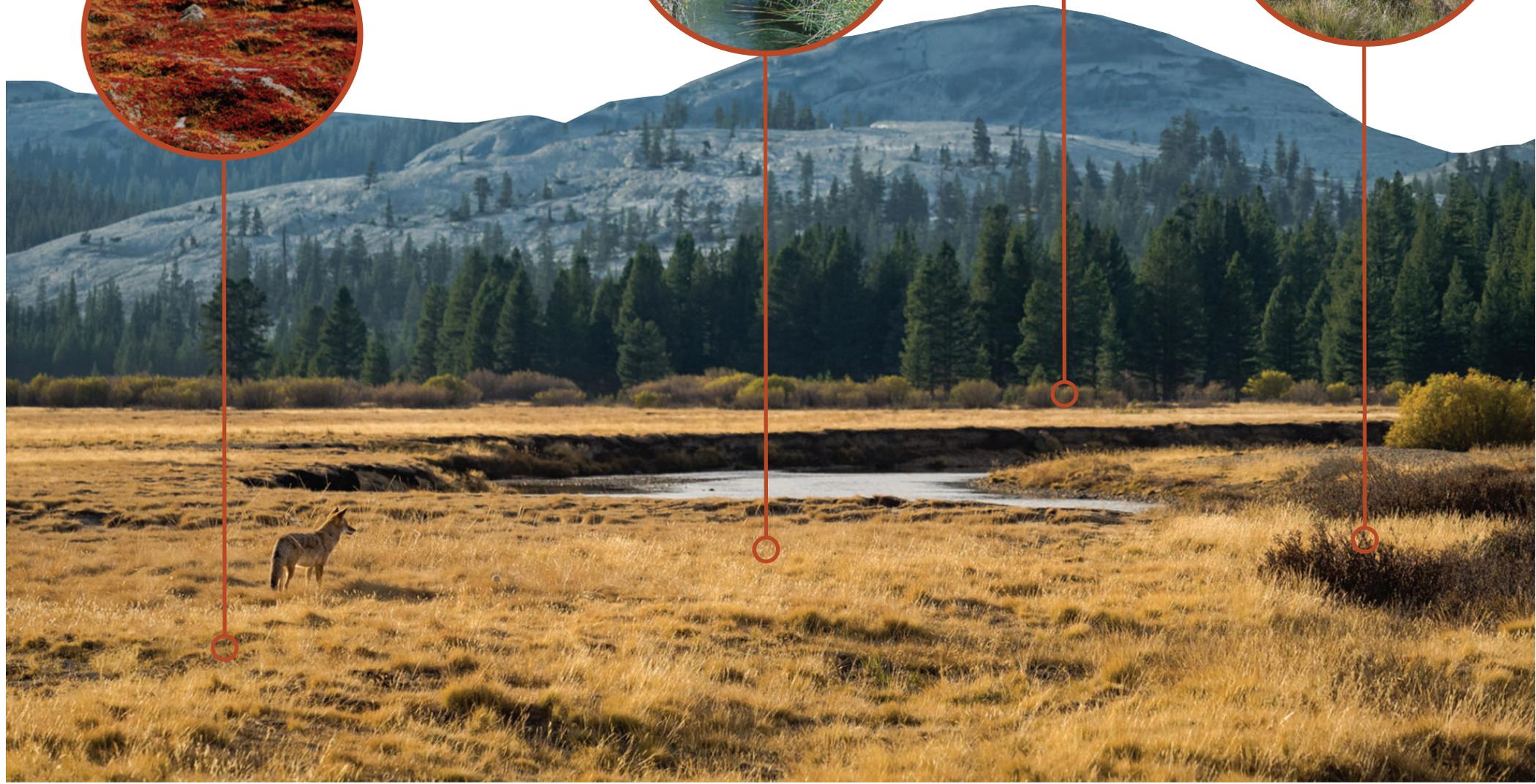
Nebraska Sedge



Western Bistort



Tufted Hair Grass



DEEP STANDING WATER

WATER TABLE DEPTH
> 36 INCH



Sitka Sedge



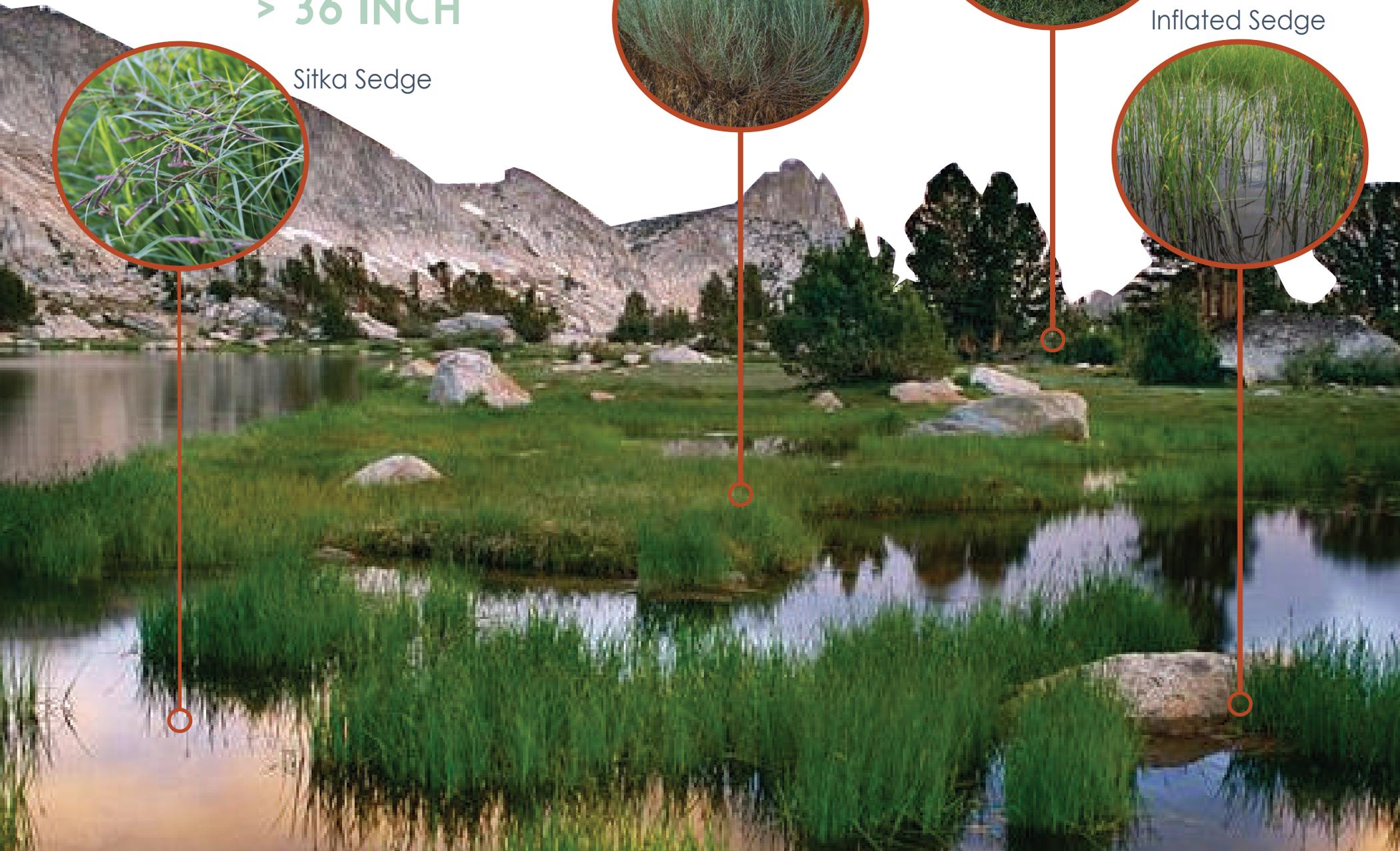
Sagebrush



Sierra Willow



Inflated Sedge

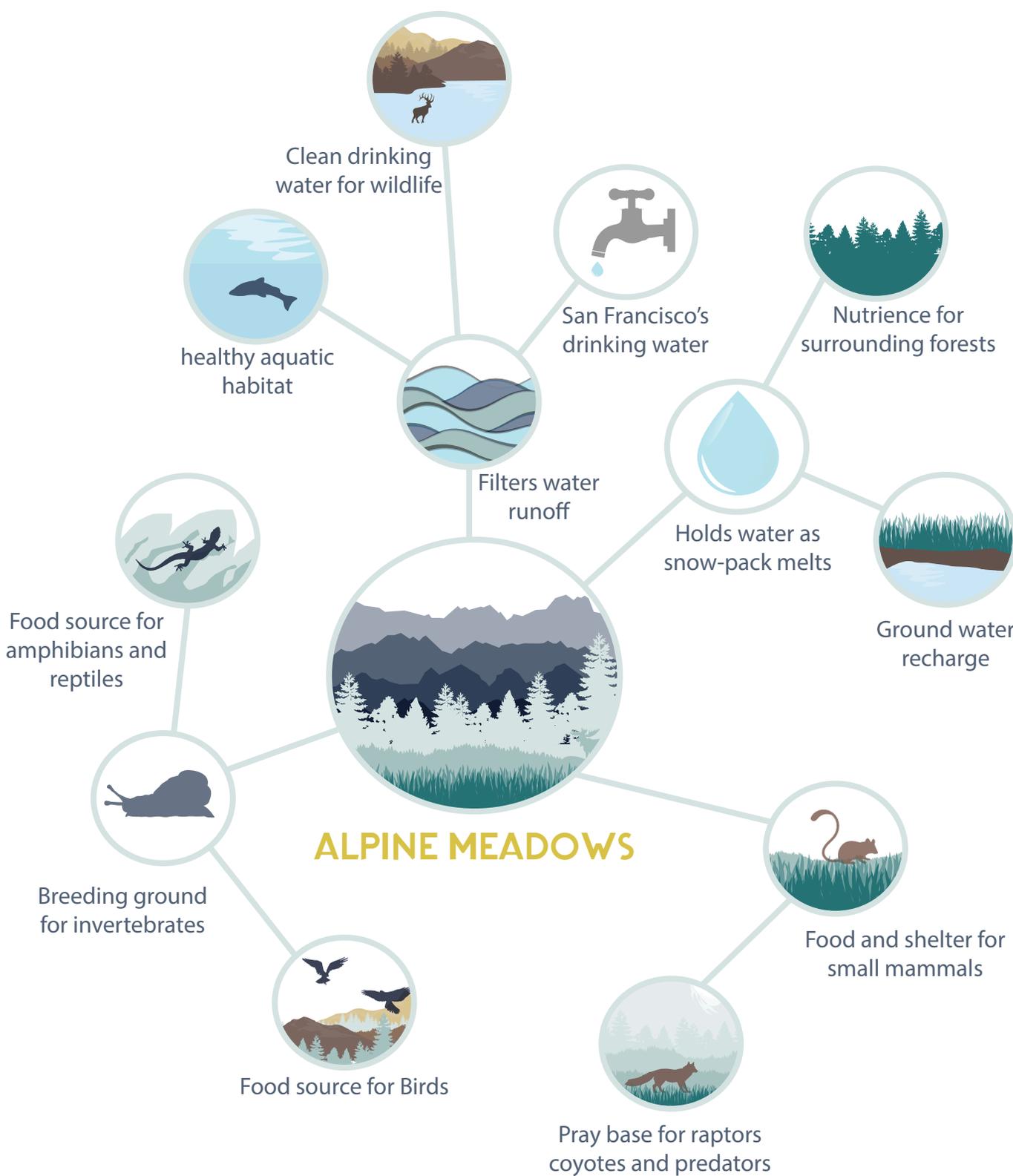


KEYSTONE ECOLOGY

noun | key · stone

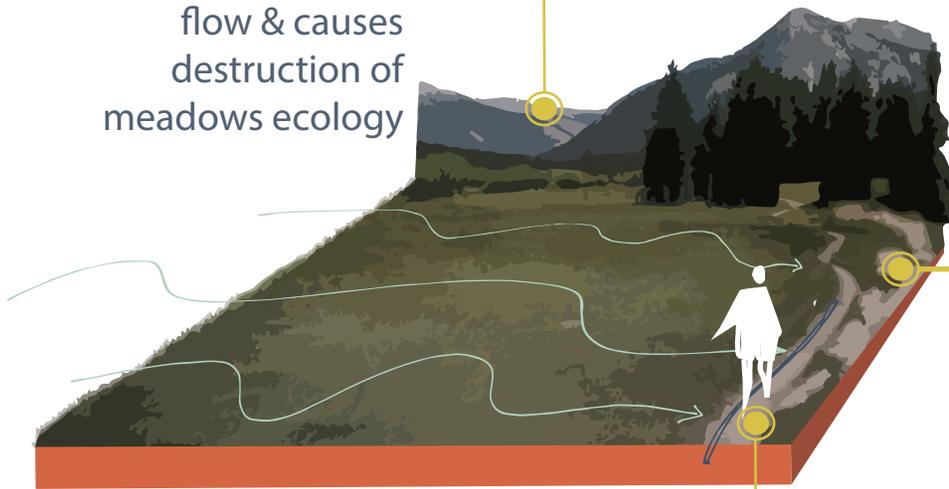
A keystone ecology is an ecology that has a disproportionately large effect on its surrounding environment relative to its abundance.

Alpine meadow ecology is one of the most complex sciences. According to the National Park Service In Yosemite National Park meadows only make up 3% of the National Park



MEADOW DESTROYED THROUGH HUMAN INTERACTION

People walking on the meadow compacts the spongy top soil. This disrupts ground water flow & causes destruction of meadows ecology



Compacted Soil creating a barrier for ground water



SOCIAL TRAILS



VEHICLES



LACK OF EDUCATION



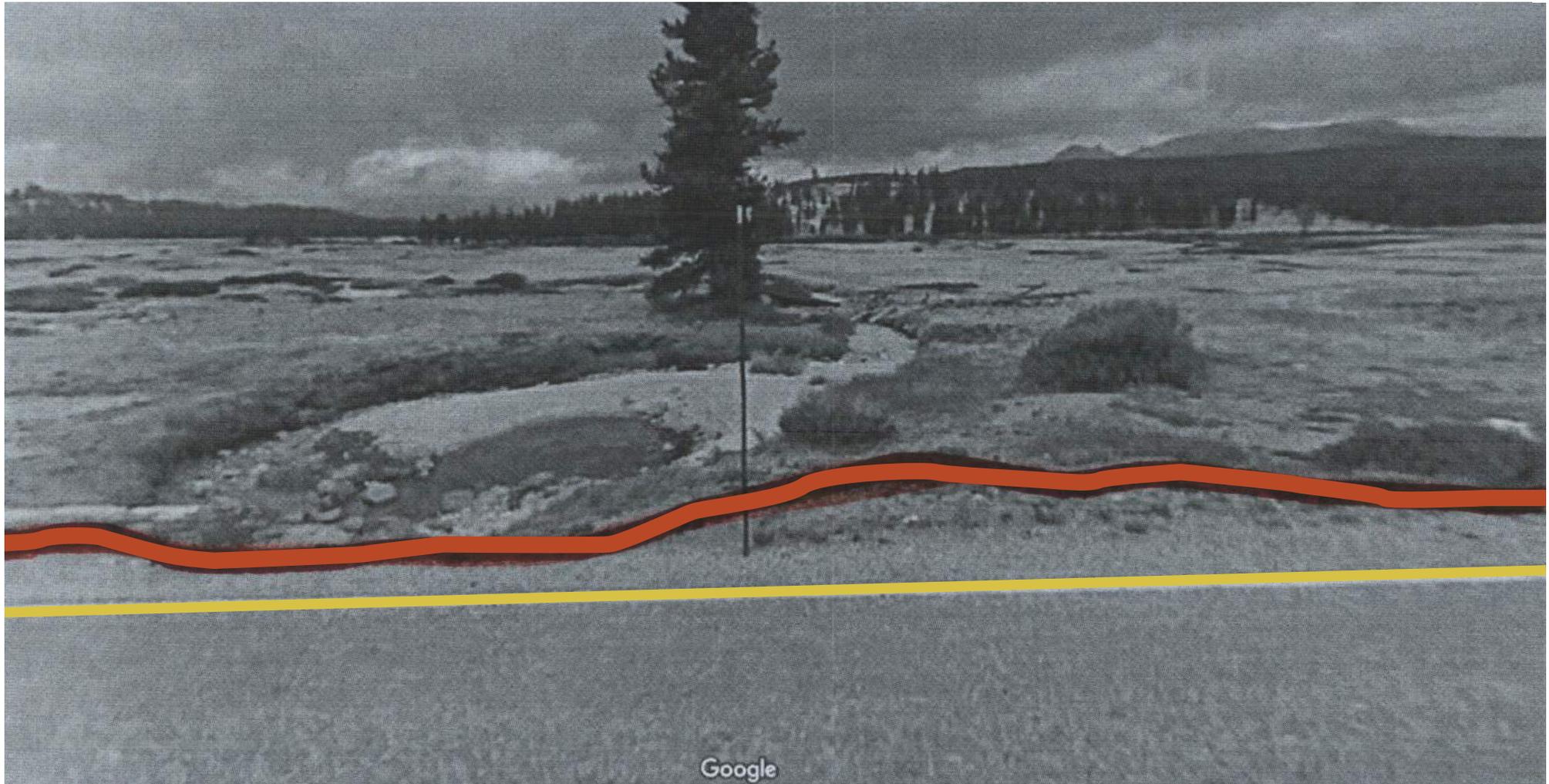
SOCIAL TRAILS





VEHICLES

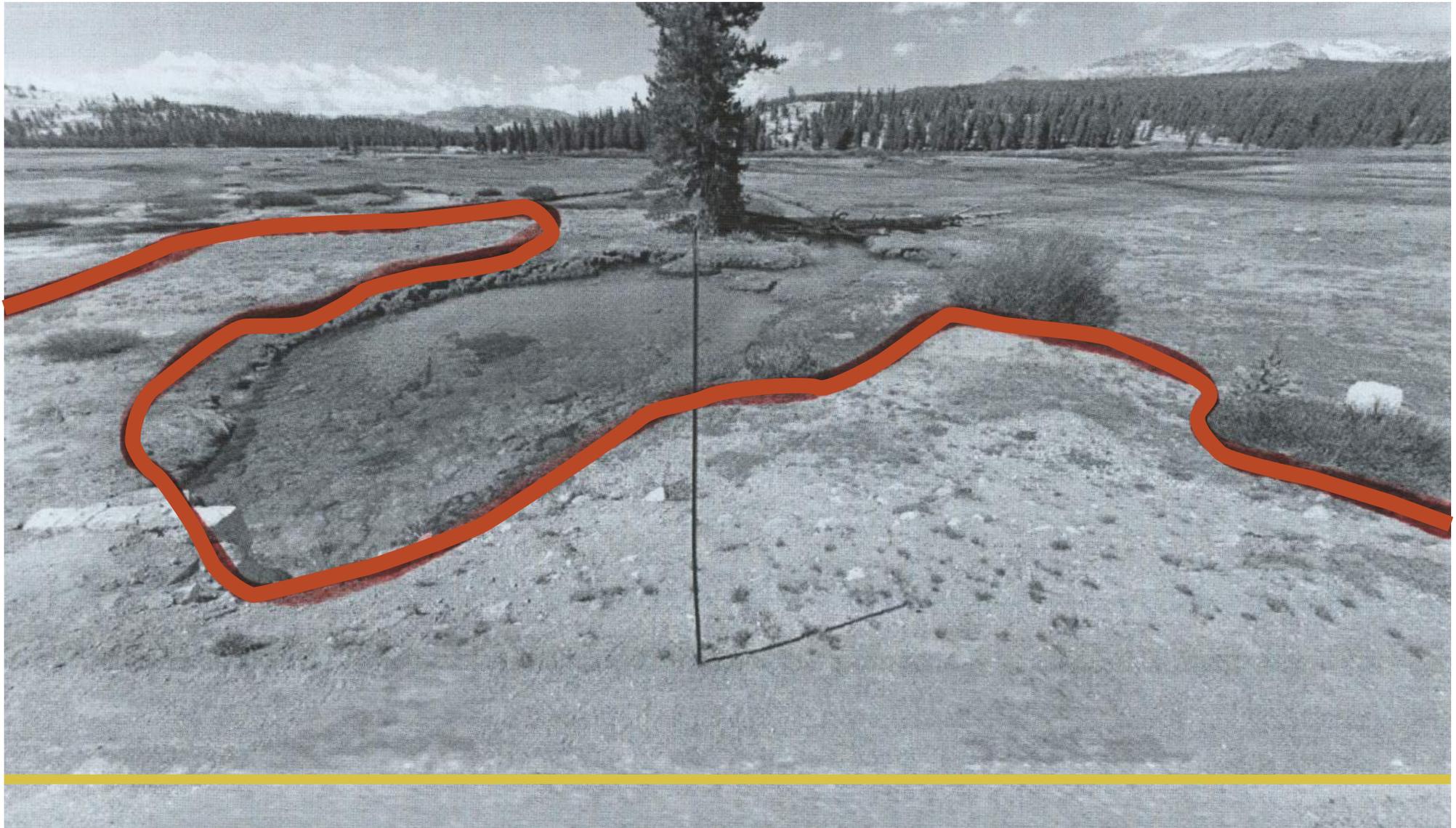
2007





VEHICLES

2012





EDUCATION

TALKING TO GARRET DICKMAN
A BOTANIST AND ECOLOGIST
AT YOSEMITE NATIONAL PARK.
HE CLAIMED THAT MOST
DAMAGE COMES FROM PEOPLE
WHO DON'T KNOW ABOUT
THE DELICATE MEADOW
ECOLOGY.

DESIGN

QUESTION



HOW DO I CREATE A WAY FOR VISITORS TO INTERACT WITH THE MEADOW WHILE PROMOTING CONSERVATION OF THE ECOLOGY?



DESIGN GOALS



CONSERVATION

PREVENTING DESTRUCTION OR UNHEALTHY INTERACTION
WITH THE ECOLOGY



EDUCATION

ENCOURAGING VISITORS TO LEARN THROUGH INTERACTION
AND EXPERIENCE



RECREATION

PROVIDING AREAS AND WAYS FOR PASSIVE AND ACTIVE RECREATION

SITE LOCATION



SURVEY

VISITOR GROUPS



35% of visitors were in groups of 2.



31% of visitors were in groups of 3-4.



69% of visitors came in groups with **children**.

VISITOR CENTER



only 45% of visitors said indoor exhibits were important.



62% of visitors said **outdoor** exhibits were the most important.

ACTIVITIES



41%

Viewing Scenery



27%

Day Hike



11%

Scenic Drive



5%

Camping



3%

Overnight Hike



1%

Stay in Lodge

CHARACTER

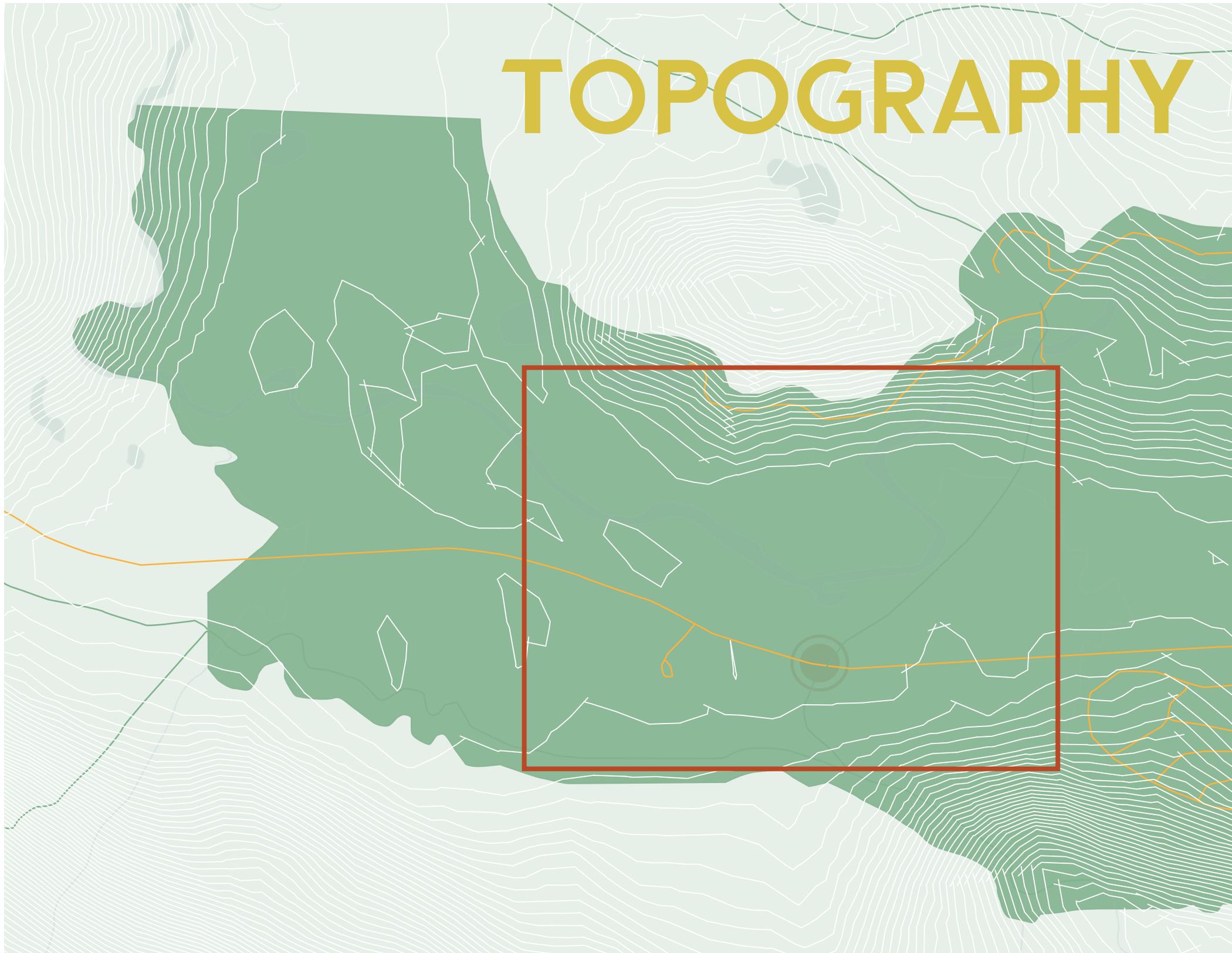
A rustic wooden cabin with a steep gabled roof and a stone foundation. The cabin is built with vertical wooden planks and has several windows with multiple panes. A wheelchair accessibility sign is visible in the foreground. The background shows trees and a bright sky.

NATIONAL PARKS ALL HAVE THE SAME DESIGN AESTHETIC THROUGHOUT, YOSEMITE INCLUDED. EVERYTHING BUILT WITHIN THE PARKS HAVE A MINIMALISTIC RUSTIC DESIGN USING LOCAL MATERIALS. THIS ALLOWS THE STRUCTURES TO BLEND IN WITH THEIR NATURAL SURROUNDINGS KEEPING THEM FROM BEING A VISUAL DISTRACTION.

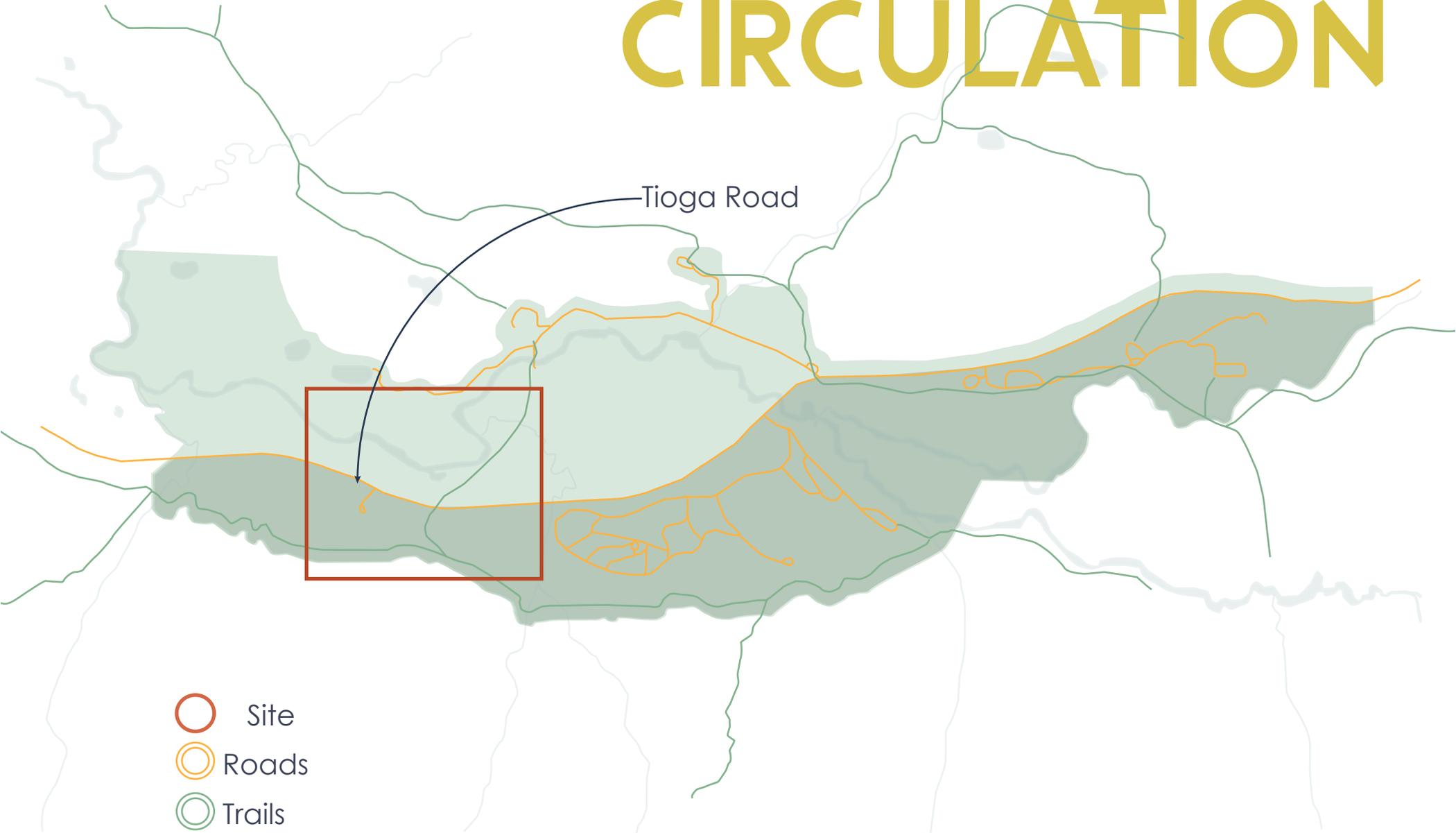
SITE LOCATION



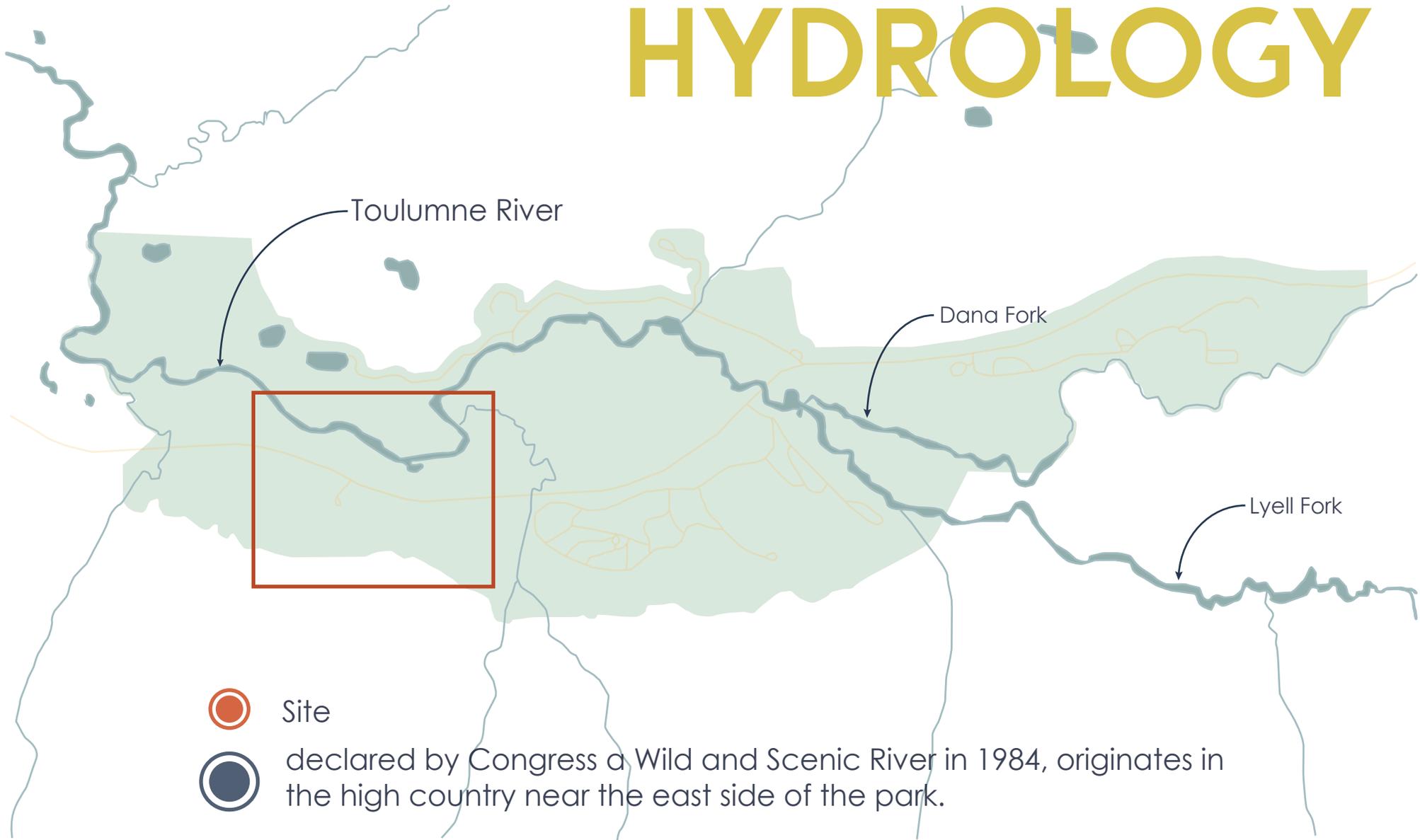
TOPOGRAPHY



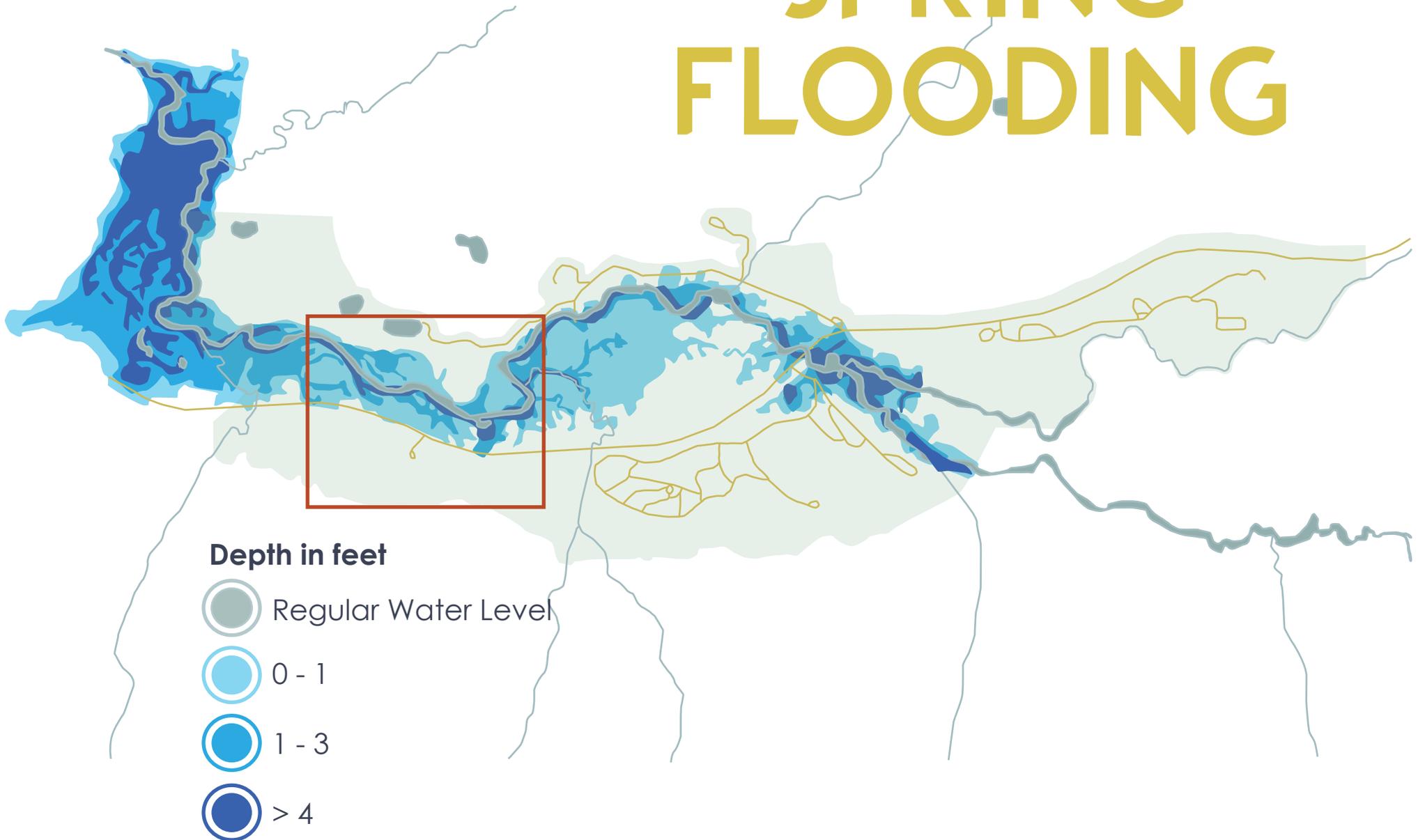
CIRCULATION



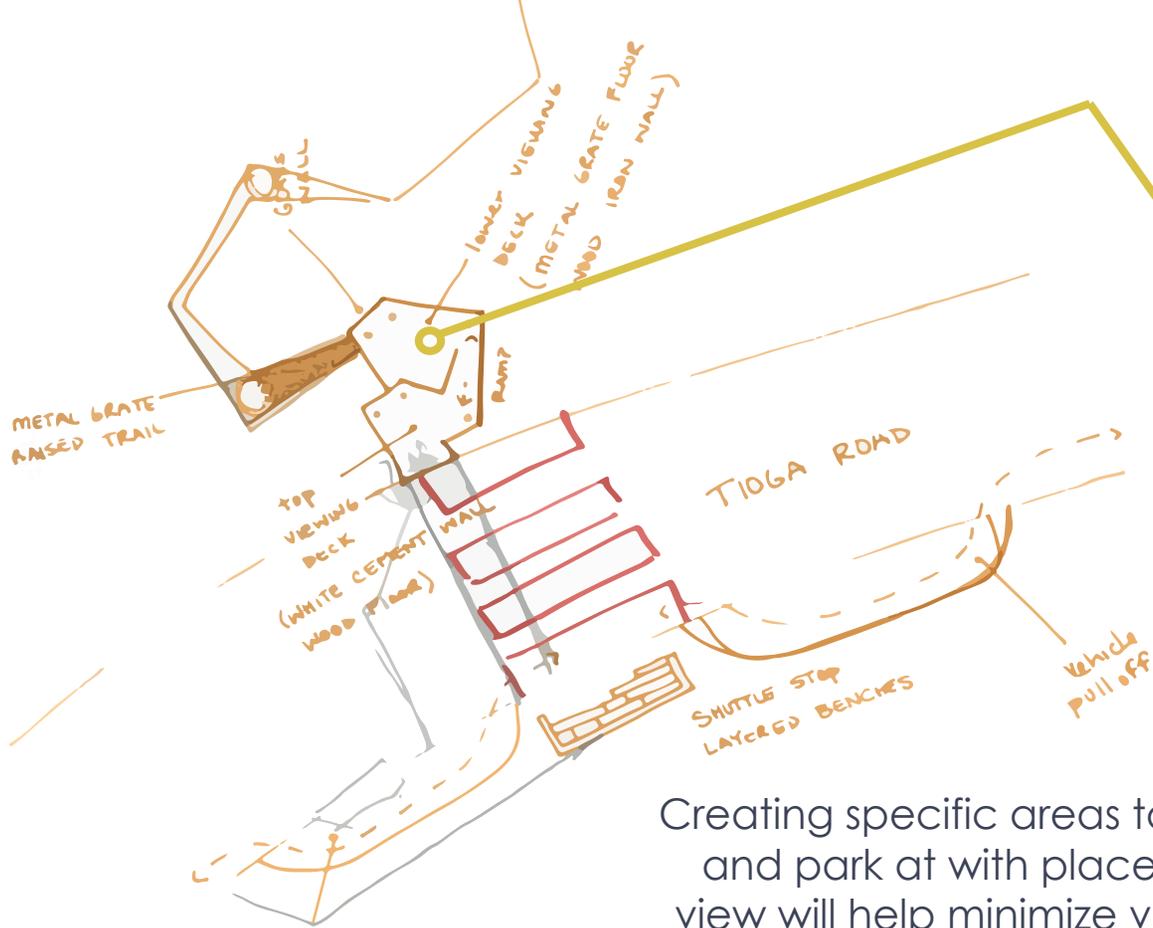
HYDROLOGY



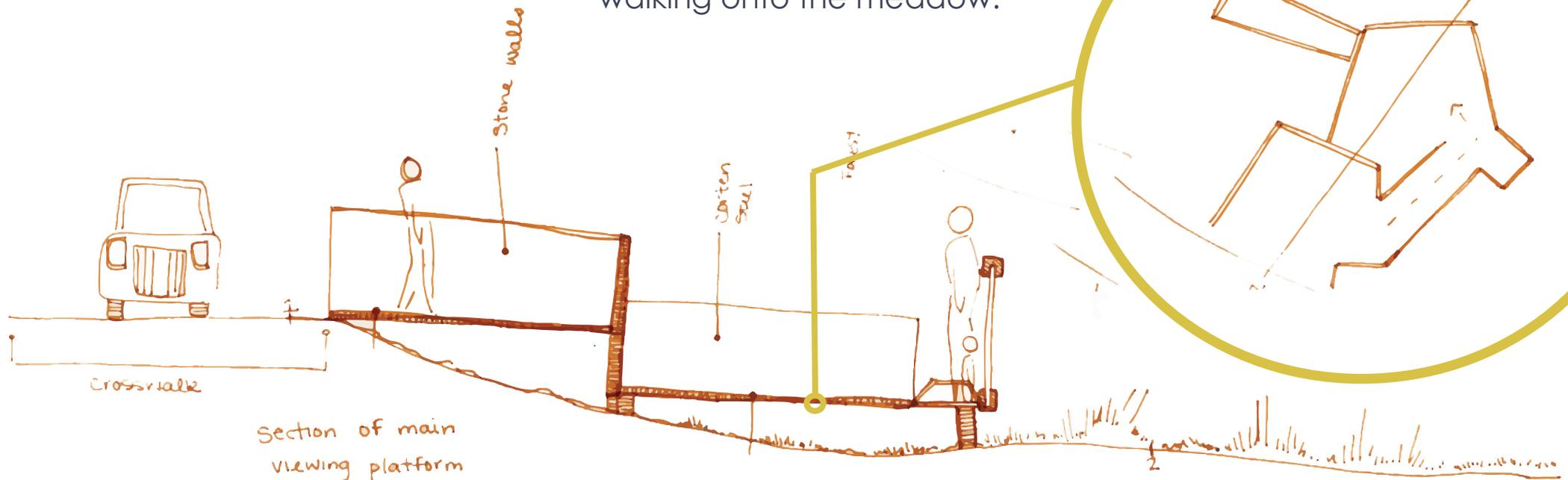
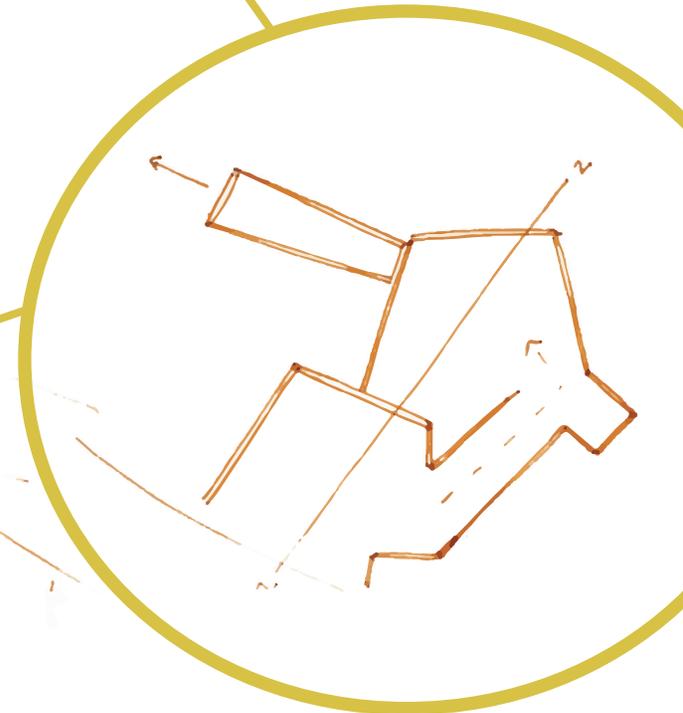
SPRING FLOODING



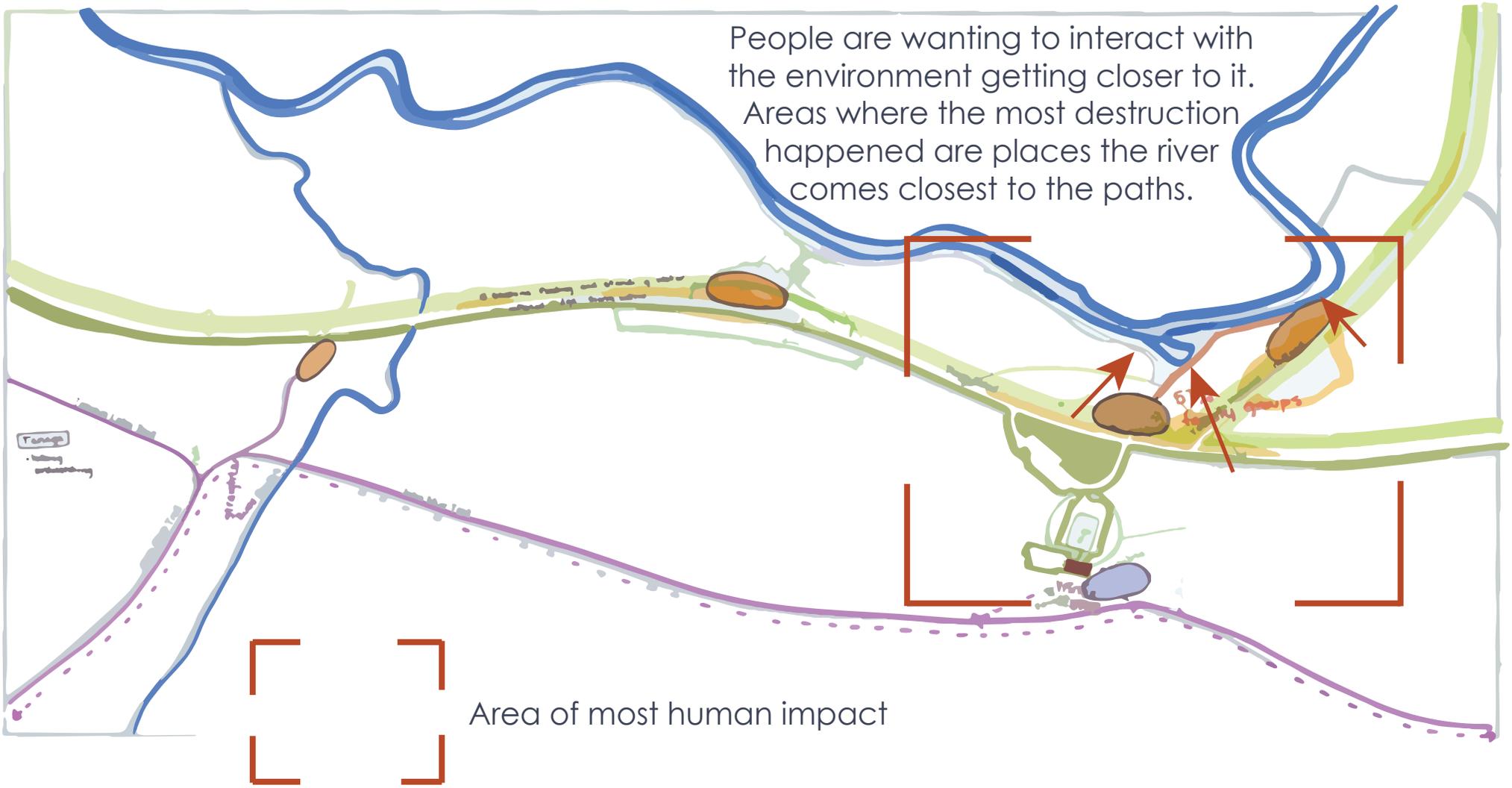
SHUTTLE STOPS



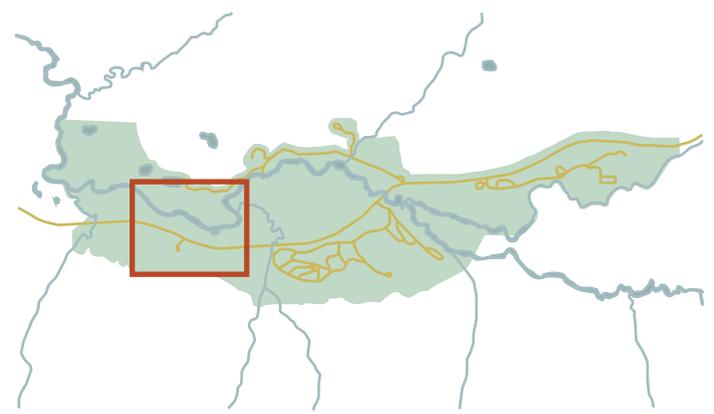
Creating specific areas to stop and park at with places to view will help minimize visitors walking onto the meadow.



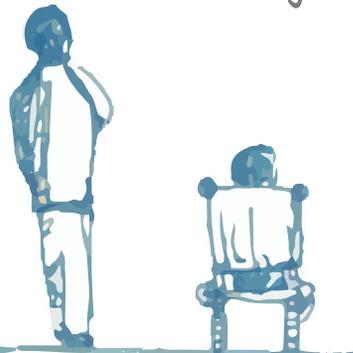
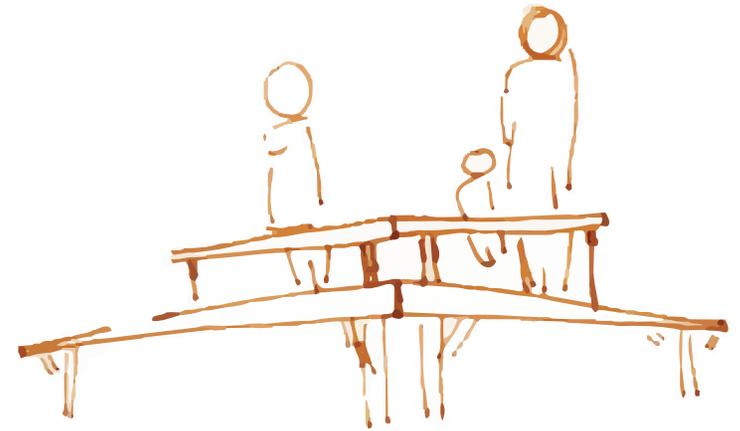
People are wanting to interact with the environment getting closer to it. Areas where the most destruction happened are places the river comes closest to the paths.



INTERACTION PROBLEMS



RAISED PATHWAYS



TUOLUMNE RIVER

Raised pathways will allow people to go into the meadow getting a closer look while not damaging the ecology.

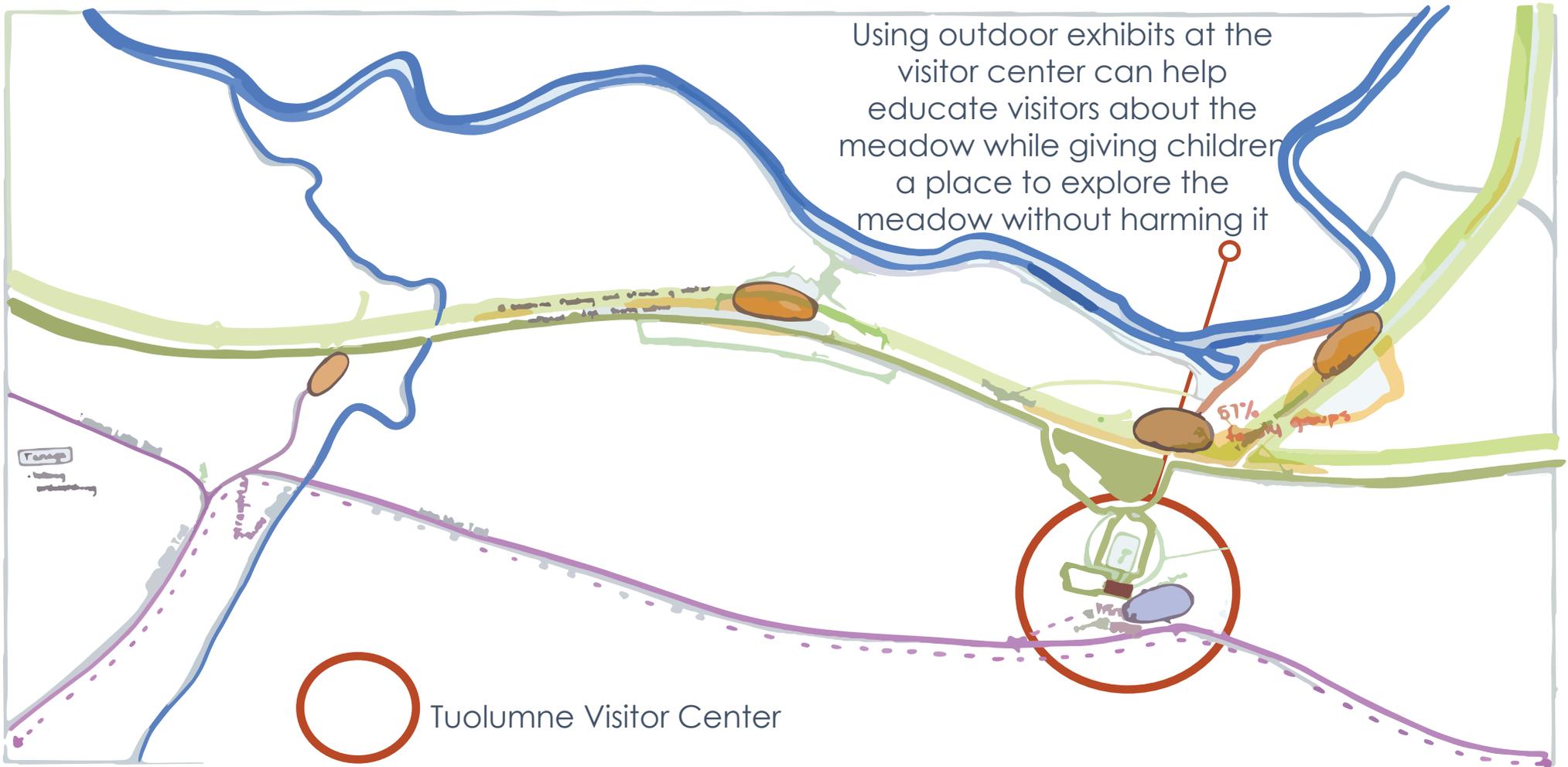
WET MEADOW

- BLACK SEDGE
- ASTER
- WESTERN BISTORT
- DWARF BILBERRY

DEEP STANDING WATER

- SKY PLOET
- ROUND-EDGE SEDGE
- SIERRA WILLOW SEDGE
- SITKA SEDGE

Using outdoor exhibits at the visitor center can help educate visitors about the meadow while giving children a place to explore the meadow without harming it



 Tuolumne Visitor Center

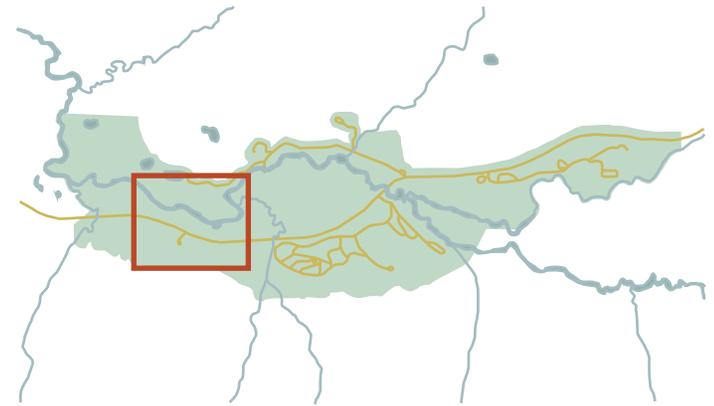
VISITOR CENTER



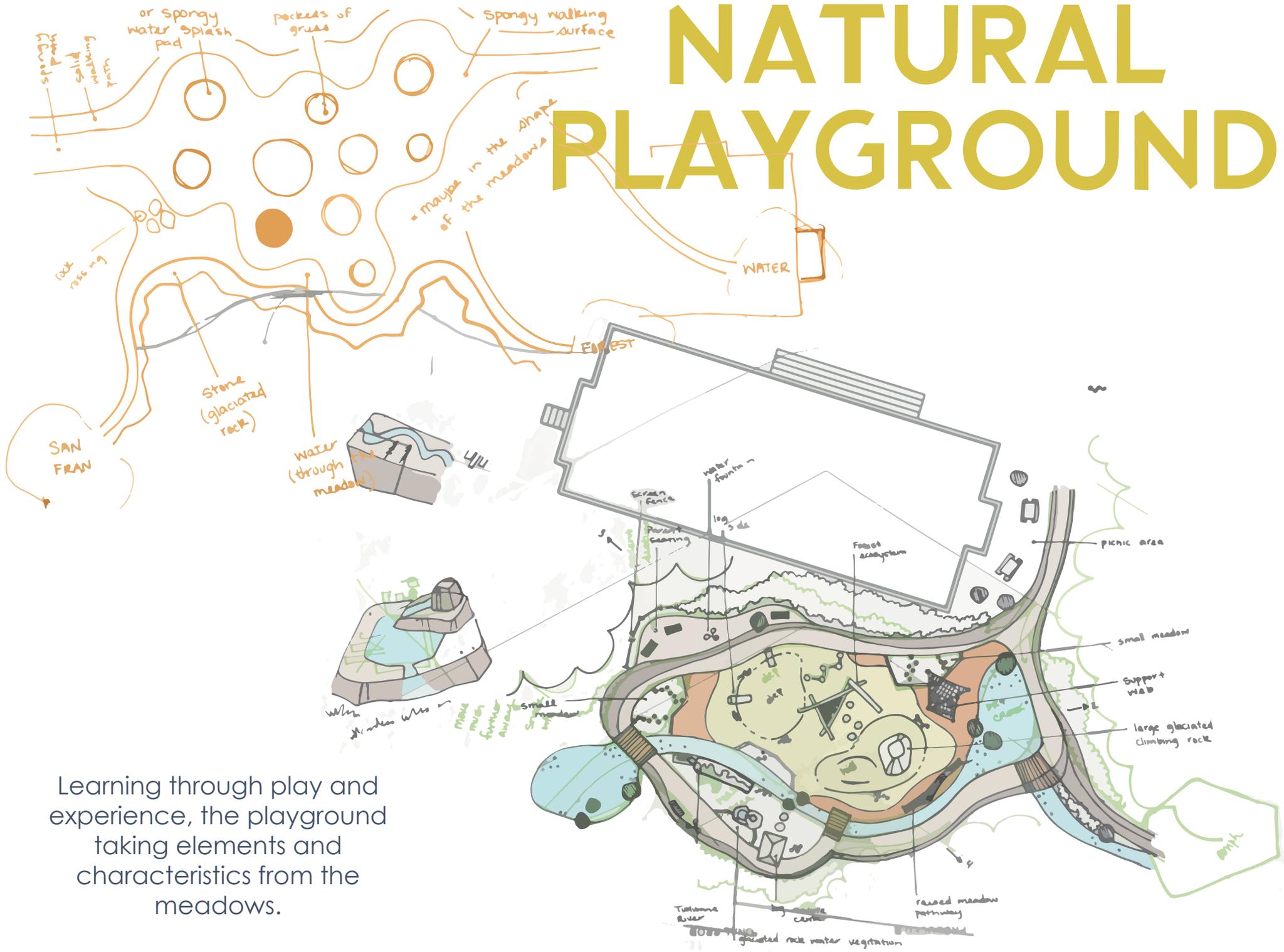
69% of visitors came in groups with **children**



62% of visitors said **outdoor** exhibits were the most important.



NATURAL PLAYGROUND



Learning through play and experience, the playground taking elements and characteristics from the meadows.

MASTER PLAN KEY

MASTER PLAN

 HANDICAP ACCESSIBLE

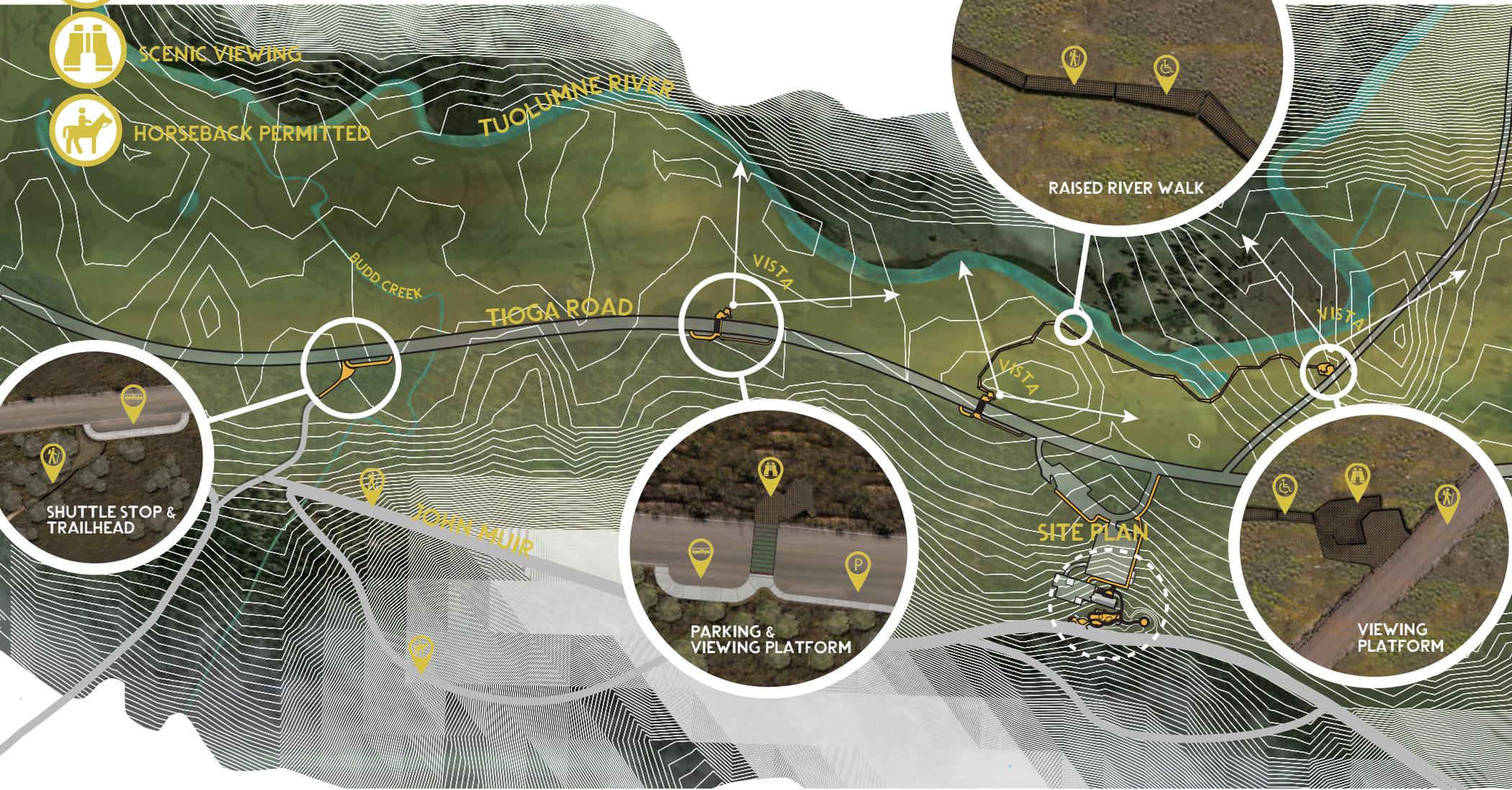
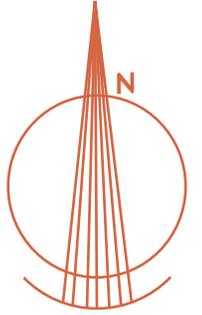
 PARKING

 SHUTTLE STOP

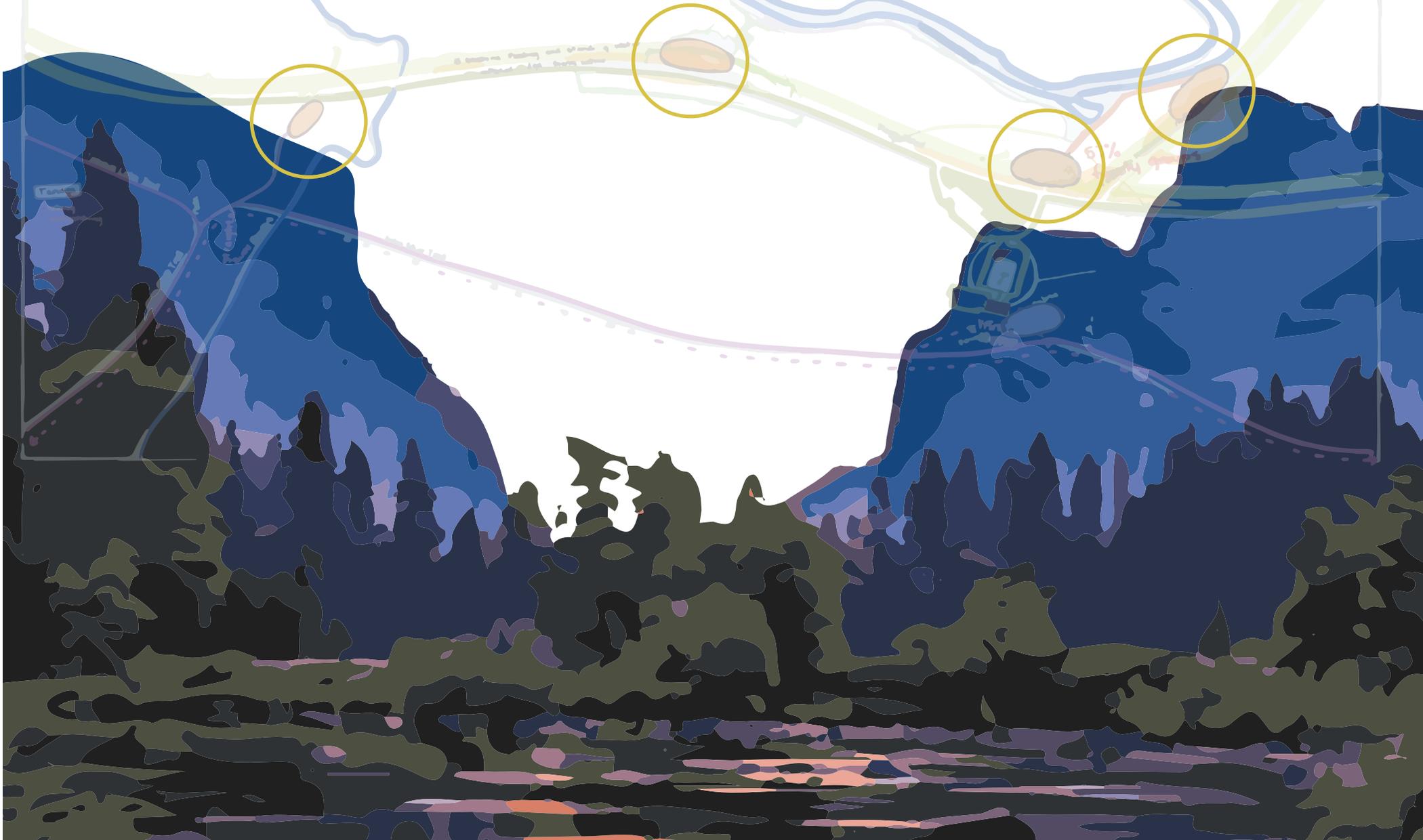
 HIKING

 SCENIC VIEWING

 HORSEBACK PERMITTED



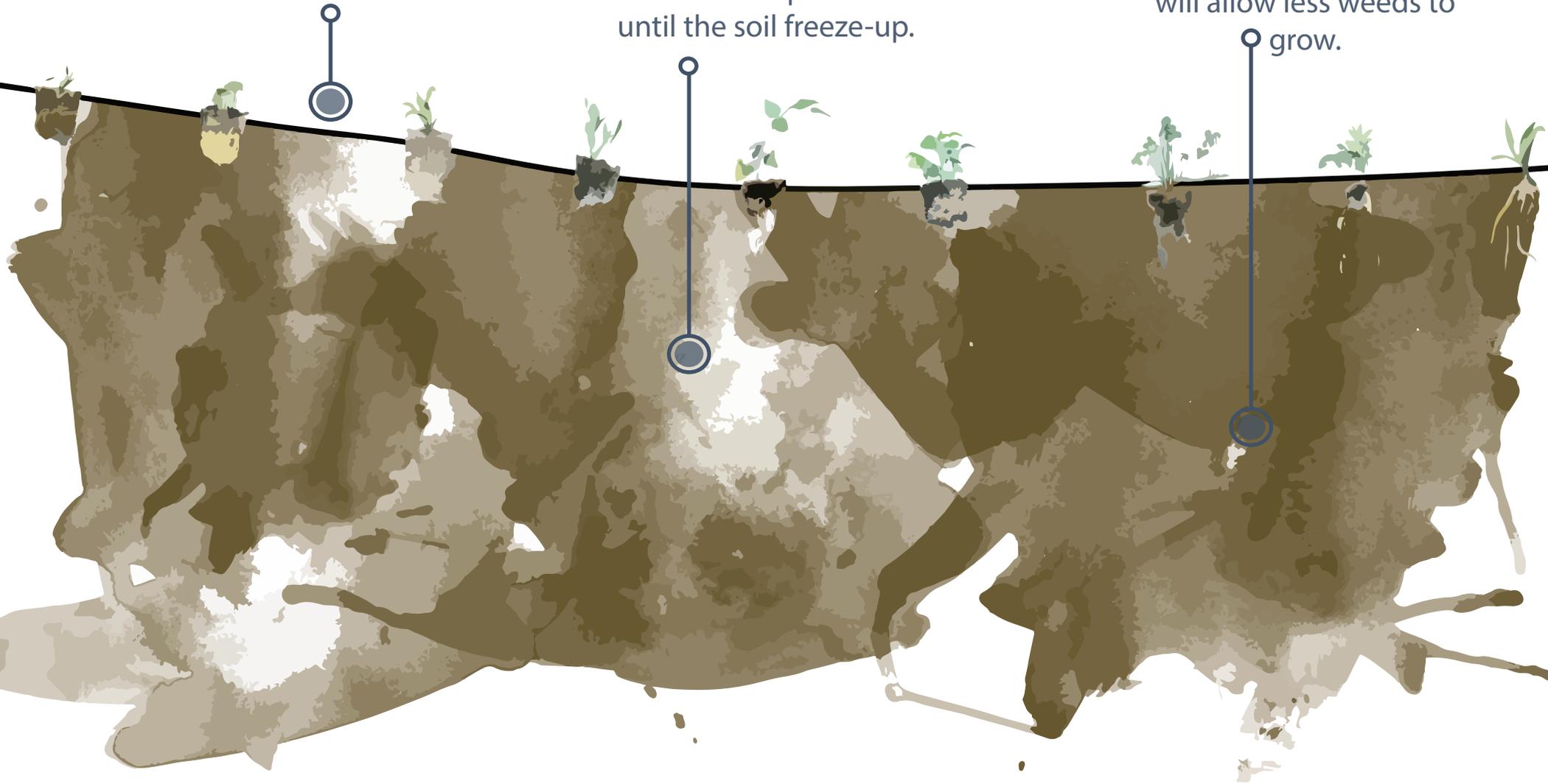
**BEFORE CONSERVATION CAN
TAKE PLACE, RE-ESTABLISHMENT
OF DESTROYED AREAS MUST
HAPPEN**



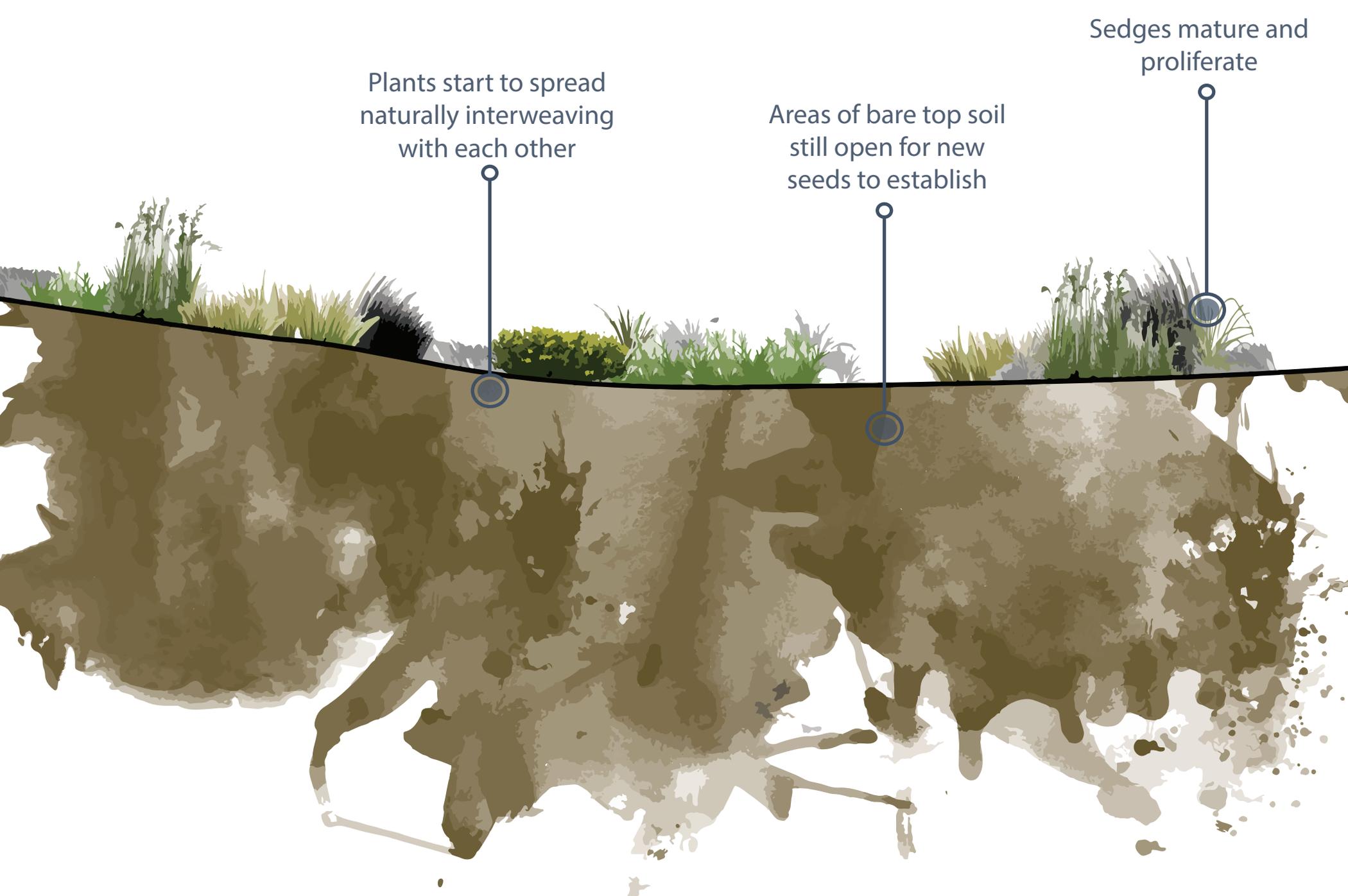
Planted by broadcast system
(thrown out by hand) assures
even natural spread.

Seeds can be successfully
planted after spring thaw till
June 30th or September 1st
until the soil freeze-up.

No-till plantings minimiz-
es disturbance of soil, and
will allow less weeds to
grow.



RE-ESTABLISHMENT



Plants start to spread naturally interweaving with each other

Areas of bare top soil still open for new seeds to establish

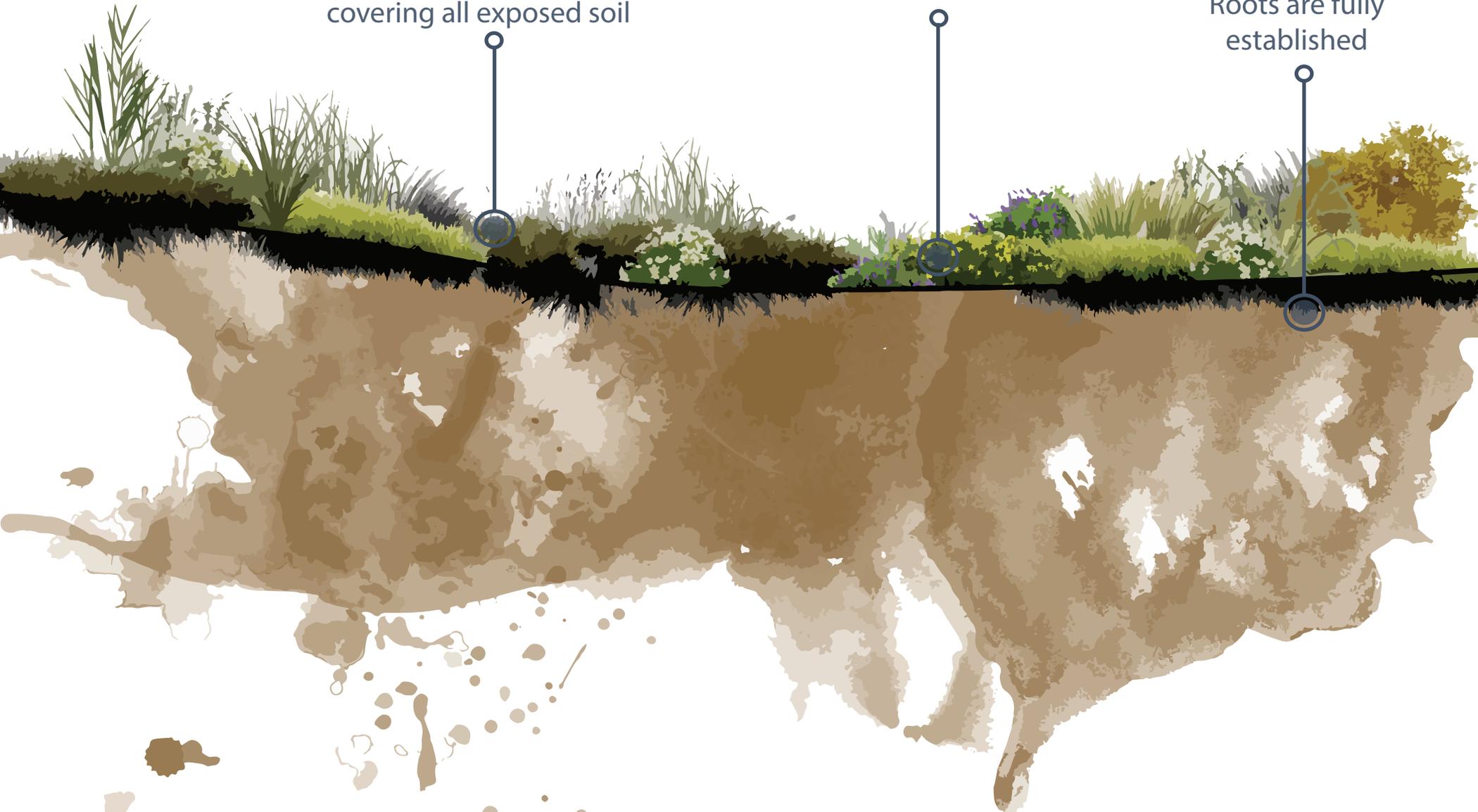
Sedges mature and proliferate

AFTER ONE YEAR

Plants have completely filled in the ground plane covering all exposed soil

Plant varieties are made up of 70% sedges & 30% forbes

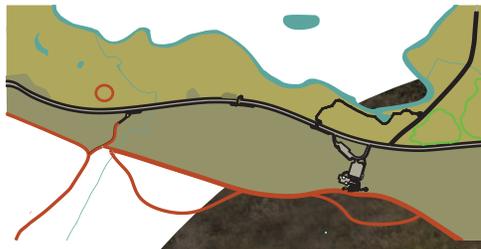
Roots are fully established



FULLY RE-ESTABLISHED

**ONCE THESE AREAS
ARE
RE-ESTABLISHED
WHAT IS TO
PREVENT THIS
FROM HAPPENING
AGAIN?**

TRAIL & SIGNAGE



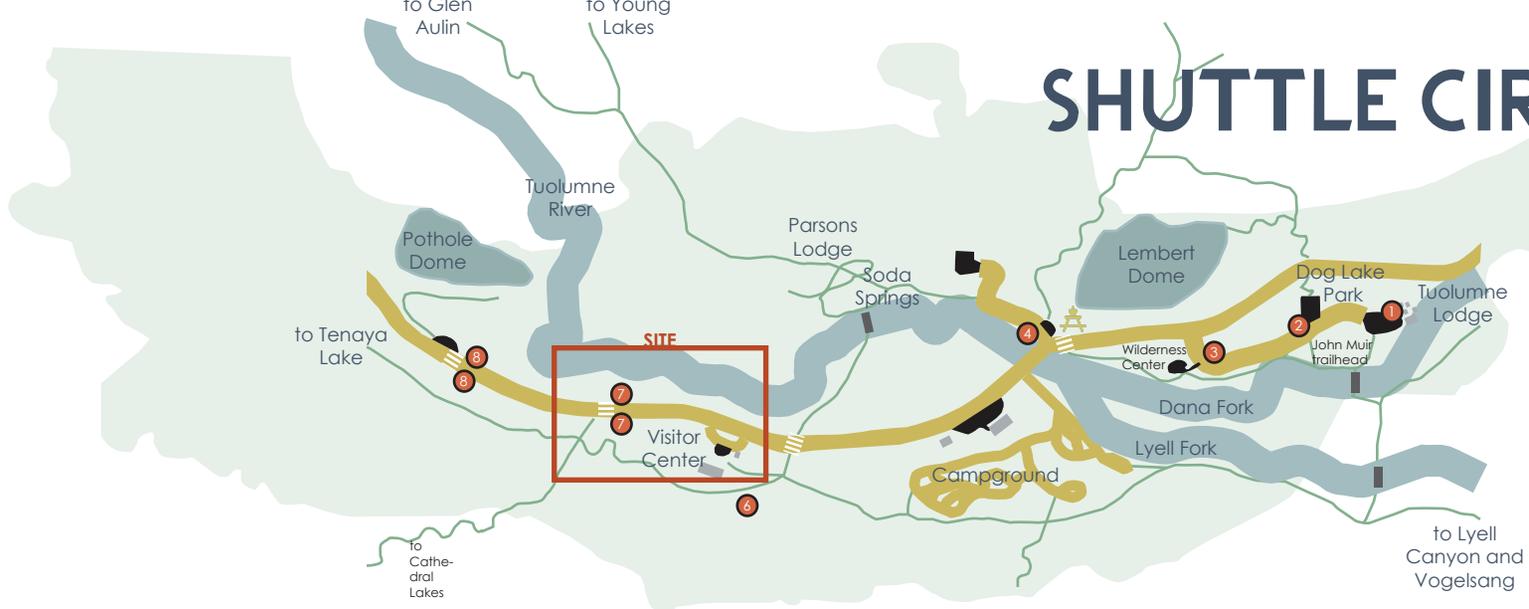
TRAILS ACCOMODATING MORE DESTRUCTIVE RECREATION SUCH AS BIKING, CROSS COUNTRY SKIING, AND HORSE BACK RIDING TAKE THE STRESS OFF THE MEADOW WHILE STILL ALLOWING VISITORS TO TAKE PART IN THESE ACTIVITIES.

WAYFINDING SYSTEM

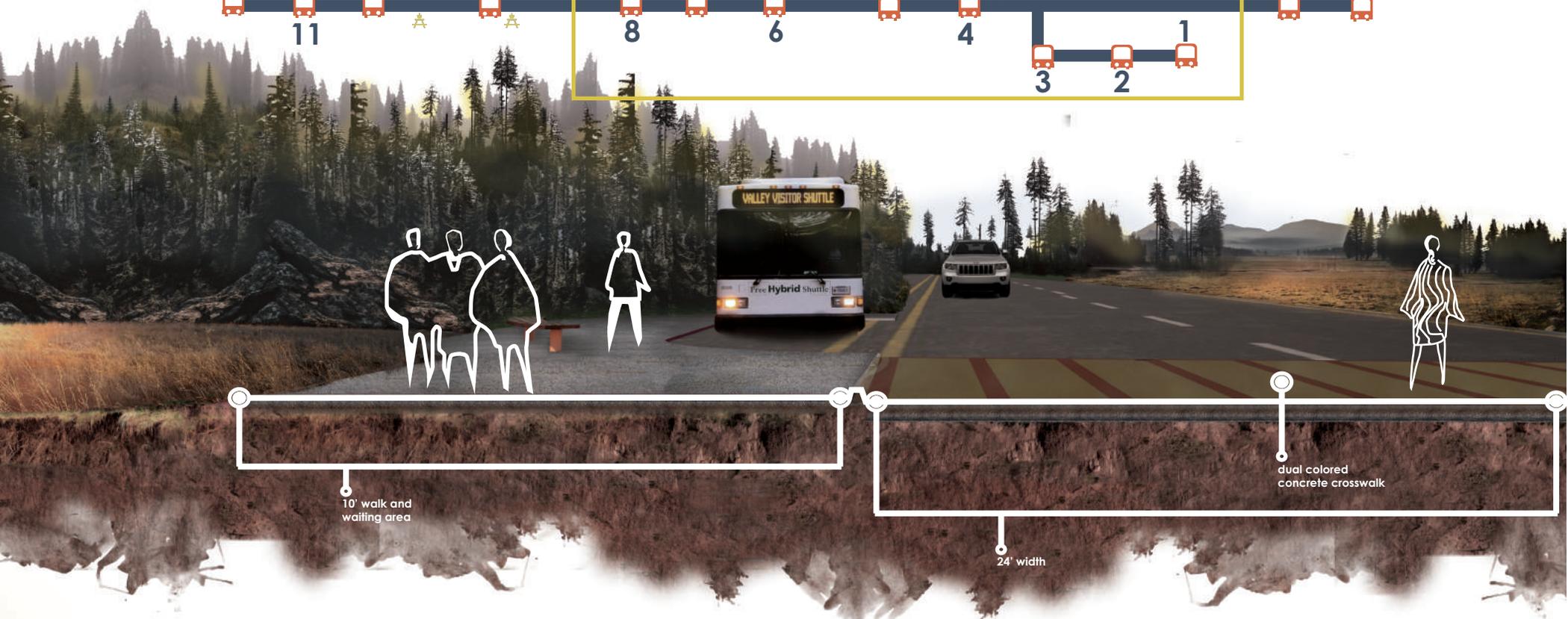
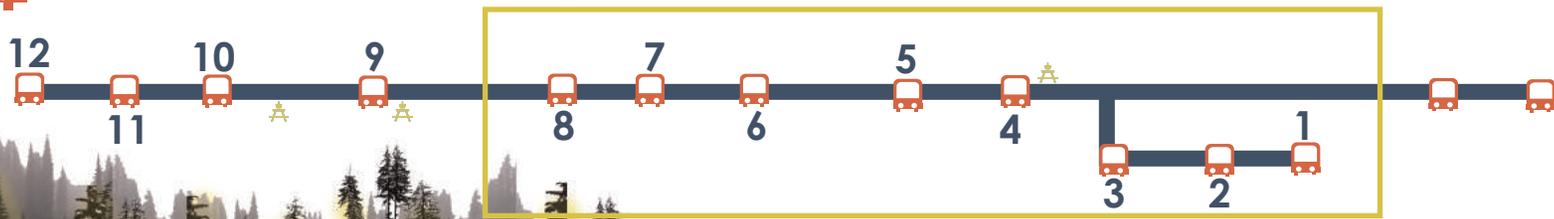
THE WAYFINDING DRAWS FROM THE MINIMALISTIC DESIGN & RUSTIC MATERIALS UTILIZED THROUGHOUT THE SITE.



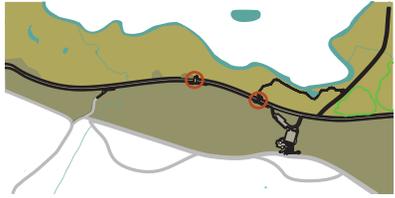
SHUTTLE CIRCULATION



TUOLUMNE MEADOWS SHUTTLE BUS ALONG TIOGA ROAD



SHUTTLE STOP



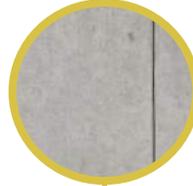
PARKING & SHUTTLE STOPS ON THE LESS DELICATE FORESTED SIDE OF THE ROAD FUNNEL PEOPLE ACROSS THE STREET TO VIEWING PLATFORMS KEEPING THEM OFF THE MEADOW ECOLOGY.

10 FOOT WALKWAY ACCOMMODATES FOR LARGE GROUPS OF SHUTTLE BUS TOURS.

Native "Lodgepole Pine" Timber



Brushed Concrete

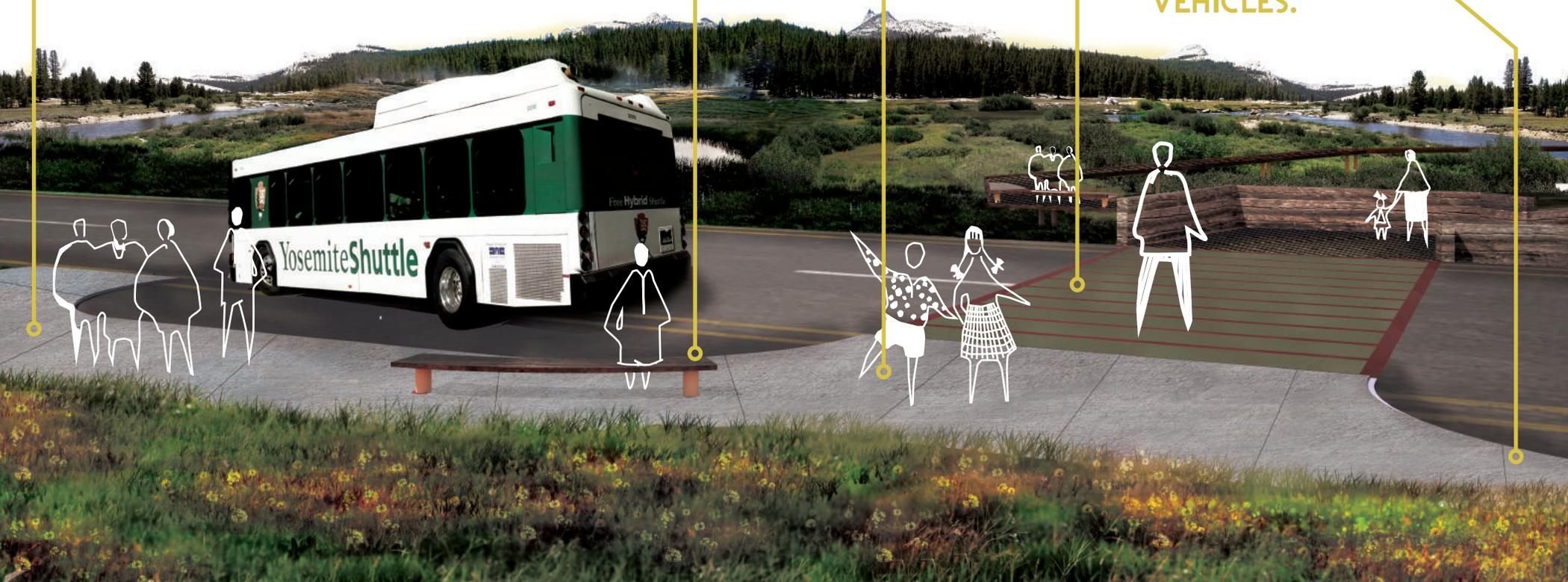


Colored Concrete



DIRECTS PEOPLE ACROSS STREET TO VIEWING PLATFORMS.

5 FOOT WALKWAY TO ACCOMMODATE INDIVIDUAL VEHICLES.



THE RIVER WALKS
MINIMALISTIC DESIGN
ALLOWS IT TO BLEND IN
WITH THE SURROUNDING
VEGETATION KEEPING THE
STRUCTURE FROM
BECOMING A VISUAL
DISTRACTION.

Glass Wall

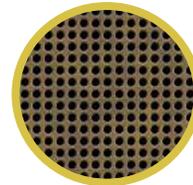


Native
"Lodgepole
Pine" Timber



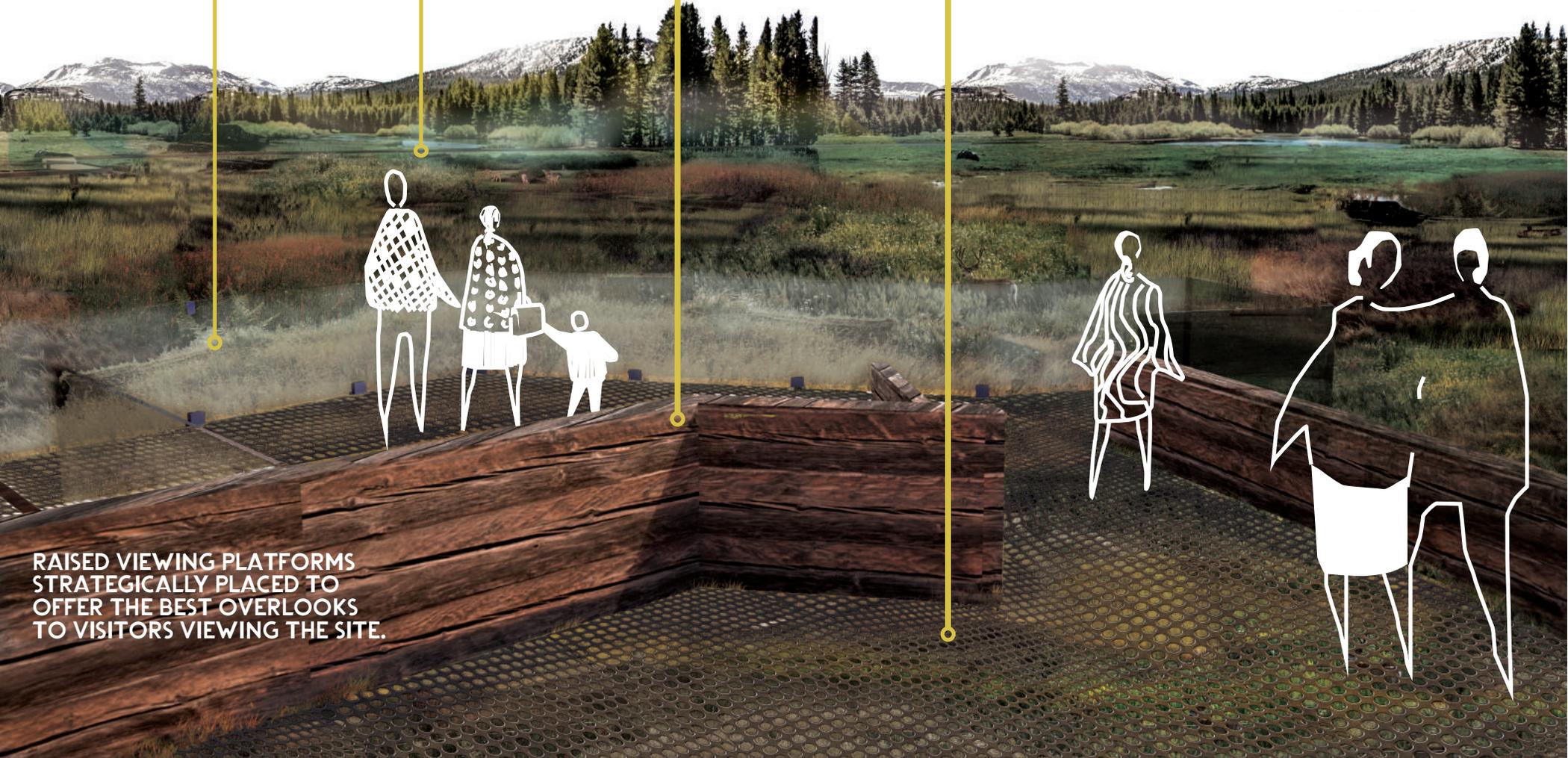
VIEWING PLATFORM

Metal Grate

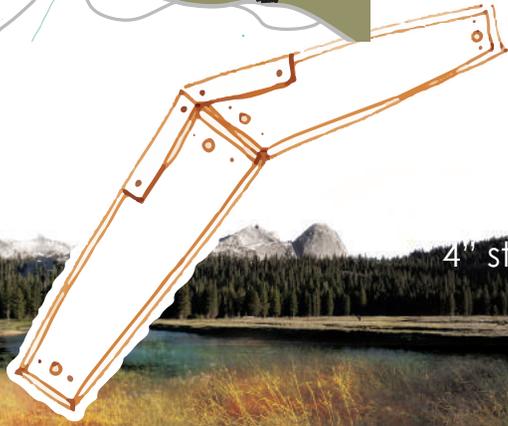
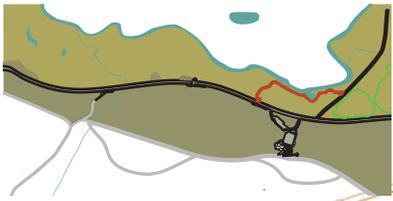


METAL GRATE FLOORING ON VIEWING
PLATFORMS AND RIVER WALK ALLOWS
FOR SUN AND RAIN TO REACH THE
MEADOW BELOW

RAISED VIEWING PLATFORMS
STRATEGICALLY PLACED TO
OFFER THE BEST OVERLOOKS
TO VISITORS VIEWING THE SITE.



RIVERWALK SECTION



4" steel lip welded

1-3' rise

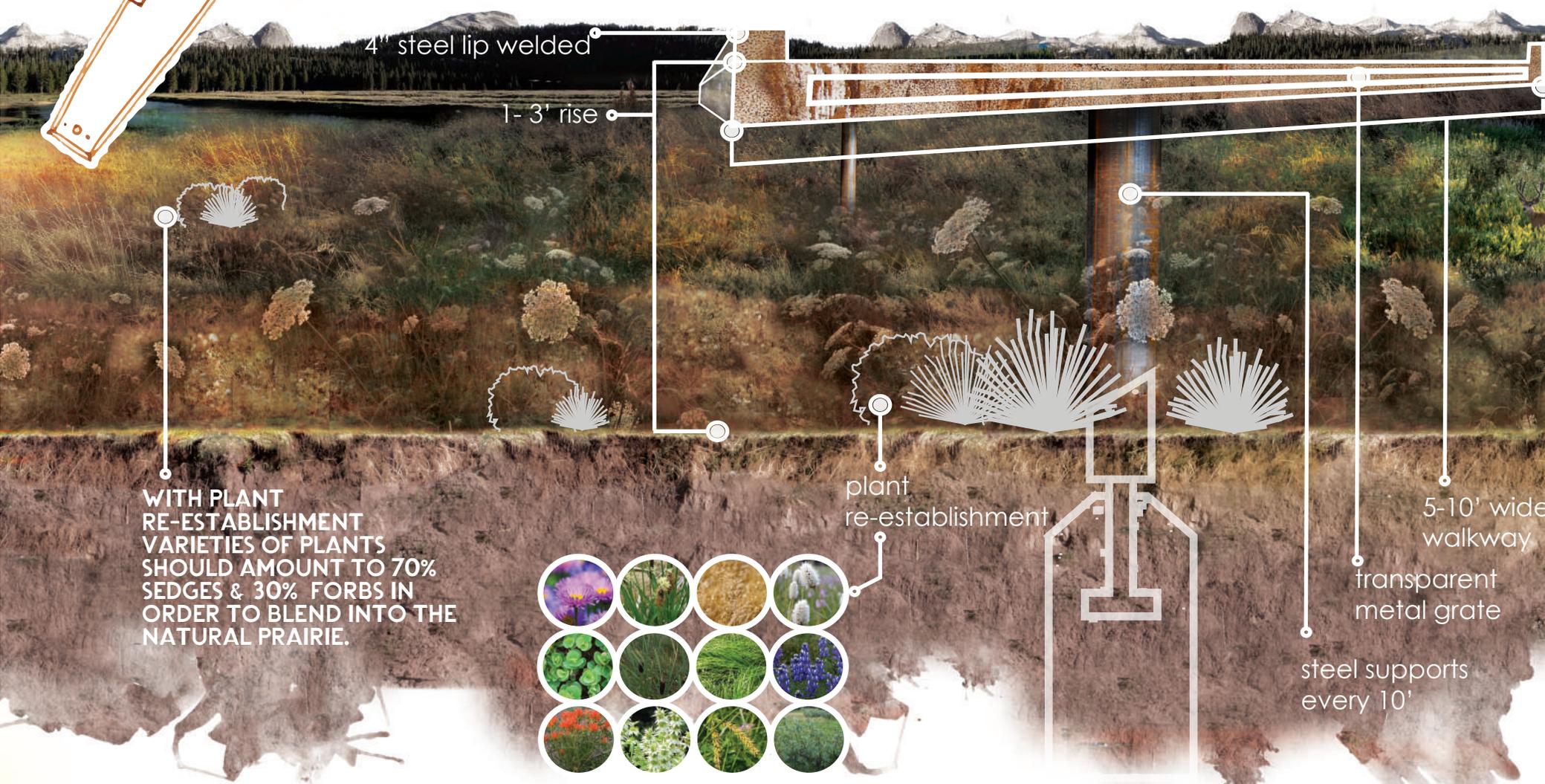
WITH PLANT RE-ESTABLISHMENT VARIETIES OF PLANTS SHOULD AMOUNT TO 70% SEDGES & 30% FORBS IN ORDER TO BLEND INTO THE NATURAL PRAIRIE.

plant re-establishment

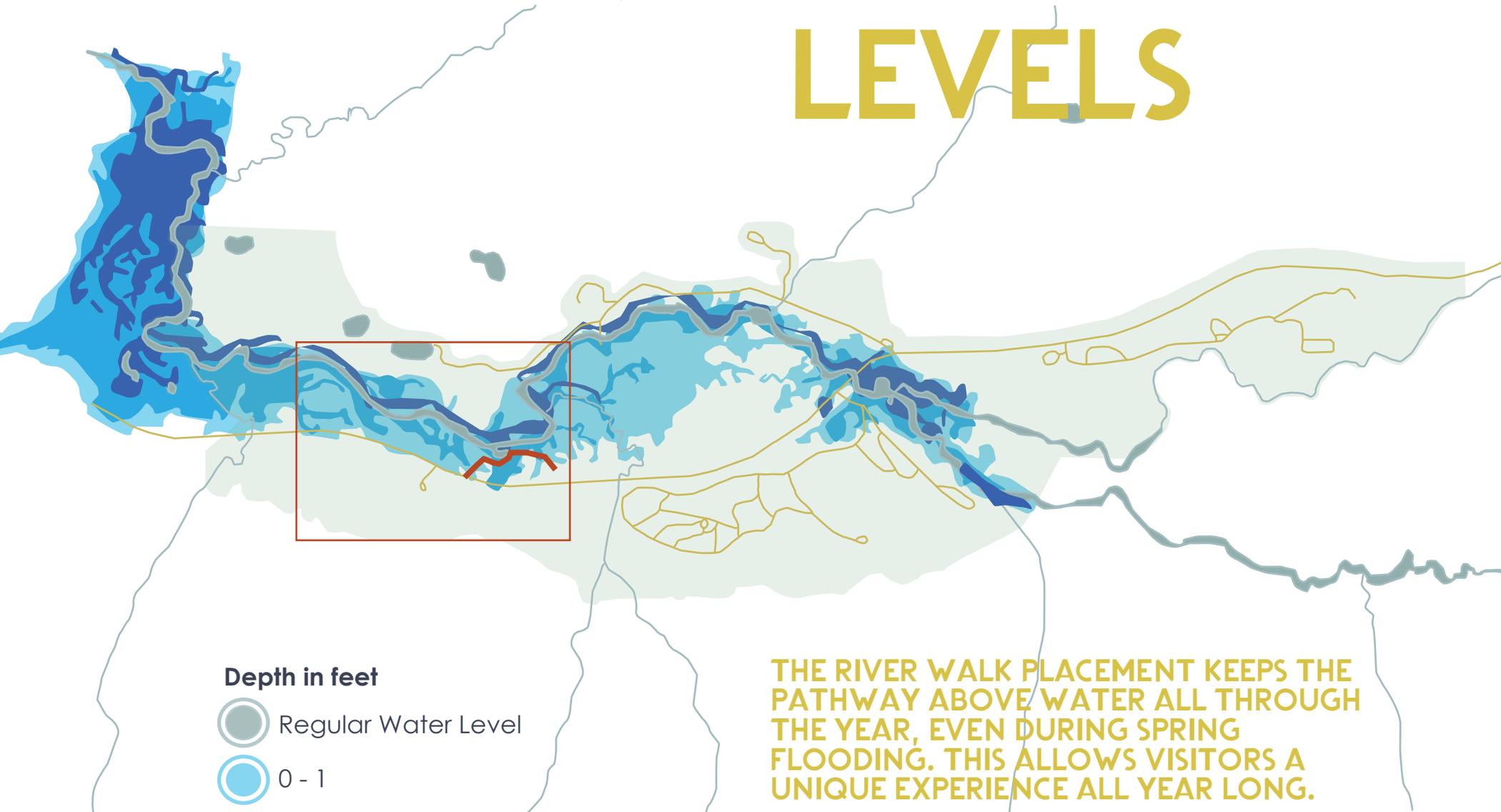
5-10' wide walkway

transparent metal grate

steel supports every 10'



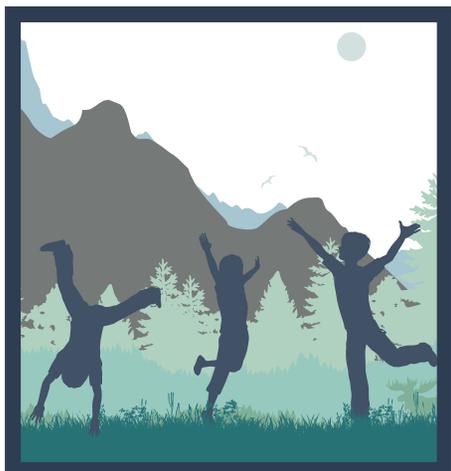
SPRING FLOOD LEVELS





VISITOR CENTER

- ① TUOLUMNE VISITOR CENTER
- ② ADA COMPLIANT RAMP
- ③ PICNIC AREA
- ④ PARENT SEATING
- ⑤ MEADOW INSPIRED NATURAL PLAYGROUND
- ⑥ DRY CREEK BED
- ⑦ PLAYGROUND PICNIC AREA
- ⑧ ALPINE AMPHITHEATER



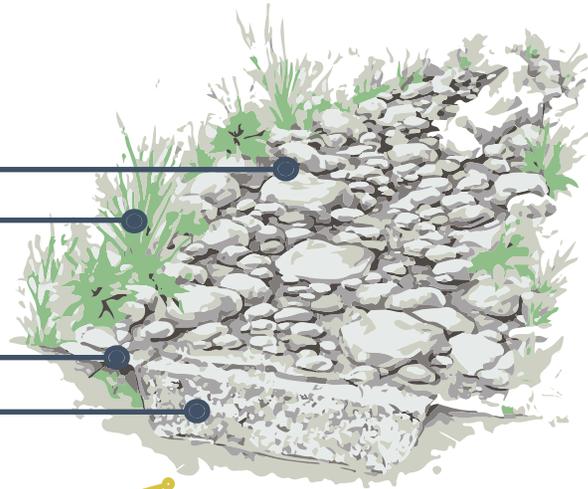
DRY CREEK BED

Glaciated Boulders

Native Vegetation

Landscape Fabric

Gravel



NATURAL PLAYGROUND

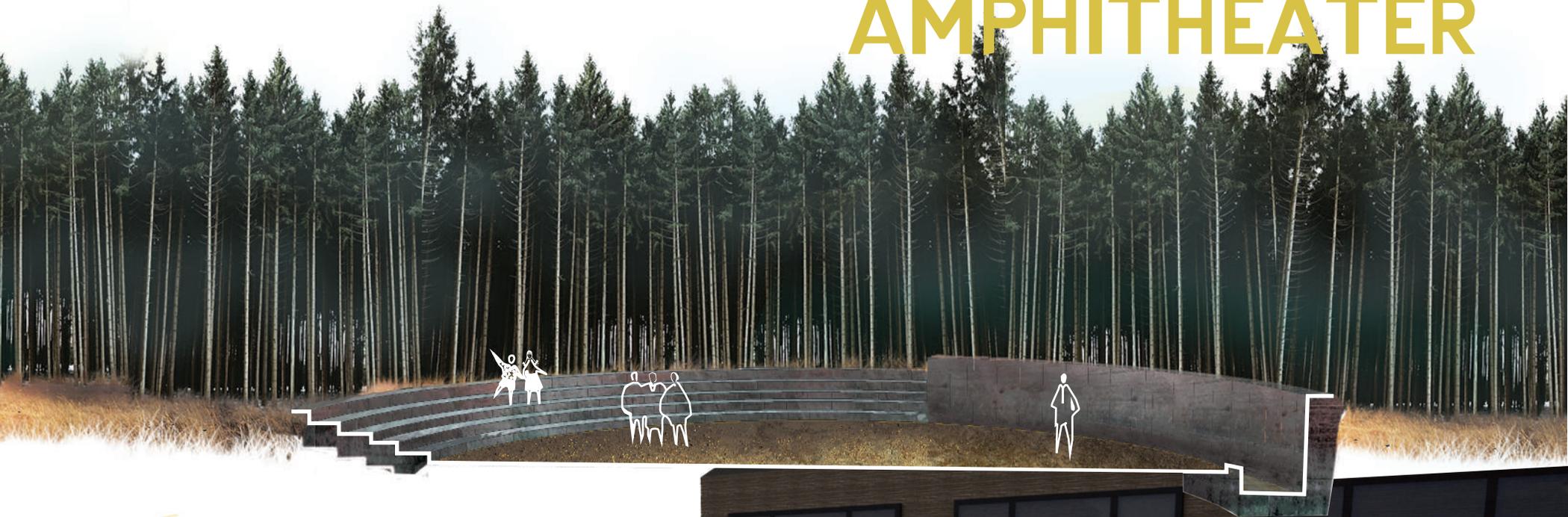
THE Poured RUBBER MIMICS THE SPONGY FEEL OF THE MEADOW.

69% OF GROUPS VISITING THE MEADOW COME IN A GROUP WITH CHILDREN. THE PLAYGROUND GIVES THEM AN AREA TO BLOW OF STEAM WHILE HAVING MEADOW INSPIRED EDUCATIONAL EXPERIENCE

THE DRY CREEK BED BRINGS THE FLOW, FORMS, & VEGETATION OF THE ALPINE MEADOW INTO THE NATURAL PLAYGROUND.



AMPHITHEATER



NATURAL PLAYGROUND

THANK YOU FOR
LISTENING

QUESTIONS?



