

White Earth State Forest Interpretive Center + Nature Park



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Wetlands:

Temples of Biodiversity

What are Wetlands?

- Saturated or partially submerged soil
- One of the most productive types of ecosystems
- Crucial role in water cycle and flood control
- Highly sensitive and declining habitat





Problems Facing Wetlands:

Why are Wetlands Disappearing?

- Loss of Habitat
- Chemical pollution
- Erosion



Thesis Statement:

In response to the rapid rate of decline of wetland habitats, I intend to create a blueprint for a 'new' state park that will provide high-quality recreational opportunities while engaging in the reestablishment and restoration of deteriorating and sensitive deciduous wetlands.



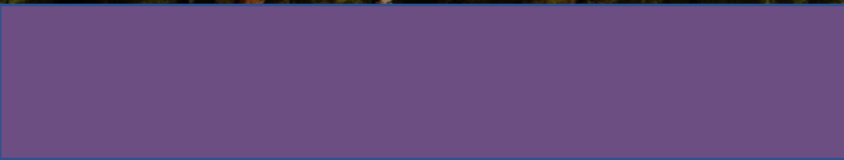
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Research Questions:

- Ecological Inventory
- Ecosystem Health
- Recreation Suitability





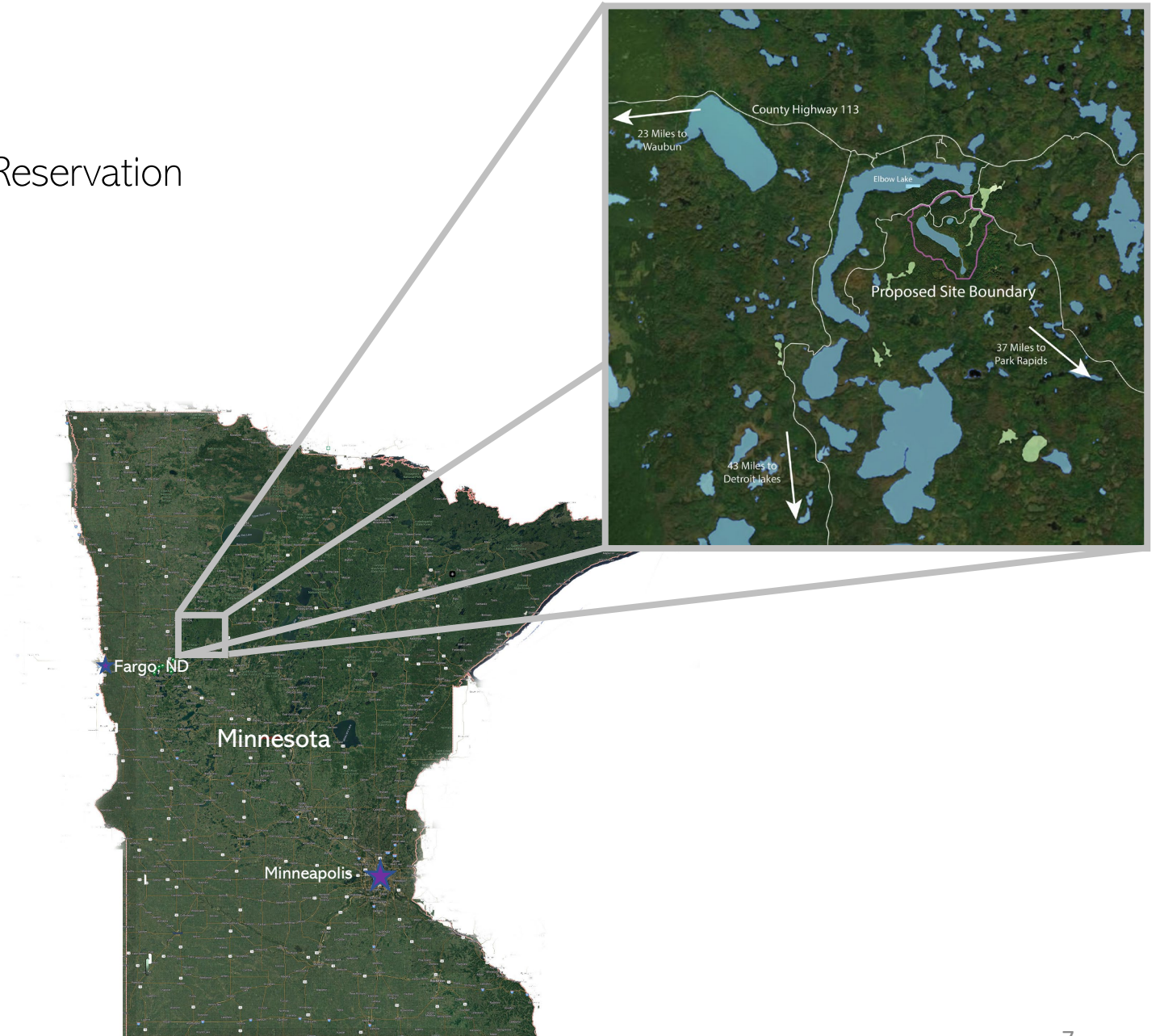
Site Location:

North-Central Becker County | White Earth Reservation

- Next to Elbow Lake
- 4 miles S off Highway 113

Proposed Site Size: 767 Acres

- Northern Minnesota Lake Country



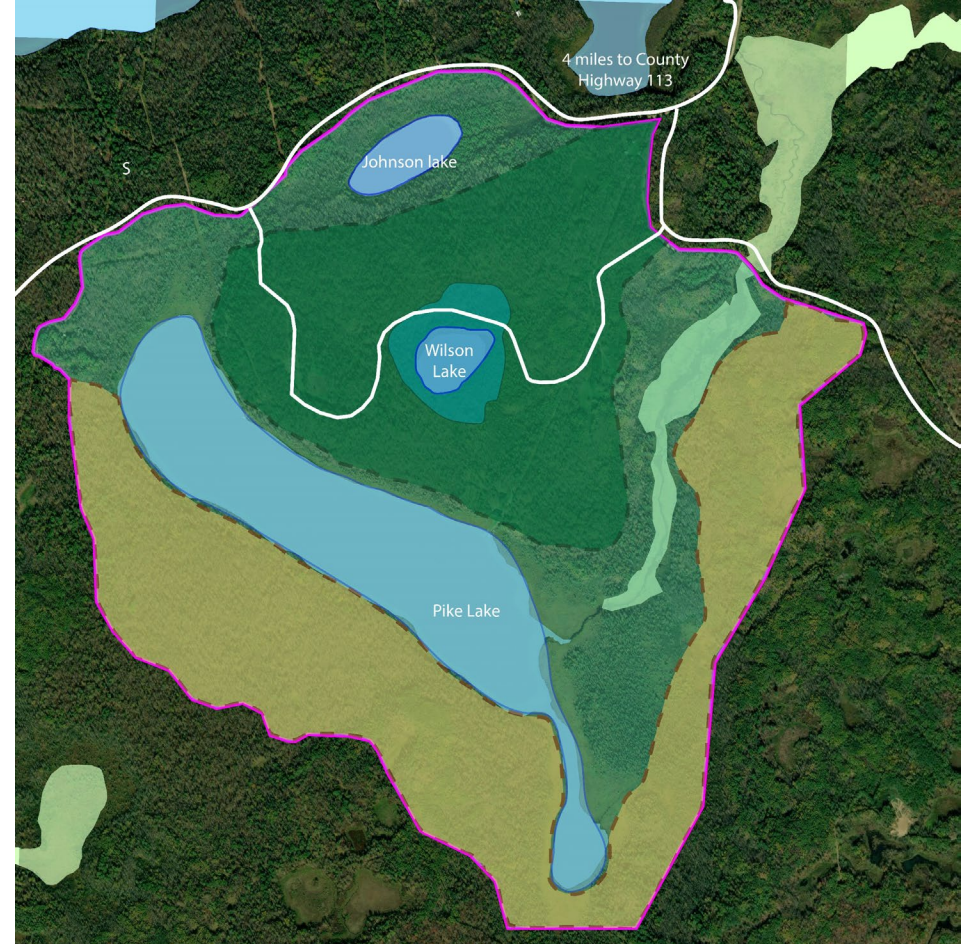
Site Introduction:

Initially chosen for desirable site features:

- Multiple ecotones
- Large wetland ecosystem
- 3 separate water bodies within site
- Riparian wetland east of Pike Lake

Local Context

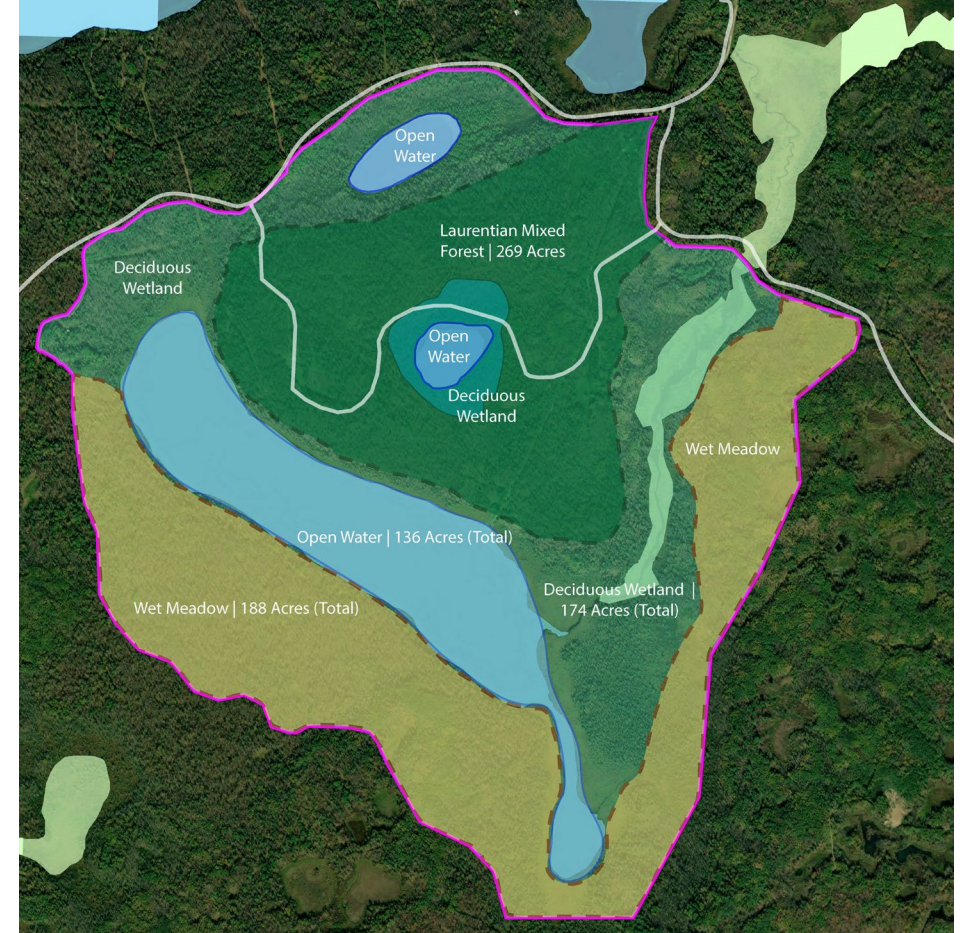
- 23 miles southeast from Waubun
- 37 miles northwest from Park Rapids
- 43 miles north from Detroit Lakes



Site Inventory:

Ecological Zones:

- Deciduous Forest | 269 acres
- Wet Prairie | 188 acres
- Wetland | 174 acres
- Open Water | 136 acres



Deciduous Forest Plant List:

- Red oak, Eastern White Pine, Quaking Aspen, Green Ash, Red Pine, Paper Birch, Northern Red Oak, American Elderberry

Wet Prairie Plant List:

- Mixed short grasses, herbaceous wetland plants, Red-Osier Dogwood, Common Chokecherry, Boxelder Maple, Cottonwood

Wet Prairie Plant List:

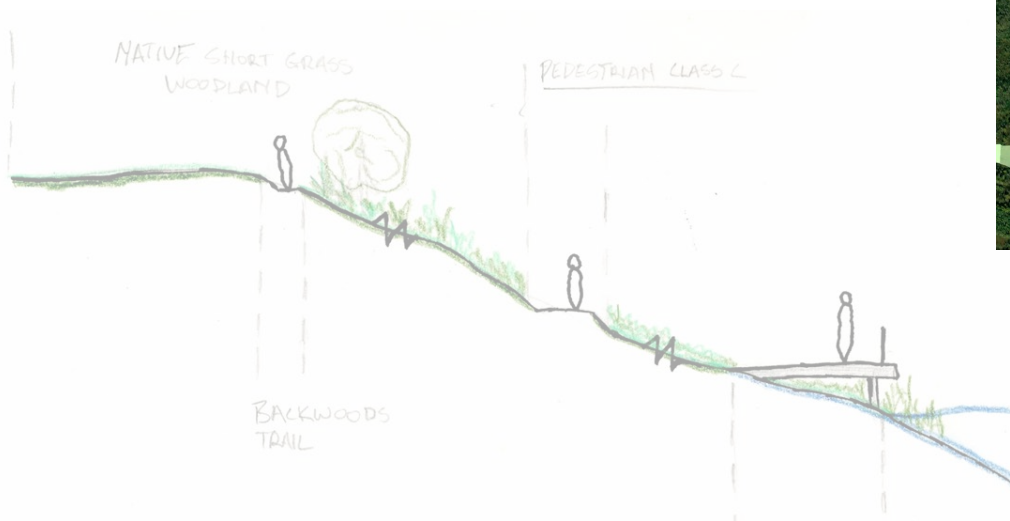
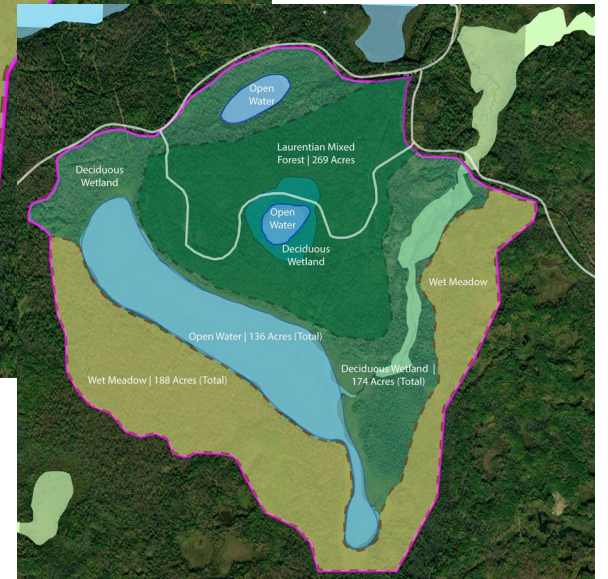
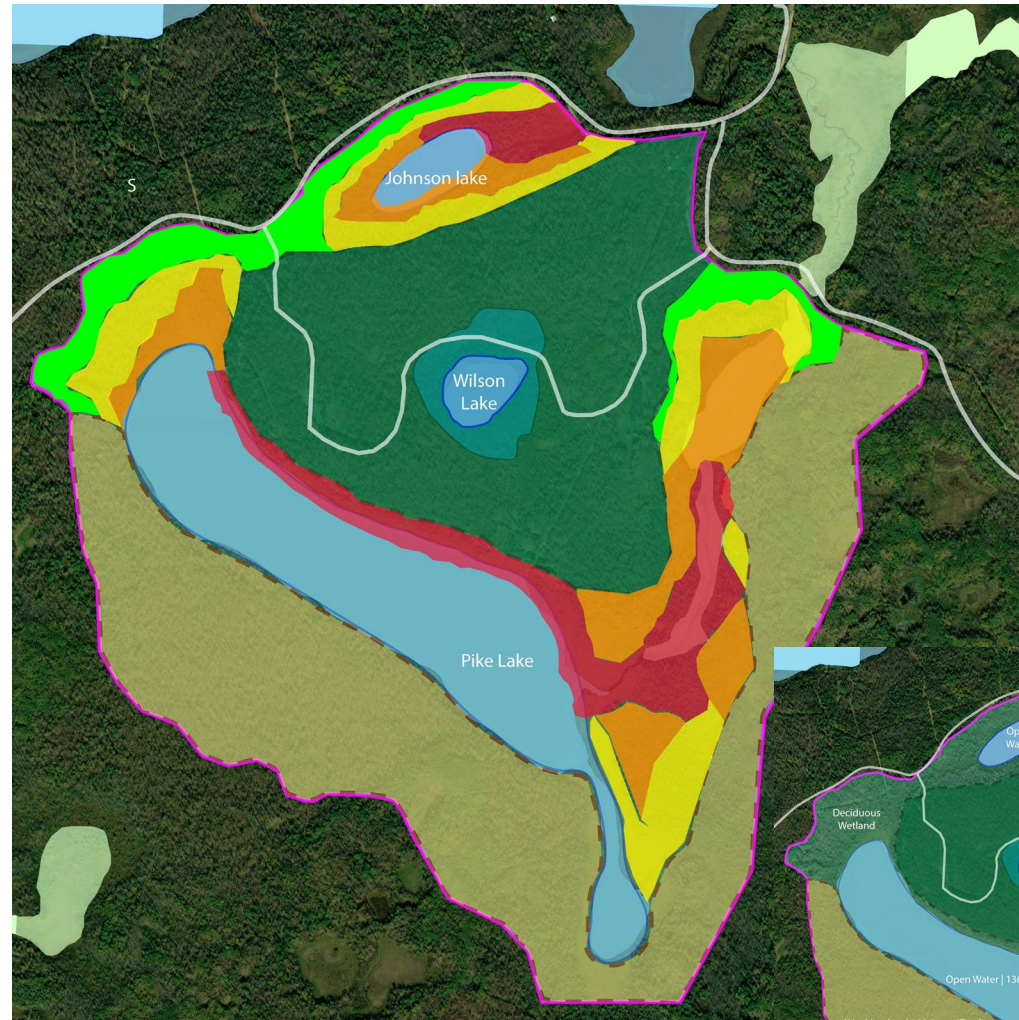
- American lotus, White Waterlily, River Bulrush, Joe-Pye Weed, Swamp White Oak, Black Ash, Black Spruce

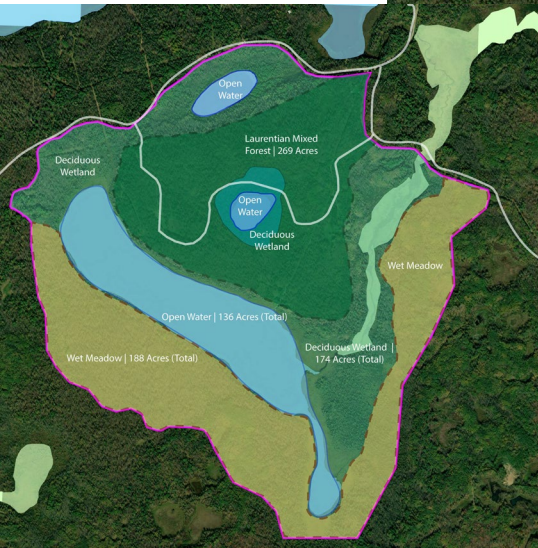
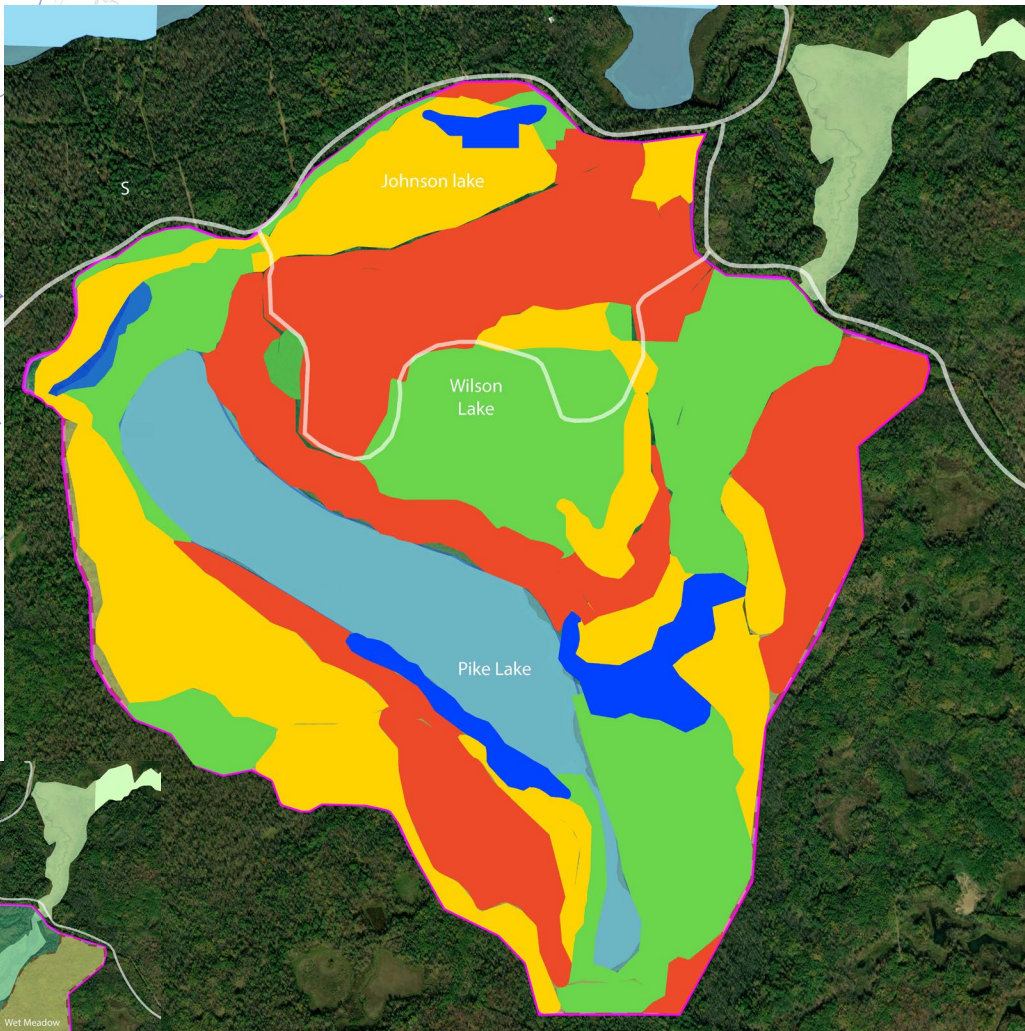
Site Analysis:

Ecological

Wetland areas were broken down according to degree of intervention required to reestablish the ecosystem

- Areas marked in green show signs of overall ecosystem health
- The yellow areas require minimum intervention
- Orange areas have lost significant vegetative material
- Areas marked in red have poor ecosystem health and require significant intervention for reestablishment

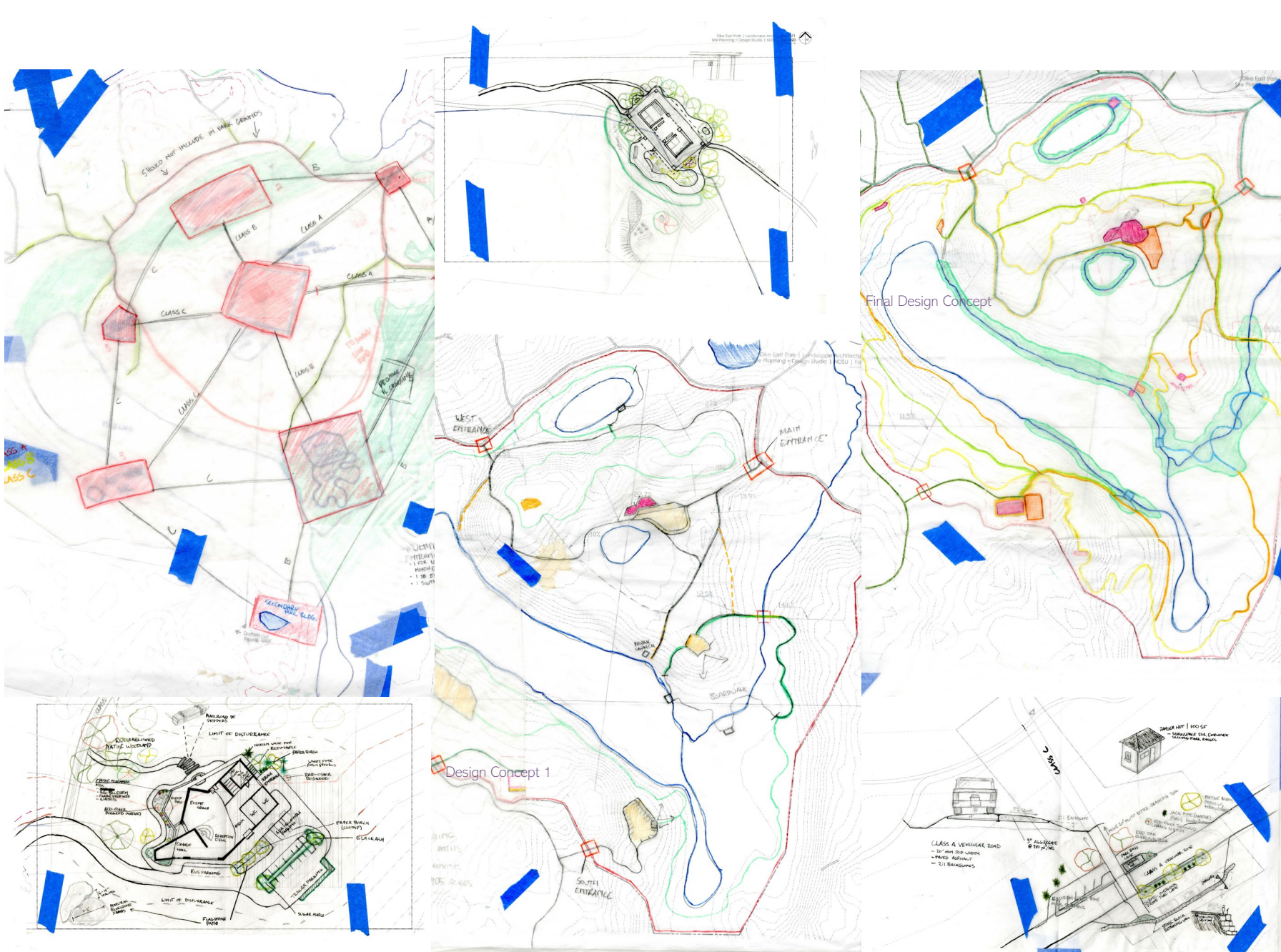




Site Analysis: Recreational

The site was analyzed and graded on topography and sensitivity in order to determine suitability for recreational activities

- The green sections of the site have a low average slope, indicating a higher suitability for walking + skiing trails
- Yellow areas have moderate slopes and terrain suitable for hiking/walking + biking trails
- Areas with a high average slope (depicted in red) offer high suitability for mountain biking and advanced hiking trails
- Blue zones show ecological suitability + aesthetic appeal for wetland boardwalk systems.



Design Development Masterplanning

Process:

- Spatial hierarchy map
- Multiple design concepts
- Site development

Masterplan

Major Elements

- Structures

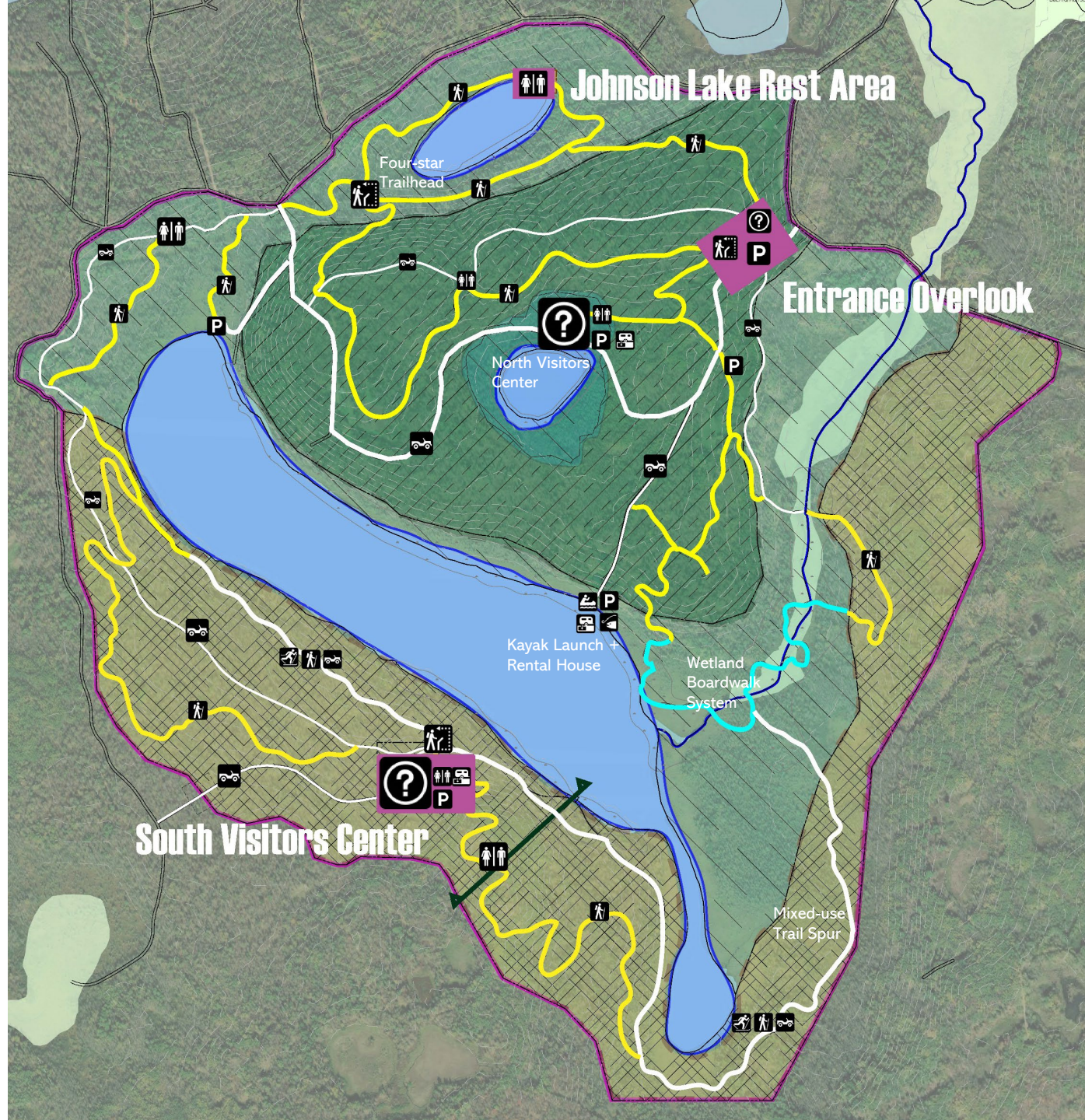
- North Visitors Center | 3500 SF
- South Visitors Center | 5500 SF
- Johnson Lake Rest Area | 750 SF
- Entry Gatehouse | 250 SF
- Johnson Lake Rest Area | 750 SF
- Trail Rest Area (Typ.) | 350 SF

- Vehicular Circulation

- Class A | 1.4 miles
- Class B | .39 miles
- Class C | 3.2 miles

- Pedestrian Circulation

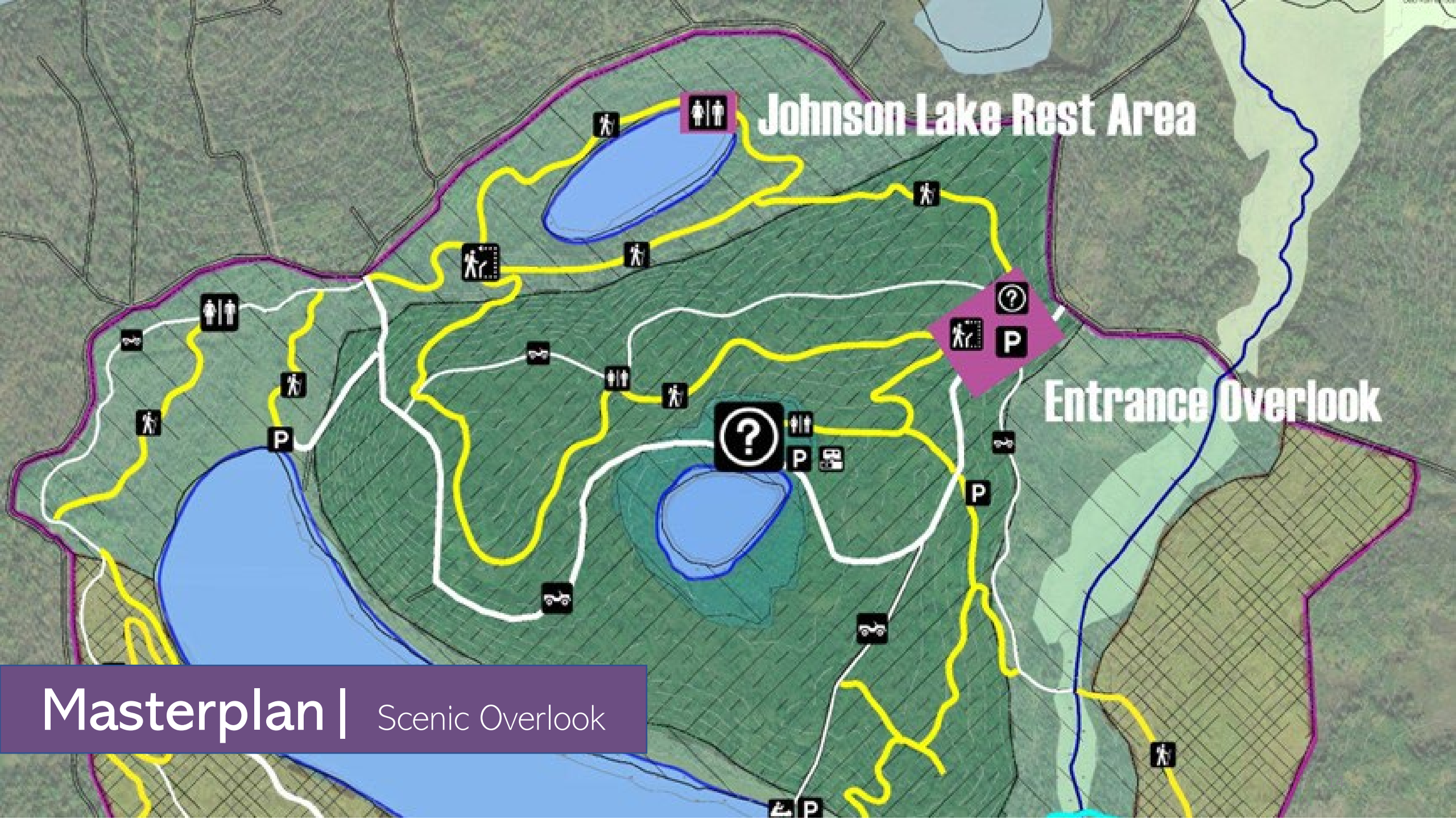
- Concrete Sidewalk | 1.1 miles
- Class C | 3.4 miles
- Backwoods Trail | 5.7 miles
- Wetland Boardwalk | 1.06 miles



Johnson Lake Rest Area

Entrance Overlook

Masterplan | Scenic Overlook





Entry Gatehouse

Ticket lane

Path continues to trailhead

Permeable paving

Scenic Overlook | P.1



Scenic Overlook +Entry Gatehouse

- 1 | Main road into park
- 2 | To Blazing Star trailhead
- 3 | Entry gatehouse
- 4 | Raised pedestrian crossing
- 5 | To Towering Pines trailhead
- 6 | Scenic overlook parking
- 7 | Park pass vehicular lane
- 8 | To County Highway 113

Scenic Overlook | Overlook Parking Section Detail



- 1 | Bioretention Soil
- 2 | Techo Bloc Aquastorm Permeable Pavers
- 3 | 3" Permeable Aggregate backfill
- 4 | Compacted Subsoil
- 5 | Drainage Backfill
- 6 | Versa-Lok Brute Modular Concrete Units
- 7 | 6" Perforated PVC Pipe
- 8 | Compacted Granular Base
- 9 | Path to Blazing Star trailhead



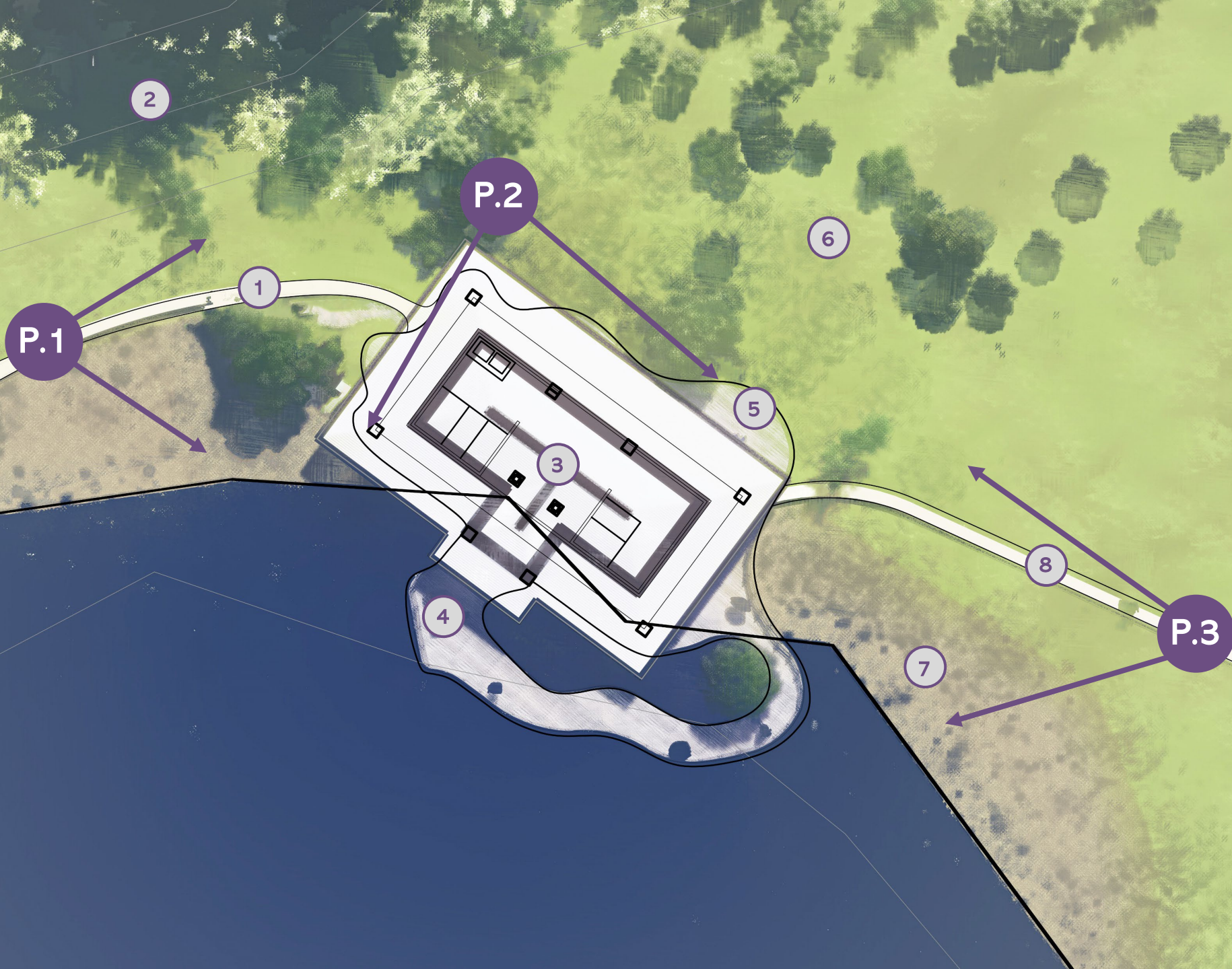
Restrooms

Wetland Boardwalk

Johnson Lake Rest Area | P.1

Emergent
Herbaceous
plants

Johnson Lake Rest Area



- 1 | Lakeside trail spur; 1.1 miles to trailhead
- 2 | Deciduous woodland
- 3 | Restrooms
- 4 | Lakeside Vista scenic seating area
- 5 | Woodland Patio
- 6 | Wet Meadow
- 7 | Emergent lake margin
- 8 | Backwoods Ramble trail spur; 1.3 miles to trailhead



Backwoods Ramble
Trail Spur

Composite Deck

Restrooms

Johnson Lake Rest Area | Wetland Boardwalk Detail



- 1 | Lakefront Vista scenic boardwalk
- 2 | Native emergent + wetland plantings
- 3 | Boardwalk footings
- 4 | Helical metal piers
- 5 | Native wet meadow plantings
- 6 | Woodland Patio
- 7 | Native Laurentian woodlands



Johnson Lake
Rest Area

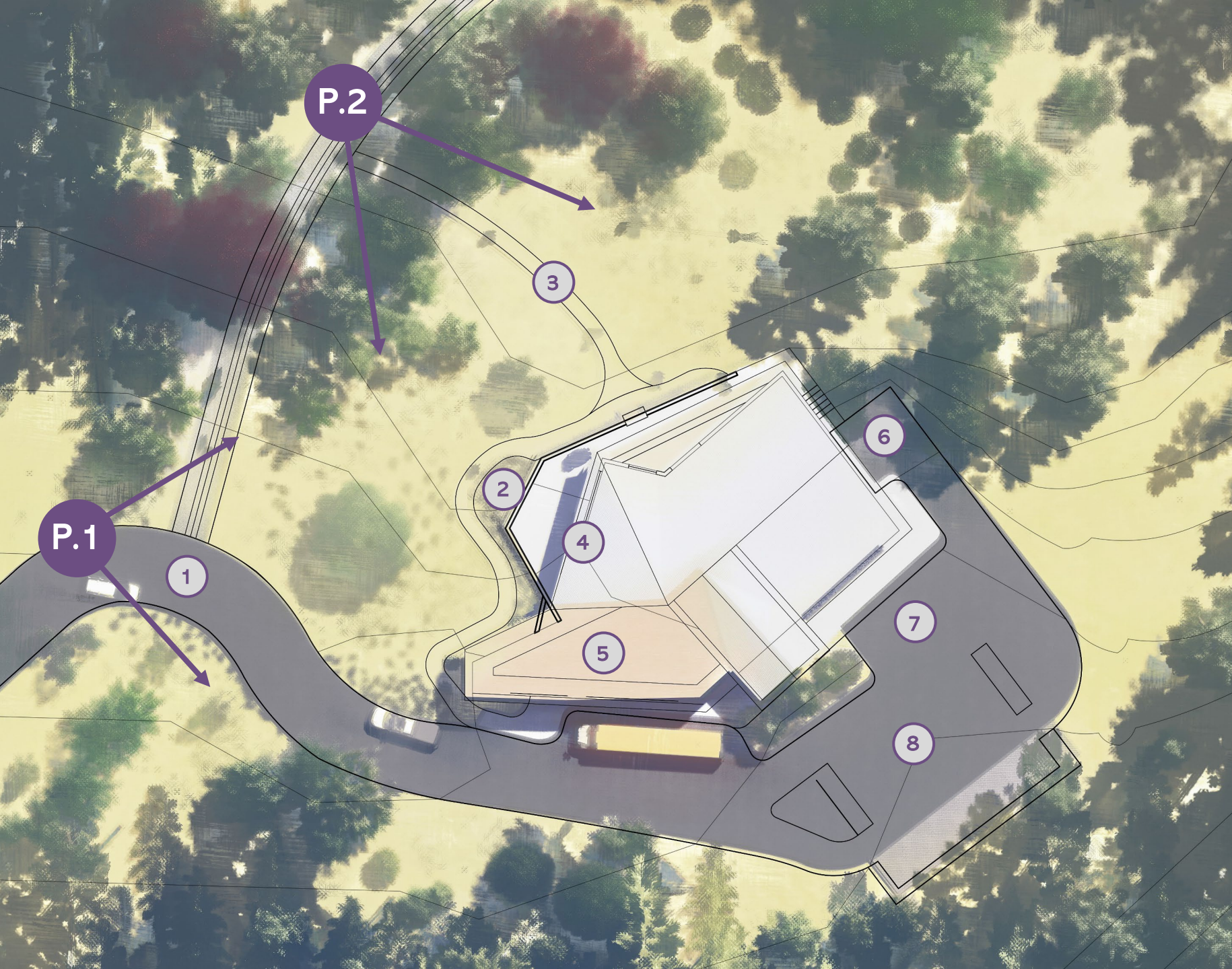
Wetland Boardwalk

Johnson Lake Rest Area | P.3

Backwoods Ramble
Trail Spur



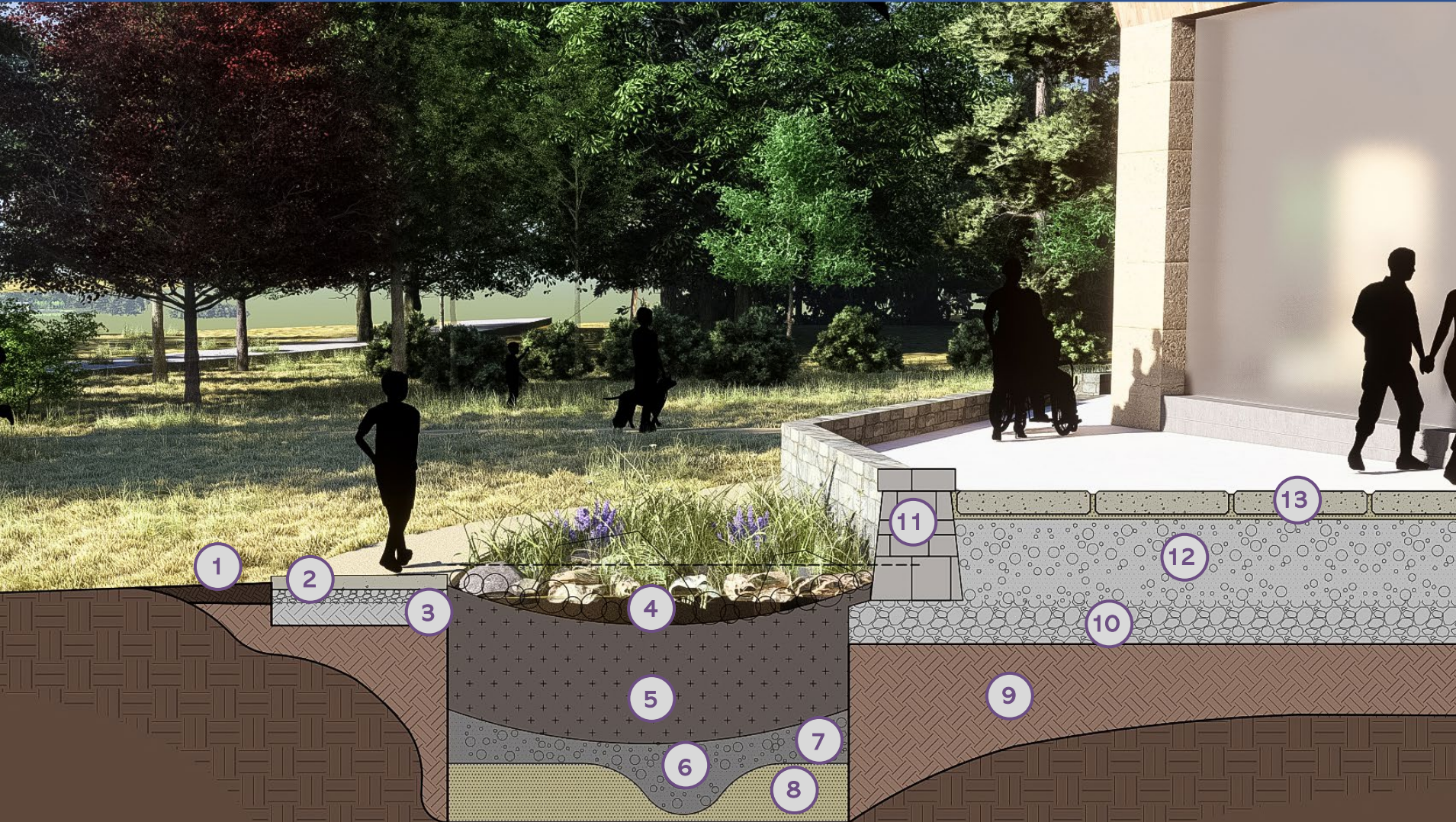
South Visitors Center | P.1



South Visitors Center

- 1 | To South Entrance
- 2 | Wetland Bioswale
- 3 | 0.3 miles to Fivestar Trailhead
- 4 | Event Patio
- 5 | Exhibit Hall
- 6 | Service Vehicle Entrance
- 7 | ADA-accessible Parking
- 8 | Permeable pavement parking lot

South Visitors Center | Bioswale Detail



- 1 | Topsoil
- 2 | 4" concrete sidewalk
- 3 | 4" angular stone subbase
- 4 | Native bioswale rock garden
- 5 | Bioretention soil
- 6 | 6" Perforated PVC Pipe
- 7 | 6" Aggregate backfill
- 8 | 9" permeable sand backfill
- 9 | Compacted subsoil
- 10 | 3" permeable aggregate backfill
- 11 | Drystack modular retaining wall
- 12 | Compacted backfill
- 13 | County Materials Grand Discover Pavers



Johnson Lake Rest Area | P.3

Recap:

I set out to create a blueprint for a 'new' state park that provides high-quality recreational opportunities while engaging in the reestablishment and restoration of deteriorating and sensitive deciduous wetlands.

Conclusions

- Through evaluating this wetland region of the White Earth State Forest as the site for a potential state park, designing thoughtful, low-impact recreational activities in wetland ecosystems can create unique opportunities for conservation and education, as well as recreation.



Questions?