

Project Name: The Trail Guide for a Hybrid Landscape

Project Location: Nebraska National Forest: Bessey Ranger District, NE

Project Purpose: •The Trail Guide for a Hybrid Landscape aims to contextualize the Nebraska National Forest - Bessey Ranger District within the Nebraska Sandhills. This comprehensive trail system unravels the entangled cultural and environmental legacy of the forest — a radical experiment, dendrological anomaly, and ecological nexus at the center of the largest contiguous temperate grassland in the world — by situating a network of trail alignments, narratives, and experiences.

Role of the Landscape Architect

•The first objective of this project was to develop a greater understanding of the actors and networks that have impacted the forest since its conception to reveal the historiographical and contemporary narratives of the forest through designed landscape interventions. To understand the dynamic interactions that take place between various systems, the forest was analyzed guided by five goals: ecology, environment, history, management, and recreation.

1.Ecology: This project seeks to provide a range of trail experiences that engage with the three significant ecologies in the NNFG — the sandhills, mixed deciduous/coniferous forest, and riparian habitats.

2.Environment: Respect the range of environmental forces — sand, wind, water, and fire — that comprise the NNFG through an intricate network of trail alignments.

3.History: which aims to engage in the storied past of the sandhills, the emergence of one of the largest hand-planted forests in the world, and its implications for the future through contextually specific moments of interpretation, wayfinding, and signage.

4.Management: Accommodate the multi-use mandate by not only strengthening the ongoing land, recreational, and ecological management but incorporating these strategies into the overall park experience and narratives.

5.Recreation: Improve park visitorship through a variety of spatial experiences with a wide range of accessibility to appeal to all ages and capabilities.

Special Factors and Project Significance

- This project considers the components of each of these elements that make up the individual system, as well as how they come together to influence the even broader system of the forest as a whole. The research and mapping from this initial analysis motivated and established the basis for the narratives behind the seven trails that were developed for the Bessey Ranger District.
- A quote from Professor Dana Fritz in her forthcoming book, “Field Guide to a Hybrid Landscape” aids in the understanding of what the term hybrid landscape represents. “The term hybrid refers to something that is purposefully mixed and has origins in the Latin hybrida: offspring from a tame sow and a wild boar. This purposeful mixture of forest and grassland is a defining characteristic and echoes the concept of combining the tame with the wild.” Trail guide to a Hybrid Landscape explores this notion of hybridity through research, analysis, and design by developing moments of interpretation.
- The elements of each trail vary from focusing on aspects such as accessibility, exercise, education, and different forms of transportation. The landscape itself presented challenges to every trail alignment, including the steep grades of the undulating hills and the loose sandy ground condition. The trail system uses the unique landscape, from its strenuous topography and dramatic juxtaposition of the forest and grasslands to its advantage, including the ability to frame certain views into the forest or expose the vastness of the sandhills from the forest edge.

Bessey Ranger District Photographed by Dana Fritz

**1.8 MILLION
TREE OUTPUT**

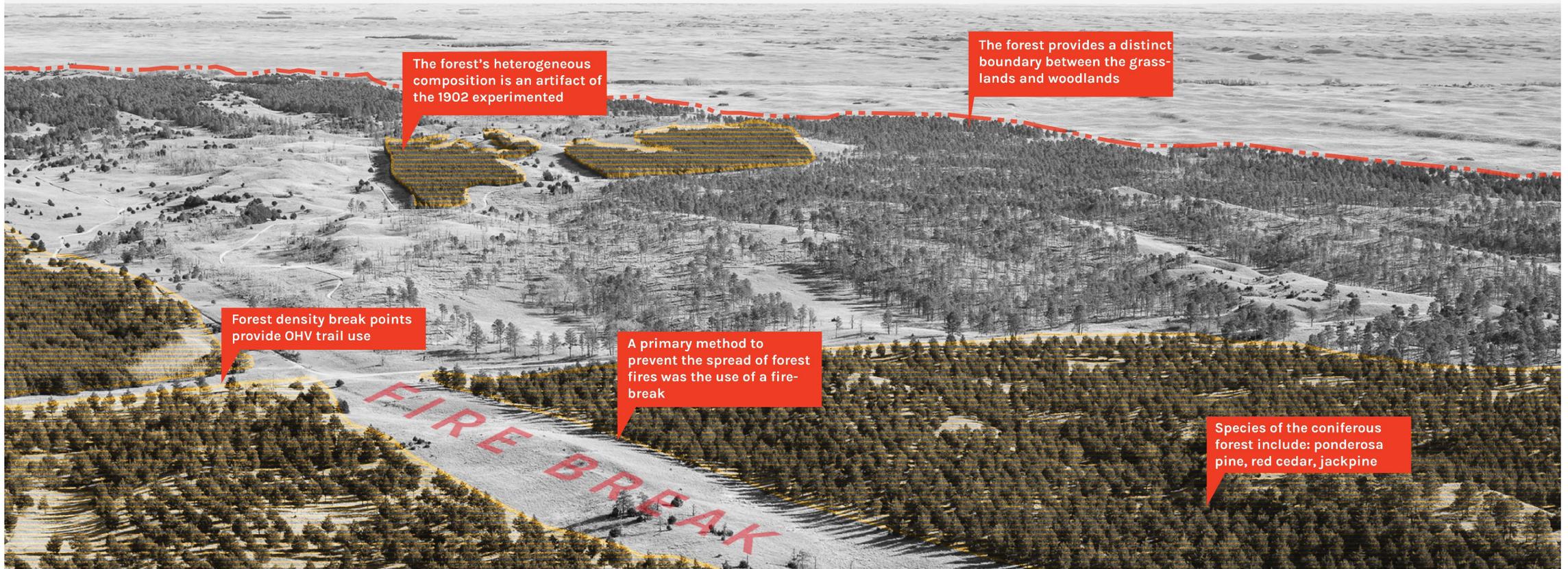
Oldest Federal Tree Nursery,
established in 1908

**20,147
ACRES OF FOREST**

The largest handplanted forest
in the world

**19,600 sq mi
CONTIGUOUS GRASSLAND**

The Sandhills are the most intact
temperate grassland in the world



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Category III-S - Planning & Analysis

Project Name: The Trail Guide for a Hybrid Landscape

The Historical Importance of the Nebraska National Forests and Grasslands

1700 ORIGIN

- Prehistory:** Girl was placed on Earth by the Creating Power.
- Pawnee:** Pawnee living along banks of Loup and Republican rivers, 1100-1400.
- Legend:** Bald Eagle, chief of the animals, creates man from clay and woman from a feather.
- Legend:** Pessigwi (White Buffalo Call Woman) gives Lakota people ceremonial pipe.
- Legend:** Water covers the whole earth, and then dries from 1000.
- Legend:** Trawa (Lord) develops the four directions: North, South, East, and West.
- Legend:** Man places fish against woman's stomach, creating more humans.
- Legend:** Buzzard's flapping wings shifted the mud, creating hills, valleys, mountains.
- Legend:** Water beetle pulls land up from sea, creating an island.
- Legend:** Spanish conquistadors overthrow Aztec Empire by force, 1521.
- Legend:** Owl receives gift of seeing at night.
- Legend:** Buzzard explores muddy island, searching for dry regions.
- Legend:** Crayfish's shell turns bright red due to the proximity to the sun.

1875 DISRUPTION

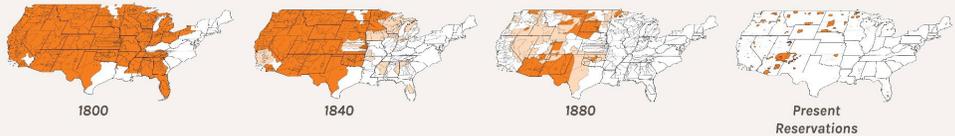
- 1800:** Meriwether Lewis and William Clark are hired to explore the American West, 1804.
- 1803:** United States buys Louisiana Territory from France, increasing its size by 928,000 mi².
- 1804:** First white settlers in Nebraska (Bellevue).
- 1805:** Smallpox epidemic reduces Pawnee population by half.
- 1855:** Battle of Blue Water first major conflict between Lakota Sioux and white settlers.
- 1857:** Cession 408 releases last Pawnee land to United States.
- 1867:** Nebraska granted statehood.
- 1868:** Cession 584 hands over last Lakota Sioux land to United States.
- 1869:** Homestead Act of 1869 gives 160 acres of land for free, if settlers farmed it for five years.
- 1869:** First homestead near Beatrice.
- 1872:** J. Sterling Morton gives "Fruit Address" encouraging citizens to plant fruit trees.
- 1875:** Fort Laramie treaty of 1875 allows Sioux Nation to retain Black Hills.
- 1875:** State government offers tax deductions for planting trees on "barren" land.
- 1875:** Federal Timber Culture Act allows homesteaders to receive 160 extra acres of land provided they plant trees.
- 1875:** Ghost Dance, a misunderstood dance of peace.
- 1891:** Up to 300 Lakota Sioux killed at Wounded Knee Massacre.

ORIGIN

DISRUPTION

The earliest instance of humans inhabiting this region is around 1100 CE, with the Pawnee tribe living along the Republican and Loup rivers, though humans have lived in North America over ten thousand years before the Pawnee settlements were constructed.

The establishment of the United States garnered legitimacy of land claims, and a growing population required more land to feed the masses. People wanted land for recreation, farming, and status. As the need for land grew, people spread westward to develop land.



HISTORY

ORIGIN

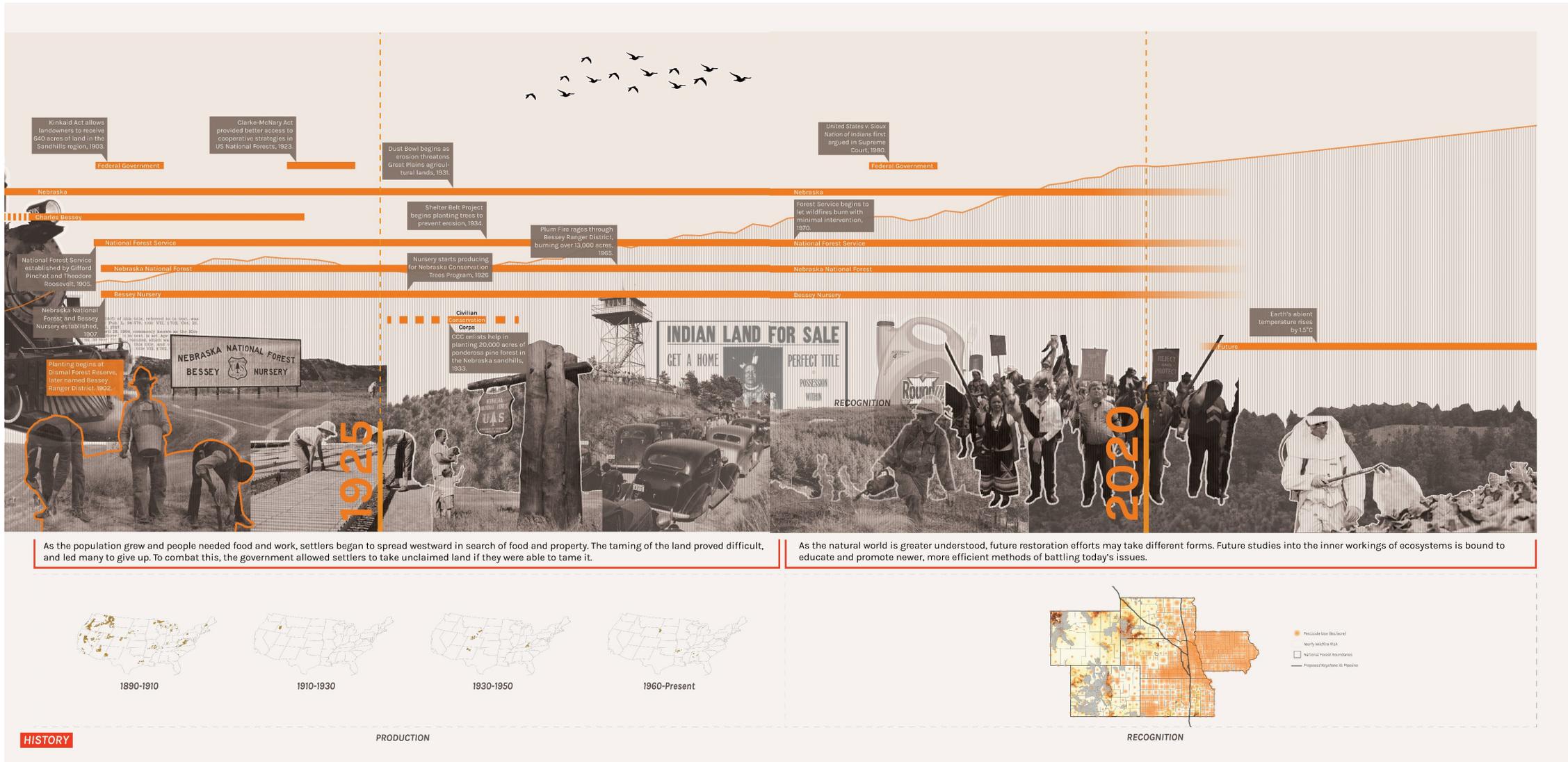
DISRUPTION

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The Historical Importance of the Nebraska National Forests and Grasslands



Management Practices in National Forests and Grasslands

PLANTING

Planting is the process of inserting tree seedlings or seeds into the soil to be grown. At the Bessey Ranger District, the planting of the forest falls under the category of afforestation. The forest originally began with the planting of many tree species in April of 1903, planting over 84 acres of jack pine, yellow pine, red cedar, and blue spruce (USDA F. S., 2021). The trees were spaced 4 feet on center to promote dense forest growth.

THINNING

Tree thinning is a land management technique used to reduce the density of trees primarily by improving growth, enhancing forest health, or reducing mortality. Thinning helps restore the natural gaps, density, and tree species distribution that exist in the forest. The need for thinning arises when competing vegetation threatens a certain tree's ability to grow because it becomes overcrowded or more susceptible to insects and disease.

BURNING

Prescribed burning is the process of setting planned fires to help maintain a forest's health. These fires are intended to mimic natural fires which are necessary to the forest ecosystem. Additionally, prescribed burning can target specific tree species like the Eastern red cedar which is invasive and difficult to control. In the Bessey Ranger District, controlled fires are used both within the forested areas and outside the forested areas.

GRAZING

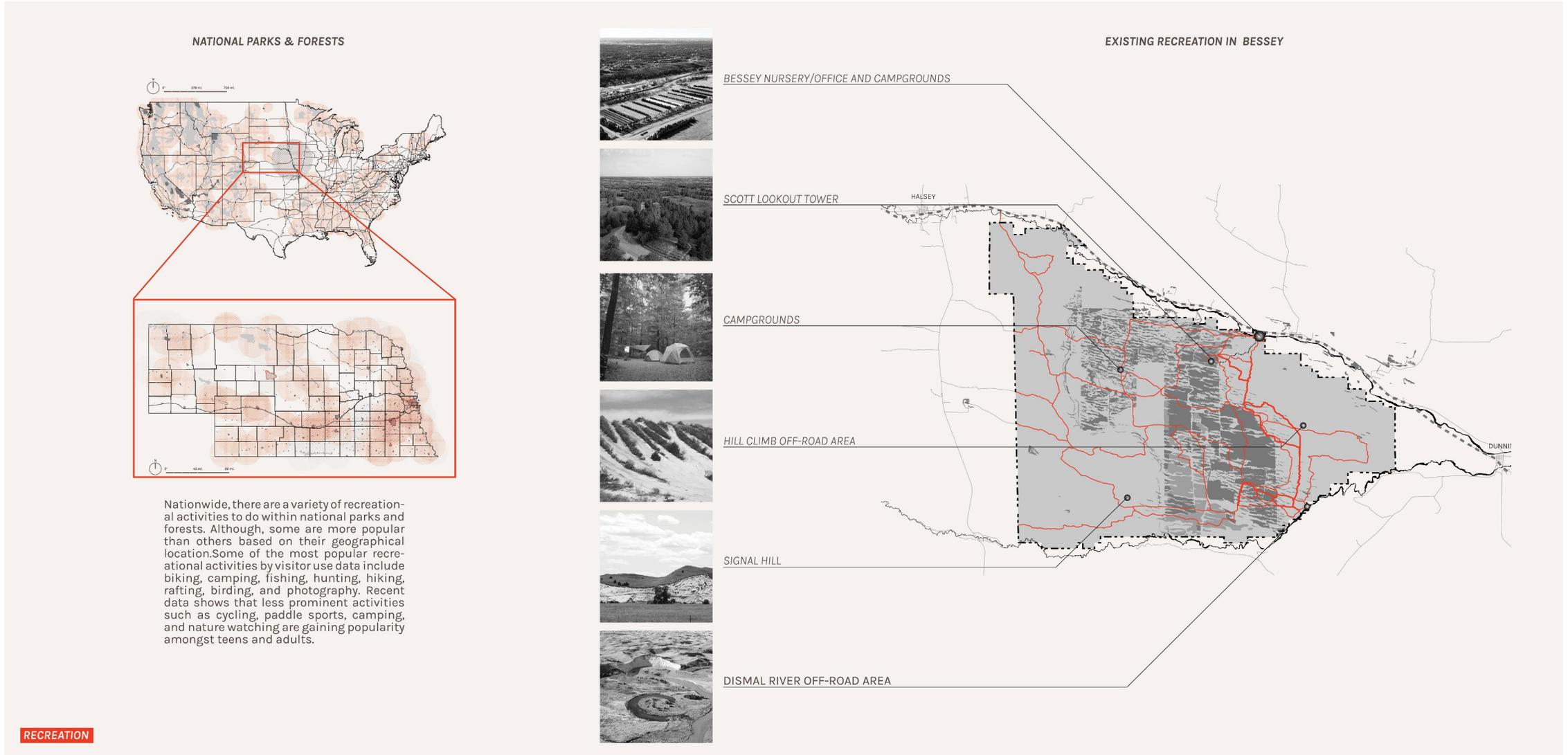
The Forest Service maintains 5 goals for the management of rangelands in regards to grazing including maintaining vegetation, soil, and water health, integrating range vegetation management to achieve multiple-use objectives, providing for livestock forage, supporting the people and communities that depend on grazing, and to provide expertise on range ecology and grazing animals (Bradford et al., 2002).

SOWING

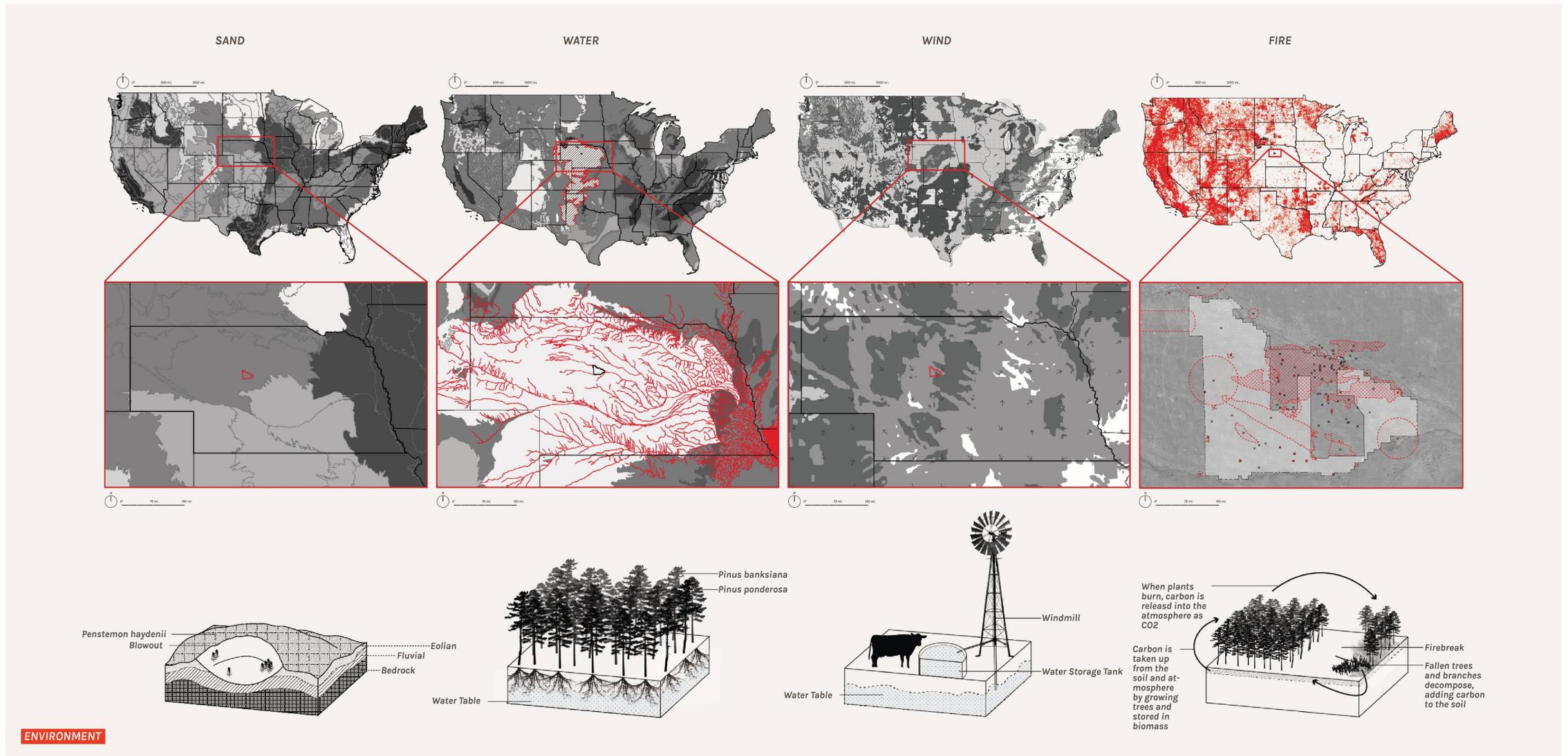
Seed sowing is the process of putting seeds into the soil to initiate germination. The Charles E. Bessey Tree Nursery within Nebraska National Forest is the oldest seedling nursery in the country. The sandy soil of the Great Plains and the Ogallala Aquifer supply the nursery with an ideal medium for growing seedlings. The nursery maintains 46 acres of irrigated seedbeds for bare root production, along with 17,000 sq.ft greenhouses for seedling production.

MANAGEMENT

Recreation Accessibility in National Forests and Grasslands



Environmental Impacts in Bessey National Forest and Grassland



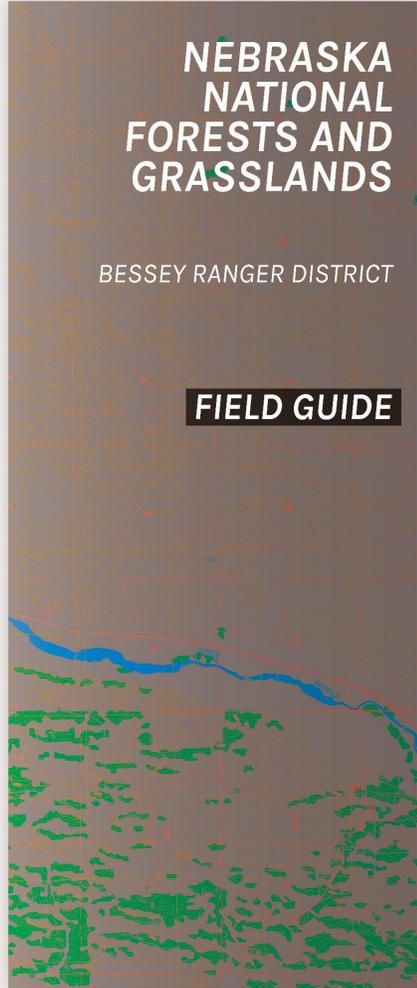
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Nebraska National Forests and Grasslands Field Guide

SAMPLE OF THE BESSEY RANGER DISTRICT FIELD GUIDE

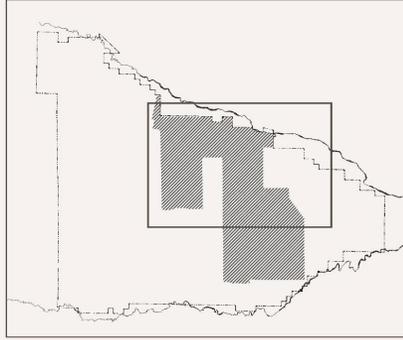


ECOLOGY

 <p>Owls <i>Strigiformes</i></p> <p>Some species including short eared owl, great horned owl, Northern saw-whet owl, and eastern screech owl. These vary in color and can be found year-round.</p>	 <p>Pronghorn antelope <i>Antilocarpa americana</i></p> <p>Up to only 5 feet including horns; Horns curve backwards and end forward-pointing, some over a foot long. Fur is reddish brown on back, white on the stomach with white stripes along their throats.</p>	 <p>Sunflower <i>Helianthus</i></p> <p>This perennial thrives during the summer months. Blooming with golden yellow petals attached around a darker middle stamen. Flowering typically lasts 30 days.</p>	 <p>White Tailed deer <i>Odocoileus virginianus</i></p> <p>Stands 1.7 to 3.9 feet tall, males weighing heavier; 150 to 300 pounds. Tan, brown, grayish brown with white color on throat, eyes, nose, and on underside.</p>
 <p>Plains coreopsis <i>Coreopsis tritoria</i></p> <p>Classified as a perennial, this plant flourishes in mid-summer to early fall. Flowers with yellow petals that form a disk-like appearance centered around a dark red center.</p>	 <p>Rainbow trout <i>Oncorhynchus mykiss</i></p> <p>Twenty to 30 inches long on average and roughly 8 pounds. Yellow white skin towards the underside and light brownish on top. Spotted with red stripes on both sides.</p>	 <p>Swamp milkweed <i>Asclepias incarnata</i></p> <p>This perennial is known for its ability to attract butterflies. Consisting of thin green foliage and large clusters of pink/white fragrant flowers.</p>	 <p>Whooping Crane <i>Grus americana</i></p> <p>Migratory bird with yellow eyes and thin, black legs. They are roughly 4.5 feet tall. Primarily white body and feathers with black tipped wings and head.</p>
 <p>Poison ivy <i>Toxicodendron radicans</i></p> <p>This woody perennial plant grows either as a short shrub or a climbing vine. Leaves are large, alternated and shiny with 3 leaflets pointed at the tip. Flowers are small yellow/green.</p>	 <p>Sharp tailed grouse <i>Tympanuchus</i></p> <p>Known as a "dancing" grouse species. Central tail feather is long and pointed. Males have purple coloring on necks during mating. Banded in brown, black, and buff color, "v" shaped marks on belly.</p>	 <p>Swift fox <i>Vulpes velox</i></p> <p>Dark, grayish, orange tan sides of throat and chest. Size of a house cat and smaller than red foxes. Nose is black and the tail is tipped black.</p>	 <p>Wild bergamot <i>Monarda fistulosa</i></p> <p>This perennial plant is known for its unique flowering. Blooming in mid summer to fall, clumps of tubular lilac/purple flowers are common. Fragrance is a big characteristic for this plant.</p>
 <p>Ponderosa pine <i>Pinus ponderosa</i></p> <p>Long lived and deep-rooted. Mature height reaches 35-45 feet. Consisting of long dark green needles varying from 4-7 inches found in bundles of 2 or 3. Most active growth period is in the spring and summer months.</p>	 <p>Showy milkweed <i>Asclepias speciosa</i></p> <p>This perennial blooms from late spring to early summer. Producing clusters of pink-white stary flowers that have a great fragrance. Attracts a large array of pollinators.</p>	 <p>Switchgrass <i>Panicum virgatum</i></p> <p>This warm season perennial grass has a columnar form that is maintained throughout the year. Color of foliage ranges from green/yellow during summer and turning to tan/beige in the winter.</p>	 <p>Yucca <i>Yucca glauca</i></p> <p>Bloom time is in the warmer season, classified as a perennial. Producing white clusters of drooping bell shaped flowers.</p>
 <p>Prairie larkspur <i>Delphinium carolinianum</i></p> <p>Blooming in the summer months, classified as a biennial. This plant produces irregular cone-shaped flowers that are bluish-purple in color.</p>	 <p>Snakes <i>Serpentes</i></p> <p>Some species including Prairie rattlesnake, common water snakes, to green racers. They range in size and can get up to 6 feet in length. Color varies between species, some are poisonous some are not.</p>	 <p>Toads <i>Bufo</i></p> <p>Unlike frogs toads have dry skin with warts and glands that can be poisonous behind eyes. They are amphibians and can vary in color as well as size.</p>	
 <p>Prairie rose <i>Rosa arkansana</i></p> <p>This low-growing perennial shrub has long, feather-like seed heads that develop in summer months. Producing petals ranging from light-bright pink. Circular yellow stamens are present in the center of the flower.</p>	 <p>Sumac <i>Rhus</i></p> <p>Perennial shrub, this plant has compound, toothed leaves. Twigs are velvety and covered with small soft hairs turning brown after first years of growth. Fruit is round fuzzy droops that's a deep red and can persist through winter.</p>	 <p>Western Prairie Fringed orchid <i>Platanthera praecleara</i></p> <p>Classified as a perennial herb this plant blooms in late June to early September. Colors ranging from white to bright yellow/orange showy flowers that have fringed lips and clustered together.</p>	

■ Endangered Species
 ■ Forested Species
 ■ Grassland Species
 ■ Riparian Species

Bessey Ranger District Trail Master Plan



BESSEY RANGER DISTRICT TRAILS MASTER PLAN

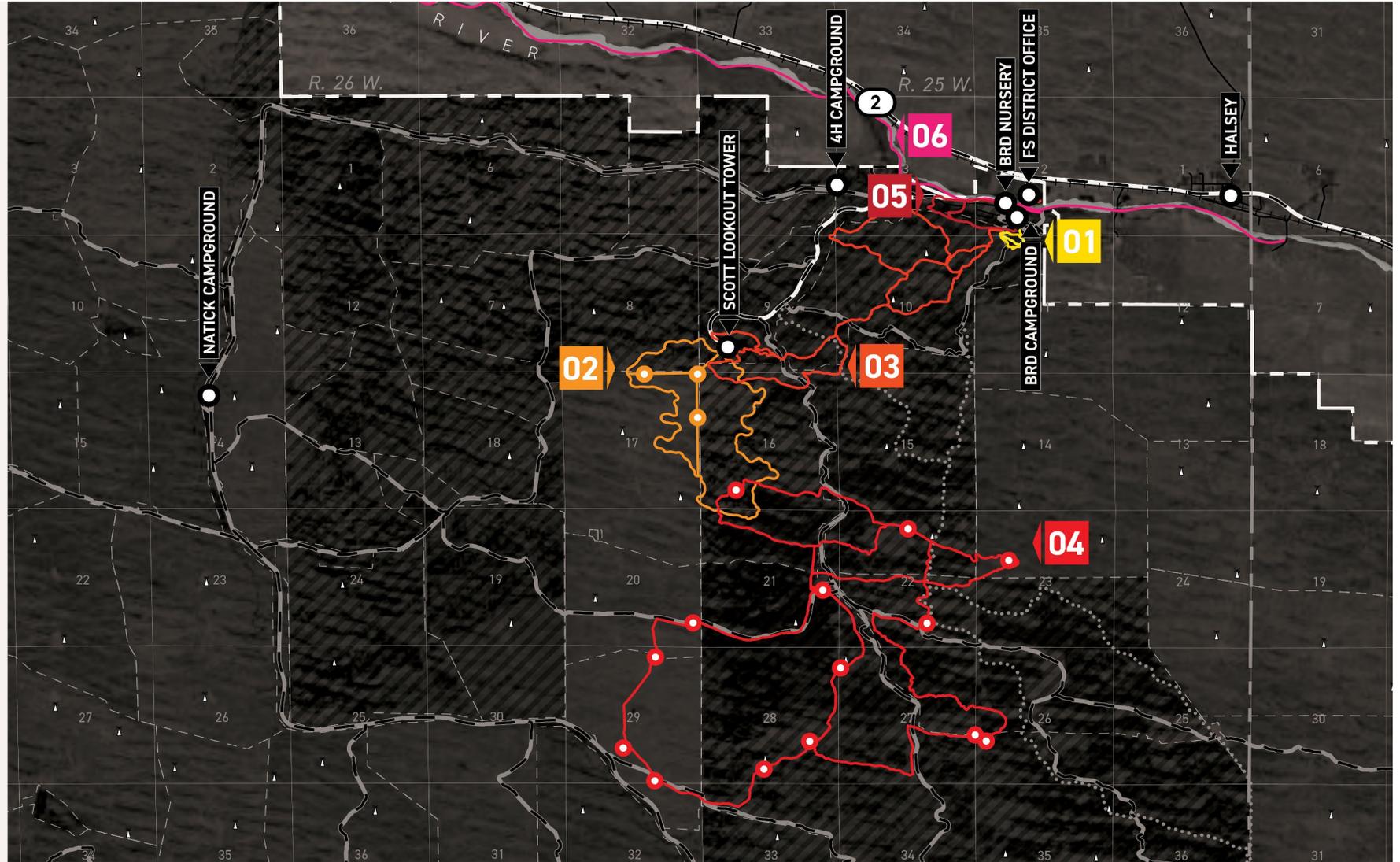
The 2022 Trail Master Plan unravels the entangled cultural and environmental legacy of the Nebraska National Forest and Grasslands — a forestry experiment, dendrological anomaly, and ecological nexus at the center of the largest contiguous temperate grassland in the world by situating a network of trail alignments, narratives and experiences throughout this extraordinary landscape.

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Moments of Interpretation

MOMENTS OF INTERPRETATION



Bessey Arboretum, Located Along The Nursery Loop



Bessey Nursery Plots, Located Along The Nursery Loop



Bessey Riparian Grounds, Located near Between the Middle Loup and Dismal River



Tree Line Boardwalk, Located Near Node Two



Tree Line Boardwalk, Located between Forest and Grassland Boundary



Middle Loup Waterway, Located Along Node one



Horseback Trail, Located near Windmill 25



Horseback Trail, Located Near Windmill 25

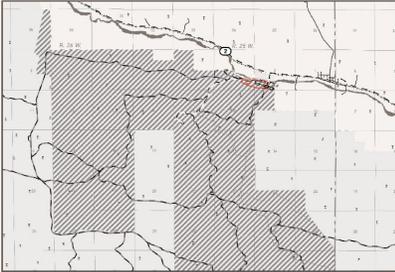


Horseback Trail, Located Near Windmill 25



Treeline Boardwalk, Located Between Forest and Grassland Boundary

Nursery Trail

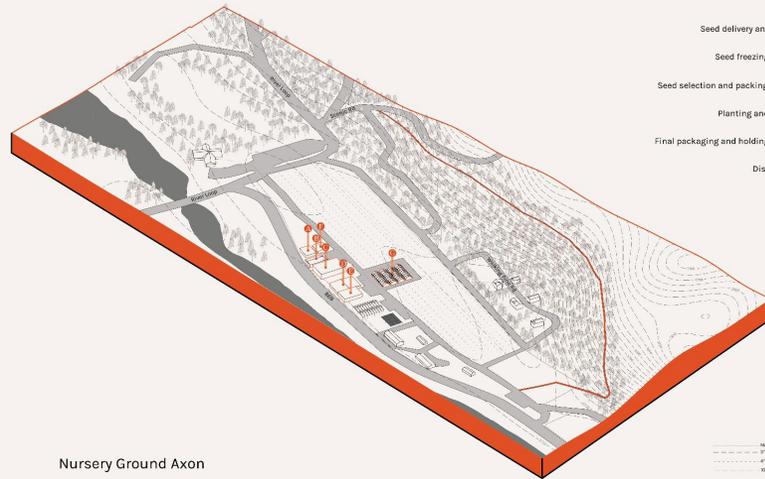
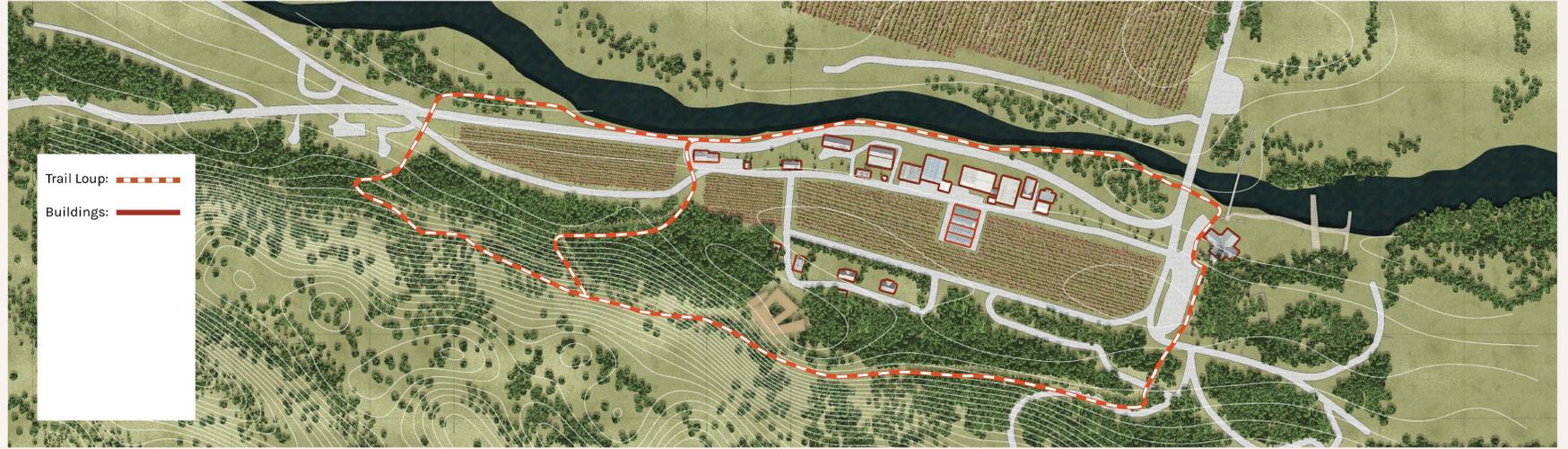


NURSERY TRAIL

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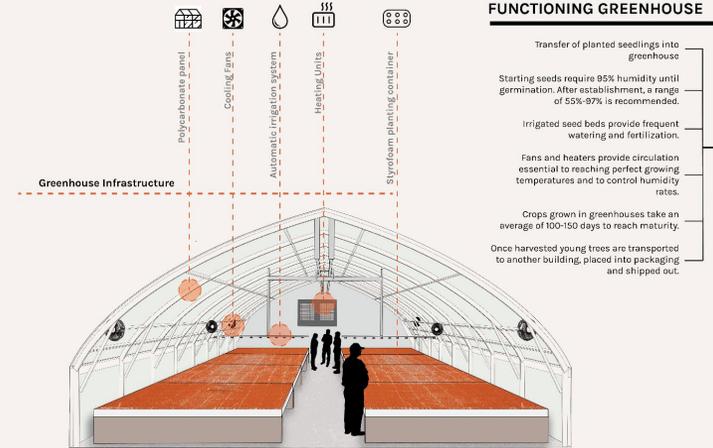
Goals

1. Maintain an accessible trail that conforms to Forest Service Trail Accessibility Guidelines (FSTAG) guidelines and provides a foundation for the archery range, while also providing a secondary trail route to create variability in hiking options.
2. Provide a fully developed wayfinding system that organizes archery range shooting opportunities to create an easy-to-follow and interesting shooting experience.
3. Integrate an education and play area that includes interpretative and informational moments on the conservation efforts, history, and management of wild game in Nebraska.



Nursery Ground Axon

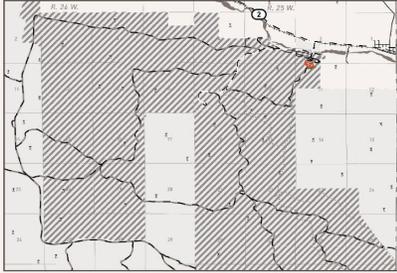
- Seed delivery and sorting **F**
- Seed freezing storage **A**
- Seed selection and packing process **C**
- Planting and harvest **G**
- Final packaging and holding storage **D**
- Distribution **B**



FUNCTIONING GREENHOUSE

- Transfer of planted seedlings into greenhouse
- Starting seeds require 95% humidity until germination. After establishment, a range of 55%-97% is recommended.
- Irrigated seed beds provide frequent watering and fertilization.
- Fans and heaters provide circulation essential to reaching perfect growing temperatures and to control humidity rates.
- Crops grown in greenhouses take an average of 100-150 days to reach maturity.
- Once harvested young trees are transported to another building, placed into packaging and shipped out.

Archery Trail



ARCHERY TRAIL

The Bessey Archery Range is a short loop trail that sits adjacent to the campsites and group campground of the Bessey Ranger District. Following Forest Service Trail Accessibility Guidelines (FSTAG) guidelines, the trail provides an accessible archery shooting experience that showcases the unique characteristics of the Bessey Ranger District. It includes a shooting tower where archers can stand in an elevated position within the canopy to test their skills in a similar manner to a treestand. Through a series of 25 targets that range in difficulty based on shot distance and shot type, the archery range provides a fun yet challenging experience for archers to test and develop their skills. Hilltop trail is a shorter secondary loop option within the archery range that provides a more challenging hike experience for individuals who wish to step off of the main archery range trail. The Canopy Walk boardwalk and play area provides a

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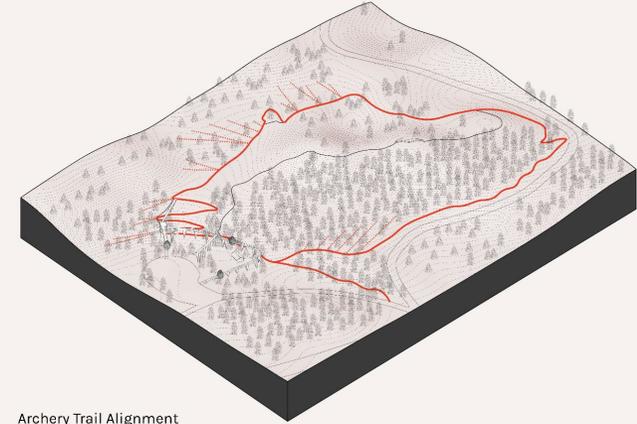
Node Section A



Node Section B



Node Section C

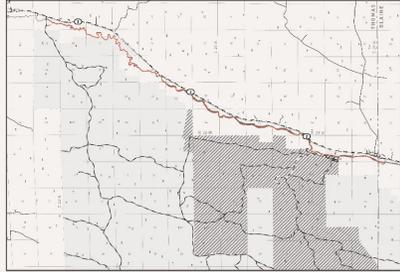


Archery Trail Alignment Display Axonometric



Archery Trail Rendered Axon

Middle Loup Water Trail



MIDDLE LOUP WATER TRAIL

The Middle Loup Water trail spans 17.5 miles starting at Thedford near Gaston Bridge and runs through Halsey up to Millers Bridge. Included between these two stops are four exit/entrances that vary in distance along the river. Recreational attractions are located at mile marker 217 (also called Oaks River), 4-H camp, and the arboretum near the main office in the forest. All recreational access locations are ABA/ADA accessible up to the riverfront along the piers. The river experience itself is meant to be relaxing whilst also being an educational opportunity to learn about the riparian waters in the Nebraska sandhills. The inspiration for most of the designs came from the typology of the land, such as the windblown and water-swept sand of the grasslands, creating organic flowing ridges. The designs also follow ABA/ADA guidelines for all visitors to have a positive experience on the river. These guidelines in the design in-

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Arboretum Plan



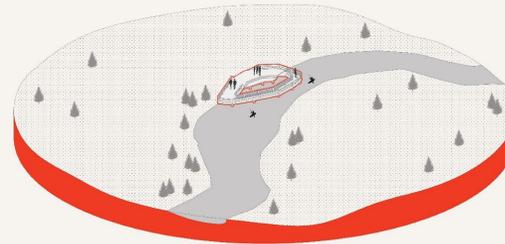
Mile Marker 217 Plan



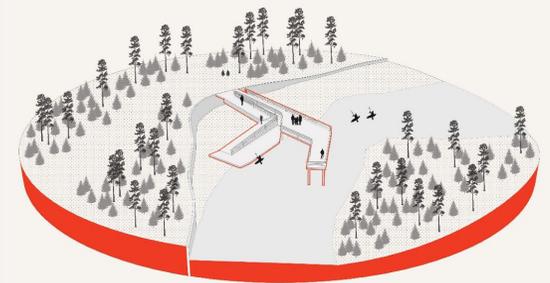
4-H Plan



Arboretum Axonometric

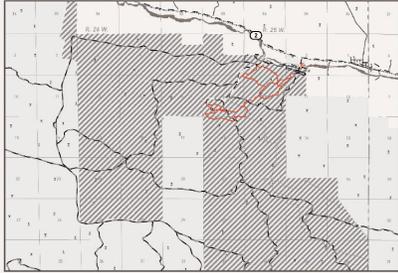


Mile Marker 217 Axonometric



4-H Axonometric

Scott Lookout Tower Trail



SCOTT LOOKOUT TOWER TRAIL

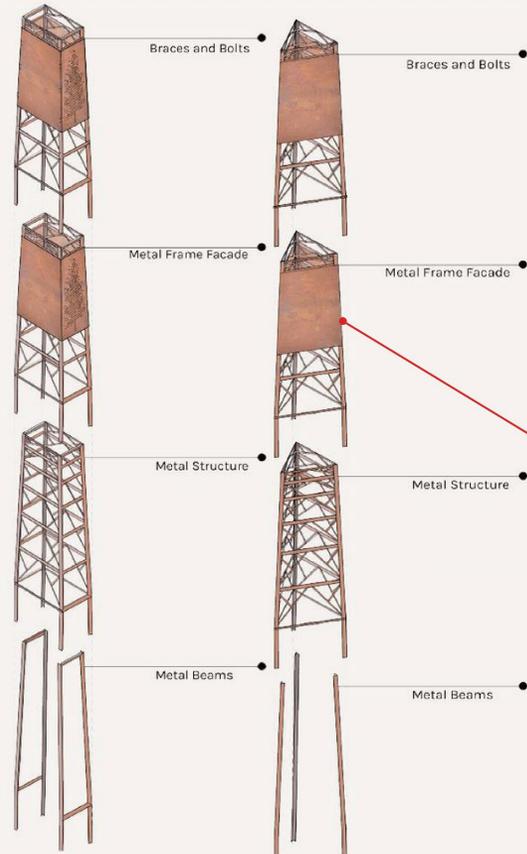
Students Josiah Nolting and Wijdan Almamari were granted the undertaking of the existing Scott Lookout trail. Design challenges consisted of providing an array of alternative trail routes to complement the preexisting trail, incorporating updated erosion strategies and developing a universal wayfinding system that would be functional, yet iconic to the Bessey Ranger District and National Forest.

Through extensive research, site visits, schematic design, and attending professional lectures related to the site the proposed expansion of the Scott Lookout trail poses an additional 6 miles of trail space to accommodate trail users and recreational activities during all seasons.

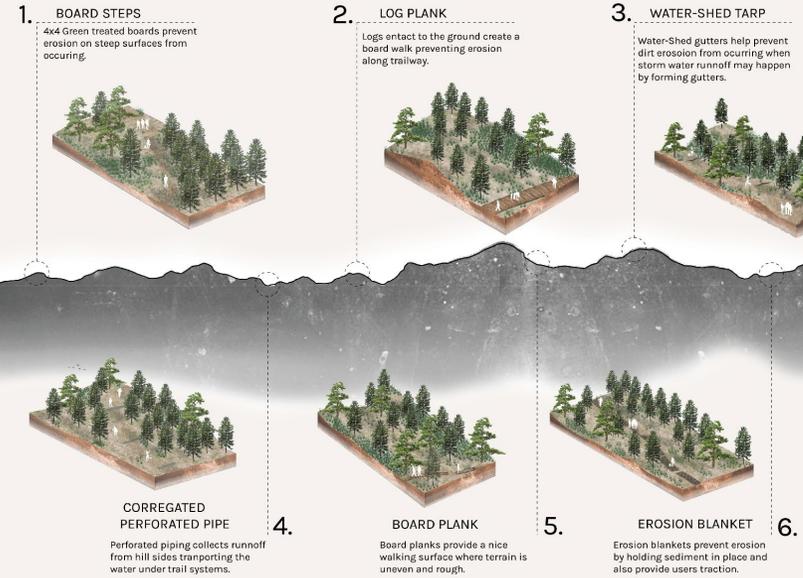
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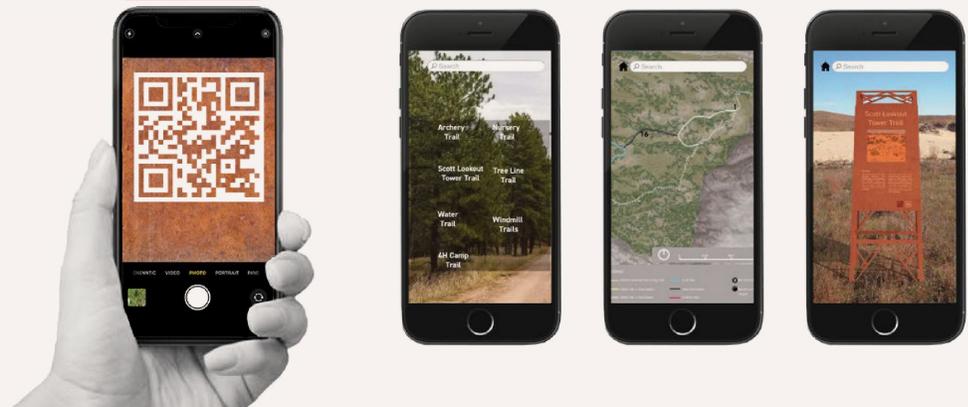
Wayfinding and Interpretation Types



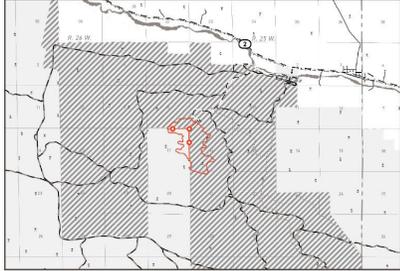
Erosion Control



Digital Narratives



Tree-Line Trail



TREE-LINE TRAIL

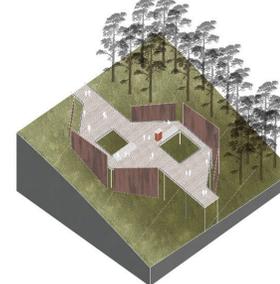
The Treeline Trail and Boardwalk provides visitors an opportunity to see the stark contrast between the Sandhills and the hand-planted forest. A series of connected boardwalks starting at the existing Scott Lookout Tower take visitors into the main firebreak and follow the North and East edges. Several interpretive nodes along the boardwalk provide educational information about the land and the forest relating to the Sandhills, fire ecology, and historical context. A hiking trail loops around the entire boardwalk with access points at its ends and provides various experiences with differing difficulty levels. The entire boardwalk meets ADA Accessibility Standards, and the northernmost trail segment maintains a 5% maximum slope and 36" minimum width to allow for some mobility devices, to create an "accessible loop." A small informal trail breaks off of the boardwalk towards the Stargazing Bowl, a natural bowl in

Goals

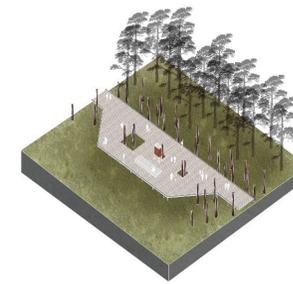
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2. Provide a fully developed wayfinding system that organizes archery range shooting opportunities to create an easy-to-follow and interesting shooting experience.
3. Integrate an education and play area that includes interpretive and informational moments on the conservation efforts, history, and management of wild game in Nebraska.



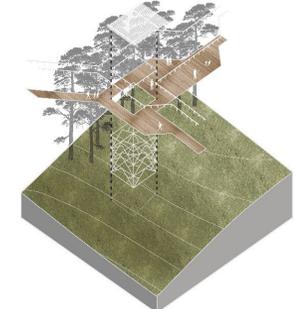
View from the Tree Line Hub



Axonometric Node 1



Axonometric Node 2



Axonometric Node 3

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