LANDSCAPE MASTER PLAN

Goldenseal Botanical Sanctuary, Rutland, Ohio

Prepared for United Plant Savers

Christina Gibson and Evelyn Lane **The Conway School** **Spring 2012**

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a sanctuary for wild medicinal herbs

Nestled in the Appalachian foothills of southeastern Ohio, the Goldenseal Botanical Sanctuary is home to over 500 medicinal plants growing in abundance. Traditional American medicinal herbs, such as American ginseng, goldenseal, blue and black cohosh, and bloodroot, blanket the forest floor in vigorous health. This project aims to design places for people to enjoy and learn from the plants found here without disturbing them in their habitat.

This herbaceous plant community thrives in this particular habitat, shaded by a diverse canopy of mature hardwoods, underlain by magnesium- and calcium-rich limestone bedrock and deep silty soils, and irrigated by steady, year-round rainfall that percolates throughout this ridge and hollow system of gently sloping hills.

United Plant Savers

Interest in traditional herbal medicine began to resurface in the 1970s, and wildcrafting (or harvesting) by herbalists increased exponentially. In the mid 1990s, alarmed by the impacts of over-harvesting—markedly diminished populations of wild plants—several conservation-minded herbalists founded United Plant Savers (UpS), a non-profit organization dedicated to protecting at-risk medicinal plants in their native habitats throughout the United States and Canada.

In addition to many other conservation initiatives, UpS publishes a list of At-Risk and To-Watch plants that is continually updated. The criteria for the designations are based on factors such as market demand, habitat specificity, sensitivity to human activity, and lack of known propagation techniques or large-scale cultivation. Updating this list and expanding upon the scientific research and data needed to determine plants' status are ongoing tasks for UpS. UpS also reaches out to the larger community of botanists, foresters, herbalists, and naturalists to contribute to this growing body of knowledge.

In the late 1990s, UpS acquired roughly 380 acres of land in prime medicinal plant territory to create the Goldenseal Sanctuary, the inspiration and model for a network of now almost 100 independent botanical sanctuaries created and stewarded by UpS members. The sanctuaries share a common conservation ethic, modeled by the Sanctuary: medicinal habitats are protected for the sake of the plants and for future generations, and the medicinals are not commercially harvested or sold. UpS also encourages its members to propagate seeds in appropriate locations (aided by the organization's Plant Give-Aways) and weed out non-native species.

Wild Geranium
Geranium maculatum


Trillium
Trillium grandiflorum

Swamp Rose Mallow
Hibiscus moscheutos

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Goldenseal Botanical Sanctuary

Client Mission and Project Goals

protection, restoration, and education

United Plant Savers has been gradually transitioning the Goldenseal Botanical Sanctuary from a farm to an educational facility, by helping the land regenerate after years of farming, grazing, logging, and mining. Restoration efforts began with Paul Strauss, herbalist and prior owner of the property, who played an integral role in saving the land from further resource extraction in the 1970s and later participated in the founding of UpS. Strauss established about eight acres of prairie on former pasture land at the edge of the forest and dug ponds to encourage biodiversity. He has noted that the goldenseal growing on the property has doubled from about three to six acres since he purchased the land over thirty years ago.

A greenhouse, shade house, and shade garden were constructed for medicinal plant propagation. UpS converted a remnant barn into dorms and constructed a yurt with kitchen and study space. Interns live at the Sanctuary in the spring and fall to study herbal medicine, assist in ongoing projects on the land, and learn sustainable harvesting and propagation practices. With the help of the interns and volunteers, UpS maintains the Talking Forest Trail (or the “Medicine Trail”) that winds through lush populations of thriving medicinal plants on the property. The trail is complete with informational plant signs and descriptions, allowing people to visit the plants and learn from them.

The 380-acre property is accessed by this driveway from Loop Road. Above shows the view of the farm, looking east into the Main Hollow.

project goals

The UpS Board of Directors would like to draw more visitors, research projects, volunteers, and student groups to the Sanctuary, while continuing to be a model of protection and sustainable land management. They have the following goals for this landscape master plan:

1. Create a welcoming, clear arrival sequence from the entrance on Loop Road to the Medicine Trail in the woods.
2. Design an identifiable “center” where visitors can gather and orient themselves to the Sanctuary grounds and to the mission of UpS.
3. Design spaces to accommodate day and overnight visiting groups, including designated parking, classroom space, camping options, and outdoor eating facilities.
4. Identify critical locations to expand and protect native plant communities and remove opportunistic non-natives.

The following sustainability objectives will also guide the designs:

- Respect intact forested habitat and limit disturbances from group use in these areas.
- Reduce mowing where possible to reduce fuel, labor, costs, and pollution runoff into Main Hollow Creek.
- Stabilize and buffer the banks of Main Hollow Creek to prevent further erosion from flood events, and to infiltrate stormwater runoff from structures and parking areas in order to limit the amount of polluted water entering the creek directly.
- Remove aggressive, invasive species in disturbed areas (e.g., in formerly grazed areas, along old fence lines, and at forest edges) to enable native plant communities to thrive.

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CONTEXT: Natural Landscape

The Sanctuary is located in a region defined by a unique combination of geology, soils, and plant communities. About seventy percent of the Sanctuary is composed of a unique upland mesic habitat characterized by sheltered slopes with rich, moist, well-drained soils. Where this habitat has not been disturbed by strip mining, deforestation, or cattle grazing, it is home to over 500 species of medicinal plants.

central hardwoods region

The Sanctuary is in the central hardwoods region of North America. According to *Designing with Native Plant Communities* "This is the heartland of North America's deciduous forest, the region in which it reaches its richest and most exuberant development" (Diekelmann and Schuster, 1982).

Appalachian plateaus

Sedimentary rock that has been warped upwards forms the Appalachian Plateaus, a mountainous chain running from northeast to southwest. With the exception of the Cumberland and Allegheny Mountains, the Appalachian Plateaus consist of sheltered and relatively gentle slopes. Their ridges and hollows (or valleys) are all at high but relatively consistent elevation. The Sanctuary's lowest elevation is about 600 feet above sea-level, and its highest elevation is about 950 feet above sea-level.

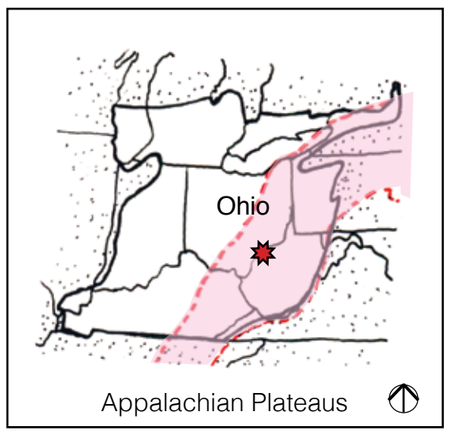
unglaciated soils & limestone bedrock

Southeastern Ohio was not reached by the most recent glaciation event. The region is therefore covered in deep, silty-loam soils that are moist and well-drained. Limestone bedrock creates calcium- and magnesium-rich soils which support a wide range of plant species. These forest communities are among the most diverse and distinctive in the world.

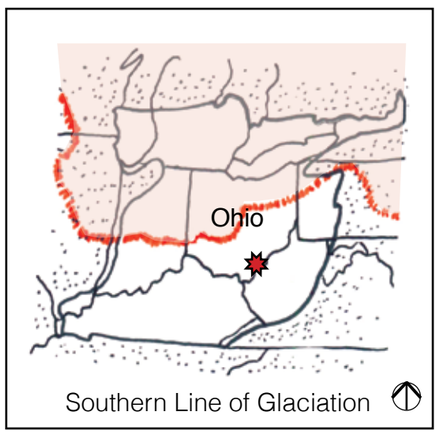
mixed mesophytic forest

The forest community native to these growing conditions is known as mixed mesophytic. Its canopy is dominated by as many as twenty tree species, including species found almost nowhere else, such as white basswood and yellow buckeye. Organic materials decompose rapidly into the forest's moist and fertile topsoils. In the spring, ephemerals carpet the forest floor, giving way in summer to a diverse herbaceous layer of herbs and ferns. Native medicinals such as ginseng, black and blue cohosh, and goldenseal grow abundantly in these favorable conditions.

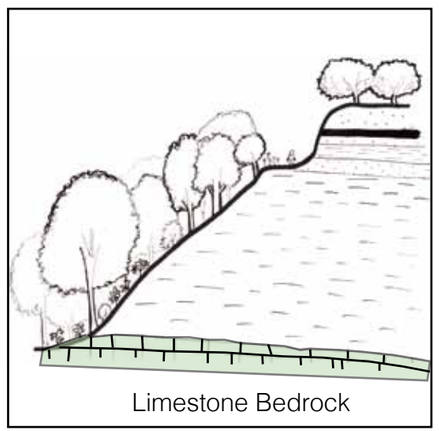
Central Hardwoods Region



Appalachian Plateaus



Southern Line of Glaciation


Limestone Bedrock

Sanctuary

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Context:
Natural Landscape

CONTEXT: Cultural Landscape

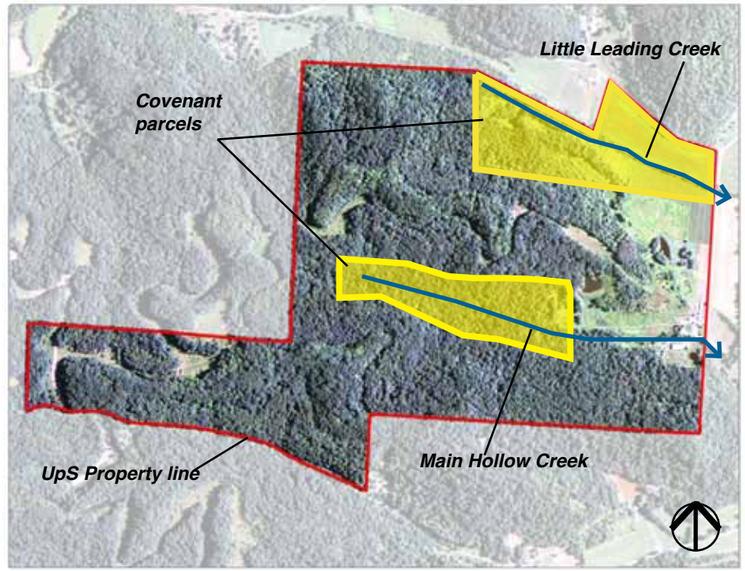
a history of resource extraction

The Sanctuary is located in Rutland Township of Meigs County, Ohio, in the Appalachian foothills. Agriculture, timber harvesting, and coal mining have shaped the culture, land, and economy in this region. The present-day Sanctuary used to be called Paynes Woods, and this area of intact forest was well known by locals for medicinal plants. However, parts of the Sanctuary grounds—especially on the north side—were farmed, grazed, logged, and strip-mined for coal.

The strip mines on the property were reclaimed in the early 1980s in accordance with the Surface Mining Control and Reclamation Act of 1977. Deforestation, erosion of high ridges, and acid mine drainage (AMD) have had lasting effects on the watershed, including flooding, sediment buildup, and pollution. The Sanctuary is in the southern reaches of the Leading Creek Watershed, which drains southeast into the Ohio River along the West Virginia-Ohio state line. Downtown Rutland, about four miles downstream, frequently floods during the rainy seasons due to watershed-wide effects of strip mining in Meigs County.

***1939**: The Sanctuary grounds were mostly covered with intact forest, with some agriculture.*

***1959:** Deforestation and surface (or strip) mining scarred the land.*



***2010**: The forest has been regenerating since the mines were reclaimed. Covenants (or conservation easements) were placed on two parcels of UpS property, totalling almost seventy acres of land that is permanently protected from further development or resource extraction. The covenant buffers the entire length of Little Leading Creek on UpS property and most of Main Hollow Creek.*

Lee Wood checks on a patch of ginseng he seeded two years ago.

a community conservation ethic

Property residents, brothers Lee Wood (pictured at left) and Randy Wood, have lived on this farm their entire lives. They continue to reside at the Sanctuary with their families and to act as land stewards. In 1996, the brothers prepared a Proposed Wildlife Management paper that summarizes their methods for responsible wildlife hunting, creating wildlife habitats, and dealing with trespassing hunters. They also describe the habits, likes, dislikes, estimated numbers, and population management strategies for thirty-three animals, birds, and fish on the property, from deer to flat-head minnows. Lee also maintains a mowing regime on the cleared area of the property, keeps an eye out for ginseng and goldenseal poachers, and greets visitors.

Neighbor and UpS co-founder Paul Strauss (pictured at right) is one of many neighboring property owners who share a conservation-based land ethic, among them herbalists, small-scale farmers, and former UpS interns. Altogether, farms and woodlands adjacent to the Sanctuary comprise about 2,500 acres that provide a buffer surrounding the Sanctuary, and are connected to the Sanctuary and to each other by almost eight miles of trails and old mining roads.

Paul Strauss points to a patch of goldenseal along the Medicine Trail.

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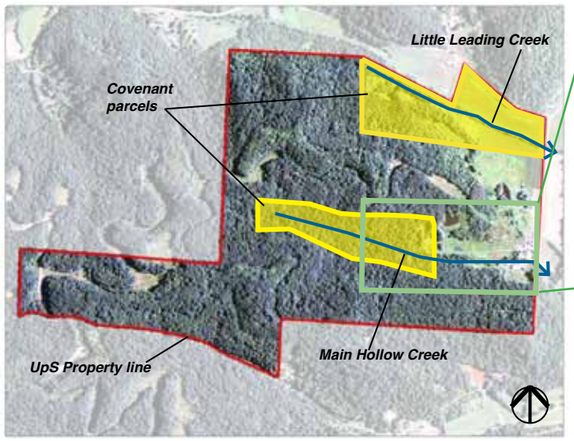
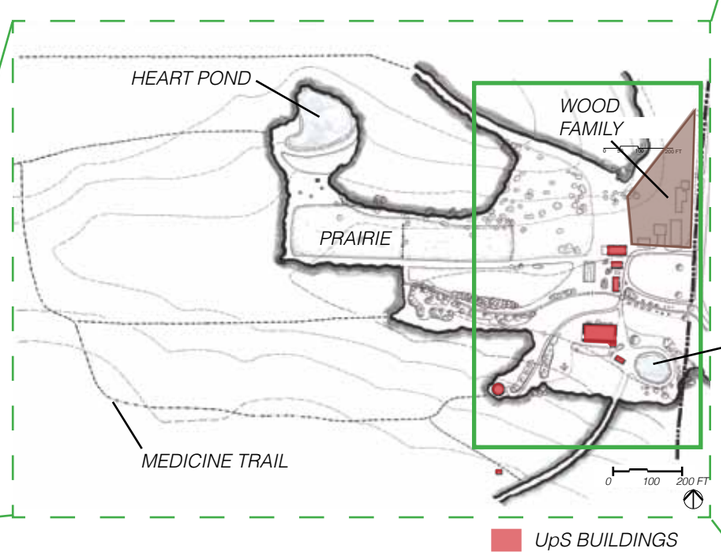
Context:
Cultural Landscape

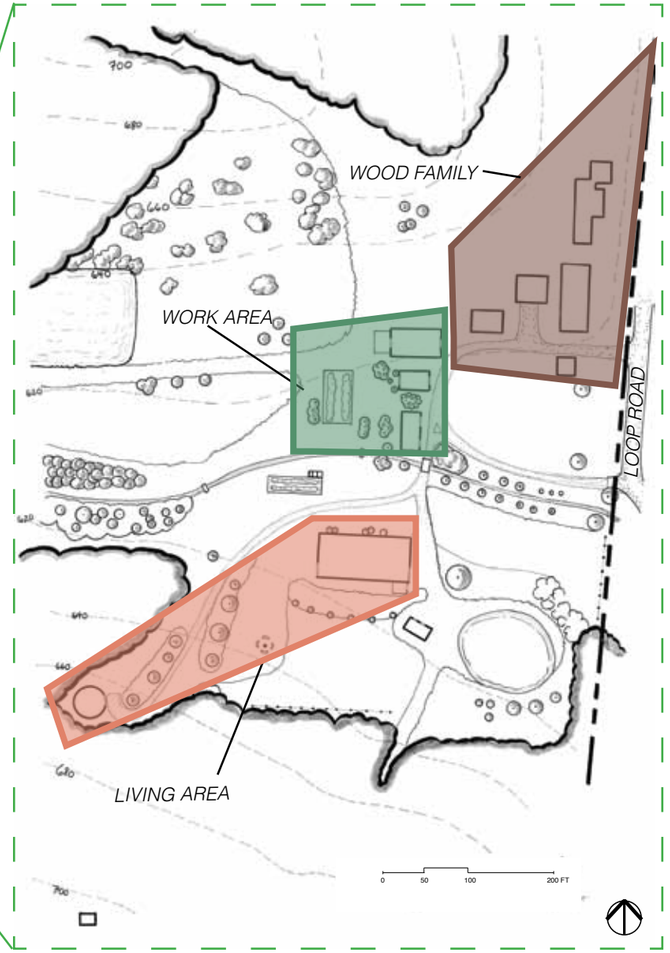
EXISTING CONDITIONS: Across Scales

The **entire UpS property** is about 380 acres total. About 70 acres are permanently protected by conservation easements, meaning that no building, clearing, harvesting or resource extraction may occur on these parcels. This project does not address the entire property, but rather the main area of use near the southeastern corner.





The **main area of use** includes the Wood family home, UpS buildings, two ponds, the prairie, and the main loop of the Medicine Trail. The trail takes visitors through the diverse mixed mesophytic forest community in which many medicinal herbs thrive.



The **project focus area** is used intensively by interns, visiting students, guests, and the resident Wood family. This project will not address the Woods' portion of the focus area. The project will, however address the relationships between the work area, living area, and access to the Medicine Trail from the entire project focus area.

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Existing Conditions: Across Scales

EXISTING CONDITIONS: Focus Area

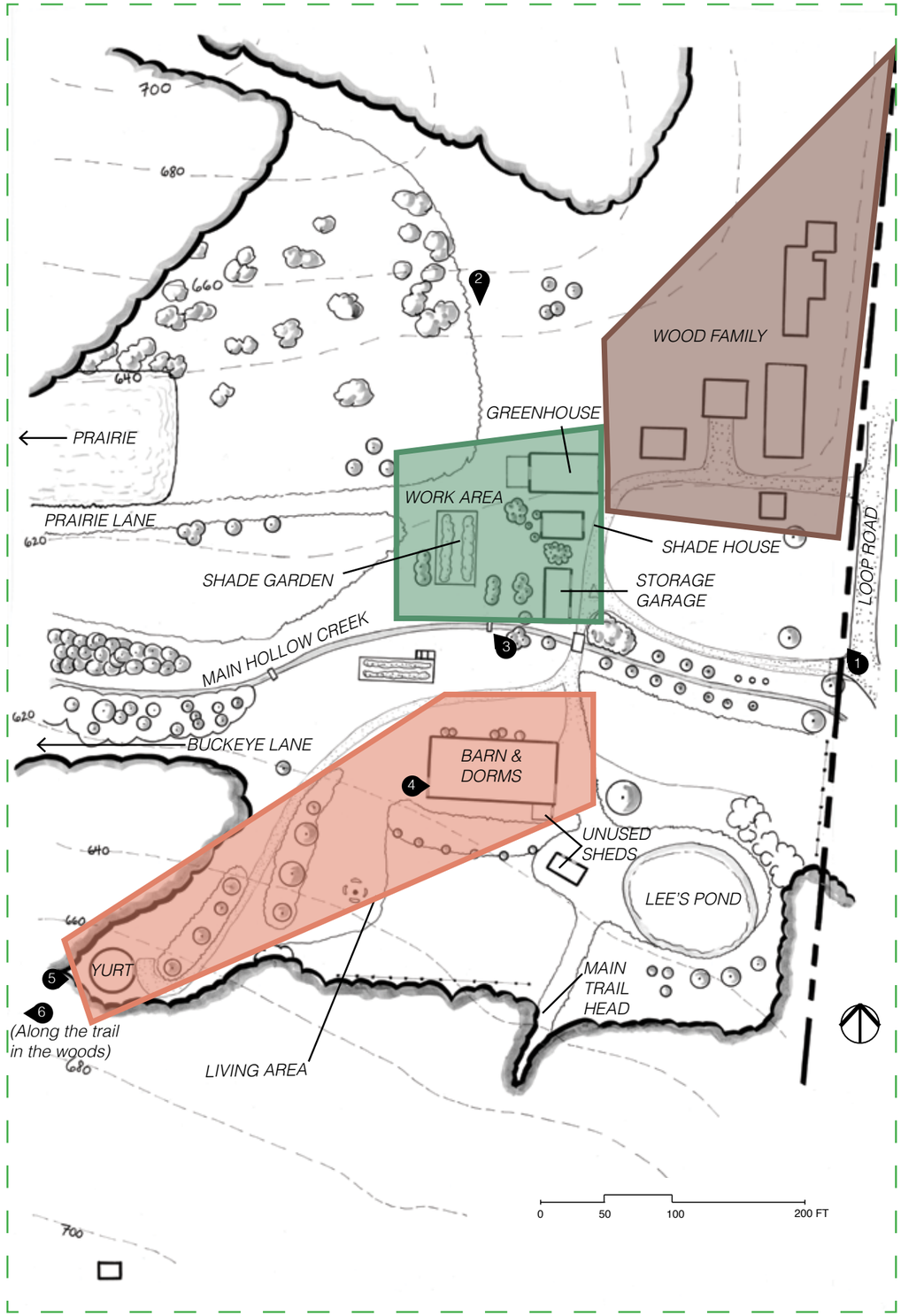
The focus area is the center of activity at the Sanctuary and is mainly in use during the spring and fall.

current uses

Six to eight interns maintain trails, propagate medicinal plants, and study herbal medicine for eight weeks in the spring and six weeks in the fall.

Day-long events, such as guided hikes, invite community members to explore the Sanctuary.

Conferences and board meetings draw herbalists from throughout North America.



1

The entrance from Loop Road is marked by a signpost. Resident Lee Wood shares the driveway.

2

A view of the work area, where a greenhouse and shade houses are the center of plant propagation activities.

3

Main Hollow Creek divides the property. Crossings connect the two sides over this deeply incised stream bed, which floods several times a year.

4

The barn has been converted into dorm rooms.

5

The yurt is furnished with amenities for interns, such as a kitchen, study space, and bathroom.

6

Chip Carroll, UpS Intern Coordinator, neighbor, educator, and ginseng expert leads hikes along the Medicine Trail for day visitors.

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Existing Conditions: Focus Area

6/23

EXISTING CONDITIONS: Plant Communities

About seventy percent of the Sanctuary is composed of the rare mixed mesophytic forest that inspired UpS' purchase and proptection of the property. However, there are roughly six different plant communities in the focus area.

native plant communities

mixed mesophytic forest

Mixed mesophytic forests require a rare upland mesic habitat characterized by sheltered slopes with rich, moist, well-drained soils. On the property, the mixed mesophytic forest's canopy is dominated by as many as twenty tree species. Native medicinals such as ginseng, black and blue cohosh, and goldenseal grow abundantly in these favorable conditions. This forest is a healthy and intact ecosystem and abuts the focus area on the southwestern side.

floodplain forest

Floodplain forests are found in areas of lowland mesic-wet habitat along streams and rivers. On the property, there is a narrow strip of clay-rich silty soils along Main Hollow Creek. These soils are prone to frequent flooding at the flat bottom of Main Hollow. South of Main Hollow Creek, where the land was disturbed by deforestation and cattle grazing, a young floodplain forest community is slowly growing back. However, a regularly mown path, Buckeye Lane, cuts through the southern edge of the floodplain. This creates a large amount of edge, exacerbating a disturbed habitat in which invasive species thrive.

meadow

In southeastern Ohio, meadows grow where the original forest has been cleared and there is continual disturbance by mowing or fire. Meadows are composed of tall grasses and herbaceous perennials. North of Main Hollow Creek, where the lowland mesic habitat was once cleared for cattle grazing, is maintained as meadow through annual mowing.

old pasture

Old field communities of Eastern red cedars grow individually or in scattered groves on thin, sandy-loam soils on limestone bedrock. On the property, there is an old field of Eastern red cedars on the upland mesic-dry habitat of the south-facing slope, where the land was disturbed by deforestation and cattle grazing. Invasive species thrive in this disturbed habitat; autumn olive is currently spreading in this area.

planted vegetation areas

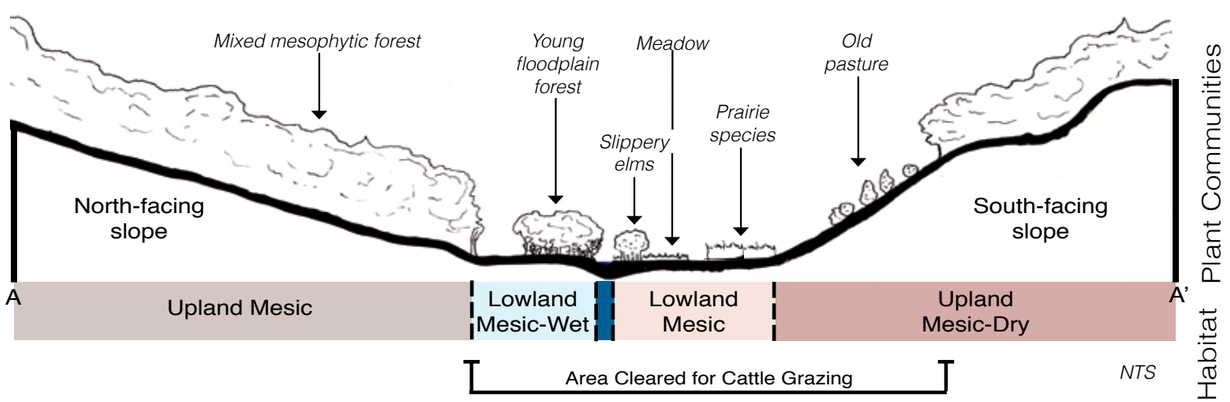
slippery elm grove

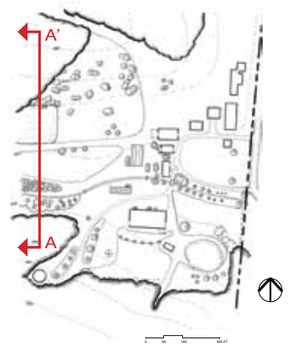
An area of meadow north of Main Hollow Creek was replaced about fifteen years ago with a densely planted grove of native slippery elms. Many of these trees are dead or dying, in part perhaps because of the lack of ecological diversity within the grove and the resulting poor soil health. They may also be especially susceptible to disease because they prefer moisture, good drainage, and shade but are growing in an area of clay-rich soils with no overstory.

prairie

Another planted area is a field of mid-western prairie species. This prairie used to be managed by annual burning, but has reportedly not been burned in six or seven years. It is brush-hogged semi-annually, and woody invasives are spreading into this area.

section looking west into Main Hollow





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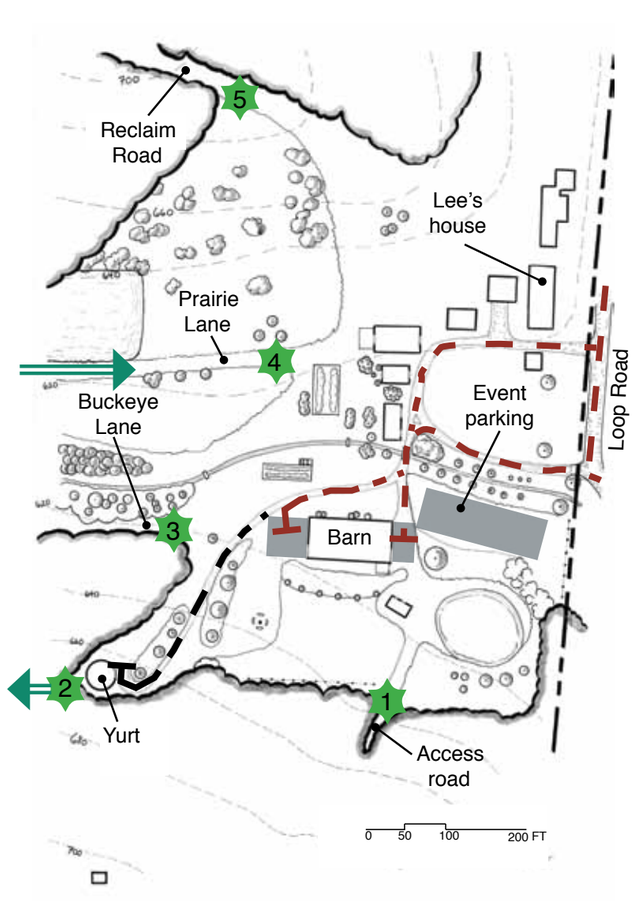
Existing Conditions: Plant Communities

ANALYSIS

arrival process

For visitors new to the property, navigating from Loop Road to the parking areas can be confusing. There are two main parking areas that can accommodate about fifteen cars, but there are no clear sightlines to these parking areas from the road.

Access from the parking areas to any of the five trailheads may also be confusing. The first trailhead is well marked but is away from the main activity areas and leads to an old access road that is steep and eroding. The second trailhead is also marked, but is hidden behind the yurt. The third trailhead is minimally marked and is often wet. The fourth trailhead is minimally marked and is additionally confusing because it does not lead directly into the woods. The fifth trailhead is minimally marked and steep. Occasional guided hikes help orient visitors. For these hikes, the trailhead behind the yurt is most commonly used. A clear arrival process that includes sightlines to parking areas, a welcome center, and clear sightlines to main trailheads may make visitors' experience less confusing upon arrival.



Main parking areas on each side of the barn are unmarked.

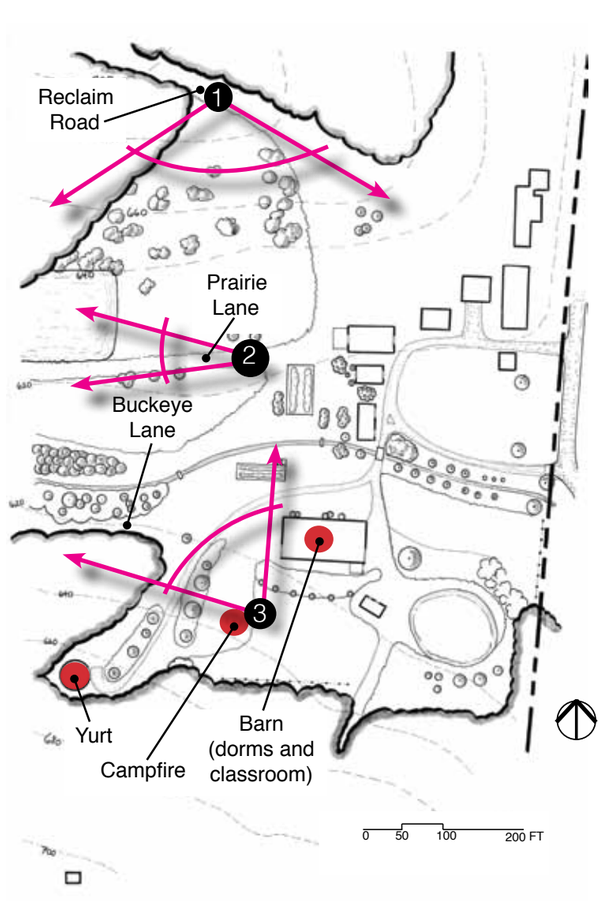
The trailhead behind Lee's Pond leads to a steep, eroding access road.

KEY
- Visitor vehicle access
- Parking area
- Trail access
- UpS vehicle access
- Hiking direction

long views and gathering areas

There are three especially long, beautiful views. The first looks west out over Main Hollow (1). The second looks west along Prairie Lane (2). The third, from the beginning of the Reclaim Road, looks out over virtually all of Main Hollow (3). These views could be experienced more often if there were changes to circulation patterns, making it more likely for visitors to gather near the entrance to Reclaim Road, walk west along Prairie Lane, or gather on the hillside south or west of the barn.

The campfire is the only area with outdoor seating options, but the seating options are minimal and next to a cold firepit. Additional outdoor seating may encourage visitors to feel more comfortable sitting outside. There are two indoor seating areas: the yurt, comfortable but often in use by interns cooking meals or drying herbs, and the barn, a good work-space but uncomfortable, dark, and with an aluminum roof that is extremely loud during rainstorms. Additional indoor seating areas may provide space for visitors and student groups to learn and converse.



An aerial view of the focus area is afforded from the south-facing hillside.

Dorms and classroom space are inside the barn.

KEY
- Long view
- Gathering area

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Analysis:
Arrival Process; Views and Gathering Areas

8/23

ANALYSIS

managed vegetation

Throughout the focus area, there are wide paths and large patches of regularly mown grasses. These widely mown areas may not guide visitors to the trailheads.

Planted areas of native species, including propagation beds, are clustered along the north side of the creek. However, visitors often notice these areas last. Focusing visitors' attention more on these areas may more strongly communicate the present and past work of UpS, such as propagating native medicinal species and restoring native plants in the landscape.

There are many mown areas, such as the grass behind the barn.

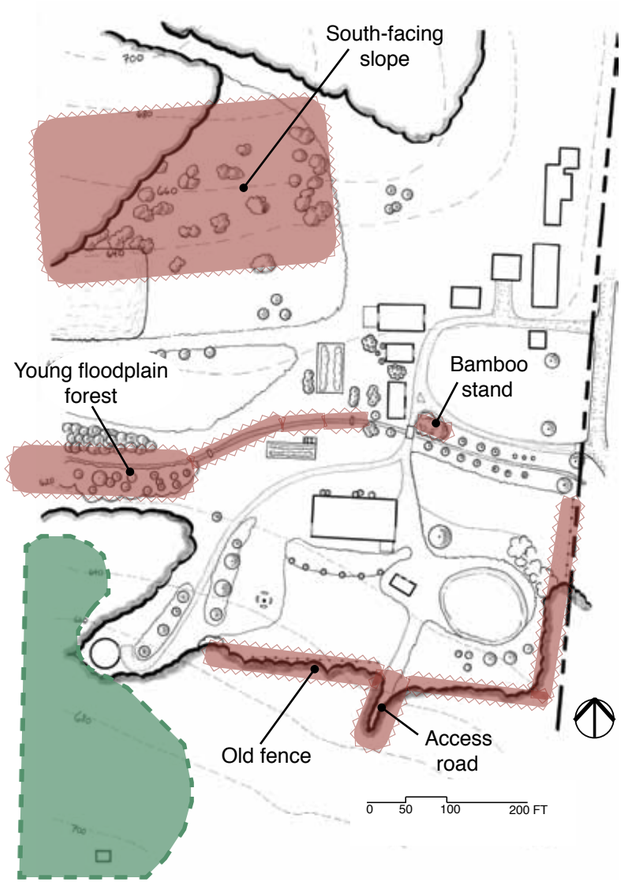
Goldenseal is propagated for UpS' plant give-aways.

KEY
- Regularly mown
- Planted area

medicinals and invasives

In the mixed mesophytic forest, the area with the most abundant native medicinals abuts the focus area on the southwestern side, close to the yurt.

Invasive species such as bittersweet, multiflora rose, and autumn olive thrive in disturbed areas. Areas with a significant amount of invasives are the steeper, deforested portion of the south-facing slope; the young floodplain forest south of the creek; thin vegetated strips by Main Hollow Creek; and the old fence line and forested edges of the access road. Invasives also grow where they have been planted, such as the bamboo stand by the driveway that must be kept in check with regular mowing and applications of salt. Invasive species grow where habitats have been disturbed; attending to the health of these habitats may reduce the amount of invasive species on the property.



Autumn olive spreads into the prairie from the south-facing slope.

Large patches of goldenseal grow in the forest understory.

KEY
- Invasive species
- Native medicinals

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Analysis:
Managed Vegetation;
Medicinals and Invasives

9/23

ANALYSIS

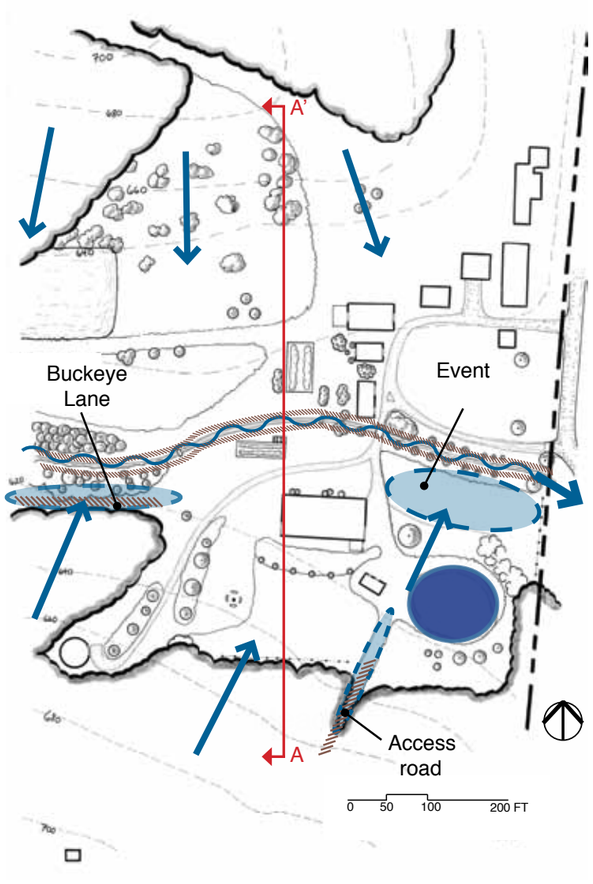
drainage and wet areas

Deforestation from strip mining and cattle grazing has caused sediment to build up in Main Hollow Creek. Such sediment build-up has occurred in many of the creeks in Meigs County, and many of the creeks overflow their banks during heavy rains. Main Hollow Creek overflows its banks by two to three feet several times a year.

To help mitigate the flooding in downtown Rutland, the Ohio Environmental Protection Agency has purchased conservation easements along creeks upstream. The EPA uses these conservation easements to either ensure that existing forest edges are maintained or to reforest deforested edges. There are two conservation easements on the property, which is about four miles upstream of downtown Rutland (see sheet 4). Main Hollow Creek's conservation easement protects the creek from its source near the western edge of the property to the edge of the property's main area of use, where the edges of Main Hollow Creek are forested.

In the focus area, many areas are unforested and grasses are mown up to the creek's edge, increasing the amount of water flowing into the creek. The lack of woody vegetation along the creek's edge causes the creek banks to be undercut by erosion, further increasing the amount of sediment deposit. Slowing and reducing the flow of water down the hillsides (twenty percent average slope) may help reduce additional sediment deposit; vegetation buffers may help stabilize the creek banks.

There are three regularly mown areas that are often wet: the mouth of the access road leading into the woods; Buckeye Lane; and north of the pond, where the meadow is occasionally mown for event parking. There is soil erosion in some of these areas, caused by vehicle use (ATVs or mowing equipment) when the ground is wet. Reducing vehicle use in wet areas may help reduce additional sediment deposit into the creek. Even if the event parking area is only mowed and used when the ground is dry, a vegetative buffer between it and the creek may reduce pollution runoff.

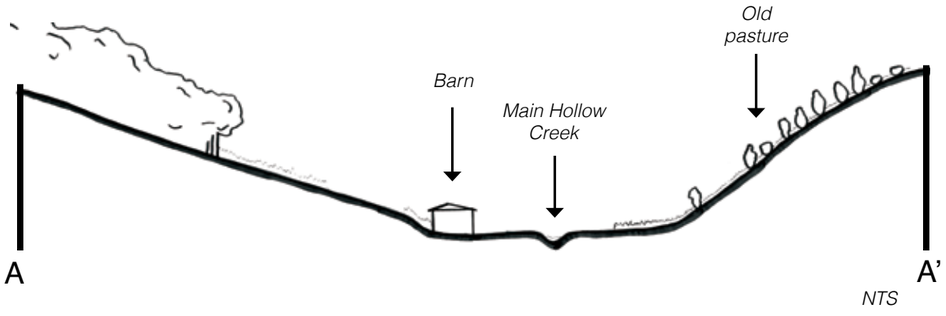


Flooding and lack of vegetation undercut the creek banks.

Buckeye Lane is frequently wet.

KEY
- Mown wet area
- Erosion
- Drainage direction
- Main Hollow Creek
- Pond

section looking west into Main Hollow



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Analysis: Drainage and Wet Areas

SUMMARY ANALYSIS

arrival process

There are no clear views to the main parking areas from Loop Road, in part because of the stand of bamboo that obscures views to the bridge. The parking areas are directly next to the barn, which is a work-space, rather than a welcome center. The barn also houses the interns, and the parking areas limit the ability for the barn to have a “front-porch.” In addition, the location of the parking areas causes the southside of Main Hollow Creek to feel like the activity center of the Sanctuary. The most abundant area of native medicinals abuts the southside of the creek, but UpS’ areas of plant propagation are on the northside of the creek. The area of abundant medicinals may also be the most sensitive habitat on the property. The main trailhead behind the yurt brings visitors directly to the most inspirational patches of understory medicinals but may also bring too much foot-traffic into this habitat.

Using the trailhead behind the yurt as the main entrance into the woods may also result in missed opportuntities to draw visitor attention to the long views on the property, since visitors walk towards the yurt to enter the woods, then east along Prairie Lane to exit the woods, and rarely along Reclaim Road.

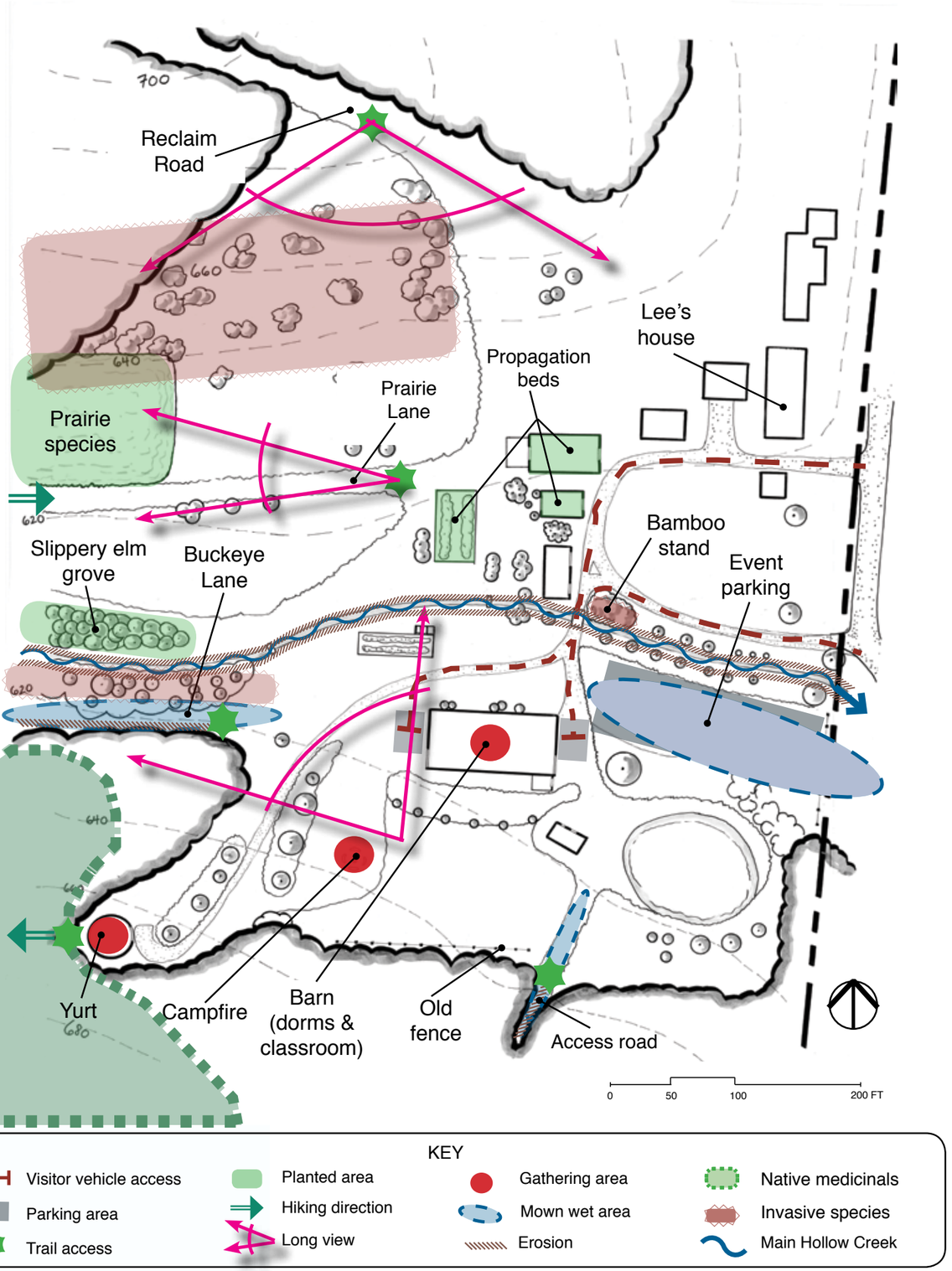
gathering areas

There are few gathering areas in the focus area. There is only one outdoor seating area, which may not be comfortable for all visitors. Indoor areas that can be used as classroom space are likewise limited. In addition, there are no seating areas to the north of the creek, close to the propagation beds.

Overnight amenities for visitors are also limited. There are dorms in the barn, but these are often in use by interns. Although visitors can camp, there are no structures specifically for keeping overnight visitors comfortable and dry.

disturbed habitats & creek bank erosion

By creating the Goldenseal Botanical Sanctuary, UpS protected a large intact habitat full of native medicinal plants. However, they also inherited some areas where the habitat has been disturbed by deforestation, strip mining, and cattle grazing. Soil erosion from these activitues has caused sediment build-up in the creeks throughout Meig’s County, and Main Hollow Creek overflows its banks several times a year.



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Landscape Master Plan
Goldenseal Botanical Sanctuary
United Plant Savers
35703 Loop Road, Rutland, Ohio

Summary Analysis

11/23

DESIGN ALTERNATIVE:
Regenerating the Northside

This design alternative focuses on the protection and restoration of both the native plant communities and Main Hollow Creek. Visitors arrive in the work area, directing more attention to UpS' work of propagating native medicinal plants.

arrival process
The driveway curves naturally into a centrally located parking area for 14 cars **(1)**. From the parking area, a welcome center with pergola awning is easily visible **(2)**. The welcome center opens to the west, where the trailhead that leads through the prairie is clearly visible **(3)**.

gathering area
West of the welcome center, centered between the propagation beds and the planted areas, is a large council ring **(4)**. Seating here provides a place for lessons and relaxation in the work area in a location that takes advantage of a long, open view down the prairie into Main Hollow.

regenerating habitats
The trail leads through an expanded area of prairie species **(5)** in order to reduce mowing and immerse visitors in this regenerating ecosystem on former pasture land. **(6)** Camping lean-tos—with enough space for 30 people—are tucked into a regenerating oak-hickory forest on the south-facing hillside **(7).** This native community is reestablished to build soil health on this disturbed slope. Trees also slow and infiltrate rainwater as it runs into Main Hollow Creek, and invasive species are hand-removed and eventually shaded out as the forest matures. A regenerating floodplain forest **(8)** to the south of the creek in former Buckeye Lane slows and infiltrates drainage .

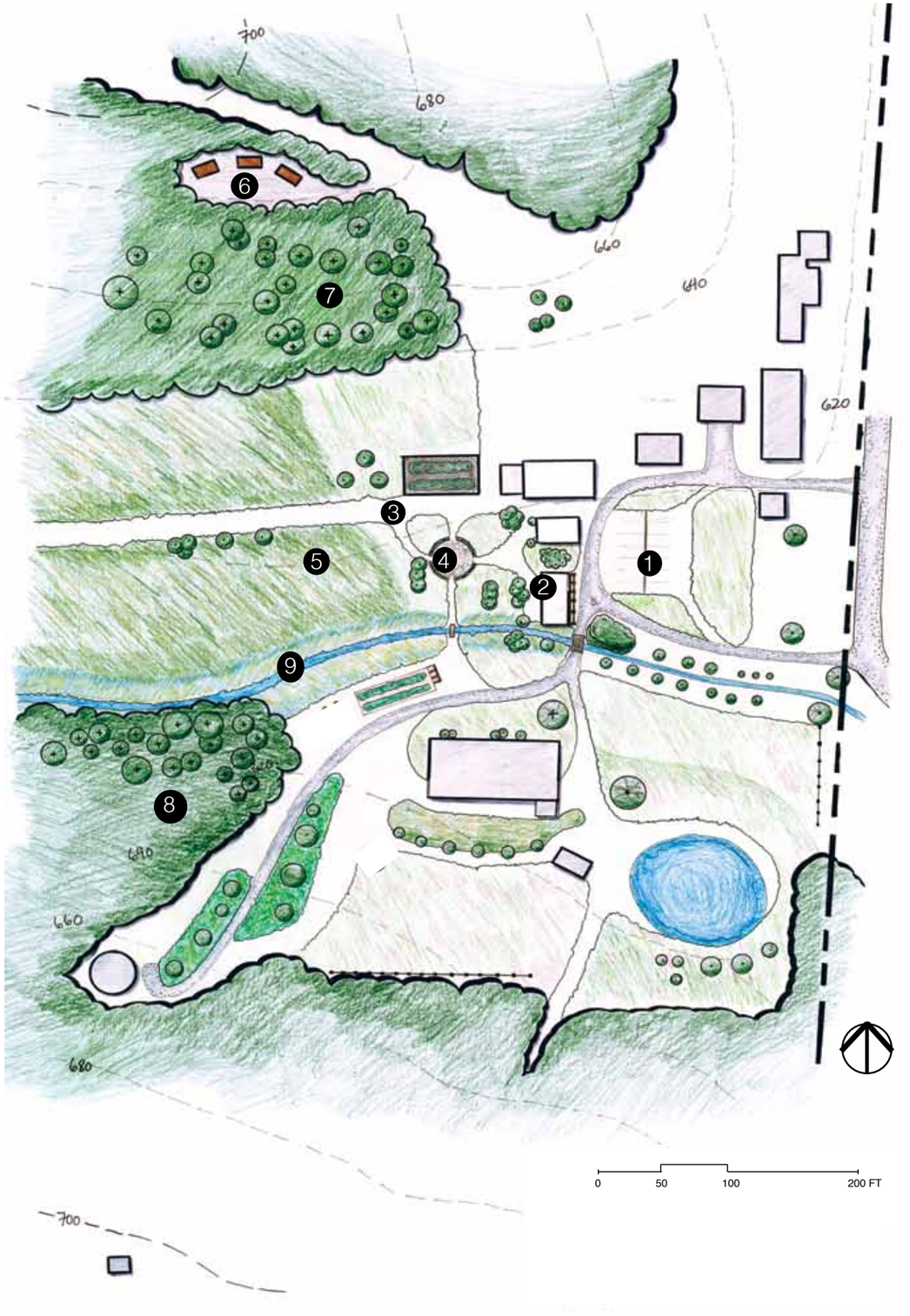
creek bank stabilization
The creek is buffered on both sides by native grasses and sedges that are managed by annual mowing **(9)**.

pros and cons
There is a clear and welcoming arrival sequence, and parking is located away from the creek and wet areas. However, the parking lot may be unattractive from the road, from the welcome center entrance, and from Lee Wood's home.

A council ring at the prairie trailhead focuses attention on the propagation beds and planted areas, highlighting UpS' focus on native habitat restoration. However, one uncovered gathering area may not be enough to accommodate large groups for various functions.

The campsite does not disturb intact forest habitat and is close to the work area.

Disturbed habitats and creek bank erosion are addressed. However, creekside grasses and sedges may not have deep enough roots to stabilize the creek banks.



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Design Alternative:
Regenerating the Northside

12/23

DESIGN ALTERNATIVE:
Southside Focus

This design alternative concentrates visitors' experience around the existing living area between the barn and the yurt, and closer to the intact medicinal habitat on the south side of the creek.

arrival process

The driveway **(1)** curves naturally to lead visitors across the bridge, views to the barn are softened by planted areas **(2)**, and parking is visible from Loop Road but it is not situated in a main area **(3)**. From the parking area (for 18 cars), a thatched-roof welcome center is clearly visible **(4)**. The main trailhead is clearly visible, is for foot traffic only, and it leads directly into the area of abundant native medicinals **(5)**.

gathering areas

Gathering areas for different sized groups **(6) (7) (8)** are concentrated on the south side of the creek, close to the area of abundant native medicinals. The view from the south side of the barn is softened by a green roof, which also muffles the sound of the rain falling on the roof, making the barn more functional as a classroom and gathering space **(9)**. Camping platforms—with enough sleeping space for 24 people—are tucked along the access trail into the woods to immerse visitors in the habitat they have come to visit **(10)**.

regenerating habitats

The old fence is removed, allowing for annual mowing up to the forest edge to reduce invasives **(11)**. The slippery elm grove is thinned and inter-planted with overstory hardwood species. This diverse canopy gives the elms much-needed shade and enhances biodiversity, which improves soil health **(12)**. A vegetative buffer of grasses and sedges separates the parking area from the creek **(13)**.

pros and cons

There is a clear and welcoming arrival process to a designated, year-round parking lot. However, this area is very near to the creek. It is often wet (and therefore cannot be mown) and may require paving, which would result in some polluted stormwater runoff to enter the creek.

There are many options for gathering, but none focus attention on the propagation beds or planted areas. A green roof on the barn would be functional and attractive, but cannot be supported by the current aluminum roof.

The campsite is in a beautiful location, but disturbs intact forest.

Disturbed habitats and creek bank erosion are minimally addressed. Locating the main parking area in a wet meadow near the creek may increase erosion and pollution run-off, even with a vegetative buffer.

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Design Alternative: Southside Focus

PREFERRED DESIGN: Integrated Visions

Clear orientation from the moment guests arrive creates a pleasant arrival and departure experience through the work area, living area, and new gathering spaces. Mown paths connect these nodes of activity. Underutilized UpS buildings are re-purposed to create an indoor classroom, welcome center, and apothecary. The propagation area and arboretum are focal points, reminding visitors of the Sanctuary's purpose and UpS' mission.

arrival process

A gravel parking lot **(1)** for seventeen cars is visible immediately from Loop Road. A hedge of dogwoods and viburnums screens the parking lot from view of Lee's house. A footpath from the parking lot leads directly to a welcome center and classroom space **(2)**, where visitors can find information about the Sanctuary and UpS. A door added to the back of the welcome center opens up to the work space and prairie, alerting visitors to the restoration and propagation work being done on the site. A trail map directly **(3)** orients visitor to the property, directing visitors to the trails visible to the north, west, and south. The shade garden is re-oriented to allow easy access between the footbridge and Prairie Lane. A medicine wheel anchors the work space area with a focal point representative of traditional herbal medicine.

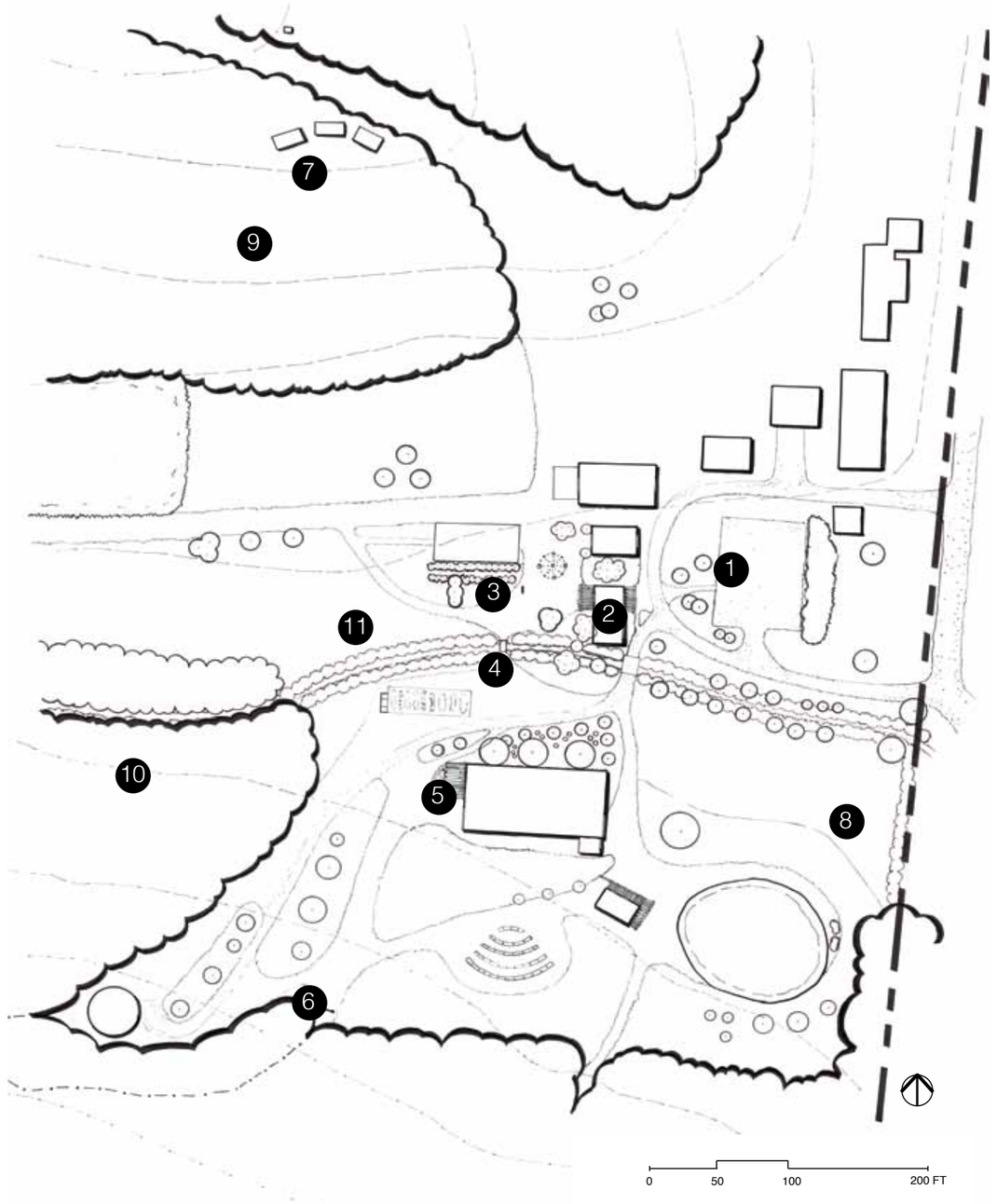
gathering and educational spaces

A footbridge **(4)** over the creek leads to a path that curves through an arboretum of exemplary mesic forest tree species that one may find along the Medicine Trail. This path passes a patio **(5)** on the northeast side of the barn. This multi-functional, centrally located gathering space is half-covered by a bamboo pergola and lined with a cob bench and oven. The main trailhead **(6)** is now visible from this central meeting place, as is an amphitheater set into the slope. The new trail entrance is less steep, wide enough for foot traffic only (3 feet), aligned with the slope, and therefore not as likely to erode from disturbance by vehicle use and drainage.

Three lean-to camping shelters **(7)**, accessible by the Reclaim Road, overlook Main Hollow, with a composting privy close-by. This formerly disturbed area is ideal for campsite because clearing of intact forest is not required and because soils have good drainage and are less likely to erode from construction, compaction, and use. The shelters open to the south to take advantage of views across the hollow and to protect against prevailing north-northwest winds.

regenerating habitats and creek bank stabilization

A row of black willow trees **(8)** are planted in this very wet area to delineate the property line and to replace the old fence. An oak-hickory forest **(9)** regenerates on the north-facing slope to build the soils, shade out autumn olive, and shelter the campsite; **(10)** a floodplain forest community and creek bank buffers are established in appropriate locations (see Planting Concept Plan, sheets 19-20). Hazel alders **(11)** buffer the creek along the north and south sides; once established, these suckering roots stabilize the creek banks and lessen the impacts of further erosion into the creek bed.



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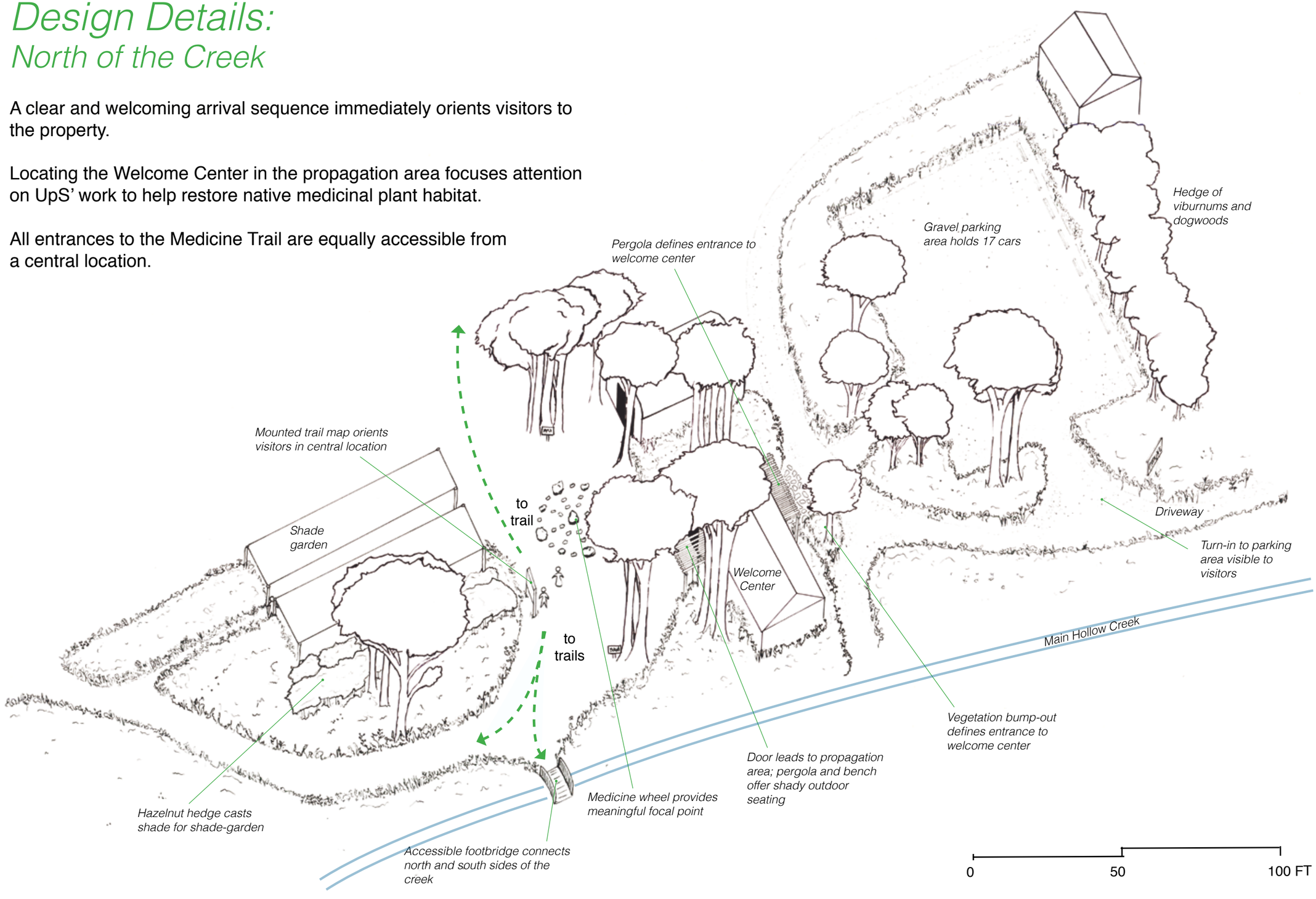
Preferred Design: Integrated Visions

Design Details:
North of the Creek

A clear and welcoming arrival sequence immediately orients visitors to the property.

Locating the Welcome Center in the propagation area focuses attention on UpS' work to help restore native medicinal plant habitat.

All entrances to the Medicine Trail are equally accessible from a central location.



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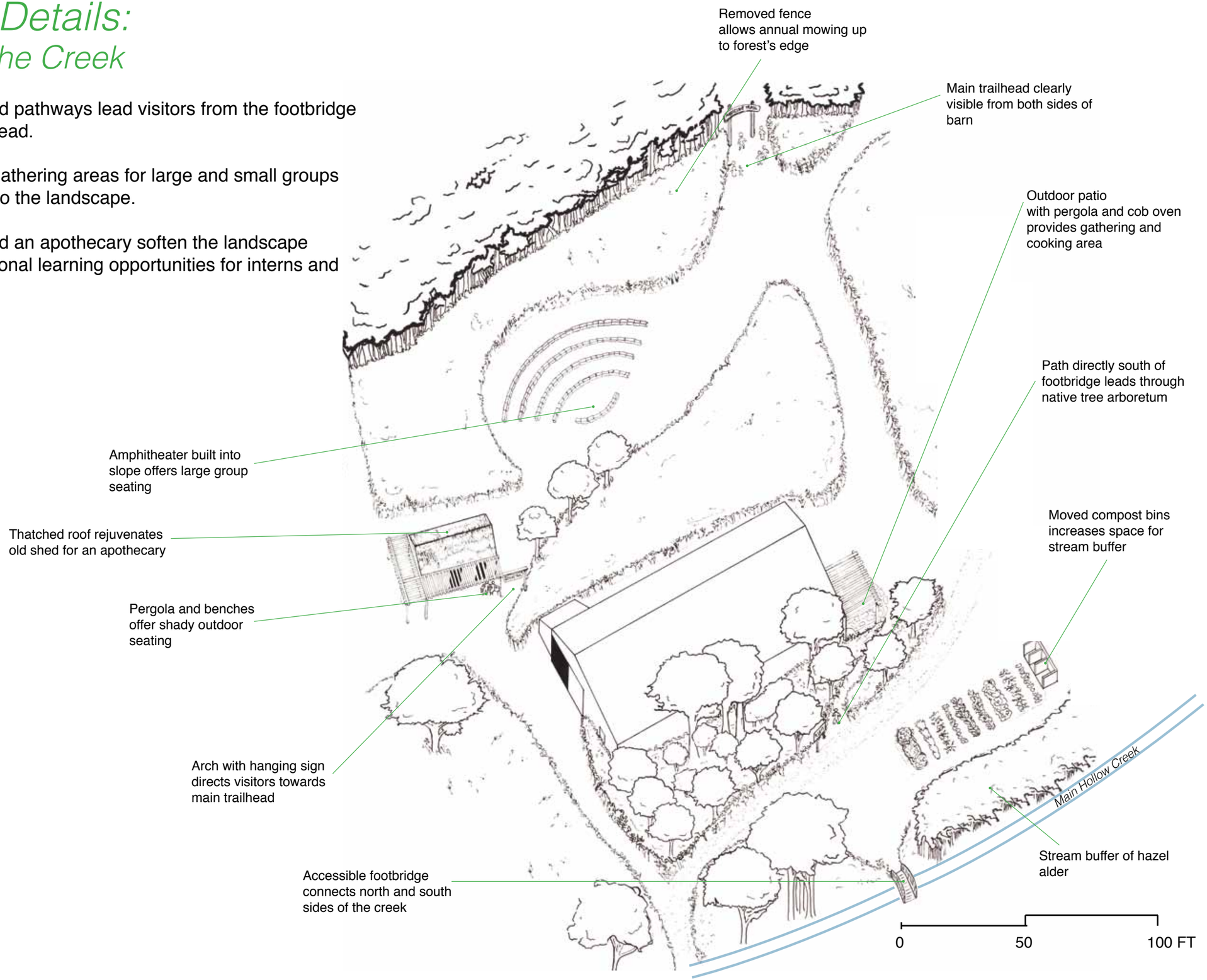
Design Details: North of the Creek

Design Details:
South of the Creek

Clearly delineated pathways lead visitors from the footbridge to the main trailhead.

Multi-functional gathering areas for large and small groups are integrated into the landscape.

An arboretum and an apothecary soften the landscape and create additional learning opportunities for interns and visitors.



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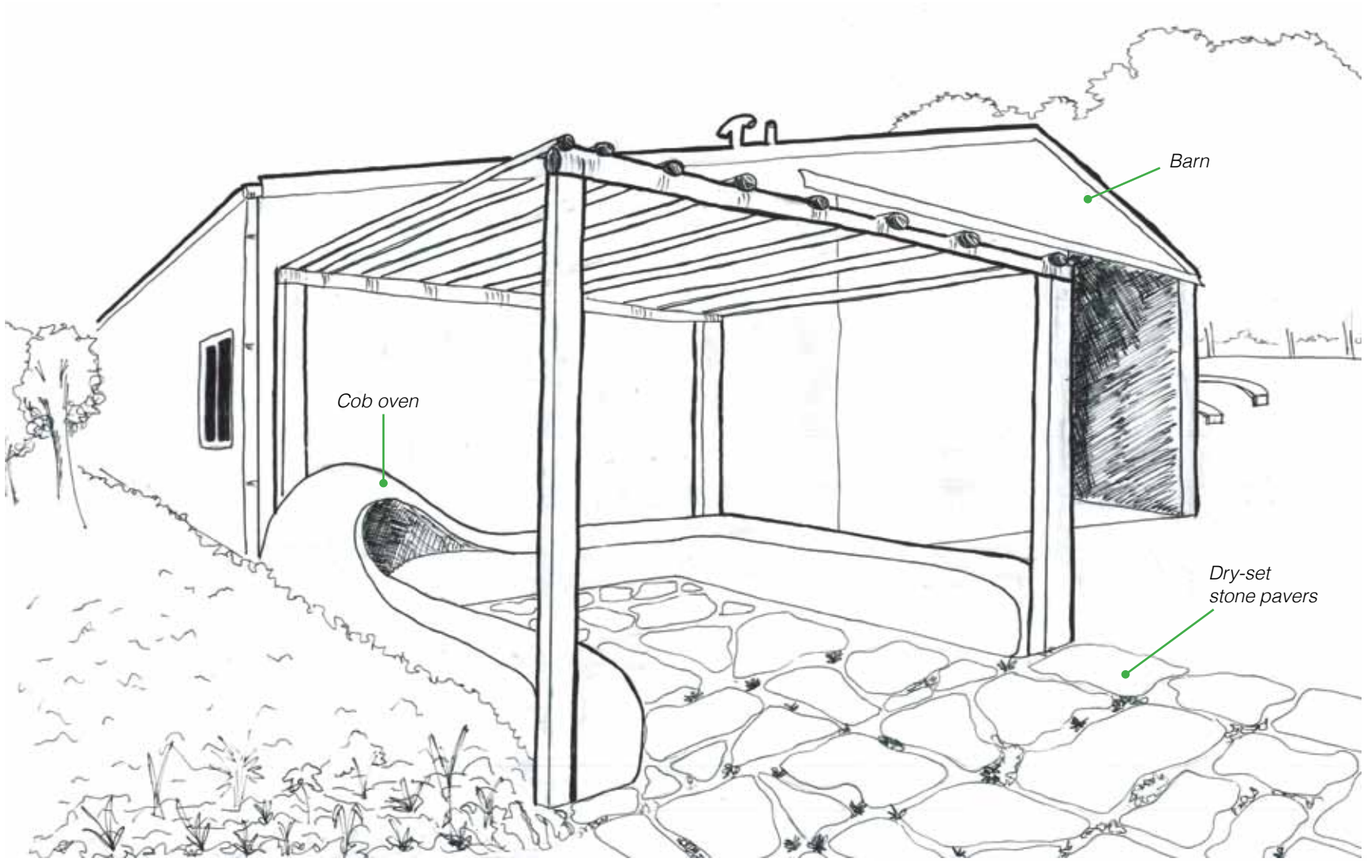
Design Details: South of the Creek

16/23

DESIGN DETAILS: Gathering Spaces



intimate outdoor seating

The east side of the barn provides an ideal location for a **patio,** lain with dry-set stone slabs that can infiltrate water with interplanted, steppable vegetation, such as creeping thyme. The spot takes advantage of a long view down the Main Hollow, and is near to facilities in the dorms and the yurt.

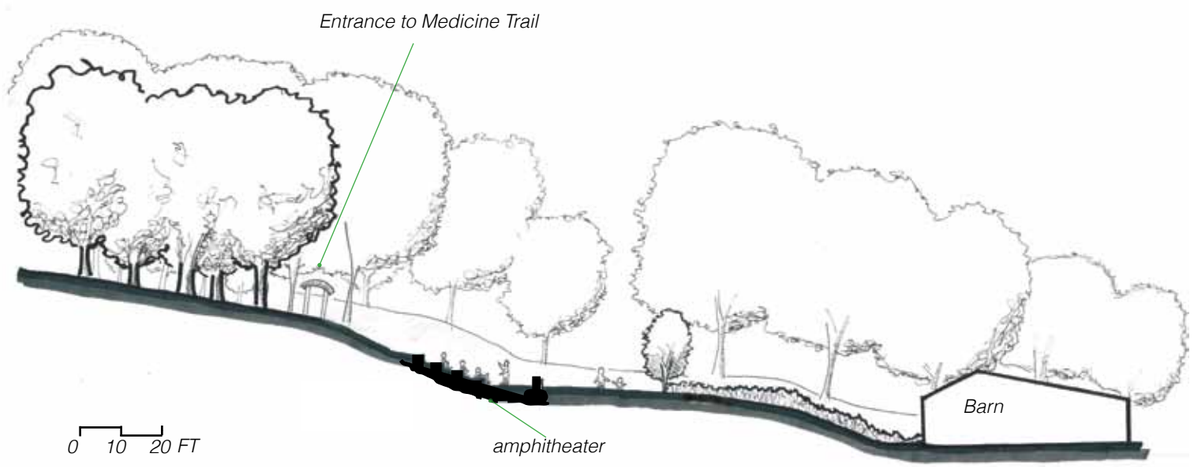
A **cob oven and bench** are constructed from locally available clay, sand, and straw for a low-cost outdoor kitchen where large groups can gather. The oven warms the connected cob bench for comfort during colder weather.

Bamboo harvested from the existing stand by Main Hollow Creek is tied to logs for a **pergola** to provide shade in the summer sun and protect the cob from rain. Vines such as hops could be trained onto the pergola to offer more shade and visual interest.

open, multi-functional seating

An amphitheater on the north-facing slope creates a multi-functional gathering and learning space in a location that affords an open, wide view of the property. Stone benches are nestled into the slope, which remains vegetated with red clover, yarrow, plantains, and mixed grasses that are mown regularly.

section looking west



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Design Details:
Gathering Spaces

DESIGN DETAILS: Materials Palette

The use of locally available, natural building materials reduces the environmental impacts of harvesting and exporting from elsewhere and enhances a sense of place by reflecting the larger patterns found throughout the landscape.

BAMBOO
There is one stand of this non-native, fast-spreading woody species on the property. This strong building material could be harvested for constructing decorative pergolas for sheltered gathering spaces.

BLACK LOCUST, WHITE OAK, OSAGE-ORANGE*
These durable, native hardwoods can be used for building camping shelters, pergola support beams, and benches.

COB
This malleable building material—a mixture of clay, sand, and straw—is an inexpensive, all-natural option for constructing an oven and seating wall around the patio area.

LIMESTONE and SANDSTONE
These rocks are found in abundance throughout the property and the region. The low hollows and creek beds are lined with slabs of limestone bedrock. The high ridges are composed of sandstone. Broken pieces of sandstone—remnants of strip mining practices—are found along these ridges. These local stones can be used for pavers on the patio, benches by Lee's Pond, and amphitheater seating.

SLIPPERY ELM*
Many of the planted slippery elms in the grove by Main Hollow Creek are under stress. Should these trees be thinned out to improve the health of the stronger ones, the flexible bark of this tree could be used for pergola ties.

STRAW, WHEAT, RYE, SEDGES, REEDS
A thatched roof crafted from locally available materials is an inexpensive option for shedding water off buildings in temperate climates like southeastern Ohio. The small, unused shed south of the barn could be thatched as part of its restoration to be an on-site apothecary for use by UpS interns.

**These trees may be found throughout the region; harvesting live trees on-site is not recommended. However, the use of fallen, broken, sick or dying trees on-site may be considered as an opportunity to give a new life to these plants on the Sanctuary, as has been done for the past several decades here already.*


BAMBOO PERGOLA landscapingnetwork.com


LEAN-TO bucktrack.com


THATCHED ROOF


COB OVEN


COB BENCH foresthostel.com


LIMESTONE PAVERS


SANDSTONE PAVERS pavinglandscapenetwork.com


LIMESTONE BENCHES

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Design Details:
Materials Palette

PLANTING CONCEPT PLAN

a welcoming arboretum

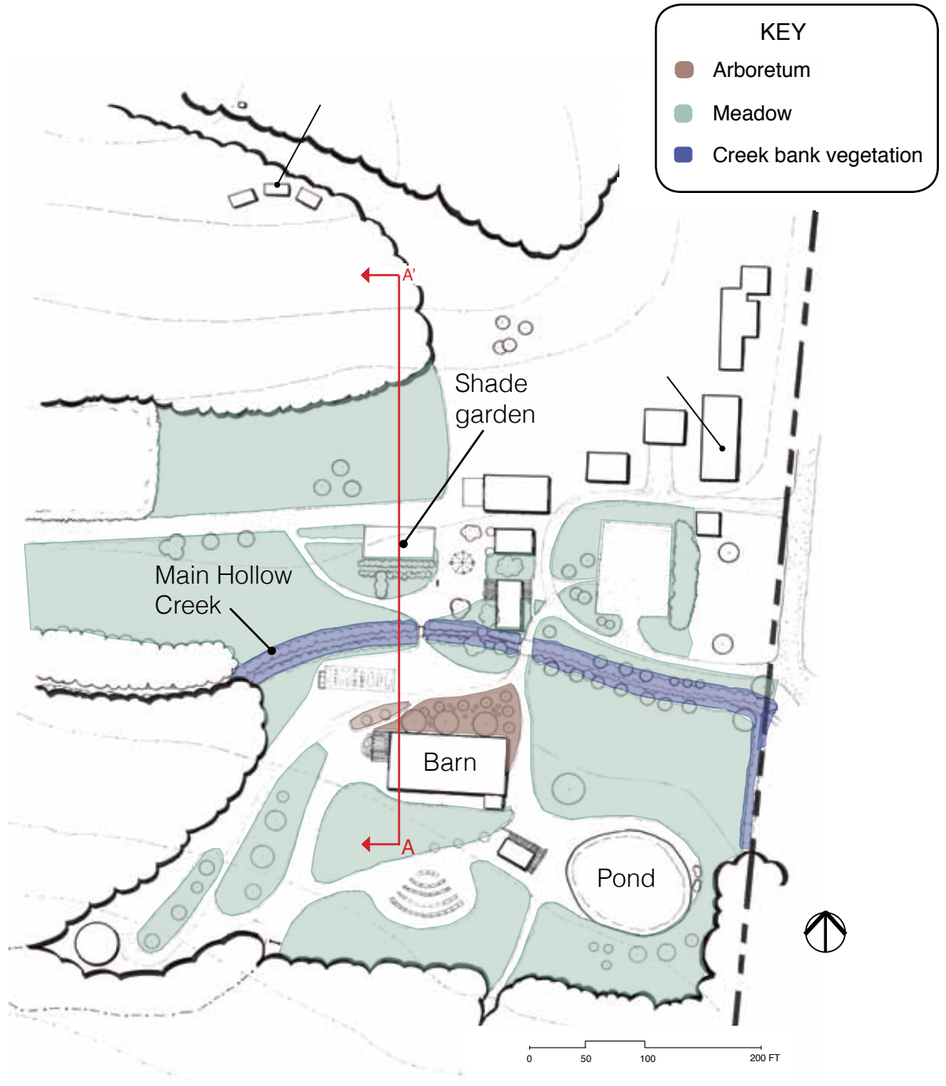
As visitors cross the footbridge to the south side of Main Hollow Creek, they are no longer faced with the large and imposing structure of the barn. Instead, the shady, north-facing slope in front of the barn is planted with mixed mesophytic tree species such as white basswood, redbud, and mapleleaf viburnum. This softens the landscape and offers a small sample of the rare forest habitat on the property. Ferns and other shade-tolerant species compose the understory.

colorful meadows

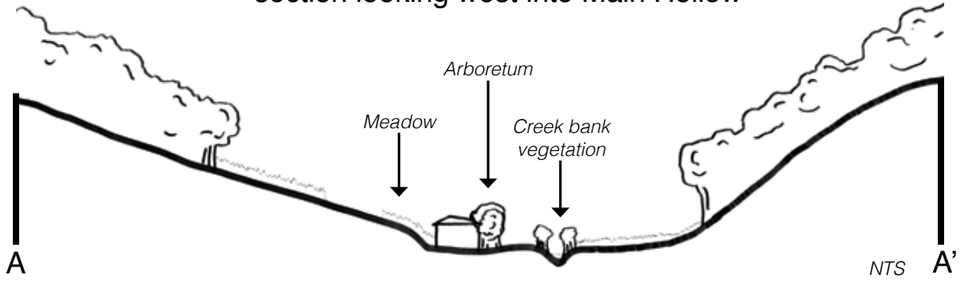
Colorful meadow flowers blooming throughout the spring and summer draw the eye as soon as one turns in from Loop Road. The meadow flowers wrap around the Welcome Center and lead along Prairie Road. Throughout the property, flowering meadows define the pathways between nodes of activity and reduce areas requiring regular mowing. These meadows are seeded and planted with native perennials such as autumn onion, yellow wild indigo, and prairie dropseed, increasing habitat diversity and drawing an array of pollinators. Flowering meadows also help buffer Main Hollow Creek, slowing and infiltrating some of the water that would otherwise run into the creek.

creek bank vegetation

Fast-growing, suckering stream-side tree species such as black willow and hazel alder grow along the side of the creek; their roots help stabilize the creek's eroding banks. Black willow, which grows taller than alder, replaces the old fence as the eastern boundary line, where views are not a priority. Hazel alder, no more than 20 feet in height, grows along the creek.



section looking west into Main Hollow



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Planting Concept Plan

PLANTING CONCEPT PLAN

floodplain forest

When the rains come and intermittent streams flow down the north-facing slope, a mature floodplain forest slows and infiltrates much of the water that would otherwise flow into Main Hollow Creek. Appalachian floodplain species such as silver maple, black gum, sycamore, and green ash create a continuous forest from hillside to creek. This helps slow and infiltrate a greater amount of rainwater, reduces the erosion that resulted from maintaining Buckeye Lane, and increases the extent of an intact native plant community. It also helps build healthy forest soils, transitioning them from bacterial to fungal. This increased soil health, as well as the reduction of edge habitat, gradually reduces the ability of invasive species to grow in that area.

The trail previously accessed through Buckeye Lane is maintained, but access to it is moved to Prairie Lane, the drier north side of the creek. The trailhead is a well-marked wooden bridge near the end of Prairie Lane.

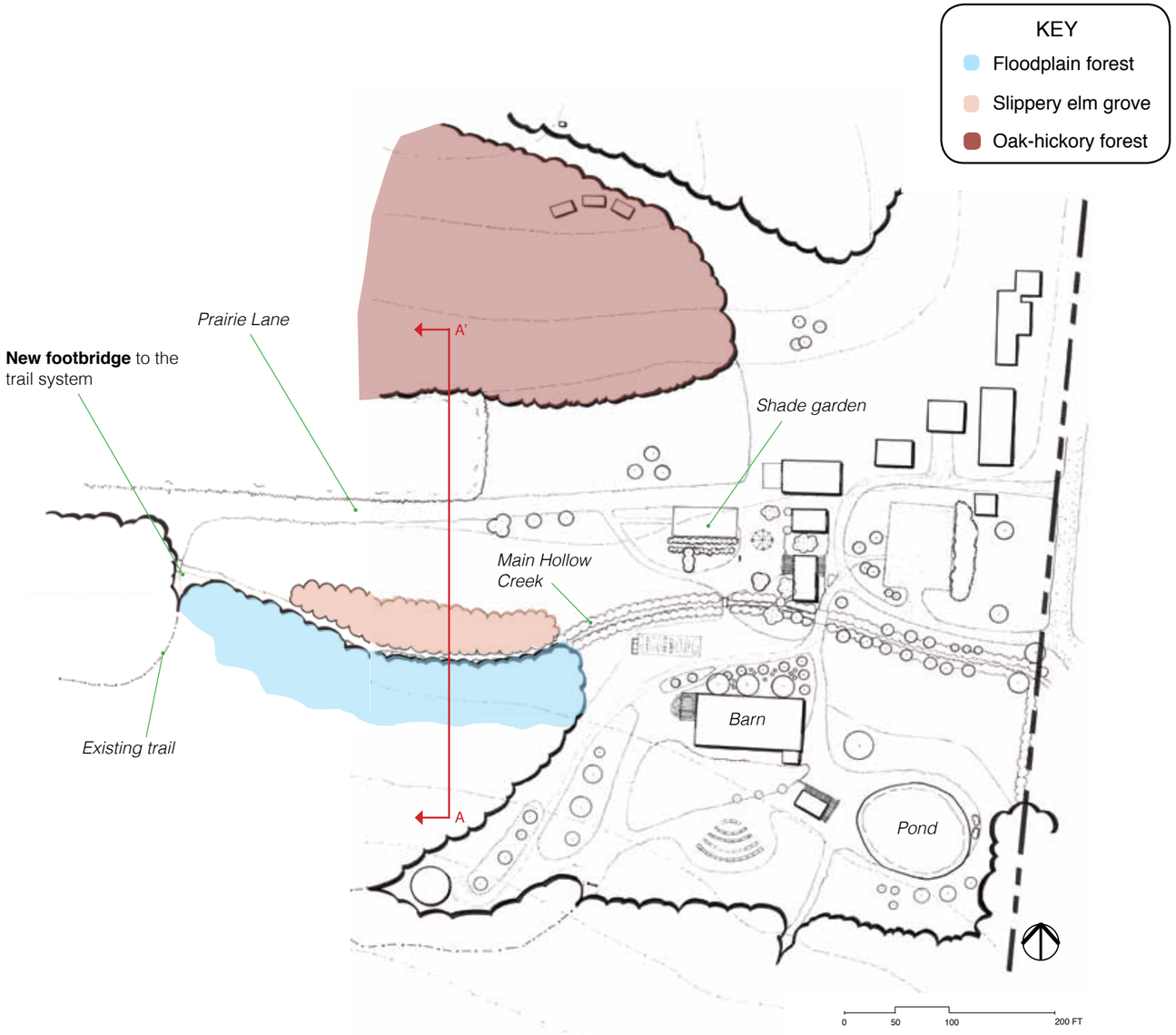
slippery elm grove

The slippery elm grove is thinned of dead and sick trees. Fast growing overstory species such as tulip poplar, red oak, and honey locust offer the shade needed by the slippery elms and create a more diverse, healthy woodlot.

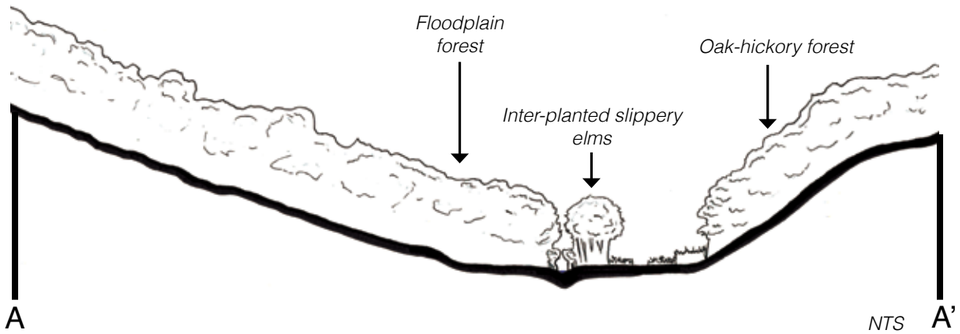
oak-hickory forest

Tree species such as white oak, black oak, and pignut hickory on the south-facing slope speed the transition of the old field on the south-facing slope back to forest. The forest slows and infiltrates rainwater, builds soil, and gradually changes the soil type from bacterial to fungal. As the forest matures, the shade-intolerant autumn olive loses its habitat.

Species such as grey dogwood and hazelnut comprise the forest understory, along with shrubs such as prickly wild gooseberry. Prickly wild gooseberry acts as a broad-scale woody groundcover and nurse-shrub to keep deer away from the newly planted tree saplings.



section looking west into Main Hollow



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Planting Concept Plan

PLANT PALETTE

arboretum

	Scientific Name	Common Name
Dominant Species	*Acer saccharum*	sugar maple
	Aesculus octandra	yellow buckeye
	Fraxinus americana	white ash
Additional Species	*Cercis canadensis*	redbud
	Cornus alternifolia	pagoda dogwood
	Cornus florida	flowering dogwood
	Lindera benzoin	spicebush
	Viburnum prunifolium	blackhaw viburnum

meadow

	Scientific Name	Common Name
Native Grasses: all conditions	*Andropogon gerardi*	big bluestem
	Elynus canadensis	Canada wild rye
	Panicum virgatum	switchgrass
	Sorghastrum nutans	Indiangrass
Moist	*Asclepias purpurascens*	purple milkweed
	Amsonia rigida	stiff bluestar
	Delphinium exaltatum	tall larkspur
	Eupatoriadelphus spp.	Joe-Pye weed
	Helianthus resinosus	resin-dot sunflower
	Liatris ligulistylis	strap-style gayfeather
	Monarda russeliana	white beebalm
	Penstemon digitalis	foxglove beardstongue
	Rudbeckia fulgida	black-eyed Susan
	Sanguisorba canadensis	Canadian burnet
	Symphyotrichum novae-angliae	New England aster
Moist to Dry	*Allium stellatum*	autumn onion
	Amsonia tabernaemontana	willowleaf bluestar
	Asclepias verticillata	whorled milkweed
	Baptisia australis	wild blue indigo
	Chamaecrista fasciclata	partridge pea
	Liatris pycnostachya	prairie blazing star
	Monarda punctata	spotted horsemint
	Ratibida pinnata	prairie coneflower
	Scutellaria incana	downy scullcap
	Sporobolus heterolepis	prairie dropseed
	Solidago speciosa	showy goldenrod

creek banks

	Scientific Name	Common Name
Suckering Creek-Side Species	*Alnus serrulata*	hazel alder
	Salix nigra	black willow

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Plant Palette

PLANT PALETTE

floodplain forest

	Scientific Name	Common Name
Dominant Species *Canopy Trees*	*Acer saccharinum*	silver maple
	Poplar deltoides	Eastern poplar
	Ulmus americana	American elm
Additional Species *Canopy Trees* *Small Trees and Shrubs* *Vines*	*Fraxinus pennsylvanica lanceolata*	green ash
	Liriodendron tulipifera	tulip poplar
	Liquidambar styraciflua	American sweetgum
	Nyssa sylvatica	black gum
	Platanus occidentalis	sycamore
	Quercus palustris	pin oak
	Alnus serrulata	hazel alder
	Sambucus racemosa	red elderberry
	Salix nigra	black willow
	Parthenocissus quinquefolia	virginia creeper
	Toxicodendron radicans	poison ivy
	Vitis girdiana	wild grape

slippery elm grove

	Scientific Name	Common Name
Sampling of fast-growing overstory species	*Liriodendron tulipifera*	tulip poplar
	Quercus borealis	Northern red oak
	Gleditsia triacanthos	honey locust

oak-hickory forest

	Scientific Name	Common Name
Dominant Species *Canopy Trees*	*Quercus alba*	white oak
	Quercus velutina	black oak
Additional Species *Canopy Trees* *Small Trees & Shrubs*	*Carya glabra*	pignut hickory
	Carya laciniosa	big shellbark hickory
	Carya ovata	shagbark hickory
	Carya tomemtosa	mockernut hickory
	Liriodendron tulipifera	tulip poplar
	Sassafras albidum	sassafras
	Prunus serotina	black cherry
	Prunus virginiana	common chokecherry
	Quercus borealis	Northern red oak
	Quercus ellipsoidalis	Northern pin oak
	Cornus racemosa	grey dogwood
	Corylus americana	hazelnut
	Rhus glabra	smooth sumac
	Ribes cynosbati	prickly wild gooseberry
	Ribes missouriense	wild gooseberry
	Prunus americana	American plum
	Viburnum lentago	nannyberry viburnum
	Viburnum rafinesquianum	downy arrowwood

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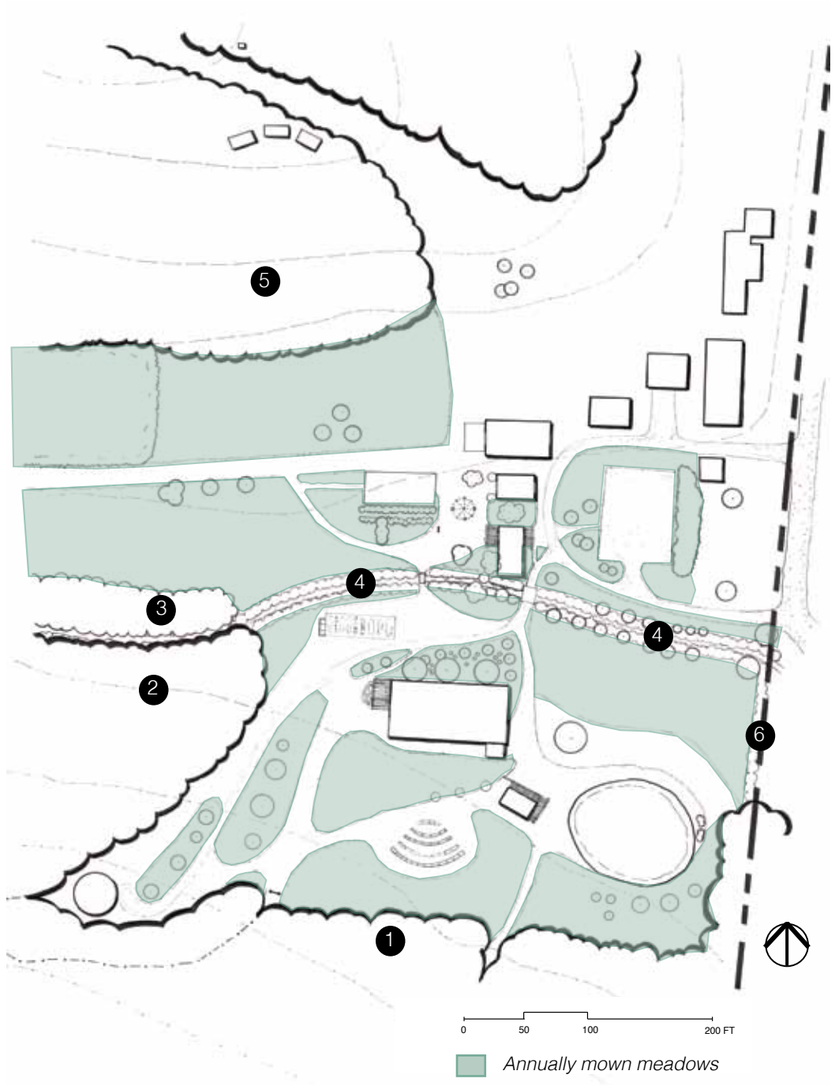
Plant Palette

MANAGEMENT STRATEGIES: Invasive Plants

main areas of management

annually mown meadows

Hand-removal of invasive woody species can be concentrated in areas of annual mowing. Once the woody species are removed, annual mowing or brush-hogging in August or September should be enough to keep these areas in meadow. Mowing specifically toward the end of the summer eliminates woody species when their energy is concentrated above ground, rather than in the root system, reducing their ability to re-sprout. It also disturbs the ground when it is the least wet.



vegetated areas

Building healthy, undisturbed, fully vegetated forest soil is the most successful method to displace and prevent invasive species. In many areas, working to restore native forest communities will help accomplish this task. However, as these areas become established, they may require invasive species management. Some areas, such as forest edges, will always require invasive species management. Bittersweet and multi-flora rose should be prioritized for removal, due to their ability to tolerate partial-shade conditions, meaning that they could move into the mixed mesophytic forest. The autumn olive, due to its ability to fix nitrogen into the soil and its inability to tolerate shady conditions, can be left to continue to build soil until shaded out by a regenerating forest community.

In the following main areas where annual invasive species management is required, one initial intensive removal may be enough for subsequent management to be limited to once a year.

1. If the old fence is removed, the meadows behind the barn can be mown annually up to the forest's edge. Areas of brushy invasives south of the tree line can be removed and then controlled by annual mowing or brush-hogging. However, invasives will still grow on the inner edge of the forest, and, in this area, annual chopping of bittersweet and clipping of multiflora rose before they set seed may always be necessary.

2. If Buckeye Lane is closed and the floodplain forest is regenerated, invasives will grow in the area until the forest again reaches optimal health, due to past disturbance and poor soil health. Chopping of bittersweet and clipping of multiflora rose may be required annually until the forest fully matures. Native grape and poison ivy vines should be encouraged, since they are native species that take up the same habitat as bittersweet. Along the outer edges of the floodplain forest, annual chopping and clipping may always be required.

3. An inter-planted slippery elm grove, though more diverse, will not become an intact forest habitat, due to its small size and large amount of edge. If the grove is kept in place, it will always require annual invasive species management.

4. The edges of the creek will always require annual invasive species management.

5. If an oak-hickory forest is regenerated on the old pasture, invasives will grow in the area until the forest reaches optimal health, due to past disturbance and poor soil health. Clipping of multiflora rose may be required annually until the forest fully matures. Autumn olive can be left to build nitrogen-rich soil until shaded out by the regenerating forest.

6. If the old fence along the property line is removed, that area can be mown annually for one to two years before a willow hedge is planted. This may reduce the need for subsequent invasive management.

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Management Strategies