SETTLING INTO THE WILDERNESS

A landscape master plan for Friends of Dance New England
Camp Timber Trails, Tolland, Massachusetts

Patty O'Neill and John Slaff
The Conway School
Spring 2018

Introduction

Camp Timber Trails, Tolland, MA

Situated at the eastern base of the Berkshires in southwestern Massachusetts, Camp Timber Trails (CTT) is a 417-acre former Girl Scouts campground recently purchased by Friends of Dance New England (FDNE) to serve as a multi-functional event-hosting space and long-sought-after home-base for both the regional dance community, Dance New England (DNE), and the Pioneer Valley-based healing and expressive arts community known as the HeARTbeat Collective. As CTT transitions from an aging summertime campground for girls to a year-round event-hosting space for groups of all sizes, ages, and interests, FDNE is consulting the Conway School to develop a landscape master plan to help guide the camp's programming, site development, and land management in a way that highlights and displays CTT's scenic landscape without degrading its ecosystem functions.

Client and Stakeholders

Dance New England

Dance New England represents a diverse community of people who enjoy dance as an empowering community activity as a means of connecting deeply with themselves, each other, and the environment. For over 30 years, DNE has organized community dance events and summer dance camps around the New England region. For much of that time, they have dreamed of owning a place of their own to hold their annual dance camps and, eventually, building an ecovillage.

The HeARTbeat Collective

The HeARTbeat Collective represents a healing and expressive arts community whose members facilitate hundreds of small events and workshops on topics ranging from dance, meditation, permaculture, herbalism, folk music, and more, with a grounding basis of connection to nature. The HeARTbeat Collective organizes several music and arts festival events including its largest, Unifier, on the summer solstice.

Friends of Dance New England

The Camp Timber Trails campground struck DNE and the HeARTbeat Collective as an ideal home for their communities and their large events, so when the Girl Scouts moved to sell the property, the groups partnered to form the trust known as Friends of Dance New England in order to swiftly organize funds and purchase Camp Timber Trails. FDNE now oversees the camp's management and development, and is considering many options for generating revenue from the property. FDNE intends to create revenue by renting CTT to various groups throughout the year.

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180 Pleasant St. | Suite 211 | Easthampton, MA 01027
413-369-4044
www.csld.edu

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Project Goals

Potential User Groups at Camp Timber Trails

FDNE seeks to achieve a sustainable balance of land use and event-hosting to maintain an environmentally sustainable home for DNE and the HeARTbeat Collective into the future. While FDNE is exploring different management strategies, potential renters, and tax abatement programs, event-hosting for a variety of groups of different sizes and interests is expected to be the major source of revenue and activity on the property. Ultimately, FDNE seeks to create an ecologically and economically sustainable, multi-functional, multi-seasonal outdoor gathering space for groups of various sizes.

Potential renters fall into one of two groups:

LARGE, SINGLE GROUPS (600 TO 1500 PEOPLE) OCCUPYING CTT ONE AT A TIME.
These groups will use the site individually for large events infrequently during the year.

- **UNIFIER** is a three-day event of music, dancing, and workshops on healing arts for 1000 to 1500 people on the summer solstice.
- **DANCE NEW ENGLAND (DANCE CAMP)** is a 12-day event that will host approximately 600 to 800 people.

SMALL GROUPS (20 TO 30 PEOPLE) AND MEDIUM GROUPS (150 PEOPLE) USING CTT SIMULTANEOUSLY
These smaller groups will share use of the site at various times throughout the year. FDNE seeks to understand how to effectively, safely, and sustainable accommodate these groups at once and determine the sites over all capacity.

- **FORESTDANCE** is a three-day event of celebration of community, life, and nature for 150 people on the fall equinox.
- Weddings
- Ecology groups
- Organizational retreats (yoga, corporate, religious, etc)
- Outdoor activities (Malamute Dog Group, Live Action Role Play, etc)

Plan Components

Informed by CTT's current use and an ecological analysis of the propety, this master plan makes recommendations for the functional and spatial arrangement of CTT. It also provides a set of conceptual and specific design typologies that may be applied as FDNE continues to develop their priorities and plans for Camp Timber Trails. This plan set includes:

- An ecological assessment of the property
- A suitability plan for programming and site development
- Design typologies and suggestions for their applications
- Master Plan with recommendations for general landscape management

Project Goals

Currently, Camp Timber Trails' facilities are equipped to handle approximately 280 people. Because FDNE intends to host a range of one large to many small groups at a time, the primary goal of the project is to create a landscape master plan for low-impact, sustainable event hosting that will preserve ecological function and highlight the scenic beauty of this property. More specifically, the goals of this project are to:

- Protect the ecological integrity of site while accommodating human activities
- Provide efficient, low-impact circulation and parking patterns
- Minimize impact on wetlands and pond
- Establish general landscape management recommendations to improve the visitor experience and maintain a strong sense of place

Specific programmatic elements to be integrated into the landscape include:

- Orchard/vegetable garden siting
- Tent platform siting
- Boardwalk and outdoor classroom design
- Permanent and overflow parking for large groups
- Barrier-free paths
- Siting parking
- Siting summer home timeshares
- Siting agricultural areas
- Siting an area for weddings
- Strengthening the connection between key areas on site
- Improving sightlines
- Selecting areas recommended for clearings and tenting

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Existing Conditions

Background

The Girl Scouts of Connecticut built Camp Timber Trails in the early 1970s in the forested town of Tolland, Massachusetts. Camp activities then included ropes courses, horseback-riding, archery, and small-craft water activities in the 16-acre dammed pond. A gradual drop in attendance rates led the Girl Scouts to abandon the eastern portion of the camp and reduce site maintenance in anticipation of selling the property.

Camp Timber Trails Today

Over the years, the Girl Scouts sold portions of the property to the Commonwealth to expand the adjacent Tolland State Forest, reducing its size from its original 1,500 acres to its current 417 acres. FDNE purchased these 417 acres in 2017. The site is bounded to the north, west, and south by state-owned forest, and to the east and southeast by Tunxis Hunting Club, which manages its forest for cottontail habitat, intermittently creating small to medium sized clearings for shrubland and young forest.

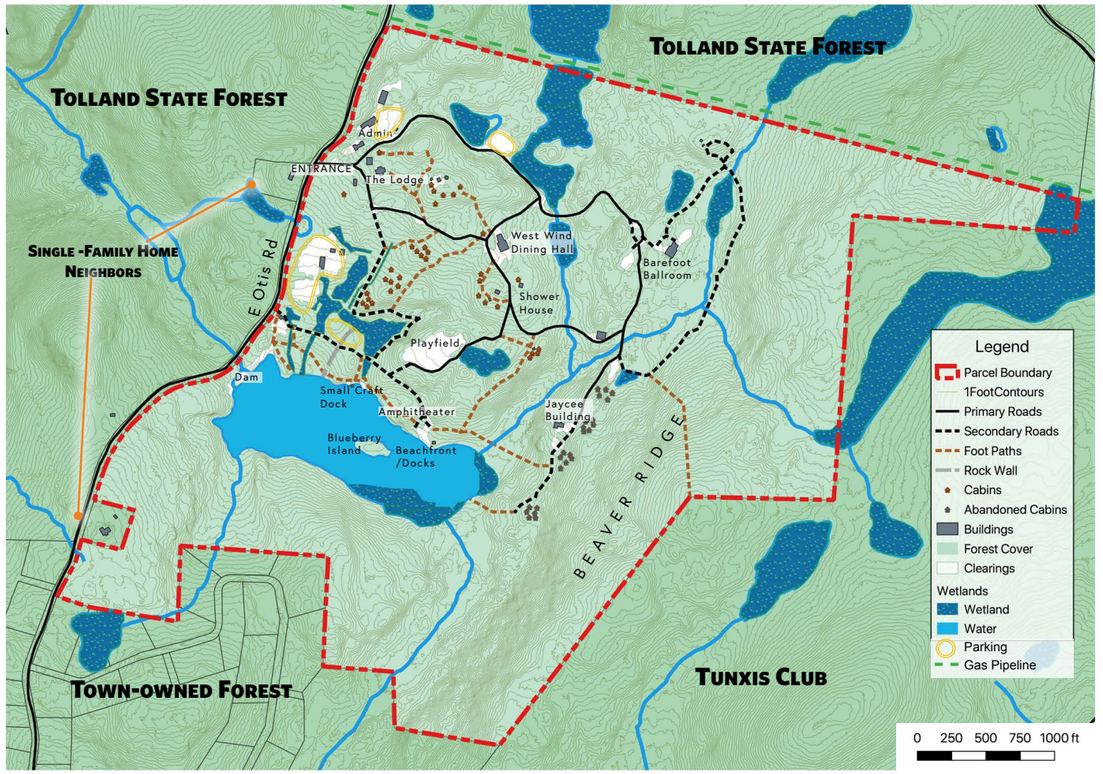
Five perennial streams flow onto CTT's forested landscape from the north, south, and east, and drain off the property to the west through a dam in "fair" condition, according to the Massachusetts DCR, at the west end of Ward's Pond. Two main networks of wetlands and streams on the site provide important ecological services, scenic value, and educational potential, but constrain potential new development and circulation patterns. The developed core is concentrated north of Ward's Pond, in the northwest corner of the parcel. From the periphery of the parcel moving inward, the topography slopes down toward the center drainage, creating a bowl-like landform. The soils at Camp Timber Trails are a well-drained, nutrient-poor, gravelly, sandy, glacial till with large rocks, boulders, and bedrock outcroppings.

East Otis Road bounds the parcel to the west. From a main entrance on East Otis Road, a driveway connects with a system of multiple in-roads and footpaths that create the skeleton of the camp's developed core, and provide access to its developed areas. This developed core includes ten clusters of cabins and main buildings like the West Wind Dining Hall, Lodge, Barefoot Ballroom, and Jaycee Building. The less-defined, secondary roads in the northeast corner of the developed core, indicated by dashed lines, are currently revegetating and would require repairs to become functional again. Gravity-fed septic systems connect to several clusters of cabins and the main buildings around the camp. Existing water and septic can serve a limit of approximately 280 people under Board of Health regulations; serving more than that would require meeting more stringent requirements under the DEP that would be difficult for this older septic system to meet. The use of porta-potties is planned for to accommodate large groups. Four abandoned cabin clusters along Beaver Ridge to the southeast may be refurbished to provide additional overnight accommodations.

Most of the property is mature, closed-canopy forest, with a few areas of young forest just north of the pond and a few clearings (in white) providing gathering and programming spaces. A large, central clearing known as the playfield provides the main programming space and performance center for CTT's largest group, the Unifier festival (1,000 to 1,500 people). It is also the main septic field. Parking is generally constrained to the northwest of the property. Parking generally occurs in front of buildings. The north gravel parking lot is the original parking area created for the campground and is situated closely between wetlands. A northeastern clearing accommodates overflow parking, and new mowed parking areas were recently cleared to provide additional overflow parking within 15' of newly delineated wetlands just north of the pond with permission from the Conservation Commission.

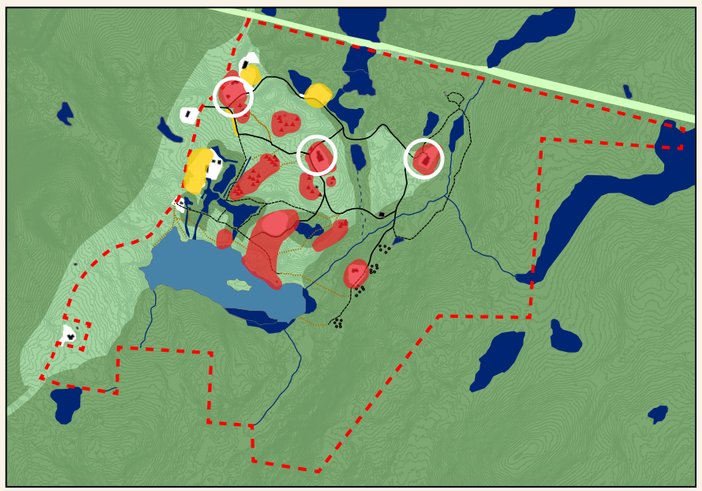
It is not always clear how one is meant to circulate through CTT. Its eroding roads made of native soils, and trails that are slowly growing in, are generally unmarked, and there are few signs or maps to orient visitors and indicate where other buildings and programming spaces are relative to their position. Multiple footpaths and one road provide access to the north side of Ward's Pond, one of the most scenic and beloved landscape features at Camp Timber Trails.

Existing Conditions



Site Use Patterns

Activity at Camp Timber Trails is generally constrained to the developed core. In red, the zones with the highest and most consistent use include cabin clusters, main buildings (white circles), clearings (white areas on Existing Conditions above), and two lake access points. Two parking areas (yellow areas) are close to wetlands, and hydrocarbon runoff here is a major concern, requiring long term solutions. Three main buildings (in the white circles) provide indoor and outdoor gathering areas, and both the Lodge and the West Wind Dining hall have commercial kitchens equipped to cook for large groups. A small beach with swimming docks in the east is the main lake access point for swimmers, with additional docks for small craft to the west. Most current woodland trails connect active areas at Camp Timber Trails, but the Girl Scouts used to maintain a network that circumnavigated the pond and explored Beaver Ridge.



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Context and Circulation

Getting to Tolland

Camp Timber Trails is located in the northwest region of Tolland, a town on the edge of the eastern Berkshires in Massachusetts along the Connecticut border. Many DNE members will be traveling from NYC, Boston, and Great Barrington, and it is easily accessed by Route 8 from the south (from New York) and northeast and west from Route 90 and MA-23 (from Boston, the Valley, and Great Barrington). Visitors enter CTT from East Otis Road which forms the camp's western border.

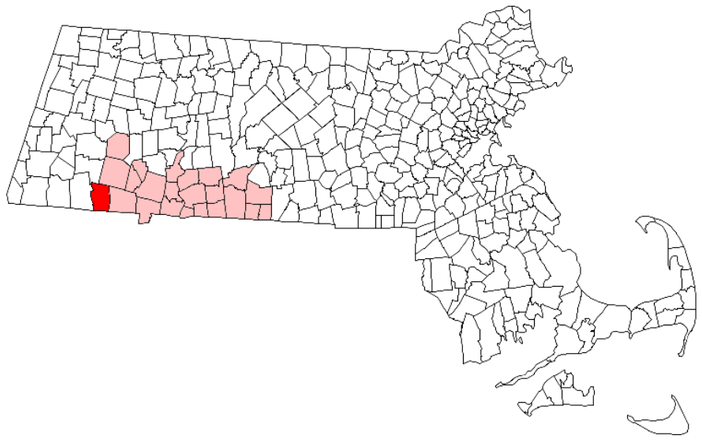
Many of the rural towns surrounding Tolland are predominately forested and sparsely developed, but Tolland is especially so. Tolland contains few amenities; it is mostly home to other campgrounds and low-density residential development for a population of about 500, 16 people per square mile, and a demographic of white middle to older-aged couples. To access groceries and gas, one would have to leave Tolland to visit the neighboring towns of Sandisfield to the east, which is closest, Otis to the north, which is also nearby, Blandford or Granville to the east, or Colebrook over the Connecticut border to the south. There are no nearby public transportation routes or trails, so most travel to CTT will be by automobiles.

Camp Neighbors

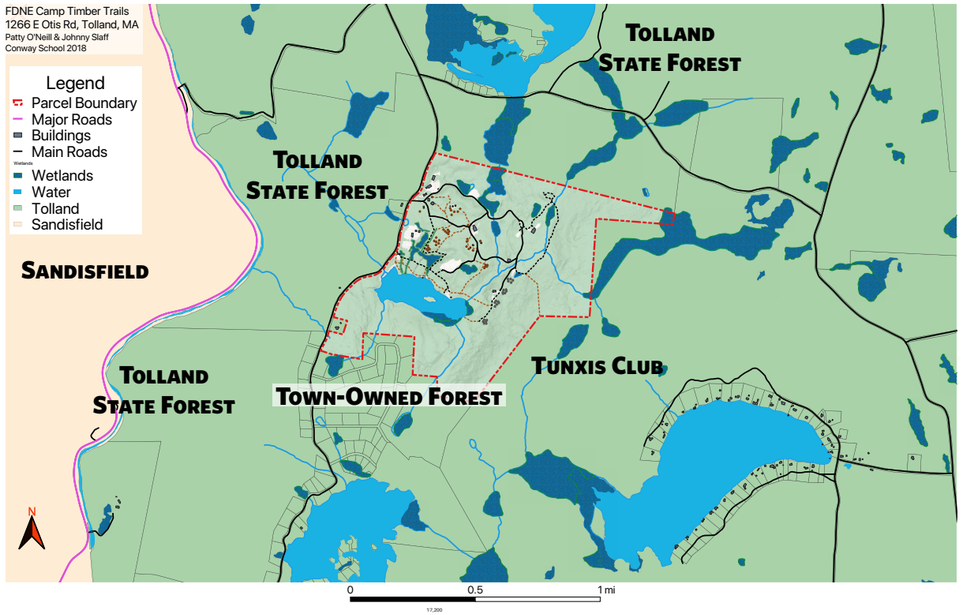
Neighboring Camp Timber Trails are two single-family homes to the west, Tolland State Forest to the north and west, and Tunxis Hunting Club to the east. The forest to the southwest of CTT is zoned for subdivisions, but the town has ownership of the land and it remains forested. Although Tolland is remote, CTT has received a few noise complaints during events held the 2017.

Implications

Because of the site's remote location, distance from most members, and lack of public transportation and forest trails near CTT, there will be pressure to site new parking lots to accommodate vehicle parking. FDNE has promised 1000 parking spaces to the HeARTbeat Collective to accommodate the Unifier festival and is actively clearing space on site to convert meadows for temporary parking. Increased traffic and the clearing of space to accommodate new parking on site may be detrimental to the forested character, wetland health, and forest contiguity, and may impact neighbor's views along East Otis Road if not properly sited, designed, and managed.



Neighborhood Map



Regional Map

Most visitors to Camp Timber Trails will be coming form far away, putting considerable pressure to site new parking areas for events.

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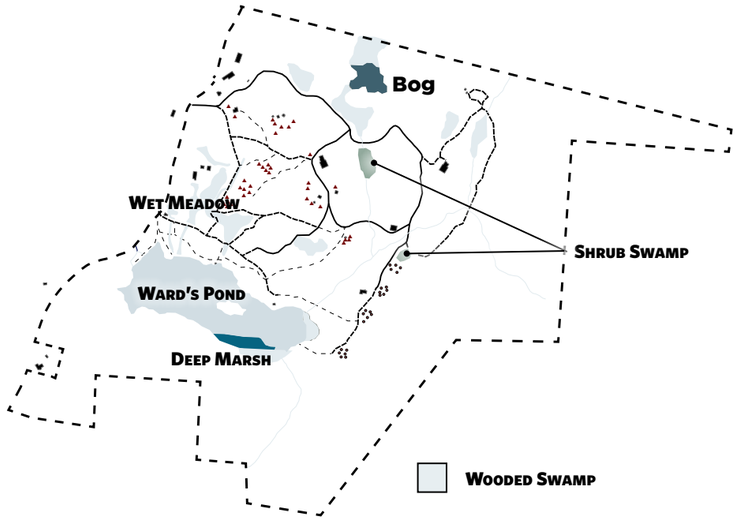
Landscape Character and Natural Communities

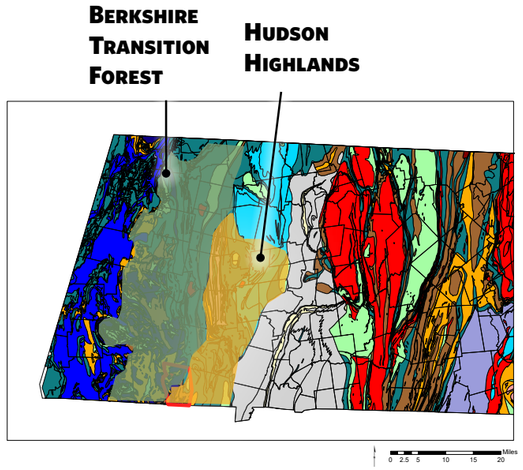
Introduction

Intact wetlands, streams, and wooded uplands surround and permeate Camp Timber Trails, providing habitat for wildlife and state-listed species, scenic value, and ecological services. Camp Timber Trail derives much of its scenic quality from its deeply forested and abundant nature characteristic of the Massachusetts' Berkshire mountains. Large granite boulders, stones, and exposed bedrock are scattered around the camp's hilly landscape; dark hemlock swamps full of moss accompany multiple rushing streams as they fill CTT's 16-acre pond. This picturesque landscape is rich with wildlife, and this beautiful scene is why people come from far away to commune with nature here. Natural community types are bolded.



Forests

The dominant forest type of the camp's uplands is a mix of **northern hardwood-hemlock-white pine Forest** in the higher, cooler elevations and **oak-hemlock-white pine forest** in the warmer, south-facing slopes. The forest type of CTT is characteristically sparse with few understory shrubs and herbaceous plants. American Beech dominants the earlier successional growth around camp's developed core; full-figured eastern hemlocks are present in dense stands and show no sign of the woody adelgid infestation common to so many hemlocks in the rest of northeast; yellow birch and hemlocks dominate near the wetlands while the paper birch occur occasionally around the uplands; old white pines red and white oak, black birch, and maple are all common throughout.



Camp Timber Trails distinct character is derived from a mix of the two ecoregions it lies between: the Berkshire Transition Forest and the Hudson Highlands.

Wetlands

CTT's array of wetland types vary in their ecological role/function and habitat provided, and together Camp Timber Trail's aesthetic and larger ecological value. **Ward's Pond**, the largest wetland on site, is a human-made pond created by damming what is now its western side. Most of the wetlands on site are **hemlock swamps**, here, fallen and decomposing trees create cavernous and moss-blanketed tip-up mound, providing habitat for amphibians, birds, insects, and mammals. A sunny **shrub swamp** lies between the West Wind Dining Hall and the Barefoot Ballroom, providing a sunny, shrub habitat that is uncommon on this parcel. A sunny **bog** hosts another unique suit of plants and insects; likely-colonized by spagnum moss which provides unique habitat for certain vegetation and wildlife, and with low-impact boardwalk access, could be one of the major ecological highlights at CTT. Spagnum, or peat bogs, take a long time to form and are sensitive to shifts in water chemistry. A **deep marsh** provides prime waterfowl habitat. A **wet meadow** community was recently identified during FDNE's wetlands delineation for parking meadows, and these are known to have an exceptional array of flowers with excellent habitat value for birds, insects, and small mammals. Maintaining water quality in the uplands and of these wetlands while highlighting, displaying, and celebrating their unique qualities will ensure CTT's landscape persists in its rugged and beautiful form.

Top Left: Hemlock-colonized stream
Top right: Red trillium, a species of special concern in Massachusetts.
Bottom: Hemlock Swamp

Soils

The underlying bedrock of granite, gneiss, phyllite, and mica schist s revealed by many many scattered boulders and stones around the property, and strongly influences the soil type. The soil is a mix of Lyman-Tunbridge, Peru-Marlow, and Pillsbury-Peacham-Wonsqueak combination. It is is extremely stony, well-drained, acidic fine sandy loam glacial till. Many agricultural and food crops will not grow easily here, but there are many native berries that can tolerate these conditions, such as lowbush blueberr. FDNE should refer to these natural community types for suitable plant species when making landscaping or agricultural decisions.

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Ecological Value and Forest Habitat

Across CTT, there are multiple types of forest habitat available. In and adjacent to the developed core, there is edge forest habitat which supports a number of species that cannot thrive in interior conditions. Similarly, interior conditions support species that cannot tolerate edge effects. Forest management can work with this gradient of interior to edge habitat by creating early successional habitat in and around the developed core where these effects are already present, while leaving all forest outside of CTT's developed core intact, because this forest serves as the buffer that allows nearby interior conditions to persist.

Edges & Interior, Young & Old

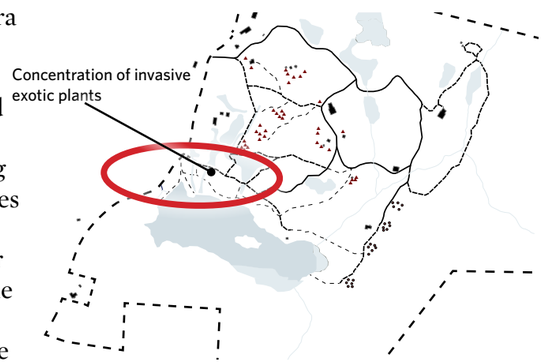
While most of the landscape is mature, closed-canopy forest, there are some younger, early succession forest stands comprising of American Beech and maple that occur around edges of clearings throughout the developed core. These younger stands likely began growing in after the Girl Scouts reduced overall landscape maintenance 10 years prior to FDNE's purchase of the property.

Being more fragmented by roads, buildings, clearings, and some early successional forest, the developed core's forest is categorized as edge forest habitat. On the southeastern and eastern periphery of the property near two streams' headwaters at the top of Beaver Ridge, the forest is categorized as deep interior forest because it joins adjacent town-owned forest and Tunxis Club forest to form a large patch with a core isolated form the edges.

Being a relatively undeveloped and heavily forested town, Tolland has more interior forest than many other more developed towns. But that could change if it starts to become more developed. CTT's location next to the hunting club forest, which is participating in forest age class diversification for cottontail habitat, which prefer early successional habitat, Tolland State forest and town-owned forest appears to offer CTT protection from surrounding development.

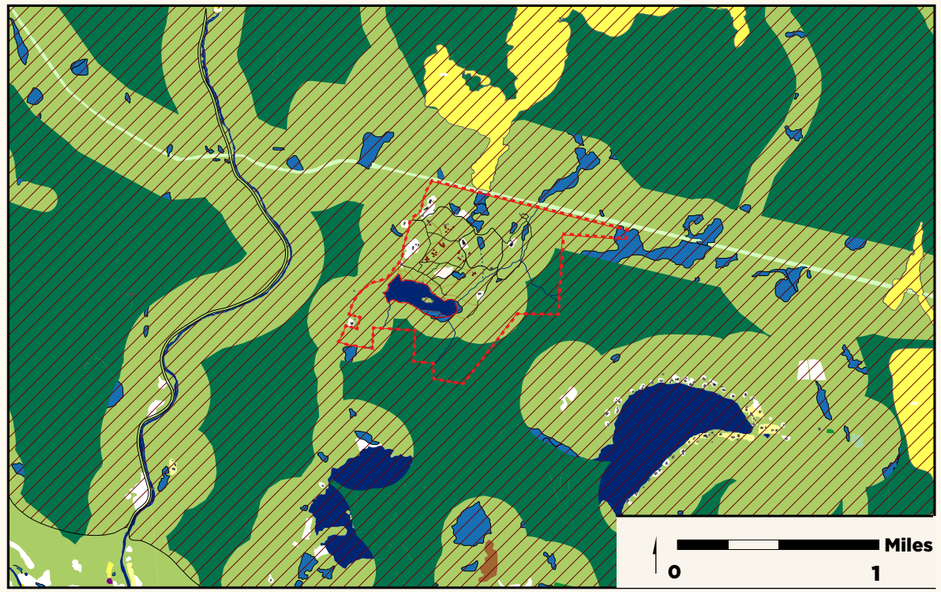
Invasive Plants Considerations

The invasive exotic plants Japanese barberry, multiflora rose, and garlic mustard were observed along the entrance of the Pond corridor and in lowland septic service corridor between the eastern row of cabins and the playfield. These species thrive in shade and areas that are frequently disturbed. Service vehicles entering along these corridors may have brought them in on tires or equipment, and disturbance of soil along the dirt corridor allowed them to establish. It is unclear how or to what extent these species could spread or change the character of CTT's existing natural communities over time, and FDNE may want to monitor how they behave at CTT to better inform decisions to manage them.



Removal methods, time, and energy will be part of that consideration, but so should potential habitat and uses of these plants should FDNE decide to live with them: The thorny, berry-producing Japanese barberry is known to provide excellent ticks habitat, but offers its fruit and cover are enjoyed by wildlife. Similarly, the white-flowering multiflora rose provides excellent cover and forage for wildlife in dense thickets and has not been linked to ticks. Garlic mustard can be eaten by humans, but doesn't appear to have much value for wildlife otherwise.

Ecological Value At Camp Timber Trails



Core Habitat

Core Habitat identifies specific areas necessary to promote the long-term persistence of rare species, other Species of Conservation Concern, exemplary natural communities, or intact ecosystems.

Critical Natural Landscape

Critical Natural Landscape (brown cross-hatch) complements Core Habitat and includes large natural Landscape Blocks that provide habitat for wide-ranging native species, support intact ecological processes, maintain connectivity among habitats, and enhance ecological resilience; they include buffering uplands around wetland, and aquatic Core Habitats to ensure their long-term integrity.

Interior Forest

Interior Forests are critically important for species sensitive to fragmentation, which is a concern around CTT because forestry, roads, and sparse residential development fragment many of Tolland's forests.

Edge Forest

Water

Gas Pipeline

The wetland complex north of Camp Timber Trails is categorized by BioMap2 as Core Habitat for a species of fish called the bridle shiner, a species of conservation concern by the Natural Heritage and Endangered Species Program. This Core Habitat ends where the gas pipelines crosses the wetland complex along the border of CTT. Because the CTT's wetland complex in this area consists of wooded swamps and a bog, it seems unlikely that the bridle shiner would find additional habitat south beyond its current range.

Camp Timber Trails and all of the surrounding property is categorized by BioMap2 as Critical Natural Landscape. Intact wetland buffers and interior forest buffered by the edge forest that surrounds Tolland's minimal development contribute to much of this region's ecological resilience.

Interior forests are present in Tolland and the surrounding Berkshire area to a high degree. In CTT, Beaver Ridge is an intact upland forest buffer that creates a narrow band of interior forest habitat to the southeast. Developing this area risks fragmenting it, so use and new infrastructure here should be carefully considered in cooperation with neighboring land uses in order to preserve interior forest where appropriate.

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Circulation and Accessibility

Rugged Conditions

The **primary roads** at Camp Timber Trails connect the entrance to parking areas, to hubs, and to event spaces throughout the developed core. They are made of native, compacted soil and are unpaved, and years of wear have caused the roads to erode, exposing large rocks that make it challenging for most vehicles to drive on safely. At certain times of the year, some areas of primary roads, particularly around the north parking lot and the Barefoot Ballroom, get very wet due to the drainage patterns of snow melt, shade, and proximity to wetlands, making them even more difficult to traverse.
These roads are able to accommodate large trucks, emergency vehicles, and RVs, and also serve as the primary circulation route for pedestrians.

Secondary roads connect from primary roads to cabins or abandoned areas of camp. Near wet areas and wetlands, these unpaved roads are muddy and re-vegetating due to excessive moisture from broken culverts and lack of maintenance. These are the only roads that connect ADA buildings to primary roads.

Trails connect cabins to hubs, and are barely distinguishable as they are not paved or marked, and look just like the rest of the forest. Trails tend to be shorter routes to hubs or clearings from cabins.

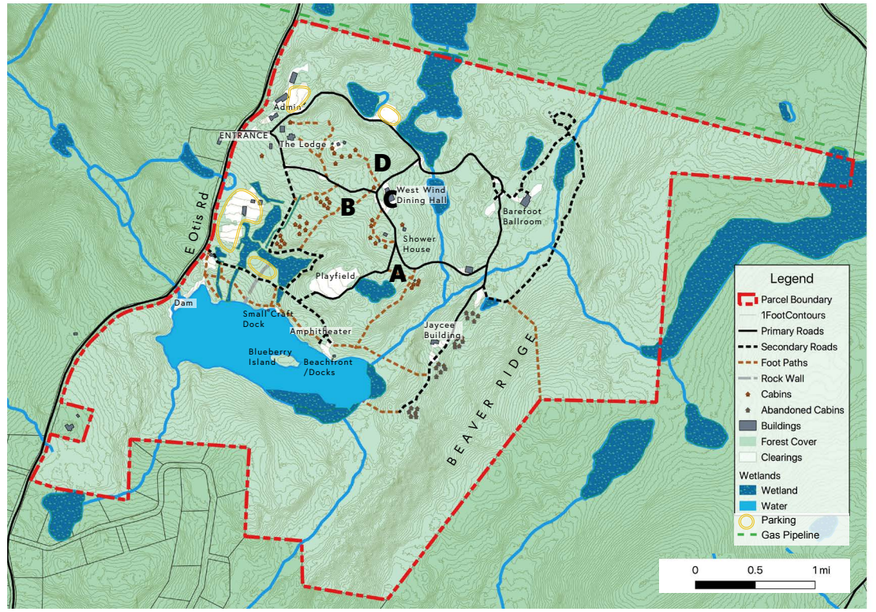
Parking areas are mowed vegetation with the exception of the north parking lot, which is surfaced with gravel. CTT receives volunteers to help work on site improvements, and most regular visitors tend to park directly in front of the buildings rather than use any of the parking lots. Parking lots largely serve to accommodate renter groups.

Effective Connections

In addition to braving rugged conditions of the various routes throughout camp, visitors must also travel long distances between parking areas, cabins, hubs, and clearings. Some visitors have reported getting lost in the woods and wetlands as they attempted to create new shortcuts.

ADA accessibility from parking lots to cabins is poor; the secondary roads that reach ADA cabins are in no shape to serve vehicles let alone mobility-challenged people. These ADA-accessible cabins are also the furthest cabins from event spaces and clearings.

Generally, once people park, they use the primary roads, secondary roads, and trails to get around camp; only primary roads can accommodate vehicles. The primary road leading from the West Wind Dining Hall down through the playfield where it connects to the secondary road to the eastern beach-front are considered the “main corridor” for pedestrians, especially for large groups. For a single, large group using the site, it may be that pedestrians will not need to share roads with vehicles, since most will be parked, (unless FDNE follows through an idea to have a shuttle circulate along the main corridor). It is unclear how vehicles will need to move through the site when multiple smaller groups share the site.



A) Main roads are eroding, exposing large stones.

B) Lesser-used roads are muddy with broken culverts.

C) Trails are difficult to discern from surrounding forest.

D) Guests park in front of buildings instead of parking lots.

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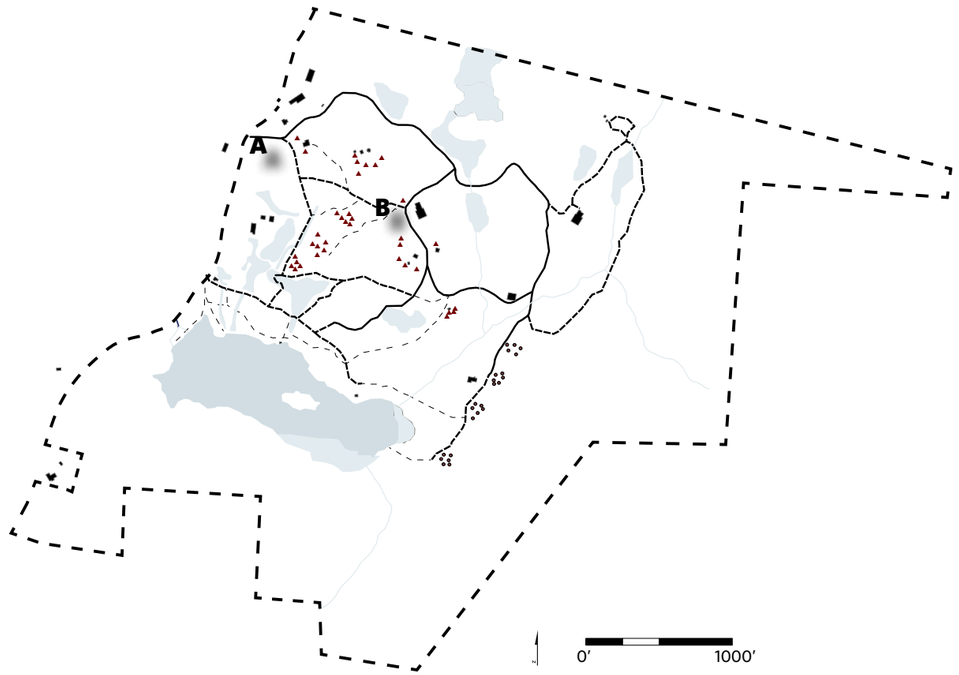
Wayfinding

A “Camp Timber Trails” sign clearly marks the entrance, visible from either direction on East Otis Road, but soon after entering the camp, one reaches a Y-intersection with no indication of what lies down either road or what the buildings directly ahead are. This lack of legibility and clarity is common around camp. There are some exceptions where building names are clearly listed and sightlines are open to destinations, but roads and paths are typically unmarked.

The lack of clear directional cues like clear sightlines to destinations, clear intersections, and directional signs makes wayfinding difficult, and could compound the challenges presented by the condition and accessibility of routes. Visitors may get lost, tire from walking more than necessary, and attempt to take ill-advised shortcuts through the forest or wetlands. This lack of clear wayfinding would be especially challenging in the dark during large events in a dark forest and for less able-bodied visitors to get around safely and efficiently on the rugged roads and trails whether there is a shuttle or not.



A) The first juncture after entering camp is confusing with no clear indication of a main route nor what sets this building apart from the rest.

B) The approach to one of the most central areas of camp, the West Wind Dining Hall and main corridor, is a surprise: sightlines to the this area are obscured from all along this primary road. If visitors could see a glimpse of this central area, they might have an easier time orienting themselves.

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the ConwaySchool
180 Pleasant St. | Suite 211 | Easthampton, MA 01027
413-369-4044
www.csld.edu

By Patty O'Neill and John Slaff

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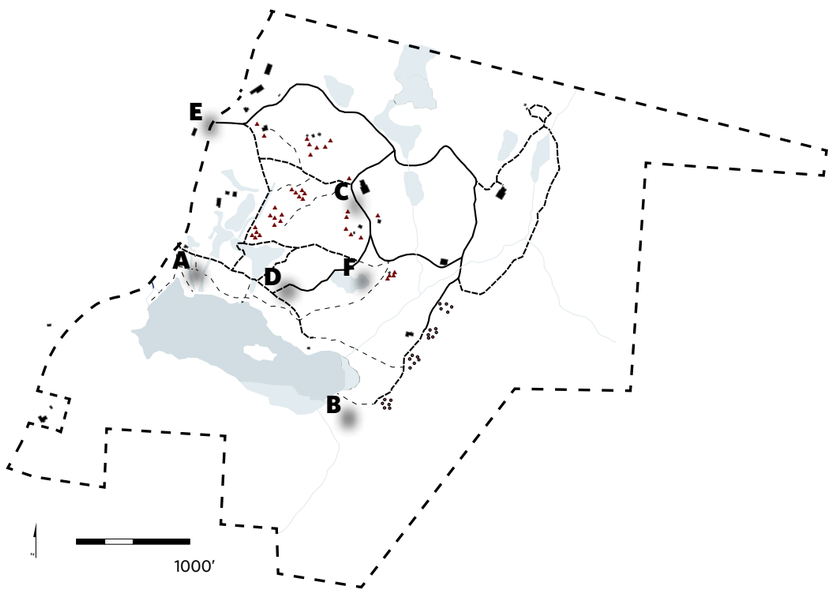
Camp Timber Trails, East Otis Rd. Tolland, MA
Spring 2018

Views & Aesthetics

Camp Timber Trails affords many opportunities to take in scenic views. **VIEWS TO THE WATER** tend to be the most cherished: the large pond is beloved from any angle, but especially its sunset-facing eastern end; the rushing streams that run over mossy boulders through dark hemlock forest are another excellent view. But as the dense hemlocks tend to concentrate along the water's edges and little tree maintenance occurred ten years prior to the sale of the property to FDNE, many of these scenic water views are hidden by trees.

Generally, most of the **CLEARINGS FEEL LIKE BIG ROOMS**; with hard edges defined by the abrupt transition from turf to tall, mature forest. There is little to no vegetation other than turf that may add visual interest to these open spaces. Entrances to these spaces are merely openings in the forest with no arrival experience but surprise that one made it out of the forest to a new space.

In a densely forested setting where few cabins or event spaces are visible to the next, a gradual change in vegetation leading up to a clearing that is visible before the arrival to a space could assist in wayfinding by opening sightlines and foreshadowing arrival. Prominence could be communicated visually to event spaces, community buildings, and cabins accordingly in the way landscaping consistently occurs around each. By capitalizing on the visual diversity inherent in the landscape, FDNE could increase visual interest, assist in wayfinding, and cultivate a sense of place by showcasing CTT's nature in varying arrangements with more nuanced landscape management.



A) The arrival to the pond near the dam from the clearing is framed by conifers, deciduous trees, and shrubs.

B) The scenic view from the narrow path overlooking the pond from the east is softened by young hemlocks, adding to the romantic, secretive vibe.

C) The arrival experience to the West Wind Dining Hall and main corridor is not defined in any way; landscaping could convey its prominence as a major event and community space and guide visitors to it and along the main corridor.

D) The amphitheater's dramatic recession overlooking the pond has potential to be very scenic, but hemlocks block water views and the flat arrival lacks visual interest.

E) The bare entrance to camp lacks visual interest and is misleading of the dynamic landscape which lies ahead.

F) The arrival to the playfield, a main event space, is dramatic, but abrupt turf-to-forest edges miss an opportunity to highlight the unique sense of place inherent in this landscape.

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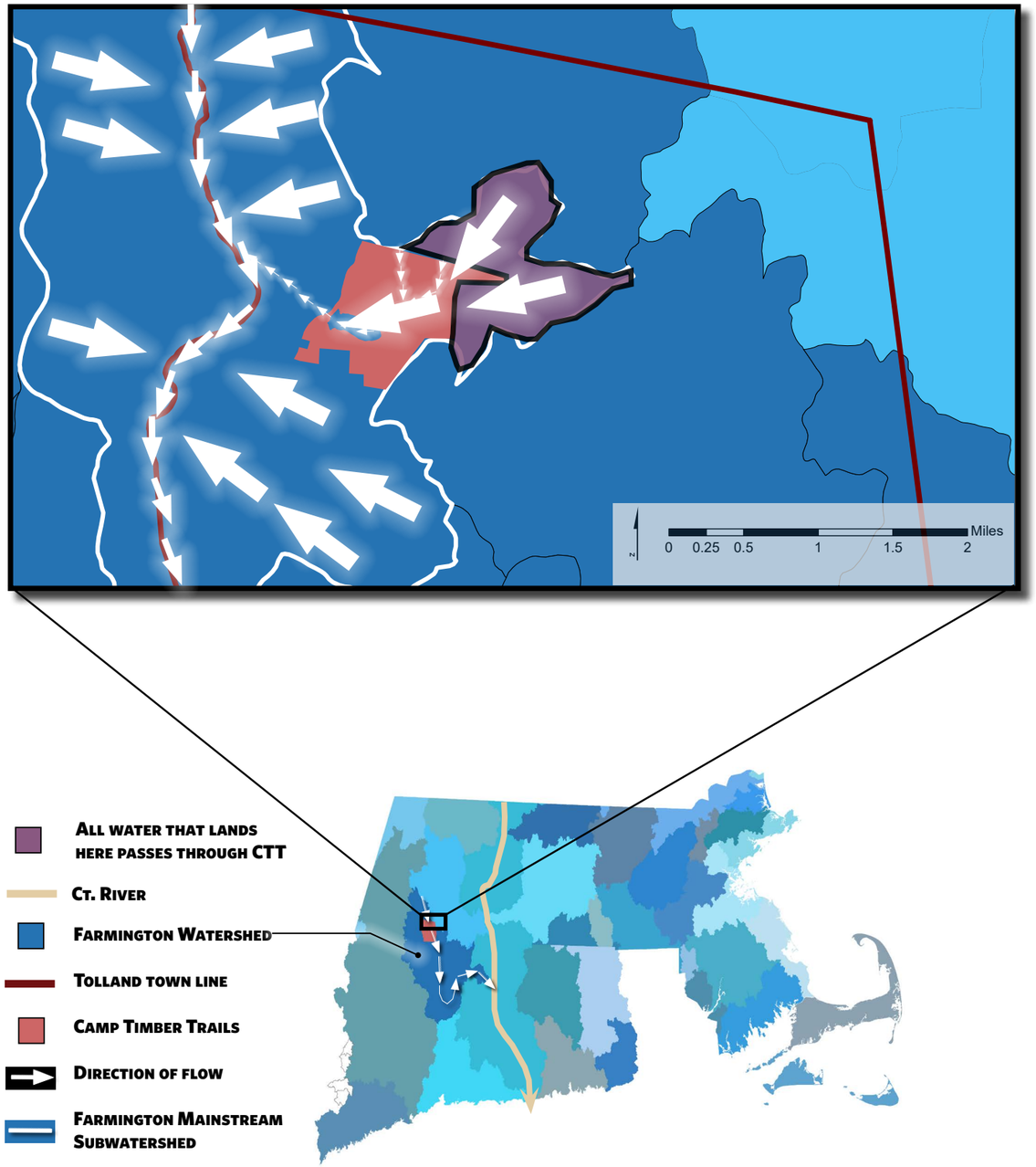
Watershed and Water Quality



The Farmington River

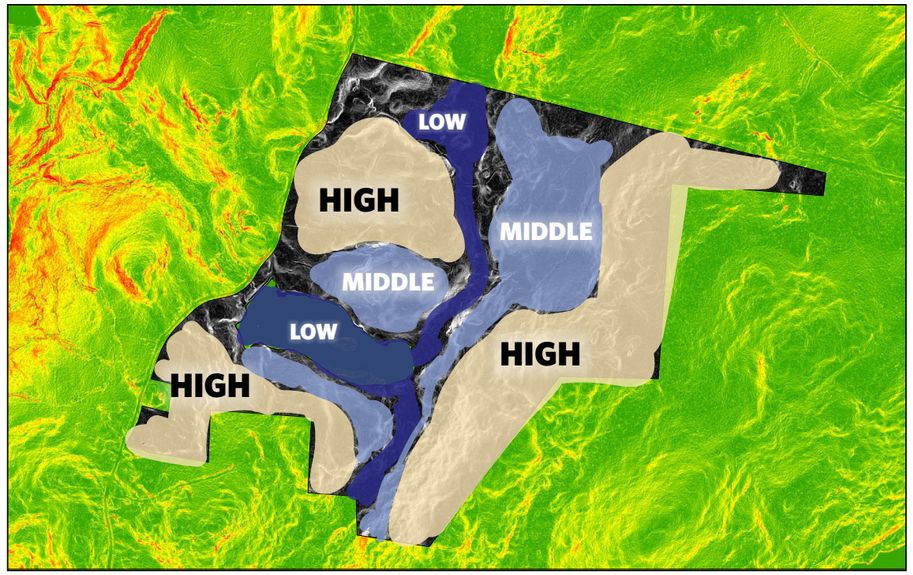
Camp Timber Trails is in the watershed of the Farmington River, a National Scenic River which is "impaired" in some of its lower portions where it flows through more densely-settled central Connecticut. Because of CTT's location at the top of the Farmington River watershed, it presents an opportunity for water quality restoration.

Watershed Restoration

Watershed restoration must begin at the top of a watershed, otherwise efforts to increase or maintain water quality could be offset or negated by harmful activity upstream. Because Tolland is at the top of the Farmington River watershed, impacts on water quality here have an effect on many miles of riverine habitat downstream.

The community represented by FDNE is committed to environmental stewardship. This responsibility is magnified by the fact that CTT is essentially a hydrologic gateway; more water than the amount that falls on CTT's land passes through it from nearby land. Because CTT forms this gateway, Camp Timber Trails has the opportunity help improve downstream water quality,.

Topography of Camp Timber Trails



Camp Timber Trails lies in a bowl-like land form over which more runoff travels than is created by CTT. Nearby land drains over CTT's ridges and through its wetlands.

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Site Drainage

Water at CTT

Intact wetlands, streams, and wooded uplands surround and permeate Camp Timber Trails, providing habitat for wildlife and state-listed species, scenic value, and ecological services. The ubiquitous wetlands, some undelineated, are beautiful, ecologically important, and restricting features at CTT.

On the scale at which Camp Timber Trails will be used, many activities threaten the wetlands. Sedimentation, physical degradation, temperature shifts due to riparian zone clearing, human waste, and hydrocarbon runoff are all major concerns. When Camp Timber Trails is in use, parking lots are full and hydrocarbons may leech into nearby wetlands. Managing parking, circulation, and infrastructure development within so much sensitive landscape will be major challenges.

Draining Away

In general, move water away from the most active and intensively-used zones. Parking areas represent some significant exceptions, where hydrocarbon runoff is likely entering and degrading the adjacent wetlands.

Limited Flat, Dry Space

Structures and active areas are at low risk for inundation and pooling; however there is little flat, dry space for new construction. Fitting additional parking, renting space, and programming spaces into this wet site is a major tension challenge for Camp Timber Trails.

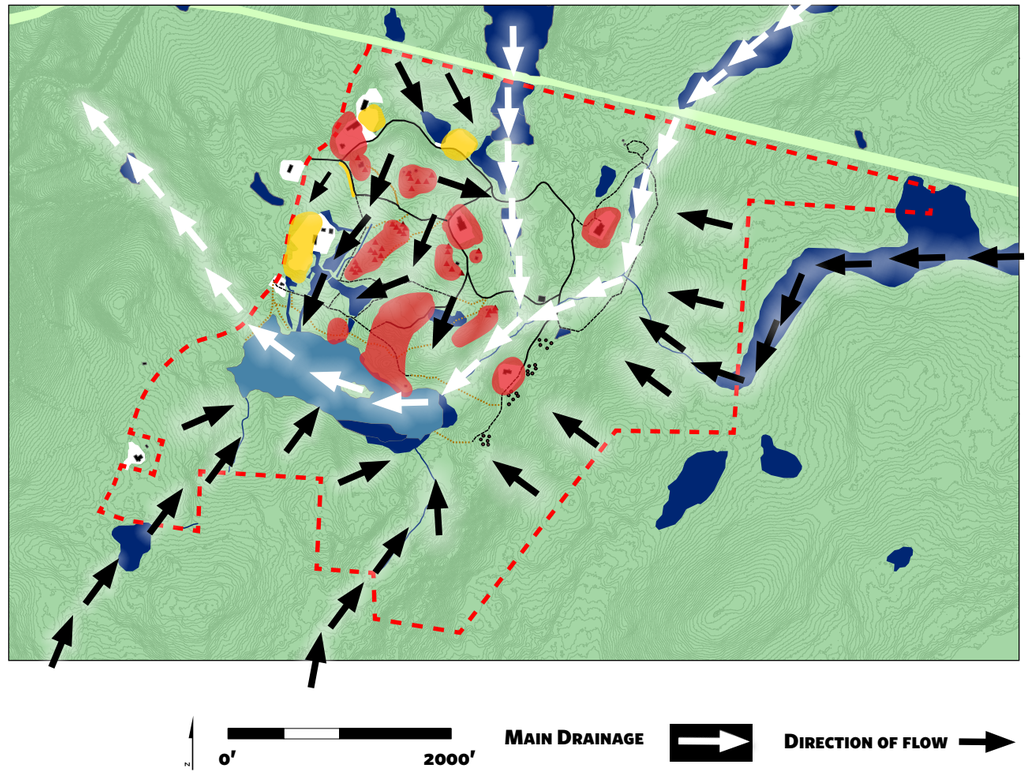
Wetland Protection

Among Camp Timber Trails' approximately 150-acre developed core, roughly 10 acres are wetlands. There are also likely many undelineated wetlands. Camp Timber Trails was designed and built before the passage of the Massachusetts Wetland Protection Act (WPA). It is unlikely that it would receive approval for construction in its current form due to multiple intrusions on wetland buffers and perennial stream resource areas. Adapting CTT's infrastructure to protect wetlands with respect to new legislation and modern wetland science should be a major goal of those developing and running CTT. Any improvements to CTT infrastructure could incorporate ways to mitigate existing impacts on wetlands. Any new construction will need to adhere to WPA standards.

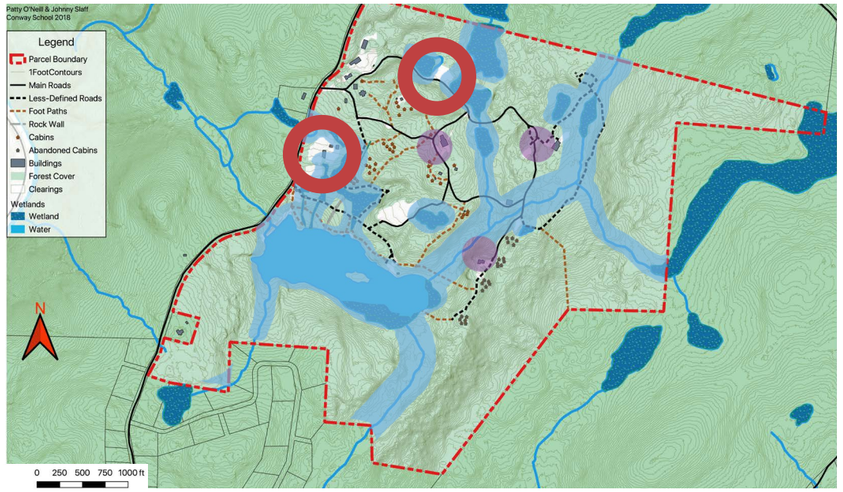
Runoff

Sediment and potentially contaminated runoff from nearby parking areas entering nearby wetlands and streams is a major concern. Sedimentation and runoff into these wetlands and streams from nearby parking areas raises major concerns around water quality. Site designs for active and parking areas an help mitigate the impacts of runoff on wetlands.

Drainage Patterns at Camp Timber Trails



Water Resource Buffers



In more than one area, water resource buffers, which are important for regulatory and ecological reasons, are infringed upon by parking areas. Without moving vehicles to other areas, or creating catchment, infiltration, and filtration systems like bioswales and retention ponds, water quality and wetland habitat quality will likely be degraded. For more information. There are also multiple wellhead protection areas at CTT (in magenta), and all parking and development should occur outside of these zones.

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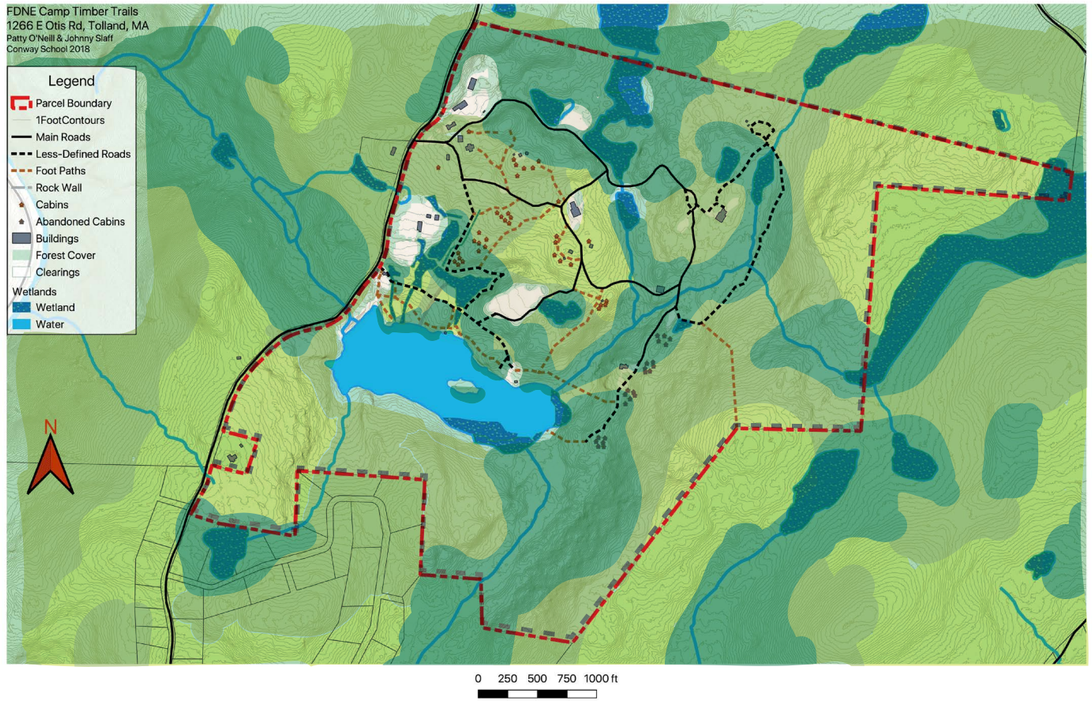
Microclimate Analysis: Forest Cover and Slope Aspect

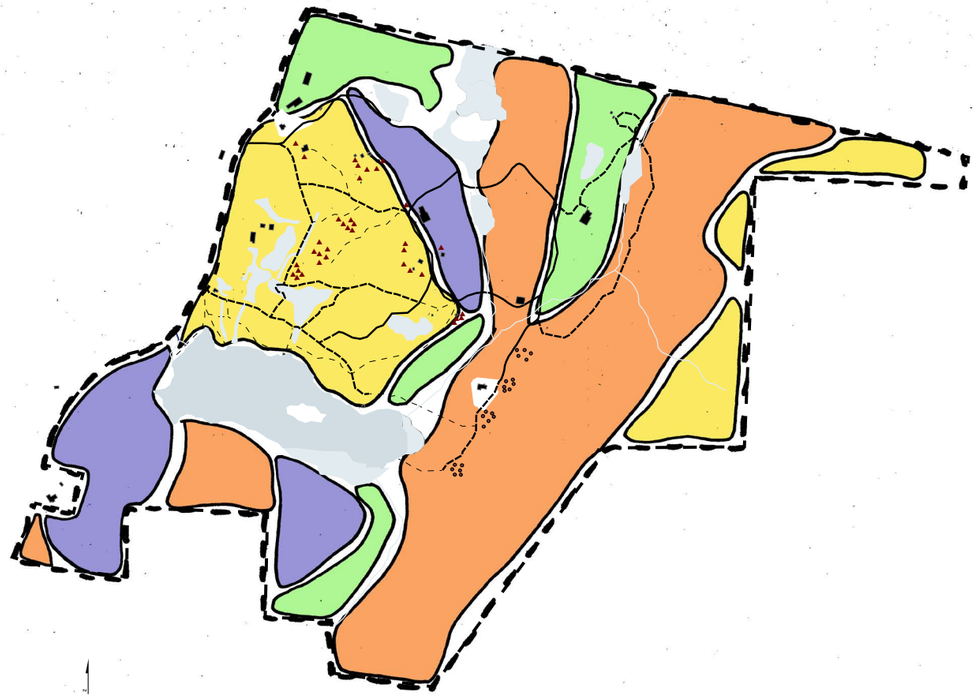
Determining Site Suitability

FDNE intends to further develop CTT, and the various microclimates across the parcel will be appropriate for different uses. Although climate is largely determined on the regional level, microclimates with varying sunlight, temperatures, wind exposures, moisture, and humidity are site specific. For example, a coniferous forest on a northern slope is cold, dark, and harsh in the winter, but may feel like a cool respite from the heat during the hotter summer months. A deciduous, south-facing slope is shaded in the summer and warmed by the sun in the winter. Looking at the forest cover type and the aspect of the slopes at CTT can provide a rough estimate of microclimatic conditions, but a closer site assessment of microclimates is recommended.



Forest Cover

Coniferous-dominant forests tend to be heavily shaded, darker, wetter (particularly at CTT), cooler, and protected from wind exposure.
Deciduous-dominant forests tend to be sunny and warm in winter after leaves drop, and shady in the summer.
A more even **mix of deciduous and conifer forest** will have more variability and must be evaluated on a site specific basis.
Unforested areas will typically be warmer year-round and more exposed to seasonal winds.



Slope Aspect

South-Facing Slopes (yellow) have the greatest existing and/or potential exposure to sunlight throughout the day and year. Ample sunlight would be suitable for many flowering and fruiting plants. They will likely receive cool southern summer breezes and be sheltered from northeastern winter winds. Therefore, these areas would be ideal for year-round habitation and passive solar technologies.

North-Facing Slopes (Purple) are least suitable for year-round habitation as they receive the least amount of sunlight throughout the day and year and face northwestern winter winds. Their lack of sunlight is less likely to support fruiting and flowering plant species. In the winter, these areas are likely to stay cold and would require a greater amount of energy inputs to be habitable.

East-Facing Slopes (Green) receive the less-intense morning sun. In the winter, this aspect will warm earlier and be buffered from cold northwestern winter winds. In the summer, this aspect may be cooler as it will not receive the most intense sunlight of the day, and may receive cool southern breezes.
West-Facing Slopes (Orange) receive the more intense afternoon sun which can lead to overheating in the summer and swing months. This may be ideal for sun-loving plants like meadows and wet meadows and may be comfortable in winter. It may also be exposed to cold northwestern winter winds and sometimes cooled by southern summer breezes.

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Site Suitability Plan

Heartland

This area would be most suitable for more development with minimal impact to ecosystem functions.

South and west-facing slopes will be temperate year-round, protected from northwest winter winds and receive cool southern summer breezes off the pond. These slopes are ideal for passive solar buildings. Maintaining a mostly deciduous canopy will allow for good air flow and shade in summer and a sunny exposure in winter. Fruiting and flowering plants would also do well here.

The area near the main entrance of the heartland may be most suitable for permanent parking because it is central to core active areas, near the main road, dry, and outside wetland buffers, and flat, which makes it easier to site ADA paths. Additionally, this area could be developed as a sunny welcome area and flexible space and highlight the wet meadow community here.

Denser development within the heartland preserves open space elsewhere on the property: Cabin clusters could eventually take on a neighborhood pattern of development along the main corridor road. Tent platforms could be sited nearby. Edges of the heartland could transition to gardens or forest that incorporate trails or boardwalks near the wetland buffers.

Entrance Gardens

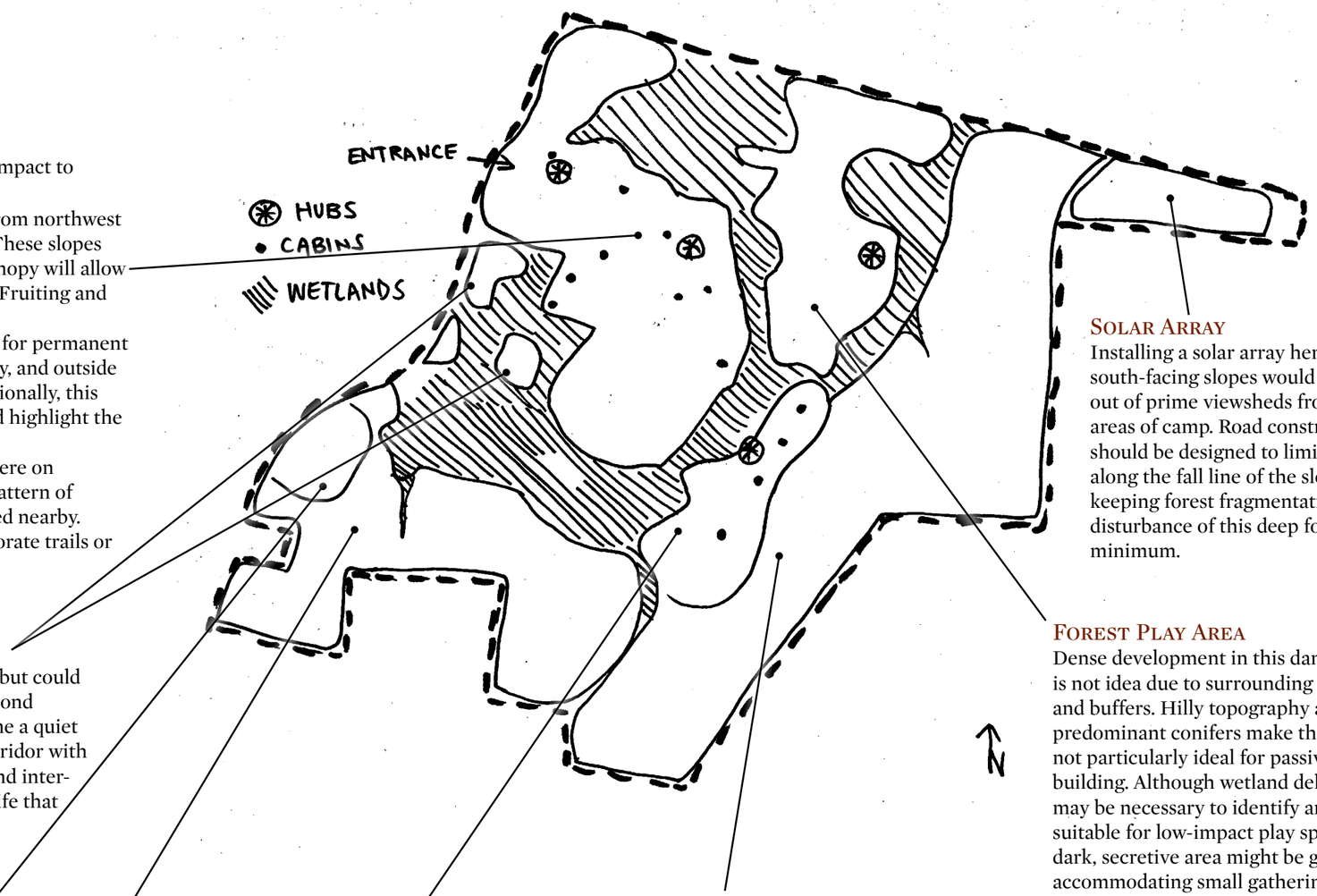
These wet areas surrounded by wetlands are not ideal for development but could highlight the wet meadow community with an entrance garden to the pond corridor. The new clearing farther along the pond corridor could become a quiet refuge garden tucked away from the more active playfield and main corridor with scenic views to the water. Maintaining open, early successional forest and inter-planting with fruiting and flowering plants could be beneficial for wildlife that prefer edge habitats.

Overflow parking

An area near the main road would be suitable for reinforced turf parking, which is durable and reduces runoff. This area is far outside of wetland buffers and the active core of camp where it will be out of sight. A privacy buffer should remain around neighbors' property.

Summer Homes

These northeast-facing, deciduous-forested slopes will be cool and shady in summer and fairly cold in winter despite some winter sun exposure, making them mostly unsuitable for passive solar buildings. It would require high energy inputs to make them habitable year-round. If summer homes were sited here, they would have shaded views to the pond on the quieter side of the property closest to the main road and be far outside of wetland buffers. However, siting buildings here may strongly impair the scenic and remote views enjoyed from the other side of camp.



Sunset View

Once refurbished, the Jaycee building and many cabin clusters within this area have the potential to accommodate large parties and weddings. West-facing slopes could be hot in the summer sun and cold in winter due to northwest winter winds, making them unsuitable for year-round habitation and passive solar buildings. This area is far from other hubs and at the edge of undeveloped forest, and the existing, shady hemlock tree cover may add to privacy. Excellent sunset views of the pond overlooking Blueberry Island and breezes off the pond could make this a special spot for reflection and romance.

Beaver Ridge

The northwest-facing slopes are highly unsuitable for year-round habitation and passive solar building as they receive the brunt of northwest winter winds. In summer, this undeveloped, forested area may receive some cool southern breezes and have scenic views overlooking the rest of camp; trails would likely be suitable here. Sustainable timber harvesting may be a suitable option if care is given to prevent erosion on slopes; harvesting would have to be weighed against any desire to maintaining valuable wildlife area with increasingly uncommon interior forest.

Solar Array

Installing a solar array here on south-facing slopes would keep it out of prime viewsheds from active areas of camp. Road construction should be designed to limit erosion along the fall line of the slope while keeping forest fragmentation and disturbance of this deep forest to a minimum.

Forest Play Area

Dense development in this damp area is not idea due to surrounding wetlands and buffers. Hilly topography and predominant conifers make this area not particularly ideal for passive solar building. Although wetland delineation may be necessary to identify areas suitable for low-impact play spaces, this dark, secretive area might be great for accommodating small gathering areas, trails, boardwalks, and observation points to wetlands. Drum circles may enjoy meeting where the streams converge, and the hilly, rocky, lower-lying topography may offer some measure of noise absorption, a benefit to neighbors. These kinds of low-impact uses could also serve as a buffer to the deeper interior forest to the east.

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Landscape Master Plan: Introduction

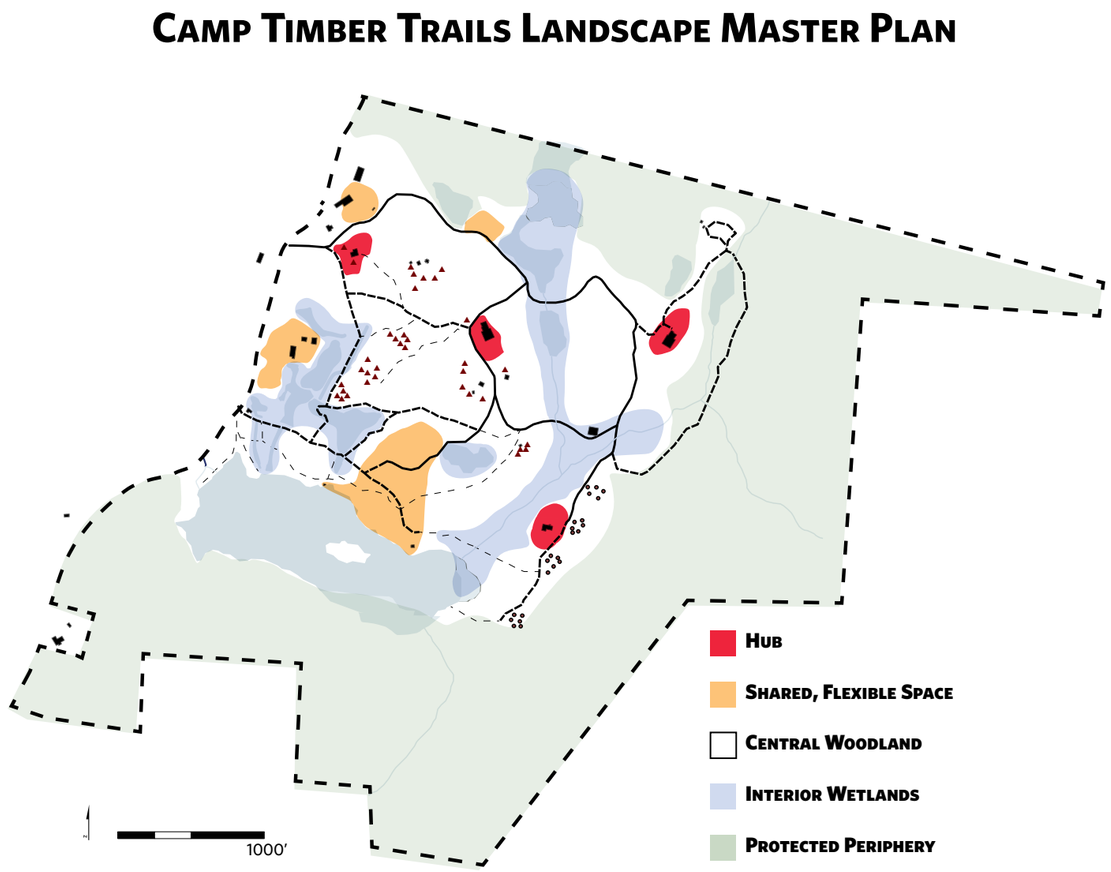
Overview

Camp Timber Trails was originally designed for one group of about 250 Girl Scouts. However, CTT plans to host groups of up to 1500 people, and will likely host multiple groups at the same time. Friends of Dance New England seeks a master plan that improves the ability of the landscape to accommodate these scenarios. If group sizes increase and CTT is consistently rented, there must eventually be a trade off between the rural character of this site and its ability to host large groups. The carrying capacity of Camp Tiber Trails will likely come down to an aesthetic decision about character, as opposed to a decision about how much ecosystem degradation is acceptable for a certain level of use.

This master plan assigns areas within Camp Timber Trails to one of five zones based primarily on the current layout and use of CTT's developed core. In order to minimize environmental impact and manage the land efficiently, this plan proposes four **Hubs** that concentrate activity and programming into distinct areas. **Hubs** are already well-suited to group programming, and all currently connect to what this plan proposes as **Shared, Flexible, spaces.** The Shared spaces are currently cleared areas and lake access zones, and should be available to all groups renting CTT because they can accommodate large groups and outdoor activities. Boardwalks and bridges will be necessary to sustainably and efficiently circulate groups through this landscape, particularly between Hubs and Shared spaces. Boardwalks will provide universal low-impact access to ecologically valuable areas, creating educational opportunities and highlighting the wetlands' beauty without degrading their ecological function. With the exception of these boardwalks and bridges, **Interior Wetlands** should be free of development or human activity. In a **Central Woodland**, some forms of development are permitted such as clustered cabins and clearings for tents. However, with the exception of new photovoltaics, the **Protected Periphery** should remain undeveloped and relatively undisturbed.

Concentrated use

Areas designated as Hubs have a few important features that make them suitable for group programming. Hubs are surrounded by cabins, or have areas around them that could support overnight accommodations like cleared spaces for tenting. Main buildings in each Hub have enough interior space and cleared outside areas to serve groups between 40 (Jaycee building, The Lodge) and 180 (West Wind, Barefoot Ballroom). The West Wind and Lodge Hubs have commercial kitchens, and the Jaycee and Barefoot Ballroom buildings could both accommodate them. Because Hubs all have potential overnight accommodations nearby, and they could all have kitchens equipped to cook for groups, they would serve as excellent independent centers for group programming. Common gathering spaces for all user groups, regardless of the group they are a part of, serve as community building and place-making spaces.



Master Plan at a Glance

Hub
(Red)

- Two large capacity hubs and two small-medium capacity hubs for concentrated use
- Overnight Accommodations
- ADA accessible paths
- Vehicle access
- Lowest ecological integrity, highest use

Shared, Flexible Spaces
(Yellow)

- Southernmost shared space: pond access in south, large clearing in north
- Remaining three shared spaces are clearings
- Generally lower habitat and conservation value due to human disturbance
- Suits the diverse needs of many groups
- ABA paths throughout and to hubs

Central Woodland
(White)

- Interstitial woodland among developed core
- Interior forest habitat with moderate level of human use
- Lower conservation and habitat value
- Some development or clearing may be appropriate for new programming space or productive landscape

Interior Wetlands
(Blue)

- Two main networks on east and west side of developed core
- High conservation value
- Highly sensitive
- Development limited to ABA boardwalks and observation decks
- Ecological and scenic highlight

Protected Periphery
(Green)

- Upland forest Envelops developed core
- High conservation value
- Sensitive to fragmentation and edge effects
- Mostly protected from new development
- Potential clearings for new photovoltaics
- Semi-Primitive Trails

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Landscape Master Plan: Hubs

Hubs

Overview

Consistent treatments for paths, signs, edges, and vegetation around buildings would help create a sense of place and unify the aesthetic of these areas. Formal landscape details such as ornamental edges around entrances signify that these are Central zones. Although not legally necessary, paths here should meet Architectural Barriers Act standards and accommodate small emergency vehicles. See path typologies for more specifics on path design in the Hubs. While landscape designs should be tailored to fit these sites' specific conditions, they should use showcase edges and seek to anchor buildings in the landscape. situate buildings in the landscape using similar combinations of native plants. The same approach should apply to all structures at Camp Timber Trails, with planted areas around cabins and secondary buildings having a simpler plant palette and low maintenance plants (primarily shrubs) to signify that these are not the Central programming area. Hubs should also share similar outdoor lighting, furniture, and wayfinding devices. This will help unify the character and aesthetic of Camp Timber Trails and ensure that different Hubs are consistently read in the landscape as centers for activity and programming. This is particularly important from a safety standpoint, because people (especially children) who may become lost must be able to recognize the most active areas intuitively, and in compromised conditions, such as at night or in the rain.

Ward's Pond is possibly the most beautiful landscape feature at CTT and should be open to all groups

The West Wind Dining Hall is the best-equipped building at CTT for hosting large groups. It has the largest interior space and kitchen, and the most cleared outdoor areas. It's also the most Central hub and has many cabins and potential tenting areas nearby. When large groups are at CTT, this often serves as one of the major cores.

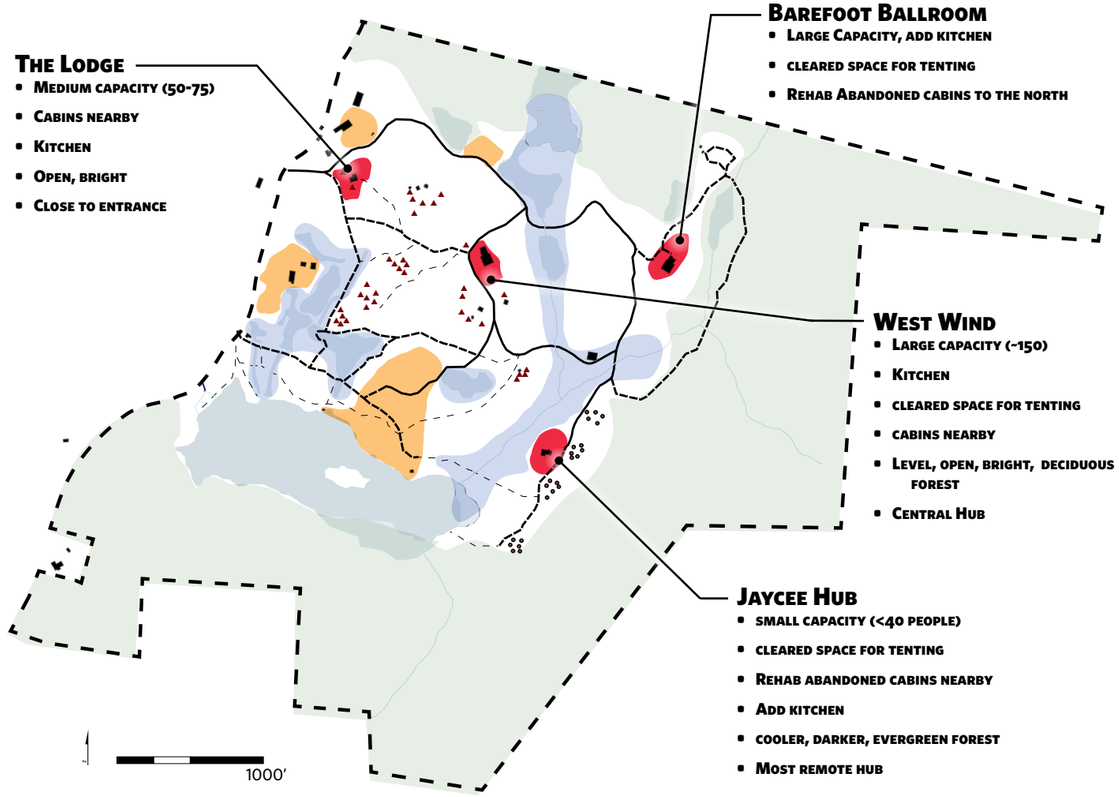
Vehicle Access

Because Hubs are Central zones for groups, vehicle access to these areas is an important consideration for transportation of equipment, utilities, supplies, and people. Trucks access Hubs via existing roads. Currently, utility and delivery trucks access the West Wind, Barefoot Ballroom, and Jaycee Hubs using a combination of routes. To the extent possible, FDNE should route all utility and delivery trucks on one of the routes instead of using all of them. This will consolidate potential sources of hydrocarbon runoff (vehicles).

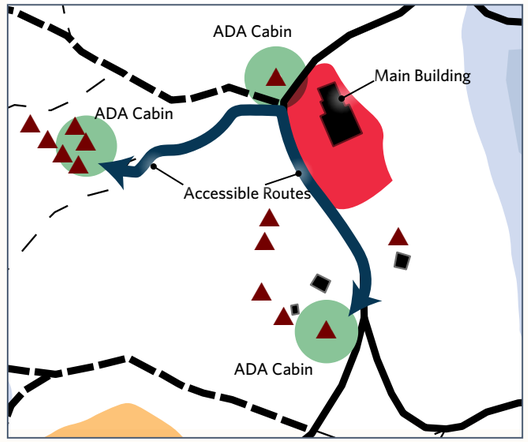
Universal Access

This plan recommends the use of universally accessible trails and architectural standards within Hubs. Planning/designing for universal access within Hubs will accommodate a broader range of users, hopefully making CTT more marketable.

Camp Timber Trails Hubs



Universal Access: Spotlight on West Wind



Retrofitting buildings to meet ADA standards can be expensive and cost may prohibit CTT from creating all universally accessible cabins. Around each hub, 2-3 nearby cabins should meet ADA standards. ADA cabins should generally be as close to programming centers as possible. However there should still be some cabins available those with disabilities who wish to experience the solitude and serenity of the of Camp Timber Trails' woods. If ABA paths (blue) connected ADA cabins (green) to the West Wind Dining Hall, the entire Hub could be universally accessible, accommodating a wider range of user groups. Note that this is an illustration of one possibility.

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Landscape Master Plan: Shared Spaces

Shared, Flexible Spaces

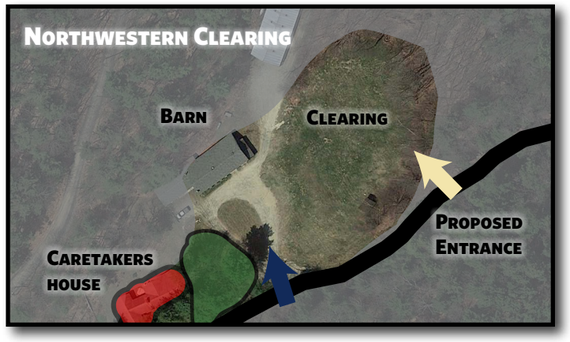
Overview

The Shared spaces should not be designed or haped specifically to one visiting group's neds and desires. Instead, they should remain flexible to accommodate a diverse set of needs. Designs that suggest permanant changes to these areas that might limit another group's use of the space should be approached with careful consideration. Several existing Shared spaces are either close to wetlands or have entrances that route people close to wetlands. Some of these areas will experience heavy use, and this demands an extra level of precaution in landscape, road, and path design. Permenant swales, retention ponds, check dams, and others measures to slow, infiltrate, and filter water should be built between regularly-used areas and wetlands to protect them from sedimentation and contamination.

Details

Five outdoor spaces on campus could be modified to better accommodate use by different groups while minimizing environmental impact.

Northwestern clearing: This 1.25-acre clearing abuts the camp caretaker's house (in red), and includes a barn, an adjacent small administrative office and an adjacent open space. A current stand of trees and vegetation (in green, above) should remain to buffer the aretaker's house from the activity of and the entrance to (dark blue arrow) the Shared space. Moving the entrance away from the director's house (tan arrow) and increasing the size and density of the vegetated buffer would

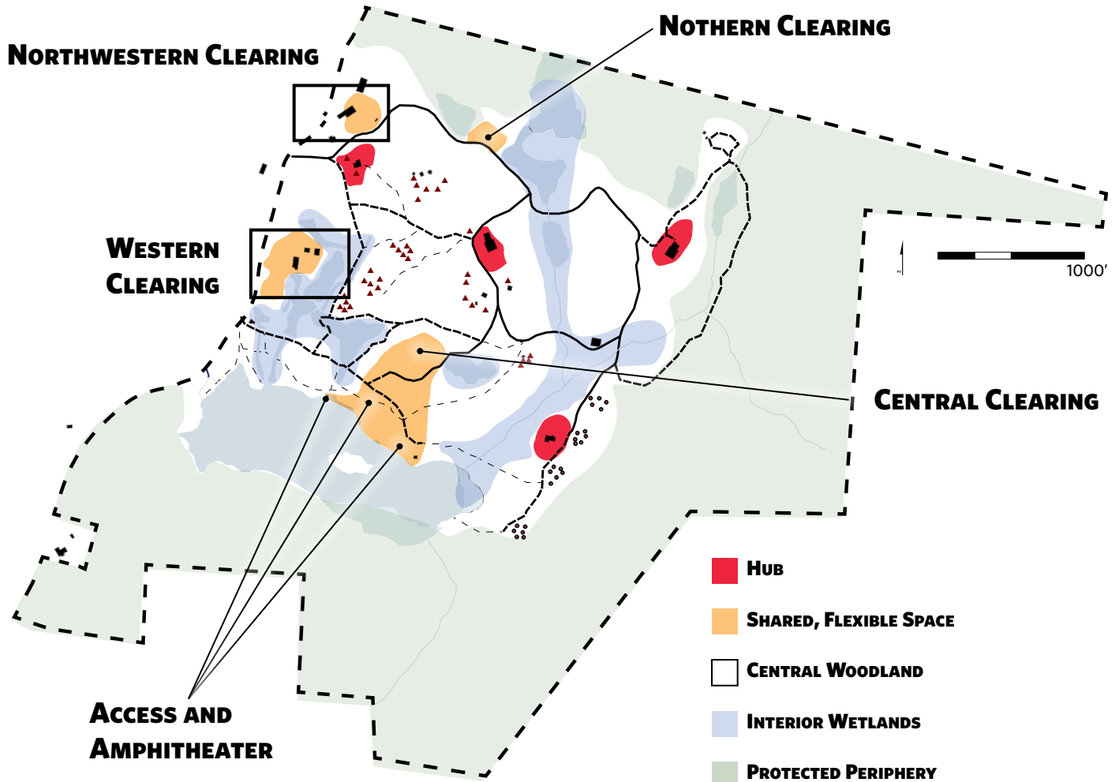


screen activities nearby and create a sense of privacy for the director's house. All wetland buffers should be respected when moving the entrance to this clearing.

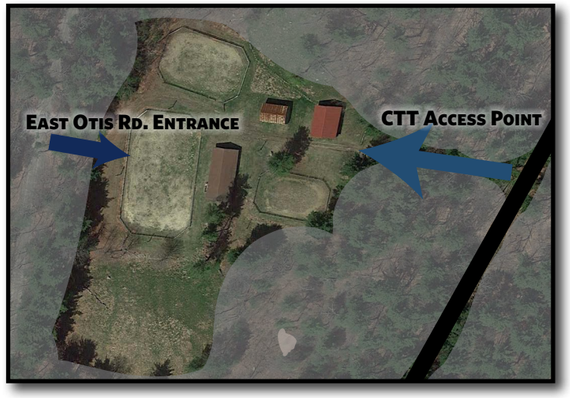
Western clearing: This 2.75-acre clearing includes two smaller outbuildings. The barn in the center was recently removed. Remaining buildings require repairs to be suitable for commercial or personal use, although group programming and parking are both possible in adjacent fields. Much of this area is either in or near regulatory wetland buffers and will require unoff catchment and treatment systems to ensure that contaminated run off does not enter the wetlands, especially if parking continues here. Directly north of this area, a cleared space could serve as overflow parking. It is fairly well-suited for parking as it is along the road and a somewhat dry site.

In the northwestern clearing, this barn could potentially accommodate group programming.

Camp Timber Trails Shared Spaces



Western Clearing



Above: Standing near the entrance from the road, this photo shows the access point from the camp between stables (since removed) and outbuildings. Below: an interesting rock formation nearby could become accent on an existing trail.

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www.csld.edu

By Patty O'Neill and John Slaff

Landscape Master Plan: Shared Spaces

Shared, Flexible Spaces (cont.)

Northern clearing. Like the Western clearing, this .8-acre clearing requires similar caution around runnoff, and could be used for both group programming and parking, although parking here should be avoided if possible. Its also close to a unique bog ecosystem on CTT's property and could be an access point for it in the future.

Central clearing. A stage for the 3-day music and arts festival called Unifier permentantly stands on the northeastern edge of this flat, 2-acre clearing. As Camp Timber Trails' largest, flat, open, cleared area, it could support a wide range of activities and programming. It currently provides the main access route to the lake. FDNE should consider moving vehicle routes away from wetlands. Either re-route vehicles on existing roads south of the clearing, or create new road access to this area away from wetlands

Lake Access Points and amphitheater. This area includes two lake access points, docks, a beach primarily used for swimming in the east, and docks for small crafts in the west. It also includes the amphitheater (tan). To prevent erosion and maintain the ecological integrity of the pond, clearing is not recommended in this area. However, selective tree removal to open up views to water is permitted if it is possible to leave a thick shrub/understory layer to maintain some habitat and prevent erosion. All other riparian management should minimize interventions and leave all riparian vegetation in place. The lake access points should remain open to all groups during their stay. However, granting temporary, exclusive access to one or more groups at a time might improve the experience of users as these areas may become impractical for certain programming needs with two groups, when too crowded, or with small children present. Lake access for swimming and boating should be restricted to docks and existing beaches (blue). People should be discouraged from extending the lake access into red areas. When developing other lake access areas for passive or active use, interventions should be minimal.

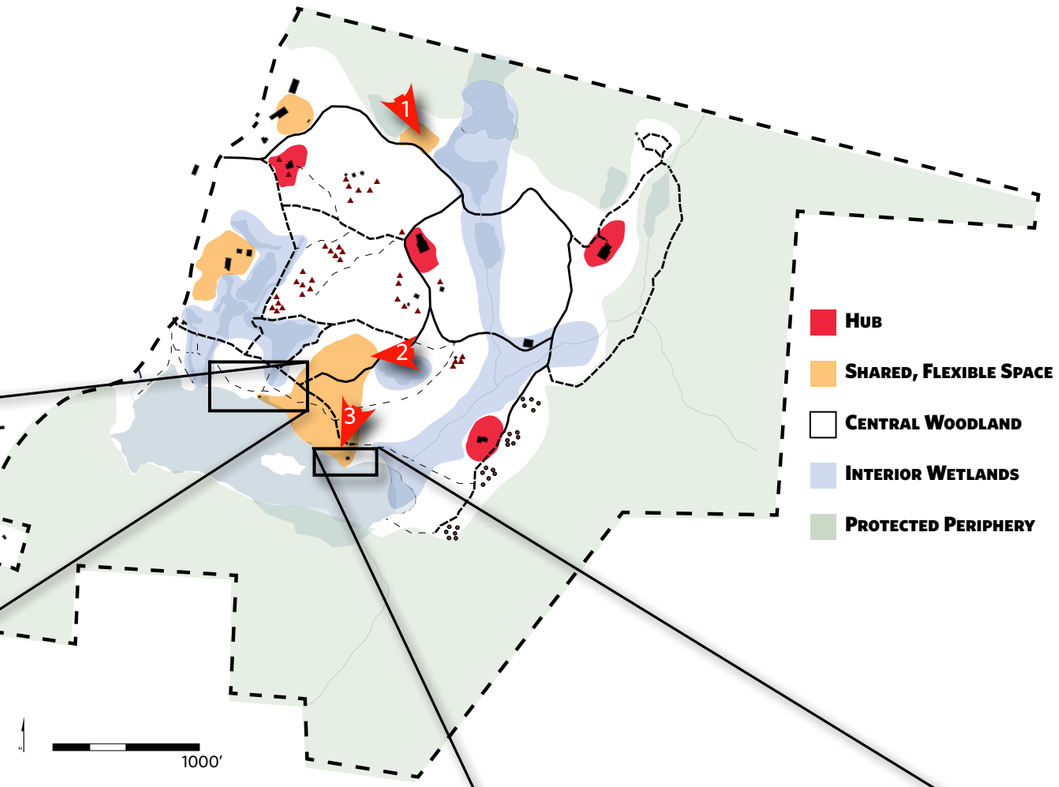
Camp timber trails' largest clearing could suit the needs of many groups. A stage for the unifier music and arts fesitval is in the northeast.

Northern Clearing

This clearing is between two wetlands. If the design typologies for swales and reinforced turf documented later in this plan were implemented here, it could provide both parking and group programming space.

Small Craft Area and Amphitheatre

Camp Timber Trails Shared Spaces



Eastern Beach and Docks

Connections With Hubs

Shared spaces are accessible from all hubs without routing people through the hub of another group. For example, if a group of 100 children in an ecology group staying in the northeast hub intends to go swimming at the beach on Ward's Pond, they can bypass the West Wind hub, which might be in use by another group. Keeping access to shared spaces open from each hub will keep wayfinding simple and decrease confusion around one of the more stressful times: moving large groups of children through the woods without losing anyone. Although ADA compliance is not legally required, trails and boardwalks connecting hubs and shared spaces should all meet federal trail standards. Additionally, trails here should be at least 5 feet wide, and should be posted with tick habitat warning signs.

the ConwaySchool
Graduate Program in Sustainable Landscape Planning + Design
180 Pleasant St. | Suite 211 | Easthampton, MA 01027
413-369-4044
www.csld.edu

By Patty O'Neill and John Slaff

Friends of Dance New England
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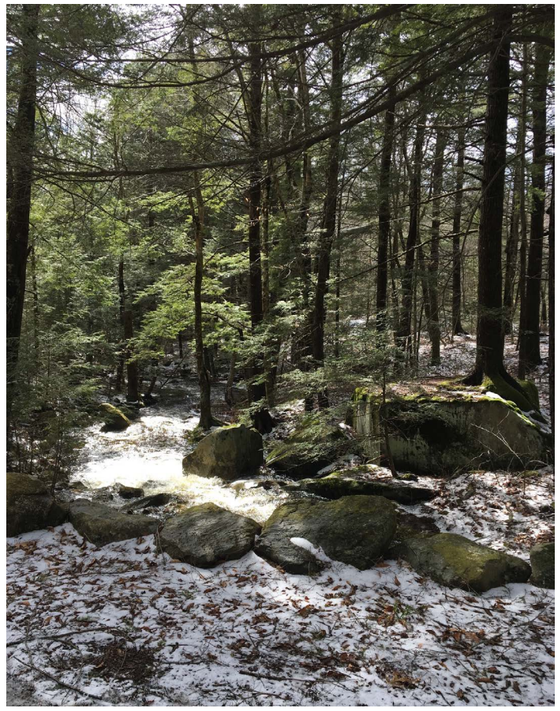
Landscape Master Plan: Central Woodland

Central Woodland

The central woodland makes up the interstitial forest within Camp Timber Trails' developed core. It is advised that a forester familiar with the area be hired to create a forest management plan for all of CTT's woodland that prioritzes, ecosystem stability, function, and connectivity over other forest values, such as timber management. Some woodland disturbance might make sense to allow for early successional habitat, and for smaller groups to explore the Central Woodland off-path for educational or recreational reasons. However, when large groups are present, people should be discouraged from travelling off-path within the woodland to protect habitat and water quality. FDNE should consult a forester or ecologist `to determine the specific capacity of these woodlands, and of the Protected Periphery, to support off-path exploration that minimizes impact and maintains CTT's character. Paths here should meet federal standards for semi-primitive trailsv, and they should be posted with tick habitat warning signs.

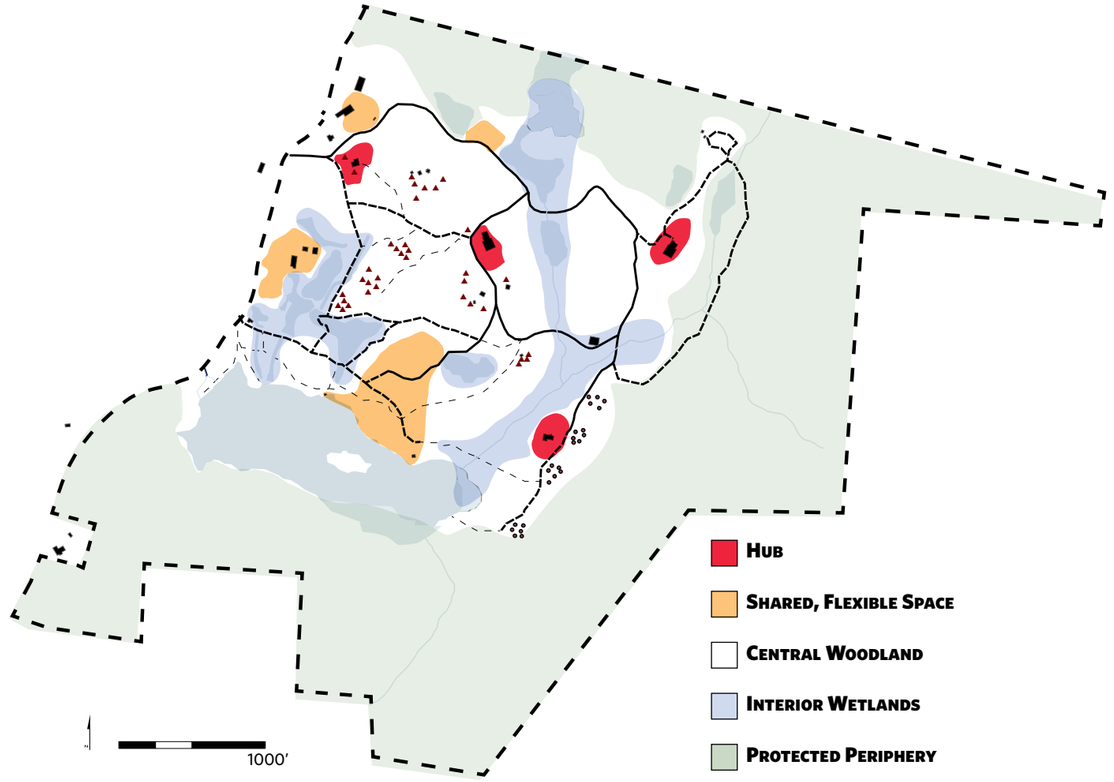
Evidence of multiple forest pests and pathogens are present in this area and will require attention and management. beech bark blight, Amaralia root rot, and birch borer, were all identified at CTT. Top Right: This sunny spot might be perfect for tent platforms or cabins if expansion of the West Wind hub was necessary. Bottom right: in multiple areas within this central woodland, stones are cancentrated into small piles, indicating this area was may have been used for pasture in the past.



Interior Wetlands

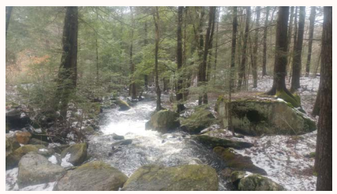
This zone includes the wetlands among Camp Timber Trails' developed core. All site wetlands should be treated with the utmost sensitivity because of their scenic value, ecological value, and proximity to active areas. Existing desire paths and any new paths through wetlands should be constricted as ABA-compliant boardwalks and observation areas. In addition to respecting state wetland buffers, new buildings, roads, and development should be clustered to prserve as much forested upland around wetlands as possible. No new buildings or parking areas should be sited within wetland buffers. However, trails that cross streams in this area may be necessary to connect hubs to each other and to shared spaces. These trails should use sustainable boardwalk and bridge designs.

Camp Timber Trails Landscape Master Plan



High and Low Energy Wetlands

Energy here refers to the speed at which water moves through a wetland system. In high energy streams, the wetland communities and habitatsary because turbidity, oxygen levels, temperature, and other important conditions tend to vary. They also have have dramatically different scenic characters. Top Left: the steep topography and rocky banks keep CTT's largest brook flowing quickly during the wet seasons. It's a beautiful scene, and the loud, rushing water is both exciting and intriuging. It presents excellent opportunities for passive recreation and riverine, forest, and geological education. Bottom Left: Near this brooks entrance into the lake, the topography is not as steep, and the brook is wider, slower, and has a larger floodplain. Both portions of this brook are beautiful, but have different habitat and scenic qualities. Top right: a very low energy wetland with sometimes stagnant water, likely created in part by beavers, whose presence is noticeable around the property. Beavers provide many ecological functions, like creating wetlands.this wetland could be an excellent place for intepretive signs, boardwalks, and observation decks.



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Landscape Master Plan: Interior Wetlands

Wetland Regulations

"Wetlands are important features in the landscape that provide numerous beneficial services for people and for fish and wildlife. Some of these services, or functions, include protecting and improving water quality, providing fish and wildlife habitats, storing floodwaters and maintaining surface water flow during dry periods. These valuable functions are the result of the unique natural characteristics of wetlands. Wetlands are among the most productive ecosystems in the world, comparable to rain forests and coral reefs. An immense variety of species of microbes, plants, insects, amphibians, reptiles, birds, fish and mammals can be part of a wetland ecosystem. Climate, landscape shape (typology), geology and the movement and abundance of water help to determine the plants and animals that inhabit each wetland." - United States Environmental Protection Agency

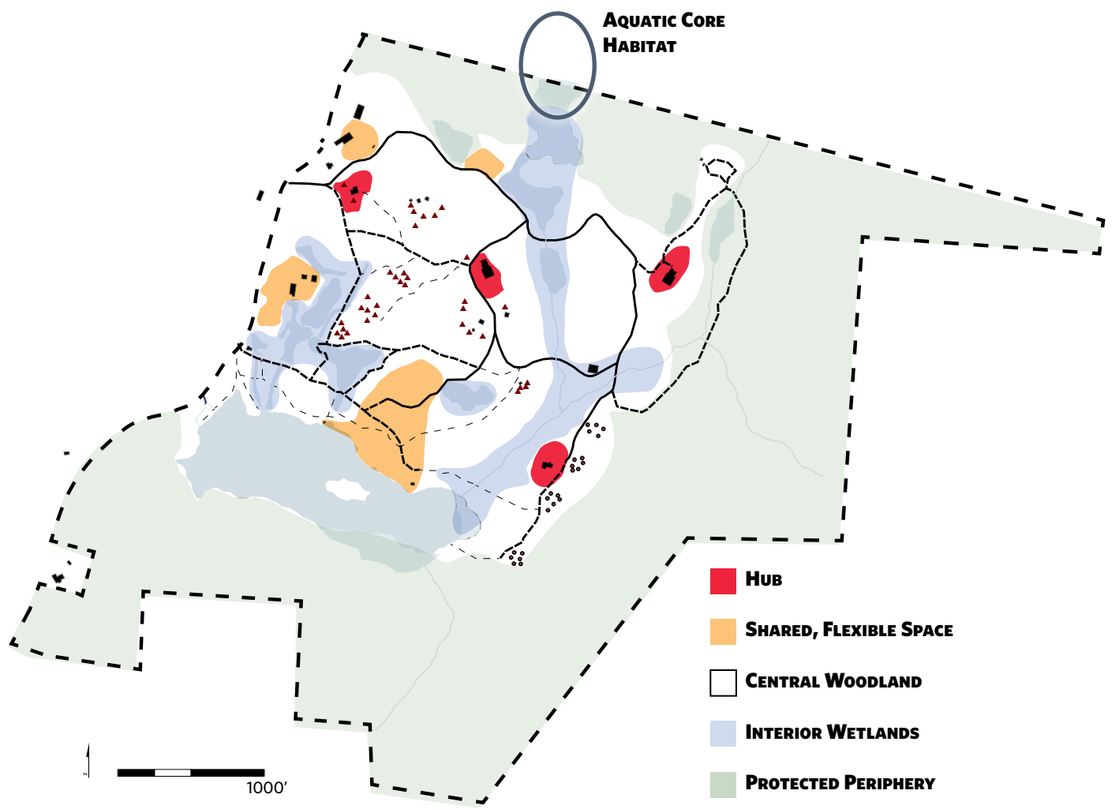
In Massachusetts, the Wetlands Protection Act estalbishes a 100' resource area around wetlands and intermittent streams and a 200' resource area around all perrenial streams. In these resource areas, also called buffers, development is illegal and there is a "no-cut, no-fill" law that prohibits moving soil into, around, or out of these areas. Town Conservation Commissions have the power to grant exemptions for projects proposed within the wetland resource areas. This plan recommends that new clearings, structures, and development be sited outside of resource areas, with the exeption of some ABA boardwalks near wetlands.

Interior Wetlands

Educational and Scenic Value

The wetlands and streams at Camp Timber Trails are beautiful, and although they are a sensitive landscape feature, their beauty should be accessible because it will enrich the experience of the groups using CTT. Providing access to beautiful landscapes while building excitement and understanding of them is one of the best ways to encourage people to treat them respectfully. A 5-week ecology summer camp is considering making CTT their home, so creating access to ecologically important areas may become a priority soon or in the future. Additionally, it may be possible to engage this group with design and management of the landscape, which could provide an excellent learning opportunity for the camp's attendents, and could serve as low/no-cost design and consulting for Camp Timber Trails.

The Y-shaped network of wetlands and streams is particularly well suited for educational and scenic boardwalks. The beauty of the eastern and southern extensions of this network is remarkable (see previous page). If accessible, they would be a magnificent highlight at Camp Timber Trails. The northern fork has two distinct wetland types nearby, and would be an excellent place for observation decks, boardwalks, and interpretive signs. In addition to more basic study, comparing these wetlands types could be an interesting subject for nascent natural scientists and ecologists. For ecology groups and general programming, the northernmost wetland could be a good place for an outdoor classroom; the rest of the time, it could be used as an observation area with seating and interpetive signs.



The view of the south shore of Ward's Pond is completely uninturrupted by human interference or development. Maintaining this serene and wooded aesthetic will be important to ensure CTT's current charaxcter persists

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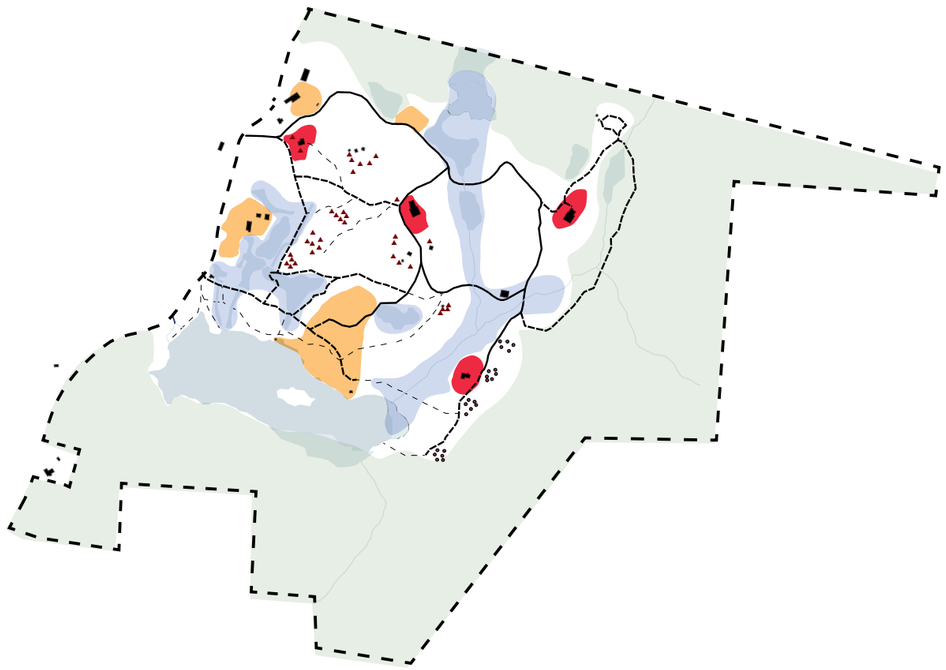
Landscape Master Plan: Protected Periphery

Protected Periphery

Approximately 250-acres of uplands and wetlands buffer the interior forest to the south and souteast from the impacts of activity at CTT. As with the Central Woodlands, consulting a forester or professional forest ecologist could provide specific management recommendations for this forest. Interior forest has high ecological and habitat value, so completely prohibiting, or at least minimizing, any new building in this area is important. Developing the area that FDNE is considering for summer homes (area south of Ward's Pond) would likely result in a dramatic loss of CTT's rural and wooded character. The view of this area from the north is the only, wide open, expansive view at CTT, and because it slopes toward the north, any new buildings here would be obvious and may interrupt this scenic area. Any new roads or structures in this area will create an edge which disturbs interior forest habitat and the species it supports. In the north, ample undisturbed buffer space will protect aquatic habitat home to a Species of Concern.

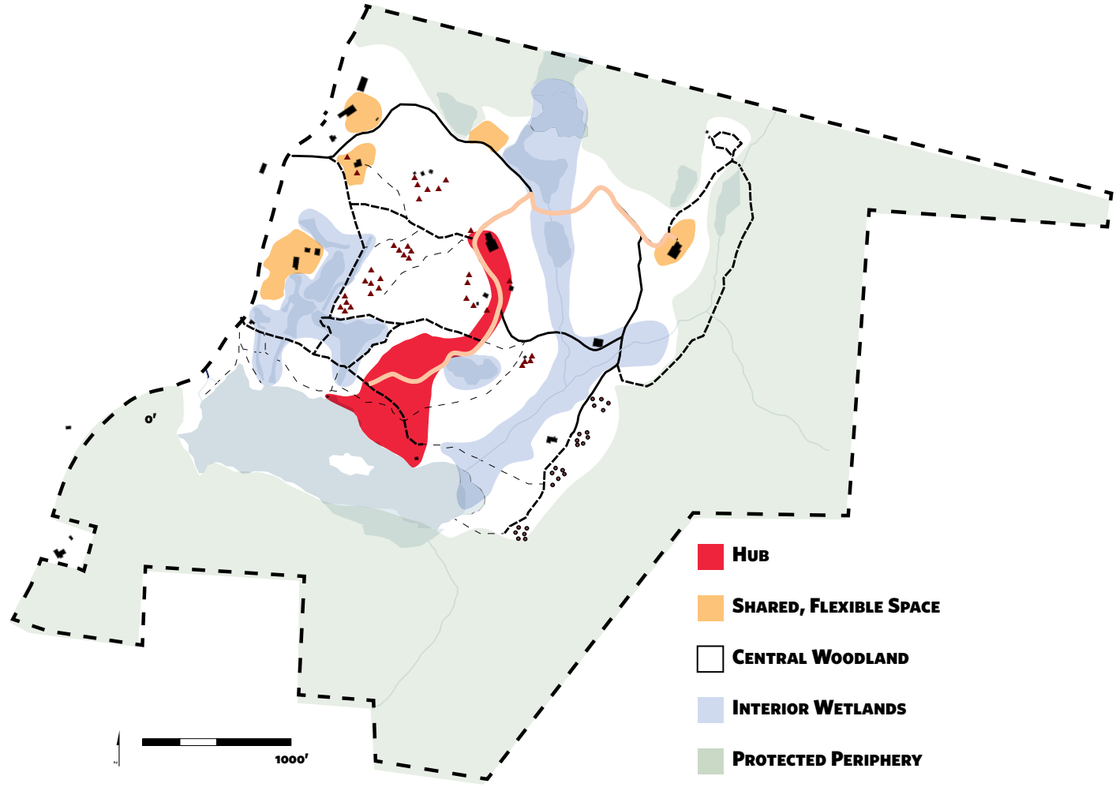
Camp Timber Trails should provide access to these beautiful uplands, but people should generally be encouraged to stay on trail unless the group's presence is temporary and doesn't pose a great risk for erosion and habitat degradation. Trails here should all meet federal trail standards and standards set for sustainability in the typologies section.

Camp Timber Trails Landscape Master Plan: Multiple Groups



Camp Timber Trails Landscape Master Plan: One Group

A master plan for one group uses the same categories as the plan for multiple groups. For one group, activity is concentrated in one central hub, with nodes of shared space along periphery. Arms of the hub may extend to some of the nearby cabins and areas capable of supporting overnight accomodations. A central ABA-compliant "main street" could unify the space and create easy acceess through the hub.



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Typologies Introduction

The following design typologies include design details, construction details, and design concepts that may be employed during the proposal, design, and implementation phases of new landscape and development projects. All design typologies, suggested materials, and design concepts must be adapted to site-specific conditions, and additional research and help from professionals in the field may be necessary. All implemented design typologies should cohere with the aesthetic and style of Camp Timber Trails.

Typologies: Ecological Land Use

Camp Timber Trail's sensitive ecosystems are part of what makes the place special, but also presents challenges for sustainable development. Land-use decisions will reflect priorities, and accommodating development will inevitably include some trade-off for maintaining existing wilderness character to the degree with which FDNE feels comfortable. The following concepts can help guide development away from the most ecologically sensitive areas, maintain healthy wetlands, and make the best effort at avoiding disruption to the wildlife with whom they share space their space.

Further Recommendations

To evaluate ecological performance, FDNE should monitor how site use changes the land and influences wildlife patterns, and be open to adjusting its programming and/or landscape management to respond to their observations.

Forest Management

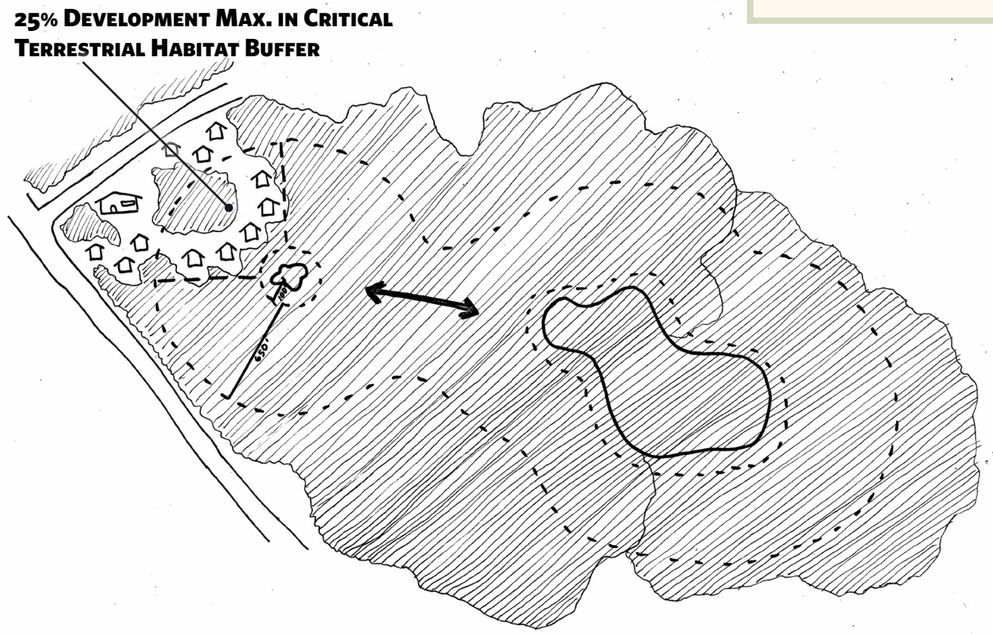
- Leave understory shrub layer, leaves, and woody debris
- Avoid compaction of duff
- Prevent random collection of firewood from forest to maintain structural diversity of forest
- Harvest or purchase wood from a local source free of tree pests and diseases–don't move firewood
- Do not salvage harvest

Wetland Buffer Zones

- Massachusetts Wetland Protection Act limits development near wetlands with a 100' vegetated, no-cut, no-fill buffer around water bodies and intermittent streams, and 200' vegetated, no-cut, no-fill buffer around perennial streams. This is insufficient upland space to adequately protect wetland wildlife over the long term, but does afford decent protection of water quality from pollution and sedimentation runoff.
- The perimeter of wetland can be identified by the presence of hydric soils, obligate wetland plants, and a hydrological connection.
- The buffer zone should consist of uncompacted duff (leaves, woody debris, and soil) and many layers of vegetation (herbaceous and woody understory, canopy tree cover).
- Filter or divert polluted runoff from draining directly into wetlands and their buffer zones with vegetated infiltration swales or basins.

Conservation Development

- When thinking about developing an ecovillage, explore conservation development layouts. Future development should adhere to these concepts.
- Cluster development away from sensitive water resources and rare habitats.
- Observe where wildlife crosses CTT (typically around water corridors, south-facing slopes, early successional forest and shrubland, and ridgelines) and allow continued passage.
- Fences and other barriers should allow wildlife to pass underneath or not have to travel long distances to go around.



Outside Threats to Local Diversity

The variety of natural community types that occur across CTT's landscape are examples of the diversity found in the Berkshire wilderness, and these should be appreciated and preserved. Tolland's general lack of development and extensively forested character seems to have prevented the widespread introduction and establishment of invasive exotic species, pests, and diseases that are common around more developed areas.

As FDNE continues to develop and grow, consideration should be given to the increased exposure to invasive exotic species, pests, diseases that could hitch a rides on outside construction or gardening supplies, and equipment, vehicles, forestry practices, firewood, and a range of outside visitors' belongings on their visits to CTT.

Concerns should be clearly communicated to visitors. FDNE should observe how present invasive exotic plant species behave in CTT's landscape and consider whether and what kind of management plan is appropriate. Areas where soil is frequently disturbed may create new opportunities for these species to establish. Avoid bringing in outside soil (which could contain earthworms, seeds, fungi, pests, and diseases), palettes (insects, diseases), and plant material that could alter the existing ecosystem. Rather than using exotic species, encourage landscaping and gardening with plants native to CTT's natural communities to maintain its character, unique sense of place, and provide wildlife habitat on site.

Critical Terrestrial Habitat

- Many wetland wildlife species spend most of their lives living in the upland duff, woody debris, and understory that surround wetlands.
- To minimize impact to wetland wildlife, cluster development (roads and structures) away from wetlands and the wetland edge.
- 100'/650'/25% Development Guidelines: (Maine Audubon Society) A minimum of 100' of undisturbed buffer space should be afforded around a wetland edge. The 650' beyond the initial 100' is also recommended to remain undisturbed as critical terrestrial habitat for wetland life, but a minimum of 25% development in this area has been observed to be acceptable for maintaining vernal pool-breeding wildlife populations over the long term.

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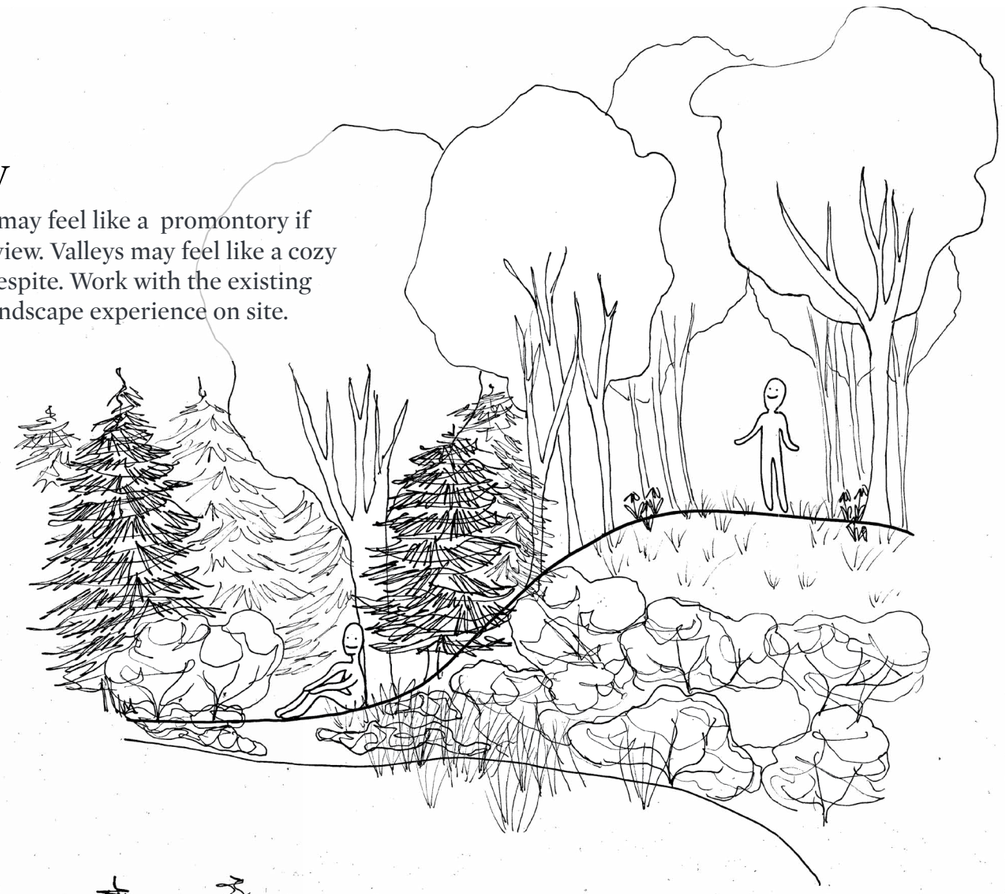
Typologies: Working with Landscape Character

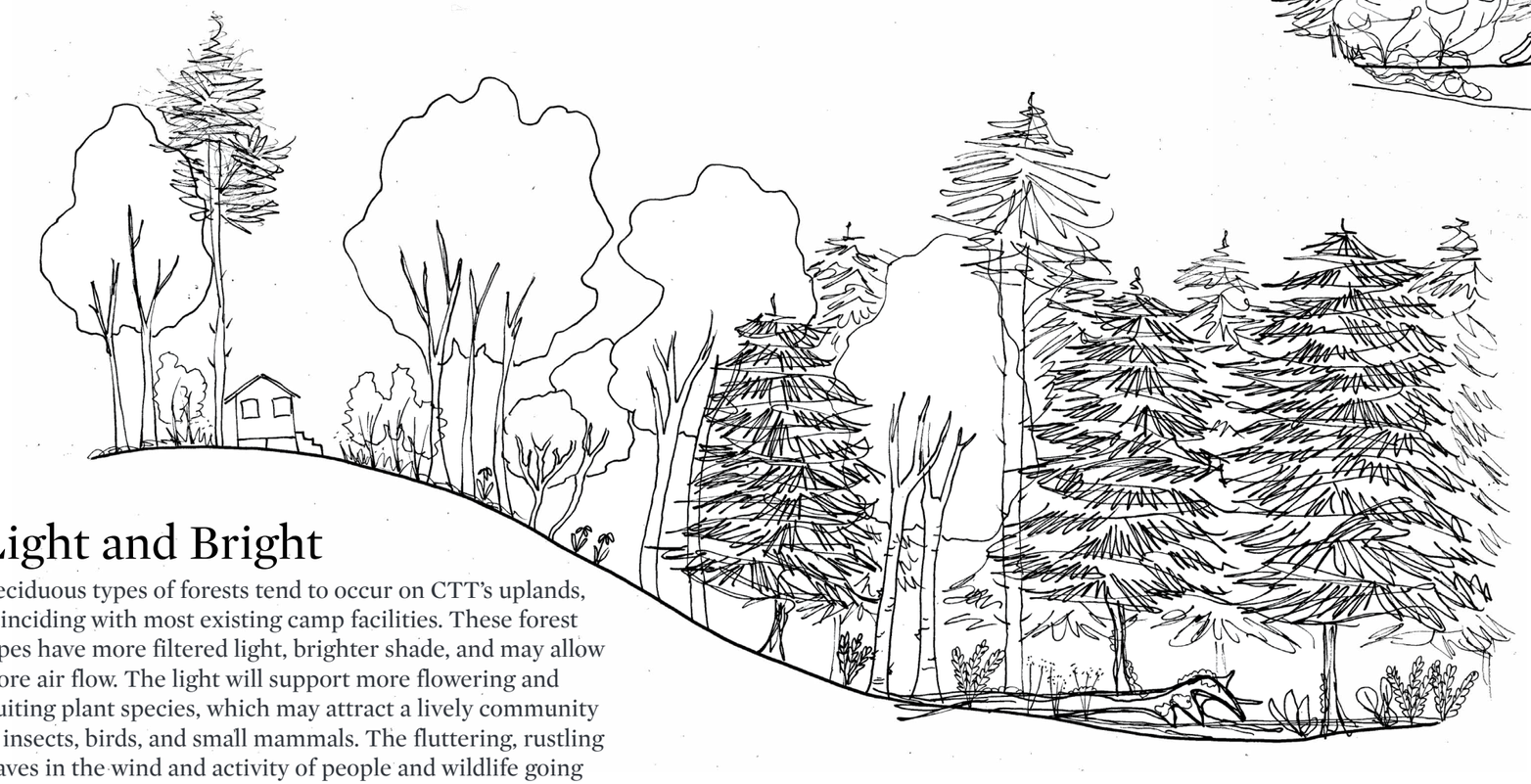
Ambiance of the Landscape

Careful observation of how the forest types, shape of the land, and movement of people make one feel can help inspire design directives. How does one want to feel when viewing a sunrise or sunset, night sky and a sunny day, alone or surrounded by friends, and upon approaching different spaces throughout the camp? How can a repeated spatial arrangement of vegetation unify similar types of spaces across CTT and distinguish these spaces from different uses?

Topography

The many hills at CTT may feel like a promontory if they overlook a scenic view. Valleys may feel like a cozy enclosure or secluded respite. Work with the existing topography to craft a landscape experience on site.





Light and Bright

Deciduous types of forests tend to occur on CTT's uplands, coinciding with most existing camp facilities. These forest types have more filtered light, brighter shade, and may allow more air flow. The light will support more flowering and fruiting plant species, which may attract a lively community of insects, birds, and small mammals. The fluttering, rustling leaves in the wind and activity of people and wildlife going about their business in dappled sunlight and clearings may make this are feel very energetic and exposed.

Dense and Dark

Hemlock-dominated forests are heavily shaded and dark, and generally cooler year-round. In the wetter locations, these mossy, dark forests may provide excellent refuge to ground-dwelling insects and salamanders. They offer a dense, wall-like backdrop and create a deep sense of enclosure that may feel secretive and remote. Observe how the needle-leaved branches slowly sway their branches and quietly whisper in the wind.

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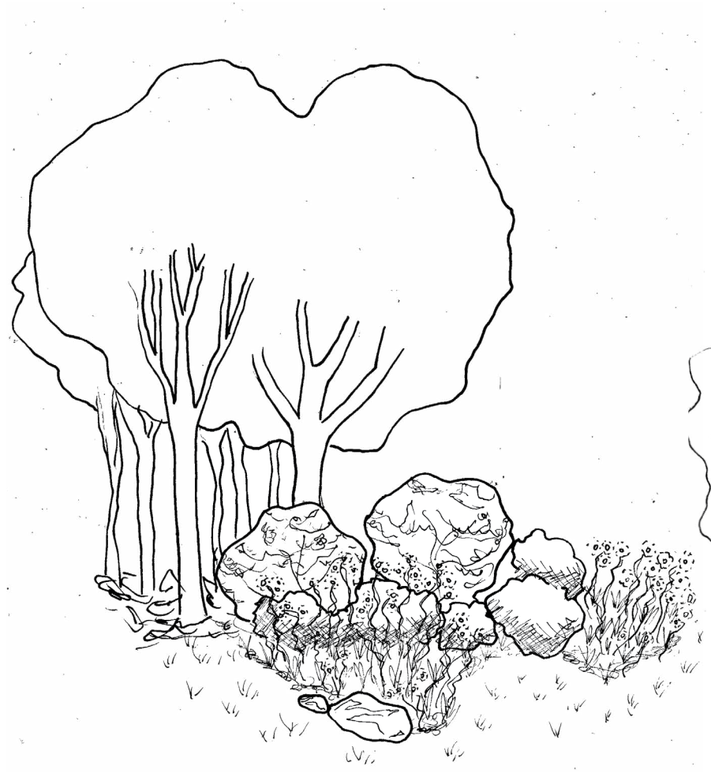
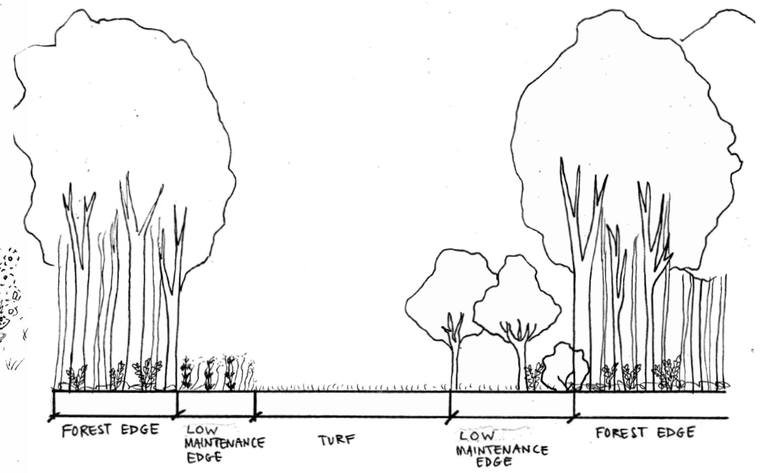
Typologies: Edges and Enclosure

Cultivating a variety of forest edge gradients from clearings to forest can frame open spaces to shape experience, influence wayfinding, create wildlife habitat, reduce maintenance, and provide a distinct sense of place that showcases CTT's unique local ecology.



Showcase Edge

- These kinds of edges are focal points to enjoy upon arrival to a space, during a pause en route to a destination, or to observe around a gathering area.
- Visible from down the road or around the corner, these edges can signal entrances to spaces, open sightlines, and create unique and memorable landmarks to assist in wayfinding.
- Planting with suitable plant species or allowing succession to design these edges would showcase uniqueness of site ecology maintain a strong sense of place.

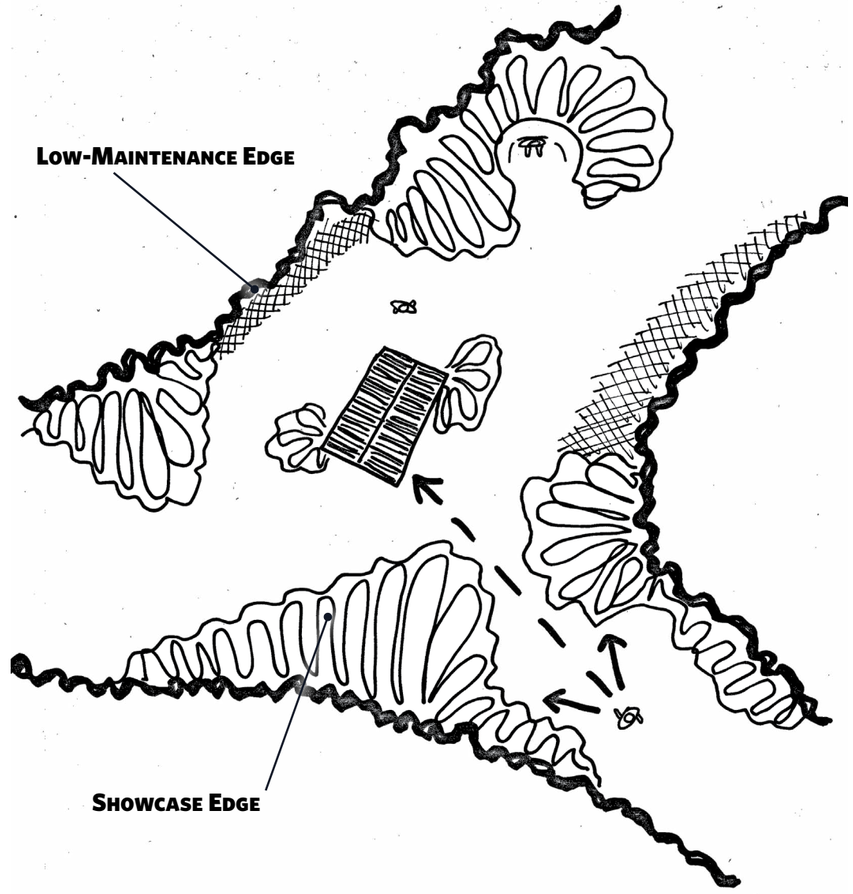


Low-Maintenance Edge

- These edges can create some variety along the edges of clearings to add visual interest and distinctiveness to a space while adding different kinds of plant and wildlife habitats.
- Allowing a gradient of vegetation to grow from clearing to forest edge through infrequent, periodic mowing can soften the appearance of a space's perimeter while lessening maintenance requirements.
- Various arrangements of shrubs or spaced trees on the edges of clearings can create different feelings of enclosure or frame a great view.

Managing Natural Succession

Camp Timber Trails has many distinctive natural communities, and these should be highlighted. Allowing wild vegetation to selectively grow into clearings and edges can reveal an assortment of plants found at this landscape's earlier stage of forest succession that require more sunlight, like fruiting shrubs and flowers. The design can then be shaped by selective removal of particular species to give spatial prominence to other species. The appearance can be further managed and tamed with cues to care: wild meadows can have hard mown edges around walkways and roads so that it looks more intentional and cared for rather than abandoned. Let the edges grow in for a year or two to see what comes up, and then decide which species to highlight, which to cut back, and how often to mow.



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Typologies: Forest Garden and Productive Edge

Forest Gardens

In a forest, many food crops are unable to grow because they require more sunlight than reaches the forest floor. After clearing land for agriculture, large amounts of time and energy are required to keep the fields or garden free of weeds. In this region, weeding is simply preventing a forest from growing. Forest gardening attempts to work around this tension by mimicking the structure and function of forest edge ecosystems. Instead of a closed canopy, trees in forest gardens, generally dwarf varieties, are placed with enough space between them that an edge can develop. At the edge of a forest, more sunlight reaches beneath the trees, feeding energy-intensive crops.

Productive Edge

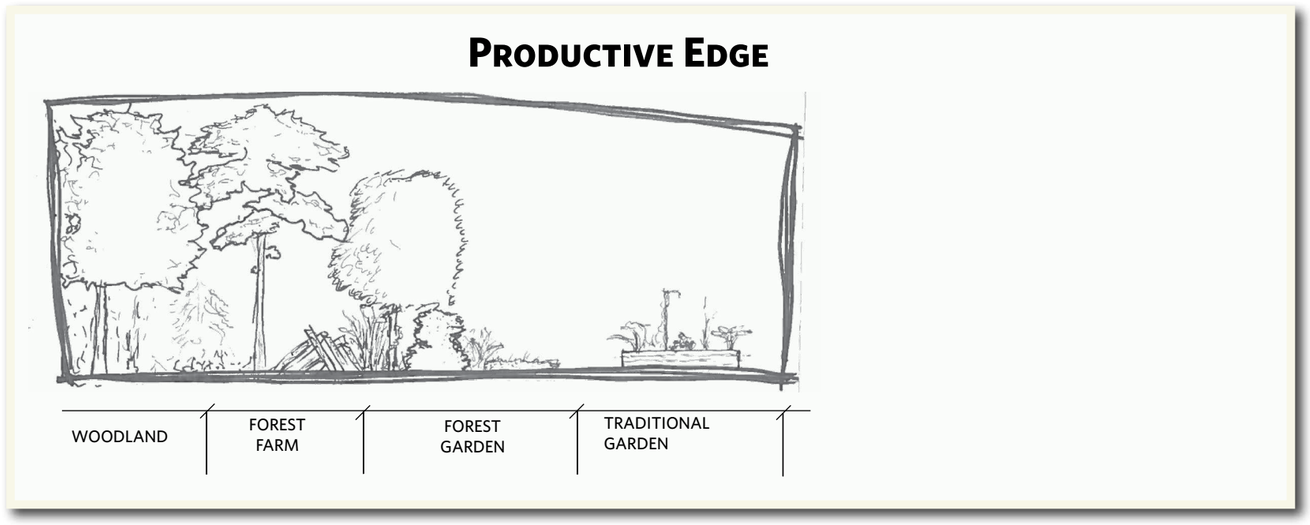
Using forest gardening together with forest farming could form a productive edge. Forest farming is producing understory crops like mushrooms, medicinals, or edibles under an existing canopy. Because it uses an existing canopy, forest gardens at CTT could abut existing woodlands that were planted with understory crops.

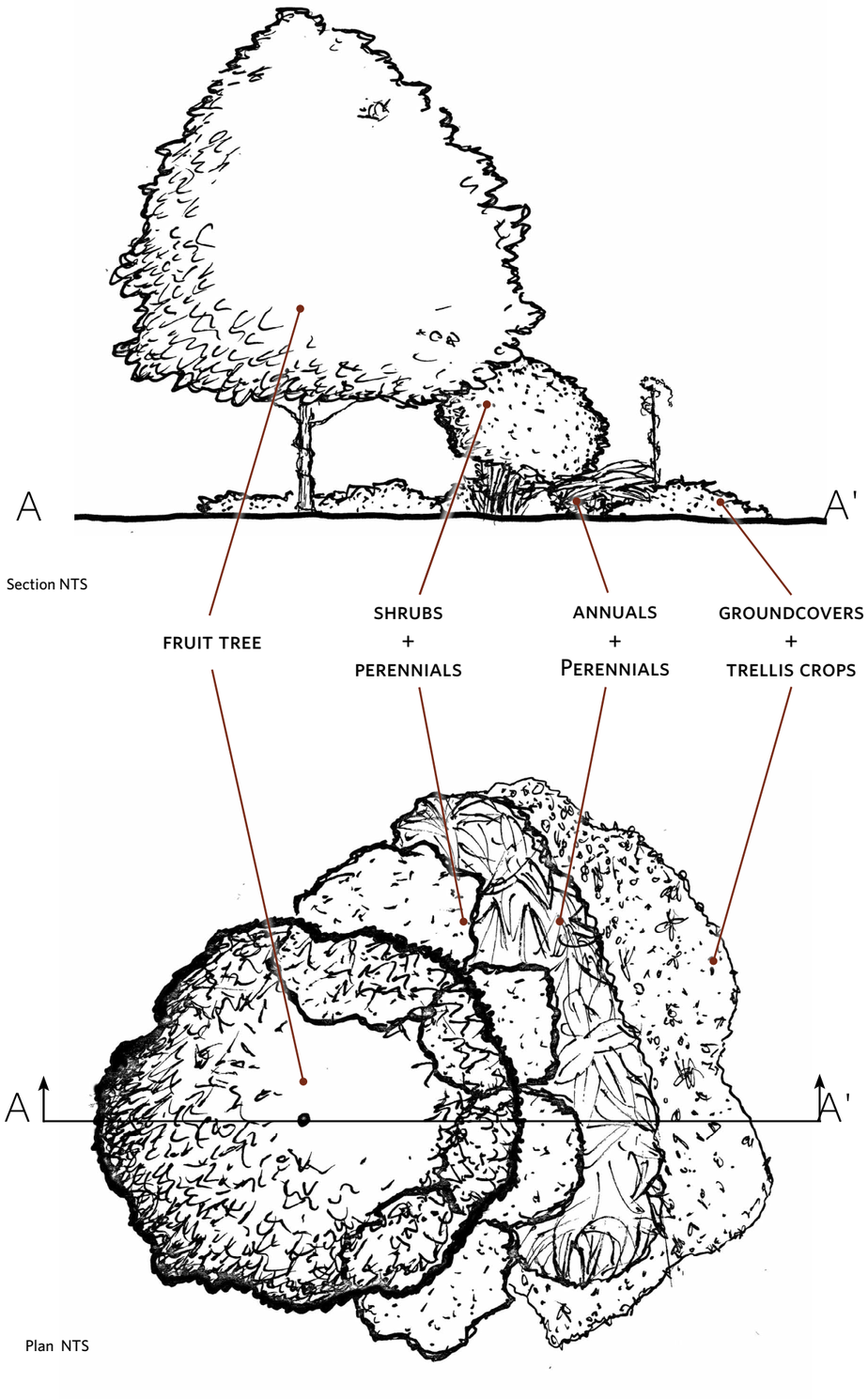
Forest Gardening

Chard, Carrots, Comfrey, and a number of other species are able to grow n all the light available around the base of this fruit tree.

Forest Farming

This forest, with an understory covered in black huckleberry, resemble what a forest at CTT might look like if colonized by low bush blueberry, a species that may be viable as CTT's forests mature.





Not for construction. Part of a student project and not based on a legal survey

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the ConwaySchool
180 Pleasant St. | Suite 211 | Easthampton, MA 01027
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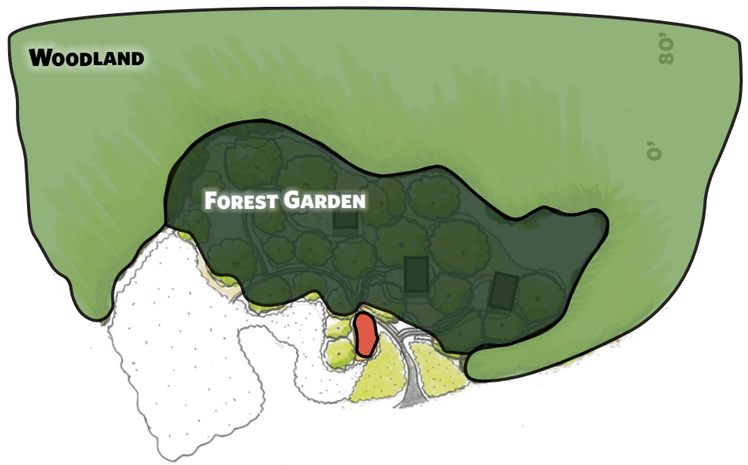
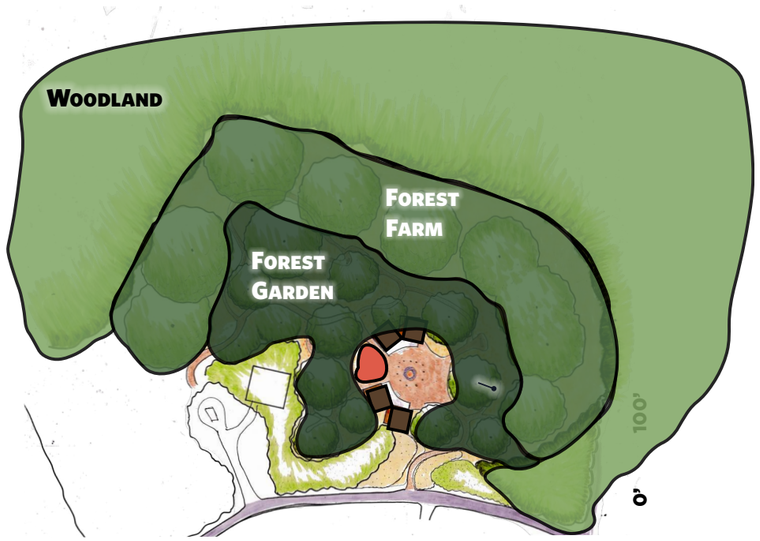
FOREST GARDEN

Typologies: Tent Platforms with Productive Edge

Friends of Dance New England hopes to add more space for tent camping to their grounds, specifically for children and adolescents. They requested designs for tent platforms, because the rocky conditions make site preparation for tenting labor intensive and in some areas, prohibitively costly. FDNE also plans to produce some food on site, and is seeking designs for productive landscapes.

Two alternative typologies integrate these client goals using different design concepts. Both typologies could be developed in multiple areas at Camp Timber Trails, and elements of each could used to create a synthesis of the two somewhat distinct environments achieved in each design. The orientation and layout of these designs should be adapted to site-specific conditions, and builders should be careful to maximize solar gain for the forest gardens at any location.





Both versions of this typology create opportunities for children to learn about plants and alternative forms of productive landscapes by locating tent platforms among forest garden polycultures. In both typologies, children wind their way on paths through an edible landscape to tent platforms enveloped by forest gardens. Providing easy-access to edible plants encourages children to familiarize themselves with plants, because children tend to find edible plants more interesting. (Who can resist fresh berries?) This is especially valuable for children whose exposure to plants has been in a largely urban setting where mature and abundant edible landscapes are either rare or non-existent.

Site Scale

Determining the suitability of a site for new forest gardens or tent platforms requires thorough ecological site analysis. The analysis process should also take into account how these new features will integrate into the overall landscape and layout of CTT. Both of these areas may be suitable for tent platforms. They are close to hubs, and are relatively open.

beyond the tall pines in this stony landscape, young beech trees are beginning to grow where the girl scouts likely cleared underbrush and/or canopy. With some cutting and thoughtful successional management, this area may be well-suited for tent platforms, although growing productive plants here is likely not worthwhile judging by the number of large rocks in this area.

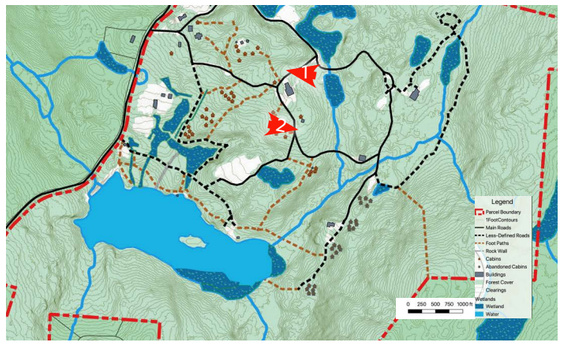
Because it is flat, free of rocks, and cleared, it is particularly appealing for productive plants. Some of the tall trees that form the southern boundary of this clearing would likely need to be removed in order to create enough sunlight for most productive plants like fruit trees, vegetables, and berries. The eastern portion of this site may be in the wetland or stream buffer. Further soils and microclimate assessment is required for this area.

Tent Platform Criteria

- Small tent platforms for one small tent should be 15'x15'
- Large tent platforms for family tent or two small tents should be 20'x30', this would be enough to also provide a porch
- Where new tent platforms are installed, there should be at least 100 sq feet of open space per tent platform or per person if the platforms are larger.

Platforms should use rot-resistant wood like black locust. Non rot-resistant lumber from on site should be used for structures or parts of structures that aren't exposed to the elements.

- Ground around and under platforms should drain away from tent area and not pool, this will decrease mosquito habitat
- Platforms raised more than 30" off the ground require a railing



Forest Garden Criteria

- Dwarf Fruit trees should be planted at 15'-25' on center and in full sun
- Forest garden polycultures require groundcover, herbaceous, and shrub layers. Some polycultures may function without a shrub layer. Integrate vining plants as much as possible to fill the "climber" niche.
- Fruiting shrubs should be sited to receive at least 6-8 hours of direct sunlight during the growing season

By Patty O'Neill and John Slaff

the ConwaySchool
Graduate Program in Sustainable Landscape Planning + Design
180 Pleasant St. | Suite 211 | Easthampton, MA 01027
413-369-4044
www.csld.edu

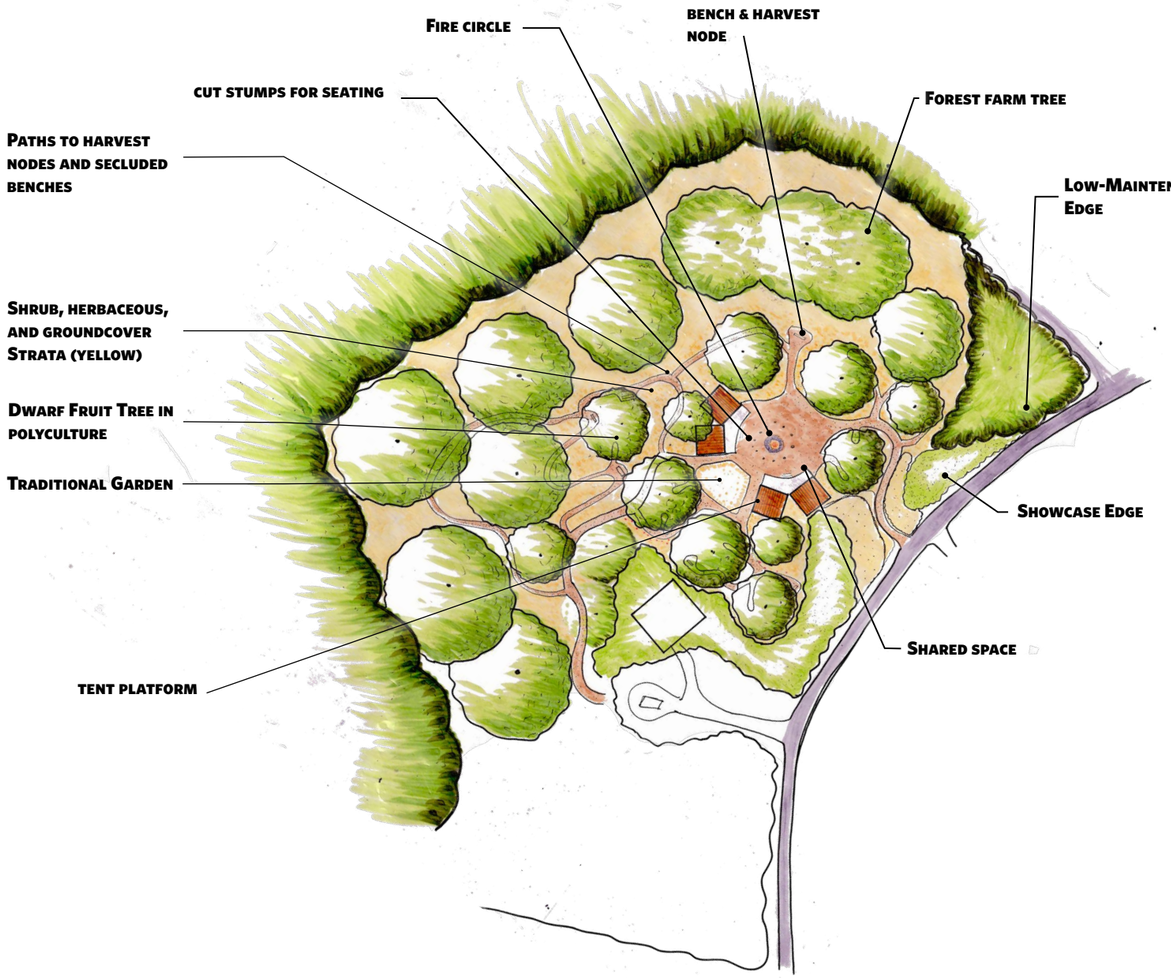
Typologies: Tent Platform and Productive Edge

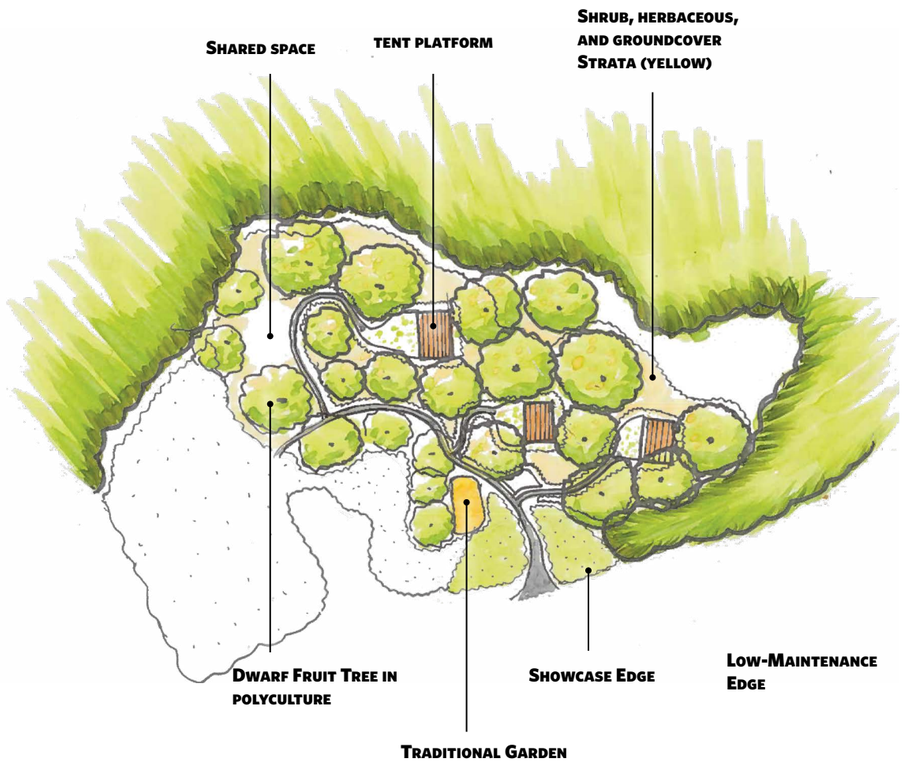
Creating Community

This design encourages community development by locating four tent platforms around a central shared space. With small paths and journeys through productive landscape, this design concept also includes solitary spaces for reflection and introspection. Four, 15'x15' tent platforms oriented around a central flexible space create a more intimate, communal experience; and undulating paths lead users through the forest garden polycultures to small harvesting nodes and secluded benches. Slightly lower than the tent platforms, a small shared porch spans two platforms, and could be used for seating, performances, or other summer camp activities.

Woodland Immersion

In "Woodland Immersion", isolated tent platforms foster personal growth and independence and create a sense of immersion in the forest surrounding forest. These platforms are 20'x30' and are able to accomodate families and larger tents, although smaller platforms could be used for an individual tent. Many of Camp Timber Trails' renters will be coming from cities and urban centers, and while communal camping has its charm and advantages, the importance of a solitary space to experience this beautiful landscape cant be overstated.





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www.csld.edu

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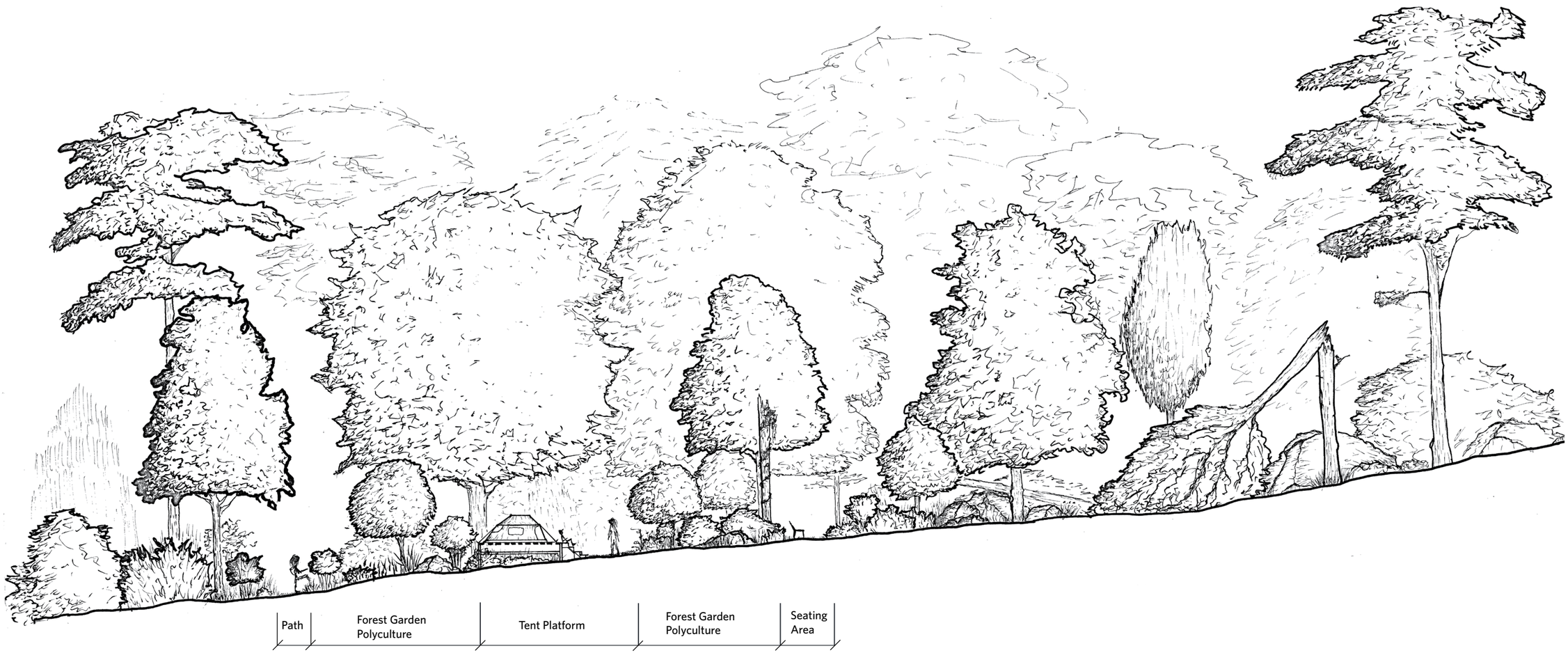
Woodland Immersion

In this section, forest garden polycultures with dwarf fruit trees surround a tent platform. Leaving space between fruit tree allows shrub, herbaceous, and groundcover layers to take advantage of the subsequent edge effects and produce food and medicine for Camp Timber Trails. Edible vines climb up snags left to provide wildlife habitat and forage, and large, mast-bearing trees provide food for wildlife and the residents of the camp. The conceptual section below is not to scale.



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TENT PLATFORM SECTION

Typologies: Wetland Boardwalk Construction

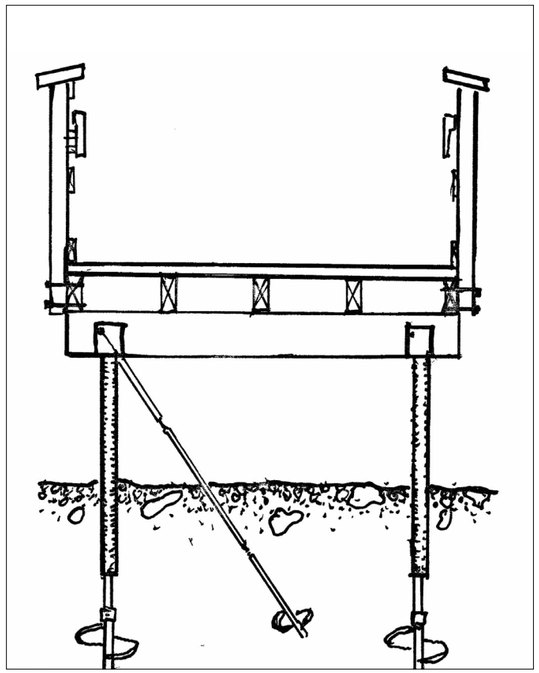
There are multiple areas within the Interior Wetlands zone where Camp Timber Trails may require paths. Boardwalk design will be influenced by site-specific conditions, and should reflect the character of the area while respecting its sensitivity. Non-pressure treated lumber should be used for all wood construction decking. Pressure treated wood will leach harmful chemicals into the wetlands. All designs must be reviewed by the local conservation commission and a structural engineer before implementation. Layout, elevation, materials, and railings are all important to consider during the design phase.

Wetland Boardwalk Footing

Four methods of constructing a raised boardwalk could provide low-impact access to CTT's wetlands. Excavation and filling should be avoided, as this will disrupt the wetland during and after construction. The first option is fastening boardwalks to bedrock and large boulders, While this may work at in some areas at Camp Timber Trails, two other methods are more widely applicable. With another method, large wooden footers are placed on the ground to distribute the pressure from the boardwalk posts. Helical anchors and diamond piers are two alternatives to excavation that can elevate boardwalks with minimal impacts on the wetland. Any trails or boardwalks built near wetlands require review by the local Conservation Commission, and boardwalks will require review by a structural engineer.

The Silvio Conte trail in Hadley, MA uses wooden footers for their universally accessible boardwalk.

Helical Anchors



Helical Anchors are large, weight-bearing screws that are augured into the soil. Their plates stabilize the anchors in the soil. Extensions may be added to increase the structures height.

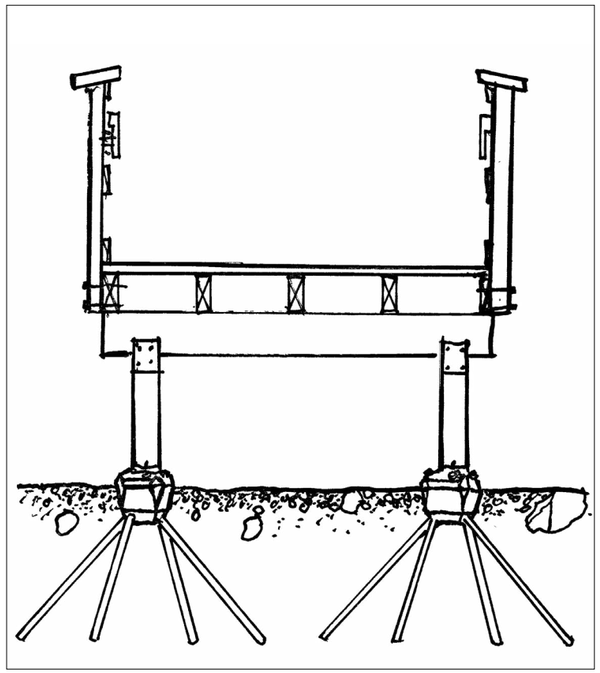
Pros:

- Installation requires no excavation, which is important in particularly sensitive areas.
- Stainless steel will not leach into standing or running water.
- Can be used in areas with high water tables and weak soils
- Works well in loose, sandy, soils

Cons:

- Hydraulic torque motor required for installation (requires truck access, may disturb wetlands)
- More expensive

Diamond Piers



Diamond piers are prefabricated concrete blocks dug shallowly into the soil, and secured with pins driven through the blocks at various angles.

Pros:

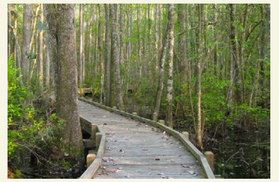
- Installation is possible with hand-held power tools, by volunteers or unskilled labor
- Less expensive

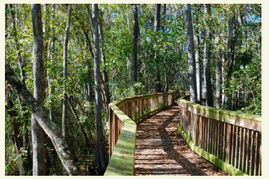
Cons:

- Requires some digging of topsoil, which is disturbing, but may be permissible if the impact is temporary.
- The wooden legs of the boardwalk may be in standing water, and are likely not as durable as stainless steel.

Access & Railings

Hand rails are required on any structure 30" above ground level, but in areas where boardwalks are lower, the choice to use a railing or not often remains with the property-owner. It is always important to have a wheel-chair stop at the edge of the boardwalks. Railings will dramatically influence the experience of the user and should be carefully considered





Boardwalks without railings create a greater sense of intimacy with the environment, however it is easier for people to travel off path. These should be used in places that are inundated permanently or areas where traveling off-path may be acceptable.

An old girls scouts trail crossed this stream somewhere near here. If CTT plans to revive the girls scouts trail to connect the Jaycee area to the swimming area, a stream crossing near here would be necessary. when this area floods seasonally, the banks will be completely inundated. While it may be tempting to travel off path here while it is dry, with consistent use from groups, this area would quickly become degraded.

This wetland may never be fully inundated, and it is possible to walk here without getting one's feet wet, so youngsters may be tempted to travel off path. These are sensitive wetlands, and protecting them from regular foot traffic is important. Using boardwalks with railings in areas like these will encourage people to stay on trail.

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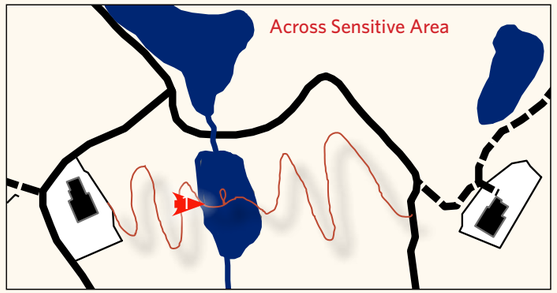
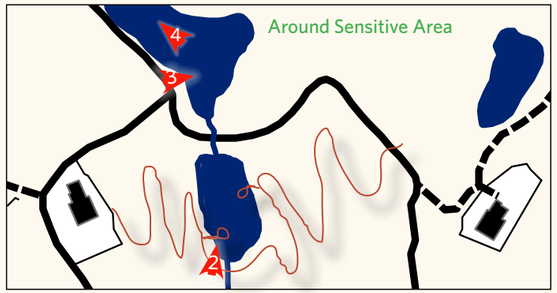
Typologies: Boardwalk Layout

Across or Around?

As a general rule, paths should avoid routing foot traffic through sensitive natural areas, such as wetlands. If highlighting a natural feature like a wetland is a priority, trail layout should travel around the most sensitive areas, as opposed to through them, and should include "out-and-back" nodes with observation decks at the end. These nodes may extend into sensitive areas for observation, but they minimize impact by keeping structures and activity constrained to a smaller area. A number of beautiful wetlands at Camp Timber Trails could serve as scenic highlights, interpretive ecological walks, and outdoor classrooms. If CTT intends to create a path between the Barefoot Ballroom and the West Wind dining hall, the trail will need to traverse either the wetland or one of the nearby streams. Below, a conceptual diagram illustrates the difference between going through and going around the wetland. It is important note that this is a conceptual diagram that is recommending routing paths around sensitive areas; it is not a site-specific recommendation for a trail layout around this shrub swamp in particular.

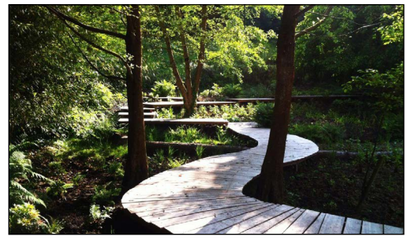


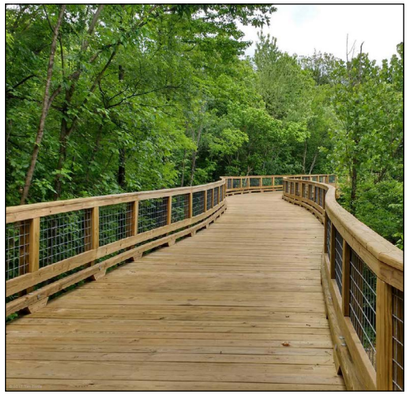


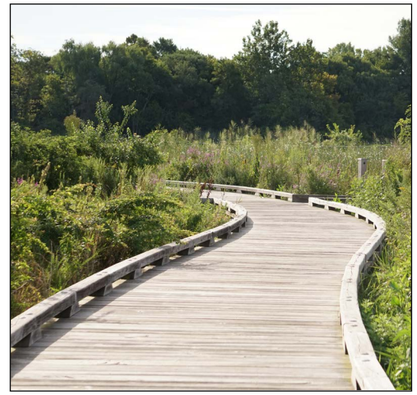
Top row from left 1) Looking east across a wetland with grasses, sedges, shrubs, and forbs. Crossing here would bifurcate the wetland. 2) The view from the southwestern side of this wetland is enticing and structurally complex, this could be a good place for an observation deck.

Bottom row: A forested hemlock swamp lies just north of the wetland pictured above. It provides a stark contrast in wetland type despite their close proximity. This could be another good place for an observation deck. Because it is near the road, this wetland could potentially be highlighted as a feature as people travel through CTT.

Linear vs. Curved







Right side: Although linear boardwalks are generally simpler and less expensive to install, they feel more like a conveyance mechanism than a place to explore, learn about, and engage with the landscape. Left side: Adding even slight undulations and curves to boardwalks creates an intriguing sense of mystery

Interpretive Signs

Educational components are important to build excitement and respect for valuable and sensitive ecosystems. Interpretive signs are an excellent way to achieve this end, however some interpretive signs (like those pictured on the left) are too tall for most children and many little people.

Other options exist for increasing accessibility to interpretive signs and ensuring that everyone is able to learn about the ecosystem they're exploring. The text and graphics on these signs should reflect the young age of many of the users.

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the ConwaySchool
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www.csld.edu

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Typologies: Path Design

Path Types

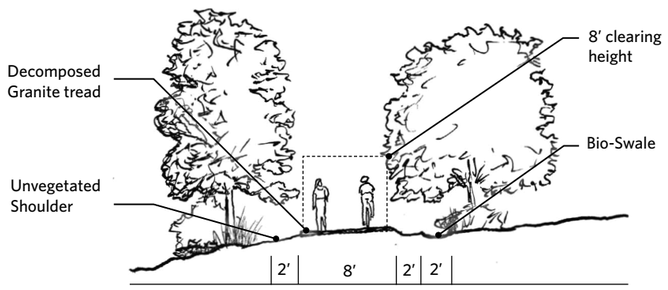
Using four main types of paths at Camp Timber Trails will keep circulation and wayfinding smooth, minimize human impacts on the environment, and help build and maintain the rustic, wooded character people love about this landscape and give cues for wayfinding These specifications should be applied to both existing and proposed paths at CTT. Path categories and their qualities are detailed below.

Pedestrians and Cars

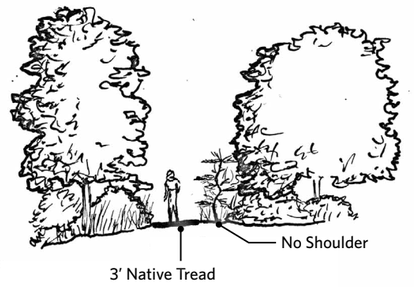
Currently, some pedestrian traffic is routed on dirt roads also used by vehicles. In the future, CTT should consider separating pedestrian pathways and vehicle corridors to improve safety, and to create an experience of CTT's landscape oriented around the human-scale.

Class	Tread + Materials	Details	Placement
Primary Path	8′ Tread, 2′ shoulder, ABA Complaint	Wide, accommodates two adults walking abreast and larger groups, can be used by emergency vehicles, feels more refined, used in hubs and between hubs and primary residential areas, surfaced with decomposed granite or other ABA-complaint material	Hubs, B/T Hubs and Primary Overnight Areas, potentially between main parking area and main hub when determined
Secondary Path	5′ Tread, no shoulder, meets Federal Trail Standard	Medium width, accommodates two children walking abreast, feels more rustic, surfaced with native material	B/T Hubs and overnight areas, Within shared spaces, B/T Hubs and shared spaces
Trail	3′ Tread, no shoulder, meets Federal Trail Standards for semi primitive trail	Thin, designed for single file travel, used in central woodland and in protected areas	Central Woodland, Protected Periphery
Boardwalk	ABA Compliant Boardwalk (variable tread width)	Variable tread width (5′ is generally appropriate), made of rot resistant wood or steel, avoid composite materials if possible	Interior wetlands, at stream crossing

Primary Paths
(8′ ABA Compliant)



Trail
(3′, Semi-Primitive)

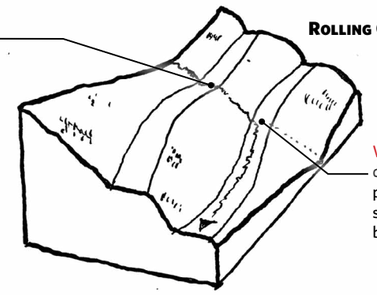


Trail Drainage

With the exception of the hub paths, all trails on CTT should use rolling grades (also called grade-reversals) to drain the paths in a sustainable way that will not erode paths and lead to sedimentation of nearby water bodies. Rolling grades are easiest to build when the trail designer takes advantage of a natural dip in the landscape and routes the trail through it, thereby draining water across that section of the trail instead of down the path. Another option is routing the trail downslope any time significant drainage from a section might pose a threat to the longevity of the trail. The frequency of grade-reversals necessary to adequately drain a trail depends on a number of conditions, like the soil type, slope and cross slope of the trail, tread design, and a number of other factors. As a general rule, if water is gouging a trails tread, it needs a grade reversal.

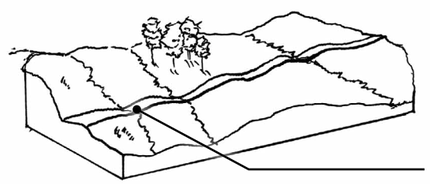
RIGHT! As this trail climbs across the slope, reversing the grade temporarily allows water to flow over and off the trail instead of down it.

Rolling Grade



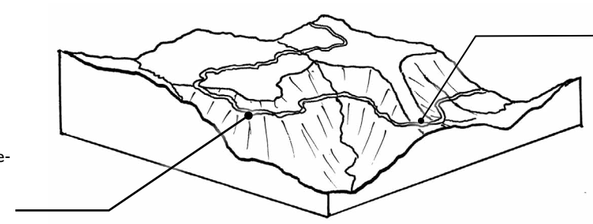
Wrong! with no grade reversal, drainage will flow down this path, degrading it and carrying sediment into nearby water bodies

Multiple Rolling Grades



with thoughtful trail design and layout, Grade-reversals can be effective even when subtle

Rolling Grade traversing a slope



The trail could have traveled directly down the fall line of this ridge, resulting in poor drainage which would create ruts in the trail and eventually require closure or rebuilding. By using grade-reversals while traversing the slope, the trail can drain from many small "subwatersheds" created by the trail.

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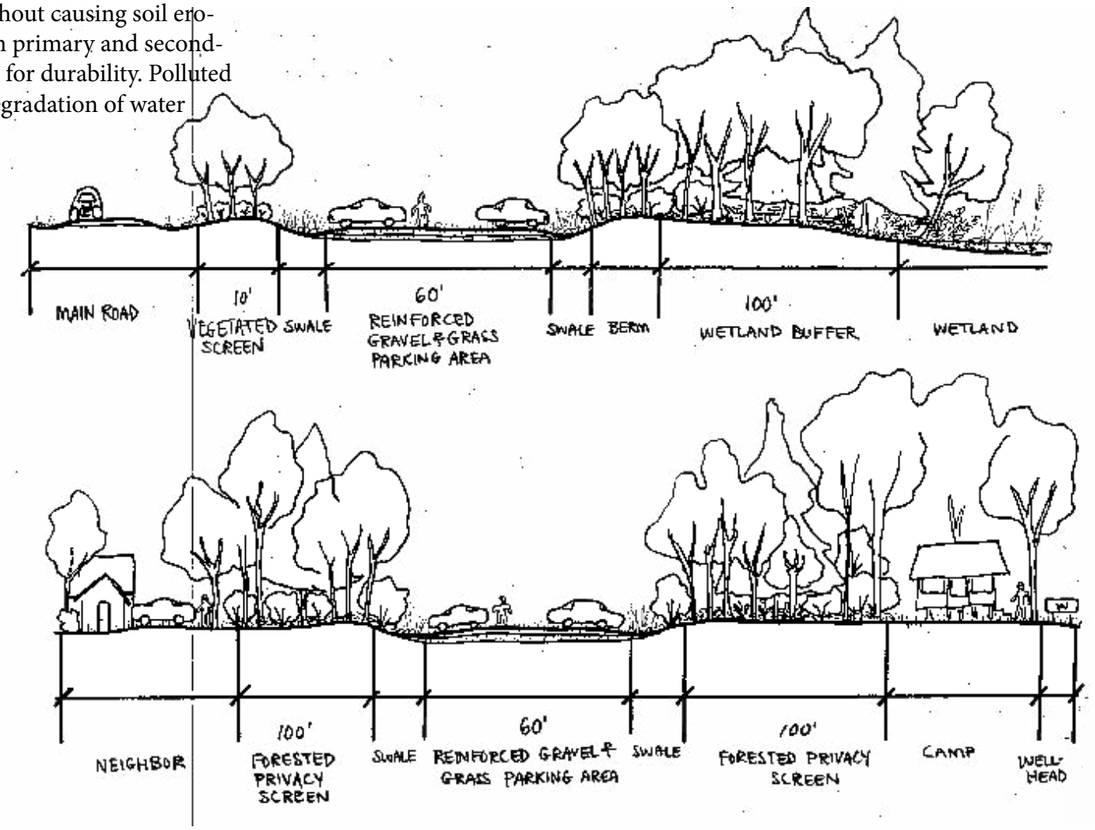
Typologies: Parking Design

To effectively accommodate vehicles over the long term without causing soil erosion and challenging driving conditions (as has occurred on primary and secondary roads through camp), parking lots should be reinforced for durability. Polluted runoff from vehicles should also be contained to prevent degradation of water resources and soil that may be used for growing food.

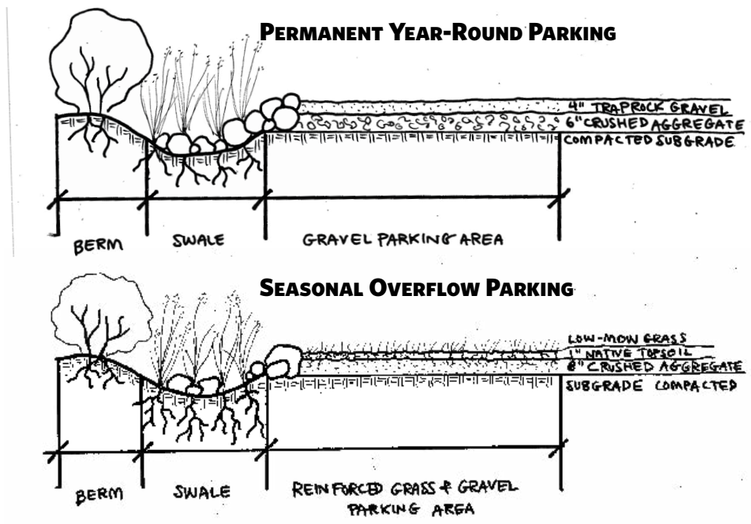
Siting Parking Areas

- There should be a designated area close enough by cabins and hubs that people will be willing to use. It should accommodate an average amount of parking permanently and probably year-round as well. Permanent parking should be situated furthest from sensitive wetland areas.
- Overflow parking should be multi-functional to accommodate parking temporarily and double as flexible event space when not needed for vehicles.
- Parking areas should be hidden from neighbor views, cabins, hubs, event spaces, and scenic views within the developed core of camp. A 100' visual buffer of forested should be maintained as a privacy screen.



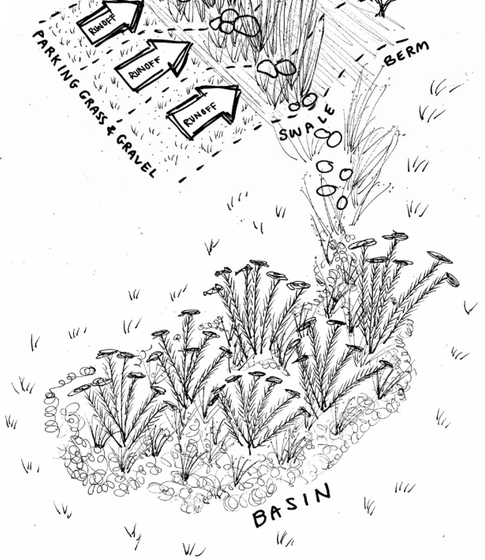
Parking Area Construction

- All parking areas should infiltrate and divert polluted stormwater runoff away from wetlands with vegetated swales around the perimeter of the parking lot.
- Permanent, year-round parking should be constructed as a more durable, multiple-layer gravel lot.
- Overflow parking areas should be constructed with reinforced turf using native topsoil seeded with low-mow grass over a layer gravel.



Infiltration Swales

- To encourage on-site infiltration, parking runoff should flow into grassy, stone-filled infilration swales around the parking area perimeter and, if needed, into larger infiltration basins sited away from wetlands.
- A raised berm behind the ditch keeps runoff contained in the swale and should be planted with shrubs to further encourage infiltration.
- Swales and berms should be constructed outside of wetland buffer zones.



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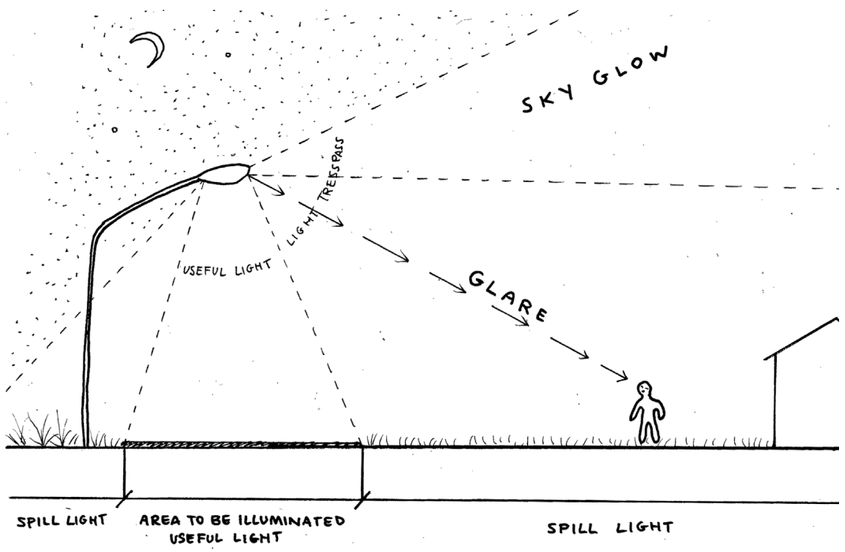
Typologies: Lighting

Tolland's forested character and lack of development saves it from the light pollution associated with more urbanized areas. Camp Timber Trails can offer visitors excellent views of the night sky and respite from over-lighted lifestyles. Appropriately dark skies are also an important component to the life cycles of wetland and deep forest wildlife. As FDNE prepares CTT for event use and safety, lighting design will be an important consideration for maintaining the cherished wilderness ambiance and ecological function.

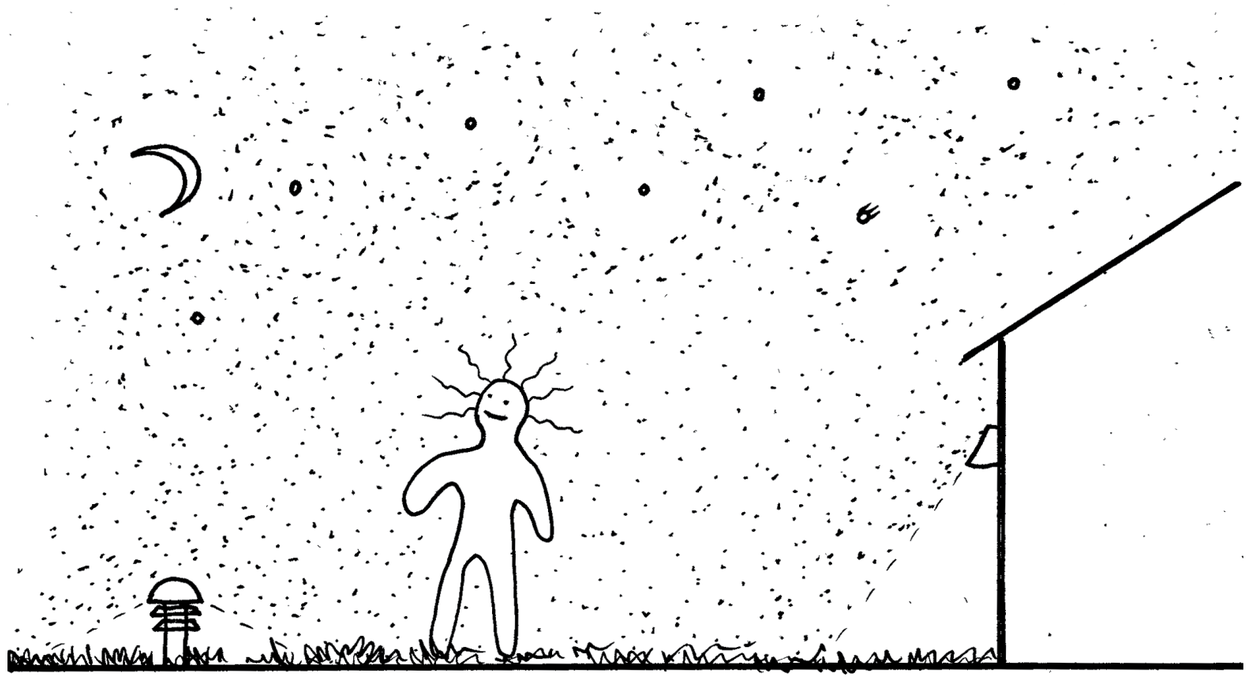
LED Lights

- LED lights are highly-energy efficient and can last as long as 20 years, but the intensity of the bright, blue light they emit is biologically disruptive to people and wildlife and should be mitigated.
- Warm-colored, amber/yellow-hued LED lights are least attractive to insects and won't disrupt circadian rhythms.
- LED lights should be phosphor-coated to reduce blue light emitted.
- Select LED lights with the lowest Kelvin measure possible, about 2000K and no higher than 2700K to reduce the amount of blue light.



Light and Life

- Similar to bright daylight, the blue light emitted by LED lights suppresses melatonin production and can interfere with people's ability to sleep.
- Many types of wildlife like turtles, frogs, salamanders, fireflies, and moths orient themselves by moonlight and can be disoriented by the bright white or bluish light of LEDs.



Lighting Design

- Light fixtures should be low or point light downward and be shaded or filtered to eliminate glare and light pollution.
- Solar bollards, louvered light posts, and string lights are some examples of lights that limit light pollution while creating ambiance.
- Light-colored surfaces will reflect light and require less lighting.
- Refer to The Illuminating Engineering Society (IES) for recommended lighting levels for various activities published in TimeSaver or Graphic Standards to establish appropriate illumination levels around camp.
- When selecting light fixtures, beware of meaningless "dark sky rated" claims used by some manufacturers. The International Dark Sky Association has a Fixture Seal of Approval (FSA) program that can assist in lighting selection.

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