

2025 Fred Dill Wildlife Sanctuary Trail Planning Grant

Final Report- July 2026

Project Goals: Our goal was to develop a trail plan that directed visitors to local historical, cultural and natural resources and protected sensitive areas. The Fred Dill Wildlife Sanctuary offers a window into our agricultural and transportation histories with an abandoned railway abutment, old field walls, and solitary “wolf” trees. The site is centrally located for easy access to outdoor recreation like hiking and birdwatching. From wetland to upland forest, we believe a well-planned trail system will guide visitors toward better understanding the Hudson Valley’s natural resources while they enjoy all the peace and beauty the Sanctuary has to offer. The project area directly attaches to the Empire State Trail and offers a cool and shady respite for walkers and abuts several residential developments making it easy for locals to enjoy.



Fred Dill Wildlife Sanctuary is a green oasis in the heart of Carmel, NY, and connects to the Empire State Trail.

Photo CCE Putnam

Partnership Project: To create a more robust trail system that serves recreational and educational goals, we created a partnership between Putnam County, NY; New York New Jersey Trail Conference; and Cornell Cooperative Extension of Putnam. Cornell Cooperative Extension (CCEPC) took the lead on grant applications and administration while New York New Jersey Trail Conference (NYNJTC) assessed and designed a trail system with input



Hudson Valley Ramble Participants at Fred Dill Wildlife Sanctuary learning about invasive species.

Photo: Call of the Loon Productions

from Putnam County (PCNY which includes Parks & Recreation, and Historian’s Office) and CCEPC. With help from the County Historian’s office and research volunteers, we identified natural, historical and cultural resources within the sanctuary. The final trail plan is sensitive to these areas and opportunities.

Planning Documentation: The completed trail plan is attached as an appendix and will be hosted as a PDF on the Putnam County website. An

interactive map is available as a KMZ file [currently hosted here](#) but will be transferred to PCNY for hosting. This interactive map is intended to be a resource that can be updated by PCNY Staff. Additionally a Trail Plan and Assessment (see attached), provided by NYNJTC, details multiple opportunities for improvement and redirection of trails, as well as a possible new spur to bring visitors closer to the wetlands. Having this well-written document in hand allows PCNY to weigh possible projects and apply for future funding opportunities to implement those projects.

Biodiversity: As part of our collaboration with NYNJTC, a trail was redirected to protect a steep slope from erosion. This work was accomplished during three hands-on, Trail University educational events led by NYNJTC. The new trail better followed the hill contour. During the trail closure, displaced native soil, carrying with it local plant seeds, was reused to cover the closed off trail. By deliberately caching and re-using local soil, we reduced the chance of introducing invasive species to the site while offering native plants a new opportunity to grow.

Community Participation: This project attracted not only Trail U. participants but was also featured in a well-attended Hudson Valley Ramble event. The Trail U. programs, offered by NYNJTC, are part of their ongoing effort to train trail maintenance volunteers. Twenty-one volunteers, contributing 84 hours of learning and service, joined us for successful trail redirection and building events. For all our organizations this project was an opportunity to recruit new awareness of our efforts and new users to the Sanctuary.

Future Steps: This trail plan offers PCNY a decision-making resource for future remediation and trail development. The trail plan includes a wide range of recommendations for improvements, some of which are low-cost trail-blaze improvements and water bars.



Before and After Trail Redirection. This new trail offers hikers path with level footing. Soil from this cut was saved and re-used to dress the old, re-directed trail
Photos: NYNJTC

Others are more costly and would necessitate finding additional funding. For example, the suggested redirect of the Brown Trail, or drainage solutions suggested for the Leaf Trail would be expensive but would reduce erosion and surface water pollution, while making a more sustainable and safer trail. New interpretive signage or a kiosk would help visitors stay engaged as they traverse the sanctuary. As PCNY determines what they can achieve in house, and what would need additional funding, Cornell Cooperative Extension of Putnam is ready to assist with grant writing, partnership building and grant execution.

To read about other suggested trail improvements for the Fred Dill Wildlife Sanctuary, please review the attached Trail Plan and Assessment provided by New York New Jersey Trail Conference.



Trail U. Volunteers clear and level the trail-bed, removing invasive Autumn Olive

Photos: CCEPC



**Hudson River
Valley Greenway**

Funded in Part by a Grant from the Hudson River Valley Greenway



Fred Dill Wildlife Sanctuary

Trail Planning and Assessment

August 2025



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Valley Greenway**

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Project Introduction

Project Summary

The [Fred Dill Wildlife Sanctuary](#) (Putnam County Parks & Recreation) is a jewel in the heart of Carmel, NY. Nestled between Fair Street, Route 6 and the Empire State Trail and bikeway, this sanctuary offers hiking, picnicking, and observation of nature. Upland forests, wetlands, and ponds make it an excellent location to observe wildlife including birds, turtles, and frogs. Local historical landmarks within the preserve include the county's early fairgrounds and horseracing track, and a beautiful cut-stone abutment, part of the once-planned New York, Boston, and Montreal Railway.



To create a more robust trail system that serves recreational and educational goals, [Cornell Cooperative Extension Putnam County](#) (CCEPC) proposed a partnership between [Putnam County Parks & Recreation](#), the [New York-New Jersey Trail Conference](#) (NYNJTC), and CCEPC. As part of this partnership, CCEPC applied for grant funds through the [Hudson River Valley Greenway grant program](#) to secure funding for NYNJTC to assess and design a trail system for the Fred Dill Wildlife Sanctuary, as well as run a series of educational ["Trail U" workshops](#).

Later phases for this project may include additional grant funding applications for implementation of trail improvements, creation of interpretive educational signage, and integration with adult and youth outdoor programming.

Jennifer Lerner (Senior Resource Educator, CCEPC) and Peter Dolan (Senior Trail Planner, NYNJTC) began discussion in December 2024 regarding grant applications. Funding was awarded in March 2025, with work slated to begin in spring.

- **May 13:** Jennifer and Chris Ruthven led Peter on an introductory walkthrough of the project area, mostly along existing marked trails. The group walkthrough started at the southern lot and ended at the northern lot, after which Peter conducted a more detailed individual assessment for the remainder of the day.
- **June 27:** Peter conducted scouting activities to explore new trail construction potential, particularly west of Michael Brook.
- **August 13:** Peter conducted a site visit to plan and prepare for upcoming Trail U workshops, as well as collect final trail data for this planning document.
- **September 13, September 27, and October 11:** Trail U workshops were conducted on the property to teach trail skills - trail maintenance, tread construction, and unauthorized trail closure - to volunteers while executing valuable work.

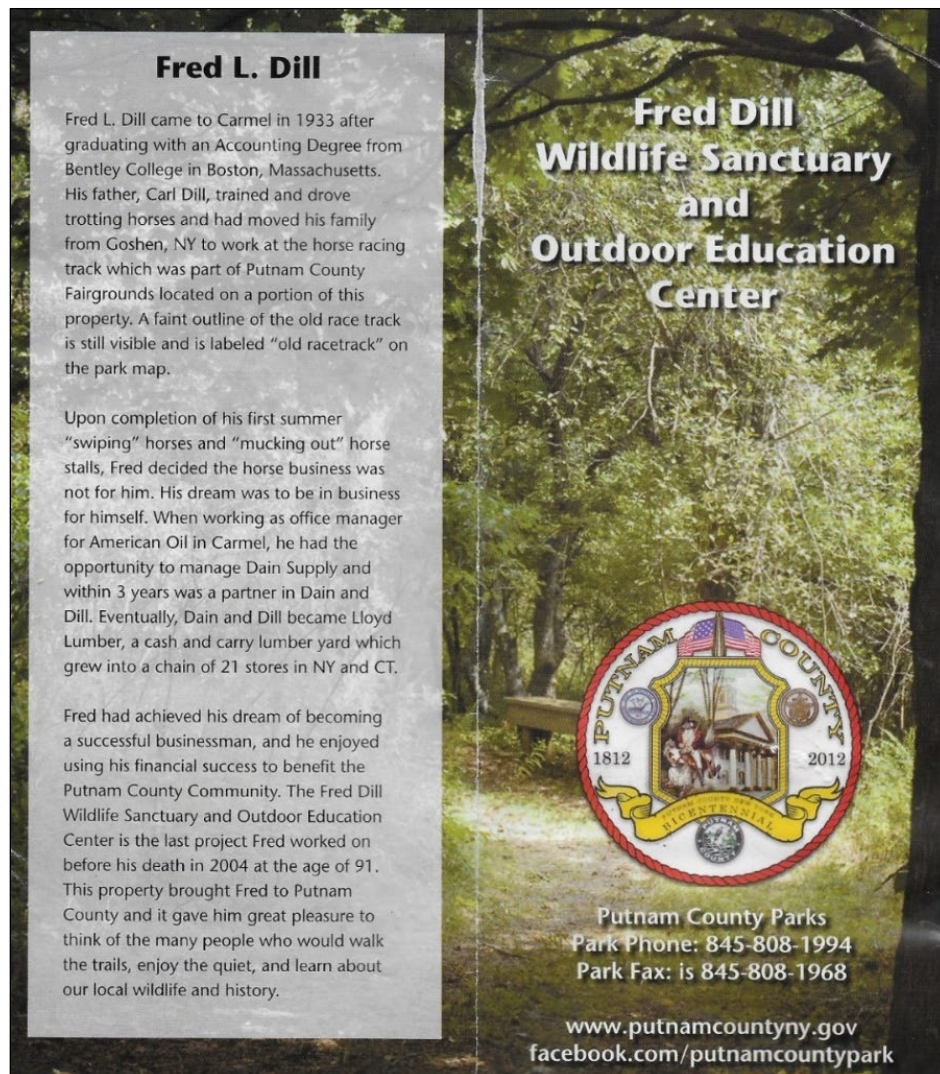
The following pages capture the primary findings and outcomes of the work described above.

Access to Trails

Fred Dill Wildlife Sanctuary is intended to serve visitors on foot only, and regulations prohibit the use of bicycles on trails (though this prohibition is not evident on location). Trails are primarily accessed from three points:

- **Trailhead 1 - Northern ([41.4288, -73.6719](#)):** This small, unpaved parking lot features a kiosk and direct access to the green-blazed Leaf Trail.
- **Trailhead 2 - Southern ([41.4198, -73.6711](#)):** Primarily accessed via the parking lot behind CoveCare Center ([41.4187, -73.6723](#)), or from the Empire State Trail, this trailhead also features a kiosk and easy access to the nearby pond and educational/picnic pavilion.
- **Brewster Road Connector ([41.4191, -73.6740](#)):** Provides access to the pond and educational/picnic pavilion via an unmarked and heavily-overgrown connector trail.

The most useful document for locating and interpreting points of interest along trails in Fred Dill is the **Fred Dill Wildlife Sanctuary and Outdoor Education Center brochure**, depicted below. At this time it is unclear how visitors may acquire the brochure, and no digital version could be found online.



Points of Interest

Twelve significant points of interest (or “stations”) are consistently mentioned in official maps of Fred Dill, and interpreted in the brochure mentioned above. Scans of the brochure describing points of interest/stations are included below and on the following page.

Station 1: What is a Wetland?

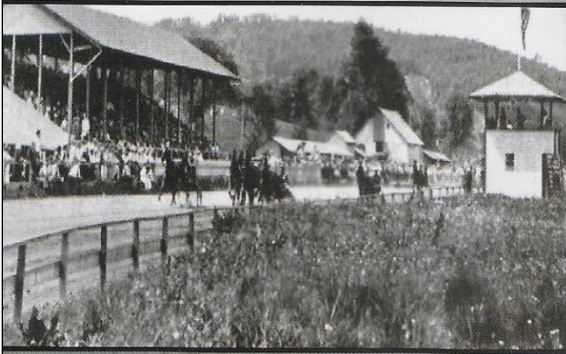
Wetlands are areas where water is the primary factor controlling the environment and the associated plant and animal life. It's where land is flooded or saturated at or near the ground surface for varying periods of time during the year. They are invaluable in controlling floodwaters, recharging groundwater, and filtering pollutants; as a habitat for waterfowl and other wildlife; and for their educational, recreational, and aesthetic promise.



Red-winged Blackbird.
Photo: ©2008 Walter Siegmund

Station 2: The Putnam County Fairgrounds and Racetrack

Around 1865 this property was acquired for the County Fairgrounds. A large building for exhibits was erected and a half mile race track was built on the low land directly in front of the exhibit building. A grandstand was later added. The original intent of the fair was to display prize livestock and produce. The decline of farming in the area left horse racing as the most important part of the fair. The Gleneida Racing Association held regular races at the track until 1932. Automobiles raced on the track for a number of years in the 1930's. Horses were kept at the track and trained for harness racing until the 1960's.



Putnam County Fairgrounds and Racetrack

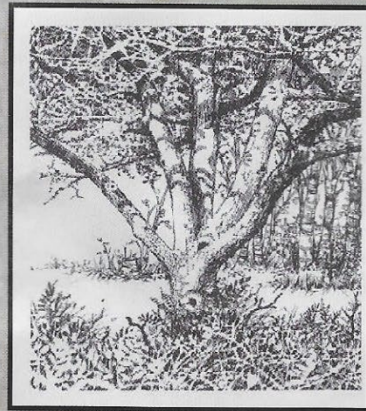
Station 3: Stormwater Erosion—Retrofit

This site was once severely eroded due to a concentrated stormwater discharge from Kelly Ridge. With the new MS4 Stormwater Regulations this type of uncontrolled discharge is no longer allowed. The Town of Carmel and Putnam County worked together to construct this stormwater retrofit in 2013 in order to repair the damage and prevent future erosion.

Station 4: Old Oak “Wolf” Tree

This large 57” diameter dominant White Oak with a spreading crown has tremendous wildlife value. A “wolf” tree is a historical remnant (equivalent to a stone wall) that is an obvious

indicator of past agricultural activity. This particular tree was from the Everett Farm. The family came from Scotland in 1746. Isaac Everett (Everitt) was a mason who built blast furnaces for melting iron ore. He settled in Putnam 1750-1760 and was one of the chain bearers who surveyed the lot lines in the

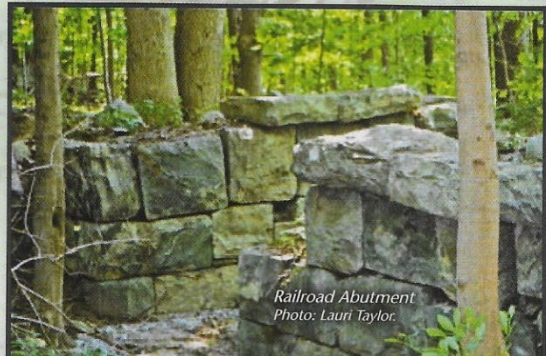


“Wolf Tree”

Philipse Patent in 1777. His son Abraham bought the 236 acre farm in Carmel from Frederick Philipse in 1813/14. Abraham and his sons were pioneers in the western cattle trade and drove fatted steers to market on foot. One of his sons Leonard K. Everett lived on the farm from about 1850-1880. He was treasurer of Putnam County in 1854, and a trustee in the association that built the Carmel Collegiate Institute and Drew's Ladies Seminary. (William S. Pelletreau, History of Putnam County, 1886)

Station 5: Hand Cut Stone Railroad Abutment

The Putnam and Dutchess Railroad had planned to split from the New York and Boston Railroad in Carmel and pass through this site. In 1873 it reorganized as the New York, Boston, and Montreal Railway. However, the Panic of 1873 hit and the leases and mergers were cancelled. Construction on the Putnam and Dutchess Railroad stopped and the intended route was never completed leaving the railroad abutment abandoned in the woods.



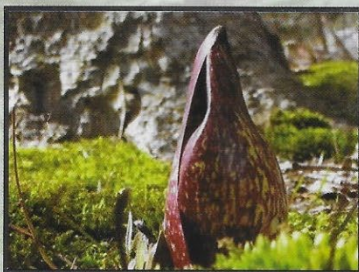
Railroad Abutment
Photo: Lauri Taylor

Station 6: Upland Woodland

The Fred Dill Wildlife Sanctuary is covered by an upland deciduous hardwood forest. This forest is dominated by oak, hickory, ash, maple, beech, birch, and tulip. Native tree seedlings and shrubs are lacking in the forest understory due to being browsed by deer. Deer have not evolved to browse on invasive species such as Japanese barberry seen at this station. By browsing on all of the native vegetation, deer have helped to spread invasive plants in the region. However, the forest still provides habitat, food, and water that attract deer, turkey, and many other birds, small mammals, reptiles, amphibians, and insects.

Station 7: Skunk Cabbage Heaven

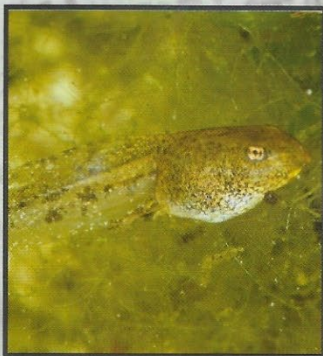
As the days begin to lengthen in February, Skunk Cabbage begins to flower. These flowers often give off a considerable amount of heat. flowered, large leaves develop, sometimes shading the entire forest floor. By the end of summer, the leaves wither and die, leaving room for Jewelweed and other wildflowers



Skunk Cabbage
Photo: ©Sue Sweeney

Station 8: Vernal Pool

A vernal pool is a contained basin depression lacking a permanent above ground outlet. It fills with water with the rising water table of fall/winter or with the melt water and rain runoff of winter/spring. It only contain water for a few months in the spring and early summer. By late summer, a vernal pool is generally dry. A diverse group of invertebrates and amphibians depend upon temporary pools as breeding ponds. Since vernal pools cannot support fish populations, there is no threat of fish predation on amphibian eggs or invertebrate larvae. Examples of these species are Fairy shrimp, Mole salamanders, Wood frog, American toad, Green frog, and the Red-spotted newt. In the early spring, look closely in the water and you may see a jelly-like mass that contains frog or salamander eggs.



Tadpole of the common frog.
Photo: Piet Spaans

Station 9: Stone Walls

Stone walls are the legacies of farmers whose lifestyle dominated Putnam County from the mid 1700's up to the turn of the Century. Men and teams of oxen cleared the rock off the land, laying course upon course of rock to form enclosures that separated fields from pasture and one man's land from his neighbors. Photos from the early 1900's still show a landscape of tree-less pastures crisscrossed by stone walls. Today, lichen covered stone walls shelter small animals as they follow their forgotten paths through the new growth forest.



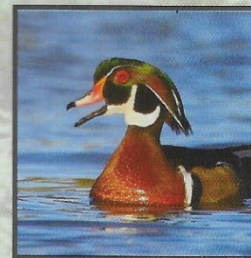
Mineral banding

Station 10: Gneiss with mineral banding

The twisted and folded layers of light-colored quartz and feldspar and dark bands of mica and hornblende in this rock are evidence of the forces that formed Gneiss (nice). Intense heat and pressure in the Earth's crust changed the pre-existing rocks into metamorphic rocks. Under these conditions, mineral crystals are often distorted, flattened into sheets, stretched, and packed together to change into meta- morphic forms. Gneiss is the most common metamorphic rock and forms the ridges of Putnam County. Due to its strength it is often used as a building material.

Station 11: Pond

A pond is one of nature's most important natural resources. It is a quiet body of water so shallow that rooted plants grow completely across the bottom. It can provide water for wildlife, recreation, irrigation, fire-fighting or just a beautiful focal point in the landscape. If you look closely you may find frogs, salamanders, newts, fish, insects as well as many different birds and animals in the pond ecosystem. Carmel High School has placed Wood Duck nest boxes near the pond to encourage breeding.



Wood duck

Station 12: Rock Outcrop

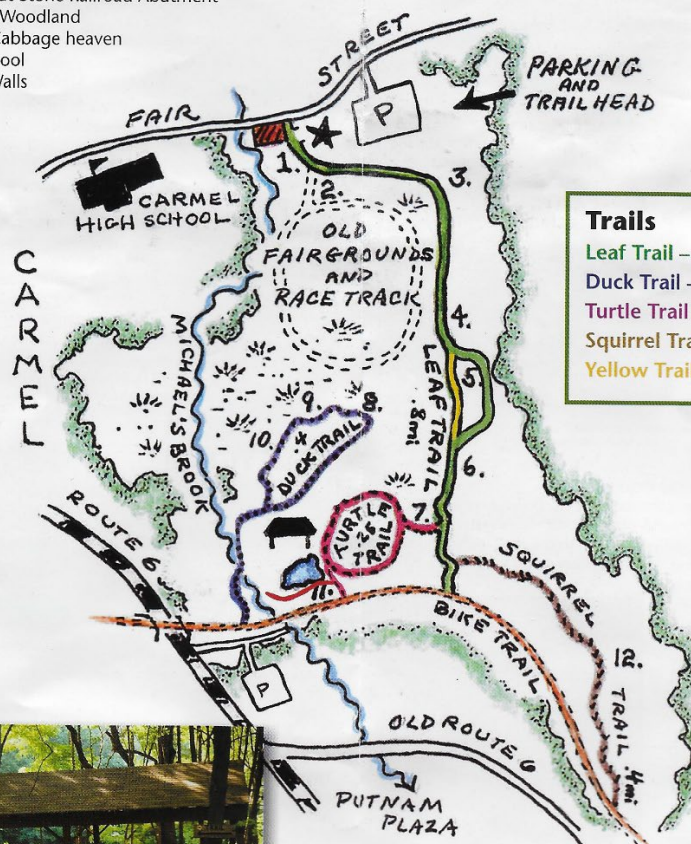
This exposed section of the crust (bedrock) is part of an ancient mountain range called The Hudson Highlands. The Highlands run in a diagonal band from Pennsylvania to the Taconic Mts. at the Connecticut border. Besides the Adirondacks, the Hudson Highlands contain the oldest rocks in the State. They are the remains of a lofty mountain range that formed about 1.1 billion years ago when the edges of two ancient continents collided. The heat and pressure of the collision folded and fractured the crust into a mountain range of metamorphic rocks (mostly gneiss) called the Hudson Highlands. Wind, water and sheets of glacial ice have rounded off the mountaintops and worn them down to their roots. They contain veins of iron ore and igneous intrusions of granite

This brochure should be digitized and made available on the official Fred Dill website, so that people can access it as they plan their visit.

Fred Dill Wildlife Sanctuary and Outdoor Education Center Brochure

Points of Interest

1. What is a Wetland?
2. Putnam County Fairgrounds & Gleneida Racetrack
3. Stormwater Erosion
4. Old Oak "Wolf" Tree
5. Hand Cut Stone Railroad Abutment
6. Upland Woodland
7. Skunk Cabbage heaven
8. Vernal Pool
9. Stone Walls
10. Gneiss with Mineral Banding
11. Pond with Educational/Picnic pavilion
12. Rock Outcrop



Pond Site Educational/Picnic Pavilion
Photo: Lauri Taylor

A Special thank you to Judy Kelley-Moberg for her assistance in the development of this brochure and for the creation of the map.
For further information contact Putnam County Parks at 845-808-1994 or Putnam County Soil and Water Conservation District at 845-878-7918.

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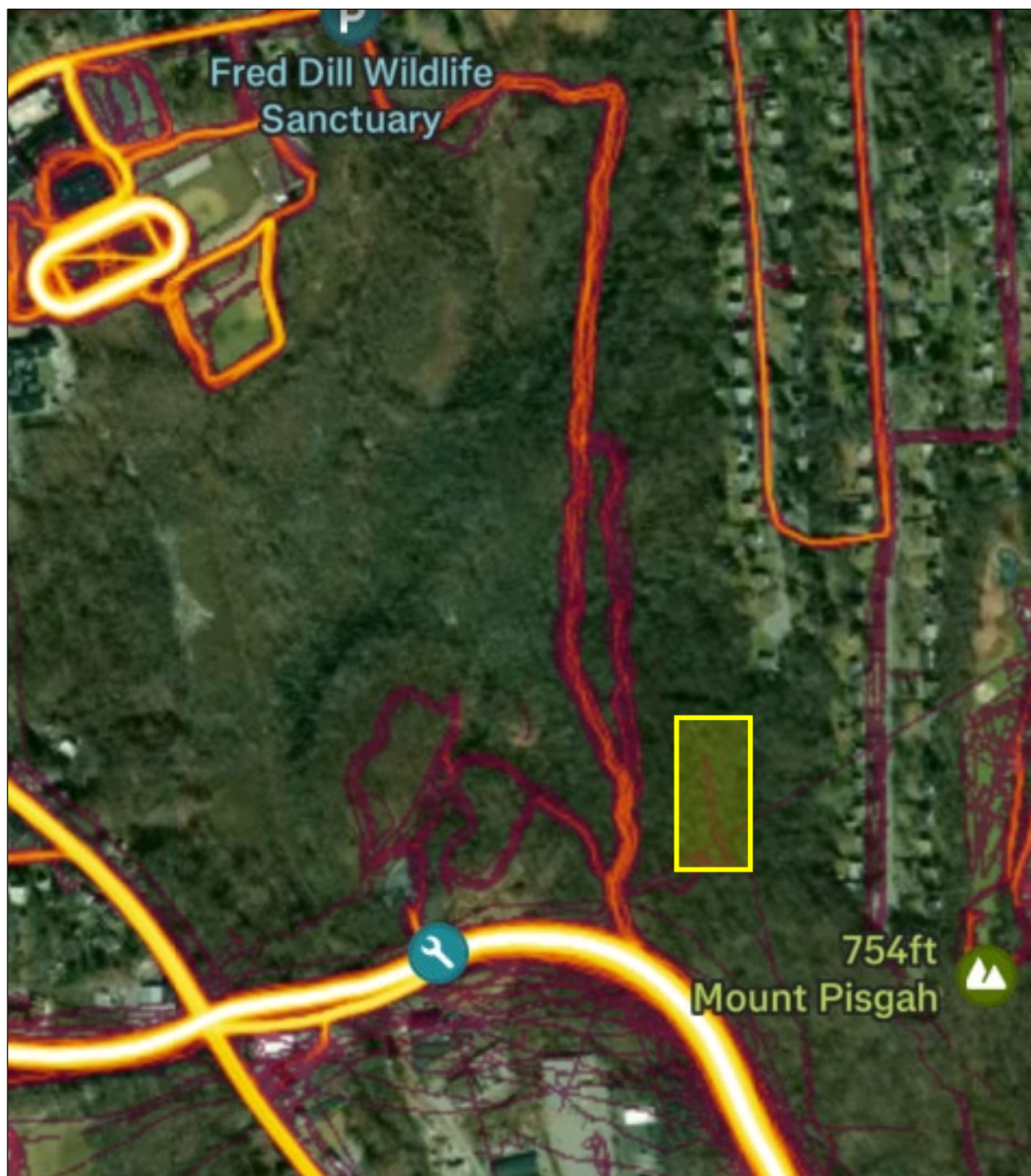
Trailhead Kiosk Maps

The kiosks located at the northern end ([41.4289, -73.6720](#)) and southern end ([41.4196, -73.6709](#)) of Fred Dill both contain the map shown below. It differs from the map included in the brochure, most notably omitting the Yellow Trail and distinguishing between the Red Trail and orange-marked Turtle Trail. It also numbers points of interest but does not name them or link to any web resources, relying on visitors to have access to the brochure for interpretation. In addition, any updated version of this kiosk map should be used to communicate the hiking-only nature of these trails.



Strava Heat Map

The [“heat map” below from Strava](#) shows relative use by all visitors to Fred Dill, as collected by the app. Notable takeaways from this map will be referenced throughout this planning document. Toggling the online map to “All Cycle Sports” shows relatively little bicycle use on trails, but does highlight some informal unmarked trails being used by mountain bikers. This may inform future targeted trail closures and restorations.



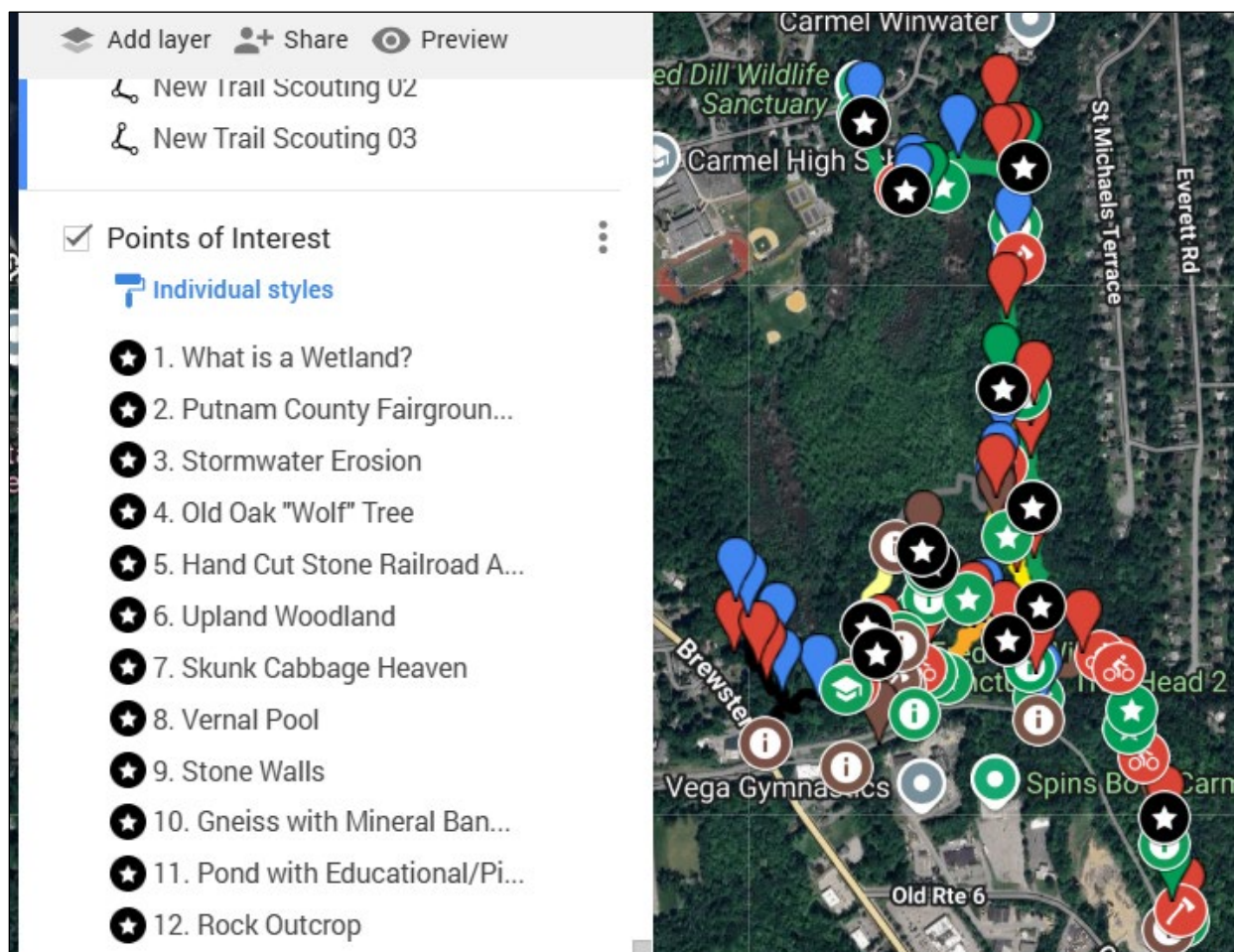
The spur highlighted above is one example of an unmarked social trail.

Google My Map

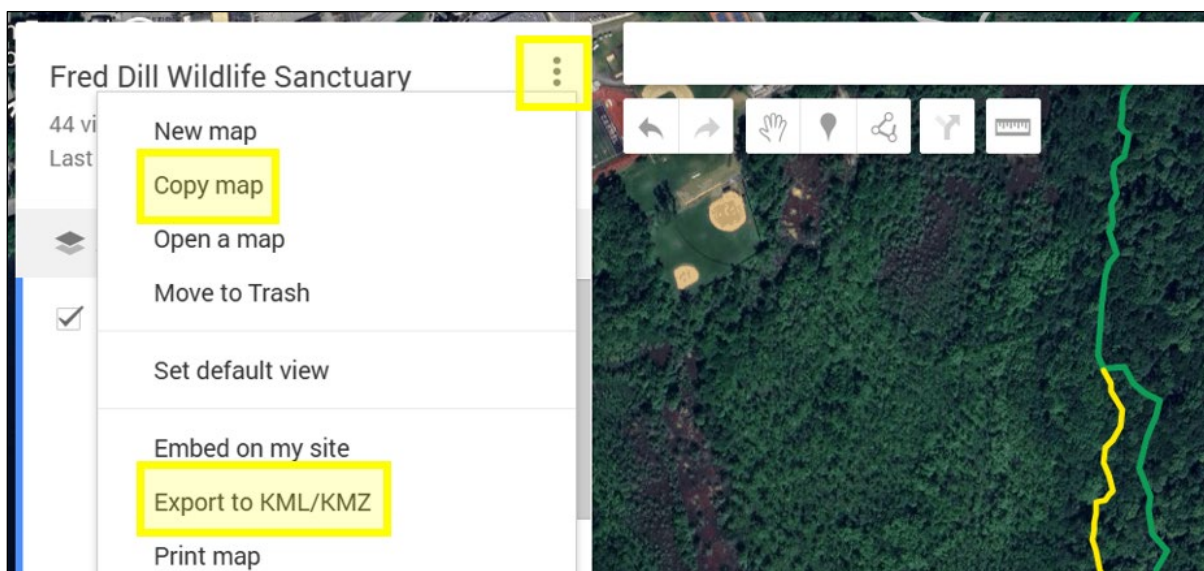
The creation of this document included extensive field scouting and data collection about existing trails and conditions. This GPS data was exported to [Google My Maps](#), where it could be curated and easily shared between project collaborators. Below is a screenshot showing some of the collected GPS data as it appears on the My Maps platform.

[The full interactive Google My Map can be accessed here.](#) It features potential trail repair projects indicated with various icons. **Green** icons indicate positive or attractive features, **red** icons indicate negative features or deficiencies, and **blue** icons indicate persistently wet areas.

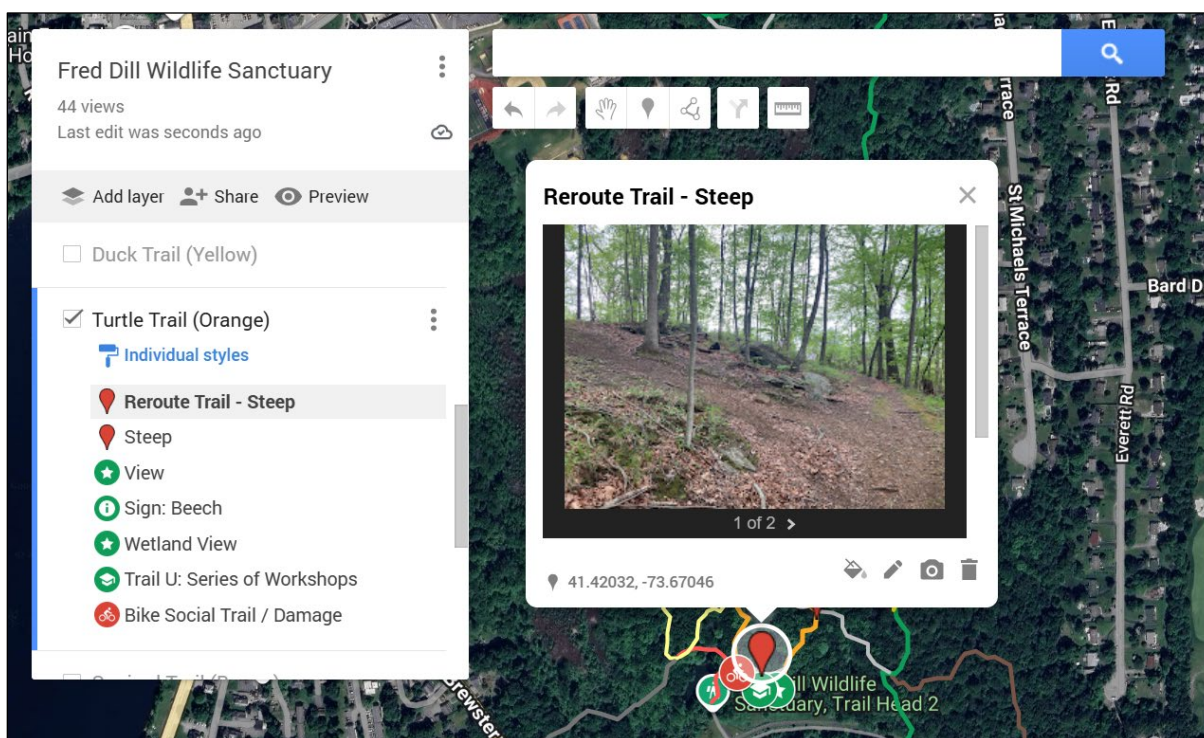
The interactive map is an incredibly important part of this Report, and it contains more information than could be reasonably presented in a traditional document like this one. **We recommend backing up a copy as soon as possible after you read this**, by both downloading the full GIS data to a secure location and also creating a duplicate My Map file which you will have the ability to edit in the future.



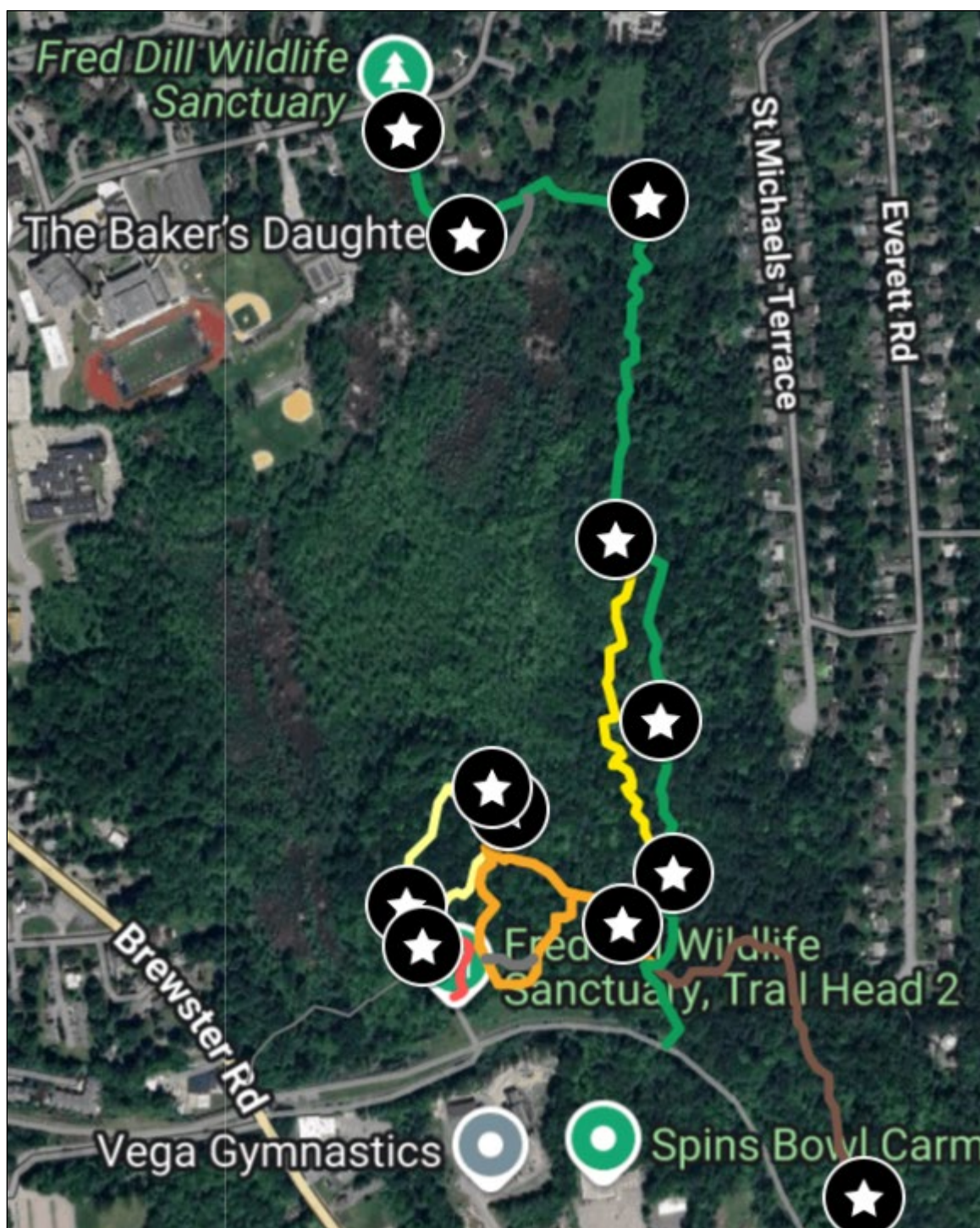
Immediately upon receipt of this document, duplicate and safely store all data from Google My Maps to ensure your long-term access. Duplicating the file to create a new My Map, under an account you control, will also allow you to curate the map into the future. This includes removing issues as they are resolved, adding new issues as they arise, and otherwise tracking the condition of trails into the future. Exported KML/KMZ files can also be imported into other programs and used to make professional, public-facing trail maps.



Clicking any pin icon on the map will reveal more information. In addition to a short description of the feature, and the exact latitude/longitude, most pins include embedded photographs. **Note that embedded photographs cannot be exported as described above.**



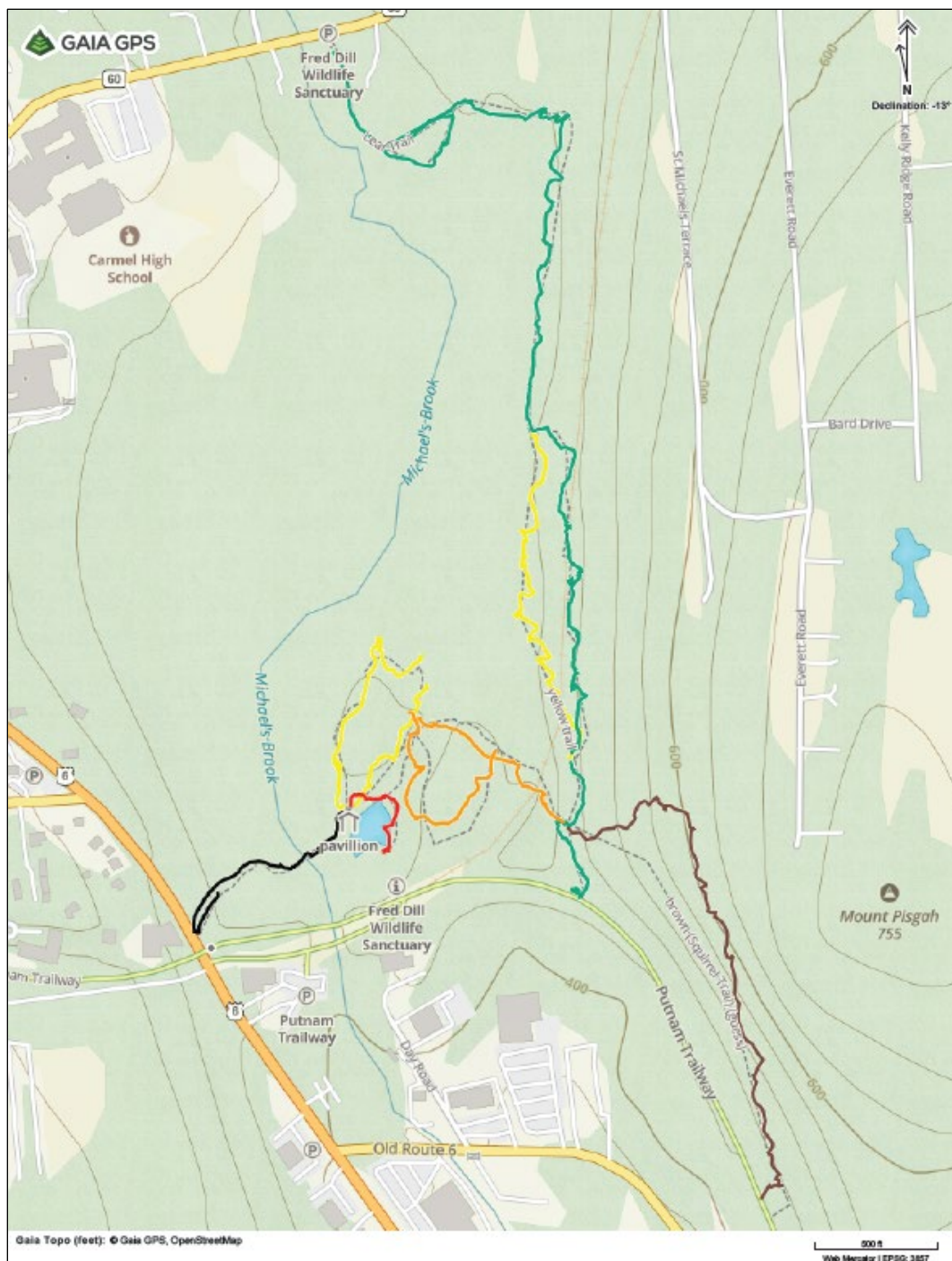
A public-facing Google My Map, embedded or linked on the [official Putnam County webpage](#), would be a valuable resource to help visitors plan their visit. The twelve points of interest indicated on brochure and kiosk maps could be included, allowing visitors to click on them to learn more about the feature at each location.



The map above shows each point of interest from the existing park maps as a star. Clicking on each star shows the number and name of the point of interest, and offers the opportunity to include additional text, photos, links, etc.

Gaia Trail Map

Initial field data was collected using the [Gaia GPS](#) app before being imported and curated on Google Maps. The “clean trail map” below is clear and accurate, and may have utility for some users. A full-resolution PDF version of this map can be provided upon request.



Note that the GPS-collected lines above do not align exactly with the [OSM base map](#) lines, and that they are a bit “choppy” due to collection while gathering data. A quicker, more direct hike of all trails will yield smoother lines.

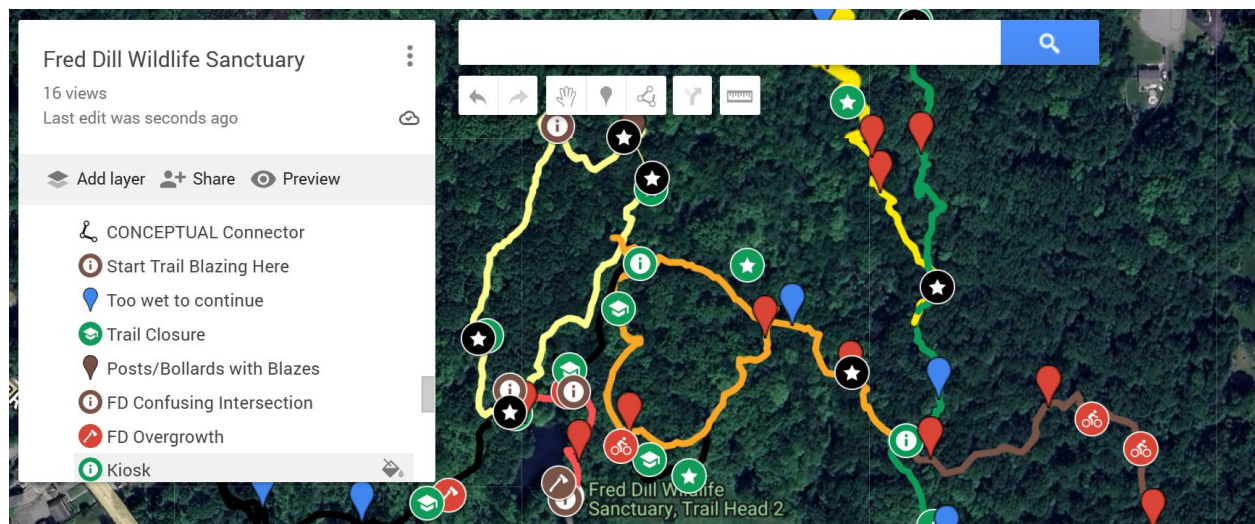
Individual Trail Assessments

The scope of this plan focuses on the following trails within Fred Dill Wildlife Sanctuary, offering a high-level assessment of issues and corresponding recommendations for each.

- Red Trail (Red)
- Duck Trail (Yellow)
- Turtle Trail (Orange)
- Squirrel Trail (Brown)
- Leaf Trail (Green)
- Yellow Trail (Yellow)
- Brewster Road Connector (Unmarked)

The maps included alongside each trail assessment are for broad context only, and not every pin depicted on the map corresponds with an item in the written assessment. This sort of information is best viewed in the interactive [Google My Map platform](#), where exact coordinate for each issue as well as notes and photos can be viewed.

To make the most of this trail assessment, **we recommend creating a personal copy of the Google My Map as soon as possible by using the “copy map” feature.** This personal copy will not only ensure that the data is saved if the original copy is eventually deleted, but will also allow issues to be tracked in real time. Volunteers and land managers can remove issues as they are rectified and add new ones as they arise, serving as a useful resource for tracking work needs in perpetuity.



The Google My Map contains much more data than could be reasonably included in this document, and in a far more useful and interactive format.

Each trail description includes an approximate mileage based on a “smoothed” version of GPS data collected. Because assessment by necessity requires doubling back, standing in place, or moving short distances off-trail, these cleaned-up lines provide a more accurate mileage estimate than the actual GPS tracks from field data collection. If a more accurate mileage is needed, it is recommended that someone walk each trail end to end with a GPS device or measuring wheel.

Red Trail (Red)

Approximate Mileage: 0.08

The unnamed Red Trail begins at the southern access point and leads to the educational/picnic pavilion. Unlike most trails at Fred Dill, it features simple colored metal tag blazes rather than a thematic icon.

Issues:

1. Entrance to the trail is difficult to see, and the paved path leading to it appears to dead-end at a fence.
2. The trailhead almost offers a nice view of the pond, but it is overgrown. Especially for people who have mobility challenges or other accessibility issues preventing them from using the trail network, it would be good to have a water view at this location.
3. Immediately upon starting the trail, the tread is narrow and rocky alongside the pond. Given that this trail is how people access the pavilion, it should be the easiest and most accessible stretch of trail in the network to accommodate school groups and people of all ages and abilities.
4. Confusing junction/intersection with both marked and unmarked trails (41.4206, -73.6711). The recent clearing of a large fallen tree at this location compounds the issue, making it unclear to visitors where to go.
5. Off-trail blazes are located along the pond's edge where no trail tread exists, potentially confusing visitors.

Recommendations for Improvement:

1. Entrance should be aggressively clipped and cleared to provide a wide, open, visible corridor for entrance into the trail network. At minimum, a signpost with three blazes in the "trail start" configuration would further invite people to begin their exploration. A sign should also be mounted indicating that bicycles are not allowed.
2. Branches and foliage obstructing the view should be cleared and maintained as an open "window" to the pond.
3. Trail construction work should cut into the upslope bank, opposite the pond, to widen the trail tread surface. Rocks should be removed wherever possible, and where not possible the tread should be graded to minimize steps up and down. While this trail may never meet all accessibility standards described in the Forest Service Trail Accessibility Guidelines (FSTAG), removing barriers wherever possible will make this short trail safer and more welcoming to as many people as possible.
4. It should be clear where trails do or do not exist - sanctioned trails should be marked and maintained, while "social trails" or "herd paths" should be obscured and blocked off as they arise. Do not clear blowdowns or overgrowth along unmarked trails. Consider "stay on marked trail" signs if social trails continue to be traveled and re-opened, as letting these proliferate can lead to lost hikers and environmental damage.
5. Any off-trail blazes should be removed.

Other Suggestions: If there is an intent to use the pavilion for school and family-friendly programming, the Red Trail might be a compelling candidate for accessible trail construction. This would likely require a professional trail construction contractor rather than relying on local volunteer labor, but it would provide a valuable opportunity for everyone to connect with nature at Fred Dill.



Duck Trail (Yellow)

Approximate Mileage: 0.32

The Duck Trail forms a loop beginning and ending at the pavilion. This convenient staging location, loop route, multiple points of interest, scenic opportunities, short mileage, and easy terrain all make it ideal as a route for children, school groups, families, and anyone else preferring a short/easy walk.

Issues:

1. Confusing intersection at the Duck Trail trailhead, in the vicinity of the pavilion. The Red Trail, Duck Trail, and unmarked social path all converge at the pavilion with unclear markings.

Recommendations for Improvement:

1. A single prominent tree or new signpost should indicate both the end of the Red Trail as well as the start of the Duck Trail. The start of loop trails can sometimes be confusing, so a simple sign with arrows pointing in both directions will help communicate the looped nature of the trail starting at this point.

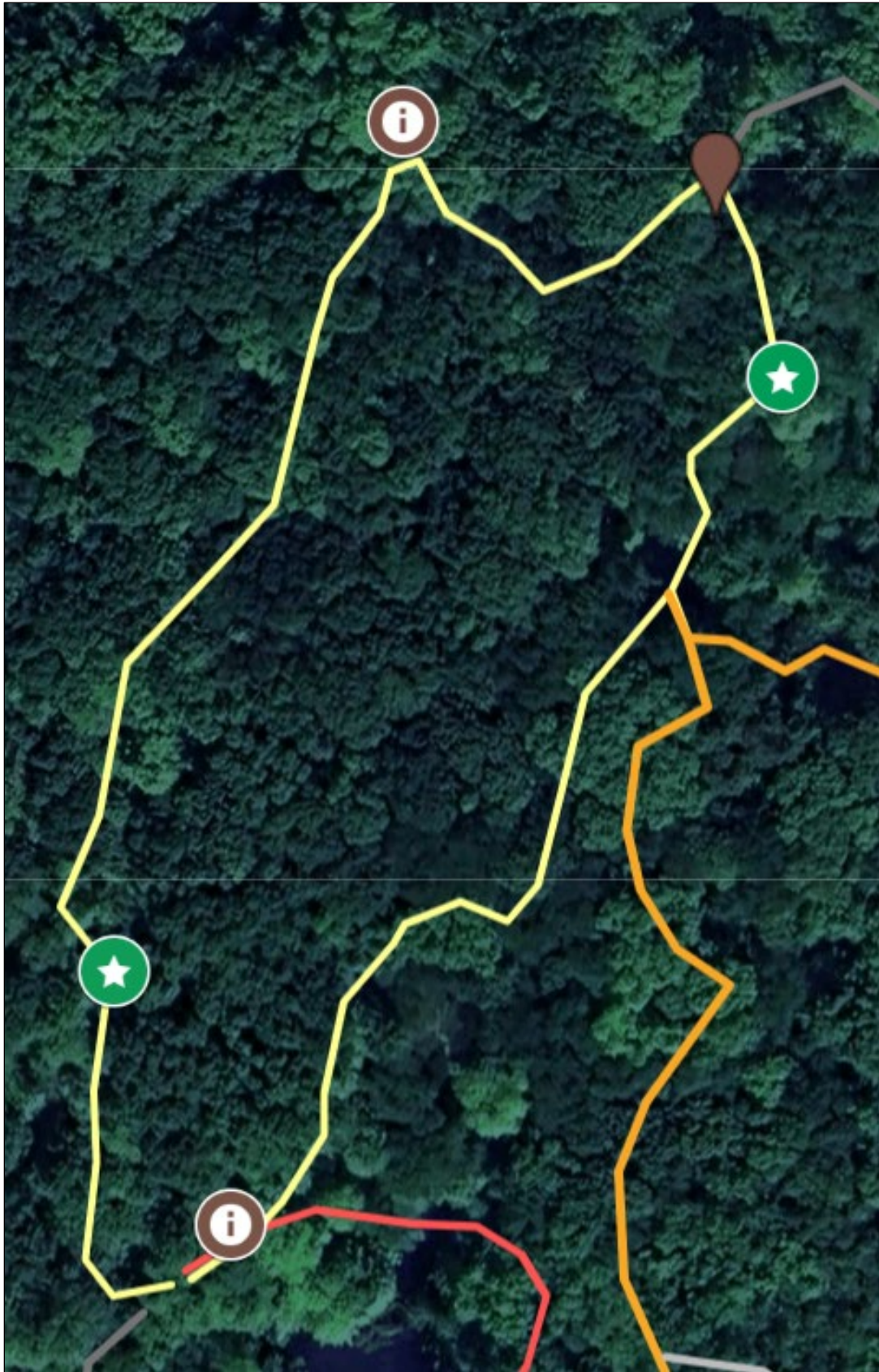
Other Suggestions: Changing the name to “Duck Loop” or “Duck Loop Trail” will make it clear to people that this trail takes them back to where they started, while other trails on the property may not.

The clearing at the northern end of the loop (41.4222, -73.6713) has a bench, wetland views, and an old stone wall. It is an ideal location for interpretation about local history and ecology.

Given the suitability of this trail for school and family groups, interpretive signage and kiosks along this trail should be given highest priority over more remote trails.



Multiple paths converging on the pavilion can be confusing. Official trails (Red and Duck) should be clearly blazed, and unofficial trails should be heavily obscured. A prominent tree or signpost should indicate trail starts and ends here.



Turtle Trail (Orange)

Approximate Mileage: 0.36

The Turtle Trail is a loop with a short spur connecting to the Duch Trail to the west, and a longer unmarked connector to the east leading to the intersection of the Leaf and Squirrel Trails. While unmarked, the connector has been included in this section.

Issues:

1. Mountain bike use is evident both on and off the Turtle Trail.
2. A steep and eroded portion of the trail should be closed and rerouted (41.4204, -73.6708). The current erosion will worsen significantly once a defined channel forms and water begins to flow down it. Best to address this problem proactively.
3. A very steep section of trail (41.42096, -73.66964) should be rectified. It poses a risk particularly in wet and slippery conditions.
4. One section of the trail has significant erosion and channeling (41.42069, -73.66897).

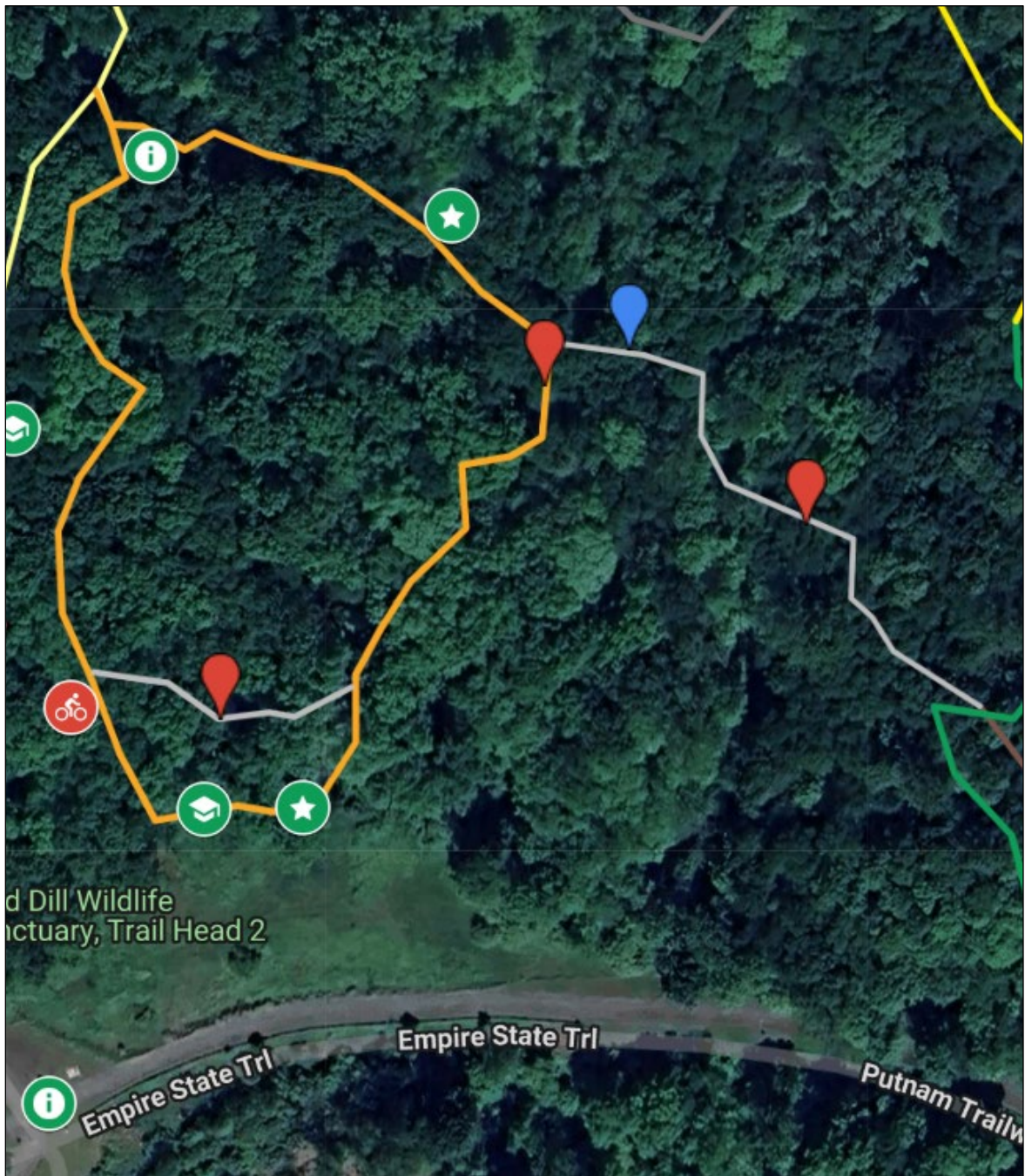
Recommendations for Improvement:

1. Visible unmarked trails in the vicinity (around 41.42034, -73.67085) should be thoroughly closed and signed to prevent worsening damage to the environment. If necessary, signed reminders to "respect nature and stay on marked trails" or similar may help.
2. A viable route was scouted and flagged, extending the Turtle Loop slightly to the south. The new route takes advantage of the natural landscape contour to circumvent the existing steep up-and-down, and affords a new south-facing view.
3. Relocation may be difficult here, and a timber-cribbed staircase may be the preferred solution. Eagle Scouts or volunteers are usually capable of this type of construction, and should be contacted for their capacity and interest.
4. Establishing grade reversals or similar tread-based drainage solutions will encourage water to flow across and off the trail, rather than down it. This should reduce erosion going forward and allow tread repairs to take place. Where pronounced intermittent flow crosses the trail, an armored swale can direct water and minimize erosion.

Other Suggestions: Changing the name to "Turtle Loop" or "Turtle Loop Trail" will make it clear to people that this trail takes them back to where they started, while other trails on the property may not.



Proper drainage structures can direct water off and across the trail, rather than down it. When damage slows and conditions/resources allow, existing damage to the tread can be addressed.



Squirrel Trail (Brown)

Approximate Mileage: 0.44

The Squirrel Trail appears to have the lowest use of trails in Fred Dill according to the [Strava heat map](#) of the area, as well as only a very generalized route on the [OSM base map](#). The trail has some issues at both ends which may discourage use (noted below).

Issues:

1. The initial climb from the intersection with the Turtle and Leaf Trails is steep - almost direct fall line, running perpendicular to terrain contours.
2. Mountain bike use is evident in several locations via criss-crossing social trails and ramped structures.
3. Near the southern end of the trail (41.41659, -73.66544) is a wet and difficult area - in addition to wet tread conditions the location has slippery wood structures and substantial downed debris in the corridor.
4. Southern intersection with the Empire State Trail is extremely easy to miss.

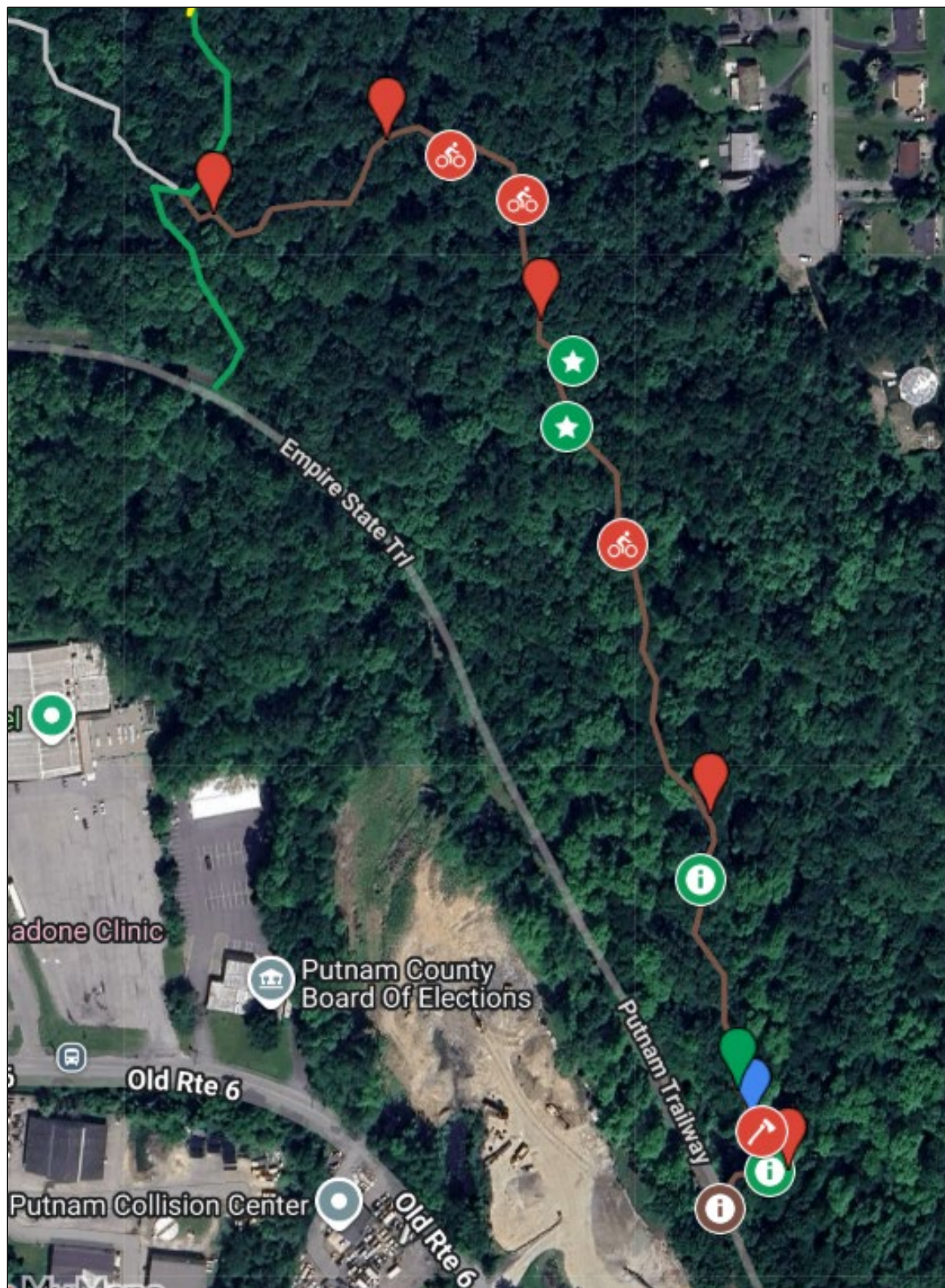
Recommendations for Improvement:

1. Trail should be rerouted to a more sustainable alignment, using broader climbing turns to gain elevation.
2. If local land management decides that mountain bikes are not allowed on the trail then social trails should be closed off, ramp structures disassembled, and regulatory signage added at trailheads. If bicycles are allowed on the trail, then the social trails should be assessed for viability and possible incorporation into the official marked trail network.
3. Work is needed to clear and open the corridor, improve drainage where possible, and then repair and/or install new bog bridging to provide dry and stable footing.
4. Entrance should be aggressively clipped and cleared to provide a wide, open, visible corridor for entrance into the trail network. At minimum, a signpost with three blazes in the "trail start" configuration would further invite people to begin their exploration. A sign should also be mounted, visible from the Empire State Trail, indicating that bicycles are not allowed.

Other Suggestions: Consider extending the northern trail start to connect to the Empire State Trail, making it possible to walk a loop using only this trail and the Empire State Trail. More information about this suggestion is located later, in the "General Findings and Recommendations" section of this document.



The Squirrel Trail trailhead as viewed from the Empire State Trail.



Leaf Trail (Green)

Approximate Mileage: 0.93

The Leaf Trail is the longest trail in Fred Dill, connecting the northern parking lot with the Empire State Trail in the south. It is also the most popular trail, according to the [Strava heatmap](#).

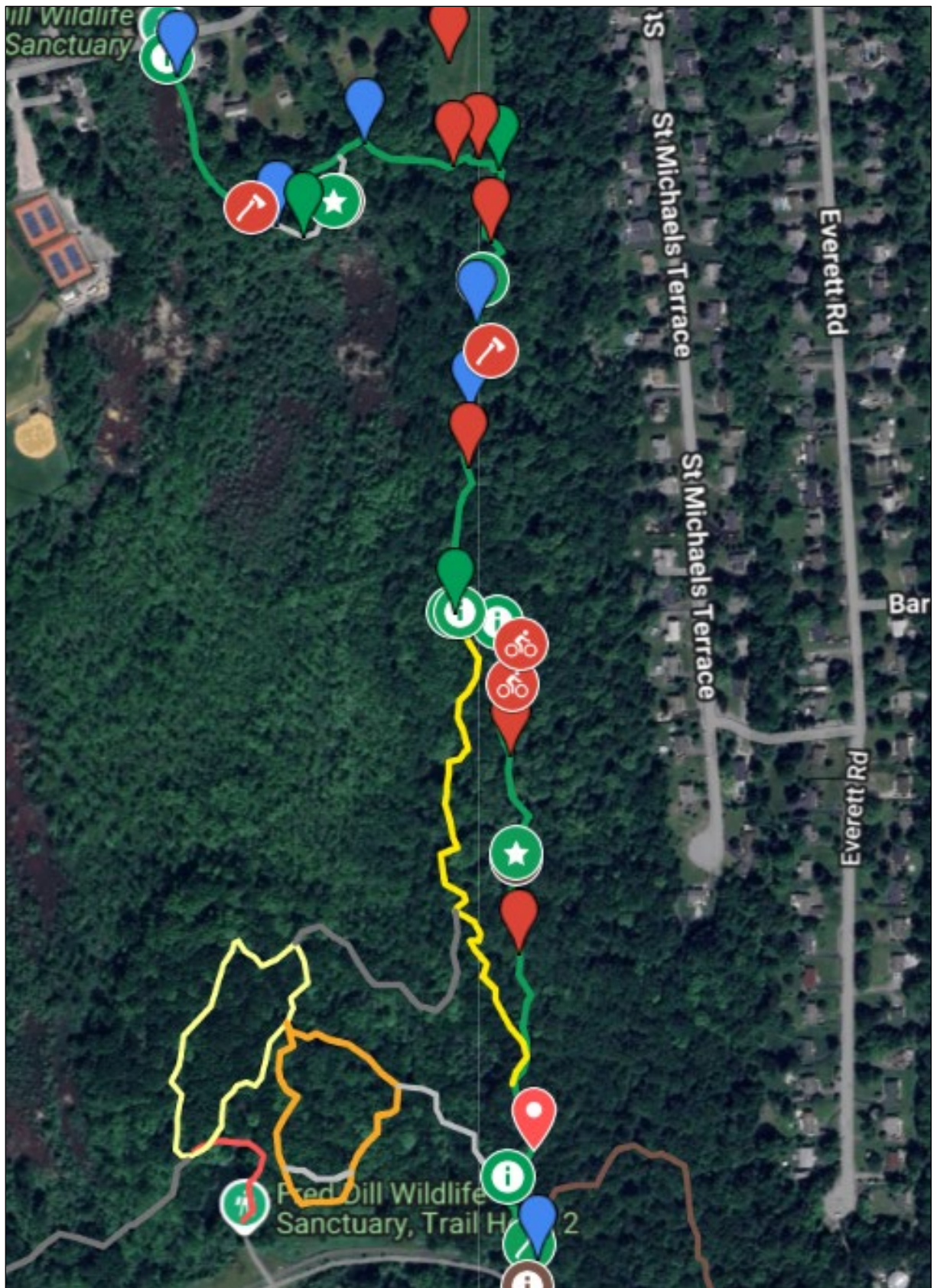
Issues:

1. The trail has several wet tread issues, noted on the [Google My Map](#) as blue pins. These are too frequent and varied to classify here, but the more significant issues have photos embedded within the map pins to guide future discussion.
2. A small “detour” forms a loop close to the northern end of the trail. The detour is very wet and fairly overgrown.
3. Trail washout (41.4235, -73.6685) is damaging tread and causing seasonally wet conditions.
4. Significant drainage damage causing deep channeling and erosion (41.4220, -73.6684).
5. Southern intersection with the Empire State Trail is extremely easy to miss.

Recommendations for Improvement:

1. The solutions vary from possibly dumping gravel or crush right near the northern trailhead, to building trail structures like drains, stepping stones, or bog bridge at other locations. Specific recommendations or work plans for each location are beyond the scope of this assessment.
2. Recommended to decommission the southern “detour loop” and preserve the northern more direct trail. The detour adds little to the trail experience. If desired, the bench indicated on the map could be moved to the viewpoint also indicated to provide a very short trail spur which allows people to sit and enjoy a wetland view while omitting the worst section of the small loop. Note that the trail beyond that short spur would have to be blocked off aggressively to keep it from reopening.
3. Most likely solutions involve a more direct cross-drain, using a culvert, armored swale, or similar feature, to guide water across the trail as expeditiously as possible. This will minimize how much water flows along the trail, causing damage and wet conditions as it goes.
4. Trail may need to be relocated upslope away from current mouth of channel. A combination such as culvert and bog bridging may be needed to both concentrate water flow and elevate a hard/dry tread surface.
5. Entrance should be aggressively clipped and cleared to provide a wide, open, visible corridor for entrance into the trail network. At minimum, a signpost with three blazes in the “trail start” configuration would further invite people to begin their exploration. A sign should also be mounted, visible from the Empire State Trail, indicating that bicycles are not allowed.

Other Suggestions: This trail contains two of the most notable and interpretation-worthy features on the property - a dramatic wolf tree (41.4246, -73.6691) and old railroad abutments (41.4228, -73.6683). The “General Findings and Recommendations” section later in this document provides recommendations for interpretation, starting with a numbered post at these and other stations noted in the existing interpretive brochure.



Yellow Trail (Yellow)

Approximate Mileage: 0.30

The unnamed Yellow Trail offers an alternative route for part of the Leaf Trail, diverging to run parallel before reconnecting. Unlike most trails at Fred Dill, it features simple colored metal tag blazes rather than a thematic icon. According to the [Strava heat map](#), slightly more people use the Yellow Trail than the Leaf Trail where they run parallel.

Issues:

1. Wet tread and other water issues are persistent along the Yellow Trail. It is downslope of the parallel segment of Leaf Trail, and catches more water as a result.
2. One relatively steep and rough section of trail (41.4220, -73.6688), while not terrible, is out of character with the grade and tread smoothness of the rest of the trail.

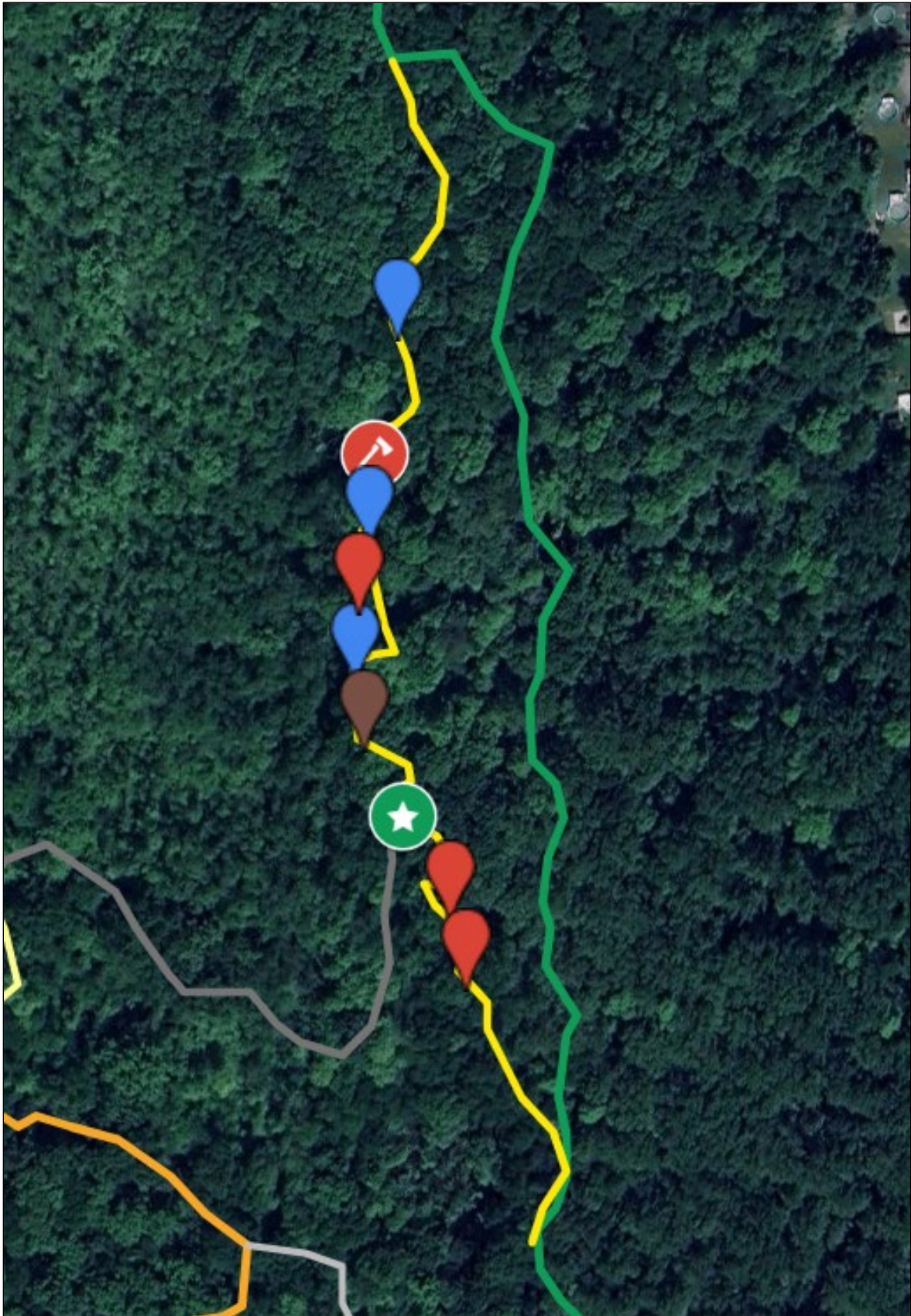
Recommendations for Improvement:

1. Specific locations and some photographs are included on the Google My Map. The solutions vary based on location, but various styles of cross-drains and stepping stone would resolve most.
2. If desired, timber steps could be used to mitigate future erosion and provide a more level and stable walking surface.

Other Suggestions: None.



An example of water flowing down the Yellow Trail.



Brewster Road Connector (Unmarked)

Approximate Mileage: 0.17

This unmarked trail does not appear on any official trail maps for Fred Dill, but is evident on the ground and shows faint but visible use on the Strava heat map. Because of its visibility, current use, connectivity to local pedestrian sidewalk, and utility to provide emergency or construction vehicles access to the pavilion, it was included in this trail planning process.

Issues:

1. Severe overgrowth, including woody branches and brush. Approaching impassable.
2. Other assorted issues - wet tread, steep slope descending from Brewster Road, unremarkable and easy-to-miss entrance.

Recommendations for Improvement:

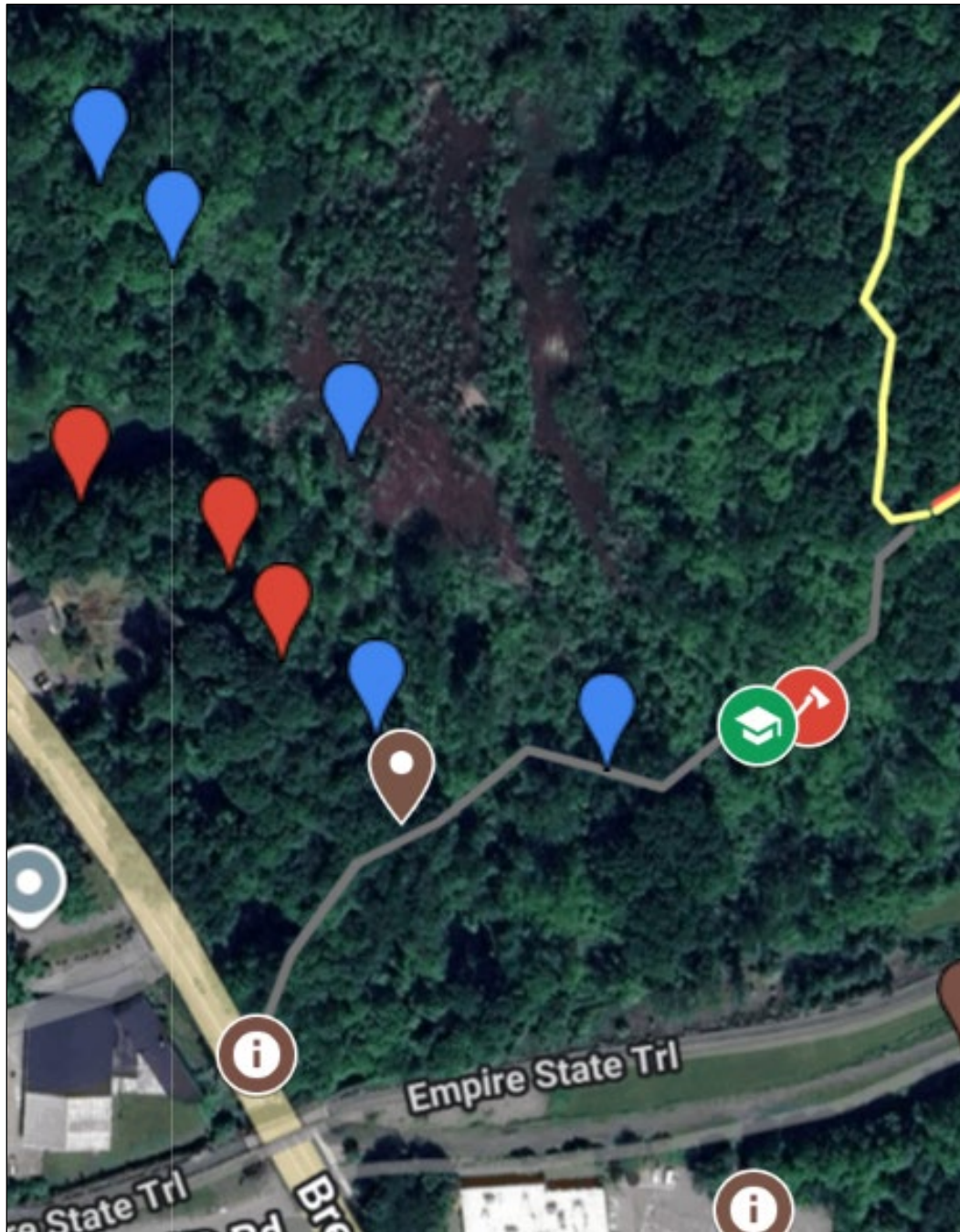
1. Should be clipped and have corridor cleared.
2. Nothing recommended at this time. See box below.

Other Suggestions: The Trail Conference recommends that this trail be clipped and cleared, but otherwise remain in its current unmarked state. This will allow clear passage without attracting the additional attention that would come from new blazing and trailhead signage.

Concerns were expressed about this route being used to access the pavilion and cause vandalism or damage. While this is possible, the Trail Conference believes in this instance that the benefits of maintaining access along this route outweigh that potential. Often, increasing use by rule-abiding visitors is the best way to discourage illegal use. If all of the recommendations in this document serve to increase visitation at Fred Dill, the recurring issues with vandalism may decrease.



View of Brewster Road from the unmarked trailhead.



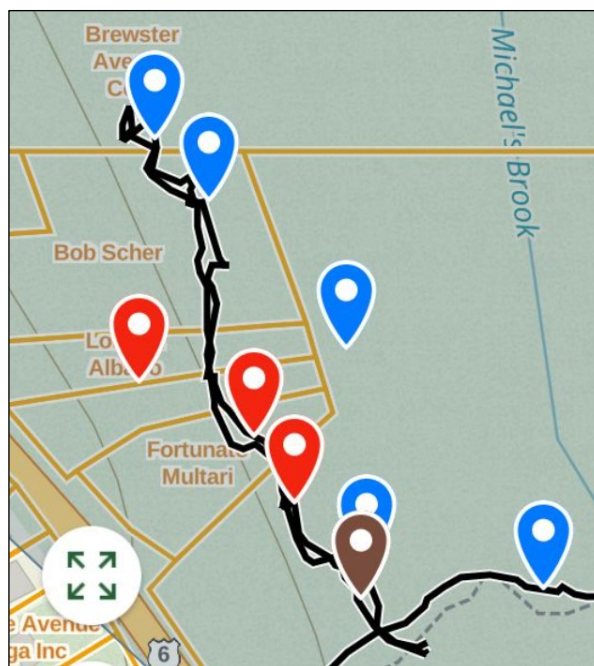
General Findings and Recommendations

The following findings and recommendations are not specific to any of the trails assessed, but apply broadly to the property and the trails within it.

New Trail Construction

One of the primary goals of this project was to explore viability for new trails in Fred Dill, with a large loop incorporating land east of Michael's Brook being the aspirational goal. Unfortunately, scouting found that the wetland surrounding the brook was extensive. The necessary stretch of dry land suitable for trail construction, out of the "topographic bowl" of wetland, was all found to be located on private property. The black GPS track below skirts the margins of the wetland - any trailbuilding further east, off private land, would require expensive boardwalk construction and significant clearing of vegetation.

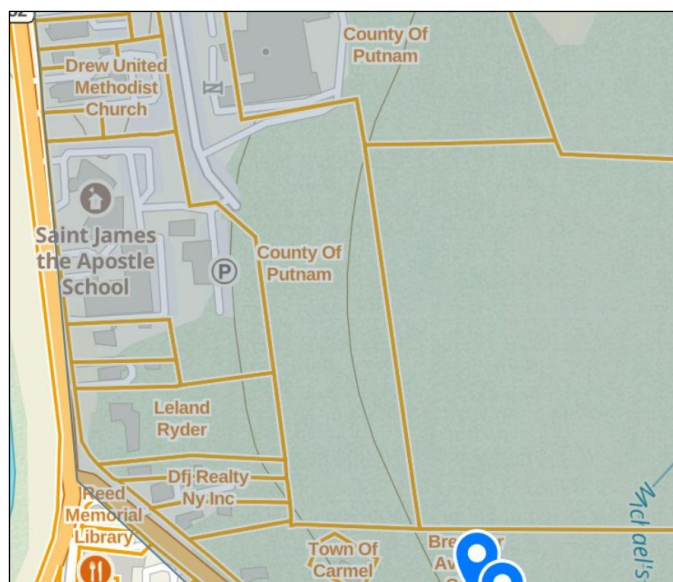
Options were also explored using the northern parking lot as a starting point, but again the flat "bowl" topography meant that wet terrain and thick vegetation surrounding the brook precluded any crossing without advanced boardwalk construction.



Reviewing maps of the area did indicate that public access to the property might be possible via County Center Road between St. James the Apostle School and the Putnam County Sheriff's Department ([41.4242, -73.6768](#)). Indeed, the Strava heat map confirmed a track from this exact location.

Based on satellite maps, this access point would have extremely limited space for a recreational trail loop and would be bounded in by the same wet terrain barriers described above. It was not explored on foot.

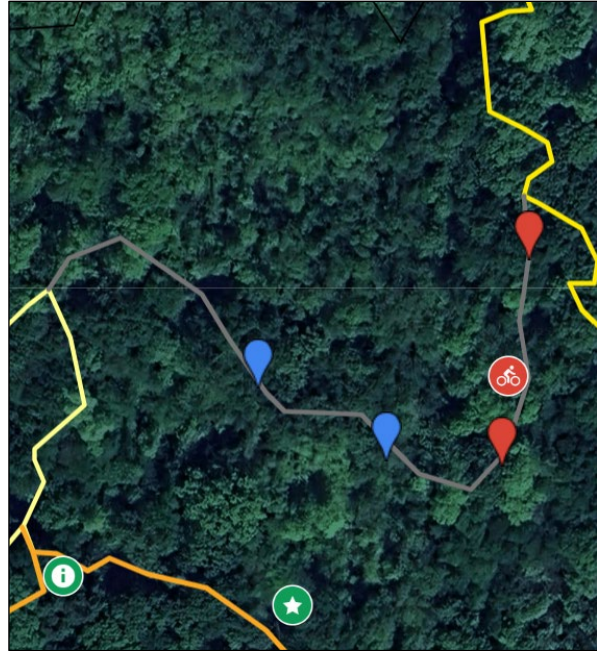
No further exploration or construction is recommended in this location.



The northernmost portion of the Duck Trail features a prominent junction with an unmarked and unmapped trail. After exploration, it appears possible to lay out and design a sustainable, enjoyable route following the approximate path shown in gray to the right.

This trail has potential to serve as a valuable addition to the Fred Dill trail network, allowing people to actually walk through portions of the wetland. More detailed exploration and layout/design work is needed to finalize this route.

Construction needs would be significant but not prohibitive. Most notable are approximately 150' of bog bridging across wet areas, and some stone moving and tread construction along a particularly rugged stretch. See "Off Marked Trails" data layer for more information.



If the potential new trail described above interests land managers and partners at Fred Dill Wildlife Sanctuary, **the Trail Conference recommends a more detailed layout and design process to flag an exact trail corridor for review, discussion, and approval.**



Bog bridging, as shown under construction above, is a simple, affordable, and low-impact way to allow access through wet and sensitive areas. It prevents foot traffic from disturbing habitat, and allows water to flow unimpeded. This structure is also exempt from NJDEP flood hazard permit requirements, making it easy to build from a compliance standpoint.

Interpretation

In discussion with representatives from CCEPC and Putnam County, several broad categories of signage and interpretation were identified. Below each category are ideas for specific signage that were mentioned during the creation of this document.

- **Wayfinding:** *Navigational Signage, Maps*
 - Clearly marking trailheads on the maps located at kiosks.
 - Updated, more accurate maps based on the data collected as part of this project.
- **Natural History:** *Wetlands, Upland Forests, Invasive Species, Habitat & Biodiversity*
 - Identify any additional old Lone Wolf trees on site. One was recently located at the intersection of the Leaf Trail and spur, and another was located in winter 2024 by CCEPC staff and volunteers.
- **Land-Use History & Agricultural Heritage:** *Fairgrounds and Racetrack, Farming History on the Landscape. Native People and their Forestry Management Techniques*
 - The farm foundations near the Pavilion. The county historian has already been engaged by CCEPC to provide more information.
- **Transportation History:** *The brief, tumultuous, and financially unstable history of Railways*
 - The ridge of soil-fill that delineates the abandoned railway bed.
 - The second dressed stone for the railway that is down in the small hollow below the soil ridge.

Within these broad categories that might receive signage throughout the property, several key “Gateway Concepts” were identified as being core to the identity and understanding of the property. The “Gateway” term refers to the idea that these concepts should be clearly (and succinctly) communicated at entrances to the trail network, so that everyone entering has the opportunity to become acquainted with them.

- | | |
|-------------|----------------------------|
| • Racetrack | • Wolf Trees / Agriculture |
| • Railroad | • Plant Diversity |

Other questions arose during exploration and discussion of the site. For example, “*Who is Michael and why is the brook named after him?*” Being able to anticipate these sorts of questions from visitors, and provide answers, will make interpretive resources as relevant and interesting as possible. Having the involvement of the County Historian to answer these sorts of questions, and elaborate on the concepts identified above, should be an early step when considering future signage and interpretation.

The Local History Resources section later in this document provides a starting point for finding more information about the subject mentioned above.

At a bare minimum, interpretation at the site should consist of uploading the existing brochure as a PDF to the [official Putnam County Fred Dill webpage](#) and/or the “[Brochures, Trail Maps & Helpful Links](#)” section of the Putnam County Parks & Recreation webpage. Once that is up, numbered posts should be mounted at each of the 12 “stations” noted in that brochure. A QR code attached to each numbered post can then link visitors to the PDF.

Trail Blazing

While trail blazing is generally easy to follow within Fred Dill Wildlife Sanctuary, some small improvements will make navigation even more consistent and clear:

- **Use triple-blazes at all trail starts and ends** to help minimize confusion at those locations.
 - o Without clear starts and end markings, it can be confusing when someone is unable to find the expected next blaze along a trail. Did the person take a wrong turn, was the next blaze vandalized, or did the trail simply end?
 - o The triple-blaze configuration shown below is commonly used in trail networks, and should be familiar to many hikers.
 - o In addition to being an established symbol, the additional blazes make trailheads easier to spot from a distance.
-
- **Ensure that all sharp turns have double turn-blazes** clearly visible before or at the turn location.
 - o While already used in many location at Fred Dill, it is worth ensuring that anyone blazing trails is familiar with this convention and uses it wherever appropriate.
 - o In addition to being a widely-recognized trail convention, using two blazes at turns makes markings at these potentially confusing areas twice as visible.
 - **Replace or “back out” any tag blazes being engulfed by tree growth.** When tags are mounted on trees, approximately 1/2” of nail should remain exposed to allow the tree room to grow. In some locations, trees are beginning to damage or swallow up blazes.
 - **Use a diagram similar to the one above on trailhead kiosks** to ensure that visitors are able to recognize and follow trail blazes before they begin their hike.

The Trail Maintenance and Construction Resources section later in this document links to the Trail Conference’s Blazing & Maintenance Resources webpage. This page features our Trail Maintenance Manual as well as additional blazing recommendations for tricky situations, like trail intersections or crossings.

The majority of tag blazes at Fred Dill are in good condition, but some are beginning to be deformed or engulfed by tree growth. Volunteer trail maintainers should inspect blazes and “back out” the nails on any tags that appear on the verge of damage.



Trail Blazes at Fred Dill Wildlife Sanctuary

Red Trail (Red)



Duck Trail (Yellow)



Turtle Trail (Orange)



Squirrel Trail (Brown)



Leaf Trail (Green)



Yellow Trail (Yellow)



Regulatory and Trail Closure Signage

There is a need for signs which clearly and consistently communicate the prohibition of mountain bikes on trails at Fred Dill, as well as signs to mitigate use of unmarked social trails. Used in conjunction, these signs can stem user conflict, environmental damage, and erosion.

Below are examples of signs that serve these purposes, to help inspire similar designs or products to install at trailheads and key intersections within Fred Dill.



Trail Color Changes

Two ideas for changing trail colors, to make an easier-to-navigate trail network, should be considered. The first described below is simpler, but the broader change described on the next page is preferred.

Option 1: Simple Change

With what appears to be the relatively recent addition of the brown-blazed Squirrel Trail to the network, one small trail change is worth considering. The image on the left below shows the current trail network. Note three items:

- The prominent and relatively long green-blazed Leaf Trail drops hikers at an unremarkable and poorly-marked trailhead, rather than tying into the “core loops” area containing the Turtle Trail, Duck Trail, pavilion, and pond.
- The orange-blazed Turtle Trail has an unmarked “stem” trail coming off its loop. This stretch with no marking at all may cause confusion for some people.
- The brown-blazed Squirrel Trail almost makes a convenient “loop side trail” option with the Empire State Trail, but stops short of reaching it.



Current Blazing: Note the unmarked connector trail (shown in gray), the brown trail dead-ending at an intersection, and the green trail's terminus at an unremarkable point of the Empire State Trail.



Proposed Blazing: The unmarked connector has been turned into the new terminus of the green trail, leading the prominent green trail into the “core network.” The brown trail now both begins and ends at the Empire State Trail, allowing a simple loop with a single color for navigation.

Option 2: Broader Change

A more dramatic alternative is to extend the green Leaf Trail all the way to the main southern entrance, subsuming the Red Trail entirely and co-aligning with portions of both the Duck Trail and Turtle Trail loops.

This would provide a complete end-to-end experience of the full trail network and allow people to “jump off” onto side loops as desired. This contiguous linear trail would also make it easier to add navigational signage directing people back to parking lots, without needing to direct them along multiple trail colors and intersections - simply get on the green, and walk in the right direction.



Screenshot of proposed trail network revision, using the Leaf Trail as a “backbone connector” between both prominent northern and southern trailheads for ease of navigation through Fred Dill.

While there are some small downsides to this solution - co-aligned trails mean twice as many trail blazes along short segments, and co-aligned trails can confuse some people - the overall benefits of simpler navigation and easier directional signage should make it worthwhile.

Future Trail Conference Collaboration

The process of writing this document revealed several opportunities for future collaboration with the Trail Conference. Should funding opportunities appear through open space grants, environmental commissions, local nonprofits, or other means, the work listed below would build upon the work started in this planning document.

- **Layout and Design Work**
 - The steep ascent on the western end of the Squirrel Trail should be rerouted using a clinometer to ensure sustainable grades. The proposed new trail also needs design work. Having a professional trail builder flag a construction-ready lines would allow local volunteers to tackle construction.
- **Social Trail Assessment and Recommendations**
 - Unmarked trails, many of which show evidence of unauthorized mountain bike use, are present in the vicinity of the Turtle Trail and Squirrel Trail. Tracking down these trails, collecting GPS data, and making recommendations would help determine what should be improved and formalized or closed off. Over time, if left unaddressed, these social trails can proliferate and cause user conflict, environmental damage, and lost hiker issues.
- **Further Trail U Workshops**
 - Three Trail U workshops are currently scheduled as a companion to this document, addressing the recommended relocation at the southern portion of the Turtle Trail. Based on conditions found in Fred Dill, future workshops to train local volunteers might include:
 - **Trail Layout and Design**
 - As an alternative to having a professional conduct the layout and design work described above, volunteers could be taught these skills to put to use on the Squirrel Trail and proposed new trail.
 - **Trail Structures: Drainage**
 - The eroded stretch of trail noted in the Turtle Trail description would be an ideal hands-on teaching location for this topic, and help address real issues in the process.
 - **Invasive Plant Management Tips and Techniques**
 - Given the local interest in plant diversity, a workshop teaching how to effectively remove invasive species and mitigate their return might be topical and valuable.
 - **Eyes of a Trail Builder Workshop**
 - This workshop is designed to empower volunteers to identify and repair small trail issues. Running it with local volunteers and park staff may be an effective way to improve local trail knowledge and self-direction.
 - **Graffiti Neutralization and Trail Closure Workshop**
 - This workshop can be taught with minimal emphasis on graffiti and stronger emphasis on effective environmental restoration, decompacting soils, and effectively obscuring undesirable social trails (including mountain bike trails). If unauthorized social trails persist, this workshop can train volunteers on how to address them.

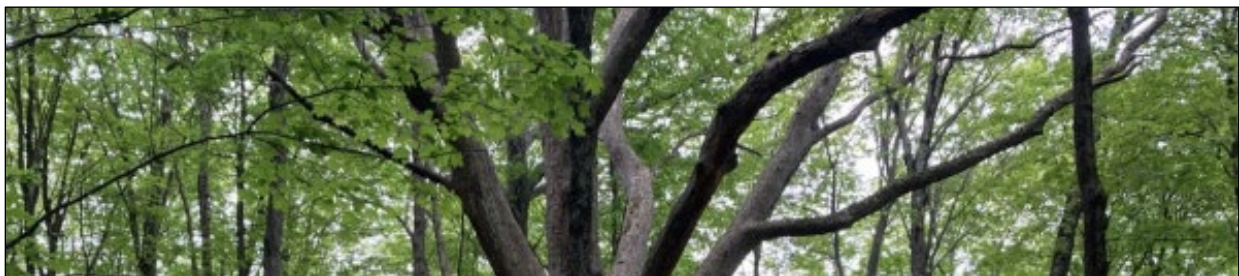
Resources

The following subjects are relevant to future work at Fred Dill Wildlife Sanctuary. By collecting helpful resources here, we hope to capture institutional knowledge and make this document as useful as possible into the future.

Local History

The below resources can be useful in future interpretation of both human and natural history in Fred Dill. They should serve as a starting point for interpretive brochure updates, new website/QR resources, or physical signs and kiosks.

- [Official Fred Dill Wildlife Sanctuary Webpage](#): This page provides a brief historical overview of the site. Note that the trail map is not linked here (see below).
- [Brochures, Trail Maps & Helpful Links](#) (Putnam County Parks & Recreation): This page features the Fred Dill map, but not a link to the sanctuary's webpage (see above). These separate resources should be connected, to make learning about and navigating the site easier for visitors.
- [Putnam County Historian's Office and Archives](#): Local government office which preserves, interprets, and promotes the history of Putnam County. New York's Town and Village Historians have been serving public history since 1919.
- [Putnam History Museum](#): The mission of the Putnam History Museum is to collect, preserve, interpret, and present the history of Putnam County, Philipstown, the West Point Foundry, and the Hudson Highlands.
- [New York Heritage Digital Collections](#): Various useful resources including [historic maps](#). Interesting stories to be gleaned from maps - for example Kelly Ridge was once called Mount Pisgah or Pisgah Hill, depending on the map.
- [Walks & Rambles in Dutchess and Putnam Counties: A Guide to Ecology and History in Eastern Hudson Valley Parks](#): Written by Peggy Turco, published in 2003 by Countryman Press. Features accounts of regional, historic, and natural history.
- [Big Tree Inventory of Putnam County](#): This document is said to have been completed by Martin Brech, who has since passed. Neither his family nor the county historian can locate a copy of the document at this time, but if located it may contribute to interpretation of the property.



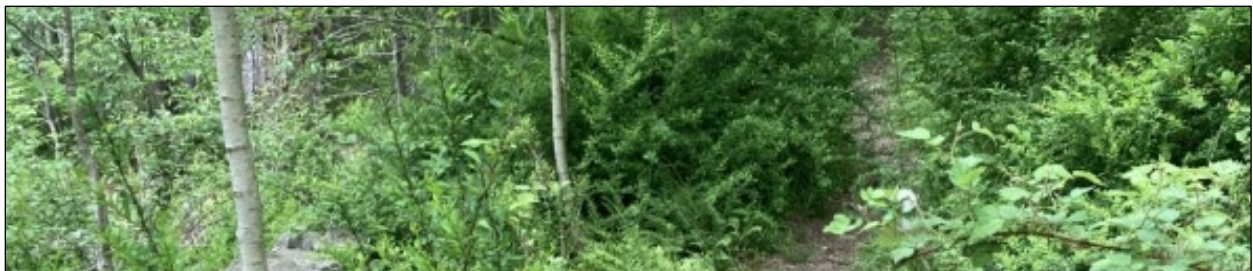
"Wolf trees" are a fascinating part of Fred Dill's land use history, but most people will not understand their significance without readily-available self-guided interpretation.

Trail Maintenance and Construction

This document is intended to identify trail issues and give recommendations to guide future improvement efforts. It should be used to help explain proposed work and desired outcomes to partners and volunteers who are not familiar with trail building.

With that in mind, **this document does not provide the detailed technical guidance necessary to build or maintain trails.** Many of the resources below are written with that purpose in mind, and can guide volunteers and partners towards more detailed plans and best management practices once it is time for construction or maintenance to begin.

- Trail Conference - Trail Design & Construction Resources
 - <https://secure.nynjtc.org/content/trail-design-construction-resources>
- Trail Conference - Natural Surface Trail Building
 - <https://secure.nynjtc.org/sites/default/files/Natural%20Surface%20Trail%20Building%2002.05.25.pdf>
- Trail Conference - Blazing & Maintenance Resources
 - <https://secure.nynjtc.org/document/trail-maintenance-manual>
- IMBA - Mountain Bike Trail Development Guidelines
 - <https://www.imba.com/resource/mountain-bike-trail-development-guidelines>
- USFS - Forest Service Trail Accessibility Guidelines (FSTAG) - Pocket Version
 - <https://www.fs.usda.gov/sites/default/files/FSTAG-Pocket-Guide.pdf>
- USFS - Standard Trail Plans and Specifications
 - <https://www.fs.usda.gov/managing-land/trails/trail-management-tools/trailplans>
- American Trails - Trail Accessibility Hub
 - <https://www.americantrails.org/resources/accessibility-hub>
- NJDEP - Invasive Species
 - <https://dep.nj.gov/invasive-species/plants/>
- NYNJTC Lower Hudson PRISM - Invasives Management & ID Guide
 - [https://secure.nynjtc.org/sites/default/files/INVASIVES%20MGMT%20&%20ID%20GUIDE%20\(1\)_0.pdf](https://secure.nynjtc.org/sites/default/files/INVASIVES%20MGMT%20&%20ID%20GUIDE%20(1)_0.pdf)



In some areas, especially with invasive barberry, aggressive trail maintenance is needed.

Acknowledgements

It was a pleasure to become acquainted with the Fred Dill Wildlife Sanctuary, and I sincerely hope that this document contributes meaningfully to its long-term stewardship and care.

Warm thanks are due to the staff of [Cornell Cooperative Extension of Putnam County](#) for making this project possible. Particular gratitude is reserved for Jennifer Lerner, Senior Resource Educator, for her guidance and input throughout the process of creating this document.

This effort was also supported by staff of the [Putnam County Department of Parks & Recreation](#) and the [Putnam County Office of the Historian](#). Many volunteers regularly contribute to the stewardship of Fred Dill Wildlife Sanctuary, with special thanks to Ed Iliano, Cornell Cooperative Extension Master Gardener Volunteer and history researcher.

This project was funded in part by a grant from the [Hudson River Valley Greenway](#), without which it would not have been possible.



Cornell University



**Hudson River
Valley Greenway**

Final appreciation is reserved for everyone who attended the Trail U workshops conducted as part of this project, to learn more about caring for trails while improving the experience at Fred Dill in the process. Their willingness to learn and work, purely out of a desire to give back to trails and the land, is inspiring and empowering.

Wishing happy hiking to all who visit Fred Dill,

A handwritten signature in black ink, appearing to read 'Peter Dolan'.

Peter Dolan (He/Him)

Senior Trail Planner

New York-New Jersey Trail Conference

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