# Town of Stratham, NH

**Trail Inventory and Assessment** 

For

Stratham Hill Park, Gordon Barker Town Forest, and adjacent properties



# Contents

Introduction	3
Trail Maps	4
Trail Identification Chart	15
Trail Descriptions	16
Recommendations and Planning	49
Access	49
New trails	49
Trail maintenance recommendations	50
Leaf Blowing on trails	50
Trail structures	51
Improvements to signage and trail markers	51
Winter Use of trails	52
Impacts on wildlife habitat	52
Use of E-bikes	53
User Conflicts	53
Dogs and trails	54
Events and group size	54
Accessible trails	55
Closure and decommissioning of trails	
Trails to consider for closure include:	55
Costs of trail construction and/or decommissioning	56
Partners and volunteers	56
Town property and private landowners	
Trail Improvements and Projects – Five-Year Plan	
Conclusion	58

#### Introduction

In the spring of 2020 SnowHawk LLC was hired by the town of Stratham, NH to do an inventory and assessment of the extensive trail network in Stratham Hill Park, the Gordon Barker Town Forest, and abutting properties that are located in an area northeast of the town's center. The actual location is between Portsmouth Ave. to the north and west, Gifford Farm and Lovell Road to the east, with Crockett's Way, Scamman Road to the south. The Stratham Memorial School is located on the eastern edge of the trail network. The trail network area is surrounded by residential neighborhoods and nearby farms. The total area is comprised of a little over 200 acres of woodlands, wetlands, and a few open meadows and small ponds that are surrounded by residential areas with connections to other green spaces. The language for the easement properties state that their purpose is for land protection, recreation, wildlife habitat, and forestry.

The Parks and Recreation Department, Stratham Conservation Commission, and Stratham Park Association manage the trails with oversight and guidance from the Stratham Select Board and the Southeast Land Trust (SELT) as two abutting properties have conservation easements held by SELT. This trail network is well covered by the number of trails currently in use and they serve a wide variety of user types. Hiking, dog walking, and mountain biking appear to be the biggest draw with winter activities such as snowshoeing, cross-country skiing, and fat-biking.

The Town of Stratham and all who use the trails have much to consider for the future of these properties and the impact of the trail network. Several of the users have taken greatest interest in the trails and how they are maintained but it is apparent that it takes more than what the town and volunteers can provide to keep up with all that is needed. The general consensus is that with a few exceptions, the trails are in relatively good condition. The trails have seen some maintenance over time but not all have received the attention they require. This was an excellent time to have an assessment done before the trails are "loved to death".

There has been a growing concern for how the number of trails and amount of use affects the landscape. This is especially true with the increased interest in outdoor recreation. Abutting landowners with easements and SELT have shared some concerns with the number and quality of trails and how it might be affecting the intent of the easements. The Stratham Select Board and Town Planner also expressed an interest in assessing this growth in use. The increased pressures are being felt in most every town and while it is wonderful to see the public enjoying what these special places have to offer, the importance of long-term management and maintenance has become more apparent.

A total of four reconnaissance trips were made to assess and inventory the trails. The first of these involved a day of travel through the forest mostly by mountain bike. Seth Hickey, Parks and Recreation Director was the main contact for this assessment and he provided invaluable guidance and direction during the first tour of the trails. Further reconnaissance trips were done on foot and bike again to explore the remaining trails. In total it took nearly twenty miles of riding and another eight or so of walking to gather and analyze the information included in this document. There were portions of unlisted trails and shortcuts that may not have been discovered and were not reviewed. Those trails should be considered when evaluating any impacts on the properties but it will take someone with a better sense of where those are to do so. The field work was performed during an unusually dry period so some observations may not reflect conditions normally found.

The possibilities and potential for these trails are seemingly endless on a property of this size but this analysis aims to be a reasonable assessment of the current network with an eye towards meeting the goals and intent of the easements, best management practices, long term maintenance, and benefits to the flora and fauna as well as the recreational users.

This report will look at the number of trails, trail conditions, potential of recreation types, access points and parking, potential impacts on wildlife habitat, as well as safety and sustainability. This document will briefly assess the condition of each individual trail along with a separate map for each one. Field mapping was done using an Apple iPhone and Gaia GPS. Maps available from the Town of Stratham as well as other online resources from TrailForks.com were used to identify and confirm trail locations and support the findings reported here. Trails for People and Wildlife, a book and mapping tool created by NH Fish and Game, was also used to identify potentially sensitive wildlife habitat.

Maps created with Gaia were used in the field for each trail that was assessed. These maps demonstrate an overview of the landscape in a variety of map types including topographic, aerial and satellite imagery, as well as wildlife habitat sensitivity.

# Trail Maps

The work of mapping trails is best done by creating tracks for each separate trail. For this project, the map provided by the Parks and Rec. Dept. was used for locating each trail. This saved time and effort in the field and certainly made it easier to locate and follow the trails throughout the forest. With the myriad of trails here, producing the maps was more difficult when highlighting individual tracks or trail segments as desired for this report. Therefore, some of the individual trail maps used here are from other sources such as Trailforks.com. Some of the more finished maps were generated using the GIS program ESRI ArcMap 10.6.

Thirty-two individual trail maps have been created for use to highlight each one individually as well as how they relate to the myriad of other trails. Many of these are connected to create one continuous trail or access another trail. A few new or additional trails may not appear on every map or are shown on only one of these formats depending on whether it was from the field data or using an online source as well when it was produced. Every effort was made to point out these variations.

The trail maps in this report are available with waypoints and photographs for users of Gaia GPS but are not being shared publicly on the Gaia site. Numerous waypoints and photographs were taken of each stream crossing, wetland, or other areas of concern. This information can be made available to other users of Gaia or shown in a presentation. Photographs will be available and saved on a flash drive that will accompany this report.

The Stratham Hill trail map that is currently used by the town is shown on page 4.

The following pages (5-8) contain the Gaia GPS maps that were produced from the field data that was collected during the site visits in the spring and early summer (2020).

- Page 5: Gaia Satellite view with labels
- Page 6: Gaia USGS topo
- Page 7: Gaia Outdoor

 Page 8: Gaia Satellite with waypoints (each point marks a feature or photograph showing a feature, area of concern, or a trail structure)

Maps on pages 9-12 were produced by Rick Brackett, GIS Specialist using ESRI ArcMap 10.6 and the field data provided by SnowHawk LLC.

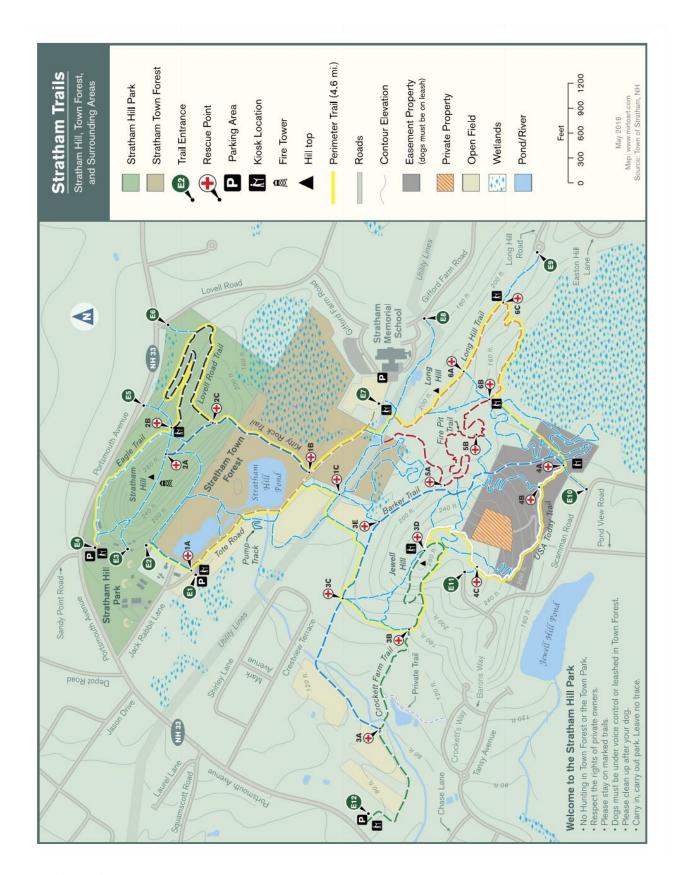
- Page 9: USGS Topo overview
- Page 10: LIDAR (with trail overlay and emergency points)
- Page 11: LIDAR overview (includes boundaries of town properties and easements)
- Page 12: LIDAR overview (with boundaries and NH Fish and Game wildlife impact)

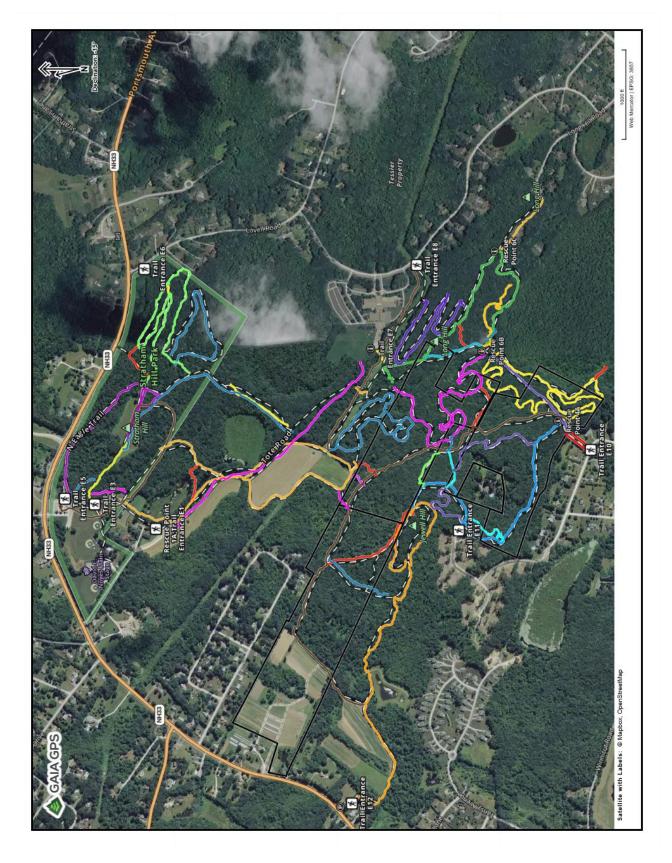
For a closer perspective, the maps on pages 14-38 show an expanded view of each trail and how they are displayed on Trailforks.com. This website allows the user to highlight individual trails and many are known by the names used on the site. The ability to highlight each trail individually makes this an effective method to display the individual trails.

The Gaia GPS maps on pages 39-45 are used to show trails that are not shown on Trailforks.com. For the purposes of this document, many of the trail names are commonly used while others were assigned names based on their location or relationship to adjacent trails.

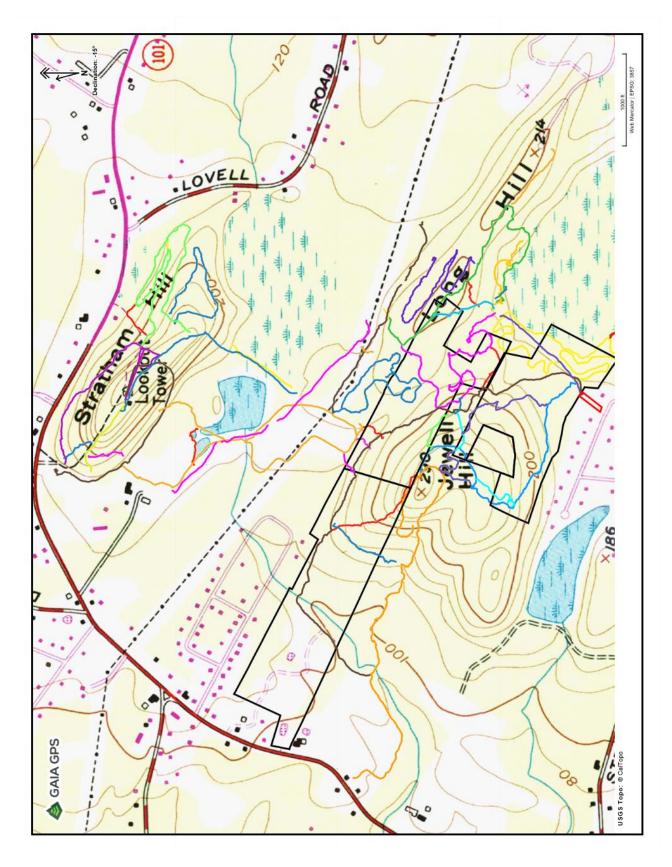
Some maps use numbers that correlate with the trail names (see list on pg. 13) as it would be difficult to place names in the limited spaces available. An effort was made to simplify the labeling but with the number of variations to the trails, roads, intersections, etc. it may be helpful to refer back to the larger overview maps when reviewing individual trails.

Boundaries for Stratham Hill Park (SHP), and Gordon Barker Town Forest are shown as well as the boundaries for the Barker easement and the Short easement. Unless otherwise noted in each individual trail description, the trail is on town owned property and therefore is managed by the Stratham Conservation Commission.

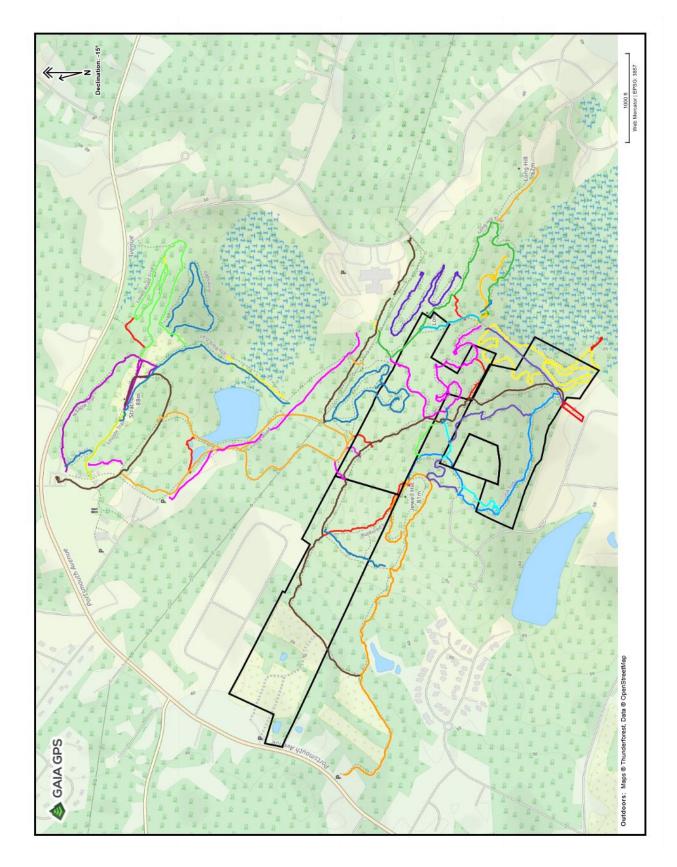


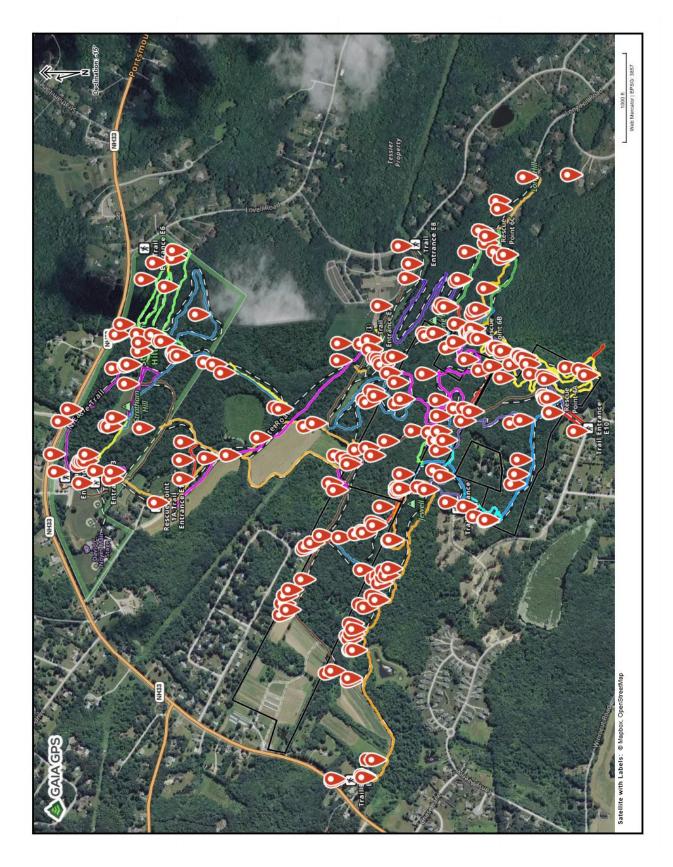


Gaia -Satellite with labels

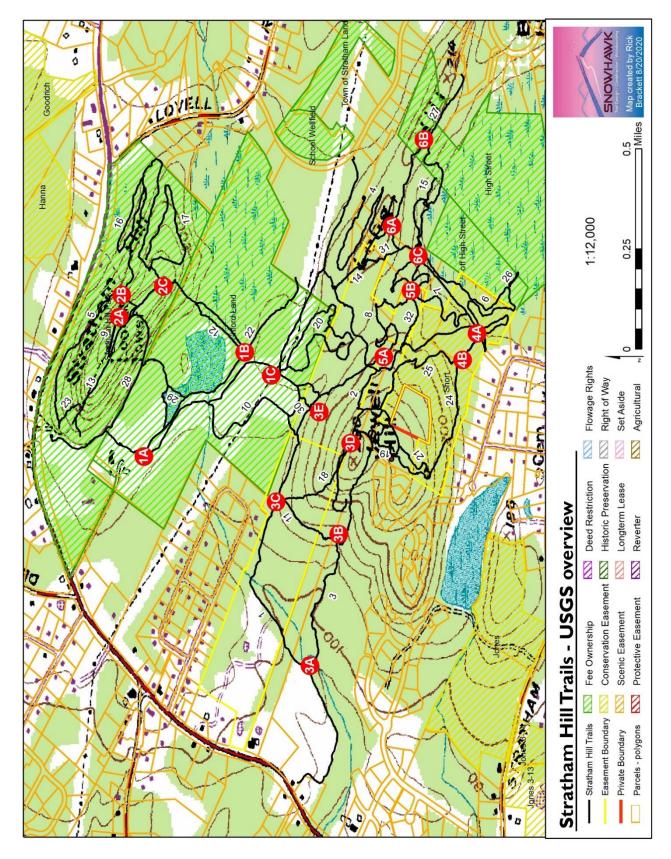


Gaia - USGS topo map

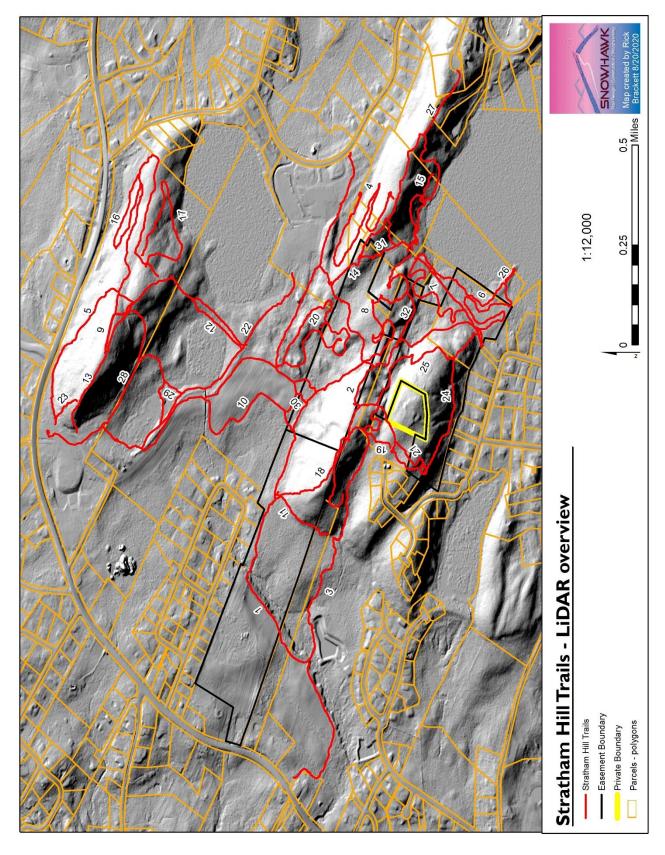




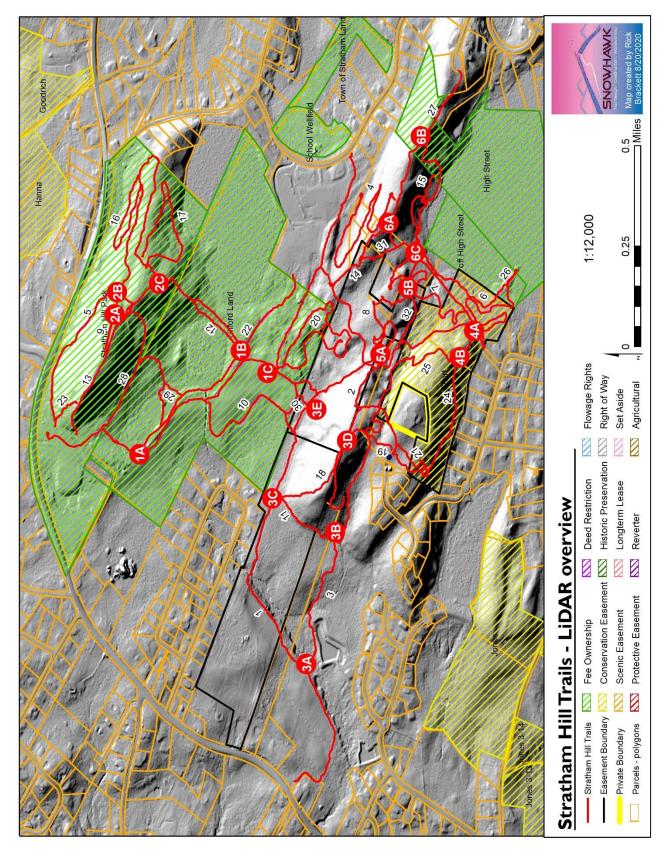
Gaia Satellite with waypoints



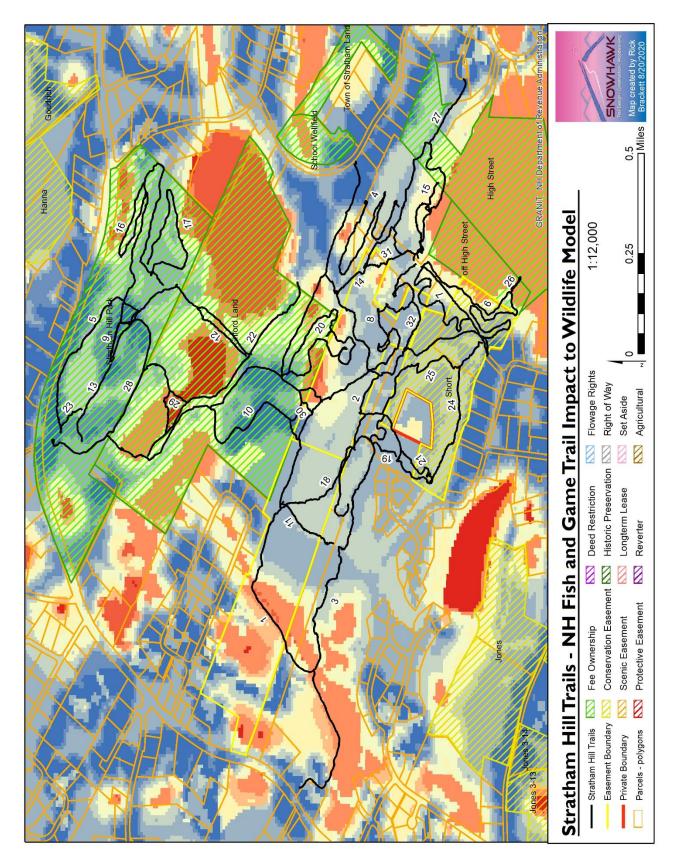
USGS Overview



<u>Lidar with trail overlay</u>



Lidar with easements and trails

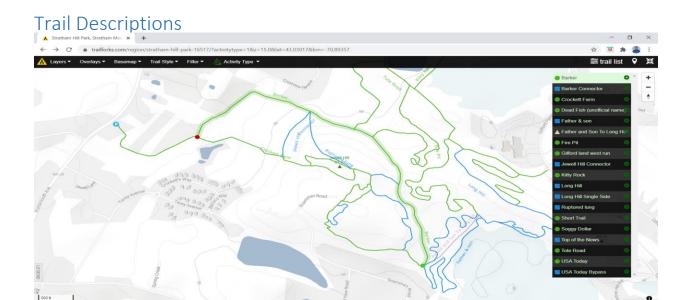


NH F&G Trail Impacts to Wildlife Model

# Trail Identification Chart

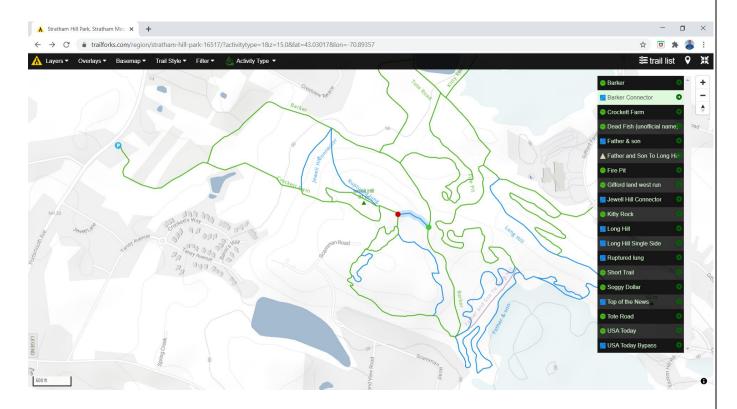
# **Trail Identification**

#	Name	Page
1	Barker	14
2	Barker Connector	15
3	Crockett Farm	16
4	Dead Fish	17
5	Eagle	18
6	Lower Father and Son	19
7	Upper Father and Son	20
8	(Unnamed trail/access road)	21
9	Fire Pit	22
10	Fire Tower Road	23
11	Gifford Land West Run	24
12	Jewell Hill Connector	25
13	Kitty Rock	26
14	Lincoln Trail	27
15	Long Hill	28
16	Long Hill Single Side	29
17	Lovell Road	30
18	Rivendell	31
19	Ruptured Lung	32
20	Short Tail	33
21	Soggy Dollar	34
22	Top of the News	35
23	Tote Road	36
24	Tuck	37
25	USA Today	38
26	Yellow Jacket	39
27	Father and Son Extension	40
28	Long Hill to Entrance E9	41
29	Old Ski Slope	42
30	Tote Road to Fire Tower Road and variation	43
31	Cross Trails between Barker and field	44
32	Long Hill Connector 1 & 2	45
33	Barker to Fire Pit Connector	46



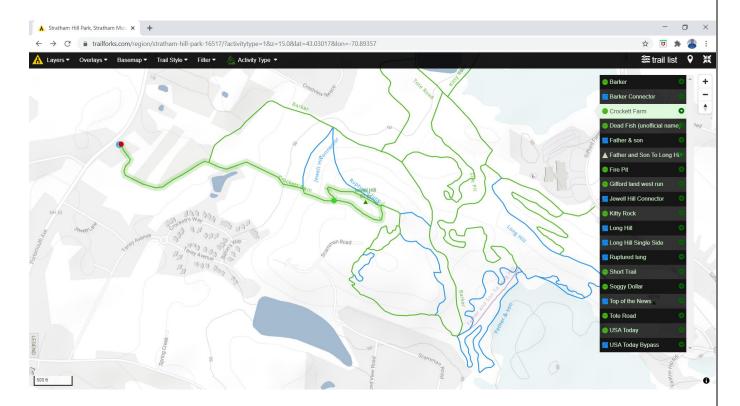
#### 1. Barker Trail (1 mile)

- One of the main trails that traverses from the southernmost point of the network
   (Rescue Point 4A) to where it intersects with Crockett Trail near the western edge of the
   network, nearly all of it on the easement properties.
- As an old road it combines single and double track trail.
- Good condition overall for the amount of use it receives. Some minor erosion on corners. And some minor rutting. Continue to monitor and mitigate erosion as needed.
- Bridges are in good working condition with a few needing improvements on ramping to the deck.
- Much of the southern end of the trail is on the Short easement held by SELT. A larger
  portion to the north is almost entirely is on the Barker easement (also SELT).
- Used by hikers and bikers.



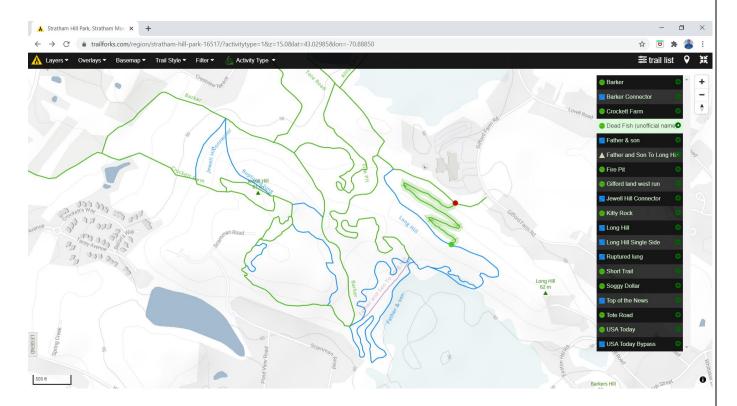
# 2. Barker Connector (460')

- Connector trail between high point of Barker (and jct. to Fire Pit access) and upper USA
   Today trails.
- Moderate grades with some signs of erosion especially where trail meets Barker and the intersection is widening.
- Monitor and mitigate erosion as needed.
- Most of this trail is on the Barker easement held by SELT.
- Used by hikers and bikers.



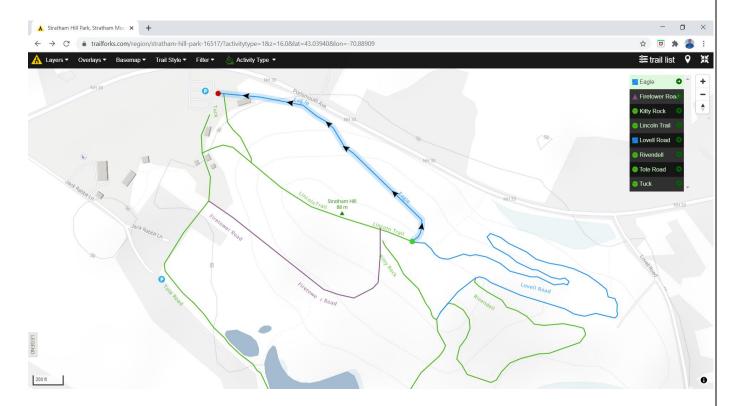
#### 3. <u>Crockett Farm</u> (5256')

- Trail begins at E12 with parking area then follows flat terrain at edge of farm fields.
- As it enters the forest it begins to climb at moderate grades with some bridges/boardwalks in good condition.
- Trail grade steepens as it approaches the loop over Jewell Hill with signs of serious erosion. Visible roots and widening of trail. Needs work and/or rerouting if possible.
- Intersects with USA Today and Ruptured Lung at top of Jewell Hill. Northern side of loop is working but could use some benching to improve tread and minor erosion control.
- Higher priority project due to amount of use.
- Upper portion to Jewell Hill is part of the Perimeter Trail.
- Used by hikers and bikers.



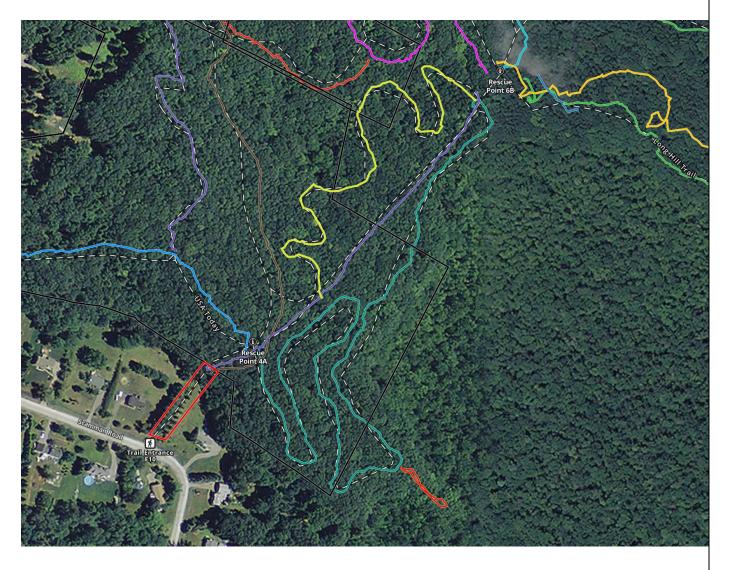
## 4. Dead Fish (2688')

- Trail between Tote Road and Long Hill Trail designed to follow easier grades by traversing back and forth across terrain with climbing turns.
- A bit rocky, especially near the lower section.
- Continue to improve benching with removal of rocks as needed.
- Used by hikers and bikers.



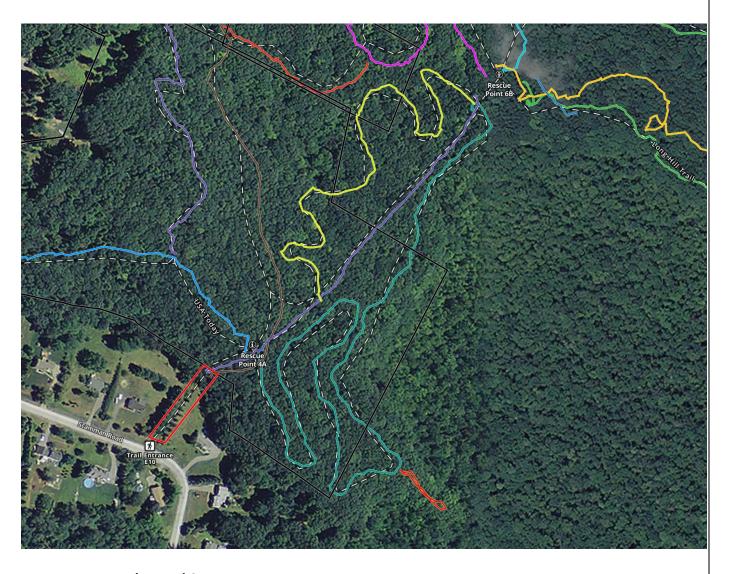
## 5. Eagle (1776')

- Departs from main parking area and joins Lincoln Trail on east side of the fire tower.
- Trail splits in two at one point with visible erosion on both sides. One short steep section that exceeds ideal grade.
- Wider trail with heavy use due to proximity to road and parking.
- Includes exercise stations.
- Monitor erosion and repair obvious sections needing work.
- Part of the Perimeter Trail.
- Used by hikers and bikers.



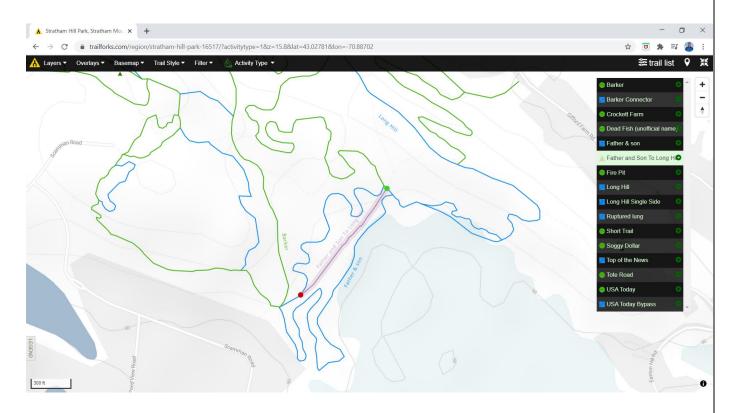
#### 6. Lower Father and Son

- This is the lower portion of a loop trail (shown at center in green) near the southernmost portion of the trail network that is that is bisected by old road/trail.
- This section is flatter than Upper Father and Son and skirts a significant wetland. A short trail enters and exits from a point where it turns away from the wetland (see Father and Son Extension).
- Needs minor work on a few wet areas and more significant bridge/boardwalk repair.
- A portion of the trail is on the Short easement held by SELT.
- Used by hikers and bikers.



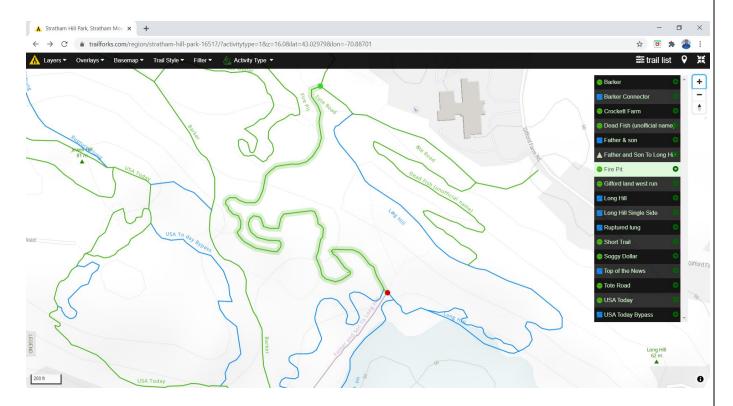
### 7. Upper Father and Son

- This is the upper portion of a loop trail (shown at center in yellow) near the southernmost portion of the trail network that is that is bisected by old road/trail.
- This is more of a rolling section than Lower Father and Son with some grade changes.
- Needs minor work on a few wet areas and bridge/boardwalk repair.
- A portion of the trail is on the Short easement held by SELT and a small section is on the Barker easement.
- Used by hikers and bikers.



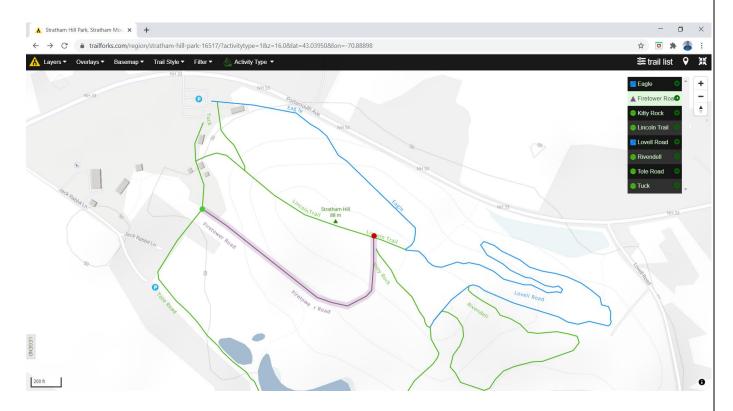
# 8. (Unnamed Trail/access road) (1017')

- This access road leads to a junction of several trails (Father and Son, Long Hill, etc.) at emergency point 6B from what has been entrance E10.
- It is flat to rolling and in very good condition with one stream crossing over a suitable bridge in good condition.
- No maintenance needed at this time.
- A portion of the trail is on the Short easement held by SELT.
- Part of the Perimeter Trail.
- Used by hikers and bikers, dog walkers.



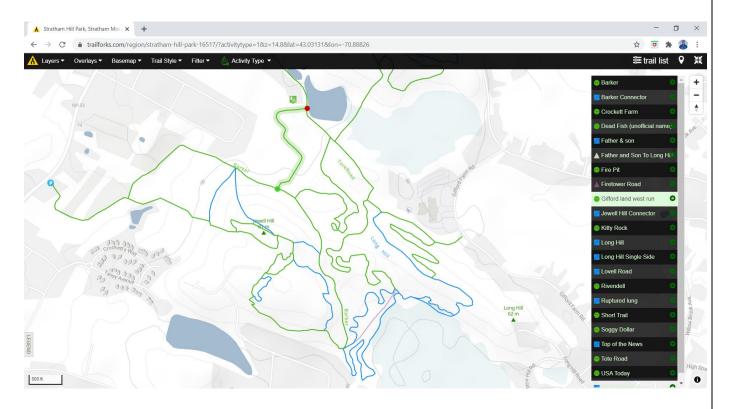
## 9. Firepit (4078')

- A twisty single-track trail with appropriate grades primarily for biking that runs between
   Tote Road and the junction of Long Hill/Father and Son.
- Good tread with few obstructions and few erosion concerns.
- A few small bridges that are appropriate and only require a bit of maintenance.
- Monitor and address erosion as needed.
- Most of this trail is on the Barker easement held by SELT.
- Used by hikers and bikers.



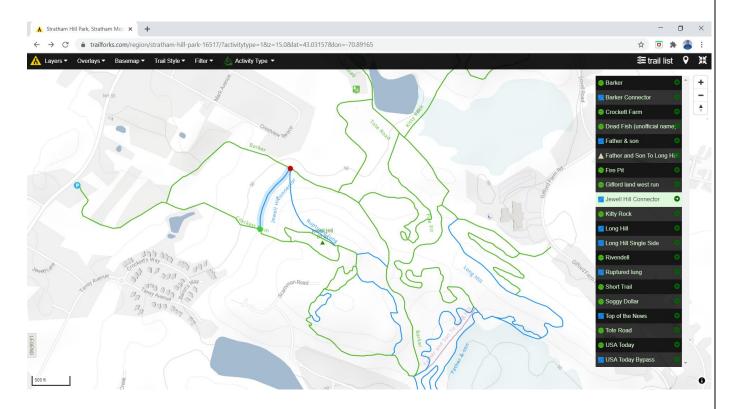
# **10. Fire Tower Road (1667')**

- This road is used as access to the fire tower area from the main area of the park and doubles as motorized access as well.
- In excellent condition as it is regularly maintained.
- Used by work vehicles, hikers, and bikers.



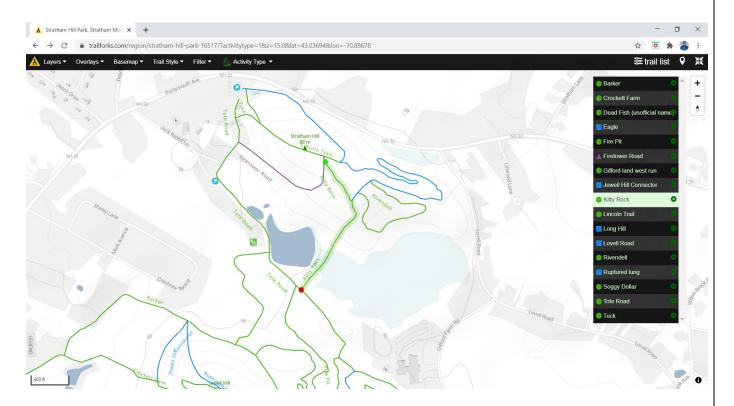
## 11. Gilford Land West Run (1896')

- Single-track trail that follows the edge of a good-sized field.
- Well-built with no work needed at this time
- Good for hikers and bikers though more appropriate for biking given the indirect route from point-to-point.
- Needs work in a few locations as noted and bike group is aware of this. Popular route
  that deserves to be used but if there are concerns of impacting habitat considering
  closing only a portion could be considered.
- A small portion is part of the Perimeter Trail.
- Used by hikers and bikers.



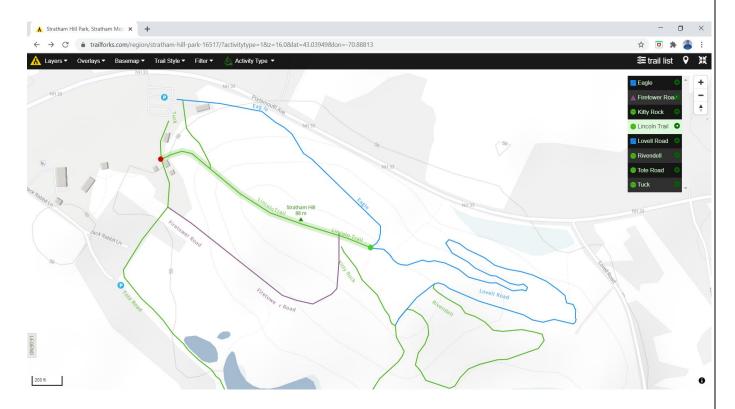
## 12. Jewell Hill Connector (906')

- A connector trail between Barker and Crockett Farm Trails.
- Flat to mildly rolling terrain that is in good condition. Crosses through two stonewalls
- Passes the low end of Ruptured Lung and a closed trail that is still shown on the current town map.
- Monitor and address concerns as needed.
- Part of the Perimeter Trail.
- Most of this trail is on the Barker easement held by SELT.
- Used by hikers and bikers.



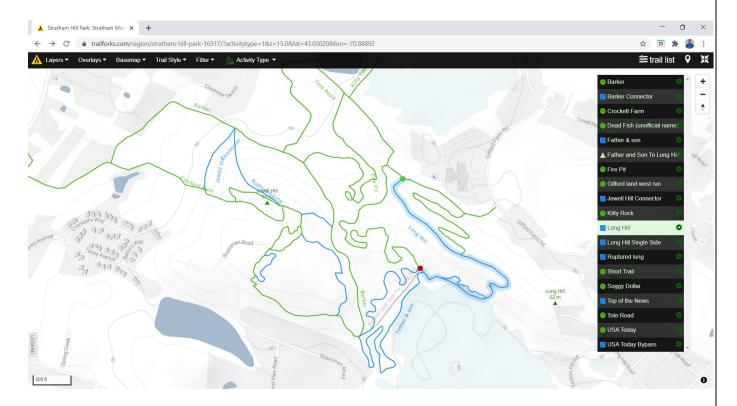
## 13. Kitty Rock (2025')

- Runs between Tote Road and the intersection of the Lincoln Trail and Fire Tower Road.
- Flat to moderate grades. Some areas with exposed roots and rocks make for difficult travel for foot and bike traffic.
- A parallel trail avoids some of the rough sections but has its own rough spots. Consider
  whether both are necessary and whether it makes sense to close one or divide foot and
  bike traffic.
- Work on this could include some reshaping and removing/resetting rocks as needed.
   Old rebar that sticks up where they held old wooden water bars should be removed.
- Part of the Perimeter Trail.
- Used by hikers and bikers.



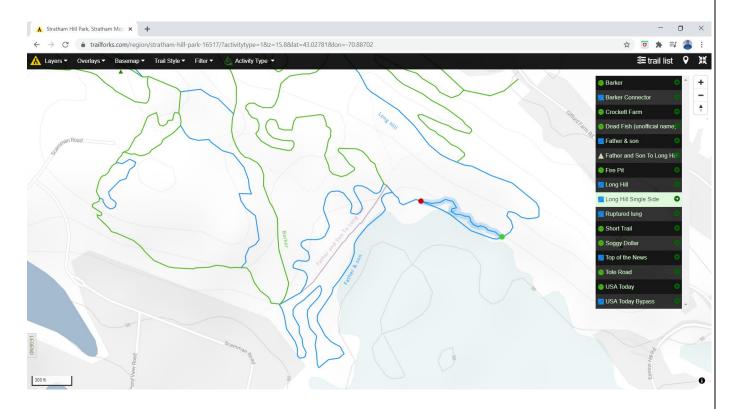
#### 14. Lincoln Trail (1523')

- This trail climbs at a very steep grade to the fire tower.
- Gravel and maintained but with great potential for erosion. Rubber strip water bars
  have been used to alleviate some of this but they don't appear to always be effective. If
  they will continue to be used, they need to extend well beyond the edge of the trail. At
  this pitch, grade dips would probably not work in heavy rains. Any effective methods
  would probably not be wheel friendly and bikes would need to use another route.
   Several would be needed to work properly. Good crowning of the road would help.
- Used by hikers and bikers, but not best suited for biking due to steep grade and skidding tires. Uphill would test the best of riders.



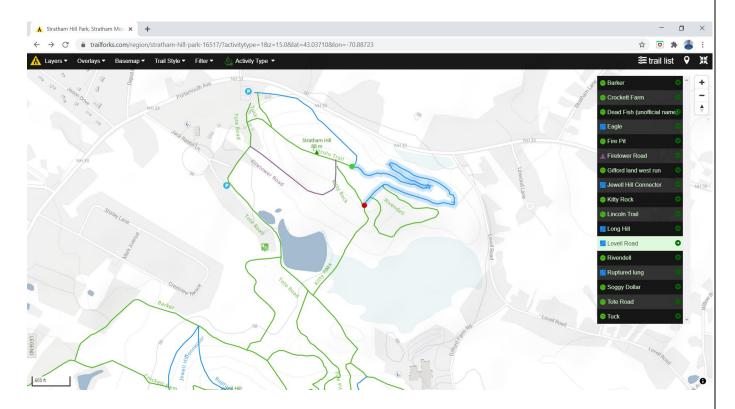
#### 15. Long Hill (3669')

- Extends from emergency point 6B to the intersection with Tote Road. The portion along the ridge is another old road now used as a trail.
- From emergency point 6C going down to 6B it is a single-track trail with a few steep pitches and turns as it reaches another old road at the bottom.
- A rougher, wet section on the low section could be improved with turnpiking (elevated trail tread technique) and fill. A reroute was done to avoid this when necessary (see Long Hill Single Side).
- Would benefit from some benching to improve the sidehill portion of the single-track.
   Some minor rutting especially at corners of the same section, probably from bike traffic.
   Monitor and improve rutting and erosion areas as needed.
- Part of the Perimeter Trail.
- A short section of this trail is on the Barker easement held by SELT.
- Used by hikers and bikers.



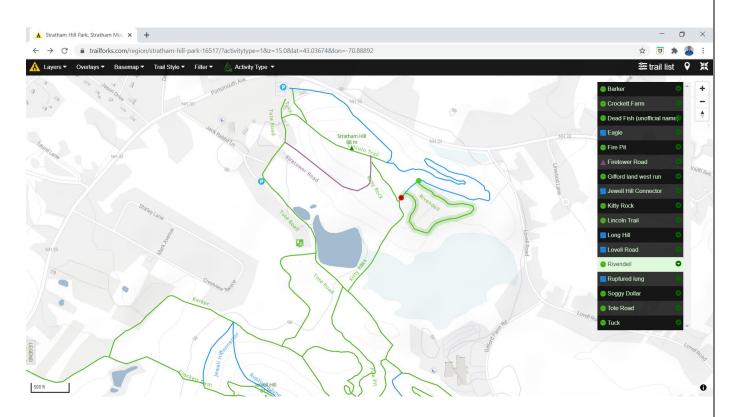
# 16. Long Hill Single Side (814')

- This was cut a single track reroute above a wet and rough section of Long Hill Trail.
- An effective option to the wetter road section of Long Hill Trail that could use minor adjustments if it will continue to be used.
- Mostly used by mountain bikes.



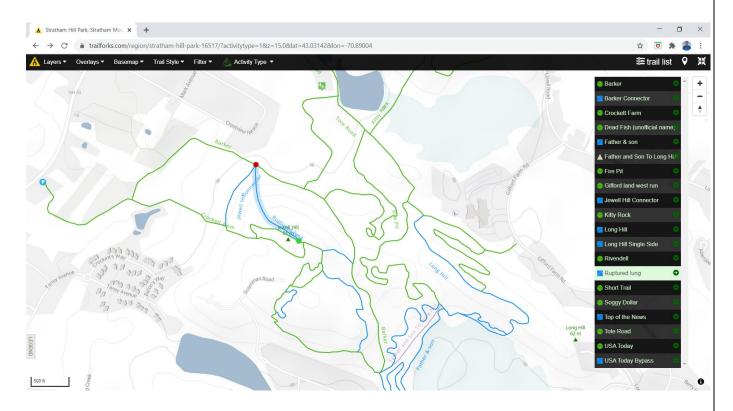
## 17. Lovell Road (4146')

- A wider corridor single-track trail that is in the northeast corner of the network.
   Intersects with Kitty Rock in a logged area and the intersection of Eagle and Lincoln
   Trails. Also intersects with a steeper trail that is recommended for closure (see Old Ski Slope, pg. 42)
- In relatively good shape with a few wet areas on the low side that could be hardened
  with turnpiking and/or fill. Some trail braiding that could be minimized and a shortcut
  that could be kept for an optional short route.
- Boardwalk and some rock features are located near the Eagle/Lincoln junction. The boardwalk needs replacement due to poor construction and use of Trex (slippery when wet).
- Approaches a home near the far eastern end.
- Part of the Perimeter Trail.
- Used by hikers and bikers.



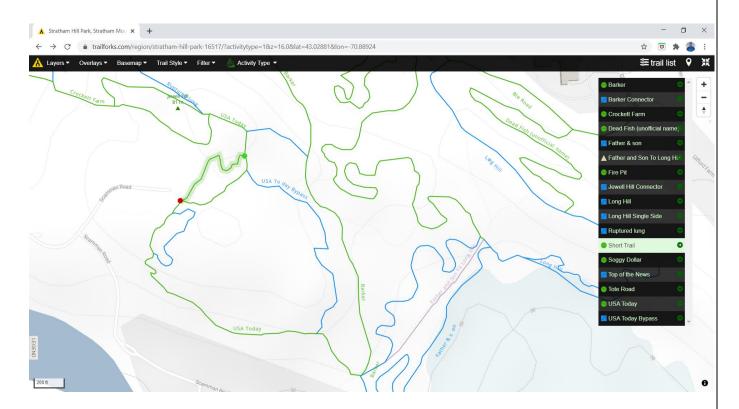
# 18. Rivendell (2389')

- A newer single-track trail that was likely cut for mountain biking.
- Bridge/boardwalk structures and stonewall crossing in good shape.
- In very good shape as it is newer and used less.
- Used by hikers and bikers.



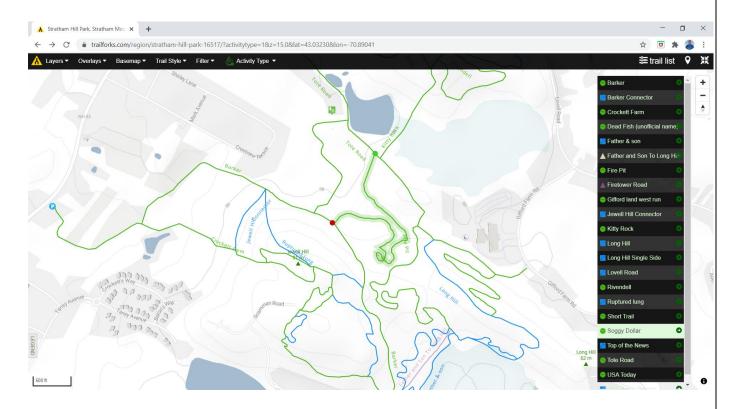
## 19. Ruptured Lung (1227')

- Connector trail between the top of Jewell Hill (emergency point 3D) and the intersection of with Barker Connector.
- After leaving the top of the hill it follows a very steep grade that is well beyond sustainable trail standards. Gravel covered and eroding with no reasonable way to address erosion. Safety concerns for biking downhill and likely beyond most or all biker's ability to ascend. Steep for walking as well.
- Rerouting might be possible but if monitoring shows increased erosion closing this trail
  is recommended. Another nearby trail was also closed so it also opens a good portion of
  forest for wildlife habitat.
- Most of this trail is on the Barker easement held by SELT.
- Used by hikers and bikers.



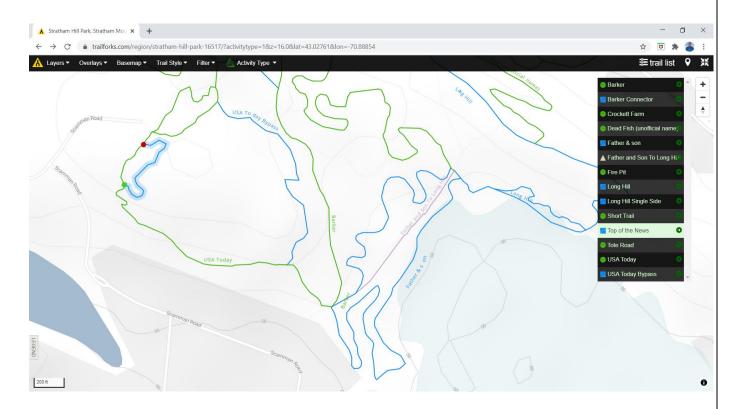
## 20. Short Tail (704')

- A short and meandering optional route to the west of USA Today near the end of Scamman Road.
- In good shape with one boardwalk that is also in good condition.
- Close to adjacent neighborhood and also the upper section of Crockett Trail.
- Used by hikers and bikers.



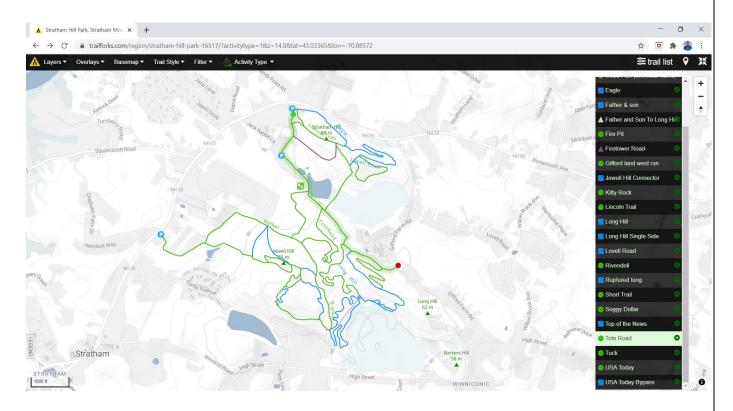
## 21. Soggy Dollar (3655')

- Twisty single-track trail to the west of the Fire Pit Trail that begins and ends on the trail
  near emergency point 1C and the corner of the field near 3C.
- Relatively good condition with no serious maintenance needs other than a few bridge/boardwalks that are also in good condition.
- Skirts some small wetland areas.
- A portion of this trail is on the Barker easement held by SELT.
- Used by hikers and more likely bikers.



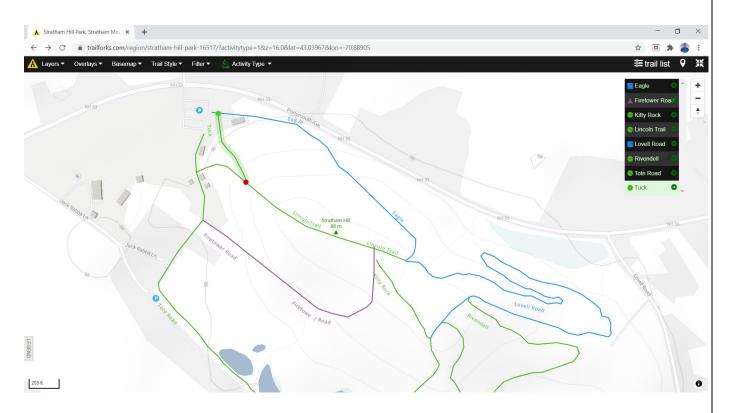
# 22. Top of the News (761')

- A short and meandering optional route to the east of USA Today near the end of Scamman Road and just below Short Tail.
- In relatively good shape. Monitor for erosion and mitigate as needed
- Close to adjacent neighborhood.
- Used by hikers and bikers.



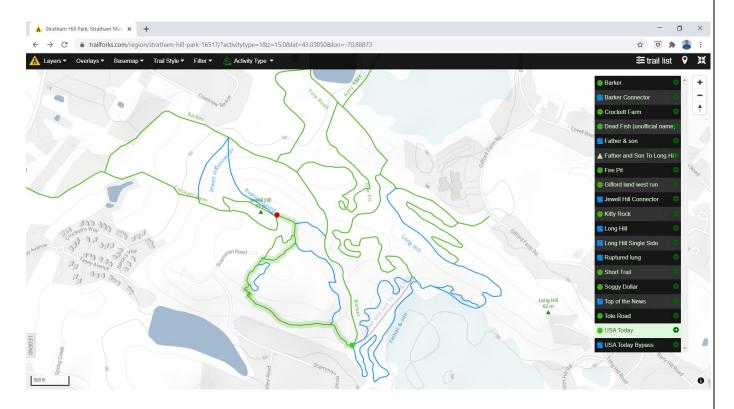
### 23. Tote Road (1 mile)

- Old road that is one of the most heavily used trails. It extends from the main area of the
  park to Gifford Farm Road near Stratham Memorial School. A portion of the eastern end
  also follows a power line.
- Flat, wide and user friendly with some sections of single and double-track on the eastern half with some gentle rolling terrain.
- No serious needs for maintenance at this time. Root section by Jack Rabbit Lane needs attention
- Used by hikers, bikers and very popular with dog walkers. Also used by school groups to access the park and town forest.



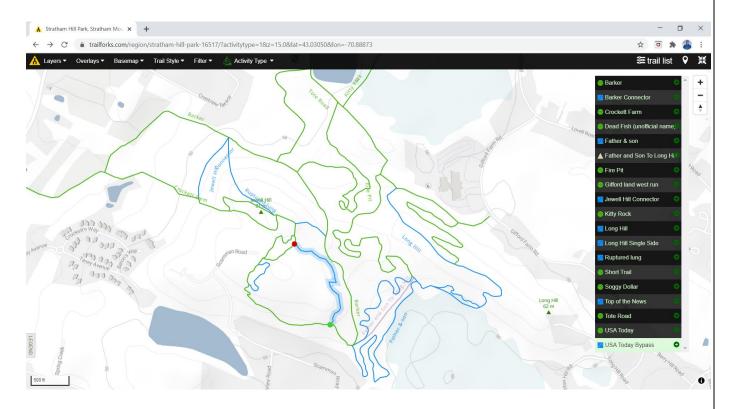
# 24. Tuck

- A short and fairly steep hiking trail between Eagle Trail and part way up the Lincoln Trail.
- As a hiking trail it doesn't need much work but monitor for erosion and address any concerns with simple grade dips and check dams.
- Used by hikers, not likely to be used by bikers.



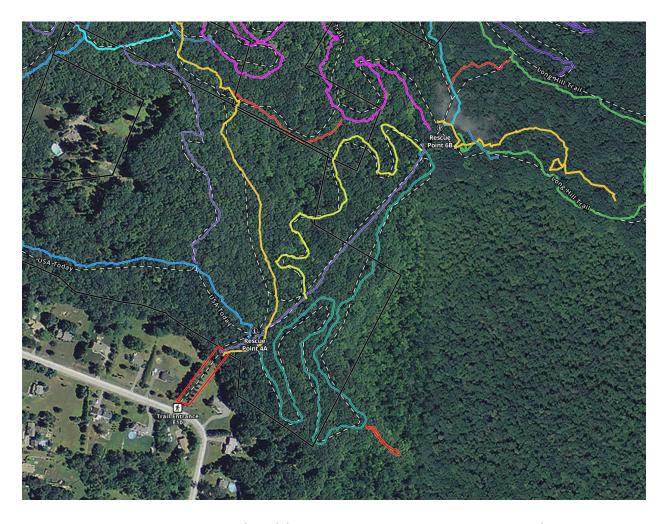
### 25. USA Today (3322')

- One of the main trails in the southern section that runs between the intersection of Barker/Father and Son to the top of Jewell Hill.
- It follows varied grades and does exceed ideal grades on a corner where the slope is steeper. This spot needs some work for both ease of travel and erosion control.
- Trail comes to within a few feet of some backyards in an adjacent neighborhood.
   Features an old USA Today newspaper box near the point where it crosses a driveway to a private property.
- Much of the lower half of the trail is on the Short easement held by SELT.
- Heavily used and showing some roots and rocks where soil has eroded and/or compacted.
- Would benefit from defining a narrower corridor and trying to restore the landscape in eroded areas. Address erosion problems and bench cut areas with excessive side slope.
- Part of the Perimeter Trail.
- Used by hikers, bikers.



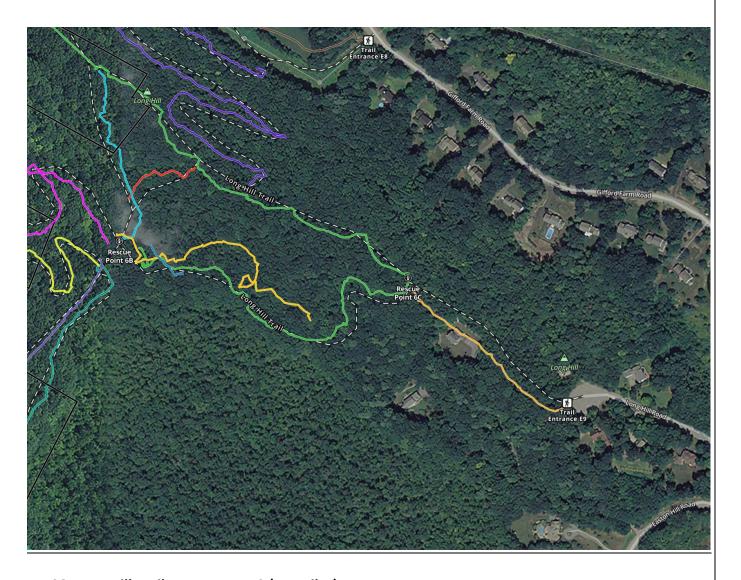
### 26. Yellow Jacket (1545')

- A single-track option that goes from emergency point 4B to where it intersects with a connector from USA Today to Barker. It travels on a course on the eastern side of the nearby house that is mostly surrounded by the Short easement.
- Relatively good condition with a few wet areas that use bridge/boardwalks for crossing.
   These could be lengthened to avoid more of the wet ground. Grades are mild to moderate with a couple of short steeper sections but suitable and using the terrain as it should.
- Monitor for erosion and rutting and repair as needed.
- Most of the trail is on the Short easement held by SELT.
- Used by hikers and bikers.



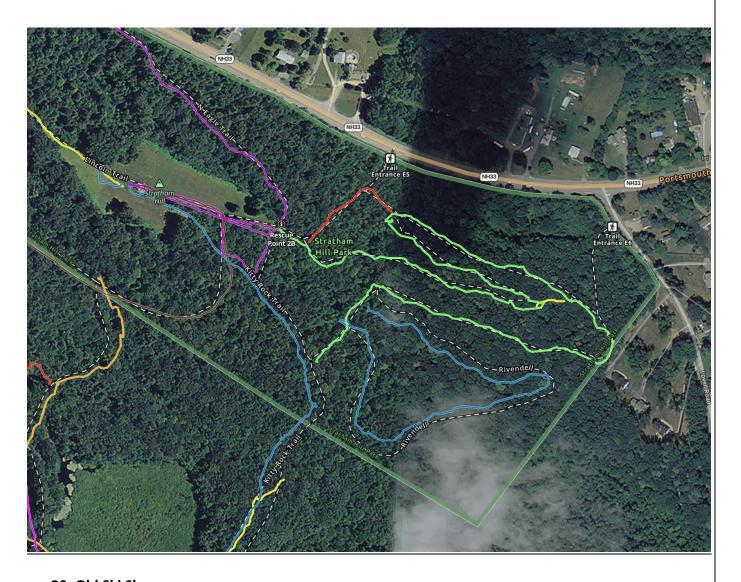
# 27. Father and Son Extension (384') (shown in red on lower middle of page)

- Built primarily with mountain biking in mind but it serves hikers and bikers and creates a spur off from lower Father and Son and farther towards the wetland.
- The necessity is debatable and closure is recommended due to the short and seemingly unnecessary loop as well as the relatively poor condition and proximity to the wetlands.



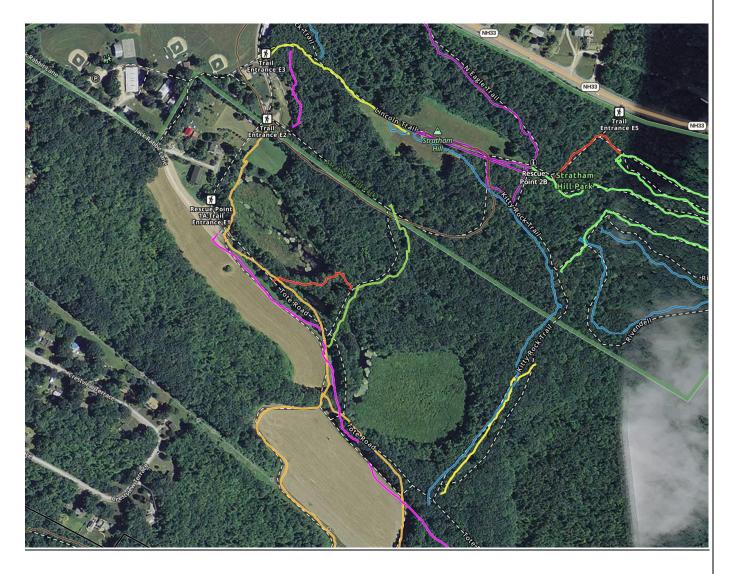
# 28. Long Hill Trail to Entrance E9 (.15 miles)

- Connector from access point E9 to Long Hill Trail that is an old road that departs from a neighborhood cul-de-sac and bypasses close to a few homes.
- Well-traveled with rocks and roots showing.
- Could use fill material to cover some of the roots/rocks but otherwise is in good condition. Monitor and mitigate erosion as needed.
- Used by hikers and bikers.



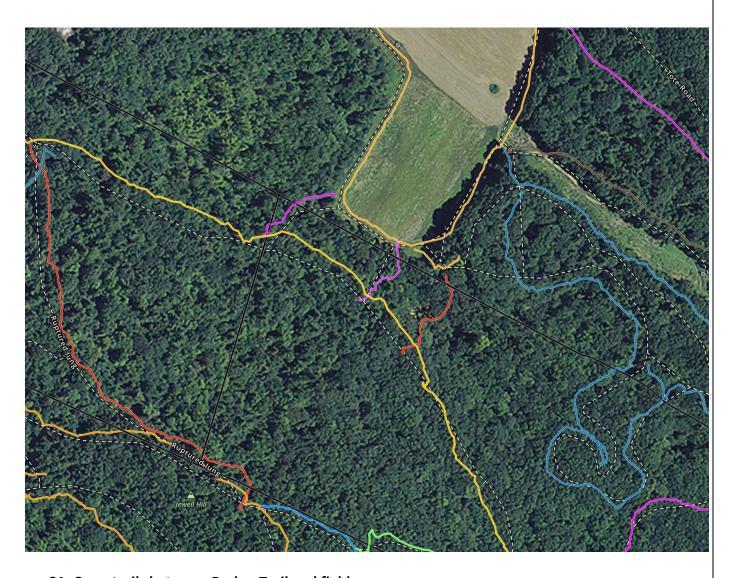
# 29. Old Ski Slope

- Used as shortcut to lower end of Rivendell (shown in red) and as a sledding hill in winter.
- Likely used for downhill only due to grade.
- Steep grade and signs of erosion.
- Closed to all hiking and biking. Recommend to maintain closure or take steps to control
  erosion.



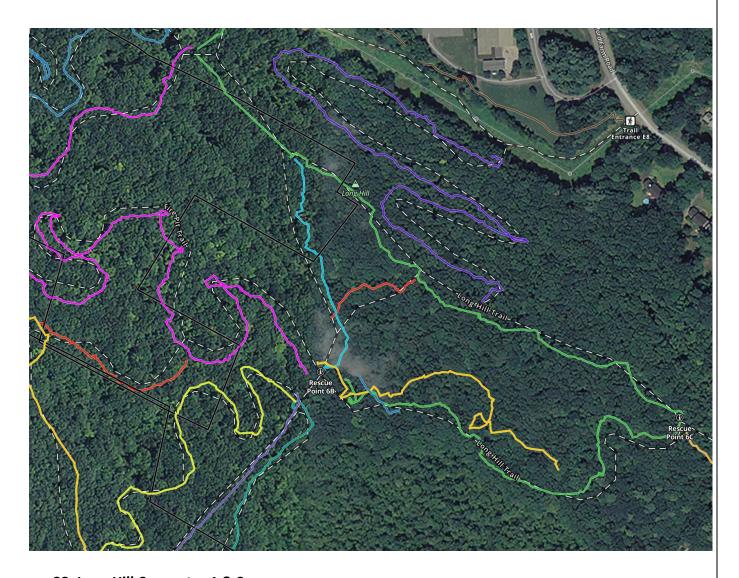
# 30. Tote Road to Fire Tower Road and variation by Stratham Hill Pond

- Gentle grade trail (shown at center in lime green) that crosses stream with a bridge near the pond.
- Well used and has educational value with proximity to pond.
- Side trail used as a variation (shown at center in red) is pleasant but shows signs of
  erosion on narrow banks adjacent to pond/wetland. Small bridge crosses to the Tote
  Road. Not foot friendly for all users due to uneven terrain. Monitor for further
  erosion and consider mitigation or closure if conditions worsen.
- Used by hikers and bikers.
- Consider closure as it is in a sensitive wildlife area.



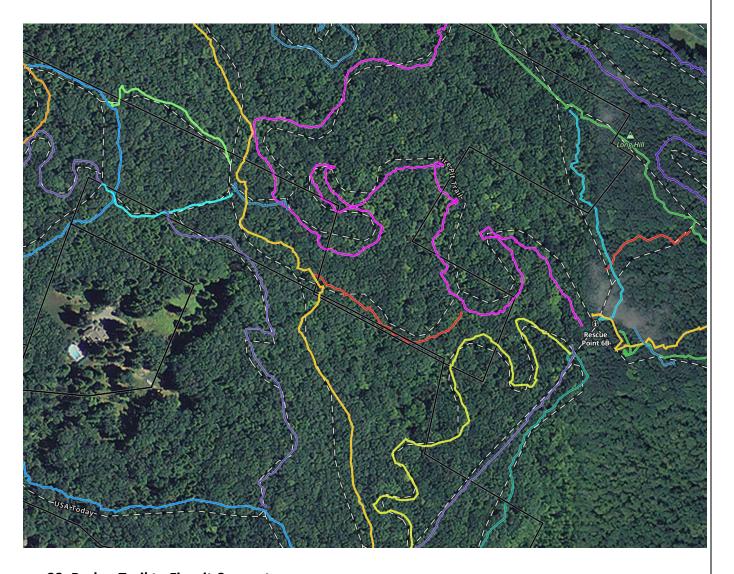
### 31. Cross trails between Barker Trail and field

- Three trails that cross between Barker Trail (yellow) and the adjacent field.
- Each one passes through low lying wet areas. Two (shown at center in purple) have bog bridges. The third and easternmost trail does not.
- Consider closure or addition of bog bridge to the easternmost trail (shown at center in red). Closure seems appropriate while it is not truly necessary with the other options available.
- Most of these trails are on the Barker easement held by SELT.
- Used by hikers and bikers.
- Consider closure as it serves little purpose.



### 32. Long Hill Connector 1 & 2

- These two trails connect the ridge portion of Long Hill Trail to the lower end at the junction of several other trails near Rescue Point 6B.
- One is more of an old road (shown at center in light blue) that climbs gradually to the ridge. There is one wet section that is being bypassed by a section of narrower single track that could be improved. This trail is still worthwhile.
- The second trail (shown at center in red) climbs/descends sharply and is prone to
  erosion and should be discontinued as the other options are more suitable.
- Used by hikers and bikers.
- Consider closure of the second trail (shown in red) as it serves little purpose.



# 33. Barker Trail to Firepit Connector

- This trail (shown at center in red) connects Barker Trail (running north-south and shown in gold) to the Firepit Trail (purple) a little below where another shorter connector just north and uphill of this location.
- Terrain is rougher, with overgrown vegetation and needs improvements to the trail tread.
- Consider closure as it appears to be used very little and is unnecessary and would open up a small portion of forest habitat.

# Recommendations and Planning

#### Access

There is a sufficient number of locations used for public access to the trail system. Access is marked E1-E12 on the town's Stratham Trail map. These twelve access points are found all around the trail network. One, E10 is being closed due to concerns by abutting neighbors about parking but it will not affect the parking needs for the users. This makes sense as parking has been limited to the nearby street and trails are accessed via a right-of-way from that location. The primary access to the trail system is found on Portsmouth Ave. at Stratham Hill Park with ample parking for several cars in two separate locations. Another access point (E12) that includes good parking is found at the western edge of the network on Portsmouth Ave where the Crockett Farm Trail is located. The Stratham Memorial School is at the eastern edge and is another point that with good parking. A few access points are located in residential neighborhoods with close proximity to homes though in most cases they are at the end of a dead-end street or a cul-de-sac. Gates are used to prevent unwanted access by motorized vehicles and there was no evidence of motorized traffic.

The following provides estimates on the number of parking spaces available at each site:

- 100 Stratham Middle School (note about this being a school, lot closed during normal school hours)
- 10 Crockett Way (Portsmouth Ave)
- 90 Stratham Hill Park main lot
- 30 Stratham Hill Park 4H Barn area
- 20 Jack Rabbit
- 4 Powerline on Gifford Farm Road
- 6 Long Hill
- 2 Crockett Way (neighborhood)

Kiosks are placed in strategic locations and are used for posting information as well as the current town map. This map does not show every available trail that has been created since it was last printed. If possible, I suggest considering kiosks at each entry point to post maps and rules for use of the trails. Educating users is critical so good signage at access points will be helpful.

Several "bootleg trails" that have been cut from nearby homes for quick access to the main trails. Many of these have been used for some time and ending their use may not always be necessary. That said, they certainly should not be encouraged and ideally, they would be closed, especially if they create problems of any kind (erosion, motorized access, etc.). This will require communication and agreements with user groups and the adjacent property owners. Details on how this is managed will be site dependent.

#### New trails

With the number of trails already available it makes sense to not construct any additional trails. The area is well served with the trails in place and maintenance of existing trails is more important than building new. That said, some sections of the existing trails may benefit from short reroutes to avoid sensitive areas, maintain proper grades, or to better align the current route. None of these are lengthy.

If any decisions are made for closing a portion of trails, there may be a need for reconnecting sections to remain in use.

Educating the trails users about not building new trails will be an important piece of preventing new construction. This includes short feeder trails that connect to nearby residences. Posting information at trail heads and kiosks as well as on the town website is recommended. If these "bootleg" trails are found they can be disguised and closed using a method that employs the planting of rocks and tree snags along with scattering debris. Official signs can also be posted stating that the trail is closed per order of the Stratham Conservation Commission.

#### Trail maintenance recommendations

Monitoring trail use would be helpful. Use of trail cameras or counters can aid in assessing the amount and type of traffic on the trails. Using an adopt-a-trail volunteer system helps to monitor impact and determine where work is needed. For example, Southeast Land Trust uses volunteers to perform trail maintenance tasks and sometimes larger projects on some of their properties.

Continue to maintain existing trails and reroute problem areas. As noted in the individual descriptions, some trails do not always meet recognized standards and best management practices. Most only require short sections of regrading or fill. Some of the bigger concerns will require more erosion control and/or rerouting to lesser grades. These can be detailed in a trail log with precise locations and needs. Creating a detailed inventory of these work items is recommended as the next step in improving the quality of the trails.

Establish the use of a trail log that is updated annually around the same time of year or based on the time when any trail work was performed. Use of photos will also help to track any changes and damage to the trails in need of repair.

#### Leaf Blowing on trails

Removal of leaves on trails, usually with leaf blowers, is an ongoing concern with trail maintenance especially when trails are used by so many different user-types. Typically, it is the mountain bike community that prefers to remove leaves from trails but hikers and others also have similar opinions. While there has been a fair amount of debate on the subject there are no clear answers as to what is correct. Some will argue that leaves are slippery when wet and prevent good traction for wheeled traffic. Some will say that it is hard to follow a trail when covered with leafy debris. Still others will point out the benefits of erosion control by keeping leaves in place. All of these may be true.

The concern for long-term trail quality is how the removal of leaves affects erosion. Leaves do offer some protection to the trail tread in the same way that shingles protect a roof. It's referred to as "splatter erosion" by some. On the opposing side of the debate is that leaves left over time are organic matter that turns to mud. Each has merit for consideration. There is also the noise factor of leaf blowers and the impact on abutting landowners and more importantly how it affects wildlife. This needs to be included in the conversation since the conservation of wildlife habitat is also a factor.

A good solution that has worked well at other locations is to keep the leaves and only hand rake areas that accumulate enough to create problems where they won't disappear over time. It's surprising to see how many will dry up and disappear on their own. If they do deposit into a pile that stays it is best to remove them before they turn to an organic mulch thereby creating mud and preventing the water from

exiting the trail. Too much organic build-up in drains or dips will defeat the purpose of how they help with erosion control. This can be part of the maintenance that should be done in spring and fall at a minimum.

Trail closure is an option if a trail is deemed unsafe due to the presence of leaves. Presently there does not seem to be a need for any rerouting of trails due to leaf build-up but the leaf issue is one that can continue to be tracked as part of semi-annual inspections.

#### Trail structures

As noted, there are several structures such as bridges and boardwalks. Only a few are in need of repair or replacement. Most are smaller bridges for small stream crossings with a few longer boardwalks crossing wet sections of trail. Whenever possible, considerations should be given to using sustainable measures starting with proper drainage and using stone and gravel for trail hardening before building wooden boardwalks or bridges that can be costly and require maintenance over time. Granted, wooden structures are often the only solution. These should be built to accommodate all user types and be constructed in such a way that they don't affect adjacent streams or wetlands. All materials should be pressure-treated lumber, white oak, black locust, or similar for rot resistance and longevity. In situations where longer spans (typically referred to as over 16') are required it may be necessary to have engineered plans for safety and liability reasons. Often these longer structures may require professional assistance or at least knowledgeable builders. The State of NH recognizes the International Building Code for construction projects. Individual towns may have additional codes related to structures. Wetland permits will also apply when the structure does not go from bank-to-bank and involves excavation in the stream bank or construction in a stream bed.

Maintain structures and rebuild them as needed. Any existing structures should be monitored on an annual basis for quality and safety reasons. Bridges and structures used to cross wet areas are probably the most critical structures requiring constant maintenance. Bridge designs vary but when using decking, it is best placed so that it is perpendicular to the trail tread. This is a more foot and wheel friendly design that is safer for traveling on. Railings should be used when the bridge is more than 30" off the ground.

Erosion control structures should be limited to grade dips and tread shaping to allow water to flow off the trail at appropriate locations. The rubber water bars in use on some trails seem to work in most cases but they should be angled and extend well beyond the edge of the trail to be most effective. All drainage structures should be cleaned of debris periodically and at least once in the spring and fall. All structures need to be "wheel friendly" to allow for the safe passage of bikes and other permitted wheeled vehicles. Often good design measures using the terrain and grade are the best solutions of all.

Some of the erosion issues could be managed and/or corrected by limiting some trails to one-way traffic. The Lincoln Trail is an example of this. Mountain bikes especially can cause problems from spinning wheels on steep uphill climbs or from locking brakes going downhill.

### Improvements to signage and trail markers

With such a maze of trails that are in such a limited amount of space, it is wise to mark them well. During the assessment and mapping it was sometimes confusing where some of the trails were. The trail name signs at the entrances were helpful where there were any and the emergency points also helped to confirm locations along the trails as they often marked key intersections. There were some intersections that were not as clear, especially where there were shortcuts made or where an

intersection had been heavily impacted in open areas. Shortcuts and trails cut without permission only add to the confusion if one isn't familiar with the trails.

It would be helpful to all users if the trails were marked more frequently along the routes they follow. This does not mean every tree needs marking and good judgement should be used for how they are placed so as not to impact the experience visually. This could be done with painted blazes that are color coded or with small signs that are colored and/or use actual trail names. Each have their advantages and disadvantages. Blazing is cheap and nails are not placed in trees. This does require periodic maintenance. Signs can be stolen or removed for whatever reason. Both require a tree that is large enough for the blaze to be applied so they are most effective in forested areas. Posts with signs or blazing can be used where trees are not available.

The emergency response using GPS coordinates and waypoints seems to be a solid system that can be altered as needed. Work with the local EMS to continually train staff and test the system.

Signs associated with specific events should be removed quickly after the conclusion of the event.

#### Winter Use of trails

Winter use of trails has an impact when the snow compacts and becomes icy later in the winter. This surface then melts last and is often in place when spring rains begin. The result is that the water runs down the sides of the compacted snow and creates erosion problems that go beyond the summer concerns. Although it's not usually more of a problem with snowmobile trails, it's worth watching for this where trails are used for winter fat-biking, skiing, and snowshoeing.

### Impacts on wildlife habitat

One of the main reasons for this assessment was to determine the impact on wildlife habitat in the forest. According to the NH Fish and Game "Trails for People and Wildlife" tool used, there are areas of the forest considered to be high impact, primarily in and around the wetlands and the adjacent forested areas, as well as some of the field edges. Some of the older, original trails/roads are in areas considered as high impact. This appears to be less of a concern with the newer trails.

The impact on wildlife should also be measured by the amount of traffic and the type of use an area receives. The heaviest traffic tends to be closest to Stratham Hill Park and the trails in that area. This is also where travel occurs on the older, original trails that tend to circumnavigate or skirt the edges of the ponds and wetlands. These are the same trails that often see the most dog walking activity and dogs can certainly create disturbance to wildlife, especially when they are not leashed.

Mountain biking, snowshoeing, skiing, etc. do not necessarily create any more impact on wildlife than everyday foot traffic. Bushwhacking, off-trail travel and hunting can also disturb wildlife but typically there are fewer people doing this. Hunting is permitted with written landowner permission on private properties, but not on property owned by the Town of Stratham. Seasonal closures are an option if there are specific concerns about wildlife during mating season or in the harsh winter months. Early morning and evening are often active times for many species so the time of use can also factor into the concerns. Fortunately, mechanized traffic for recreation is not allowed as that does have a larger impact. Limitations on chainsaws, leaf blowers, and other power tools might also be a part of the solution to preventing excessive noise.

Unless there are rare or threatened species, it is our opinion that it is unlikely that wildlife would be drastically affected by the trails in their current state or as they are used at this time but it is an important item to monitor and address as needed. It is important to remember the importance of the wildlife corridors between nearby forest lands and how they relate to these properties.

#### Use of E-bikes

E-Bikes, bikes that use electric motors to assist the rider, are becoming increasingly popular but come with a good deal of controversy with landowners and trail users. Opinions on the bikes themselves are not nearly as important as the implications they may have to trails and the surrounding environment. A common concern is that eBikes will hasten the degradation of trail networks with their power and their ability to allow riders to cover more trails in less time than if done by pedal power. More importantly, given the speed at which they can travel, safety should be an important consideration for the others using the trails.

There are a few different classifications of e-Bikes:

- \* Class 1: eBikes that are pedal-assist only, with no throttle, and have a maximum assisted speed of 20 mph.
- \* Class 2: eBikes that also have a maximum speed of 20 mph, but are throttle-assisted.
- \* Class 3: eBikes that are pedal-assist only, with no throttle, and a maximum assisted speed of 28 mph.

A few trail networks that have begun to allow these bikes generally limit the use to Class 1 eBikes. The New England Mountain Bike Association (NEMBA) is monitoring the use and reviewing their support of eBikes. IMBA is considering their support and has been softening their views. The verdict is still out on what the final decisions might be. The National Park Service and U.S. Forest Service are considering allowing them. There may be a place for them on trails that are designed with these eBikes in mind or on roads that will support them. Green Woodlands in Dorchester, NH is one area that has begun to allow them on a trial basis. Given the fact that this is still a relatively new aspect of biking, it would be best to refrain from allowing them on Stratham trails until more is learned about the impact on trails and the safety of users (both the riders and other users on the trails). Continue to monitor the potential use of these bikes and any specific needs for their use.

#### **User Conflicts**

User conflicts may exist whenever trails are used for a variety of activities. It is obvious that the trails here may face this problem as many are currently shared by walkers, bikers, and dogs all at the same time. A common rule of trail courtesy involves right-of-way. It seems that many hikers—even experienced ones—may not know or always remember this, but hikers going uphill have the right of way. This is because in general hikers heading up an incline have a smaller field of vision and may also be in that "hiking rhythm" zone and not in the mood to break their pace. Often an uphill hiker may let others come downhill while they take a breather, but remember that's the uphill hiker's call.

If you're about to pass another hiker from behind, a simple "hello" is often the best way to announce your presence. Remember, many of us can zone out on those long, steep inclines! When passing, always stay on the trail to reduce erosion.

Since mountain bikes are considered more maneuverable than hikers' legs, bikers are generally expected to yield to hikers on the trail. However, because those mountain bikes are often moving considerably faster than said legs, it's usually easier for hikers to yield the right of way—especially if a mountain biker is huffing and puffing up a tough incline. A biker should never expect a hiker to yield, though.

Because mountain bikers move faster, hikers should also be aware of their surroundings on shared trails. Conscientious mountain bikers will call out as they come down steep slopes or blind switchbacks, and they should also let you know if there are other bikers following them.

Educating the public on trail etiquette is recommended. Posting information on appropriate websites and at trail heads and in kiosks would help achieve this goal.

#### Dogs and trails

The trails are very popular for dog walking and rightfully so. However, there have been concerns expressed about the number of dogs and more importantly the safety of others when dogs are on the trails. Several other parks and trails have guidelines and restrictions for when, where and how dogs may be included with the other users on trails. These concerns are related to all pets (or farm animals) and not just dogs.

For safety reasons and for the protection of wildlife (megafauna to the tiniest amphibians) it is suggested that all dogs be leashed when on the trails. This allows everyone to use the trails at the same time without accidents with bikers and close encounters with people. This is especially true when several dogs are walking in a group or when they meet on the trail and must pass at a close distance to other dogs or people on the trail. Even with leashes, dogs should be kept in control and brought to the side of the trail when there are others passing by.

One other solution is to designate certain trails for dog walking while restricting others. Some of the wider trails or those with good visibility over a distance are more conducive to the spatial needs of sharing the trail corridor. Trails such as Tote Road and the trails around the meadows are good examples.

Here are a few ideas to consider as part of animals sharing the trails:

All animals must be on a standard or retractable leash not greater than six feet in length.

Animal owners must clean up any waste eliminated by their animals and dispose of it in provided containers or remove it off-site.

Animals must not be left unattended at any time, including in vehicles.

Any Stratham Town Ordinances will also apply here.

#### Events and group size

The impact of large groups using the trails in a short period of time such as a race or similar event can have negative effects on trails. This is especially true if conditions are wet or muddy. Entire trail systems have been damaged and required substantial maintenance in situations like this. Good judgment should be used if conditions were less-than-ideal during a scheduled event. Realizing this is always tough to manage with prior planning, it would be wise to limit activities to some of the larger trails with adequate

drainage and rerouting or closing sections that might be impacted. The Parks and Recreation Department currently has systems in place to properly manage the events they sponsor using cancellations or postponing events when necessary. This is currently managed by the Parks and Recreation Director. The Town also provides a summary of planned events to the Edith C. Barker Revocable Trust (Barker Family) at the beginning of every year.

#### Accessible trails

Accessible trails are designed for use by those with physical or mobility limitations. They are typically hard-surfaced trails that are on low angle grades. There are strict standards set by the American Disability Act (ADA) and the Architectural Barriers Act (ABA) for how these are constructed. Though the park and some of the town forest areas may be the most appropriate and cost-effective locations for trails such as this, there are none that meets these standards beyond the paved areas. Consideration should be given to adding more of these opportunities over time. Portions of the Tote Road or trails along the field edges would be good choices for this. These trails would allow for the enjoyment of diverse environments by those with physical limitations and they meet the grade requirements and are already for surfacing.

There is a demand for more of these trails as they serve so many users. They are often multi-use trails but can also be restricted to certain users (example: wheelchairs but not bikes). Nearby examples of similar trails can be found at Mt. Agamenticus in York, ME and some excellent examples at Crotched Mt. Rehabilitation Center in Greenfield, NH.

### Closure and decommissioning of trails

The decision to close and decommission trails is one that will fall to the Parks and Recreation Dept. and/or the Stratham Conservation Commission while considering input from this report and the community. Future needs and plans for logging or other work in the farm or forest areas may dictate temporary or permanent trail closures. As discussed, wildlife concerns may be better left to advice from experts with more knowledge on the impact for these parcels. There are trails, or sections of trails, that were never placed in appropriate locations to be sustainable and low maintenance. Others may be shortcuts or duplicates of nearby trails and are either unnecessary or creating more damage to the landscape. These could be removed without significant changes to the current recreational uses of the property. It's wise to inform and educate the public on any changes and closures with the trail system. Include any and all online resources that are known to be used for trail information as this is where many people are finding recreational areas now.

#### Trails to consider for closure include:

- Ruptured Lung (#19, pg. 32) Steep grades and erosion concerns. Monitor for continued erosion and close if it cannot be managed.
- Father and Son Extension (#27, pg. 40) Proximity to wetlands and poor condition.
- Old Ski Slope (#29, pg. 42) Steep and safety concerns.
- Side trails between ponds from the Tote Road to Fire Tower Road (#30, pg. 43) proximity to wetlands and wildlife sensitive areas.
- Easternmost cross trail from variation by Stratham Hill Pond (Barker Trail to field) (#30, pg. 43) unnecessary with other nearby connectors and in a wet area.

- Southernmost cross trail between Barker and the adjacent field (#31, pg. 44) poor conditions and a duplicate of other nearby trails.
- Easternmost connector trail between Long Hill and Fire Pit Connector (#32, pg. 45) steep and erosion concerns.
- Lower Barker to Fire Pit Connector (#33, pg. 46) duplicate of other nearby trails and in poor condition.

These choices for closures will still allow access for hikers and bikers to other existing trails. The remaining trails are well positioned for connecting with other nearby trails. The benefit of providing more open space for wildlife habitat is also increased to meet the goals of conservation.

### Costs of trail construction and/or decommissioning

Ask any professional trail contractor about the cost of trail work and you'll get a wide range of numbers. There are so many site-specific variables that include such things as length/width, soils, access, vegetation removal, season, machine vs. hand-built, contractor overhead, volunteers or not...the list goes on.

When the time comes to build or maintain trails and trail structures, or decommission others, it will be necessary to decide on whether the work can be done by town employees, volunteers, or if it will require a professional trail contractor. Using contractor bids will provide a better sense of the actual costs. Contracts and agreements can be based on the information gained through the bids and interviews. This requires a complete and thorough trail log/survey to present for the bidding. This assessment was not intended to serve that purpose but hopefully using this information as a foundation for that work will help with that process. On-site inspections with a focus on designs and related costs are best for getting fair and equal estimates. There are several reputable contractors based in the Northeast with a wide variety of experience, skills, and areas of expertise. A list of these can be made available if requested.

It is important to note that Stratham has the good fortune of having town employees with a good knowledge of trail construction and most likely a group of volunteers that are dedicated to doing good trail work as has already been demonstrated. They should continue to be part of any plans for future maintenance or trail closures.

Careful consideration should be given to the long-range view and future maintenance of any trails. Without maintenance, trails can quickly fall into disrepair and understanding the amount of work that goes into good maintenance is easily forgotten. Current volunteer work groups may not always be interested or available and though they provide excellent service, trail contractors can be expensive. As a cost savings measure it would also be possible to hire a contractor that is willing to lead groups of volunteers for routine maintenance.

#### Partners and volunteers

Continuing to maintain and develop partnerships with users and volunteers will be a key to the long-term success of managing the trail network. It will take many hands to do the work needed. Partners (such as the mountain bike community, Scout groups and school teams, etc.) will be key to accomplishing the goals. Building a base of volunteers who are ready to help will be important. Training volunteers about best management practices for conservation as well as trail construction and

maintenance are an important piece of this process. Some professional trail contractors are willing to train and/or work with volunteers on trail projects.

Communicating updates and changes with user groups on a regular basis is also important as is providing time for regular meetings with Parks and Recreation staff, at least on a seasonal basis.

#### Town property and private landowners

The Stratham Conservation Commission manages the Gordon Barker Town Forest and the Stratham Select Board manages the area of Stratham Hill Park. But last and certainly not least, private landowners may have opinions or preferences on how the trails are or are not used. Planning and decisions should be made with respect for their wishes and the generosity of allowing use of their land.



# Trail Improvements and Projects – Five-Year Plan

### 2021

- Trail assessment with recommendations, photo documentation, annual use log.
- Formation of Trails Committee, ad hoc advisory
- Discuss potential options and solutions with town officials and include general public feedback session(s).
- Make decisions on any immediate concerns, limited uses, dogs, leaf blowing, closures, etc.

### 2022

- Trail assessment with recommendations, photo documentation, annual use log.
- Update Stratham Trail Map with changes based on additional and closed trails.
- Create a detailed trail survey log for areas needing maintenance, reconstruction, rerouting, and/or decommissioning with a timeline for completion.
- Address any immediate trail safety concerns or prioritized maintenance needs based on the trail survey.
- Improve trail marker / signage system where needed.
- Host a trail maintenance workshop to teach volunteers and build the volunteer base.
- Improve trails using reconstruction and/or rerouting as prioritized. Utilize volunteers to tackle smaller projects.

#### 2023

- Trail assessment with recommendations, photo documentation, annual use log.
- Improve trails using reconstruction and/or rerouting as prioritized taking next steps on larger projects and to improve overall network. Use volunteers whenever possible and contractors if necessary.
- Close and decommission any trails as needed.

#### 2024

- Trail assessment with recommendations, photo documentation, annual use log.
- Improve trails using reconstruction and/or rerouting as prioritized taking next steps on additional projects and to improve overall network. Use volunteers whenever possible and contractors if necessary.
- Close and decommission any trails as needed.

#### 2025

- Trail assessment with recommendations, photo documentation, annual use log.
- Complete any remaining areas of significance needing work.
- Close and decommission any trails as needed.
- Update trail map and general information based on changes to date.
- Review progress to date, discuss future needs.

### Conclusion

The combined properties of Stratham Hill Park, Gordon Barker Town Forest, the Barker and Short easements have much to consider for the future when it comes to managing the increased demands of recreation while considering the potential impacts on habitat for flora and fauna, farming, future logging, and more. It has a wide variety of features including farmland, mixed forest types, as well as streams and wetlands that provide habitat for wildlife. The 200 or so acres are an island surrounded by residential and commercial areas as well as farming and are connected to other green spaces by thin threads of forest. These properties are an excellent example of farm and forest land that interfaces well with the pressures of the surrounding landscape with residential and commercial activity as well as the

needs of the town. The mix of trails offer users many types of outdoor recreation opportunities in every season. With good planning and a long-term view of management and maintenance the area will provide opportunities for many over the years ahead while meeting the goals of the town and the mission of conservation.

It has been a pleasure to get to know these trails while realizing that there is so much more to experience and see. It is my hope that this report will help to meet the needs of all who use it and appreciate it. I am available to continue the conversation, answer questions, and offer opinions on maintaining the trails in the forest if there is ever a need.

Lew Shelley

#### SnowHawk LLC

