

Quabbin/Ware River Region FY19 Forest Harvest Proposals

The Division of Water Supply Protection [<https://www.mass.gov/orgs/dcr-division-of-water-supply-protection>] (DWSP) is mandated to protect our water resources for future generations. Forest cover provides unparalleled water quality. DWSP has determined that the most stable land cover comes from a vigorous, species-diverse, many-aged forest. The Division's long-term objective is to diversify today's mostly even-aged forest into a multi-aged forest. We are determined to do this while conserving biodiversity using sustainable forestry practices. This process will not be fully implemented for many decades because we are proceeding at a measured pace.

DWSP Foresters [<https://www.mass.gov/service-details/dcr-watershed-forestry-program>] design timber harvests that will regenerate about 1% of the managed forest every year so that gradually, over time, the managed forest will include a much broader range of age classes than is currently present. Each year DWSP Foresters propose areas to be harvested which are then reviewed by professionals in Natural Resources, Environmental Quality, and Watershed Management. Finally, these proposals are made available for public comment as presented here. **Details on how to make public comments can be found below.**

The overall purpose of this management is to restore the forest to more balanced proportions of young, mid-aged, and older trees comprised of the greatest possible variety of native species. DWSP's working hypothesis is that the new makeup of the forest will help ease the damage caused by inevitable future severe weather events, outbreaks of disease, and insect infestations.

For full details on DWSP land management please see the 2017 Land Management Plan.

[<https://www.mass.gov/files/documents/2018/02/05/dcrdwsp2017landmanagementplan.pdf>]

Public comment on these proposals is welcome and can be **submitted online at this link.** [<https://www.mass.gov/forms/dcr-public-comments>] Comments may also be submitted by U.S. mail to

Department of Conservation and Recreation

Office of Public Outreach

251 Causeway St.

Boston, MA 02114

These proposals were presented at the following public meetings:

- **Ware River:** Ware River Watershed Advisory Committee, May 10th, 2018
- **Quabbin Reservoir:** Quabbin Watershed Advisory Committee, June 4th, 2018

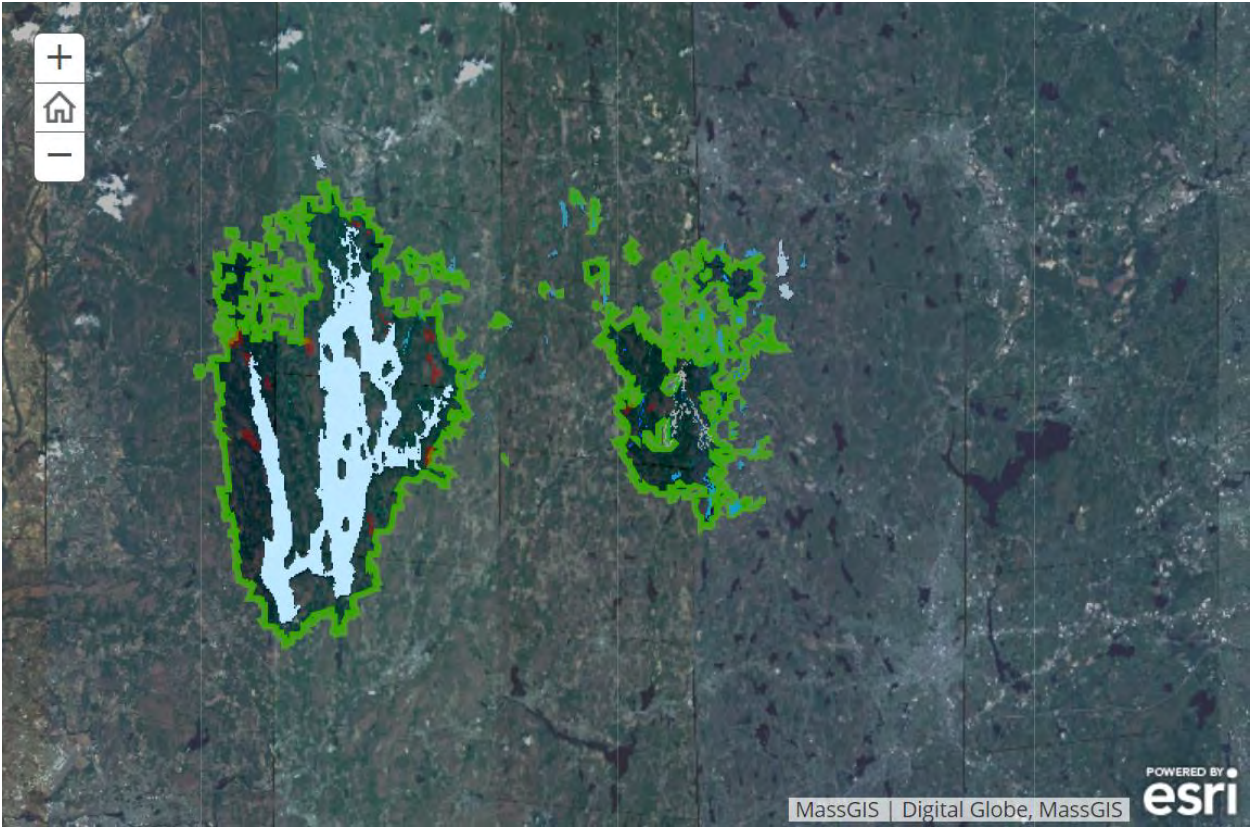
Comments must be received by the close of business on Monday, July 23rd, 2018.

If you have any questions, please contact Natural Resource Analyst Brian Keegan at brian.keegan@state.ma.us or at (413) 323-6921 x 551.

[https://youtu.be/Wi23c6Fla_Q]



Figure 1: 2019 Quabbin/Ware River Forestry Proposal Locations



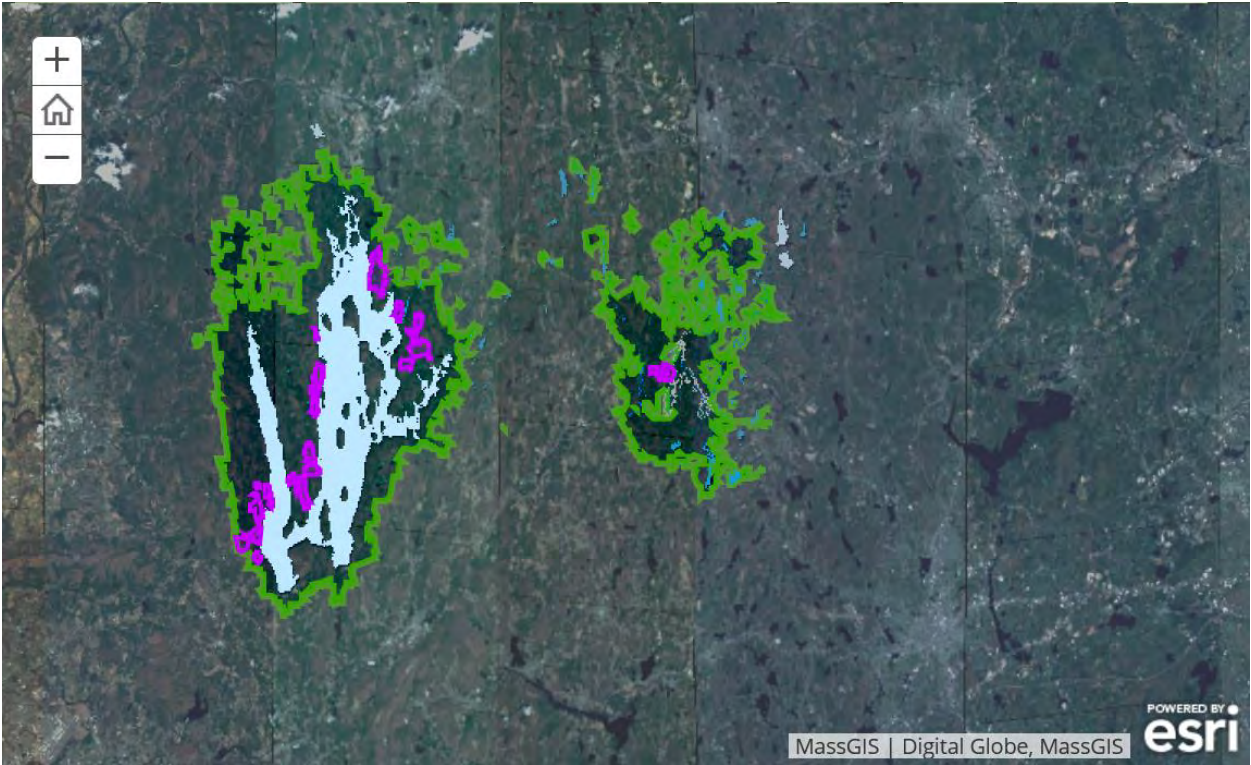
FY19 Gypsy Moth Related Oak Salvage

A combination of stress from a multi-year drought along with repeated extreme gypsy moth defoliation events has resulted in widespread oak mortality throughout the Quabbin forest. The degree of damage varies from place to place, but there are unfortunately some significant areas with near complete mortality, often of very high-quality timber. While a large amount of the dead oak will remain in place to add to wildlife habitat and forest structural diversity, DWSP intends to recoup some portion of the valuable wood volume that otherwise would have been harvested through normal practices many years from now.

This map identifies approximate areas of special concern for oak salvage. These areas have been identified through a combination of satellite imagery analysis ([performed by Pasquarella, Bradley, & Woodcock, 2017](#)) and field survey by DWSP foresters. The locations mapped here do not represent all areas with concentrated oak mortality, but those areas with the best access and operability for the amount of oak present for salvage. With these criteria, DWSP can salvage the most value from the dying oak for the least cost and impact. Ultimately, the full extent of these mapped areas will not be salvaged due to restrictions on operations (terrain, extreme slope, streams, etc.) and limited time before tree decay. It should also be understood that within each of these mapped areas salvage work will reflect the level of mortality; there will likely be scattered removals, similar to a thinning operation, mixed with pockets of near complete removals similar to our typical regeneration patch cutting operations. Some pockets of high mortality and low species diversity may have widely scattered residual trees.

All of [DWSP's standard management policies](#) apply to these salvage operations. The DCR Commissioner will need to approve any salvage work that will create openings >5 acres, as is the case for other DWSP silvicultural operations. There will be an accelerated proposal and sale schedule of these areas. Each of the locations mapped here has been reviewed by DWSP Natural Resources and Environmental Quality staff and, is here, undergoing public review prior to sale

Figure 2 FY2019 Quabbin/Ware River Oak Mortality Locations for Potential Salvage



Quabbin Harvest Proposal PE-19-10

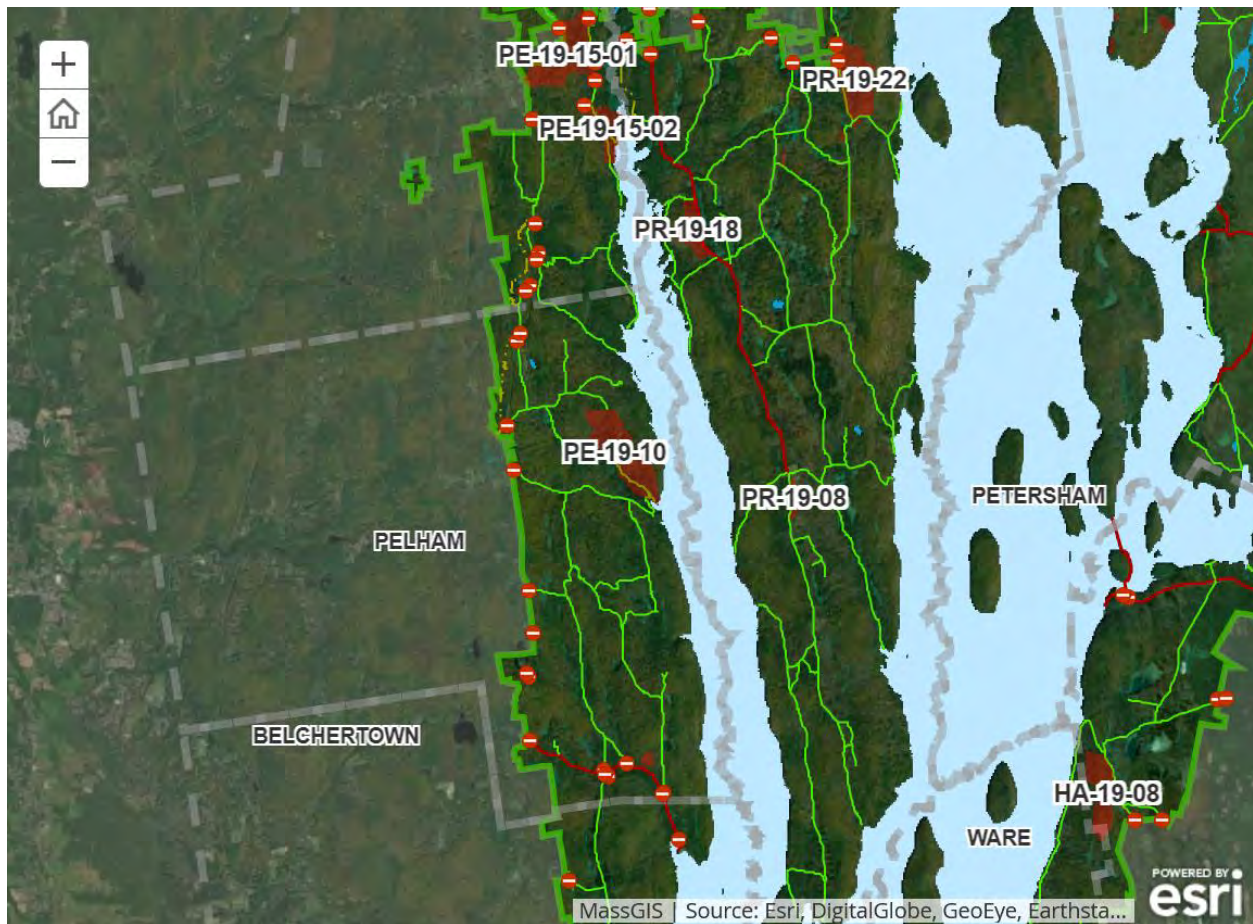
Proposal Goals

This proposal seeks to accomplish DWSP Forestry's broader goals of forest resistance and resilience through age and species diversity by treating areas with abundant dying hemlock ([hemlock wooly adelgid](#)), poorly formed white pine, low diversity regeneration, and few age classes.

Proposal Location

This proposal is located along the southern end of Purgee Brook Rd. located inside DCR Gate 12.

Total Acres: 213



General Description

	Overstory Type(s)	Acres
Dominant	Mixed Hardwoods	82
Secondary	White pine/hardwood	40
Other	Oak/hardwood	33

	Understory Type(s)
Dominant	Mountain laurel prevalent

Secondary	Tree seedlings/saplings dominate site
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Description of forest composition/condition:

The proposed area can be divided into five sections: The ridgeline running the eastern edge oriented NW to SE, a cirque in the northwestern corner, the slopes occupying the middle of the lot, the bottom to the north of Purgee Brook Rd, and the area between Purgee Brook Rd and Purgee Brook to the south.

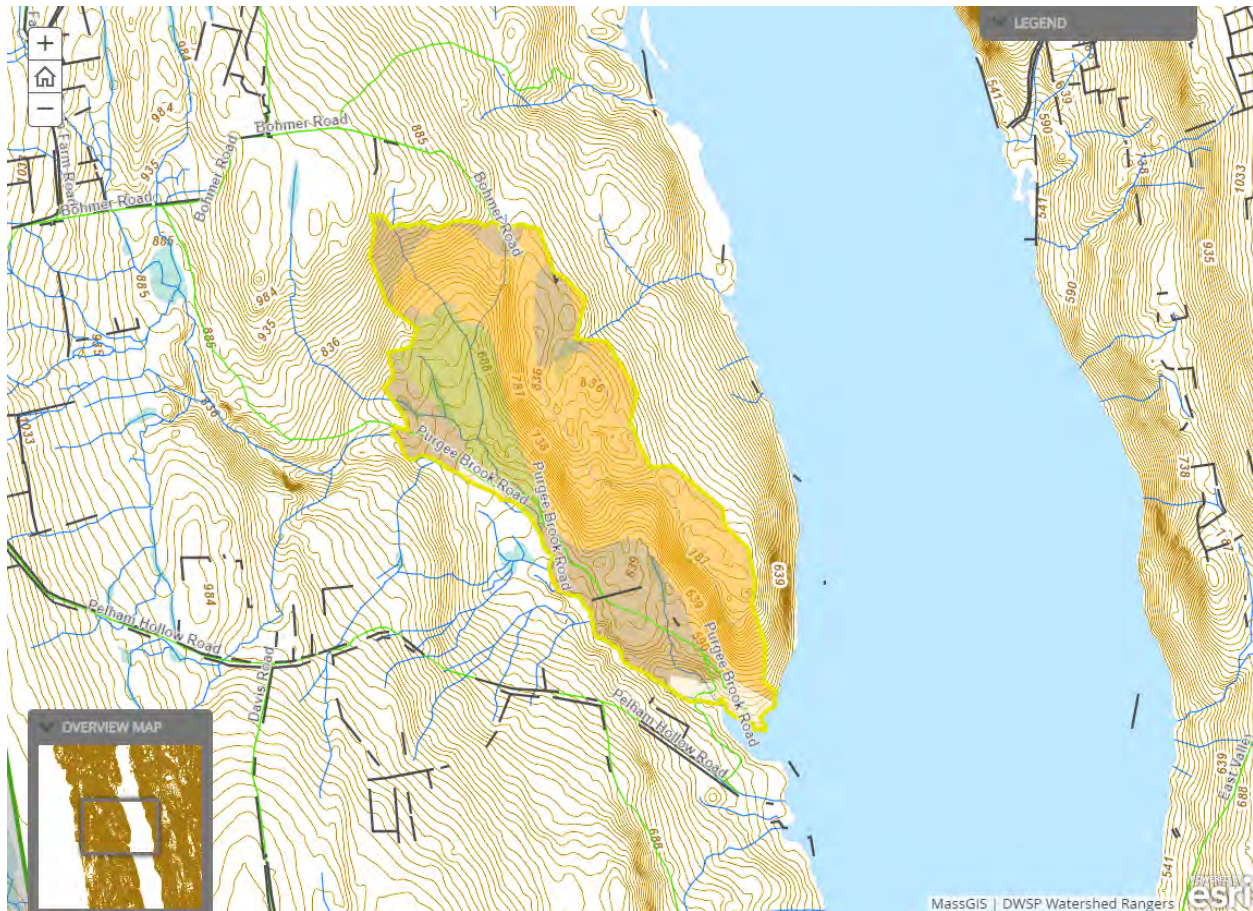
The ridgeline is primarily pine/oak to pine/hardwood or oak/hardwood to mixed hardwood forest cover except for a white pine/hemlock cover in the far south. Stocking ranges from 120-170 ft² BA / acre. What hemlock is on the ridgeline is very unhealthy and a significant portion has already died. Beneath the ridgeline overstory, dense mountain laurel pockets are present under each cover type, and where it is present beneath dying hemlock it is dense enough to impede new regeneration. In the oak/hardwood/mixed hardwood stands regeneration is poor and tends to black birch. Hemlock regeneration even at the top of the ridgeline is usually heavily browsed. An oak salvage occurred at the northern end of the ridgeline in 1985 (lot 0451, 42 ac.).

The cirque in the northwestern corner was treated with an oak thinning and then salvage in 1975 (lot 0125, 50 ac.) and 1985 (lot 0438A, 41 ac.) harvests. The stand stocking ranges from 60 - 100 ft² BA/ acre and has a large black birch sawlog component joining the remnant mixed oak overstory. Black birch in the area show a history of canker and is often poorly formed. The few remnant white pine are large (>25" dbh) and likely were kept (and would continue to be kept) as emergent legacy trees. Mountain laurel is well established in this area and of low to moderate density throughout.



Drainage Class	%
Excessively Drained	4
Well Drained Thin	55
Well Drained Thick	27
Moderately Well Drained	14
Poorly to Very Poorly Drained	0

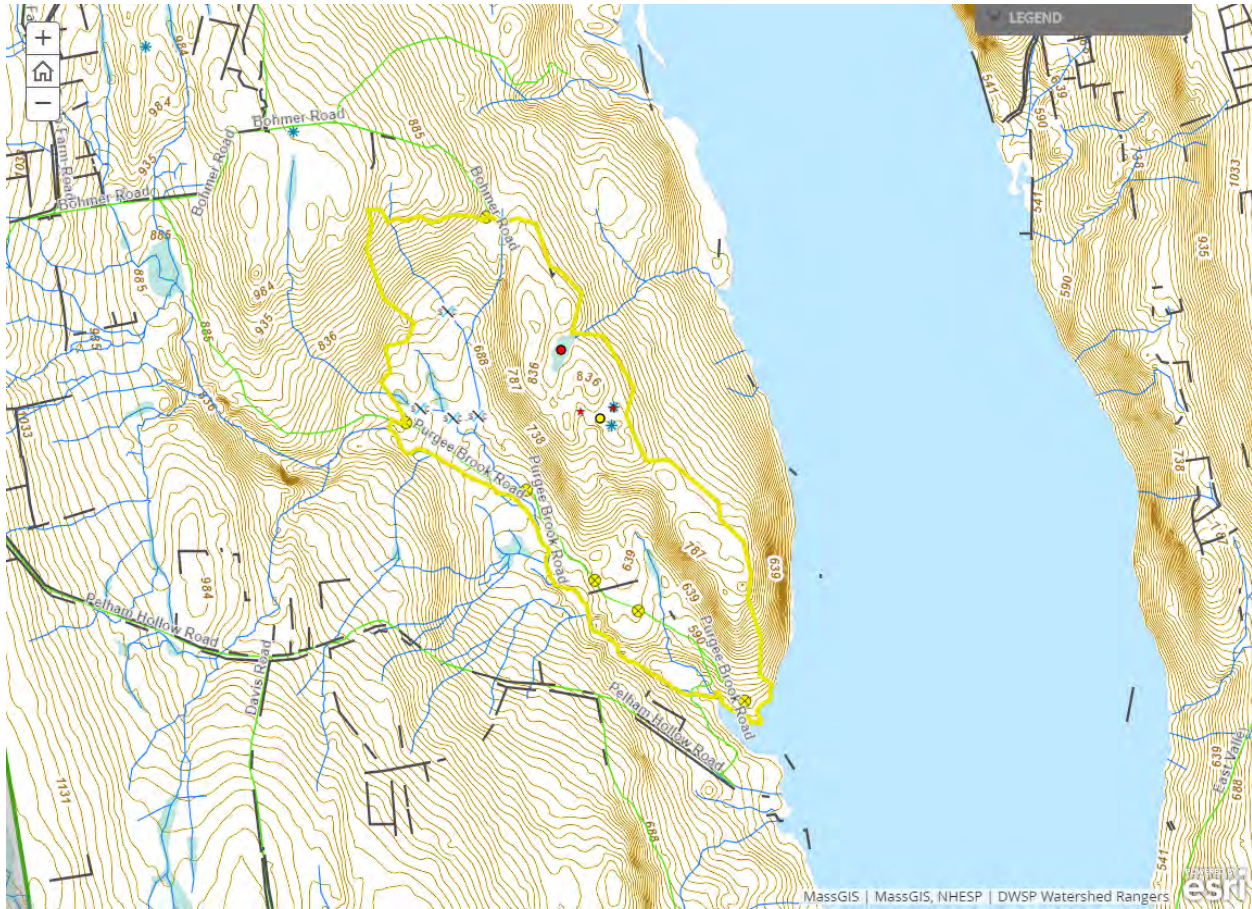
Soils are primarily Charlton Hollis Rock outcrop, with Scituate and Canton fine sandy loam on the western side of the ridge. Fine sandy loams are also classified as extremely stony.



Wetlands

- Wetlands present? - **Yes**
- Streams present? - **Yes**
- Vernal pools present? - **Yes**
- Seeps present? - **Yes**
- Are stream crossings required? - **Yes**
- Are wetland crossings required? - **Yes**
- Is logging in filter strips planned? - **Yes**
- Is logging in wetlands planned? - **No**

Wetland crossings will be necessary where historic skid road stream crossing involves streamside wetlands.



Silviculture

Acres in Intermediate cuts: **15**

Acres in prep/establishment cuts: **15**

Acres in Regeneration cuts: **33**

Average regen opening size: **1**

Maximum regen opening size: **2**

Description of advance regeneration in proposal area:

Mountain laurel dense enough to impede regeneration is present in pockets in all areas of the proposal. In areas not impeded by mountain laurel white pine is the most common advanced regeneration. Under the dying hemlock, where mountain laurel impeding, the most common regeneration is white pine and black birch. In the northern cirque black birch is the most common regeneration and dominates size classes from saplings to small sawlogs. White pine regeneration in the understory is vigorous, but midstory white pine is slowing and dropping out.

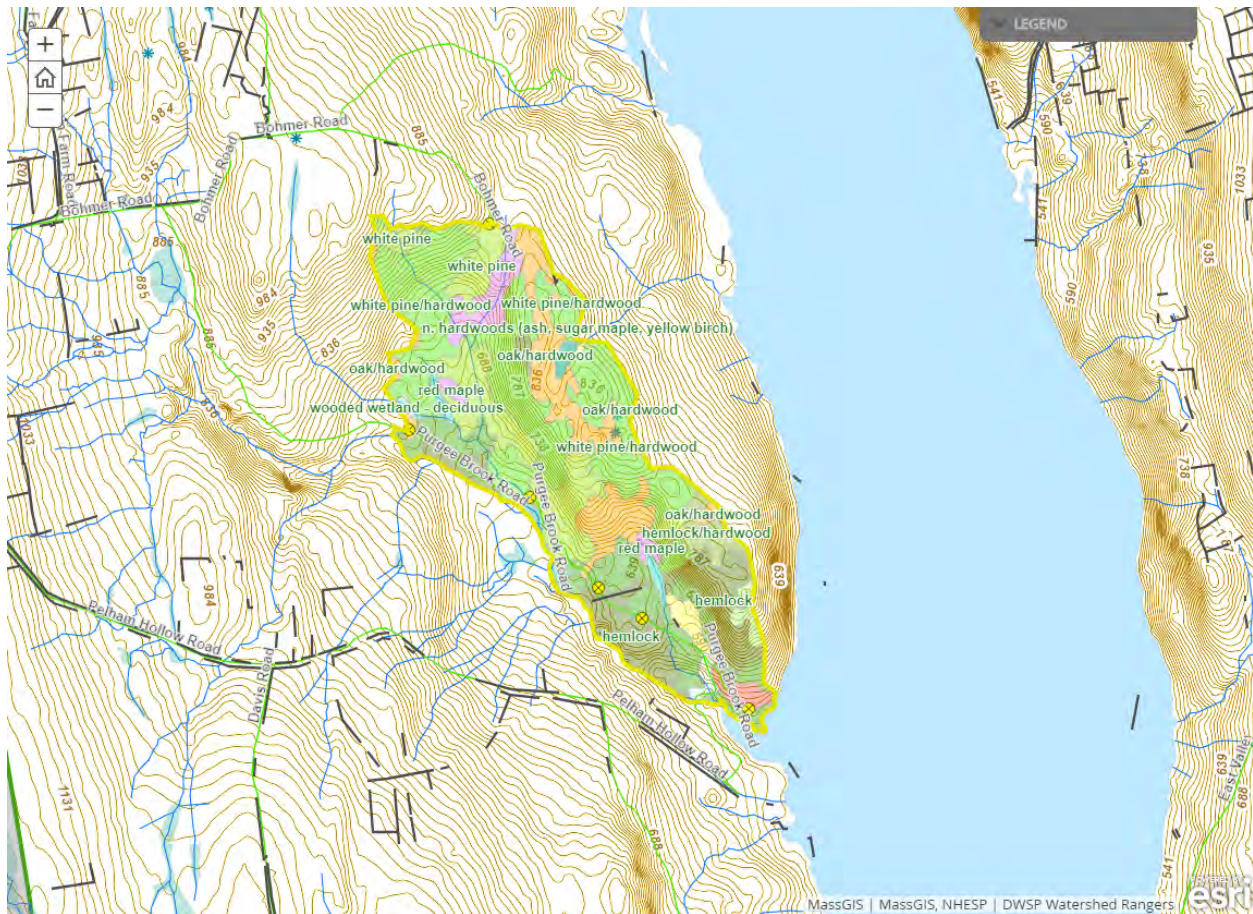
General comments on silviculture proposed:

Along the ridgeline and the northern cirque, the silvicultural goals will be to improve regeneration where mountain laurel is dense, and to improve stand quality by targeting unhealthy and poorly formed individuals. Regeneration openings will be placed where mountain laurel is most impeding regeneration with scarification requirements considered where conditions allow. Oak and hickory will be prioritized as edge and retention species, within the larger goals of increasing stand species diversity. Where mountain laurel is not impeding diversity stands will be treated with irregular shelterwood, removing poorly formed and unhealthy individuals, especially black birch (e.g. past evidence of canker, twisted understory development). In these areas, 20-40 ft² BA/ ac will be maintained. If road repair is possible, timber harvested along the ridge top and in the northern cirque will be forwarded/skidded to the existing landing on Bohmer Rd (Gate 12 Rd). Otherwise, a series of existing roadside landings on Purgee Brook Rd will be utilized for all wood.

Silviculture of the slopes will be limited by operability. Where the slope is inoperable the top and bottom will be treated to the extent possible. Silviculture of the slopes will focus on the areas of dying hemlock where mountain laurel is beginning to impede regeneration. Basal area will be reduced to low levels (10-30 ft² BA / ac) to allow shade intolerant regeneration a chance of competing with the established shade tolerant mountain laurel. In the middle section where there is little understory or midstory shelterwood prep will reduce overstory basal area to 30 - 50 ft² BA / ac to encourage increased regeneration. Regeneration prompted by the shelterwood prep cut can be released in the future with small group silviculture.

In the bottom along Purgee Brook Rd. a combination of regeneration openings and thinning will be used to target unhealthy hemlock and release existing white pine/hardwood regeneration and increase light availability to remaining healthy hemlock. Openings will be collocated with areas of diverse retention. Areas harvested in 1997 and 2001 will receive TSI and minor improvement cutting. Beyond these areas, regeneration openings will target unhealthy and dying hemlock and areas with existing hickory available to provide seed.

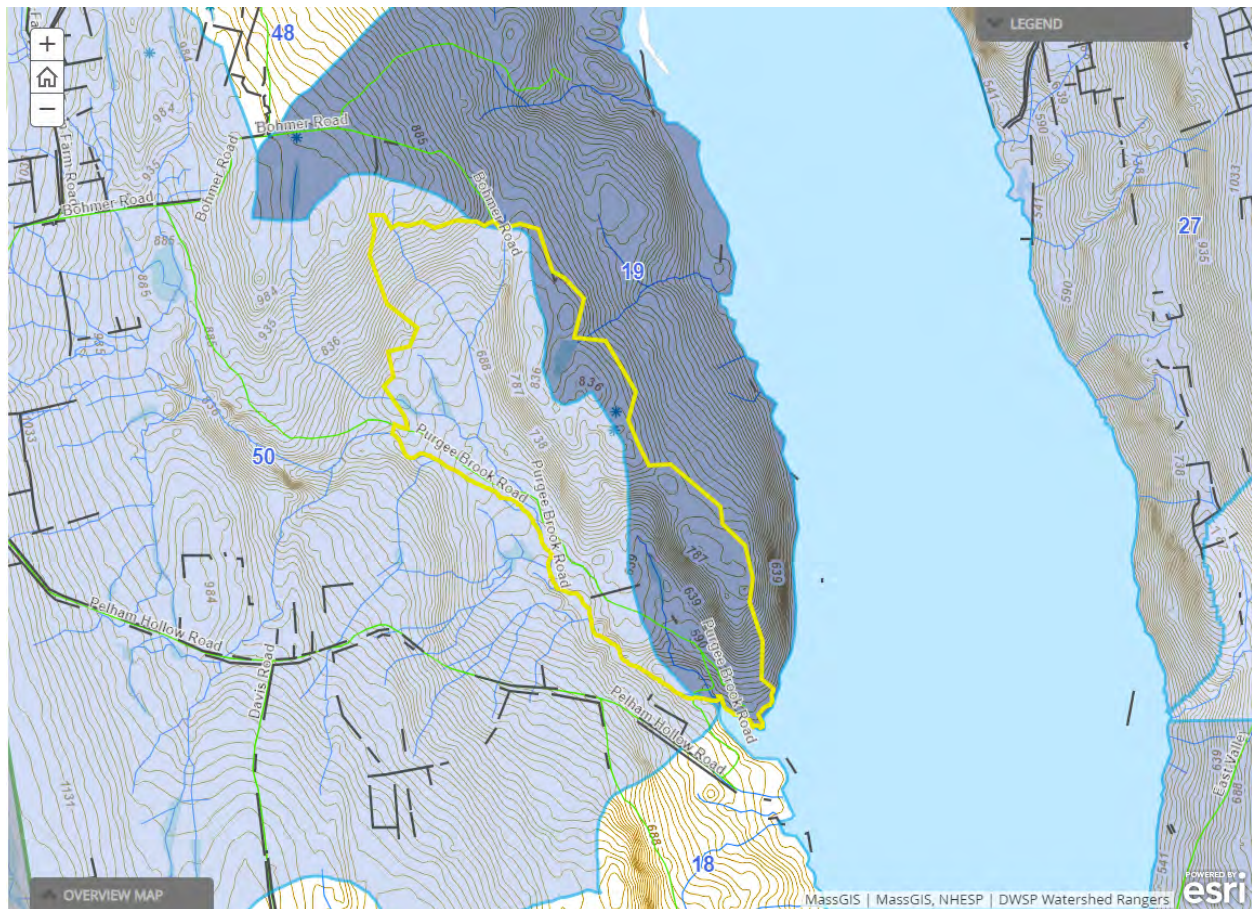
The space between Purgee Brook Rd. and Purgee Brook will likely be mostly covered by variable width filter strip and silviculture will target unhealthy hemlock, and poorly formed individuals (e.g. weevil damaged white pine) with thinning, especially where existing white pine and hemlock regeneration can be released. Basal area will not be reduced below 50 % of current levels where filter strips apply.



Subwatershed Analysis

Sub-watershed number	Total DCR-owned Acres	Acres Regenerated on DCR Land in the last 10 years	Acres Remaining for Regenerating Up to the 25% / 10 Year	Acres part of this proposal
19	437	23.7	89.3	87.6
50	1697	94.9	329.3	150.9

In subwatershed 67 where the area included in the proposal exceeds the DCR owned acres remaining for regeneration, the actual treated acreage will be closer to 20 total acres of combined regeneration/shelterwood/intermediate thinning treatment. The full area was included to prevent isolating a stand between Shutesbury Rd., Cooleyville Rd., and treated acreage which would have made future treatment more difficult.



Harvesting Limitations

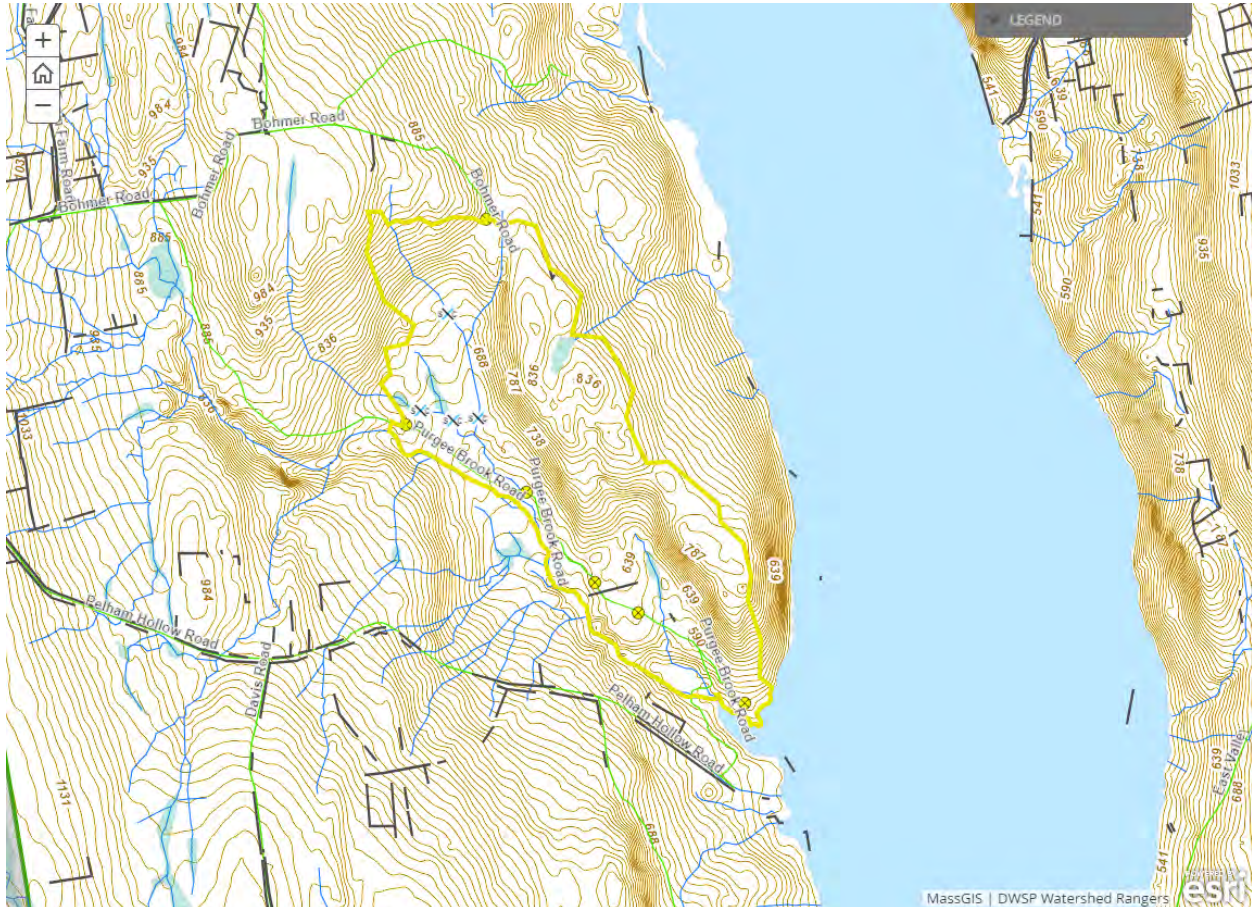
Forwarder required: **No**

Feller/processor required: **No**

Steep slopes present: **Yes**

Comments on harvesting limitations:

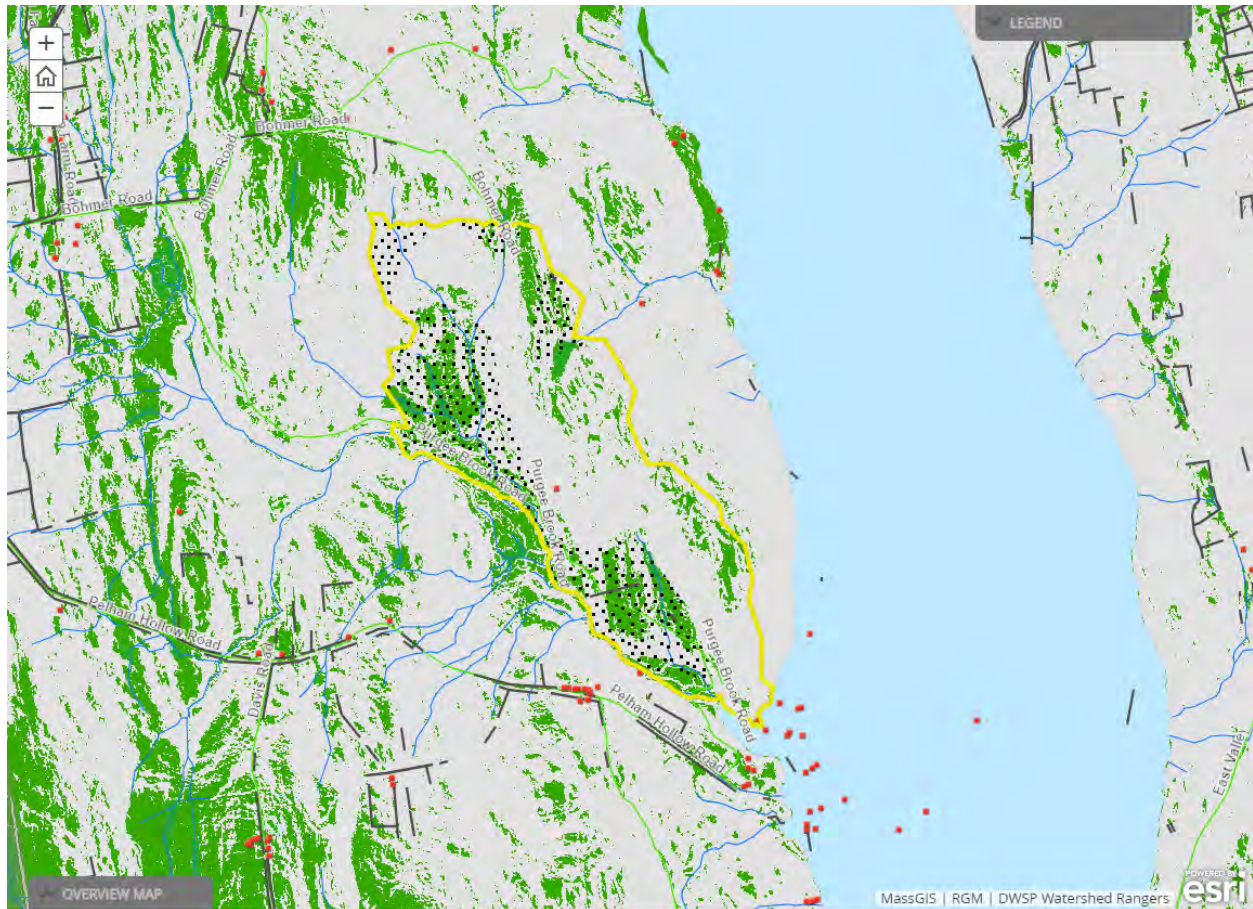
Treating areas of steep slope to any degree may require a cable skidder. A steep slope skid road would be located at the southern end of the ridge leading to the existing landing of the 2001 red pine harvest. This skid road may be avoided by sending the road north to the existing landing of lot 2038 on Bohmer Rd. Use of that landing would be contingent on repair of Bohmer Rd.



Cultural Resources

Comments on Cultural Resources:

The proposed area includes foundations for the residence, barn, and outbuilding for Daniel Murowsky (15.02). Stone walls are present, primarily along Purgee Brook Rd. and the end of Bohmer Rd. Surface stone is prevalent along the slope. Existing barways will be used where feasible and harvest layout will protect walls as much as possible. If applicable DWSP will follow any additional recommendations from DCR's Archeologist regarding protection of sensitive sites.



Wildlife Resources & Rare and Endangered Species

Comments on any unique or unusual sites or habitats on the lot:

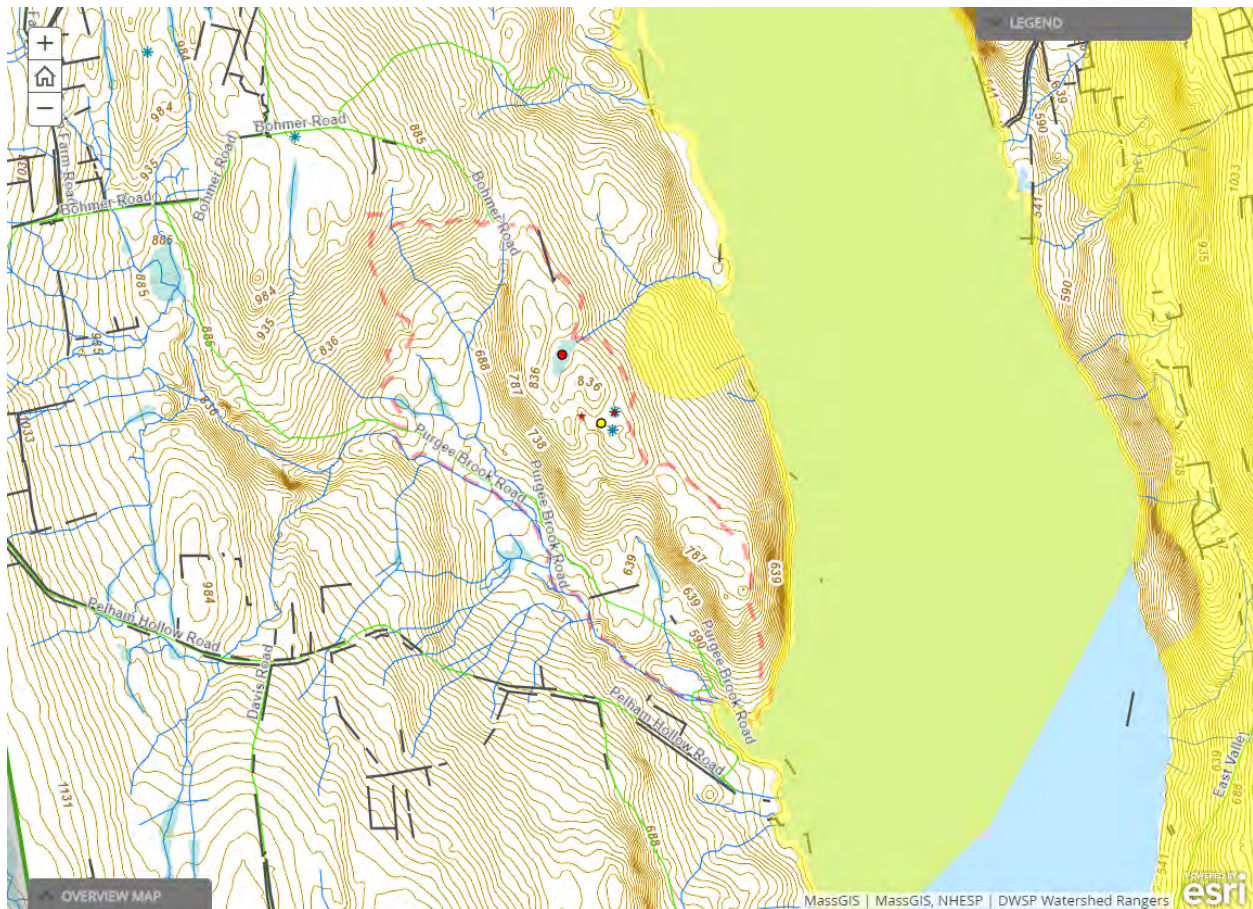
There is a beaver pond on top of the ridgeline that feeds directly into the reservoir. The pond is at 810' elevation and the flow path is 1,800' to the reservoir. There are two NHESP certified vernal pools present.

General wildlife comments:

Moose sign is prevalent. Most hemlock regeneration has been heavily browsed, moose scat is abundant in the lower sections, but still noticeably present on the ridgeline. Barred owl was heard during scouting, several grouse flushed.

Comments on Rare Species/Habitats:

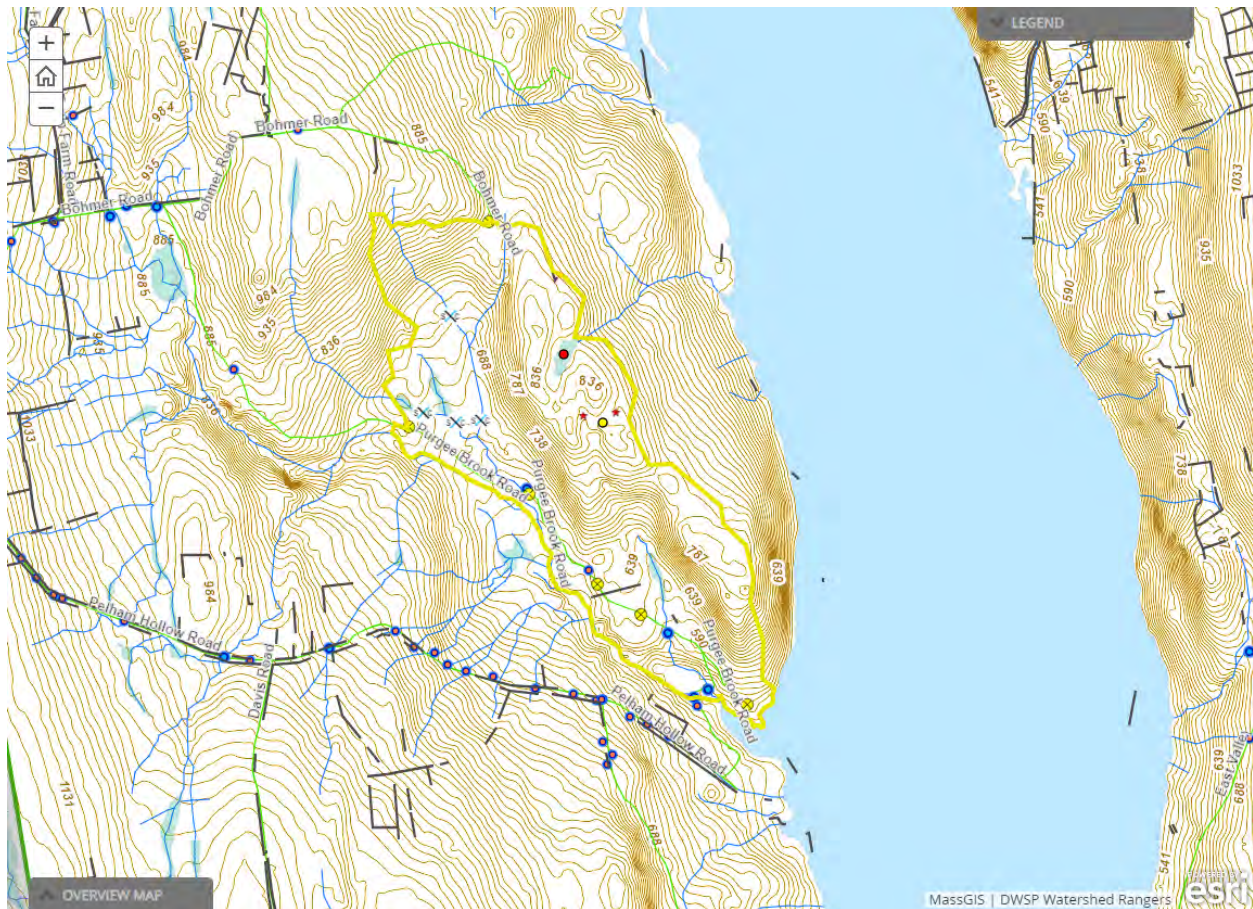
Cavity trees and potential/existing nest trees will be retained if possible. NHESP has determined that certain state-listed sensitive species or habitats may exist with the lot proposal area where Purgee Brook empties into the reservoir. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed harvest. Two DCR Quabbin Potential vernal pools are present on private property across Cooleyville Rd.



Environmental Quality Engineering

Comments on EQ Issues:

Timber will cross Purgee Brook several times on Purgee Brook Rd and Bohmer Rd on its way back to gate 12. Several stream crossings of intermittent streams will be necessary, stream crossing of perennial streams will be limited to the existing roads and Purgee Brook itself will not be crossed beyond established road crossings.



Forest Access Engineering

Gravel needed: Yes

Landing work needed: No

Culverts needed: No

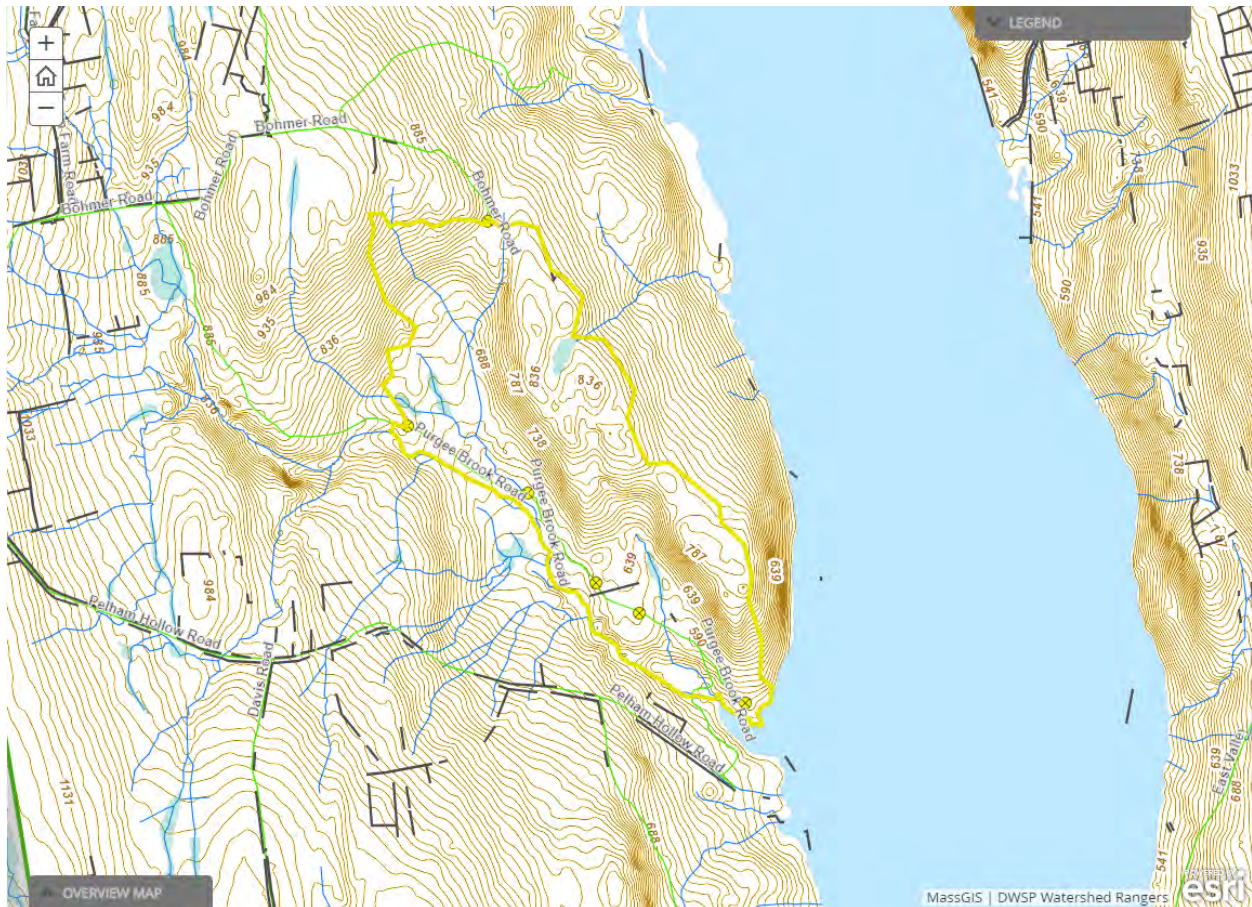
Work needed on permanent bridges: No

Beaver issue: No

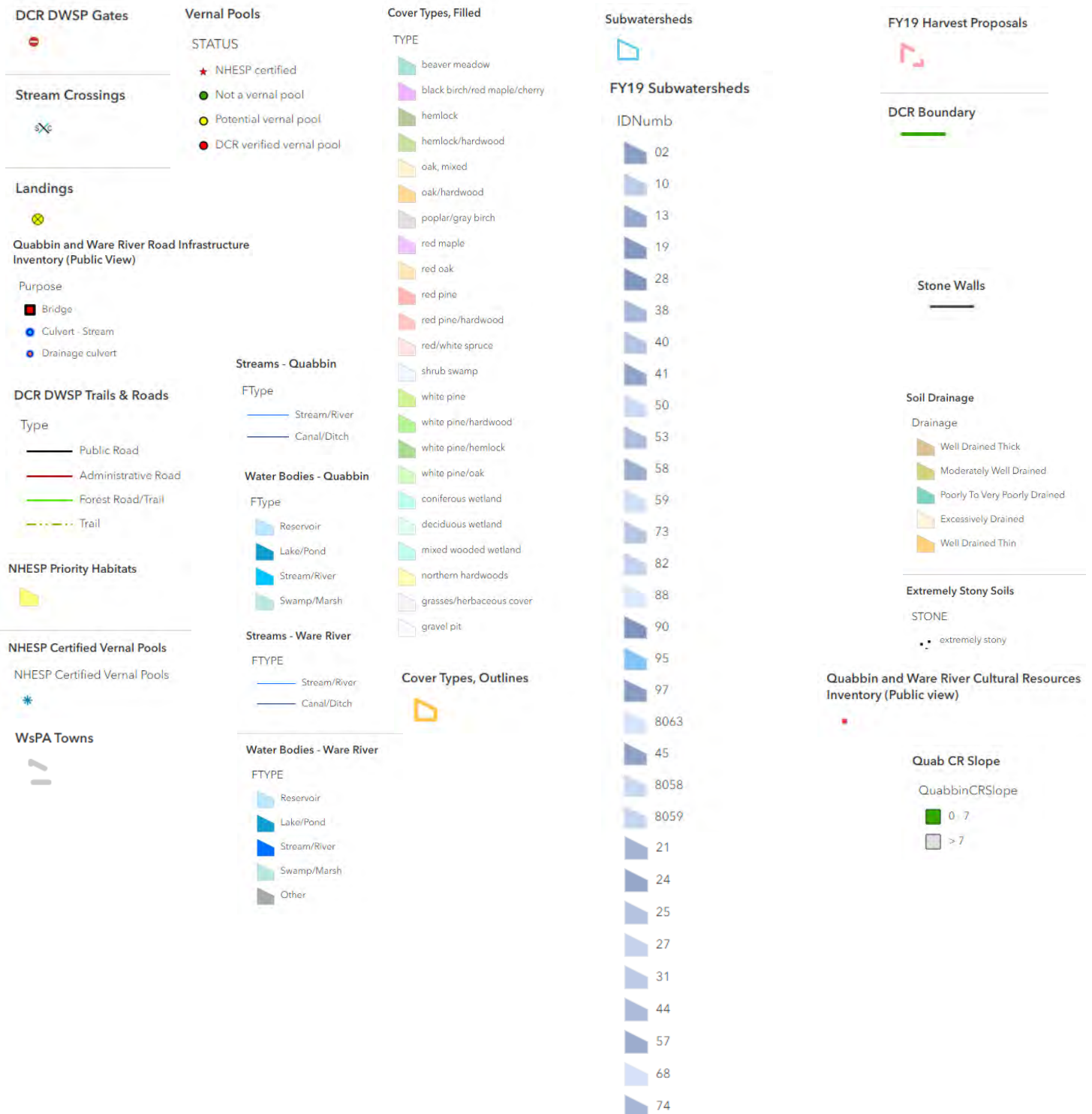
Further comment on access needs:

Bohmer Rd (Gate 12 Rd) past intersection 12-3 is badly rutted/washed and the northern end of the lot is currently inaccessible. This road would provide access to existing landings from lot

2038. Spot gravel and drainage work is needed along Purgee Brook road to prevent similar damage.



DWSP FY 2019 Quabbin and Ware River Forestry Proposals – Master Legend for story maps



Quabbin Harvest Proposal PE-19-15-01

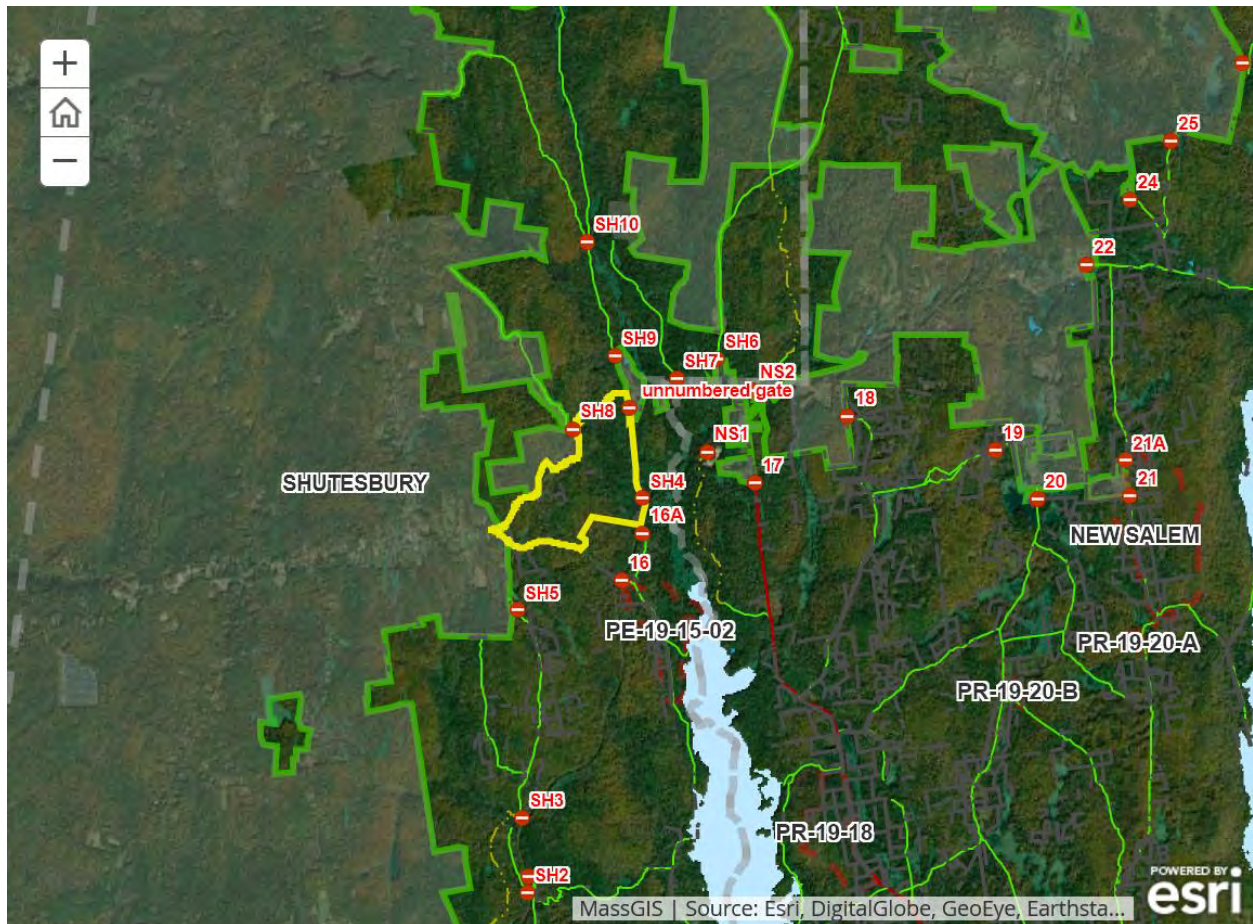
Proposal Goals

The exotic invasive insect [hemlock woolly adelgid](#) (*Adelges tsugae*) is well established in the Quabbin Reservation and is killing the eastern hemlock. As the hemlock dies often what is present in the understory is monoculture black birch or thick mountain laurel. To improve forest vigor and species diversity this proposal will treat areas of hemlock decline with poor advanced regeneration.

Proposal Location

Quabbin harvest proposal PE-19-15 is located between Prescott Rd, Cooleyville Rd, Cornwell Rd, and Daniel Shays Highway in the town of Shutesbury.

Total Acres: 213



General Description

	Overstory Type(s)	Acres
Dominant	White pine/hemlock	72
Secondary	White pine/oak	46
Other	White pine/hardwood	32

	Understory Type(s)
Dominant	Tree seedlings/saplings dominate site

Secondary	Mountain laurel prevalent
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Description of forest composition/condition:

The proposed area is defined by two prominent features, a predominant slope to the southeast, and Camel Brook traveling through the northern section. Due to a combination of difficult terrain and topography leading to a 'flashy' hydrology, crossing Camel Brook will only be done at the existing road. Therefore Camel Brook can be used to divide the proposal.

North of Camel Brook, at the bottom of the slope, the terrain is hummocky with white pine/hemlock forest and patches of isolated and connected wetlands. Past harvest of this area consists of a shelterwood prep cut in 1963 (Lot 0007, 84 ac.) a red oak salvage/thinning completed in 1983 (lot 0374, 10 ac.), and a firewood and red oak salvage completed in 1984/85 (lots 0381, 12 ac. & 0382, 20 ac.) Lots 0381 & 0382 are collocated with 0007 in the northeastern corner of the proposed area in the slope bottom next to Cornwell Rd, and lot 0374 is located in the northern tip where the slope levels off approaching the intersection of Cooleyville Rd. and Cornwell Rd. The wetness of the slope bottom is noted in an extension granted to lots 0381 & 0382 due to extensive fall/winter flooding. The white pine/hemlock cover continues upslope to the west, with a greater hardwood component on the slope north. The hemlock displays unhealthy crowns throughout and there are many pockets of dead or near dead hemlock. Under the dying hemlock black birch and mountain laurel are the dominant understory. White pine form is moderate to good quality and pockets of sapling size pine regeneration are throughout the area. Stocking ranges from ~80-130 ft² BA/ ac with the lower stocking a result of dead hemlock. Hardwood species reflect transition hardwood forest with red oak, yellow birch, and red maple the dominant overstory hardwoods.

The forest composition immediately around Camel Brook and associated input streams is white pine hemlock to hemlock. Hemlock health here is similarly poor, though fewer patches of already dead hemlock were observed. Stocking ranges from ~ 80 - 130 ft² BA / acre and black birch is the dominant species in the regeneration.

South of Camel Brook along Cornwell Rd. and Rte. 202 pole sized white pine regeneration is thick after a 2002 red pine removal (Lot 2002, 22 ac) . Upslope of the red pine harvest forest cover transitions to white pine oak/mixed hardwood and then to dominantly white pine where the slope plateaus between Cooleyville Rd and Prescott Rd. Between the top of the slope and the perennial stream there is white pine dominant cover with ~ 110 ft² BA / ac of good quality 20+" saw logs, this area was last treated with a white pine thinning in 1973 (lot 0087, 28 ac) at the top and edge of the slope and in 1983 with an oak salvage (lot 0390, 33 ac.) between Prescott and Cooleyville Rds. Past the perennial stream the cover is more mixed white/pine hardwood cover

and currently contains a lot of firewood size hardwoods. The small section north of Cooleyville Rd was part of the 2002 red pine removal and is now a mixed hardwood stand.

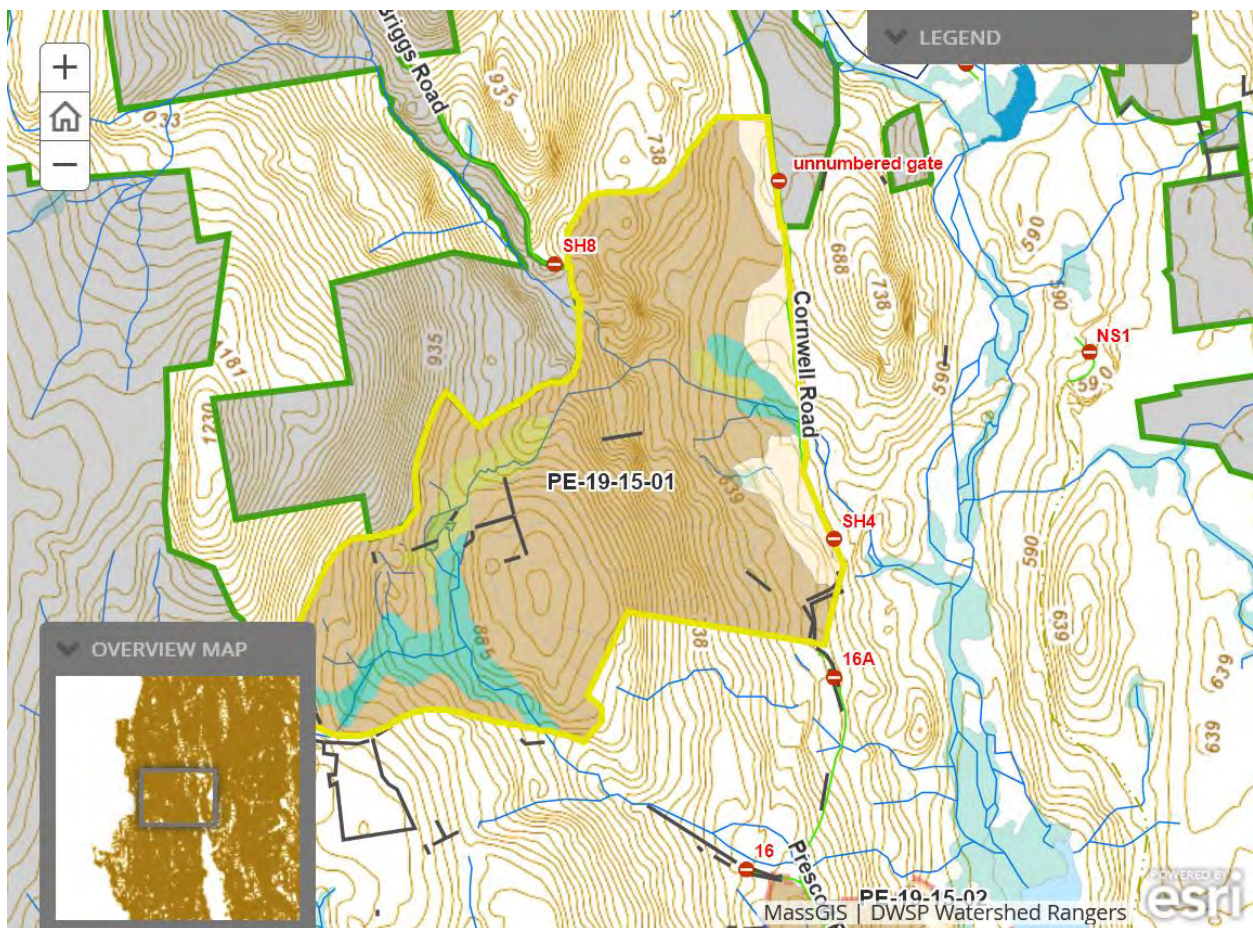


Soils

Drainage Class	%
Excessively Drained	4
Well Drained Thin	55

Well Drained Thick	27
Moderately Well Drained	14
Poorly to Very Poorly Drained	0

Soils are primarily Montauk, Canton, and Scituate fine sandy loam and classified as very stony. The lot slopes west to east and is mostly well drained. The only areas of poor drainage are near the Camel Brook bridge, centered around Gate 16 Brook and a feeder intermediate stream at the south end of the lot.

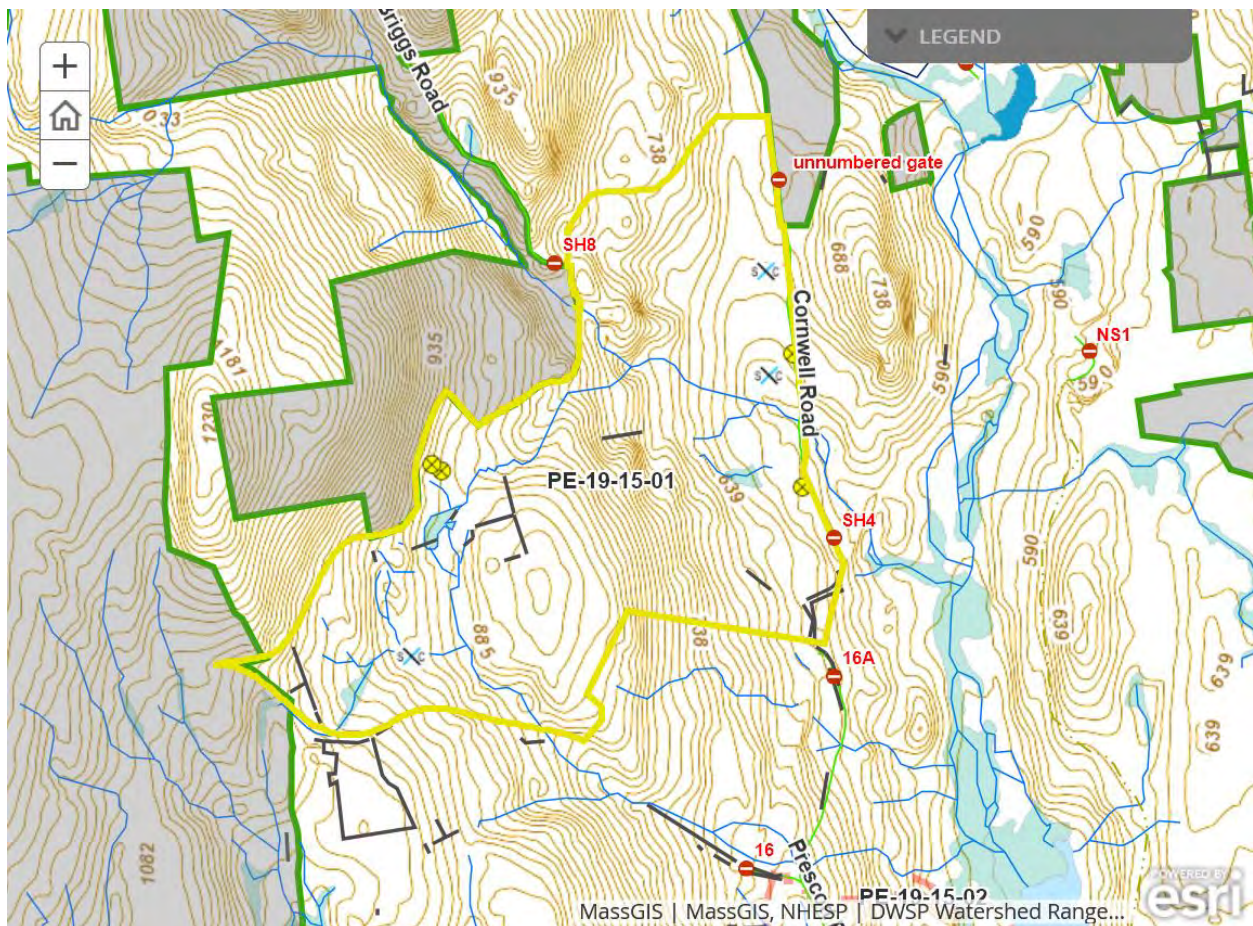


Wetlands

- Wetlands present? - **Yes**

- Streams present? - **Yes**
- Vernal pools present? - **Yes**
- Seeps present? - **Yes**
- Are stream crossings required? - **Yes**
- Are wetland crossings required? - **Yes**
- Is logging in filter strips planned? - **Yes**
- Is logging in wetlands planned? - **No**

Wetlands are primarily in the northeast end of the lot above Camel Brook. The cover is mostly hemlock with some white pine on the rises. No logging is planned in the wetlands, but crossings remain a possibility for gaining access to wood upland and to the west of the wetland to Cornwell Rd. Two DCR Quabbin potential vernal pools are present on private property across Cooleyville Rd.



Silviculture

Acres in Intermediate cuts: **20**

Acres in prep/establishment cuts: **10**

Acres in Regeneration cuts: **40**

Average regen opening size: **1**

Maximum regen opening size: **2**

Description of advance regeneration in proposal area:

In the northern hemlock and white pine stands regeneration is low density and primarily small hemlock and black birch. Moving west up the slope regeneration begins to include more northern hardwood species and some striped maple. The areas of best regeneration are in a mixed hardwood stand near the western landing on Cooleyville Rd which was cleared in 1983, and dense white pine regeneration near the main landing on Cornwell Rd cut in 1986 and revisited in 2002. There are several areas, especially near the top of the slope in the southwestern areas where mountain laurel is impeding good regeneration.

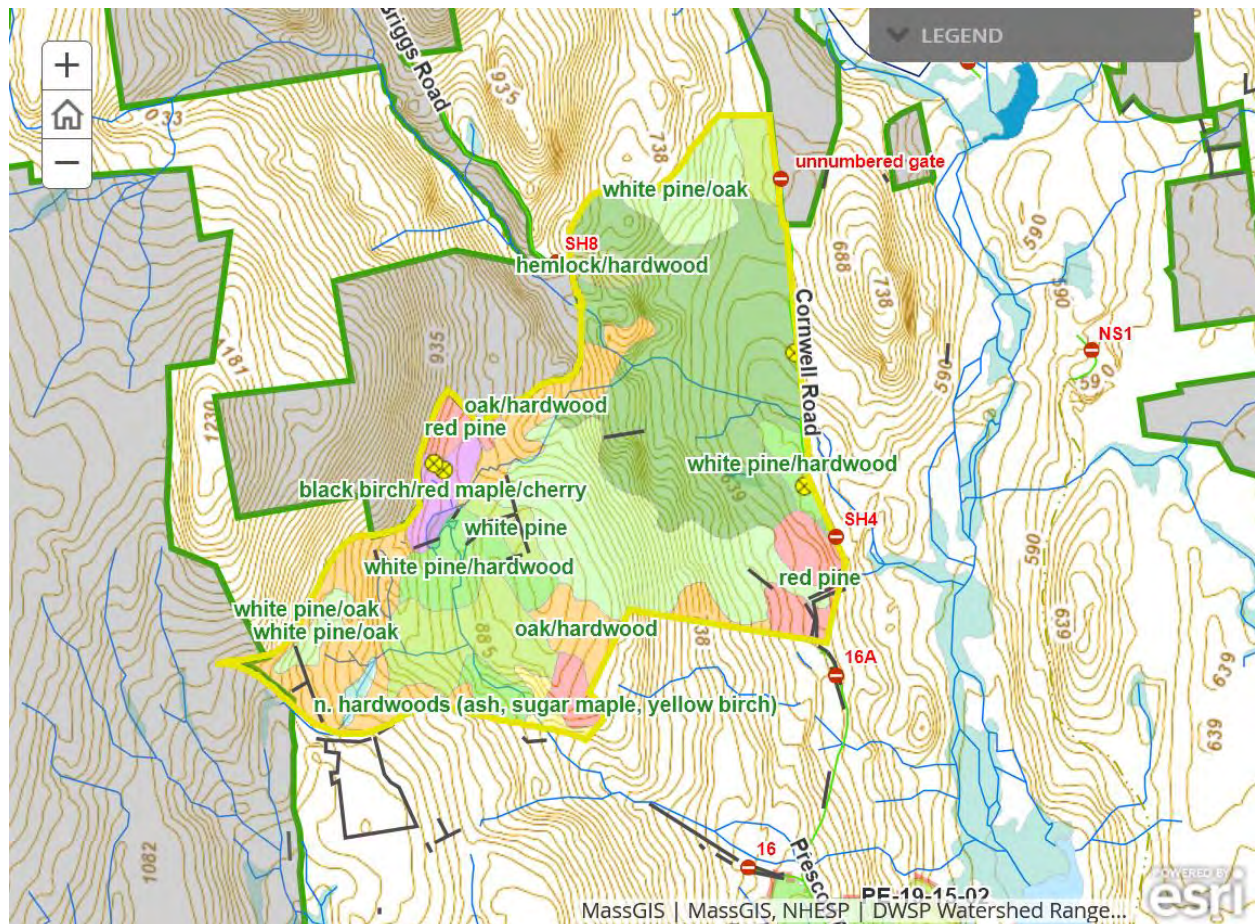
General comments on silviculture proposed:

North of Camel Brook at the bottom of the slope thinning to small openings (.25 - 1 ac) will be created targeting the poorest health hemlock and poor form white pine where operability allows. Retention will be prioritized by species diversity and health/form. Drier terrain moving up the hill may allow for larger regeneration openings collocated with intermittent oak and northern hardwood species to promote regeneration with more diversity than is currently growing.

Silviculture around Camel Brook will be predominantly thinning as filter strips and terrain limit operability.

South of Camel Brook, in the northern portion of this section where hemlock is thickest, dying hemlock will be targeted with larger openings (1-2 ac.). These larger openings will encourage shade intolerant species to establish and compete with the existing black birch regeneration and attempt to prevent black birch monoculture stands from establishing as the hemlock dies. The middle slopes will be treated with variable sized regeneration openings (0.5-2 ac.) and adjacent thinning to increase age diversity. In the south western section near the Cooleyville Rd landing in the sections with the best white pine in the proposed area, shelterwood prep cuts will be used to encourage regeneration while maintaining a multi aged structure. In the sections between the perennial stream and Cooleyville Rd that are heavy to firewood sized hardwoods, thinning will be applied to release the healthiest/best formed individuals for further growth.

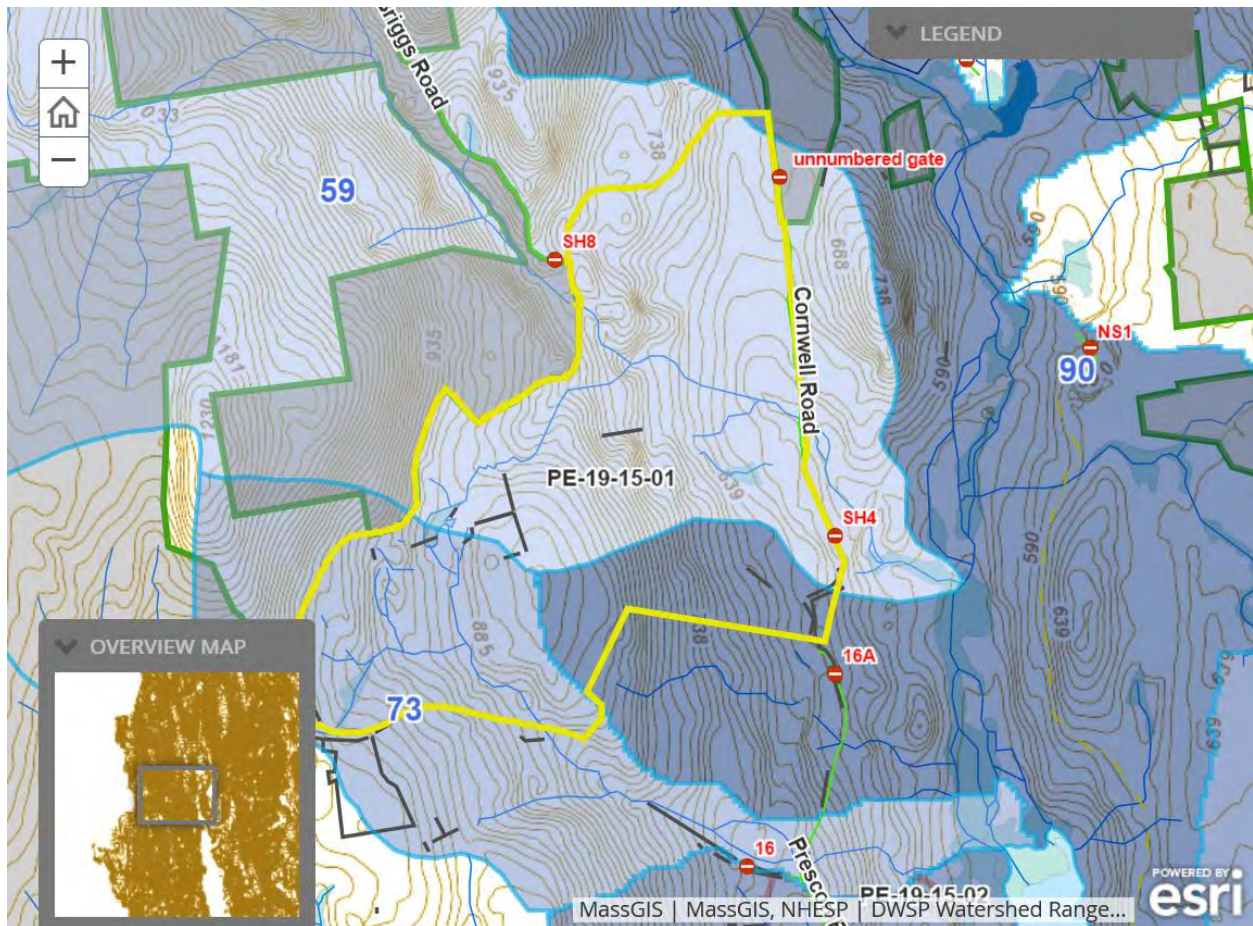
Areas of remnant red pine north of the Cornwell Rd Bridge and in the area of DCR DWSP property west of Cooleyville Rd. will be selectively cut, or included in small openings for removal before scale infestation.



Subwatershed Analysis

Sub-watershed number	Total DCR-owned Acres	Acres Regenerated on DCR Land in the last 10 years	Acres Remaining for Regenerating Up to the 25% / 10 Year	Acres part of this proposal
59	724	0	181	120
73	175	0	44	58
90	658	0	165	30

In subwatershed 73 where the area included in the proposal exceeds the DCR owned acres remaining for regeneration, the actual treated acreage will be closer to 20 total acres of combined regeneration/shelterwood/intermediate thinning treatment. The full area was included to prevent isolating a stand between Shutesbury Rd., Cooleyville Rd., and treated acreage which would have made future treatment more difficult.



Harvesting Limitations

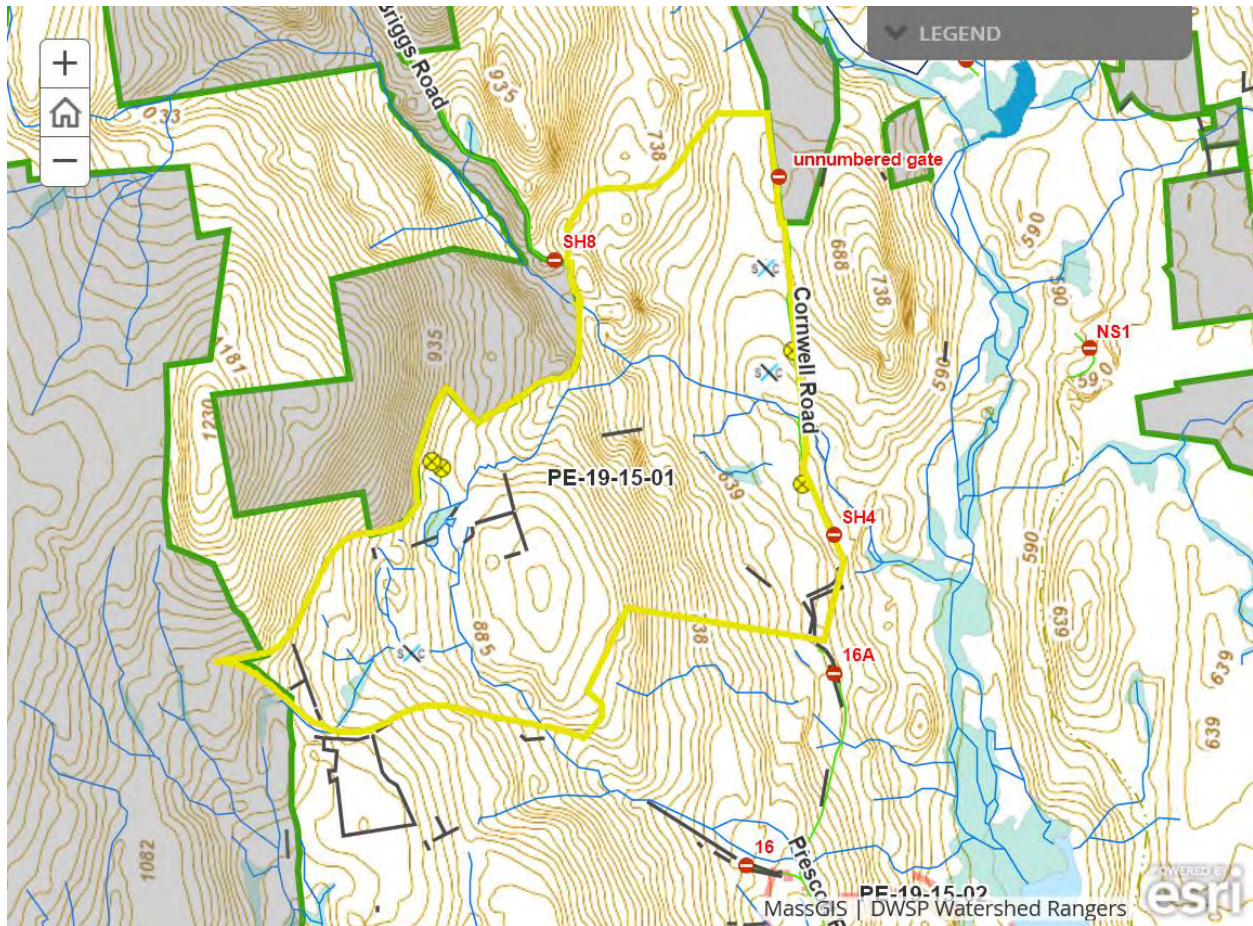
Forwarder required: **Yes**

Feller/processor required: **No**

Steep slopes present: **No**

Comments on harvesting limitations:

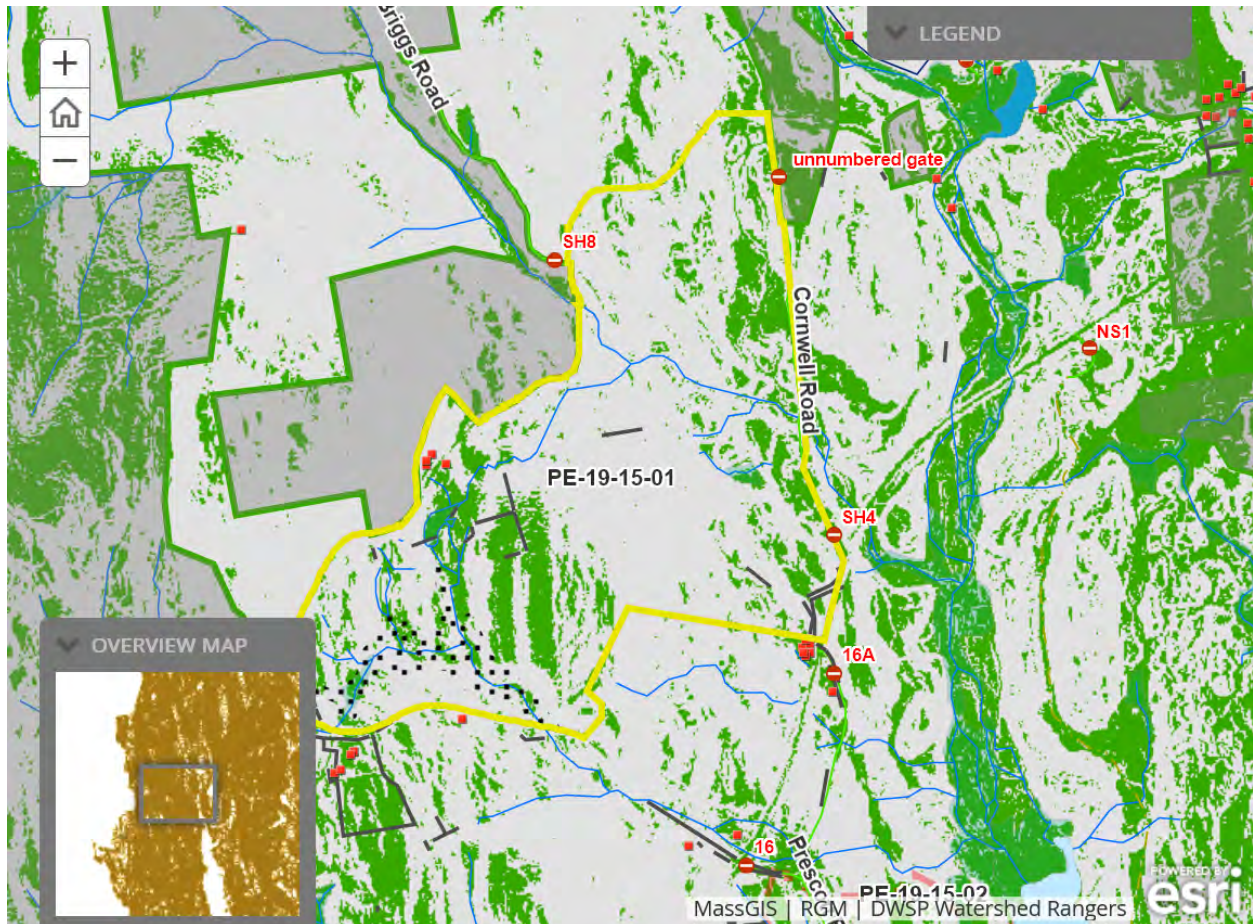
Wood harvested in the northern section will be forwarded across the bridge over Camel Brook on Cornwell Rd.



Cultural Resources

Comments on Cultural Resources:

The proposed area includes foundations for the residence, barn, and outbuilding for Daniel Murowsky (15.02). Stone walls are present near 202 and on the top of the slope near Cooleyville Rd. Existing barways will be used where feasible and harvest layout will protect walls as much as possible. If applicable DWSP will follow any additional recommendations from DCR's Archeologist regarding protection of sensitive sites.



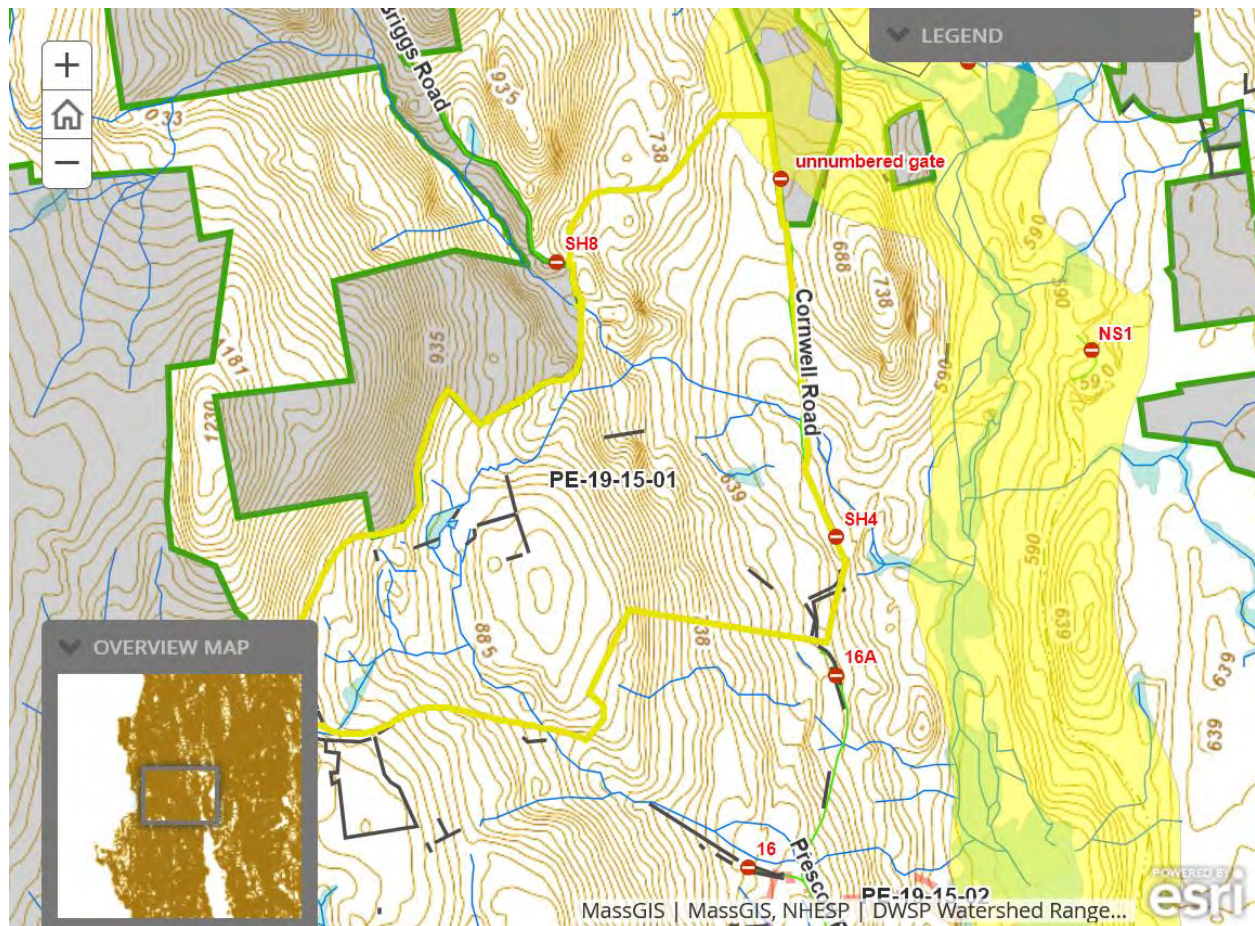
Wildlife Resources & Rare and Endangered Species

General wildlife comments:

There is considerable deer and moose sign within the proposed area.

Comments on Rare Species/Habitats:

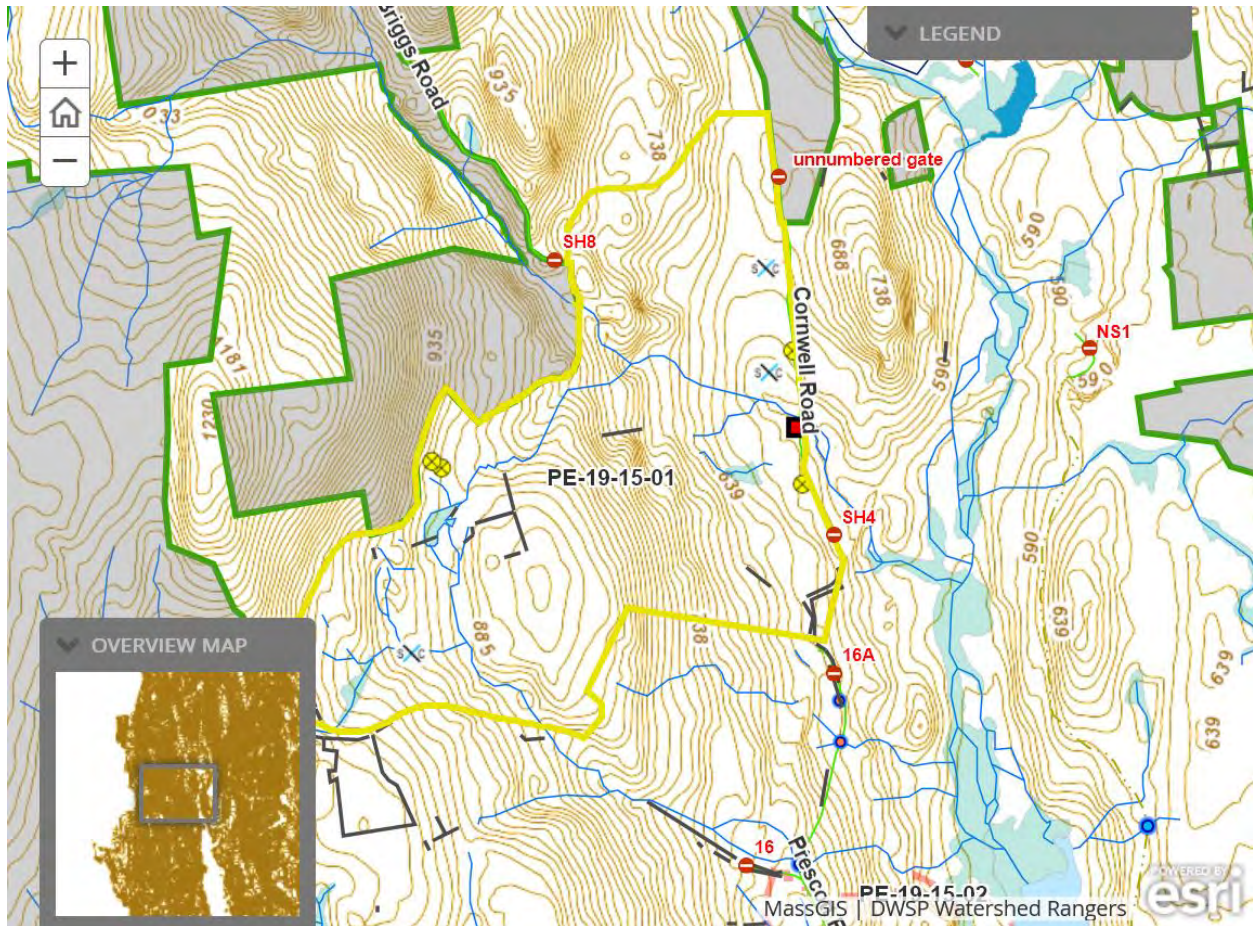
Cavity trees and potential/existing nest trees will be retained if possible. NHESP has determined that certain state-listed sensitive species or habitats may exist within the northern section of the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed harvest. Two DCR Quabbin Potential vernal pools are present on private property across Cooleyville Rd.



Environmental Quality Engineering

Comments on EQ Issues:

The proposed area contains sections north and south of Camel Brook. Equipment and wood harvested north of Camel Brook will be either landed north of or forwarded/short hauled across the Cornwell Road bridge. There will not be any temporary crossings established on Camel Brook. Crossing on Gate 16 Brook will be avoided unless there is not a suitable crossing of the intermittent stream west of the brook.



Forest Access Engineering

Gravel needed: No

Landing work needed: No

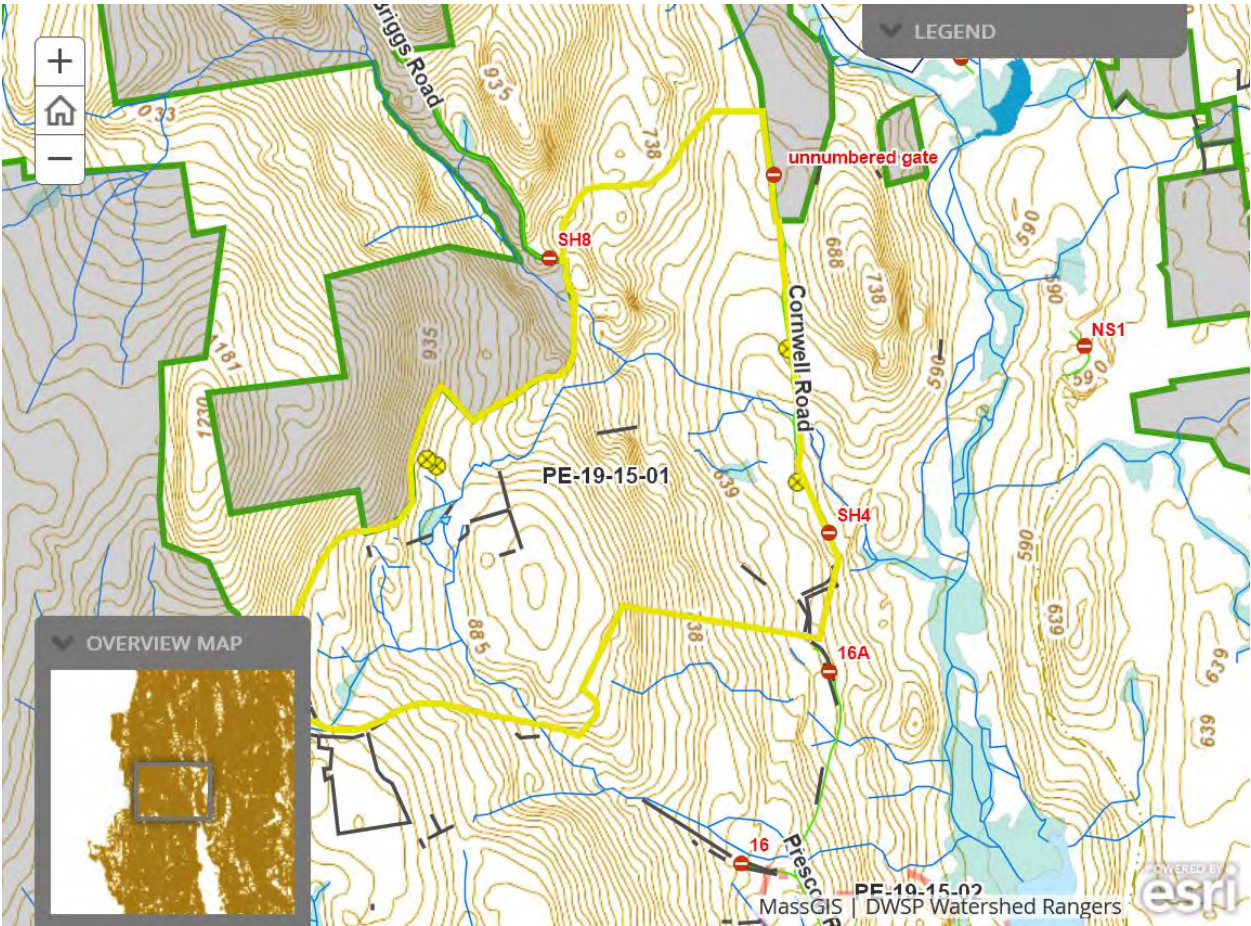
Culverts needed: No

Work needed on permanent bridges: Yes

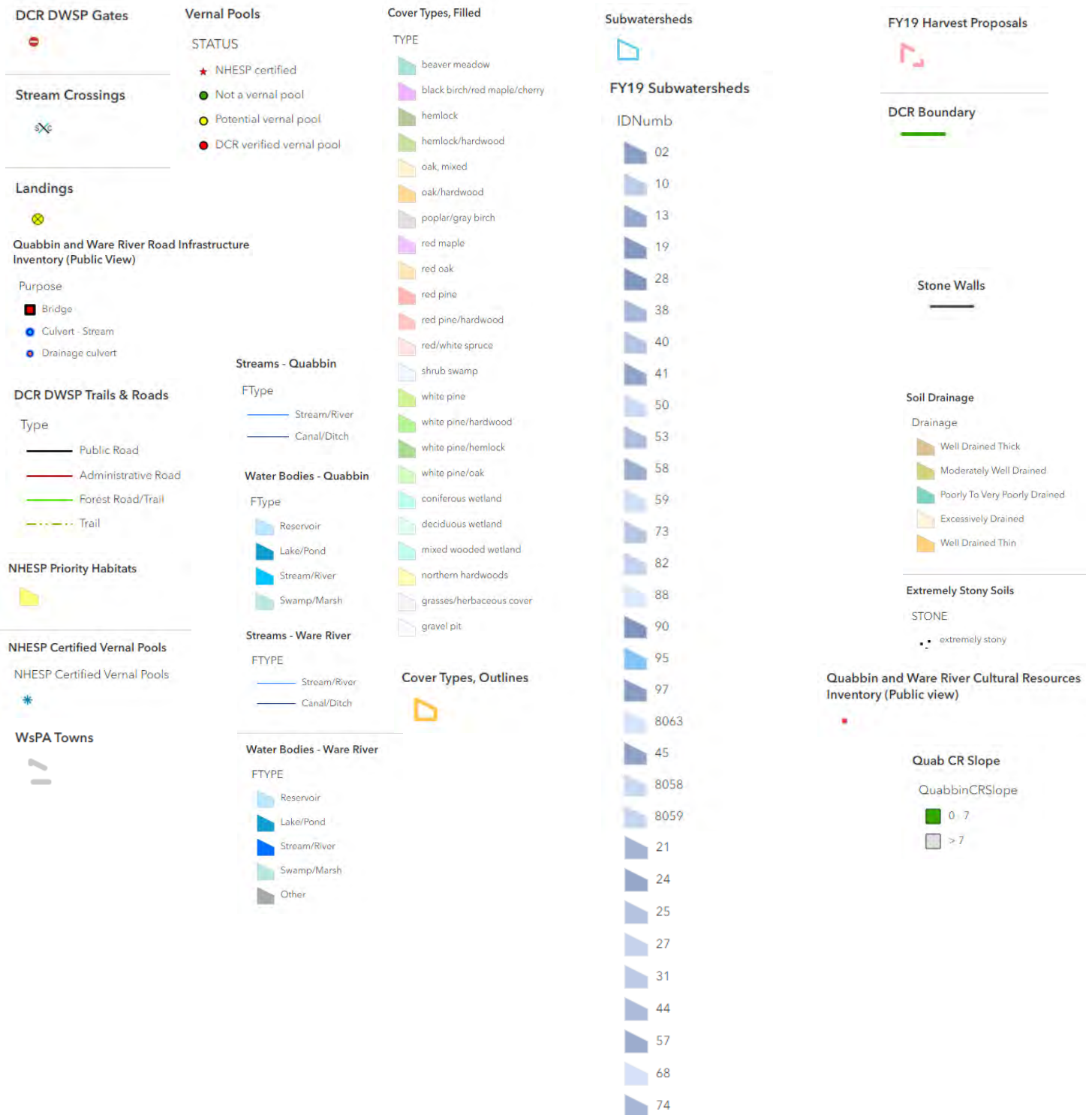
Beaver issue: No

Further comment on access needs:

New material is needed for both approaches to the new bridge on Cornwell Rd.



DWSP FY 2019 Quabbin and Ware River Forestry Proposals – Master Legend for story maps



Quabbin Harvest Proposal PE-19-15-02

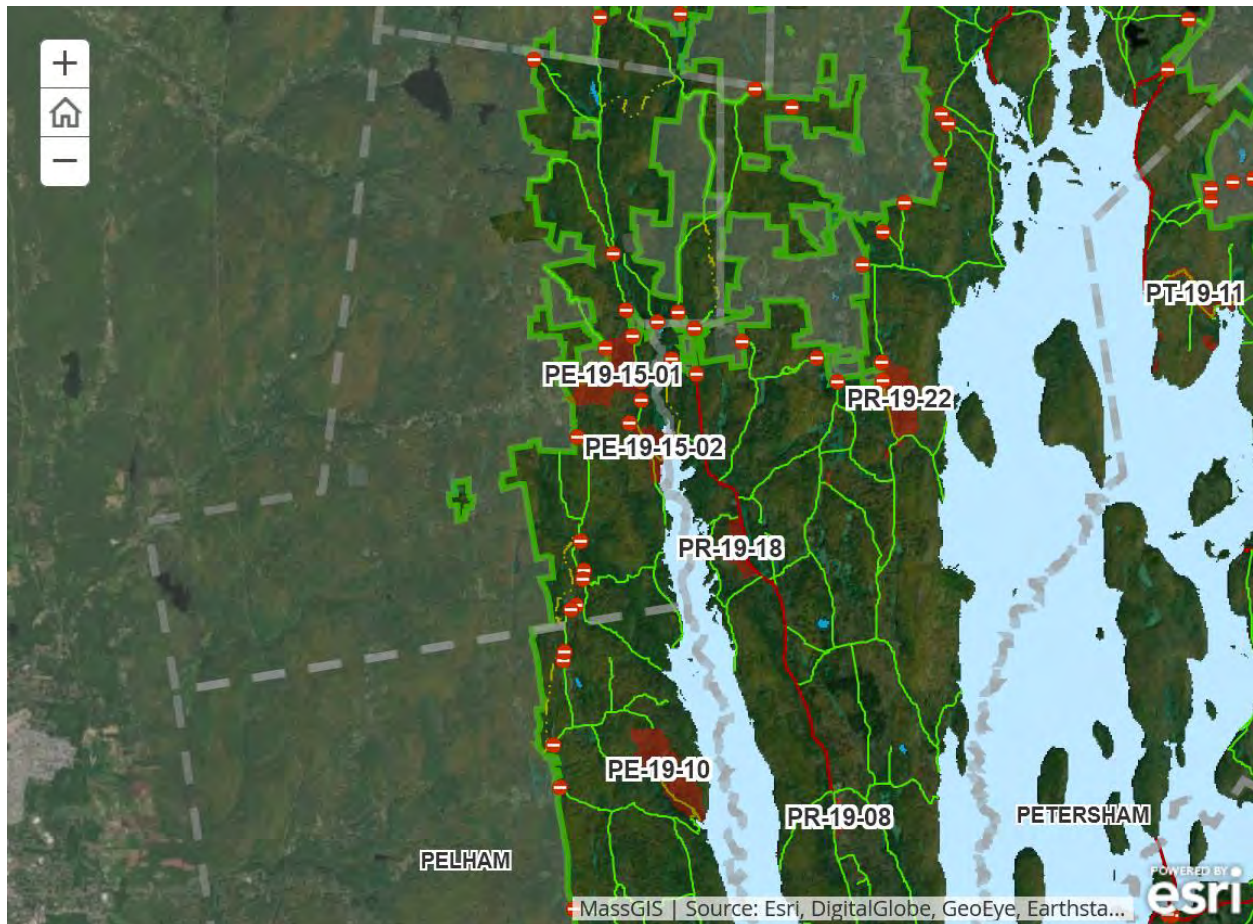
Proposal Goals

This proposal entails forest management work that will be performed as part of a larger water supply protection project. Road work is needed to improve access to the spill control equipment shed for the West Branch of the Swift River necessitating and providing an opportunity for forest management in the area.

Proposal Location

Located inside DCR gate 16A along Enfield Rd. the proposal is focused around the spill control shed road, with some area further north and south along the Enfield road.

Total Acres: 84



General Description

	Overstory Type(s)	Acres
Dominant	White pine/hardwood	56
Secondary	White pine	27

	Understory Type(s)
Dominant	Tree seedlings/saplings dominate site

Description of forest composition/condition:

The proposed lot was recently treated in 2009 with small group openings up to 0.5 acre (lot 2035), leading the white pine/hardwood cover to be more of a mixed hardwood stand. Scattered throughout is remnant white pine of varying quality and susceptibility to wind disturbance. There is also an approximately 4 acre patch of pole sized white pine regeneration near the proposed landing that has scattered weevil damage and has reached stem exclusion. Between the 'Y' formed by Enfield and Prescott Rds., there is some scattered remnant red pine left (remaining from harvest with lot 2035) mixed with mature white pine and scattered hardwood. Overstory hardwoods include red maple, red oak, and black birch, with some white oak, paper birch, and roadside sugar maple. On the western shore of the reservoir the cover transitions to a white pine to white pine/hemlock stand.

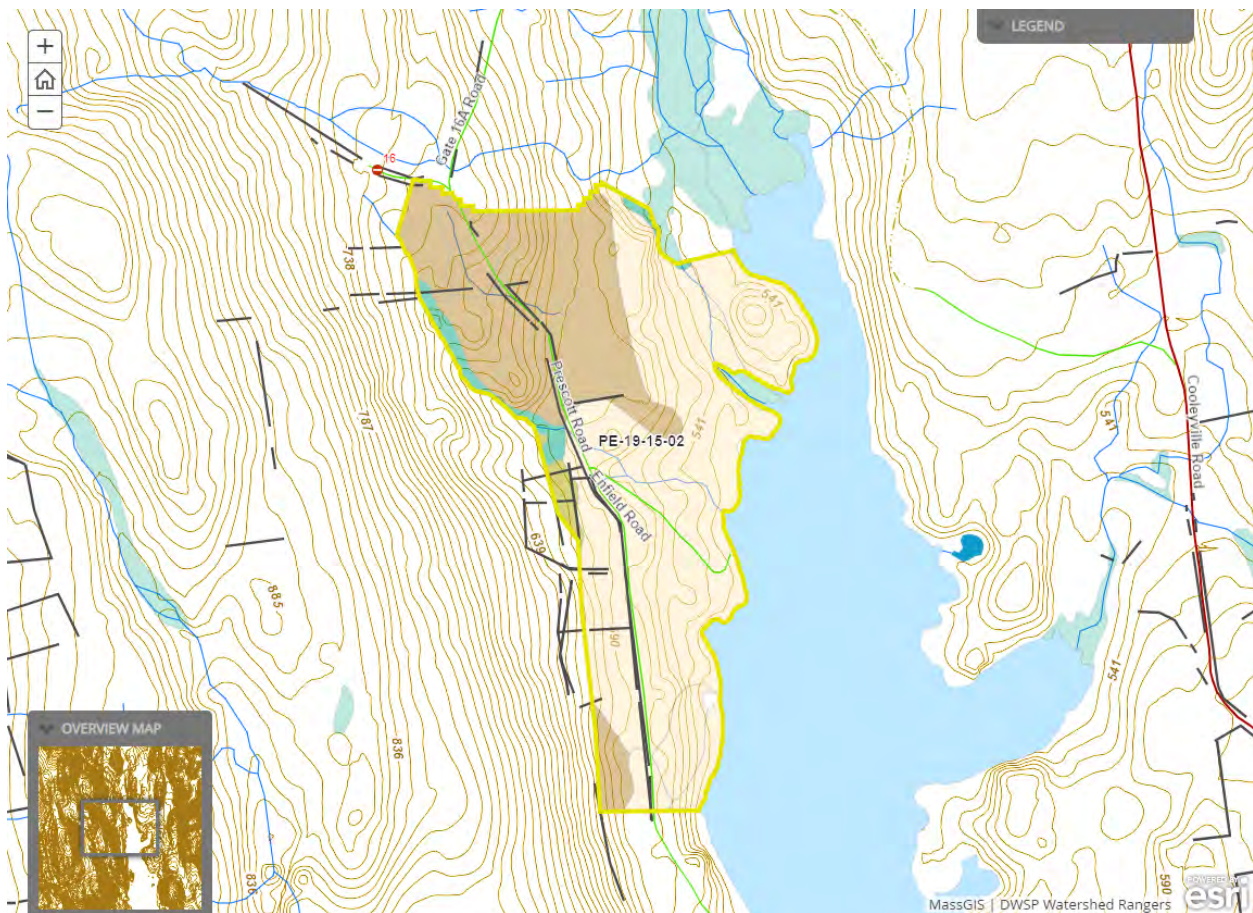


Soils

Drainage Class	%
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Excessively Drained	63
Well Drained Thin	0
Well Drained Thick	33
Moderately Well Drained	1
Poorly to Very Poorly Drained	3

Soils are primarily Hinckley sandy loam, and Canton or Chatfield canton complex loams.

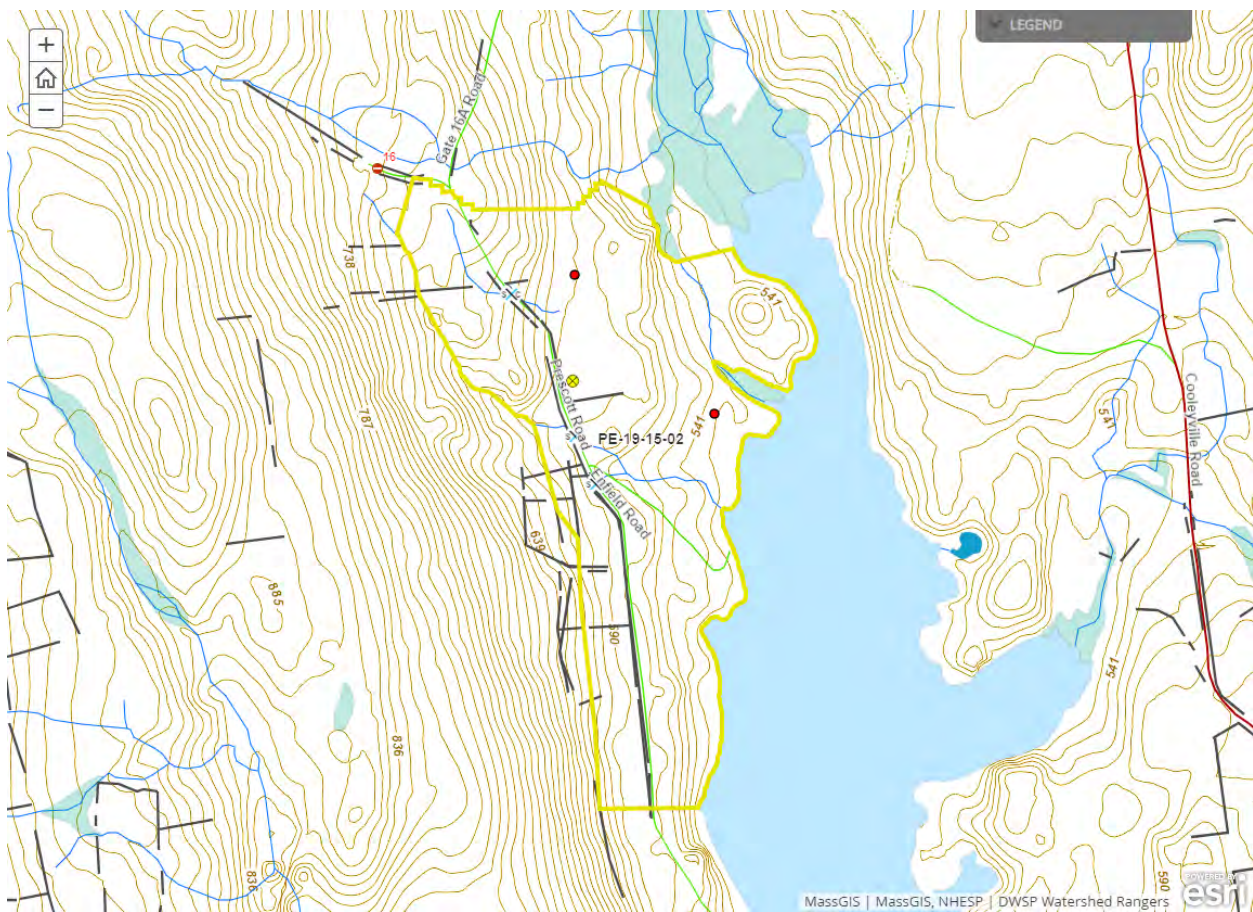


Wetlands

- Wetlands present? - **No**

- Streams present? - **Yes**
- Vernal pools present? - **Yes**
- Seeps present? - **Yes**
- Are stream crossings required? - **Yes**
- Are wetland crossings required? - **No**
- Is logging in filter strips planned? - **Yes**
- Is logging in wetlands planned? - **No**

The DCR verified vernal pools will be appropriately buffered according to DWSP policy and MA Forestry Best Management Practices. Stream crossings will be limited to existing road/culvert crossings.



Silviculture

Acres in Intermediate cuts: **20**

Acres in prep/establishment cuts: **0**

Acres in Regeneration cuts: **7**

Average regen opening size: .75

Maximum regen opening size: 2

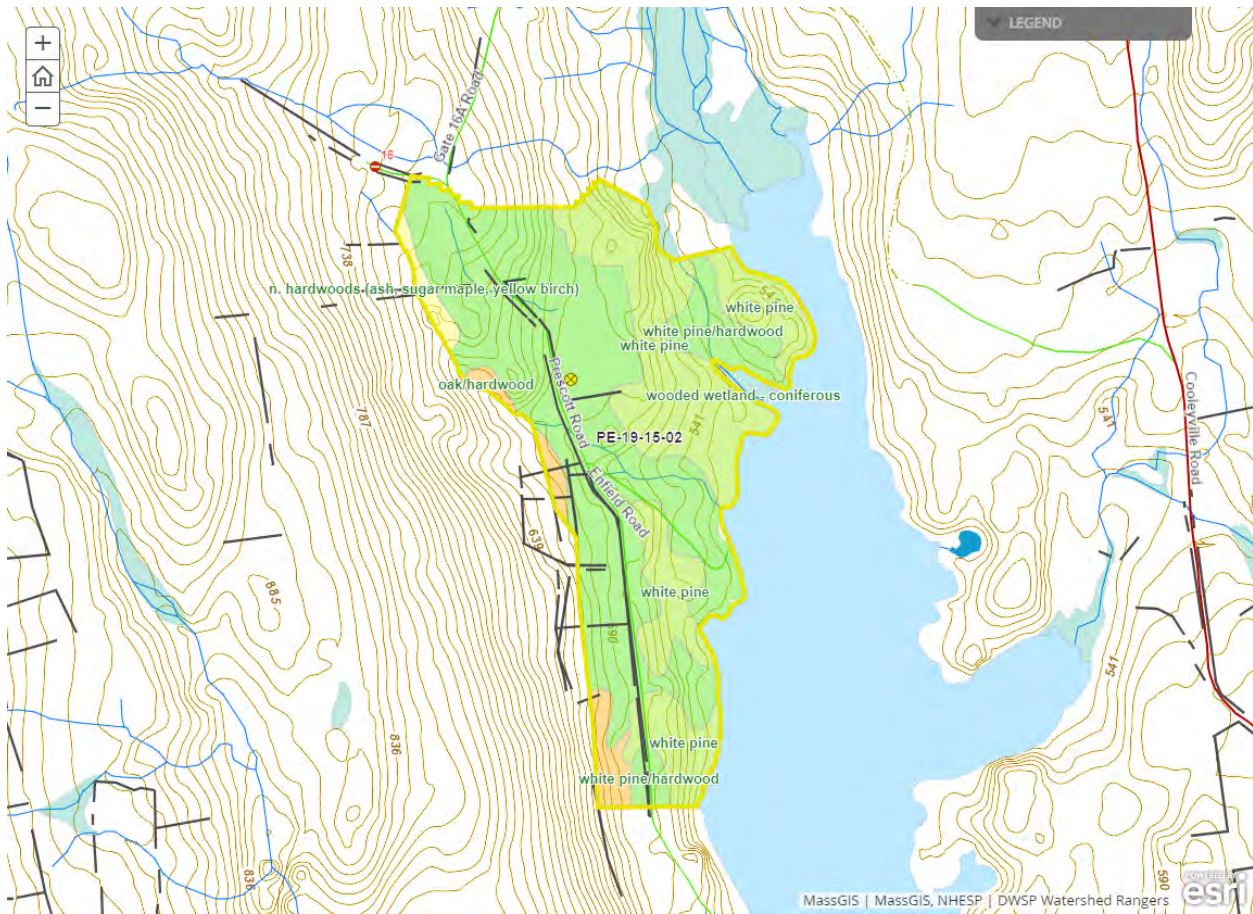
Description of advance regeneration in proposal area:

Regeneration is predominately mixed hardwood primarily composed of black birch and red maple. Adjacent to the proposed landing is an approximately 4 acre patch of dense pole size white pine regeneration. The pine has scattered weevil damage and has reached stem exclusion.

General comments on silviculture proposed:

The proposed lot encircles the spill response equipment shed for containing any spill that occurs upstream on the West Branch of the Swift River, particularly where it is crossed by State Highway 202. The road out to the spill response shed is unsuitable for spill response trucks (such as oil recovery trucks) to reach it and requires extensive work. This water supply protection project requires and allows the opportunity for further stand management. In addition to clearing some timber for the required road work, the proposed harvest will allow for some follow up management to a 2009 group selection harvest of the area (lot 2035). Harvesting will target poor form and wind susceptible white pine scattered throughout the oak hardwood cover. Care will be taken to avoid regeneration in the recently cut openings and opportunities to release openings from shading white pine will be taken. Remnant red pine will be harvested before red pine scale has an opportunity to kill the trees. Along the existing road to the spill response shed areas where the road will be rerouted will be cleared, and areas where the road is to be abandoned will be left to revegetate. Well formed white pine regeneration will be preserved and released. Any cutting adjacent to existing openings will be considered an expansion of the existing opening. The largest opening will be created near the spill response shed to allow for a tractor trailer turn around to be established. Areas that will not be left to forest regeneration near the spill response shed will be cut under the appropriate permitting for a long term change in use, and not a MA Forest Cutting Plan.

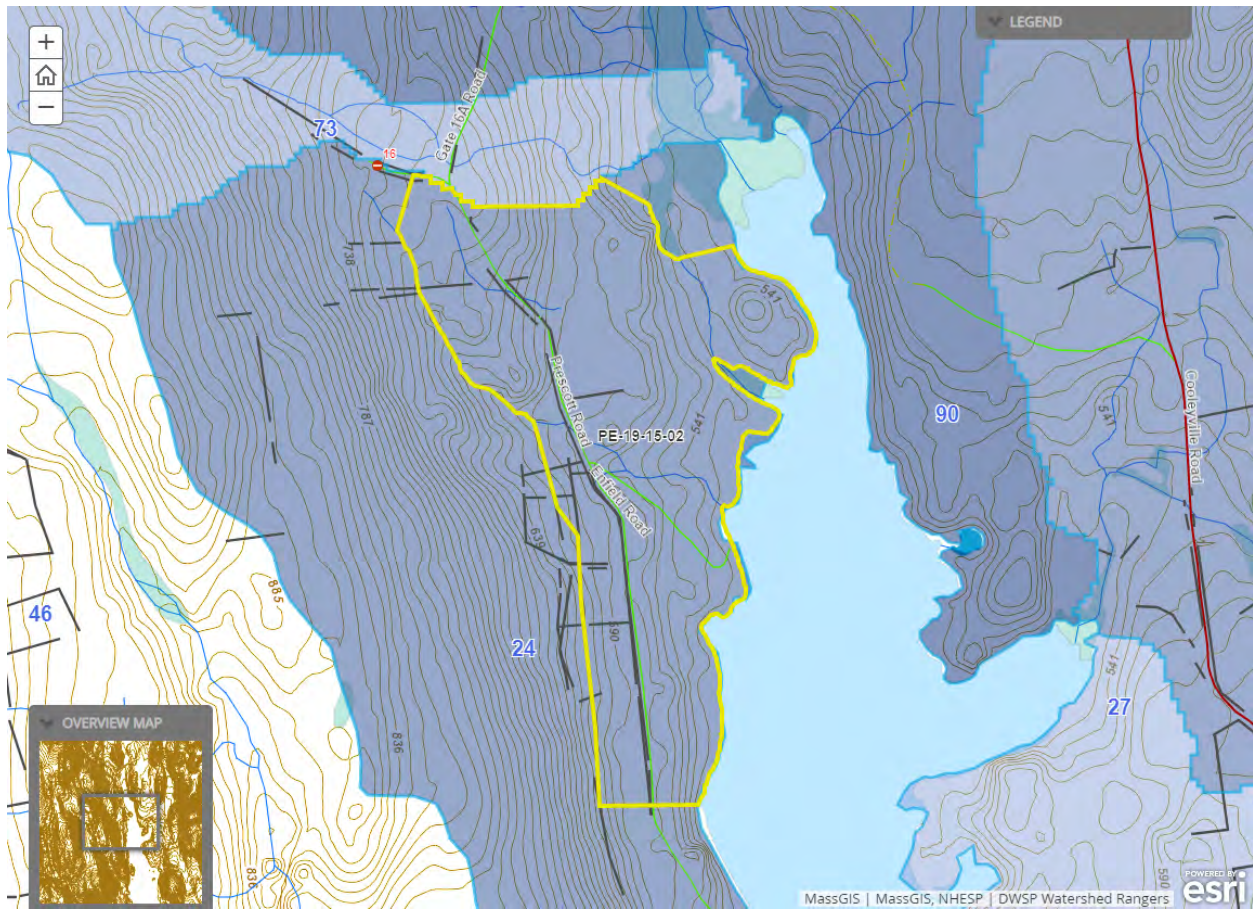
Along the road to the boom shack all stems will be cut to allow for road work, afterword along the road there should be near zero net loss of forest. The largest opening will be placed near the boom shack where space will be created and maintained to allow trucks to turn around and exit after responding to a spill.



Subwatershed Analysis

Sub-watershed number	Total DCR-owned Acres	Acres Regenerated on DCR Land in the last 10 years	Acres Remaining for Regenerating Up to the 25% / 10 Year	Acres part of this proposal
24	302.3	36.7	38.9	83

Total acreage included for consideration exceeds the acreage remaining for the 25 % / 10 year limit. However, the total acreage proposed for treatment, 27 acres, is well below the limit, and acreage treated in the last 10 years was all completed in February of 2009 and will no longer apply towards the 10 year regeneration limit as of next February.



Harvesting Limitations

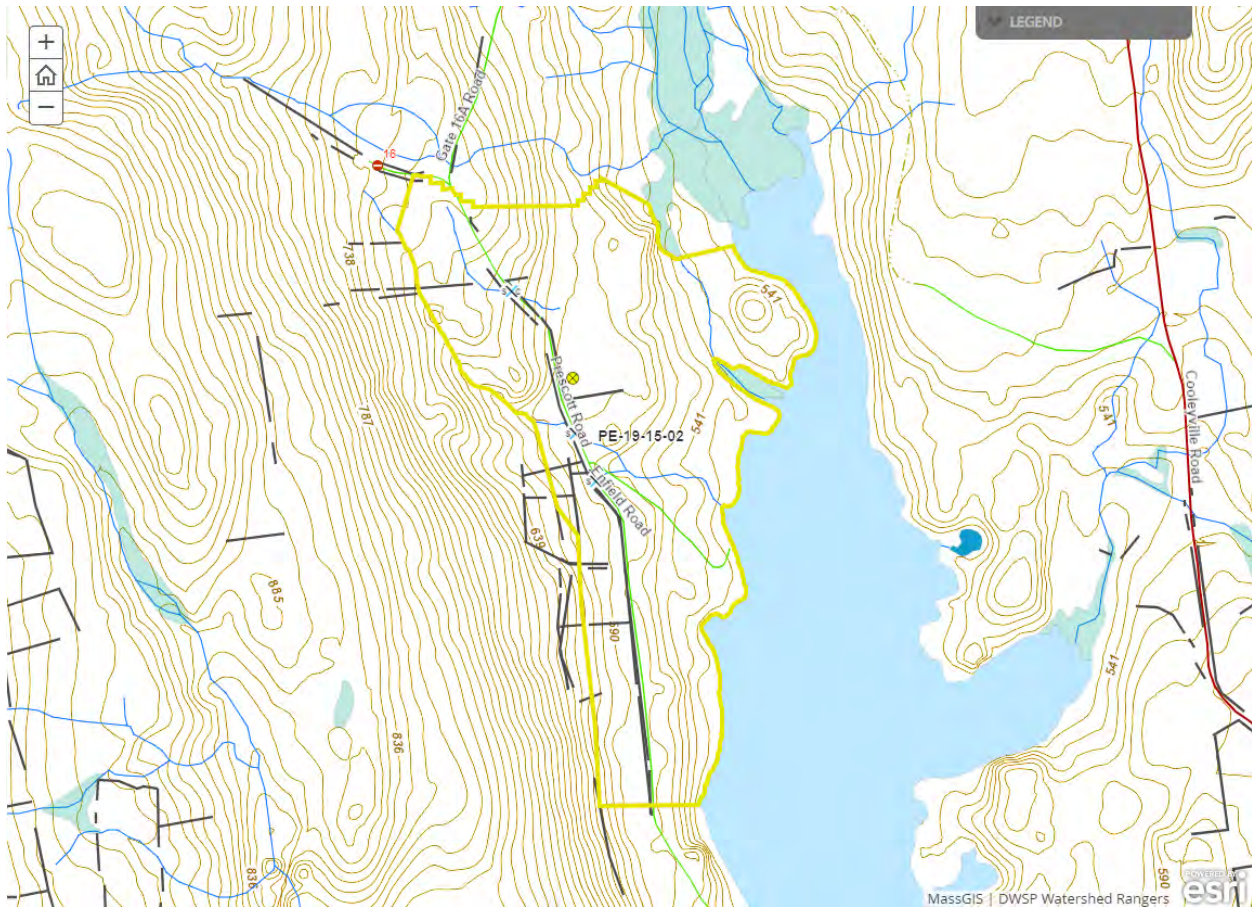
Forwarder required: **No**

Feller/processor required: **No**

Steep slopes present: **No**

Comments on harvesting limitations:

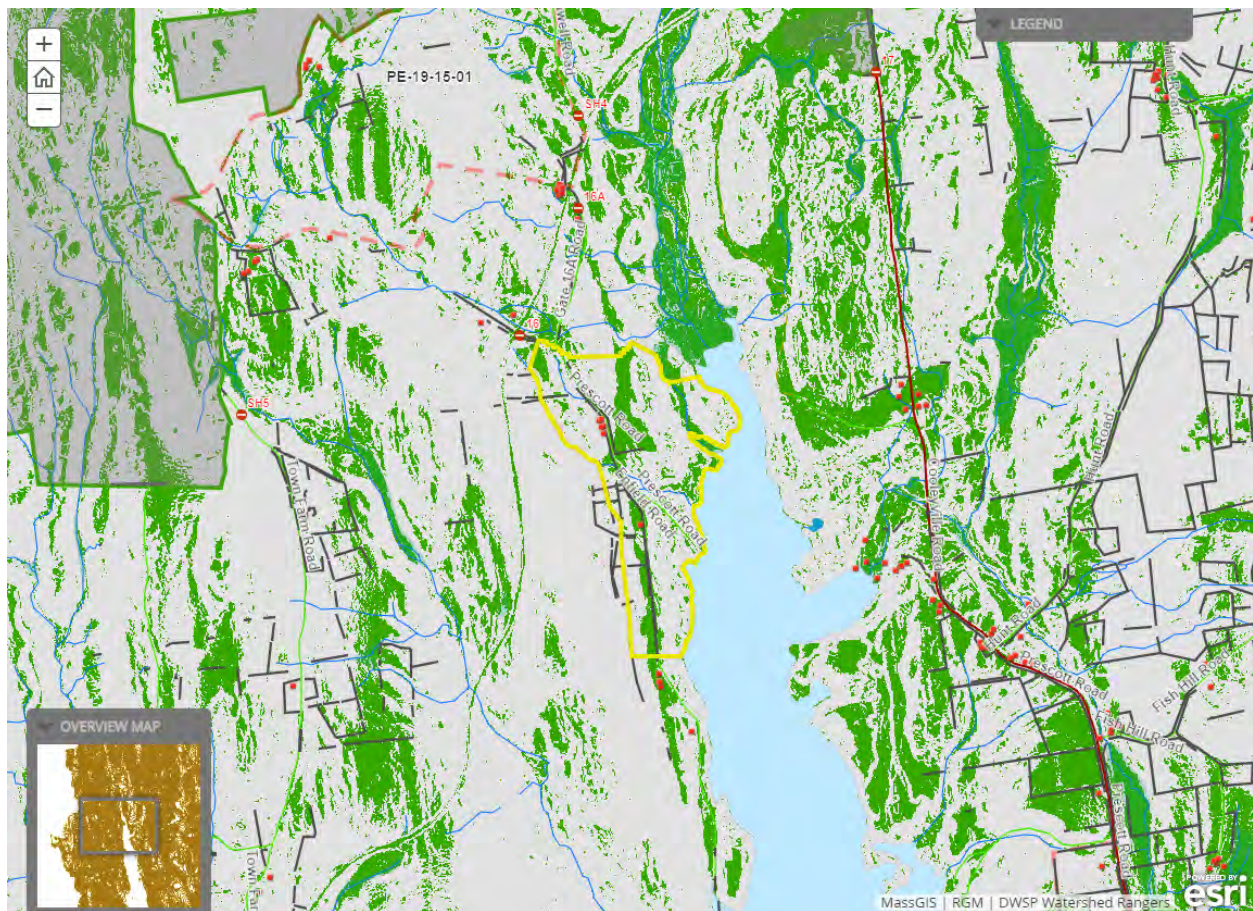
No limitations.



Cultural Resources

Comments on Cultural Resources:

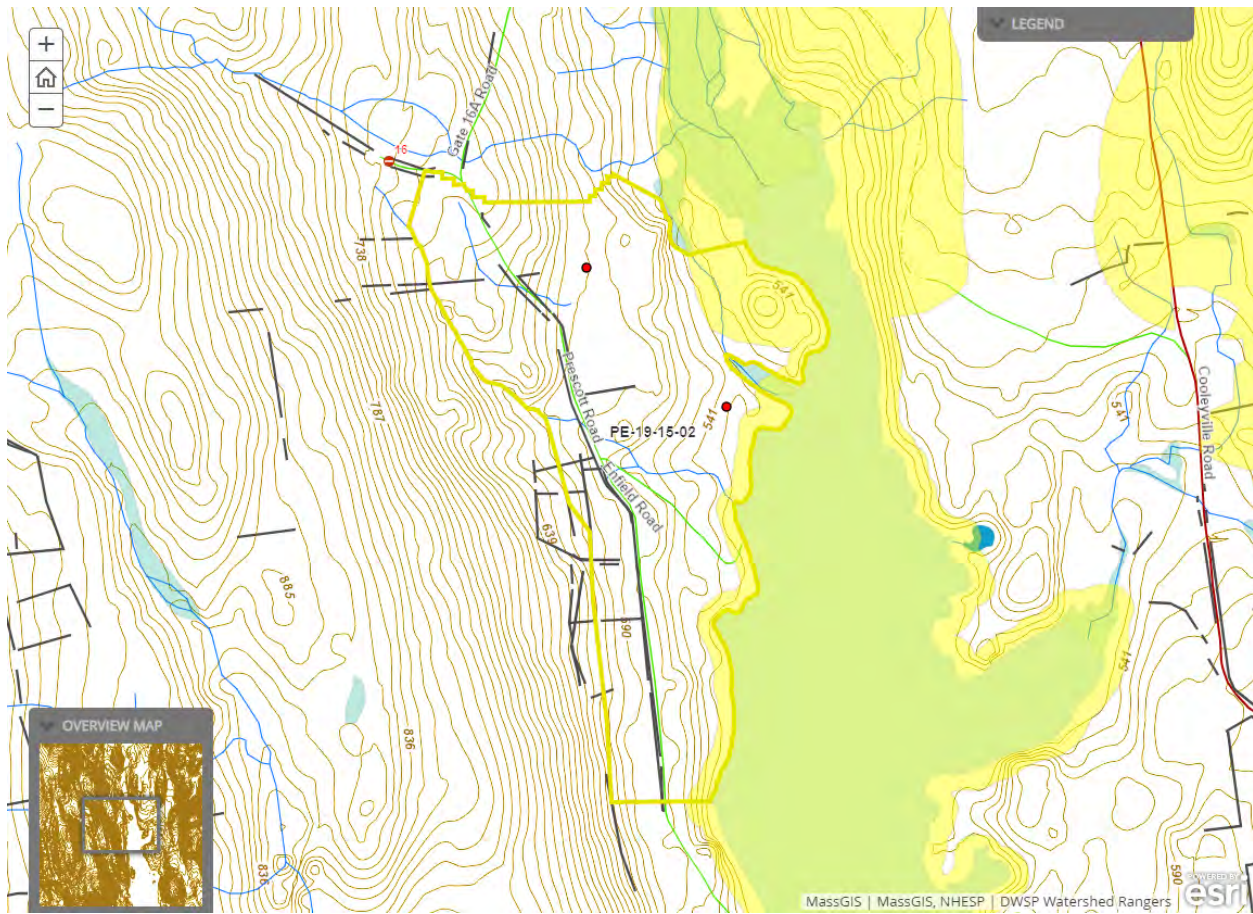
This lot contains the foundations of the homes of Orman C Marvell (14.11) and Charles Cornwell (14.1), as well as the foundations of the home, barn and outbuildings of Harry Kurwacz (4.04). All foundations located near harvest operations will be flagged and protected. Stone walls will be flagged and avoided as much as possible. Existing barways will be used where feasible and harvest layout will protect walls as much as possible. If applicable DWSP will follow any additional recommendations from DCR's Archeologist regarding protection of sensitive sites.



Wildlife Resources & Rare and Endangered Species

Comments on Rare Species/Habitats:

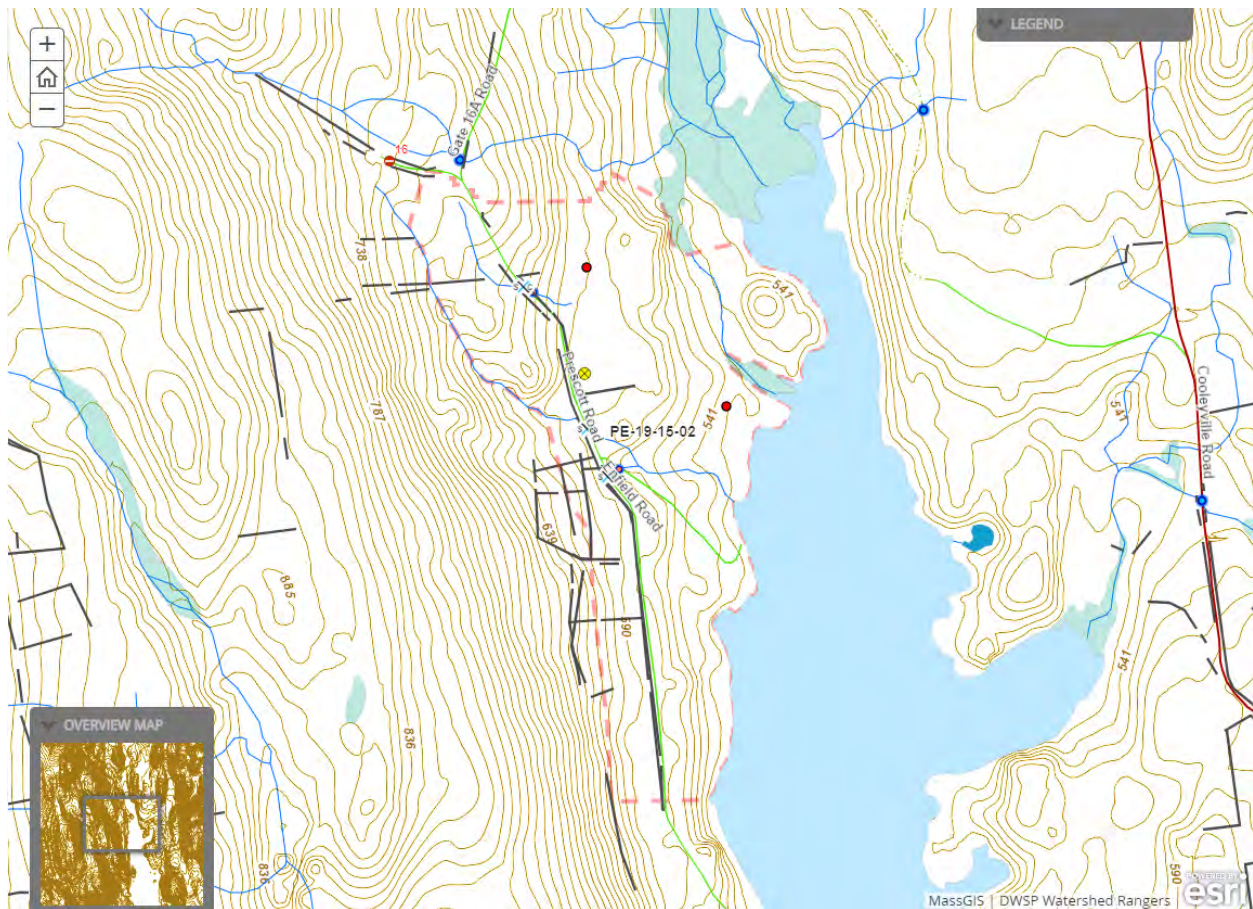
Cavity trees and potential/existing nest trees will be retained if possible. NHESP has determined that certain state-listed sensitive species or habitats may exist within the northern section of the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected species and their locations is not included in this report. DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed harvest and subsequent water supply protection project.



Environmental Quality Engineering

Comments on EQ Issues:

Stream crossings of perennial streams will be limited to existing roads and culverts.



Forest Access Engineering

Gravel needed: No

Landing work needed: No

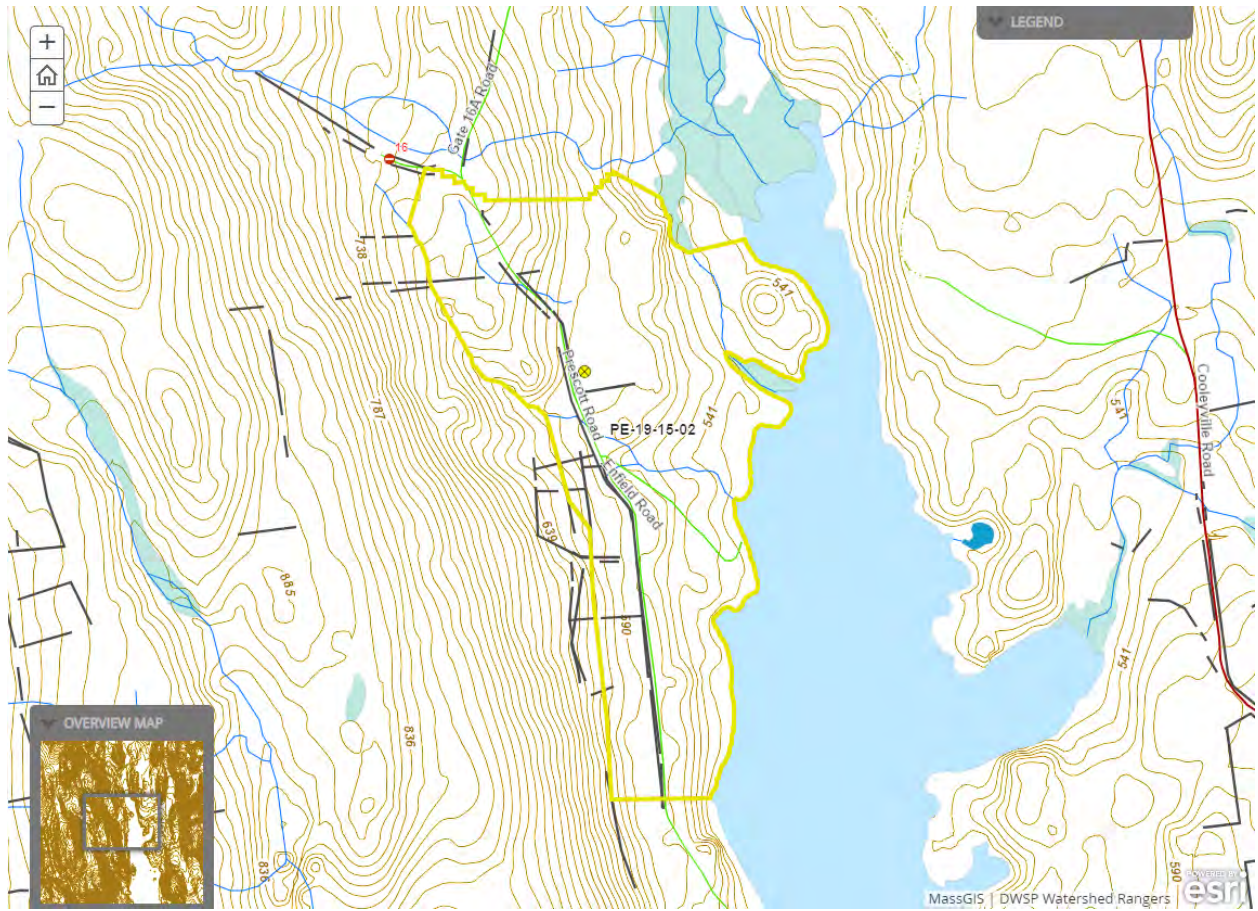
Culverts needed: No

Work needed on permanent bridges: Yes

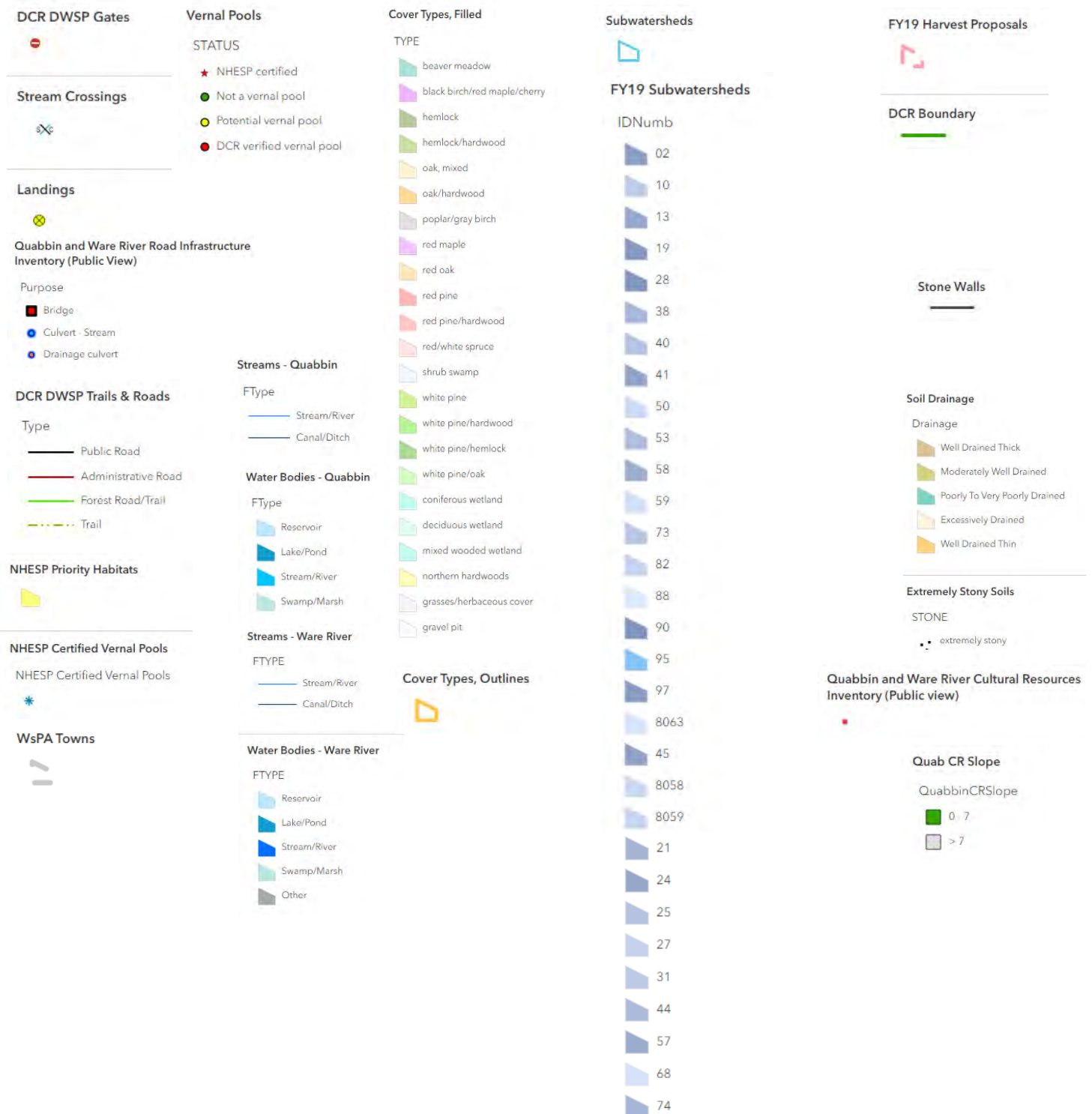
Beaver issue: No

Further comment on access needs:

No engineering work will be needed prior to the harvest.



DWSP FY 2019 Quabbin and Ware River Forestry Proposals – Master Legend for story maps



Quabbin Harvest Proposal PR-19-08

Proposal Goals

The purpose of this proposed project is to increase native forest diversity and resilience. The area is a red and white pine plantation. The preceding decade has been witness to substantial red pine mortality from both insect and disease infestation on the Quabbin watershed. Removing the surviving trees will stem mortality and hasten development of a native suite of forest regeneration.

Proposal Location

The proposal area is located on the east side of the Prescott Rd. (gate 17) south of the former UMASS observatory site.

Total Acres: 15

Previously Reviewed as PR-13-08



General Description

	Overstory Type(s)	Acres
Dominant	White pine/red pine	15

	Understory Type(s)
Dominant	Hayscented fern prevalent
Dominant	Black birch/white ash

Description of forest composition/condition:

Planted Red Pine and White Pine cover this area of the watershed. Prior to state ownership, the site was used for crops (arable) and/or improved pasture. Believing that forest cover is the best filter and conservator of water, early watershed managers were quick to reforest these open areas with a monoculture of mainly Red Pine, White Pine or a combination of the two. Most of these watershed plantations were seeded in the late 1930s through the early 1940s (CCC era).

Excepting the northern 1/3, the area, proposed in FY 13, became the first timber harvest (restart) on the Prescott Peninsula since the temporary cessation of the DWSP forestry program in July 2010. The project, executed September 2015, removed just under 50% of the total average basal area per acre (170 sq. ft.) in a random arrangement of small patches. Preceding the aforementioned harvest was a commercial thinning completed in 1991. The northern 1/3 was not part of the FY 13 proposal because the area is part of the Daniel Shays Brook subwatershed which is a component of a broad paired watershed study. Subsequently, The Shays Brook watershed has performed its function in the watershed study and is now generally available for silvicultural work.

Omitted from the 2015 harvest, the northern third has the identical composition of the southern 2/3s pre-2015 harvest; dense small and medium-size sawtimber white and red pine. Both species show health decline from Annosum Root Rot (fungus) and additionally in the case of red pine the scale insect. The understory consists of scattered patches of sapling black birch, sparse naturally regenerated white ash and sparse under planted red oak. Ground cover is mainly dense Hay Scented (typical of highly modified soils).

The southern 2/3, harvested in 2015, has an average residual basal area of 90 sq. ft. per acre that is slightly greater representation of red pine than white pine sawtimber. With an understory of the residual is black birch saplings. However, in the small patches much of the sapling black birch was cut to try and spur a greater diversity of regeneration. Most of the openings are dominated by a carpet of hay scented fern; but rubus, white ash, maple, birch, and cherry are slowly infiltrating the fern cover.

The northern half of the lot appears to have been a forest study area. Once fenced milacre plots now with sapling/pole size Black Birch along with numerous ground flags were observed.

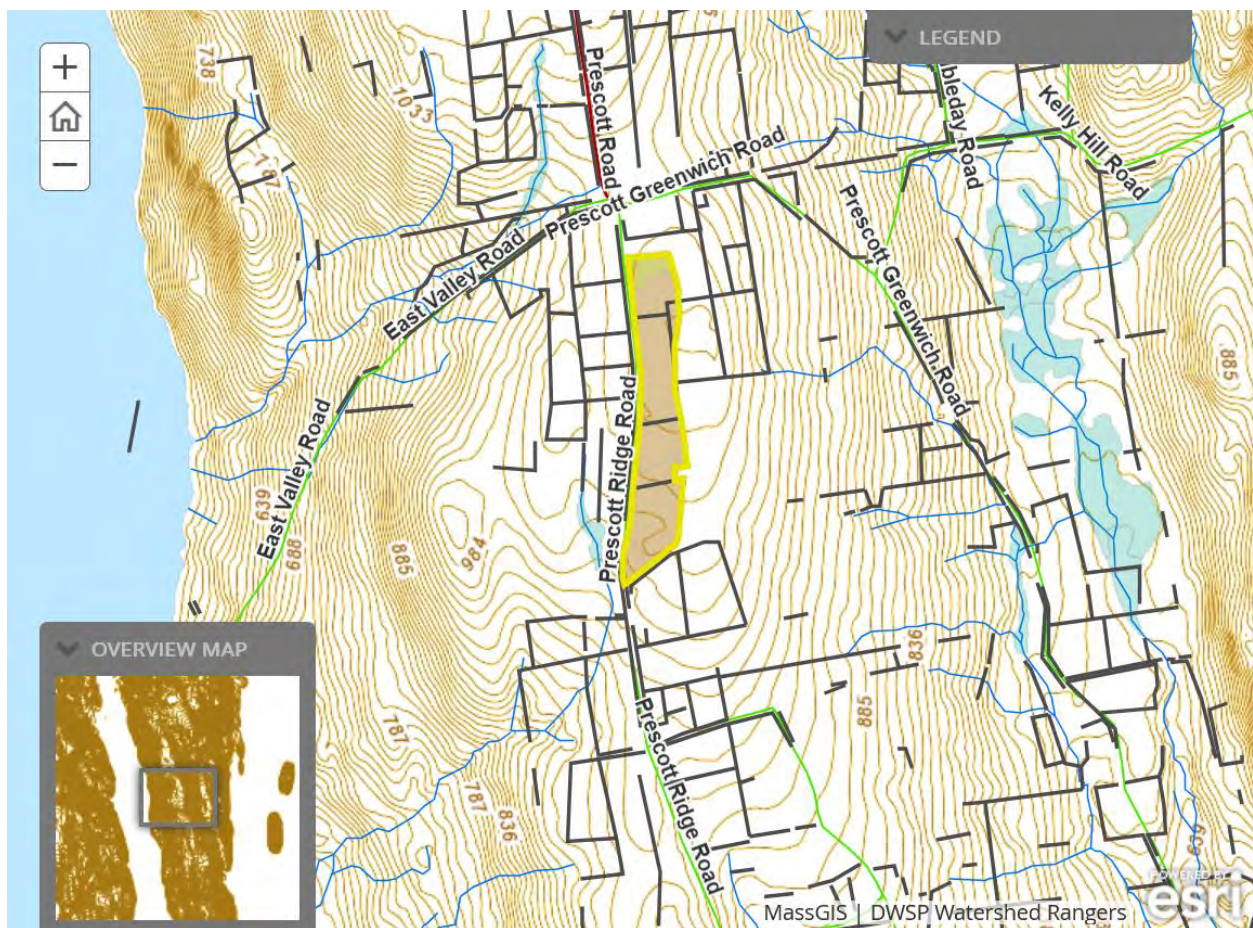


Soils

Drainage Class	%
Excessively Drained	0
Well Drained Thin	15
Well Drained Thick	85
Moderately Well Drained	0

Poorly to Very Poorly Drained	0
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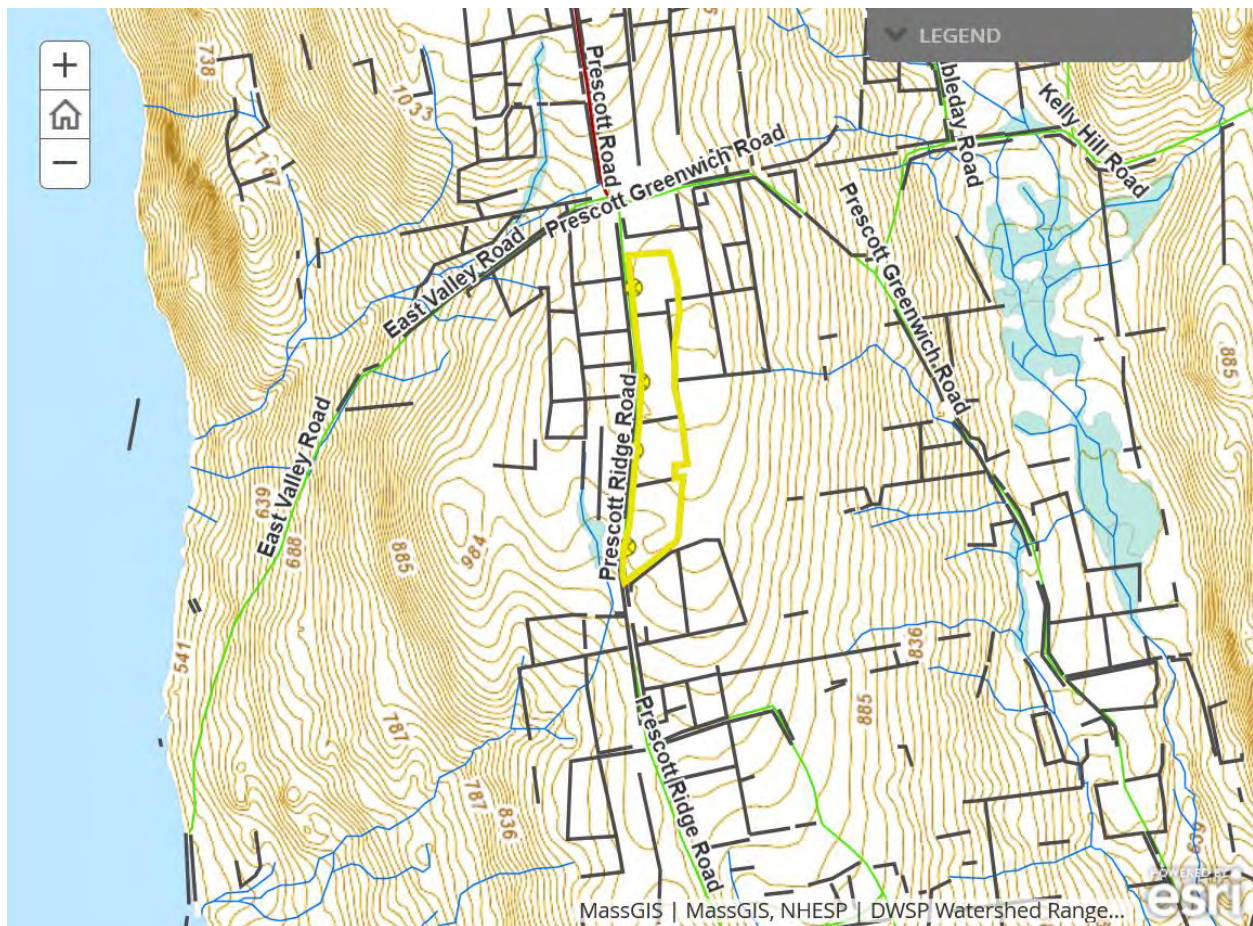
The USDA Natural Resources Conservation Service's 2012 Franklin county soil survey indicates Montauk, Henniker and Metacomet sandy loam soils cover the proposed harvest area. These soils do not pond or flood, but can exhibit a sub-surface saturation layer during the winter and spring.



Wetlands

- Wetlands present? - **No**
- Streams present? - **No**
- Vernal pools present? - **None known**
- Seeps present? - **None known**
- Are stream crossings required? - **No**
- Are wetland crossings required? - **No**

- Is logging in filter strips planned? - **No**
- Is logging in wetlands planned? - **No**



Silviculture

Acres in Intermediate cuts: **0**

Acres in prep/establishment cuts: **0**

Acres in Regeneration cuts: **15**

Average regen opening size: **0**

Maximum regen opening size: **15**

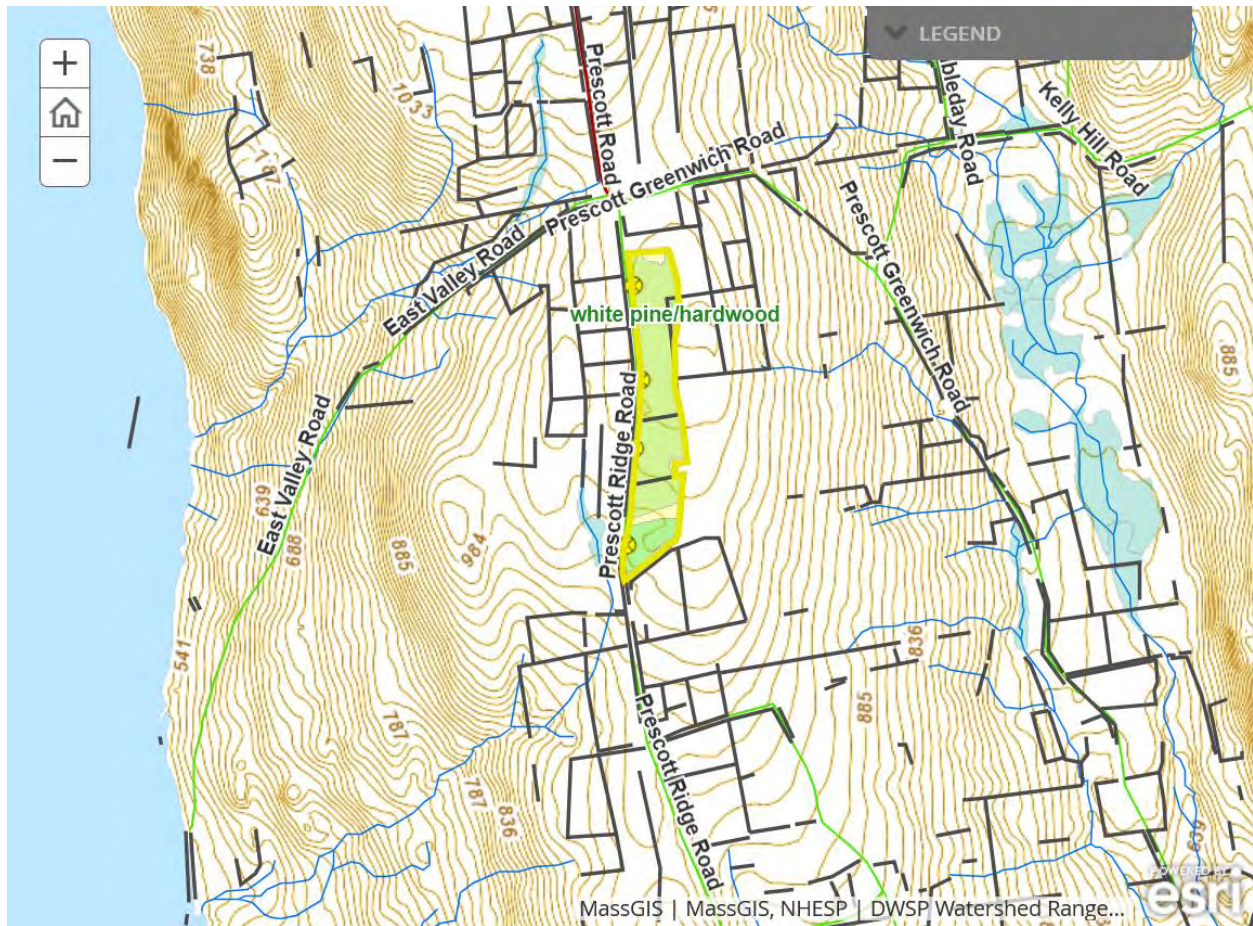
Description of advance regeneration in proposal area:

Regeneration development is severely limited due to a carpet of hay scented fern. The '91 thinning spurred sapling black birch that is growing in the residual basal area of the 2015 harvest and the uncut northern 1/3. Due to the hay scented fern, regeneration in the small openings created in 2015 is limited to scattered seedling/sapling white ash, red maple, birch and cherry. Rubus, also infiltrating the openings, should slowly breakup the dense fern ground cover.

General comments on silviculture proposed:

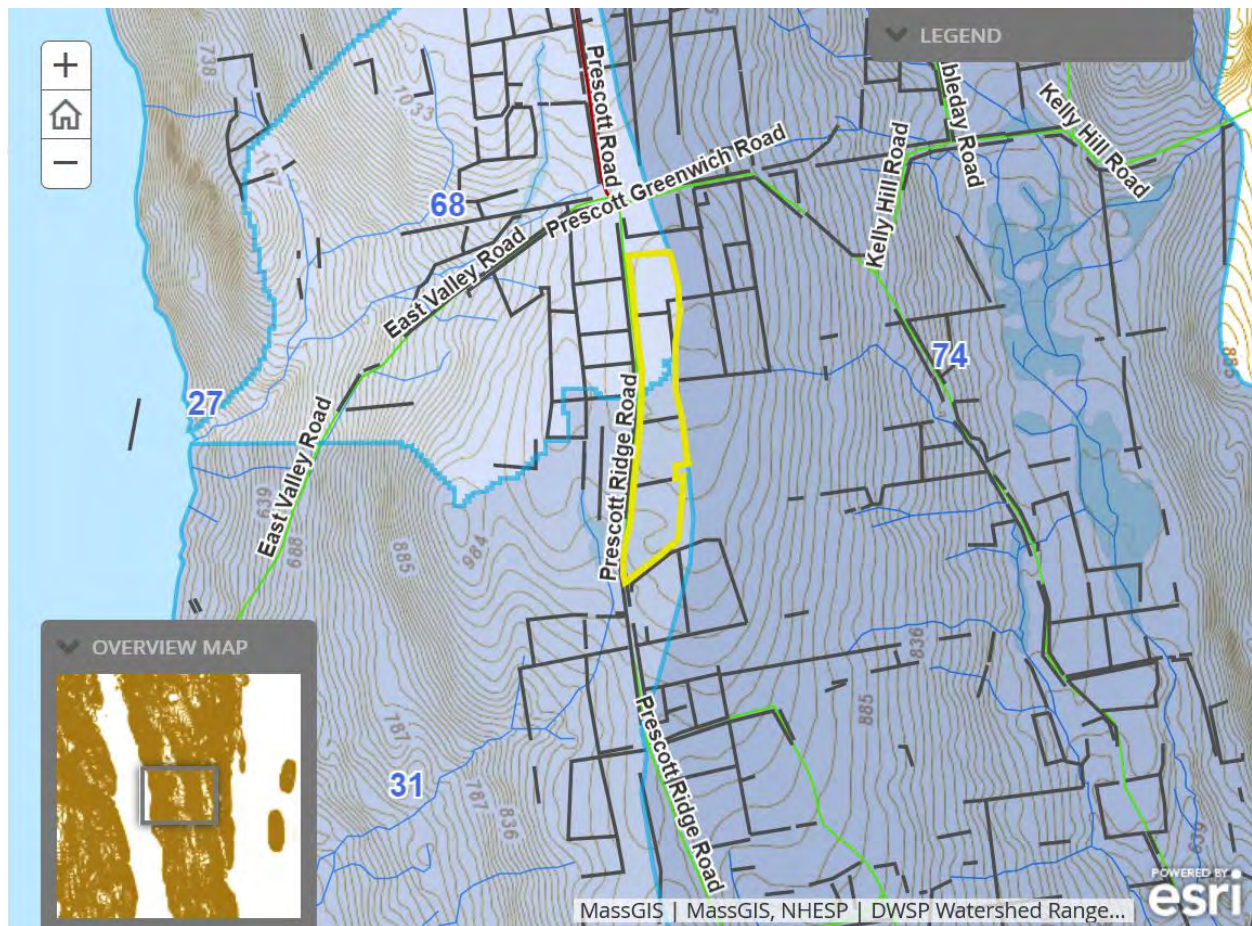
Removing red pine, the primary host of the red pine scale is the main silvicultural objective. The insect, originally found in Connecticut in the 1940s, has steadily moved northward and infested many red pine plantations throughout Massachusetts and southern New Hampshire. The microscopic beast completes two breeding cycles annually of both flight and flightless offspring. During their life cycle they burrow under the tree's scaly bark to insert their stylus and feed upon nutrients flowing through the cambium. A sure sign of infestation is gradual browning of needles from a healthy green to a rust brown. Mature red pine plantations can succumb to intense infestation in as little as two to three years. Some sign of scale has been seen since the 2015 harvest (south end; dead and dying trees). The harvest's secondary goal will be to remove low quality and/or diseased white pine.

Specifically, the harvest will expand upon the 2015 openings and create an opening in the northern 1/3 not treated in 2015. A residual basal of no less than 5 sq. ft. per acre will mostly be composed of well formed white pine, but could include live and dead snags. Significantly dropping the basal area will allow for a dramatic increase in direct to forest floor sunlight and a higher level of scarification. Both factors will aid in germination and vigorous development of young forest. Removing the red pine and poor quality white pine will hopefully allow a greater diversity of native tree species to colonize the area.



Subwatershed Analysis

Sub-watershed number	Total DCR-owned Acres	Acres Regenerated on DCR Land in the last 10 years	Acres Remaining for Regenerating Up to the 25% / 10 Year	Acres part of this proposal
31	854	24	190	8
68	219	0	55	7



Harvesting Limitations

Forwarder required: **Yes**

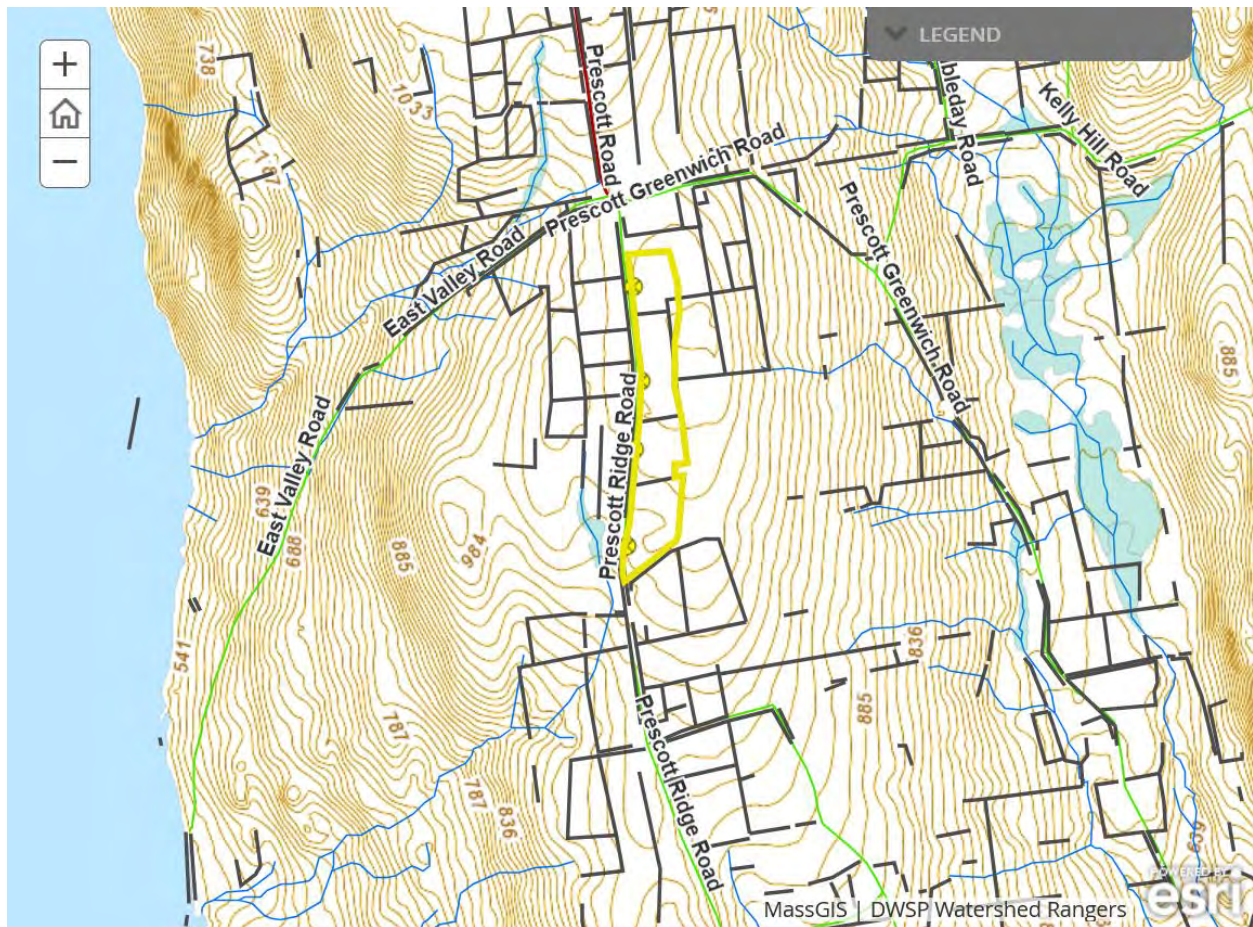
Feller/processor required: **Yes**

Steep slopes present: **No**

Comments on harvesting limitations:

A myriad of cultural resources require the maneuverability of short wood logging system.

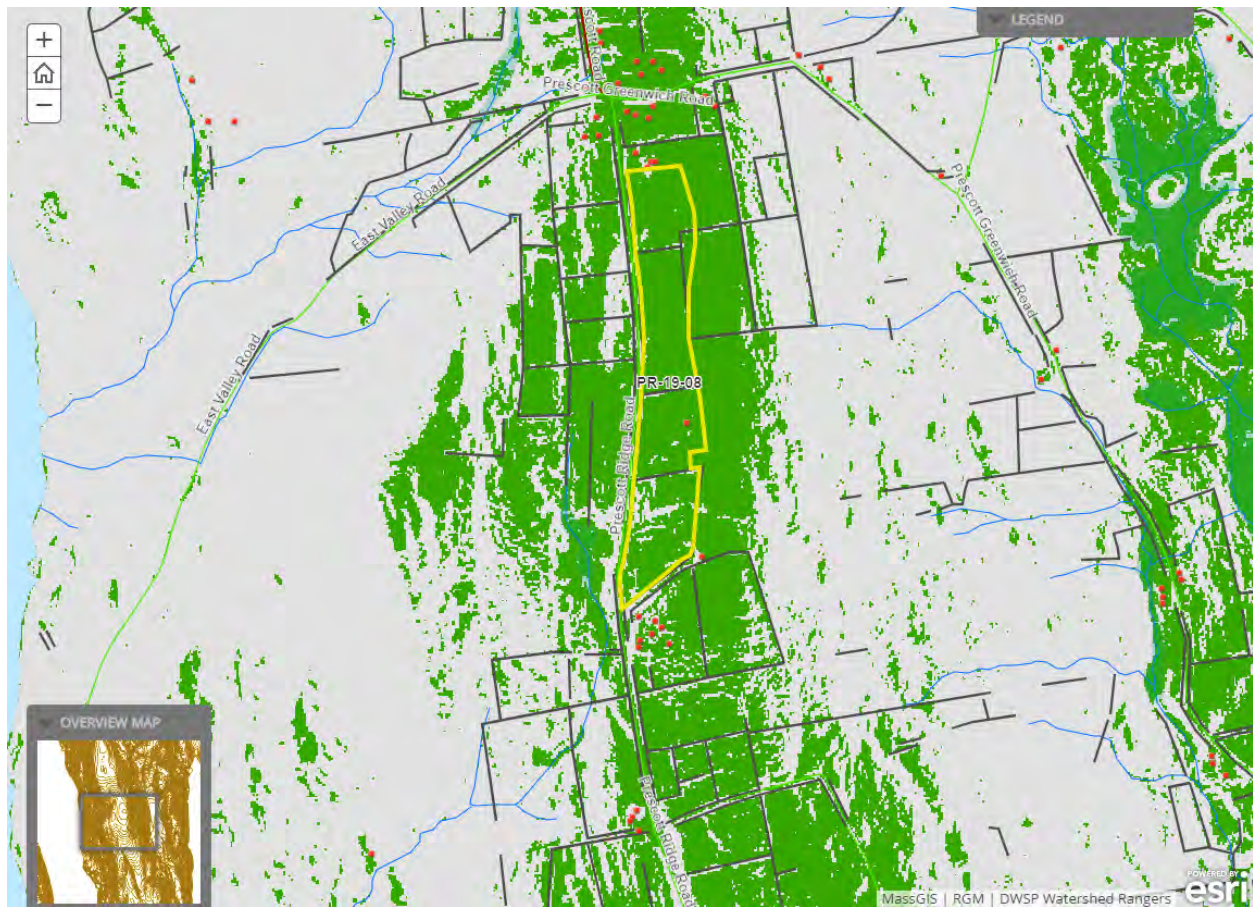
Harvesting should occur during reasonably dry non-frozen ground conditions and the equipment should be chained to maximize scarification or duff layer disturbance. In this particular case its disturbance of the dense fern layer.



Cultural Resources

Comments on Rare Species/Habitats:

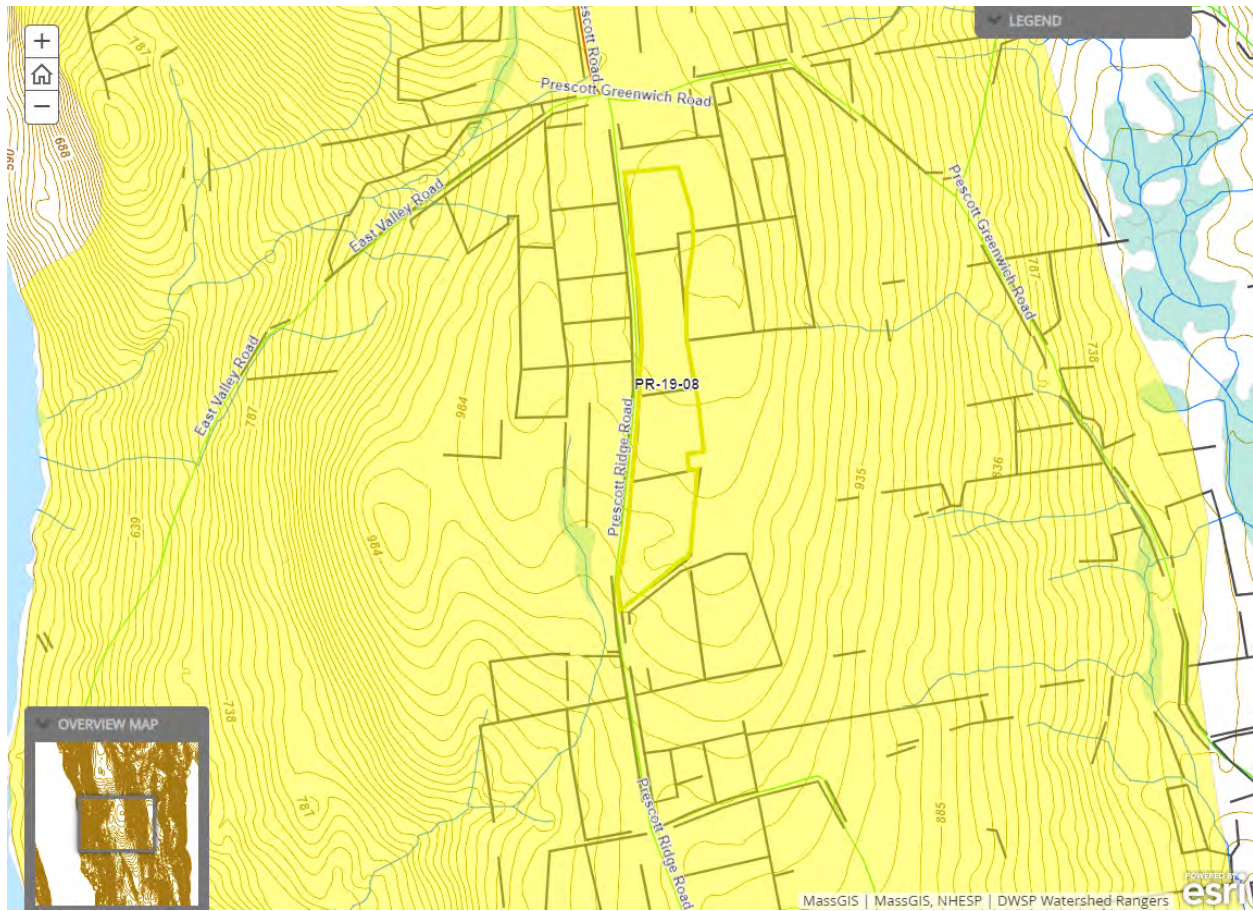
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Wildlife Resources & Rare and Endangered Species

Comments on Rare Species/Habitats:

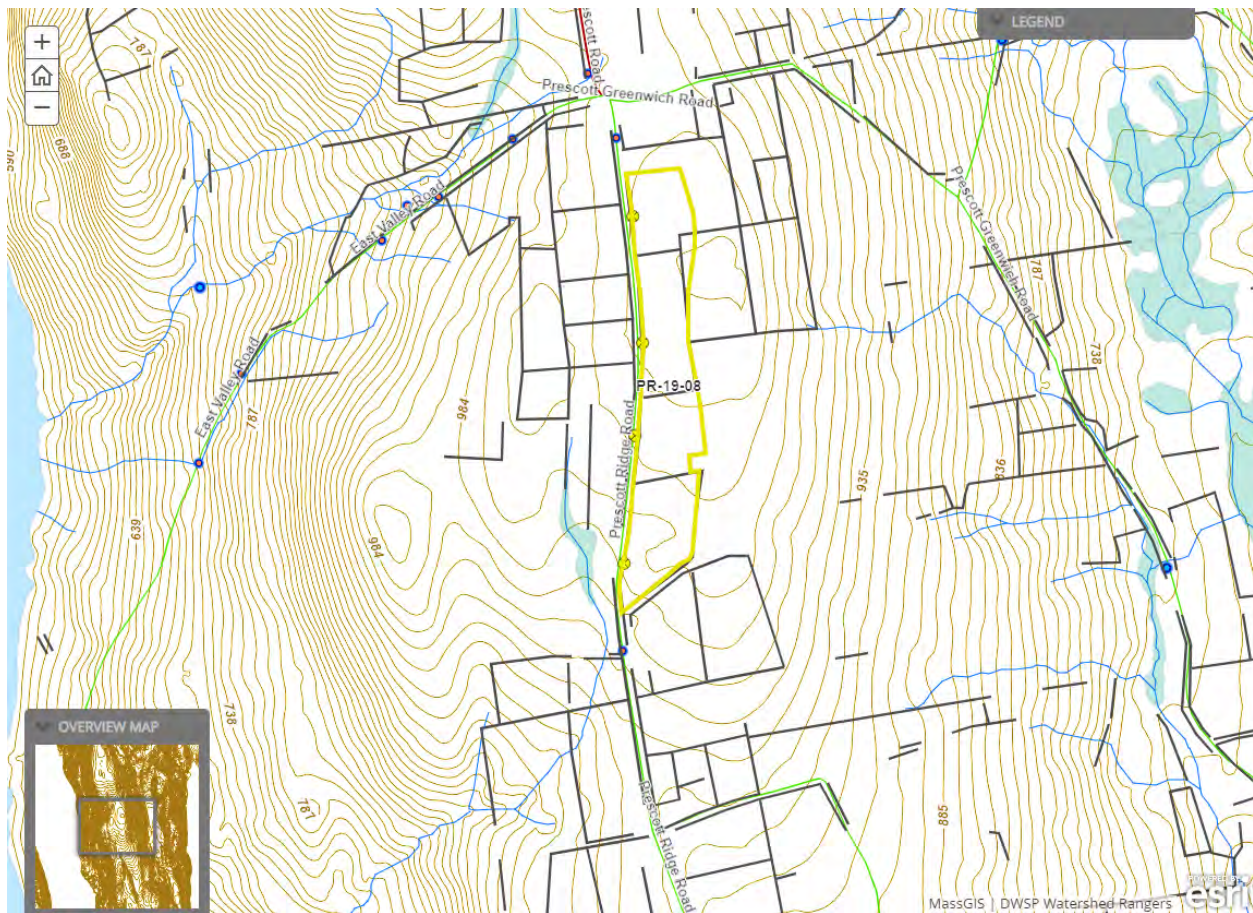
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Environmental Quality Engineering

Comments on EQ Issues:

No perennial stream crossings.



Forest Access Engineering

Gravel needed: No

Landing work needed: No

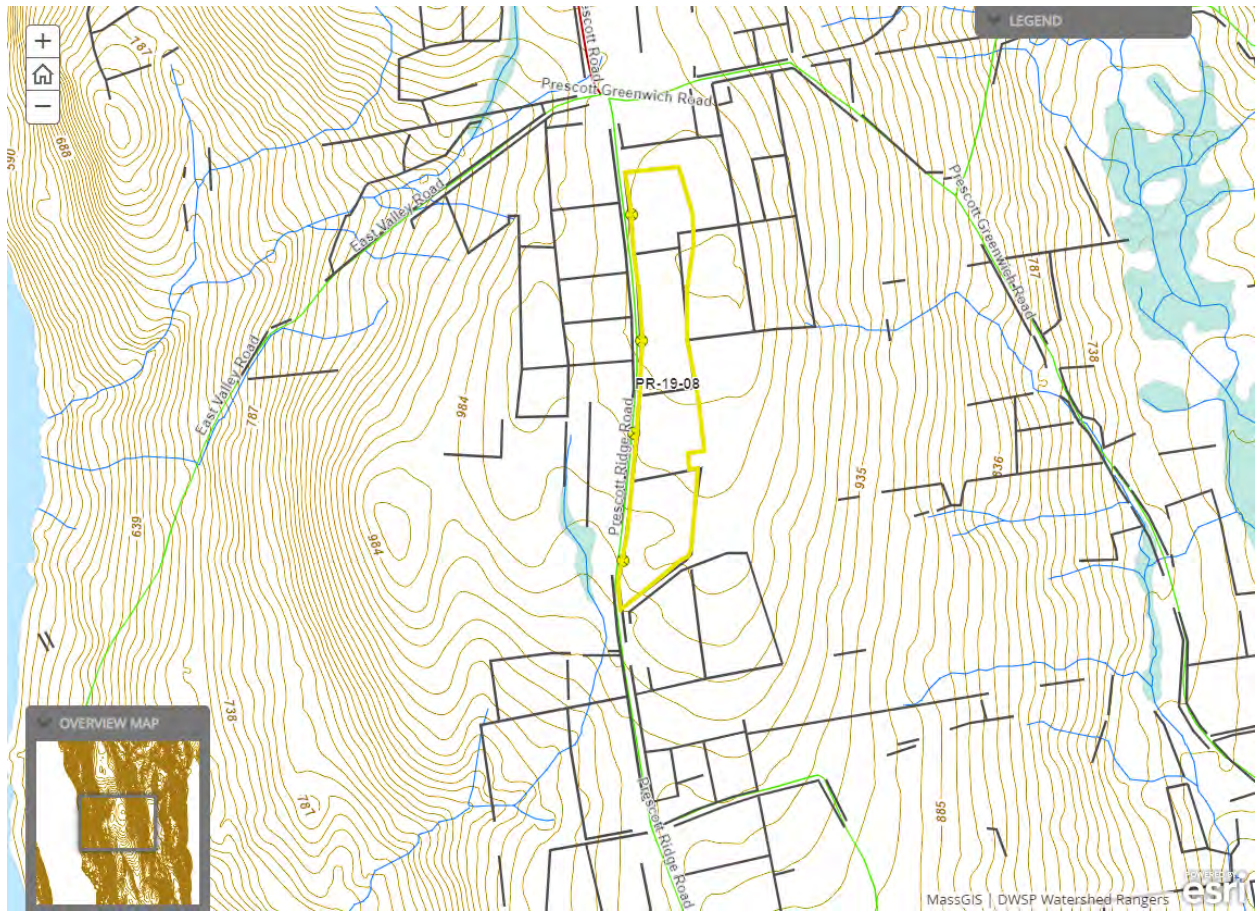
Culverts needed: No

Work needed on permanent bridges: No

Beaver issue: No

Further comment on access needs:

None.



DWSP FY 2019 Quabbin and Ware River Forestry Proposals – Master Legend for story maps

