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:

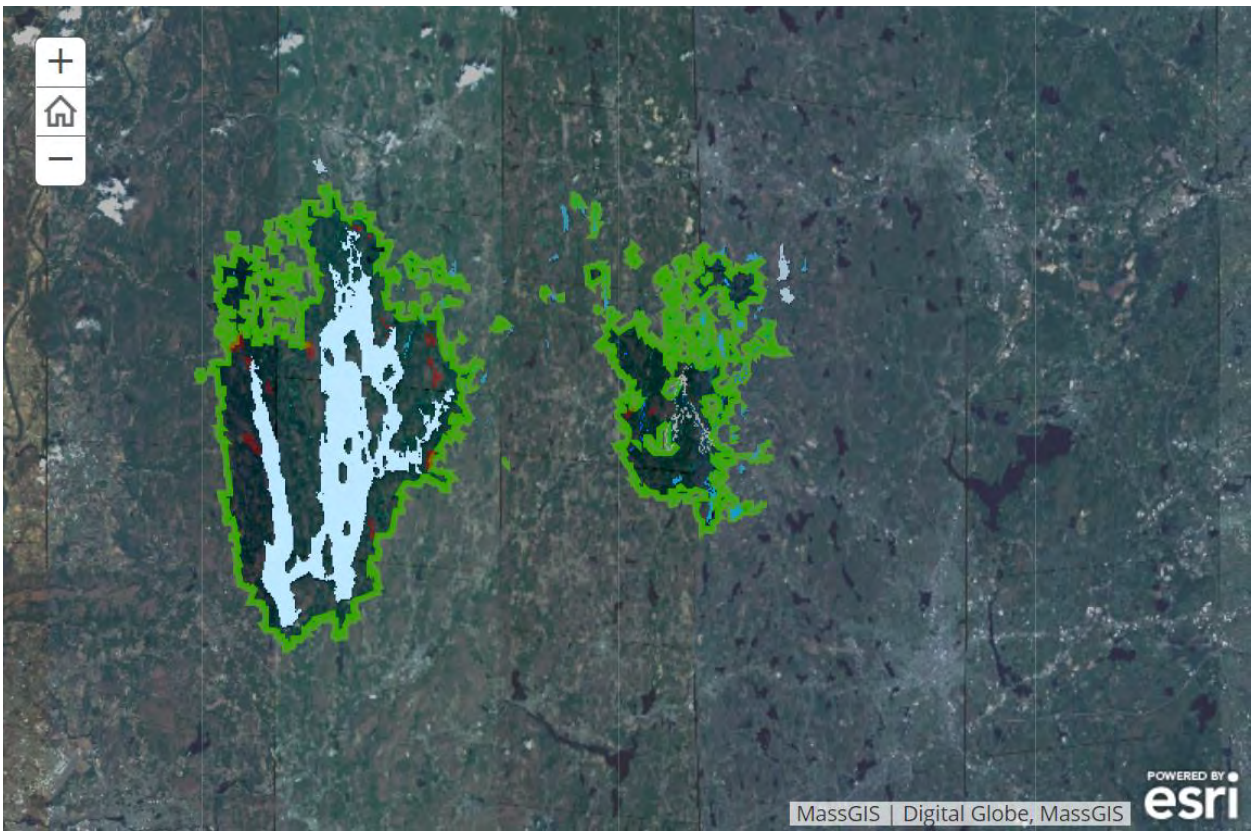
- **Ware River:** Ware River Watershed Advisory Committee, May 10th, 2018
- **Quabbin Reservoir:** Quabbin Watershed Advisory Committee, June 4th, 2018

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 Keevan at **brian.keevan@state.ma.us** or at (413) 323-6921 x 551.

[https://youtu.be/Wi23c6FIa_Q]

Figure 1: 2019 Quabbin/Ware River Forestry Proposal Locations



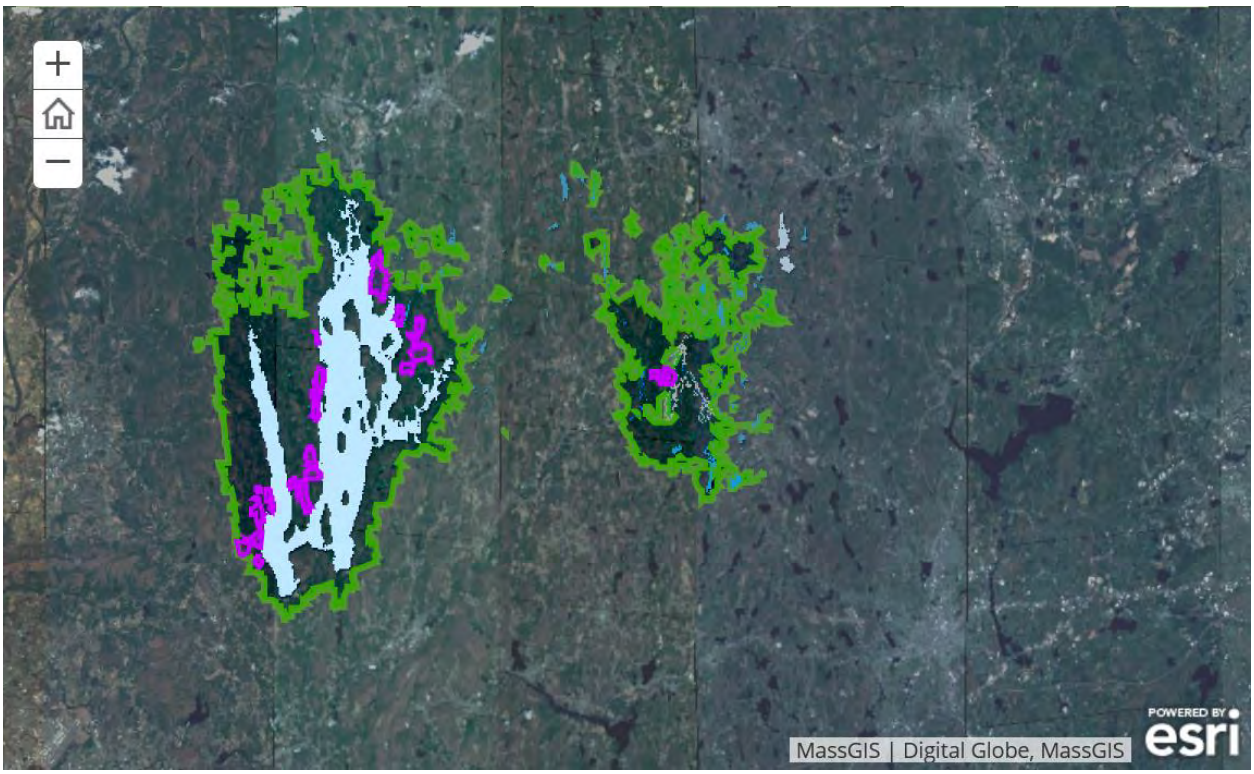
FY19 Gypsy Moth Related Oak Salvage

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 PR-19-18

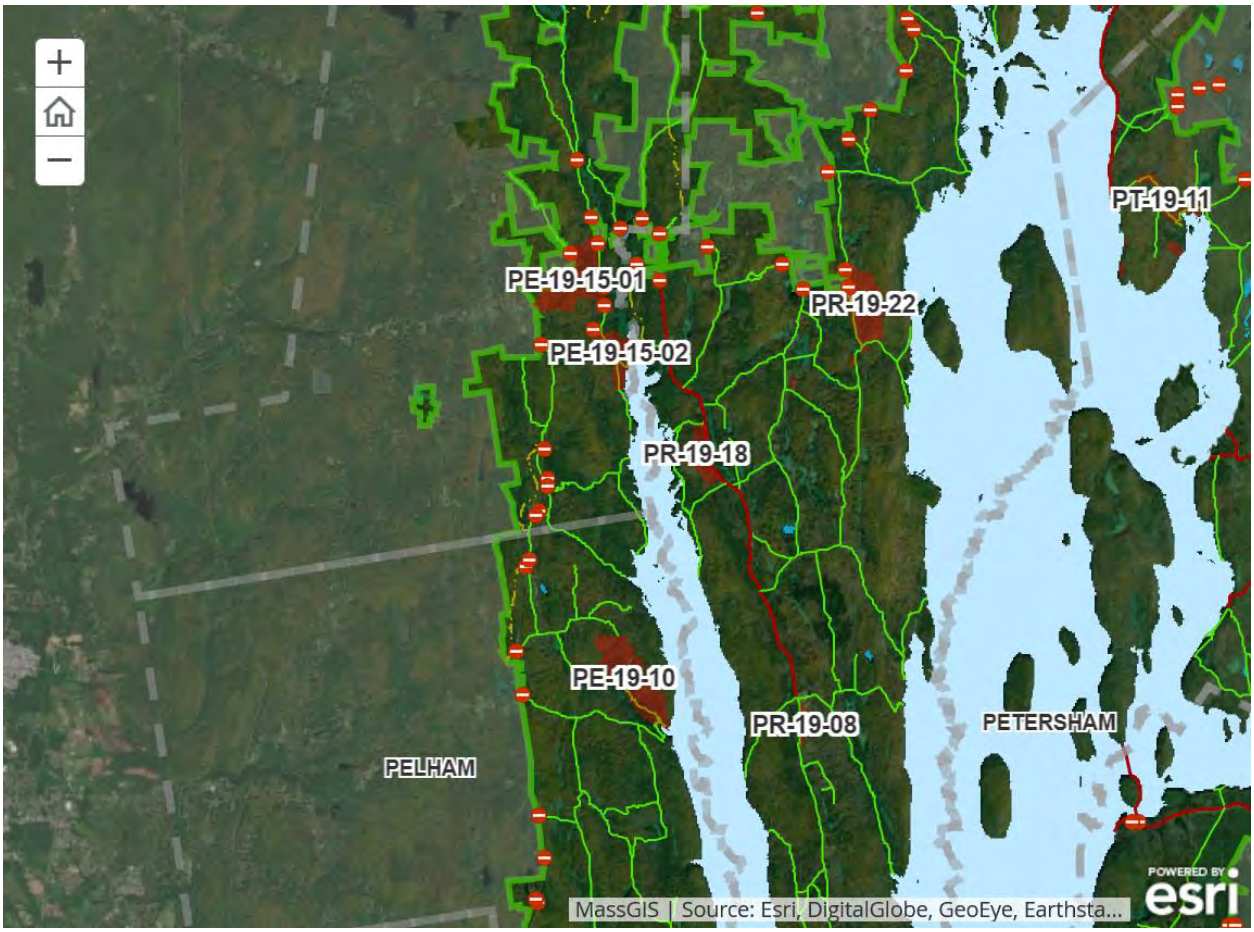
Proposal Goals

The purpose of the proposed project is to diversify forest structure and species. The majority of the area is fairly uniform high canopy forest. The proposed harvest will trigger a patchy young forest layer to develop.

Proposal Location

The proposal area is located on the west side of Prescott Rd. (gate 17) between intersections 17-4 and 17-5.

Total Acres: 74



General Description

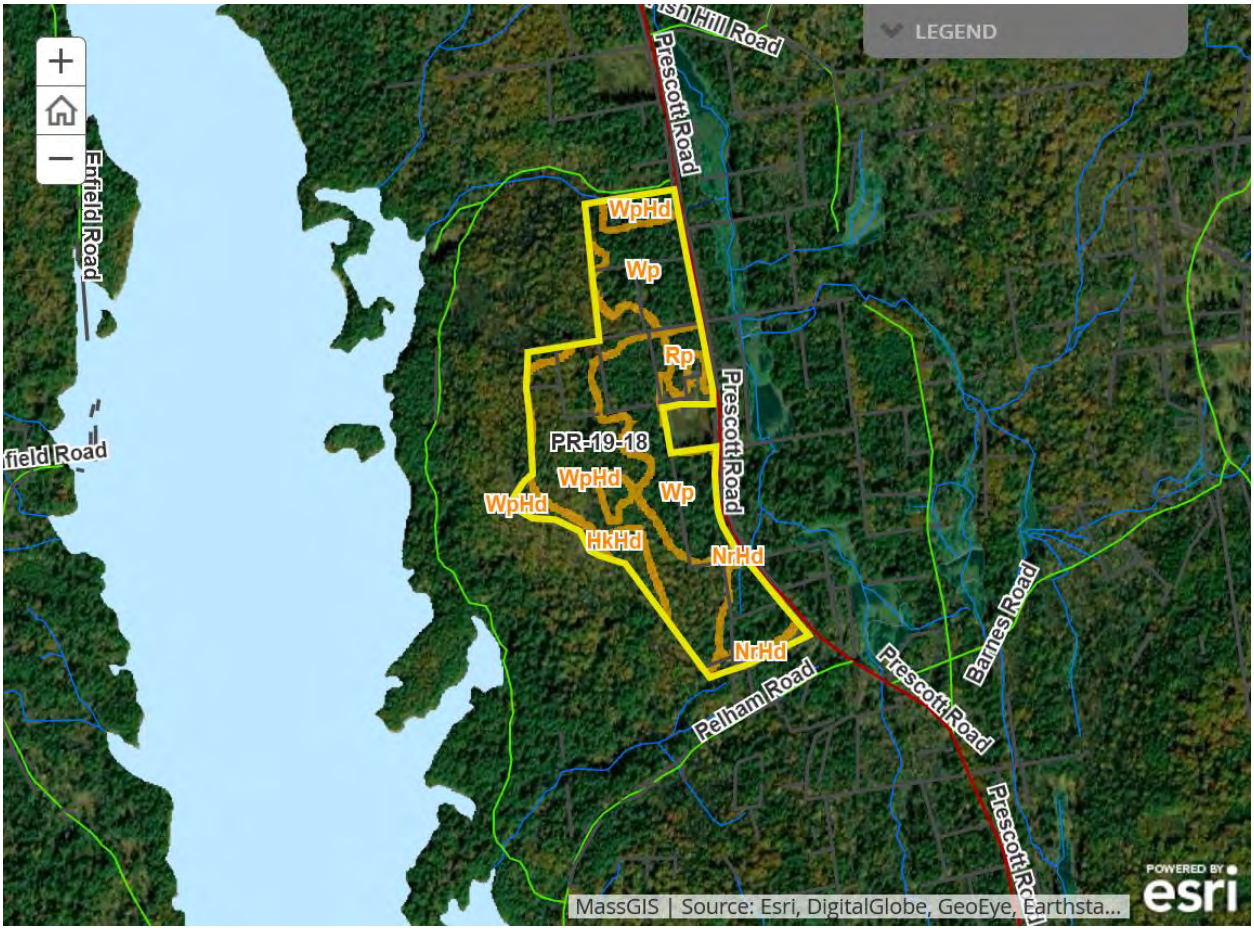
	Overstory Type(s)	Acres
Dominant	White pine/hardwood	69
Secondary	Red pine	4
Other	Northern hardwoods	1

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

Secondary	Hayscented fern prevalent

Description of forest composition/condition:

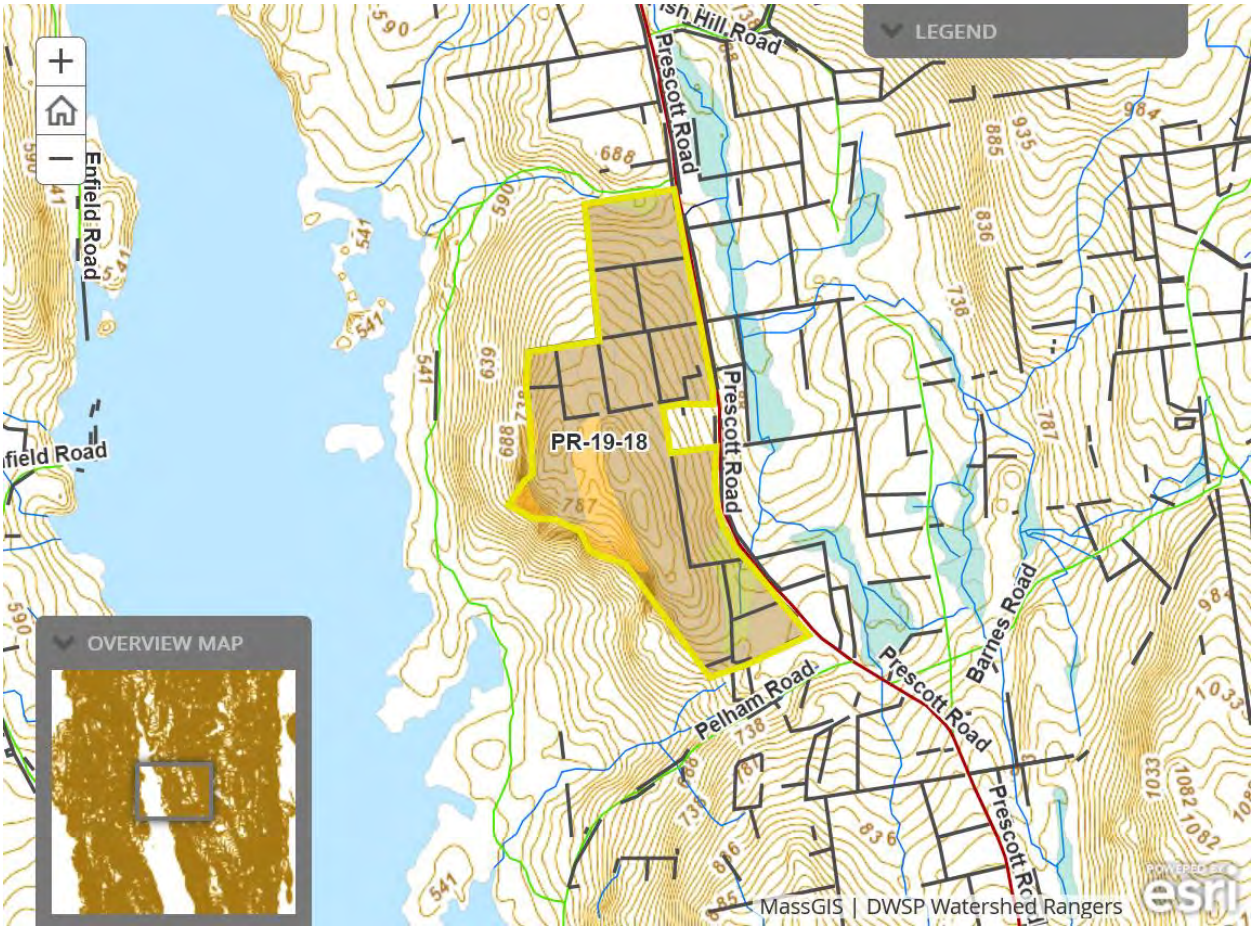
Dominant forest cover throughout the proposal area is high canopy white pine. Mixed in with the white pine is oak (red, black and white), black birch, red maple, ash, sugar maple, hickory, and hemlock. Encompassed in the white pine is a 4 acre plantation of red pine originating around 1940. Mortality amid the red pine, first observed around 2005, has been steadily spreading radially; a pattern indicative of *Heterobasidion annosum*; commonly know as annosum root rot. South of the red pine is a grove of sugar maple also known as a sugarbush. These trees have been tapped for maple syrup production every march since the early 1980s. Amid the sugarbush is a small stand (.25 ac or less) of sawtimber aspen (aka poplar) with a dense carpet of sugar maple seedlings beneath. The understory is a diffuse mix of black birch, white pine, maple, ash and hemlock seedlings/saplings triggered by a 1997 shelterwood harvest. Regeneration was further released by a 2002 overstory removal of red pine at the south end of the proposal area (5 acres).



Soils

Drainage Class	%
Excessively Drained	0
Well Drained Thin	33
Well Drained Thick	41
Moderately Well Drained	26
Poorly to Very Poorly Drained	0

Montauk Fine Sandy Loam: Stony, well drained soil derived from gneiss.
Canton-Chatfield-Hollis complex: A well drained upland rocky gneiss/schist derived loamy till over a sandy till of the same parent material.
Scituate fine sandy loam: Moderately well drained loamy till over a lodgement till all derived from gneiss

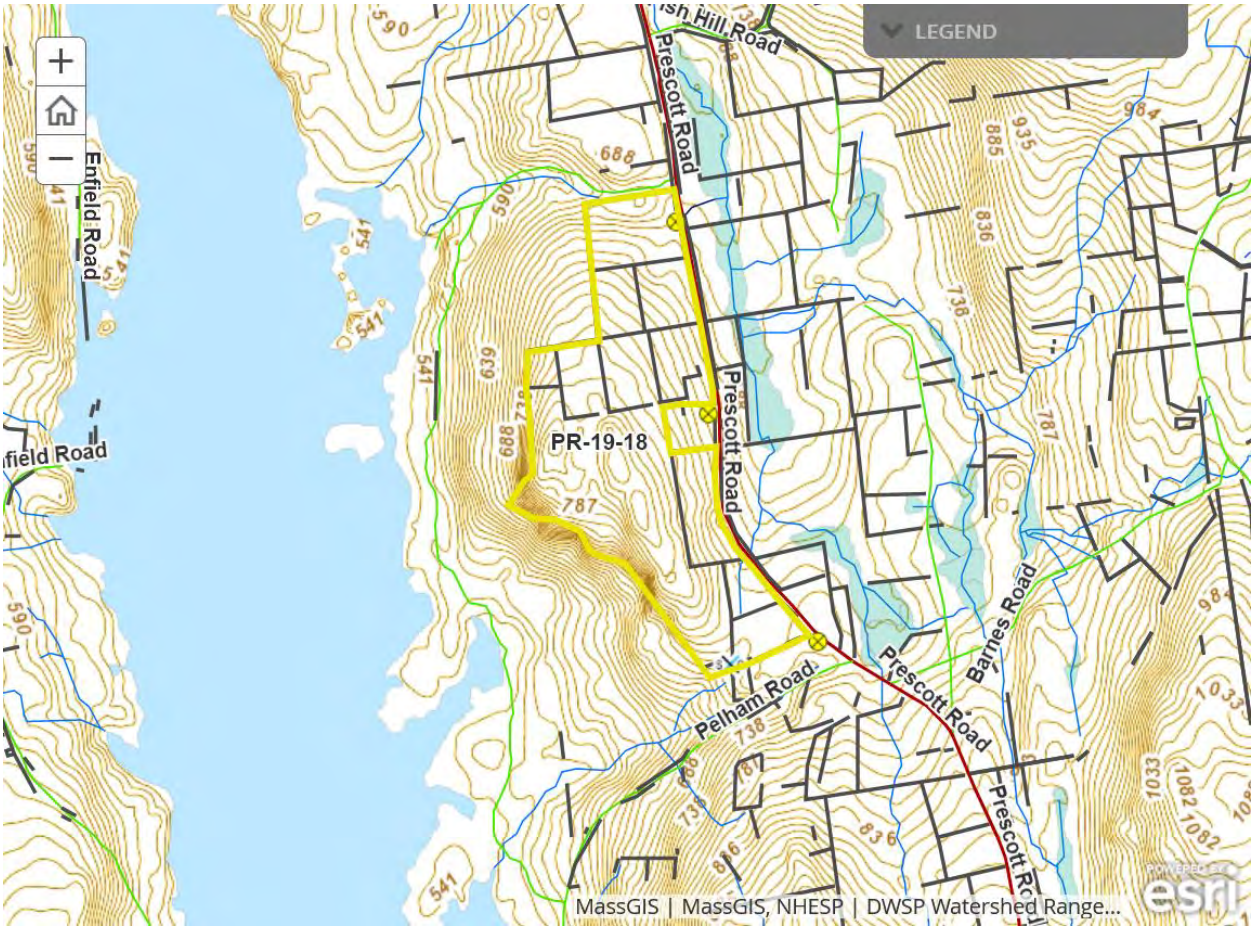


Wetlands

- Wetlands present? - **No**
- Streams present? - **Yes**
- Vernal pools present? - **None known**
- 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**

Further comments on wetlands:

Seep is located in the southern part of proposal. It drains both east and west. West flow will require a stream crossing.



Silviculture

Acres in Intermediate cuts: **0**

Acres in prep/establishment cuts: 1**0**

Acres in Regeneration cuts: **14**

Average regen opening size: **2**

Maximum regen opening size: **5**

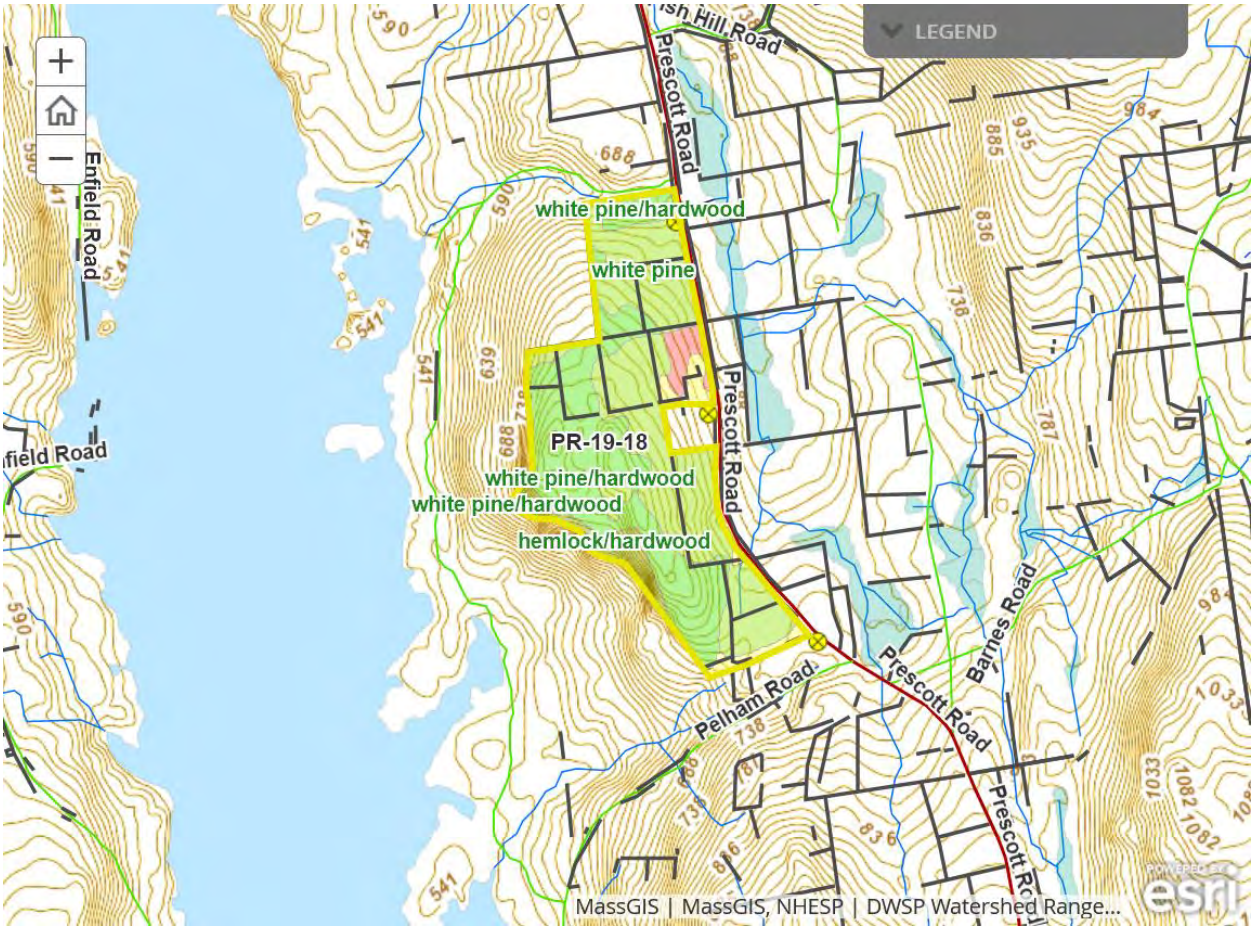
Description of advance regeneration in proposal area:

Generally speaking regeneration is abundant. Black birch and white pine have the greatest stocking followed by red maple, sugar maple, ash, hickory and hemlock. Quality and vigor of birch and pine are in decline. Browse is moderate to heavy on the hardwoods and severe on the hemlock.

General comments on silviculture proposed:

The primary goal of this harvest is to release and/or establish forest regeneration. This will be accomplished by creating openings or patch cuts in order to foster a free to grow/full sunlight environment for established understory and natural regeneration. There should also be opportunity to do some thinning in and around pockets of higher quality sawtimber. All red pine will be harvested. This should bolster long term expansion of the adjacent sugarbush (as long as invasives are controlled).

The harvest should set a course for greater structural and species diversity over the long term for this forest 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
57	2571	95	2476	38
27	1052	4	1048	36

Harvesting Limitations

Forwarder required: **Yes**

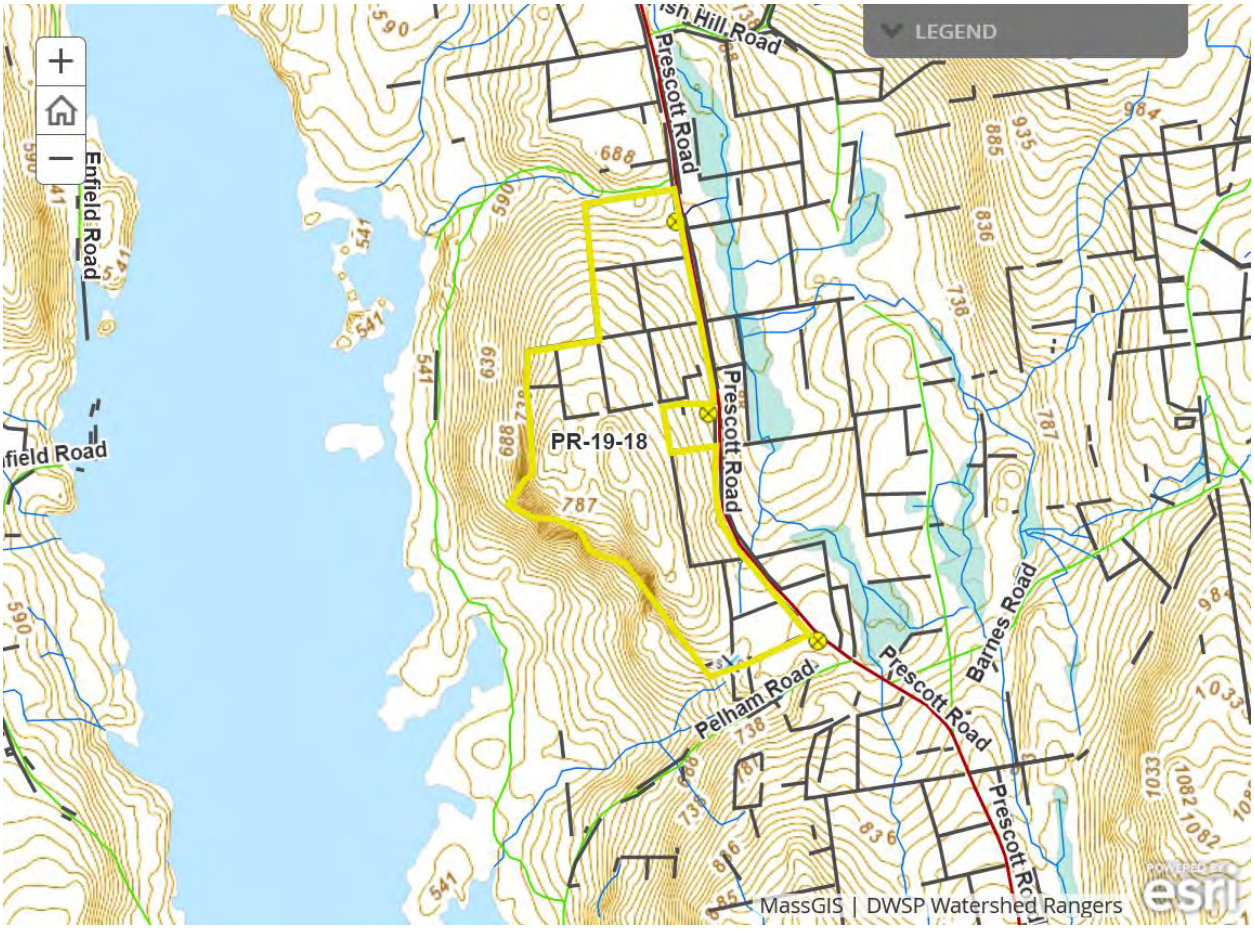
Feller/processor required: **No**

Steep slopes present: **No**

Comments on harvesting limitations:

The '97 and '02 harvests were done with a forwarder; so an existing logging road system for forwarding is in place. The area also has a lot of stone walls which tend to experience more damage/disturbance with a skidding (long wood) then with forwarding (short wood).

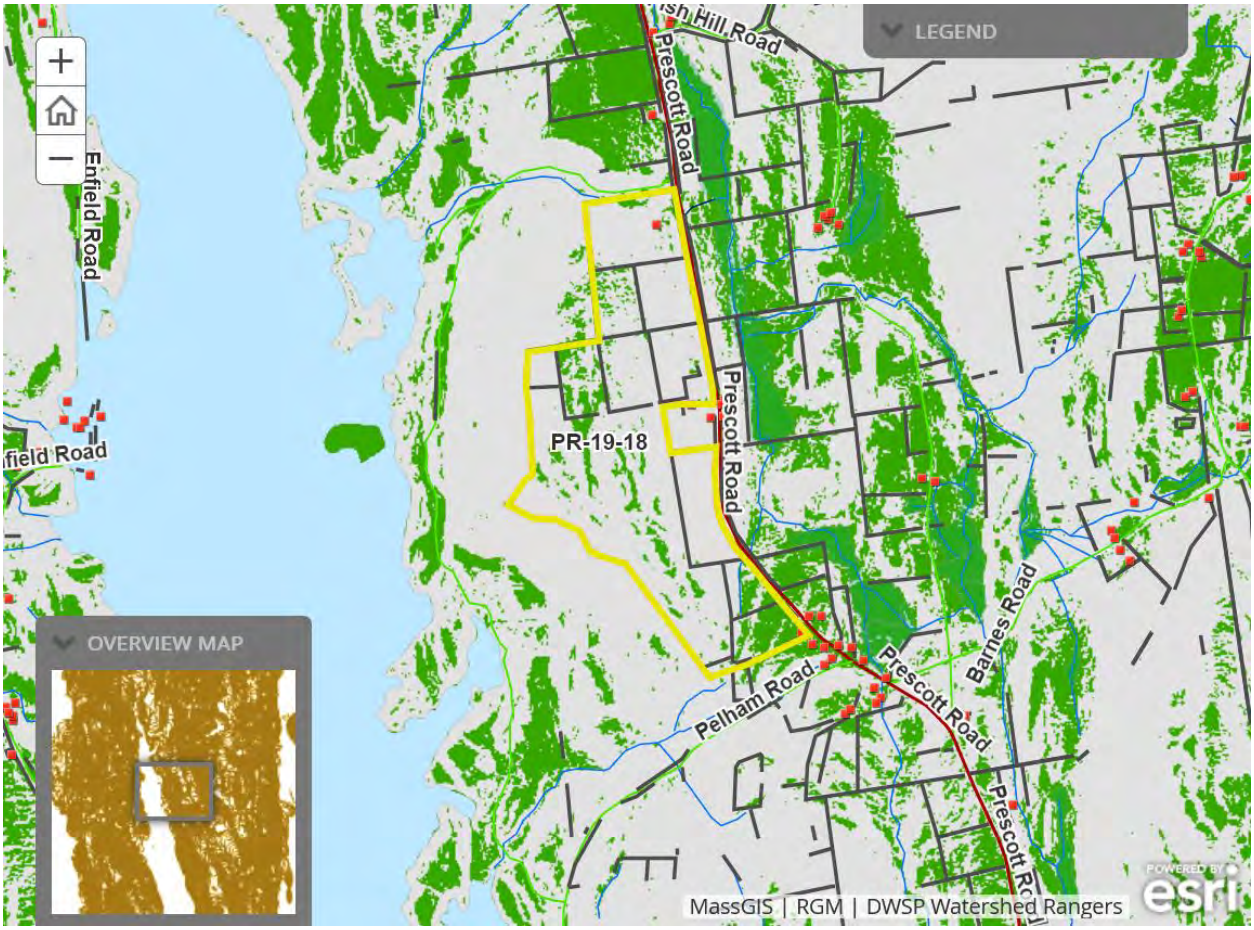
The western edge of the area has steep micro topography. However very little is over 200 feet in length.



Cultural Resources

Comments on Cultural Resources:

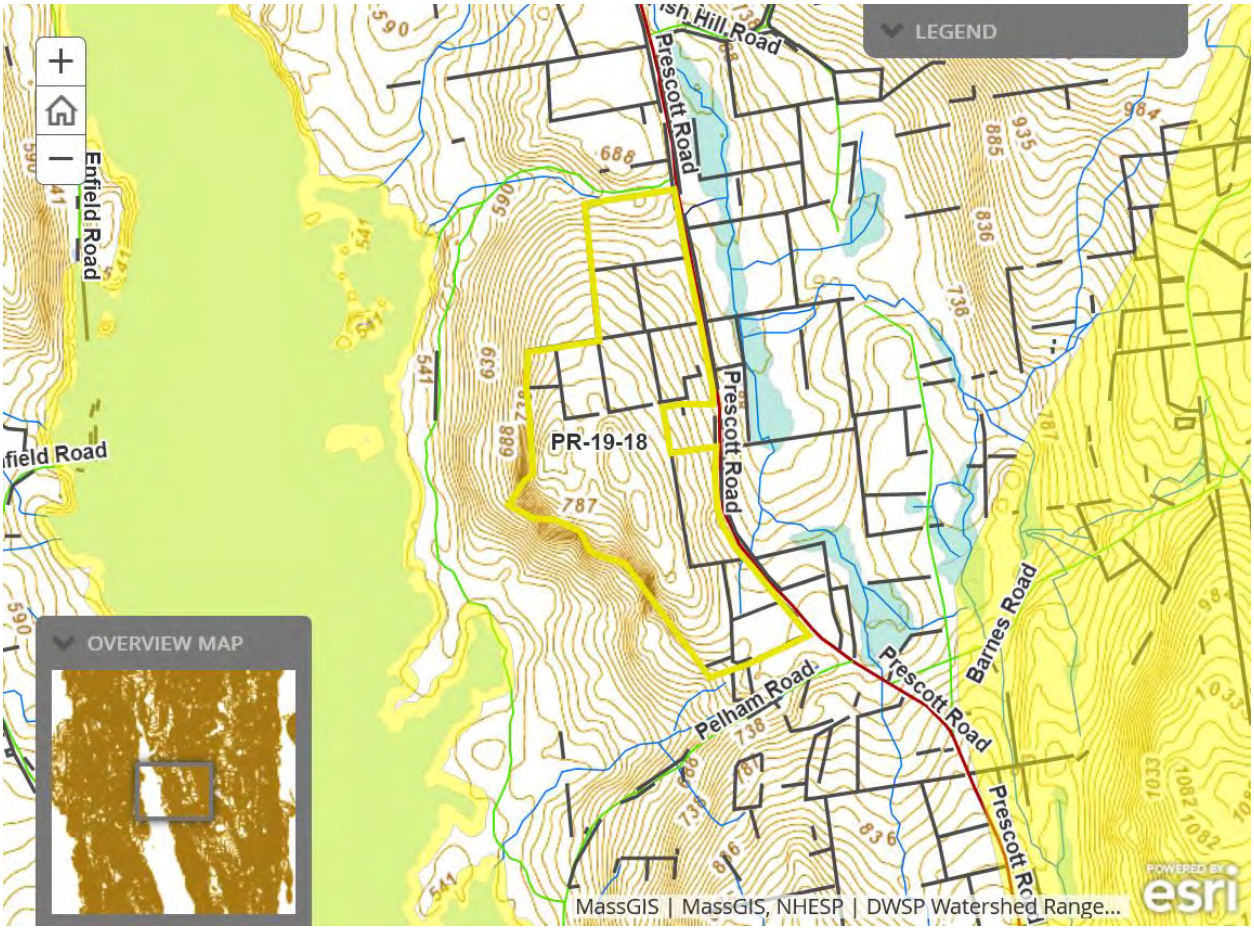
There are two old farmsteads along Prescott Rd. The field amid the proposal area has an uncovered field stone well. Stone walls exist throughout. Existing barways will be used where feasible and harvest layout will protect walls as much as possible. Wells and foundations will be flagged and avoided. 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:

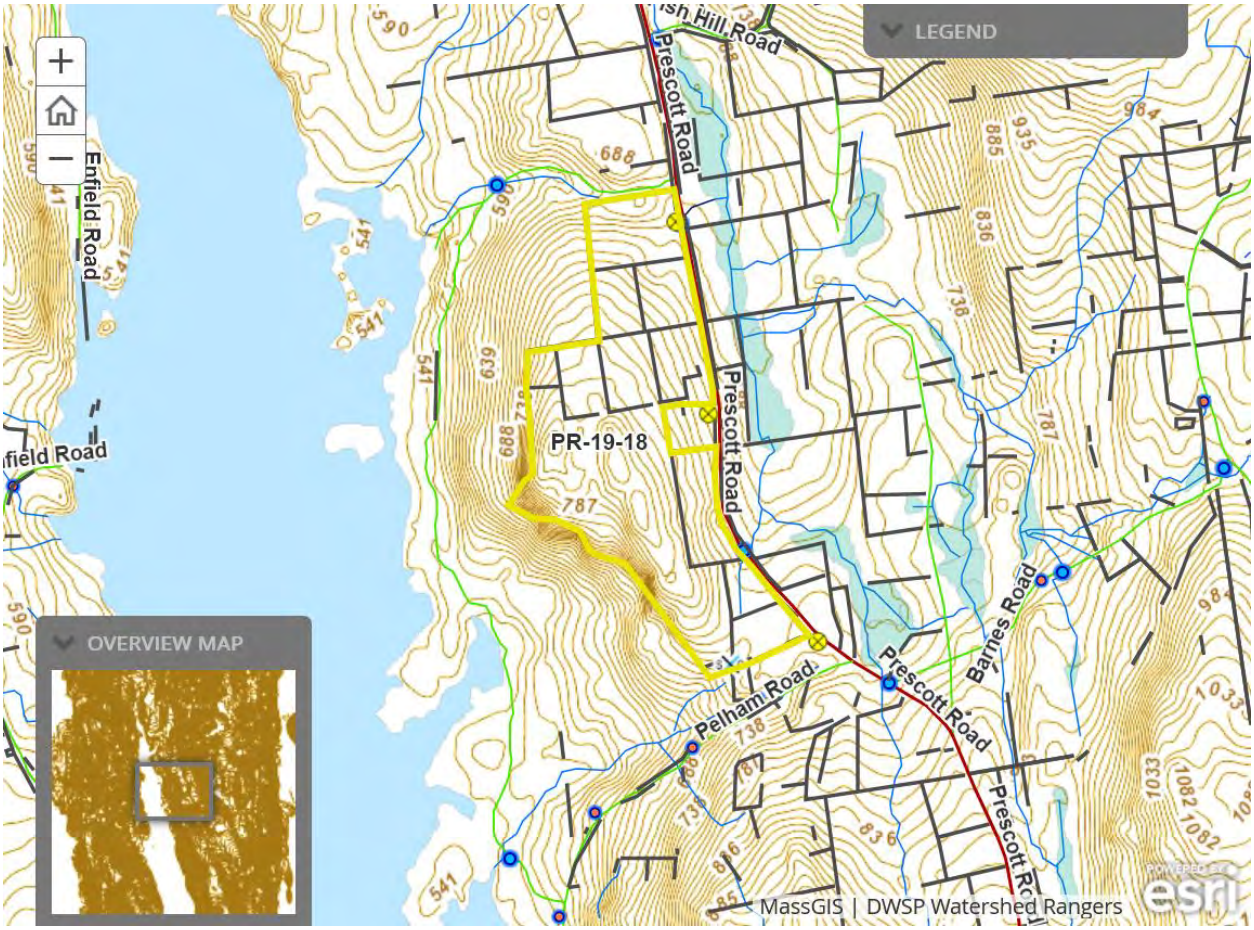
Cavity trees and potential/existing nest trees will be retained if possible. There are not any NHESP state-listed sensitive species or habitats within the lot proposal area. If any new information regarding sensitive species or habitats in the area is found DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed harvest.



Environmental Quality Engineering

Comments on EQ Issues:

No perennial stream crossings.



Forest Access Engineering

Gravel needed: Yes

Landing work needed: Yes

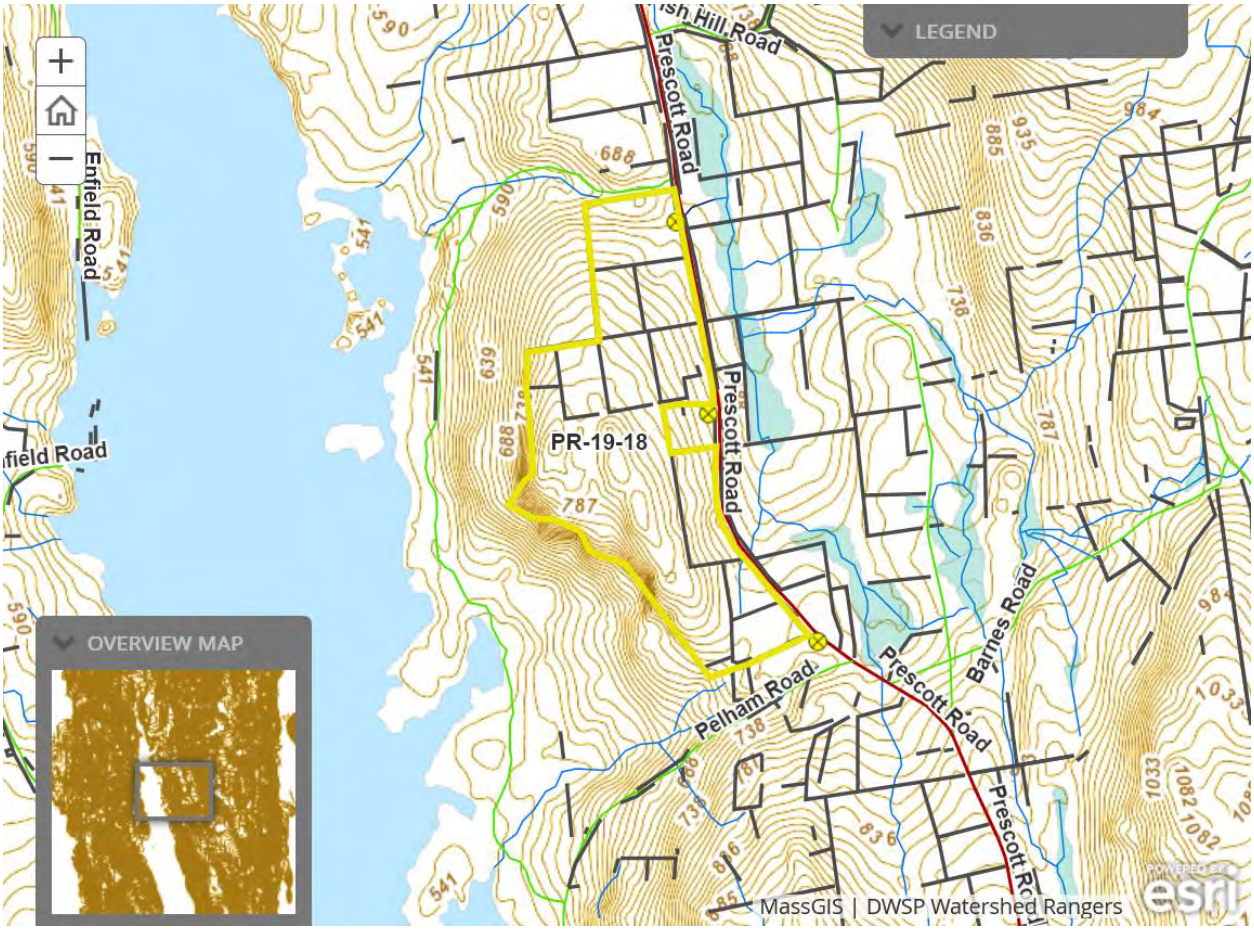
Culverts needed: No

Work needed on permanent bridges: No

Beaver issue: No

Further comment on access needs:

North Landing may need to be stumped followed by a few loads of gravel. Entrance to middle landing (Field) could use a load or two of gravel tailings to firm up some seepy ground.


LEGEND
Prescott Road
Enfield Road
PR-19-18
Pelham Road
Barnes Road
OVERVIEW MAP
MassGIS | DWSP Watershed Rangers
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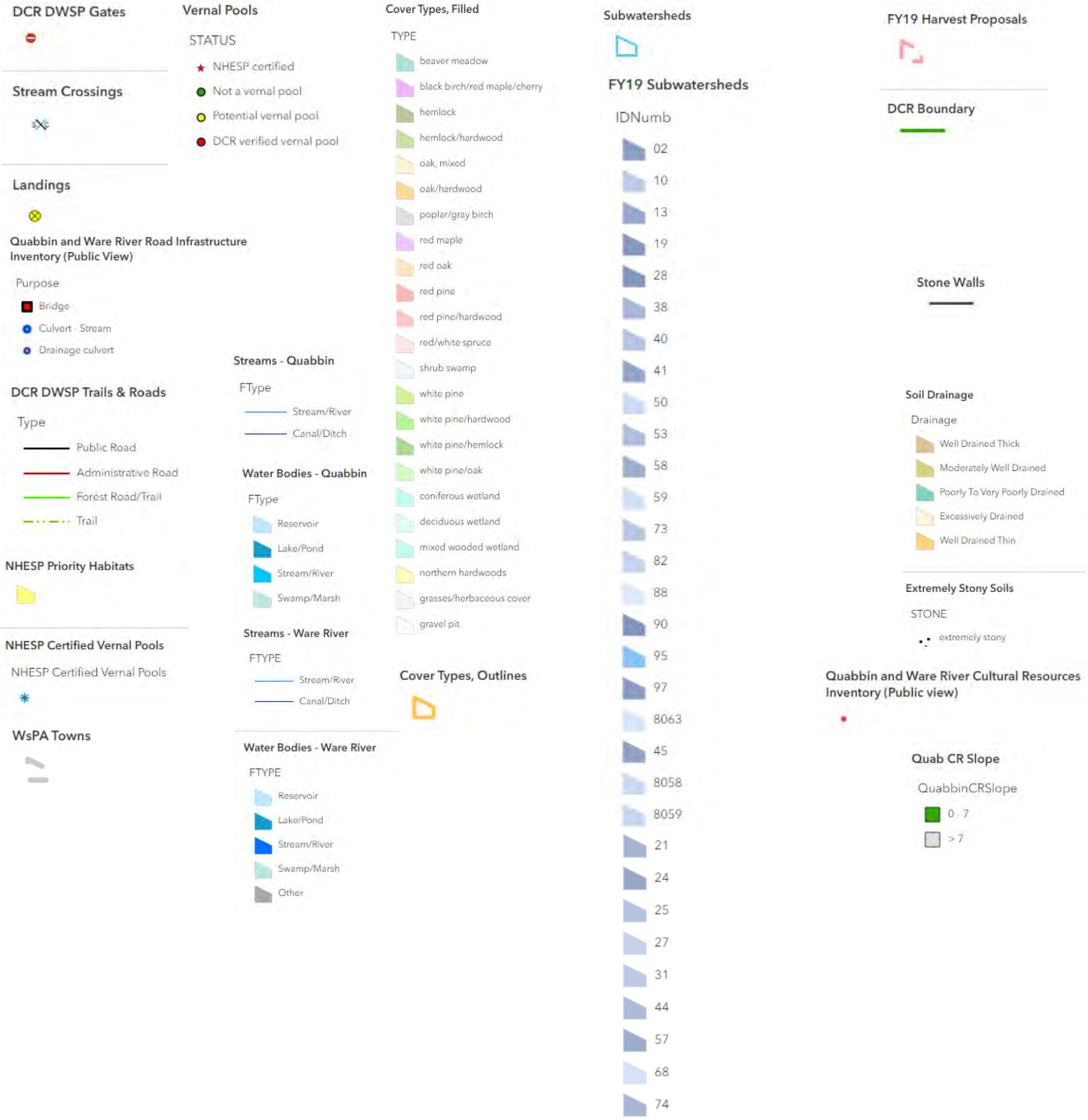
DWSP FY 2019 Quabbin and Ware River Forestry Proposals – Master Legend for story maps



Quabbin Harvest Proposal PR-19-20A

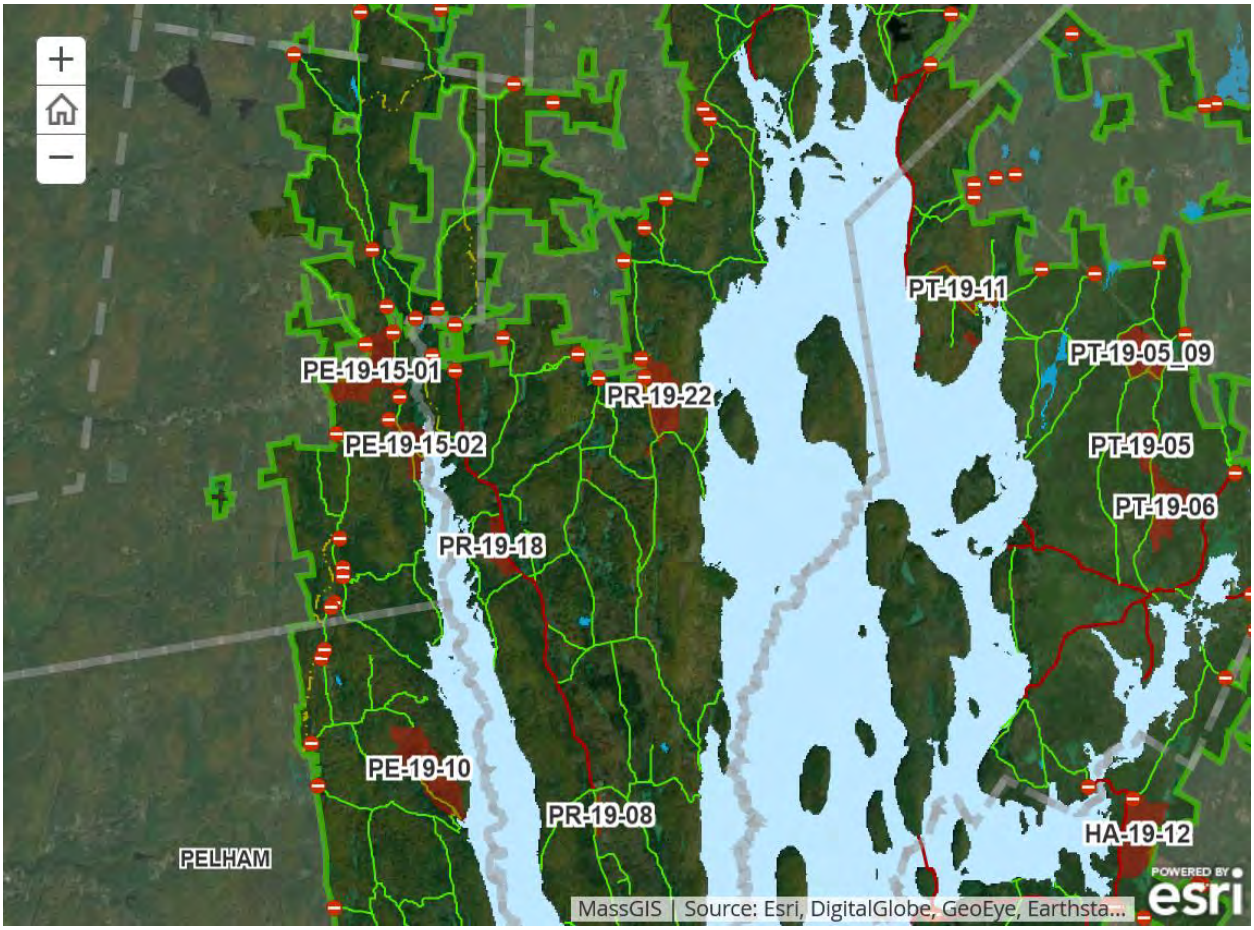
Proposal Goals

The purpose of this proposed project is to increase native forest diversity and resilience. The area is a red 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 west side of Vaughn Rd. (gate 21) south of the west branch of Underhill Brook.

Total Acres: 4



General Description

	Overstory Type(s)	Acres
Dominant	Red pine	3
Dominant	White pine	1

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

Description of forest composition/condition:

Planted Red Pine and naturally seeded White Pine cover this area of the watershed. Prior to state ownership, the site was used for crops (arable) and/or improved pasture. Specifically, at time of taking, it was the farmstead belonging to Agnes V. Latham and Ruth V. Smith.

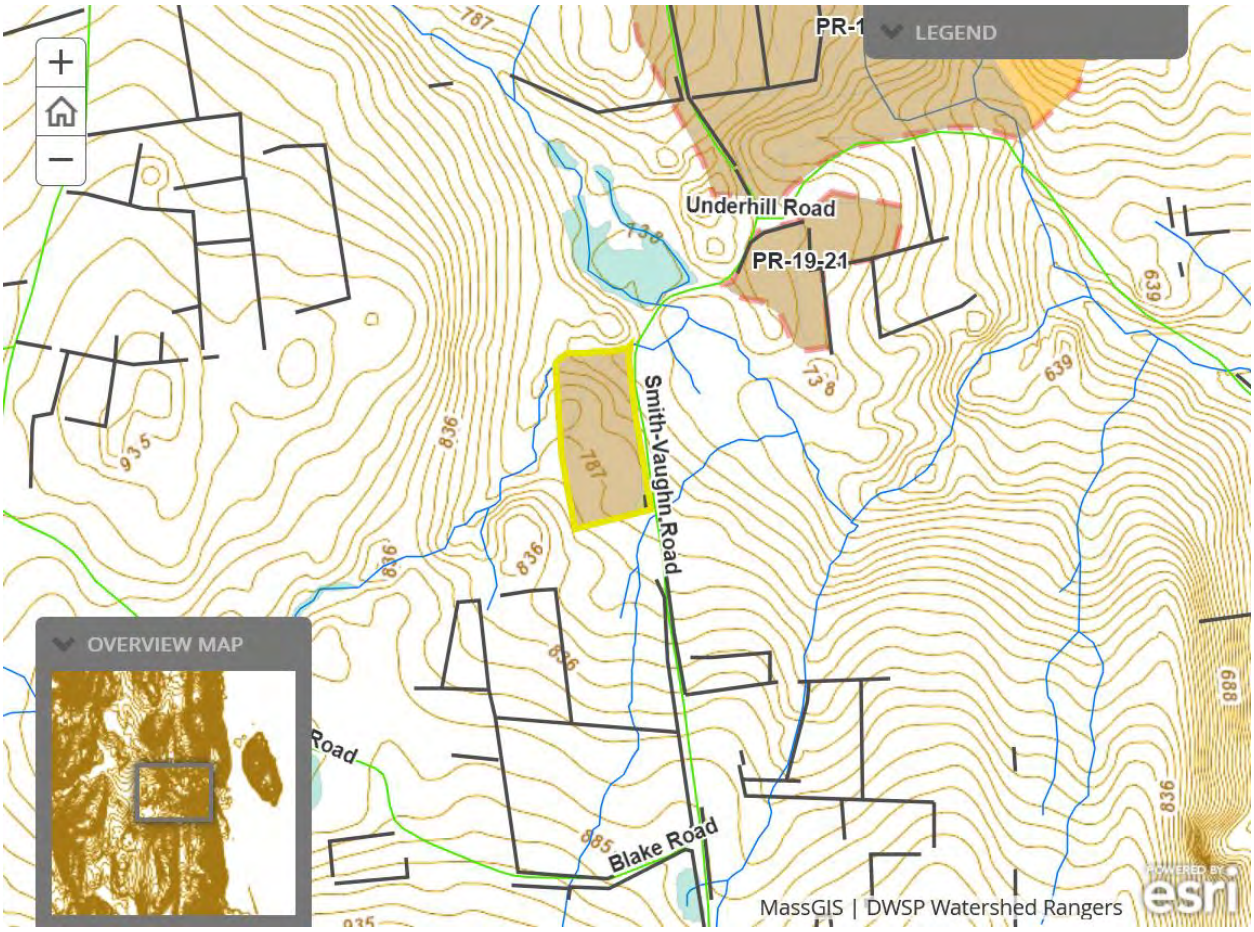
Believing that forest cover is the best filter and conservator of water, early watershed managers were quick to reforest these open areas with a monoculture of mainly Red Pine, White Pine or a combination of the two. Most of these watershed plantations were seeded in the late 1930s through the early 1940s (CCC era).

Forest composition is planted sawtimber red pine and naturally seeded sawtimber white pine overstory along with an understory of black birch saplings triggered from a 1986 commercial thinning. Currently, there is little sign of red pine scale or annosum root rot; but the two pathogens have been found 1000 feet north in red pine plantations along the east branch of Underhill Brook.

Soils

Drainage Class	%
Excessively Drained	0
Well Drained Thin	0
Well Drained Thick	0
Moderately Well Drained	100
Poorly to Very Poorly Drained	0

Montauk Fine Sandy Loam: Stony, well drained soil derived from gneiss. Canton fine sandy loam: Upland rocky well drained soil derived from gneiss and schist loam over a rock till.

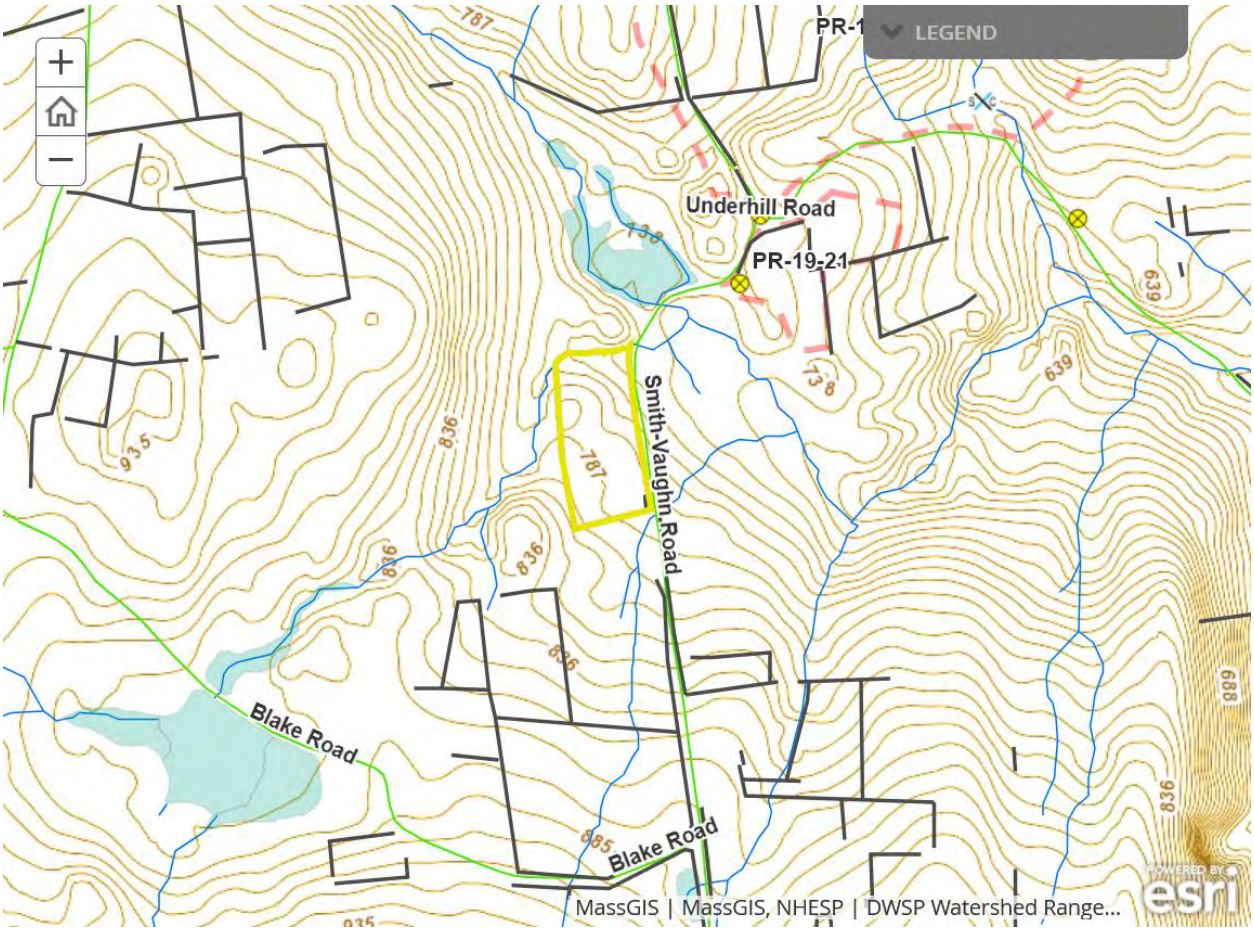


Wetlands

- Wetlands present? - **No**
- Streams present? - **Yes**
- Vernal pools present? - **None known**
- Seeps present? - **Yes**
- Are stream crossings required? - **No**
- Are wetland crossings required? - **No**
- Is logging in filter strips planned? - **Yes**
- Is logging in wetlands planned? - **No**

Further comments on wetlands:

The streams form the bounds of the proposal area. None flow through. The northwesterly stream is perennial resulting from an upstream beaver impoundment. A small seep flows northeasterly through the very southern part of the proposal area.



Silviculture

Acres in Intermediate cuts: **0**

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

Acres in Regeneration cuts: **4**

Average regen opening size: **4**

Maximum regen opening size: **4**

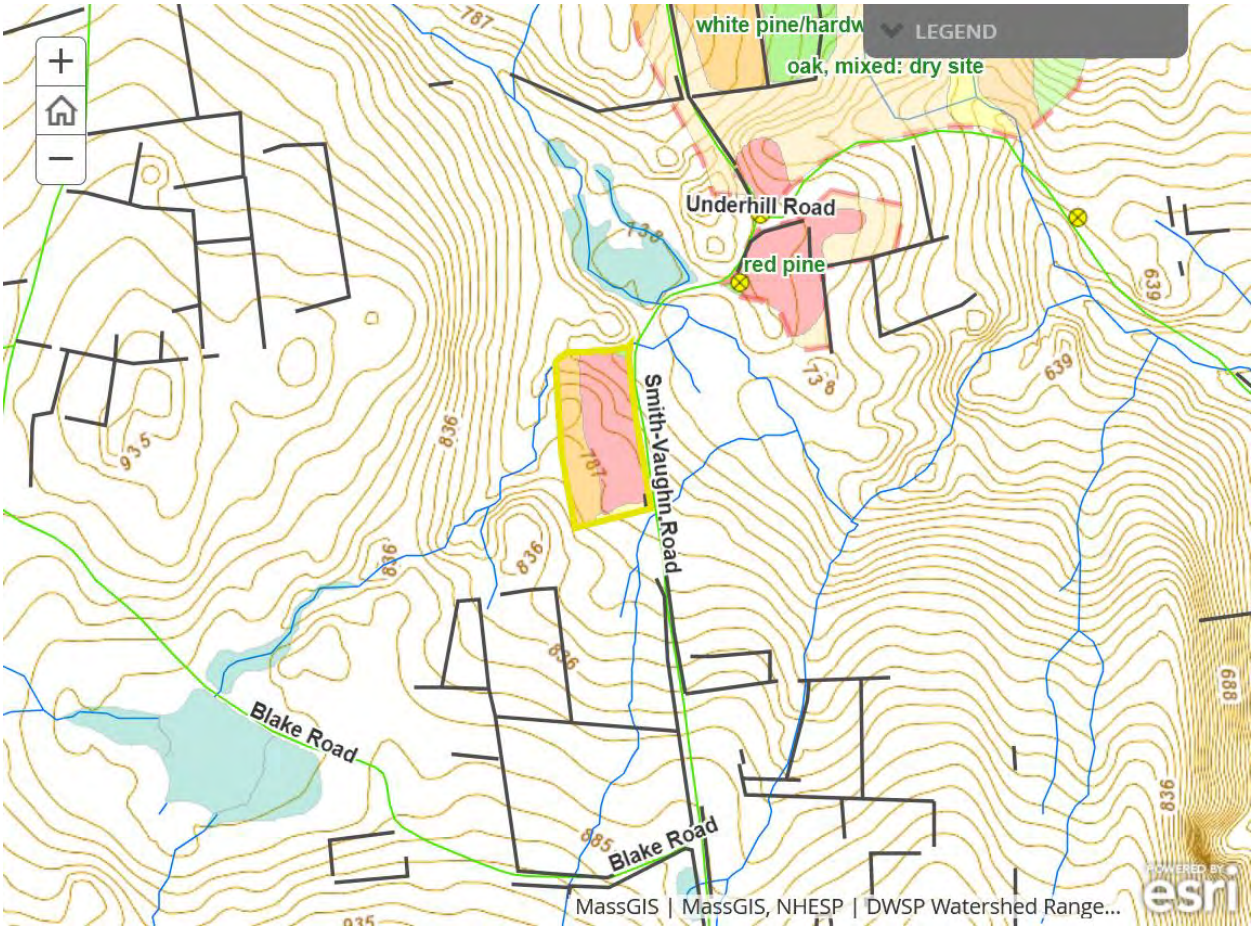
Description of advance regeneration in proposal area:

Black birch saplings in small clusters or serpentine pattern (seeded in old skid roads).

General comments on silviculture proposed:

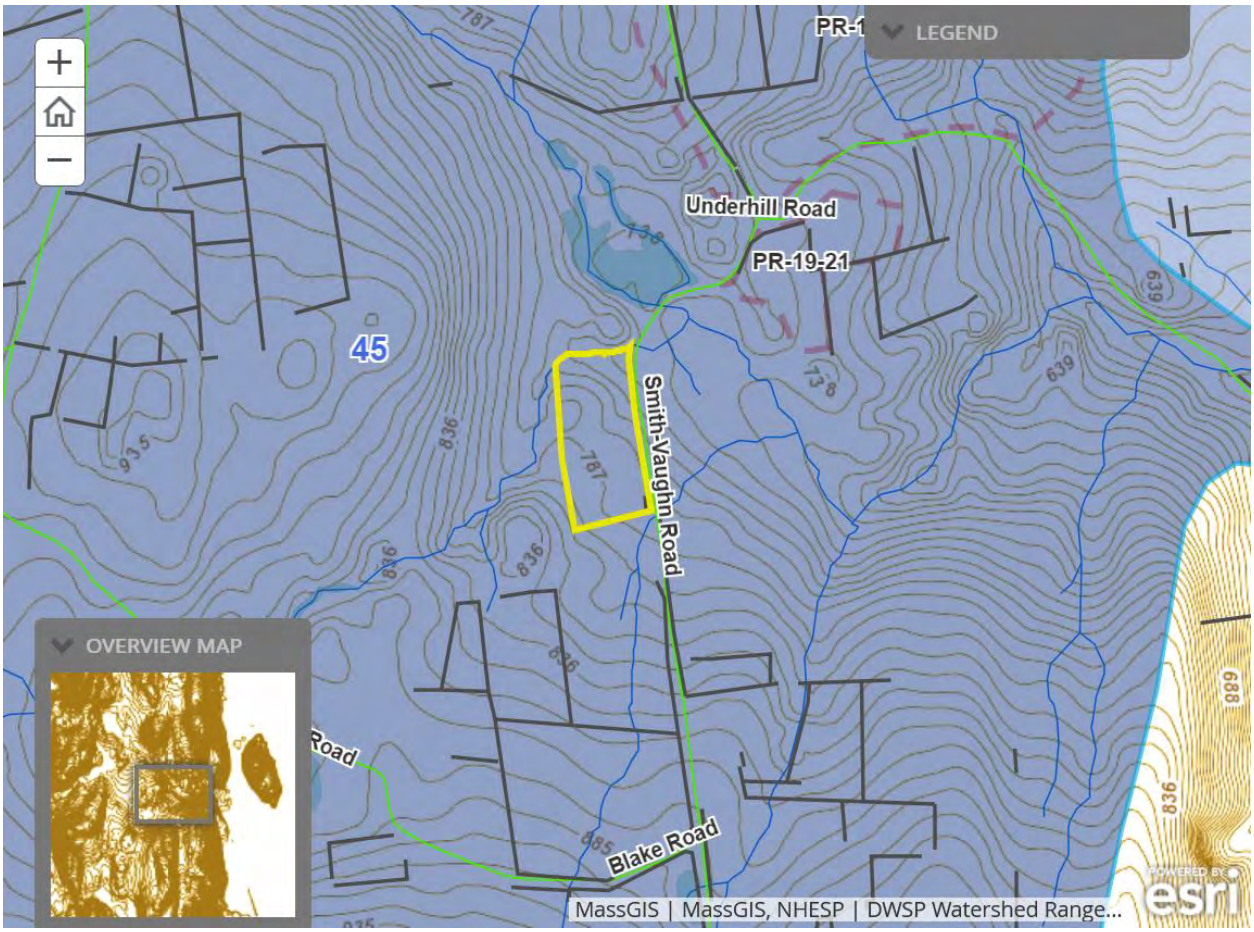
Removing red pine, the primary host of the Red Pine scale is the main silvicultural objective. The insect, originally found in Connecticut in the 1940s, has steadily moved northward and infested many red pine plantations throughout Massachusetts and southern New Hampshire. The microscopic beast completes 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.

The opening will be amid the red pine which will all be harvested. Ranging outward from the red pine, poor quality/diseased white pine will be removed. A residual basal area of no less than 5 sqr. 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
45	1119	32	248	4



Harvesting Limitations

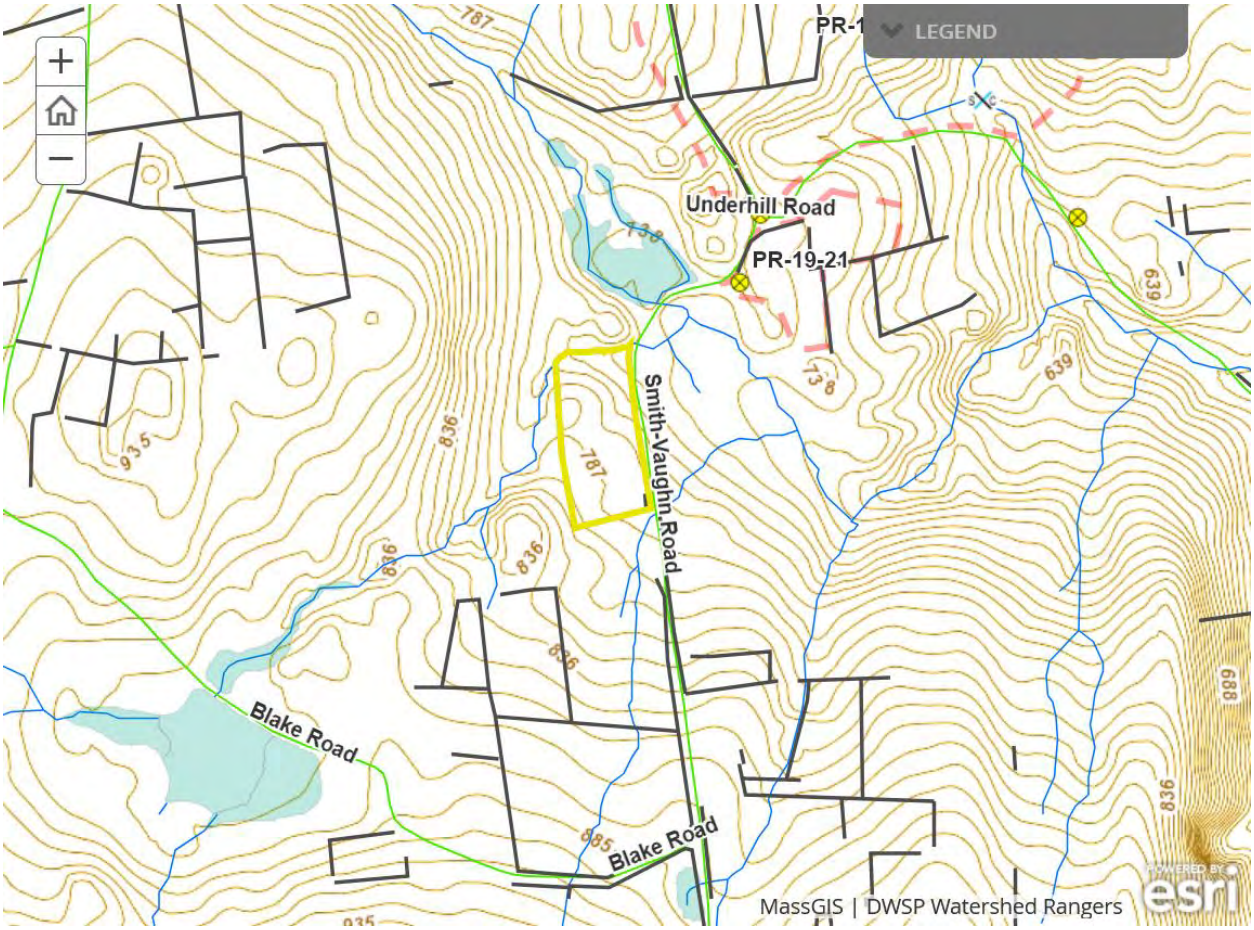
Forwarder required: **Yes**

Feller/processor required: **Yes**

Steep slopes present: **No**

Comments on harvesting limitations:

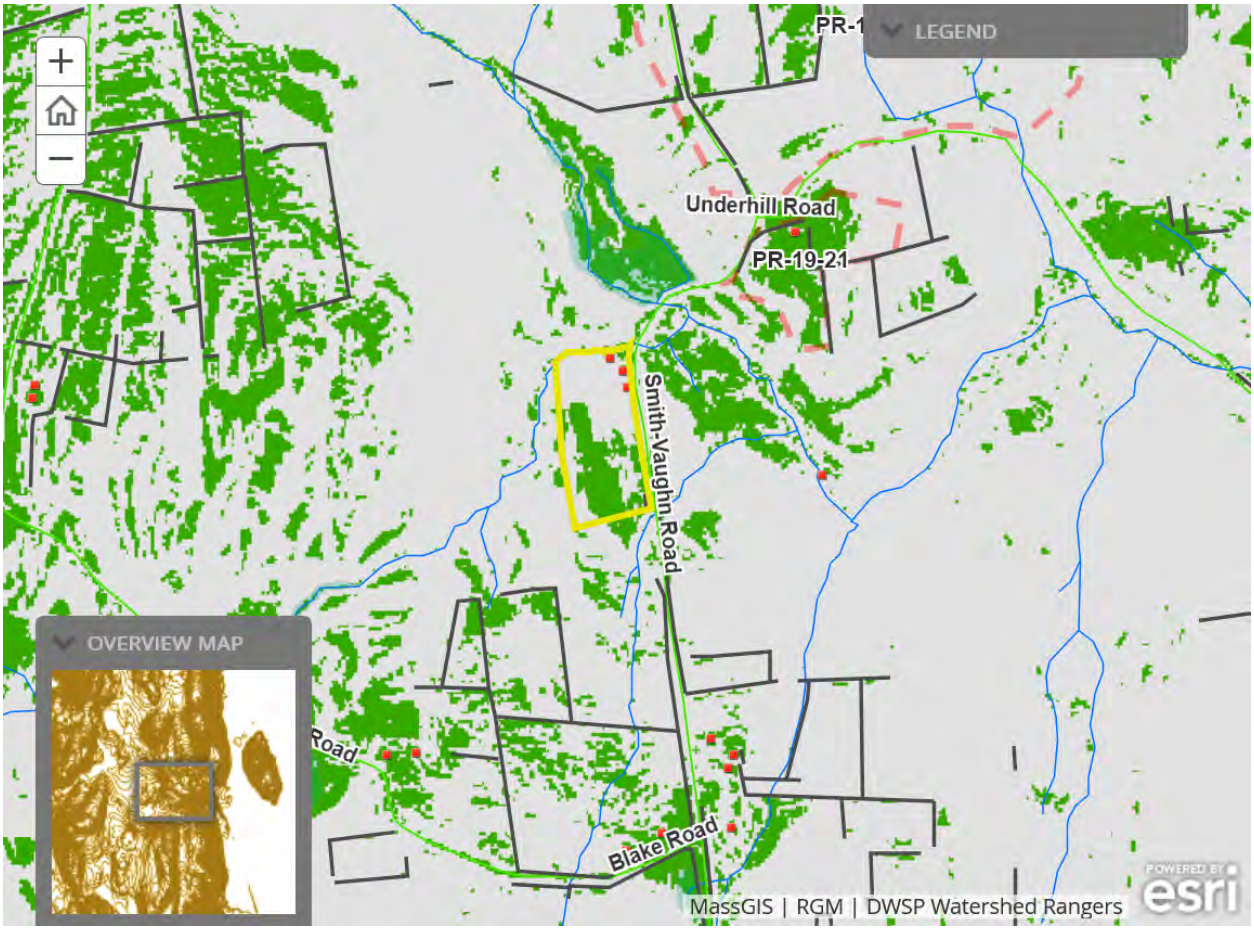
Cut-to-Length harvesting is the ideal system for red pine; the primary forest product of this proposed project.



Cultural Resources

Comments on Cultural Resources:

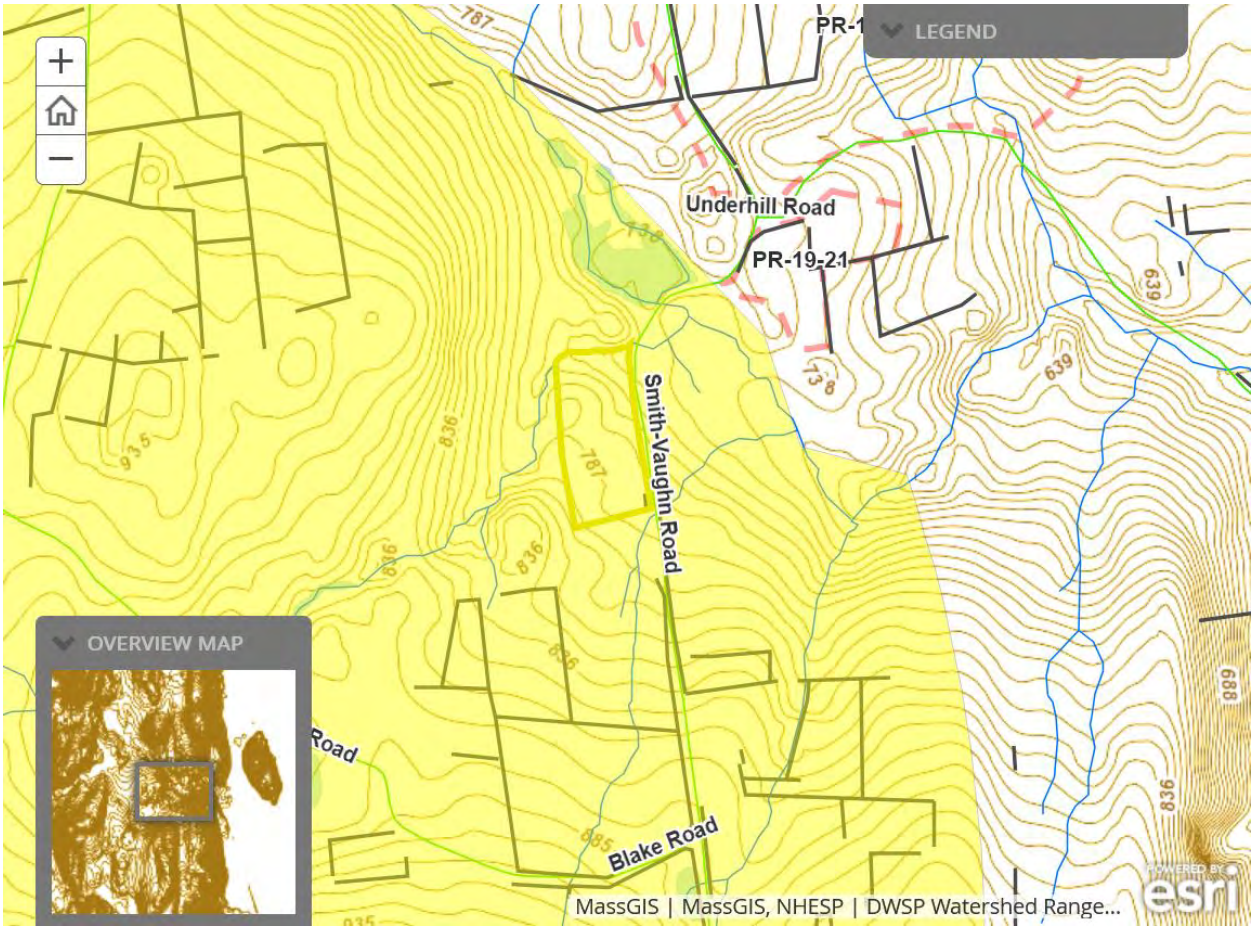
Foundations of two homes are present within the proposal area. Existing barways will be used where feasible and harvest layout will protect walls as much as possible. Foundations will be flagged and avoided. If applicable DWSP will follow any additional recommendations from DCR's Archeologist regarding protection of sensitive sites.



Wildlife Resources & Rare and Endangered Species

Comments on Rare Species/Habitats:

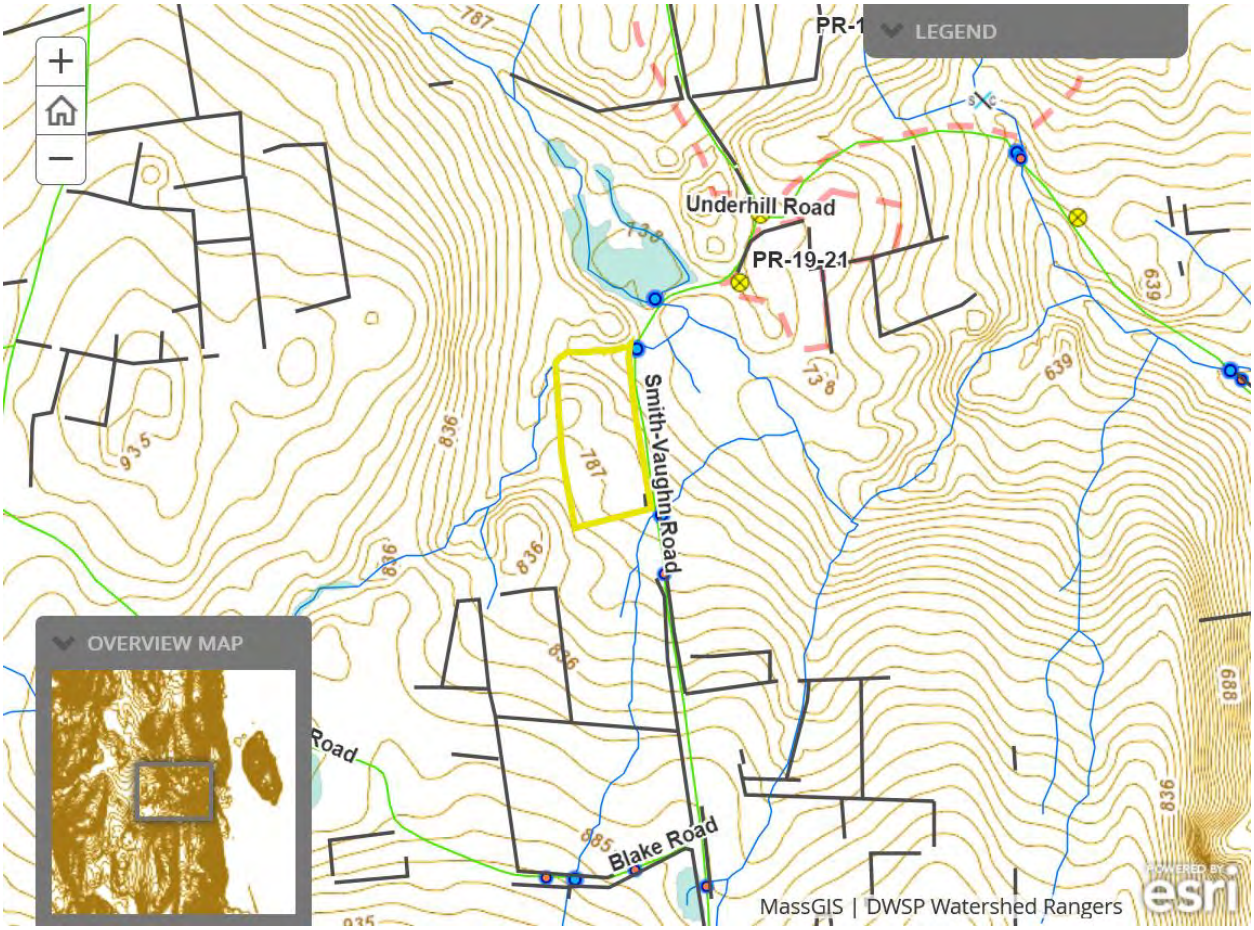
Cavity trees and potential/existing nest trees will be retained if possible. NHESP has determined that certain state-listed sensitive species or habitats may exist within the northern section of the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected 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.



Environmental Quality Engineering

Comments on EQ Issues:

There is possible monitoring opportunities at culverts under the west branch of Underhill Brook along Smith Vaughn Road



Forest Access Engineering

Gravel needed: No

Landing work needed: No

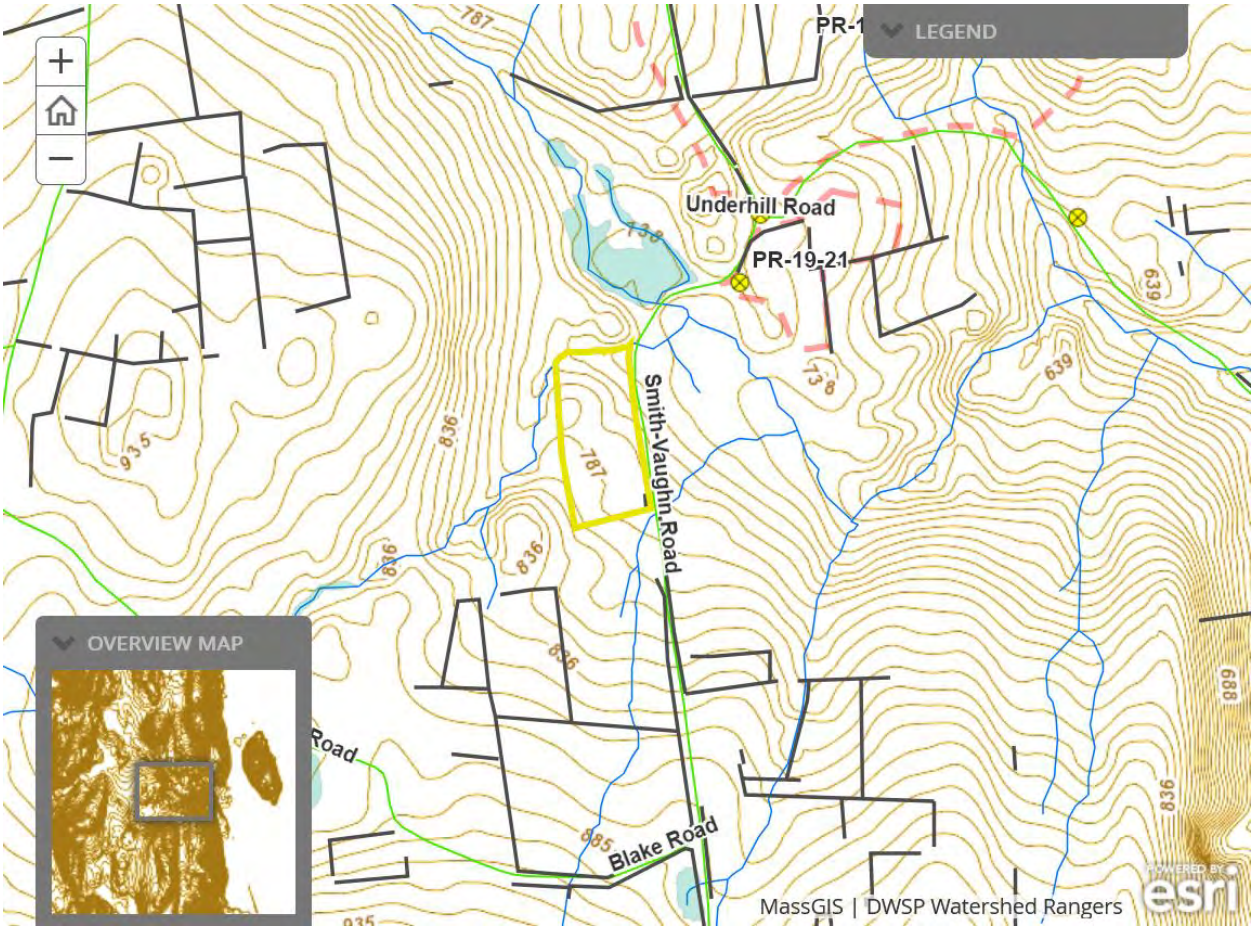
Culverts needed: No

Work needed on permanent bridges: No

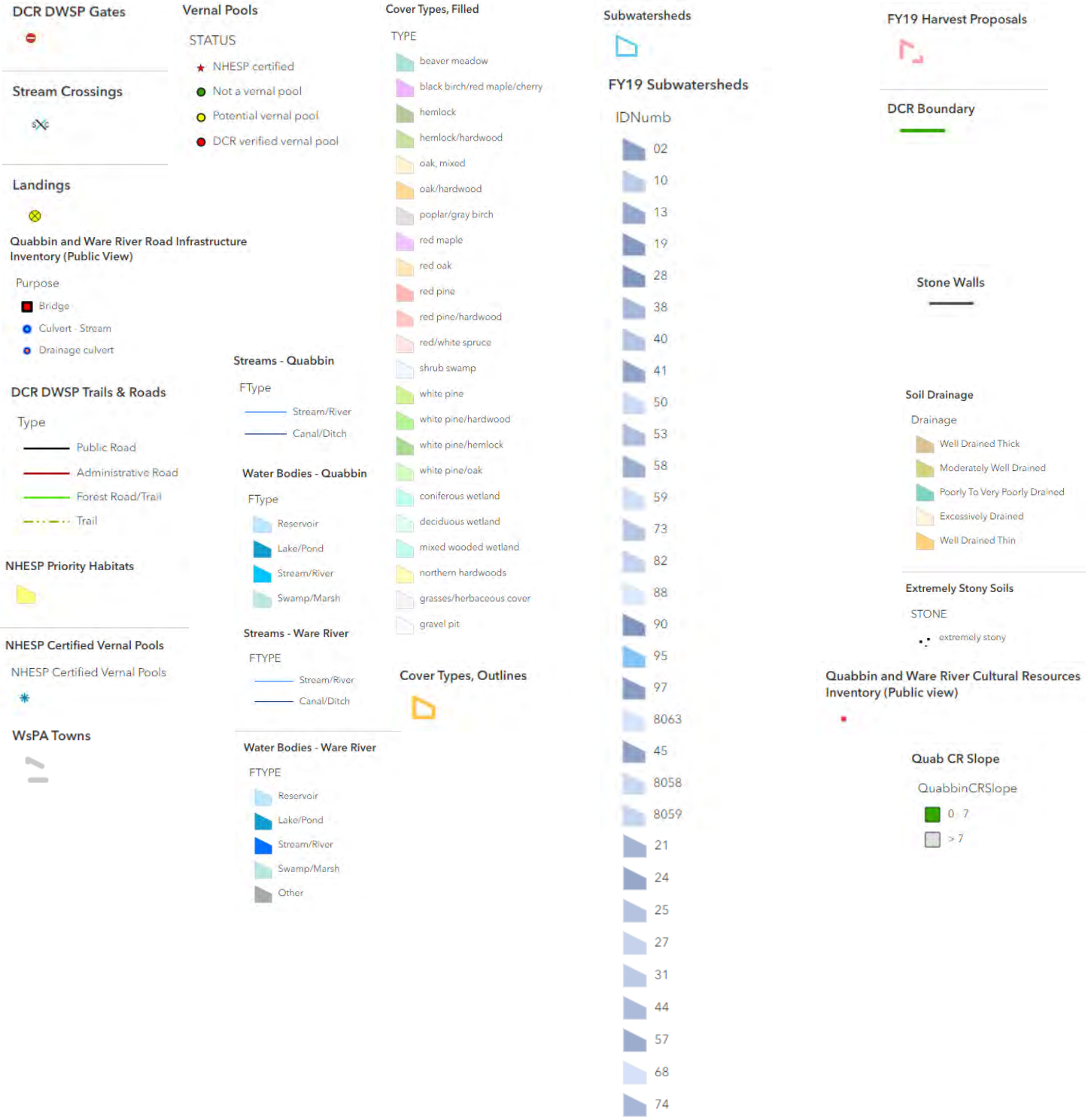
Beaver issue: No

Further comment on access needs:

May need to re-establish side ditches on portion of Smith-Vaughn Road. Section south of Underhill Brook heading up the hill.


LEGEND
OVERVIEW MAP
Underhill Road
PR-19-21
Smith-Vaughn Road
Blake Road
787
836
639
688
935
MassGIS | DWSP Watershed Rangers
esri

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



Quabbin Harvest Proposal PR-19-20B

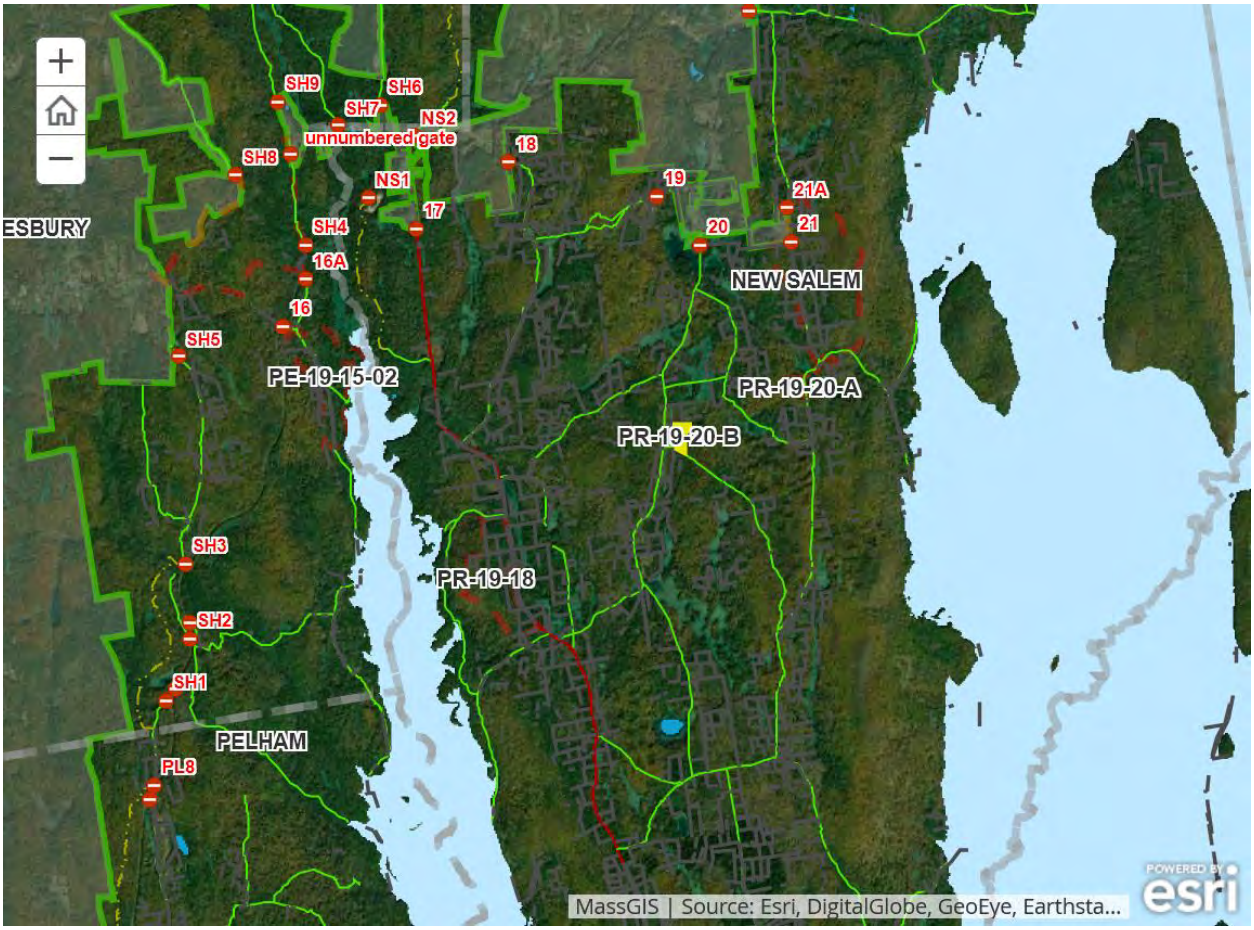
Proposal Goals

The purpose of this proposed project is to increase native forest diversity and resilience. The area is a red pine plantation. The preceding decade was 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 North Prescott Rd. (gate 20) by intersection 20-4.

Total Acres: 4



General Description

	Overstory Type(s)	Acres
Dominant	Red pine	3
Secondary	Oak/hardwood	1

	Understory Type(s)
Dominant	Tree seedlings/saplings dominate the site
Secondary	Dry site - blueberry/huckleberry

Description of forest composition/condition:

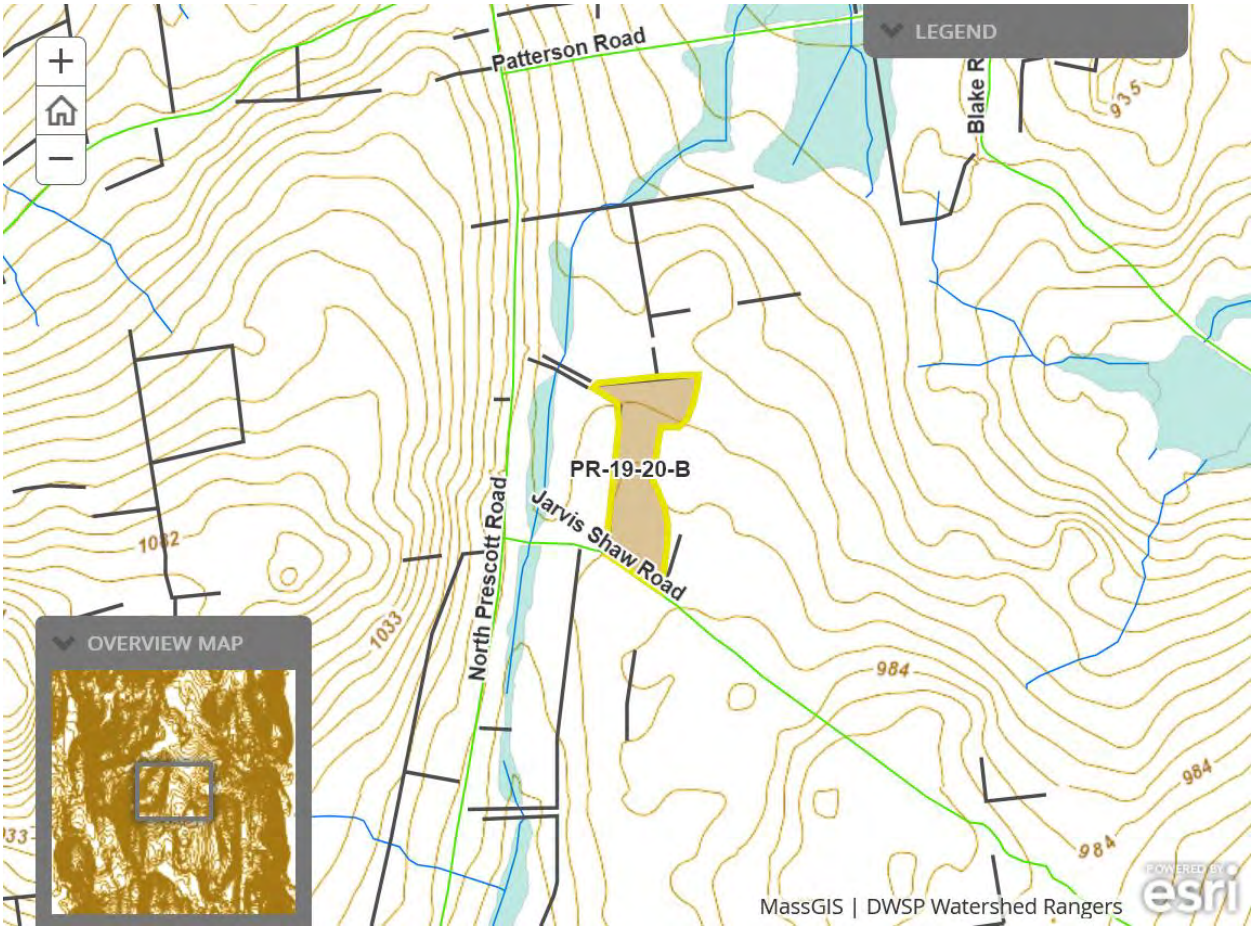
Prior to state ownership, the site was likely used as improved pasture being part of the Walter & Jerusha Waugh farmstead at time of taking. Believing that forest cover is the best filter and conservator of water, early watershed managers were quick to reforest these open areas with a monoculture of mainly Red Pine, White Pine, Norway Spruce or a combination. Most of these watershed plantations were seeded in the late 1930s through the early 1940s (CCC era).

Majority of forest cover is sawtimber size red pine (plantation) that easterly transitions into pole and sawtimber size mixed oak/mixed hardwood. The plantation has about 5-10% mortality (not bad considering the red pine scale infestation dating back to the mid 2000s in the greater Quabbin area). A regeneration layer of sapling/pole black birch, white pine and oak has developed following a prep harvest completed in 2001.

Soils

Drainage Class	%
Excessively Drained	0
Well Drained Thin	0
Well Drained Thick	0
Moderately Well Drained	100
Poorly to Very Poorly Drained	0

Montauk Fine Sandy Loam: A well drained gneiss derived friable loamy till over a firm sandy lodgement till.



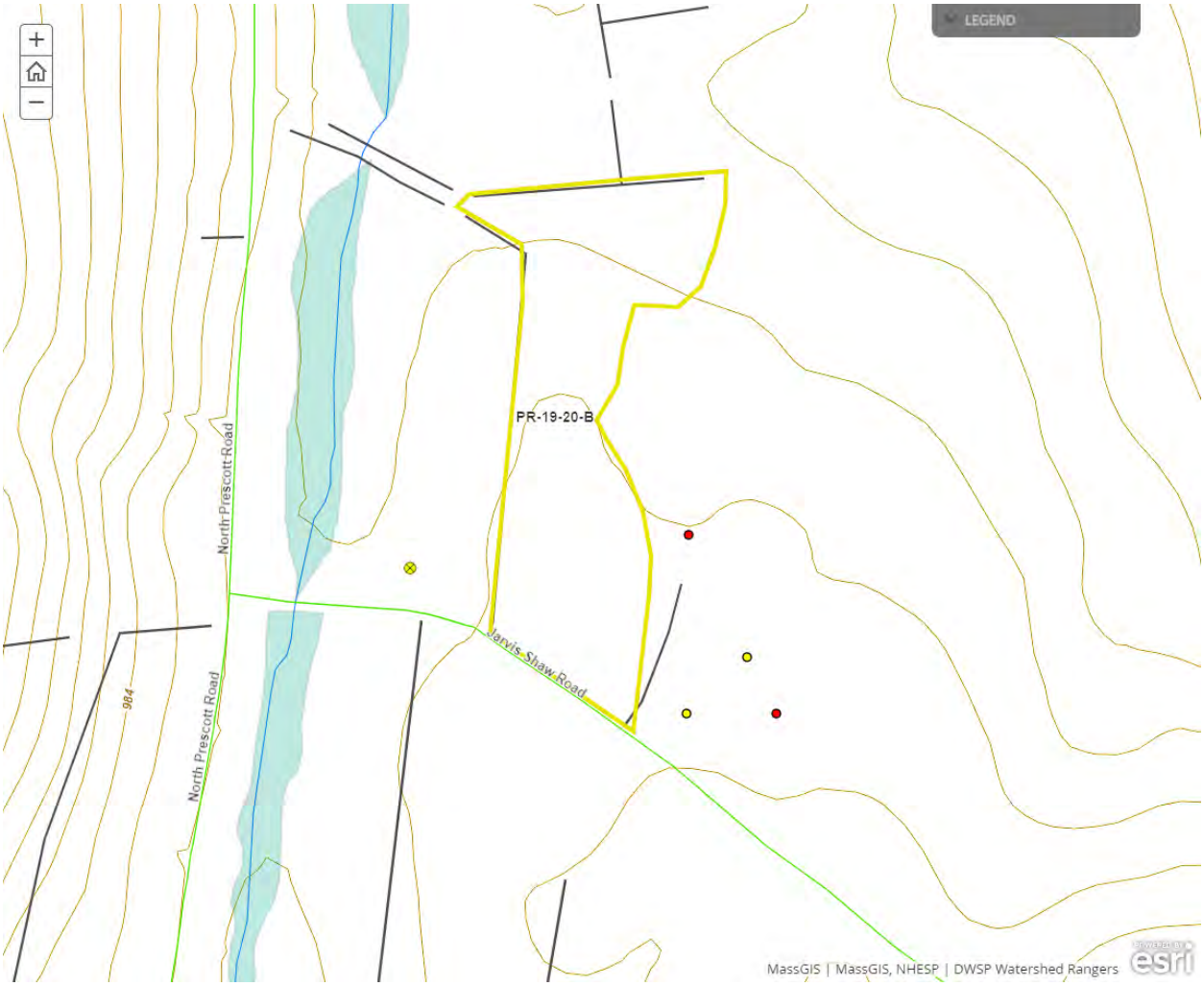
Wetlands

- Wetlands present? - **No**
- Streams present? - **Yes**
- Vernal pools present? - **Yes**
- Seeps present? - **None known**
- Are stream crossings required? - **No**
- Are wetland crossings required? - **No**
- Is logging in filter strips planned? - **Yes**
- Is logging in wetlands planned? - **No**

Further comments on wetlands:

The southeast edge of the proposal area is flanked by two vernal pools. These pools were derived from gravel extraction and the residual barrow pit left after excavation. The northern pool is encompassed by a 1 foot high metal shield; the remains of what appears to be a biological study.

All appropriate buffers will be placed around the pools in accordance with DWSP policy and [Massachusetts state Forestry Best Practices](#).



Silviculture

Acres in Intermediate cuts: **0**

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

Acres in Regeneration cuts: **4**

Average regen opening size: **4**

Maximum regen opening size: **4**

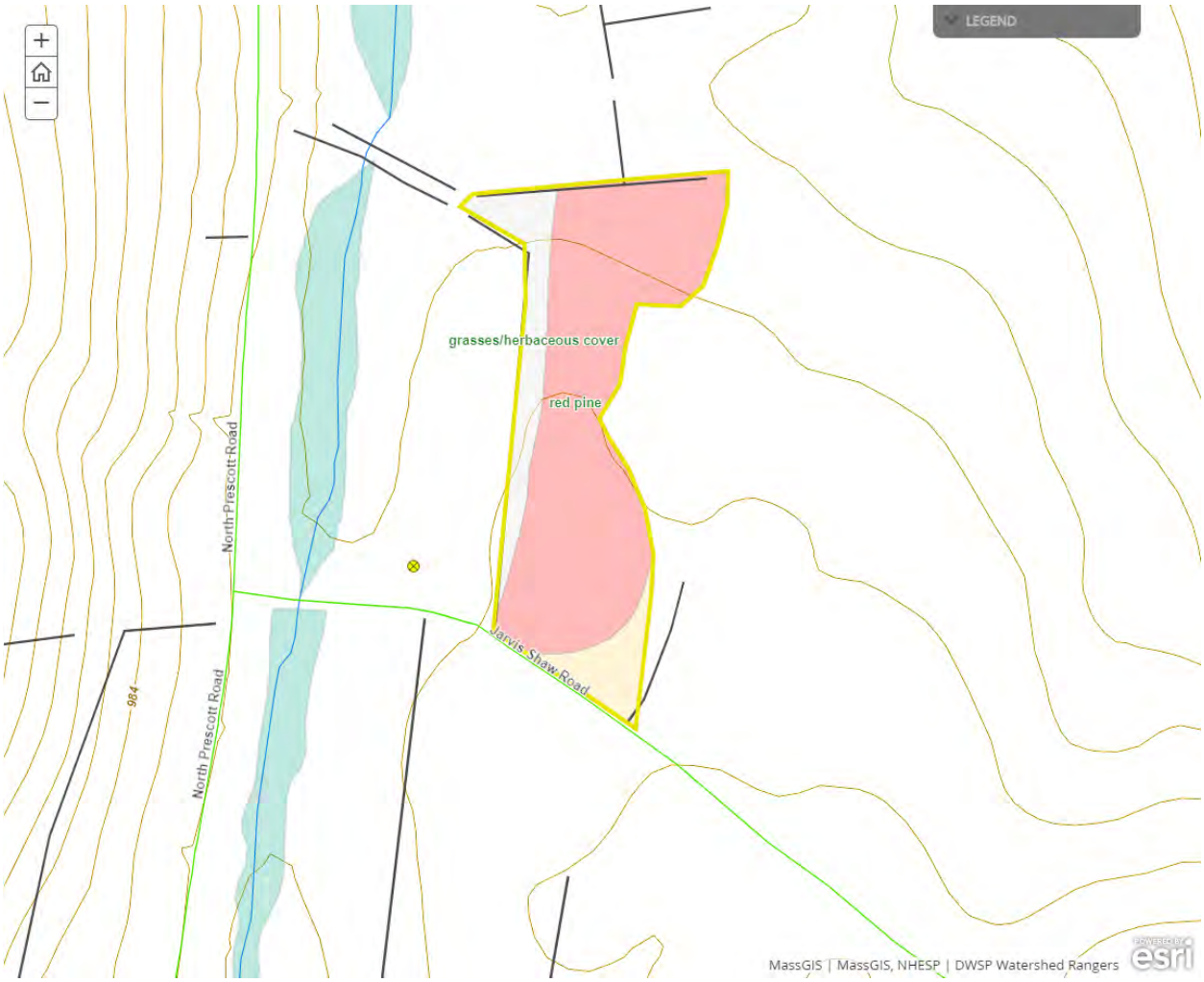
Description of advance regeneration in proposal area:

A diffuse layer of sapling/pole size black birch, white pine and oak (mostly scarlet, white and black) in adequate numbers cover the area. Most of regeneration has gotten above browse height.

General comments on silviculture proposed:

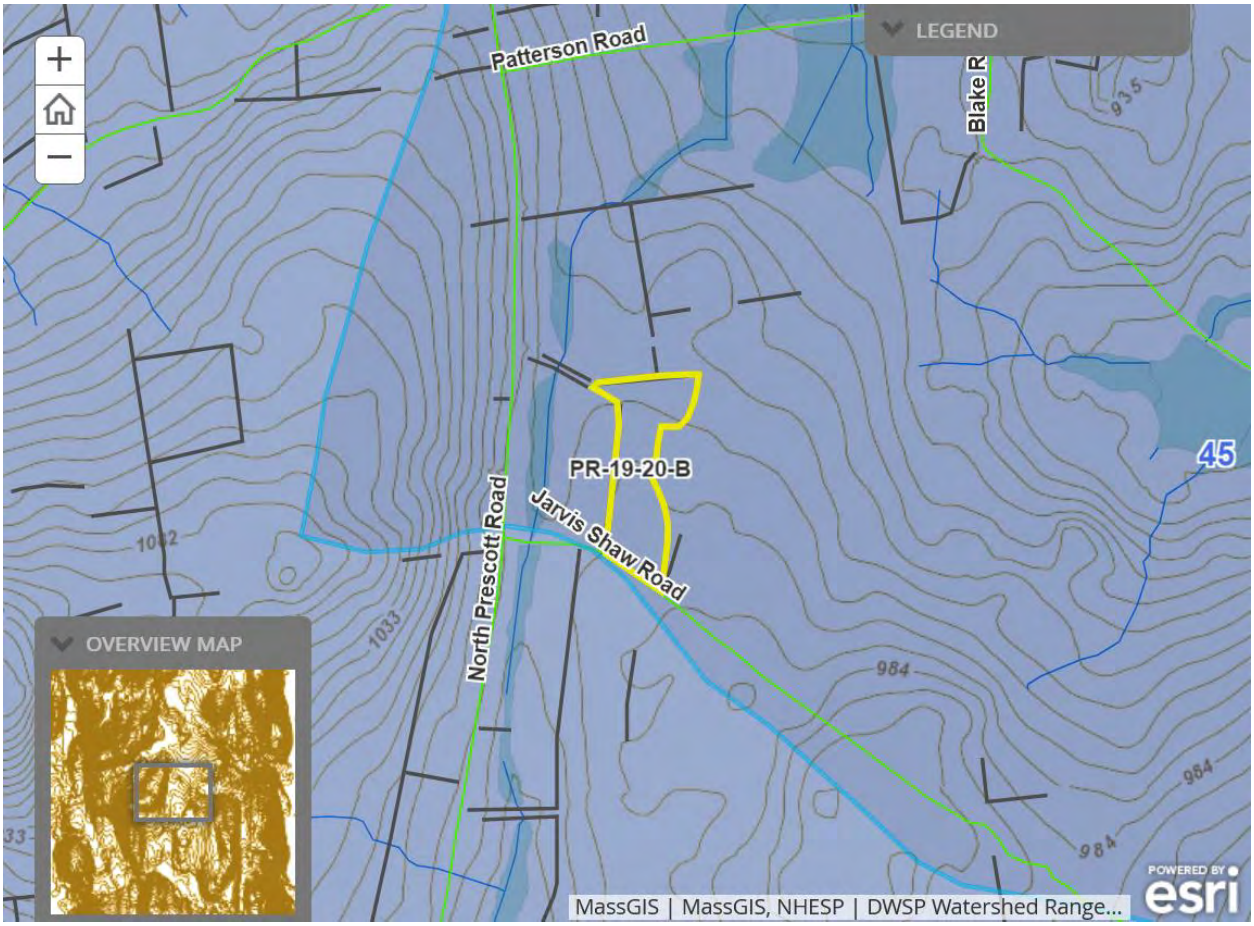
Removing red pine, the primary host of the Red Pine scale is the main silvicultural objective. The insect, originally found in Connecticut in the 1940s, has steadily moved northward and infested many red pine plantations throughout Massachusetts and southern New Hampshire. The microscopic beast completes 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.

The opening will be amid the red pine all of which will be harvested then range eastward removing poor quality hardwood. A 100 foot filter strip will be established along the west edge of the vernal pools to maintain a shaded condition. Within the opening a residual basal area of no less than 5 sqr. ft. per acre will mostly be composed of well formed hardwood, as well as live and dead snags. Significantly dropping the basal area will fully release the advance regeneration started back in 2001 and foster the continued development of this young forest age class.



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
45	1119	32	248	3.5



Harvesting Limitations

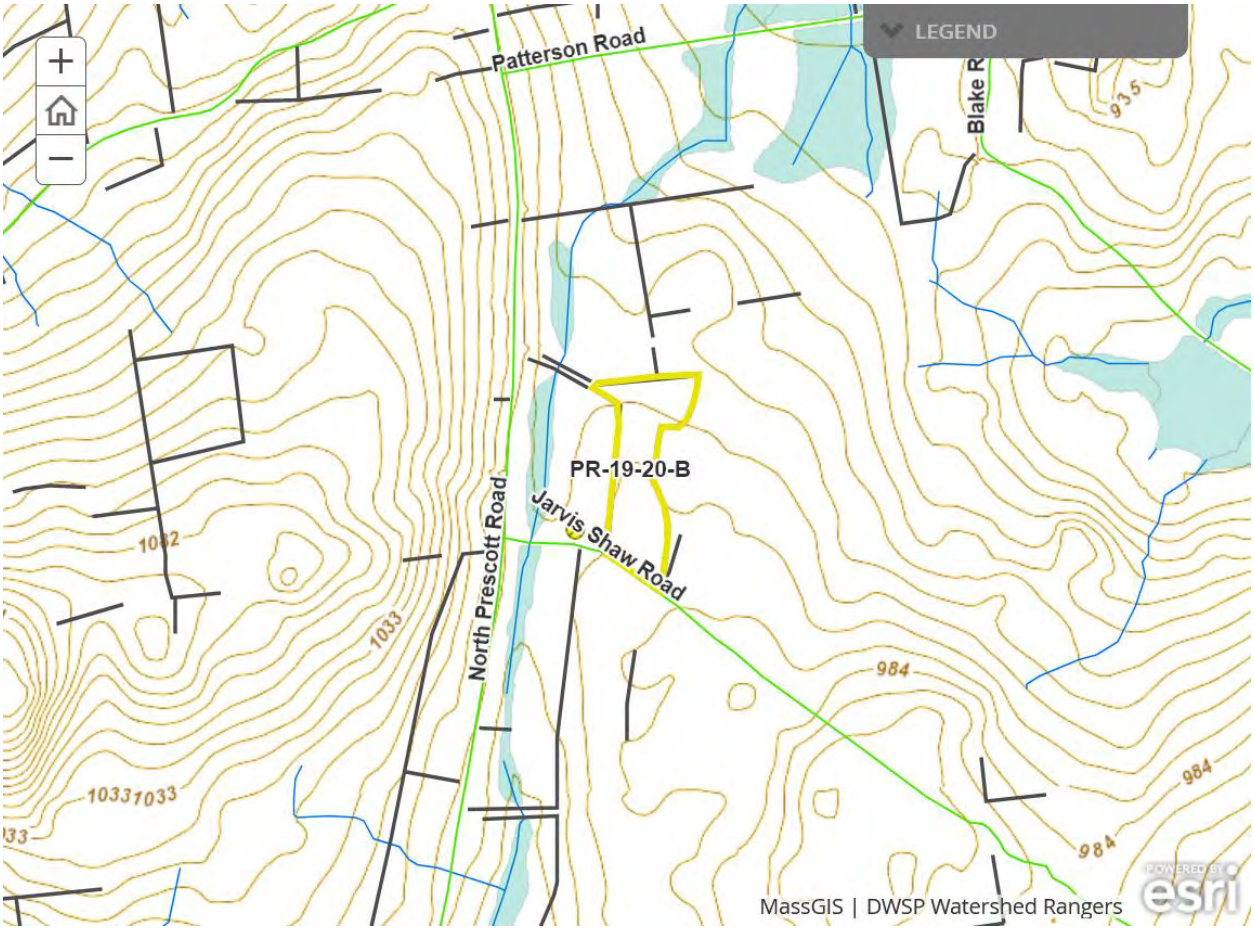
Forwarder required: **Yes**

Feller/processor required: **Yes**

Steep slopes present: **No**

Comments on harvesting limitations:

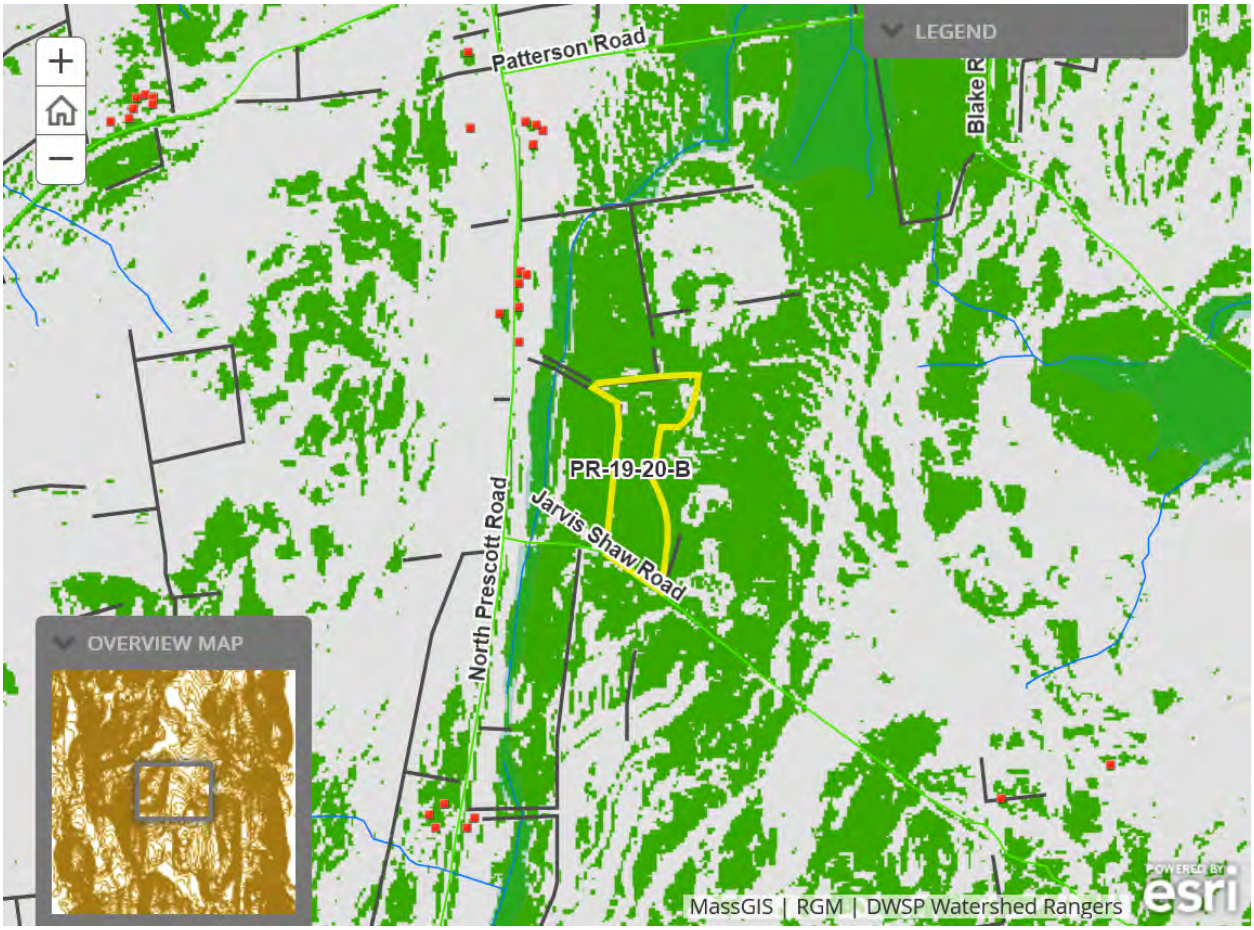
Cut-to-Length harvesting is the ideal system for red pine; the primary forest product of this proposed project.



Cultural Resources

Comments on Cultural Resources:

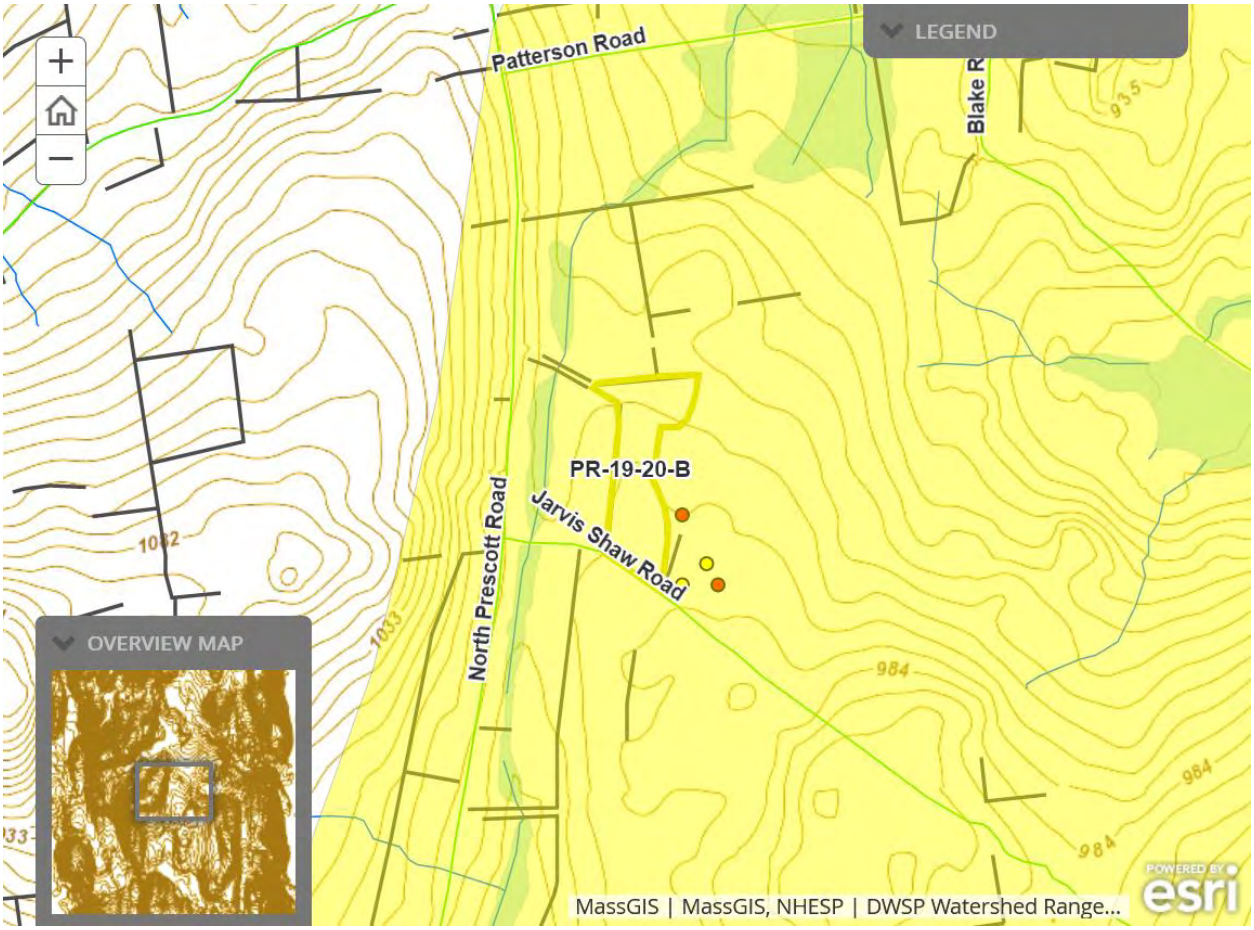
Existing barways will be used where feasible and harvest layout will protect walls as much as possible. If applicable DWSP will follow any additional recommendations from DCR's Archeologist regarding protection of sensitive sites.



Wildlife Resources & Rare and Endangered Species

Comments on Rare Species/Habitats:

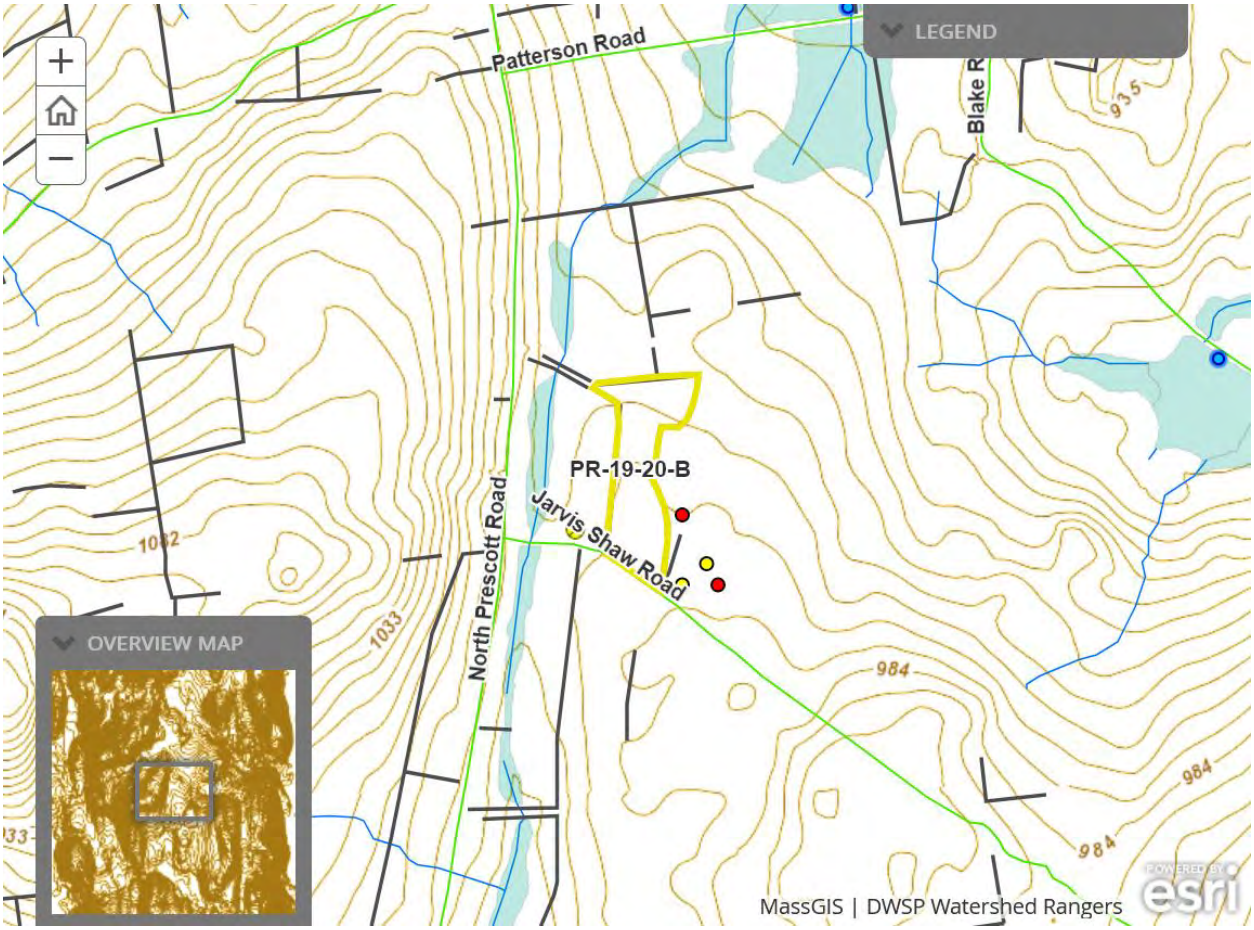
Cavity trees and potential/existing nest trees will be retained if possible. NHESP has determined that certain state-listed sensitive species or habitats may exist within the northern section of the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected 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.



Environmental Quality Engineering

Comments on EQ Issues:

There is possible monitoring opportunities at culverts under the west branch of Underhill Brook along Smith Vaughn Road.



Forest Access Engineering

Gravel needed: No

Landing work needed: No

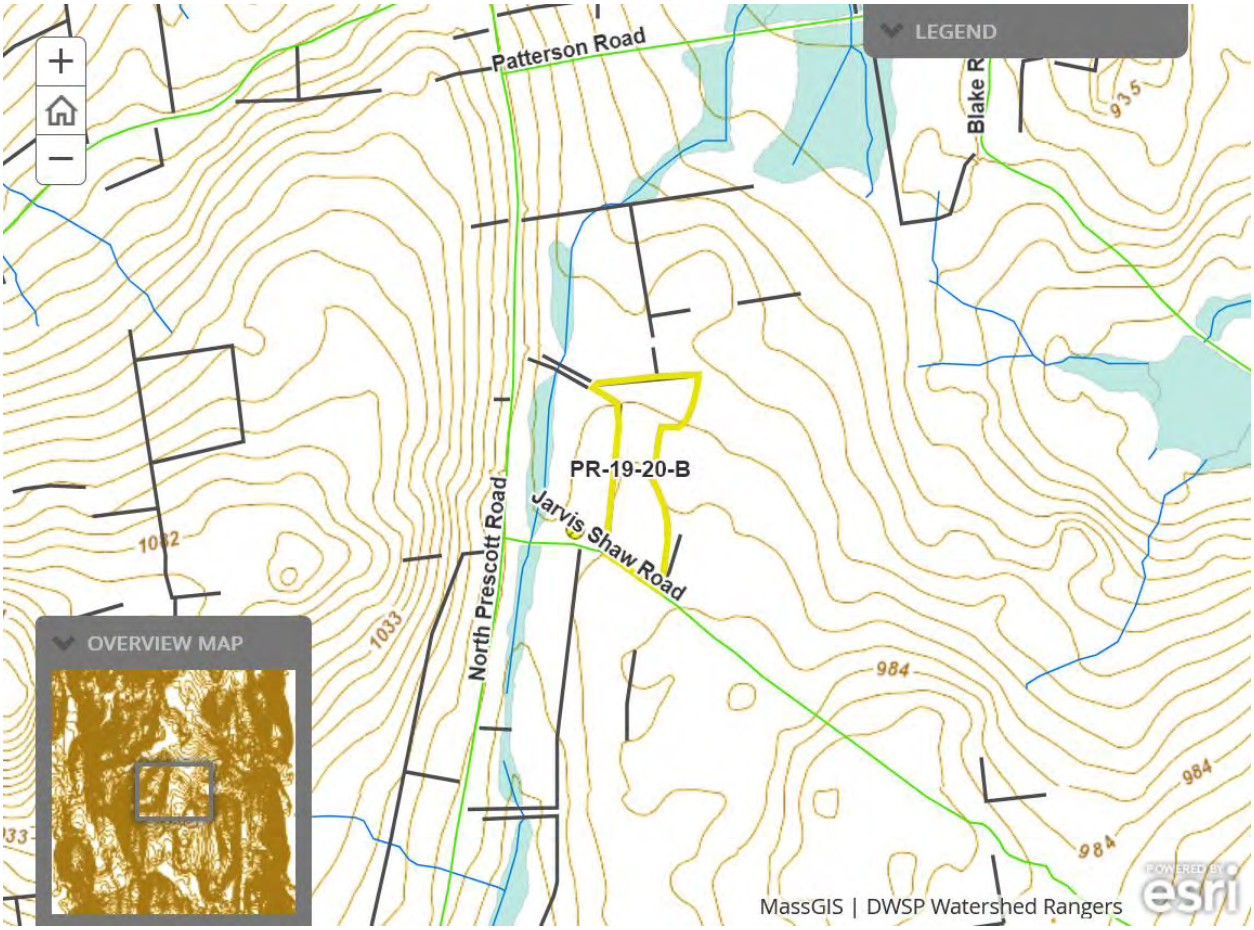
Culverts needed: No

Work needed on permanent bridges: No

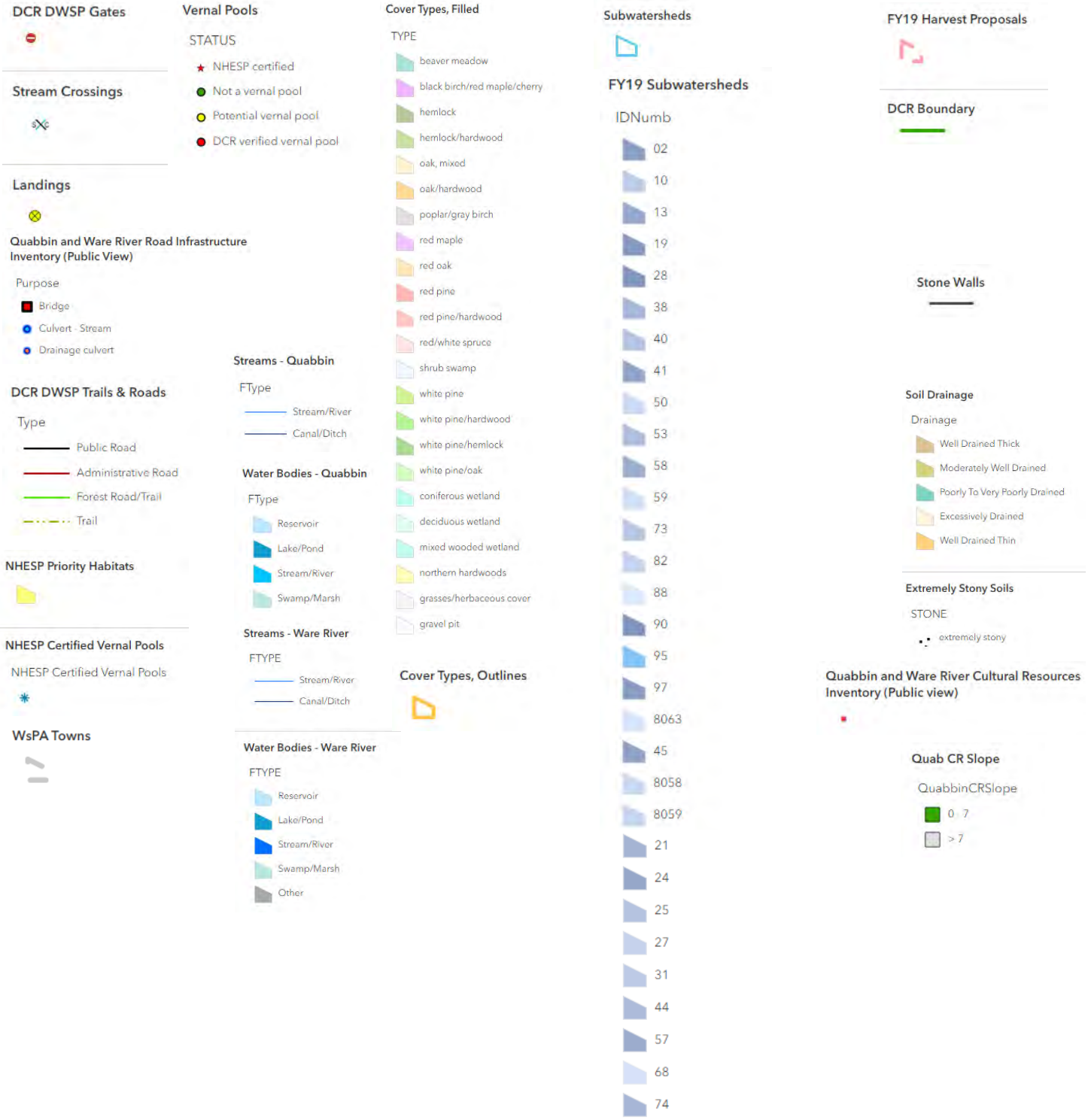
Beaver issue: No

Further comment on access needs:

None.


LEGEND
Patterson Road
Blake R
935
PR-19-20-B
Jarvis Shaw Road
North Prescott Road
1032
1033
984
984
984
OVERVIEW MAP
MassGIS | DWSP Watershed Rangers
esri

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



Quabbin Harvest Proposal PR-19-21

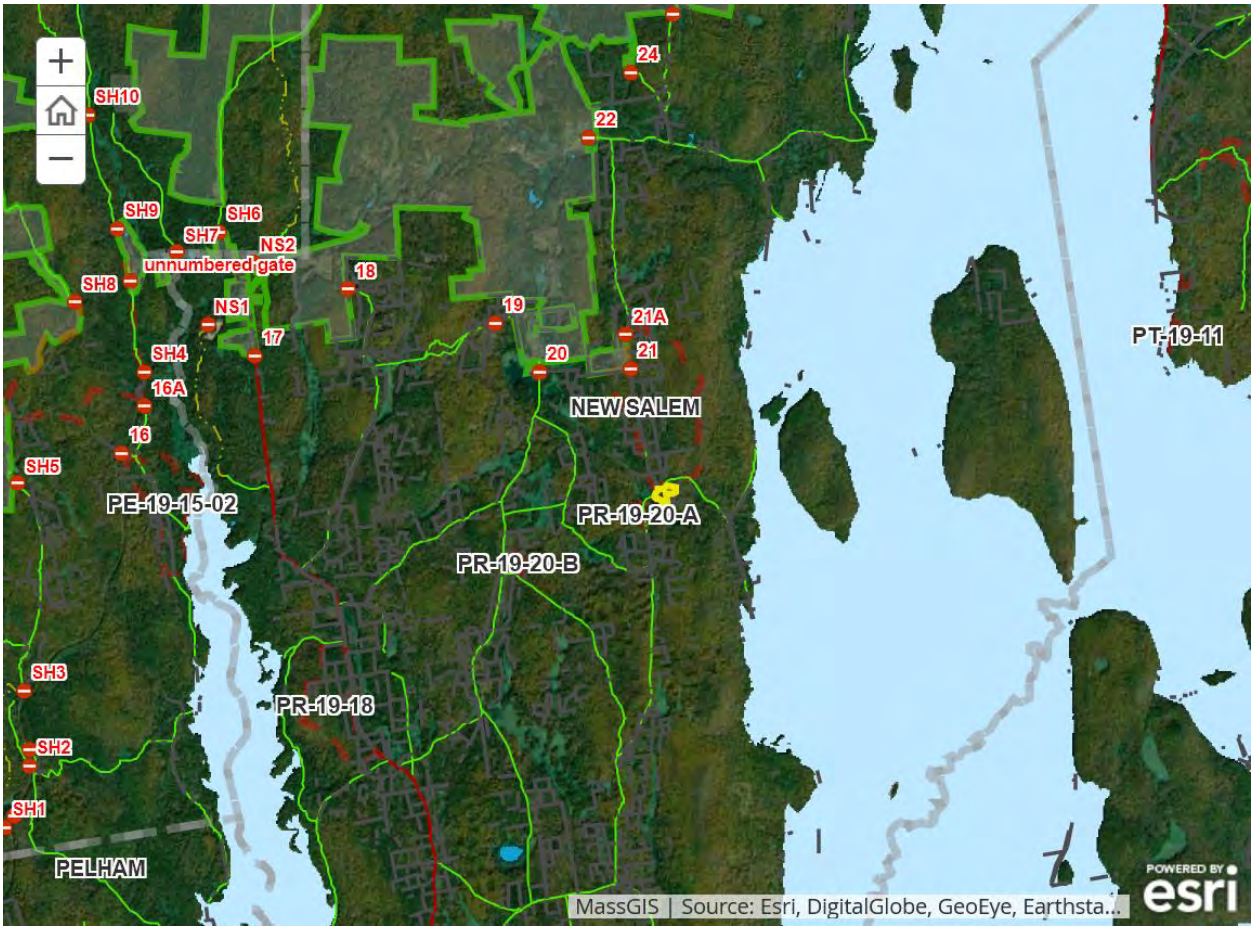
Proposal Goals

The purpose of this proposed project is to increase native forest diversity and resilience. The area is a red 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 Vaughn Rd (gate 21) at intersection 21-1.

Total Acres: 4



General Description

	Overstory Type(s)	Acres
Dominant	Red pine	3
Secondary	White pine	1

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

Description of forest composition/condition:

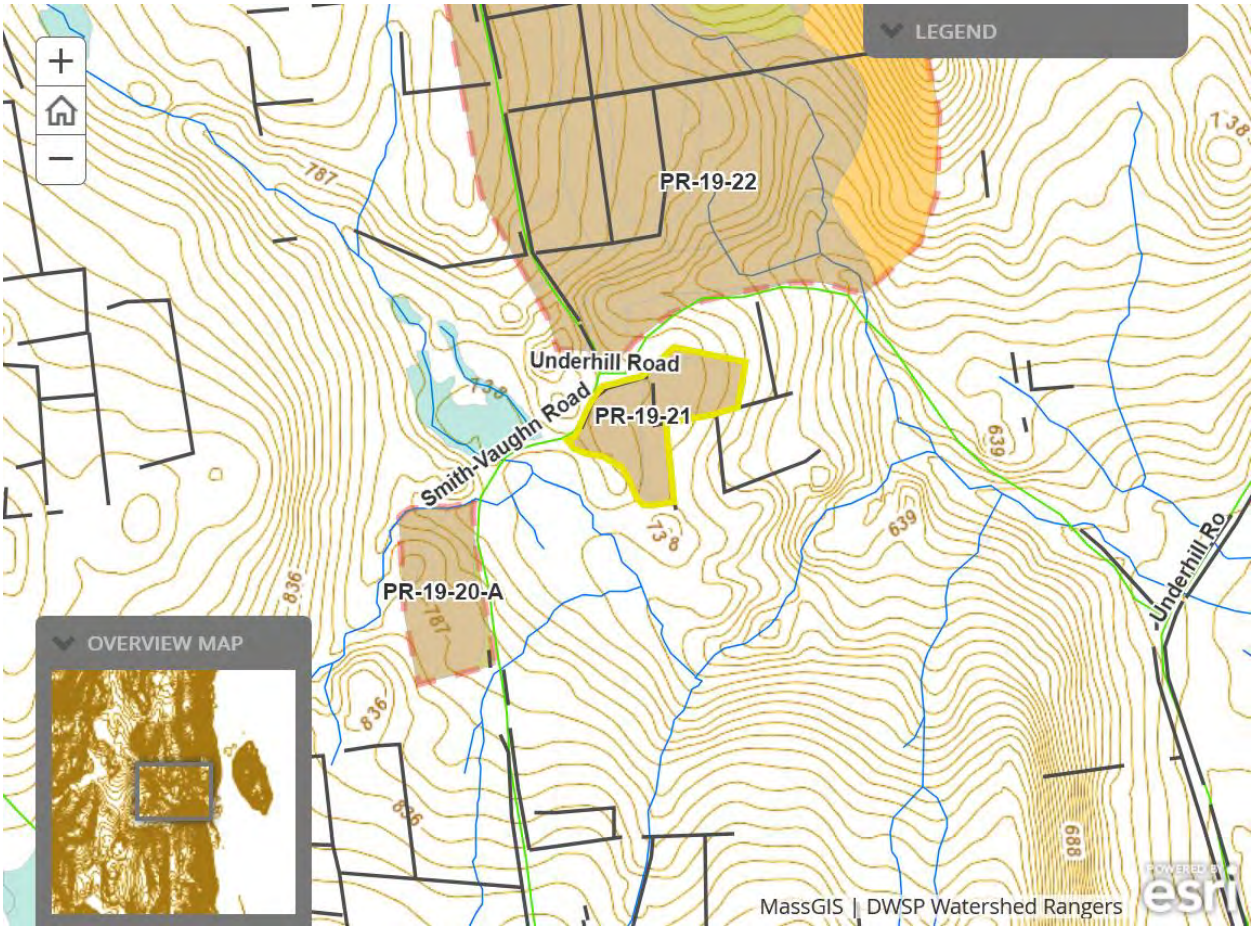
Prior to state ownership, the site was likely used as crop land (arable) and/or improved pasture being part of the Thomas S. Mann Jr. farmstead at time of taking. Believing that forest cover is the best filter and conservator of water, early watershed managers were quick to reforest these open areas with a monoculture of mainly Red Pine, White Pine, Norway Spruce or a combination. Most of these watershed plantations were seeded in the late 1930s through the early 1940s (CCC era).

Majority of forest cover is sawtimber size red pine (plantation) with fairly good quality white pine sawtimber interspersed. The plantation has little to no mortality from red pine scale; but sign of infestation is not far away. A regeneration layer of mainly sapling/pole black birch developed after a 1986 thinning.

Soils

Drainage Class	%
Excessively Drained	0
Well Drained Thin	75
Well Drained Thick	0
Moderately Well Drained	25
Poorly to Very Poorly Drained	0

Canton fine sandy loam: Upland rocky well drained soil derived from gneiss and schist loam over a rock till
Montauk Fine Sandy Loam: Stony, well drained soil derived from gneiss.

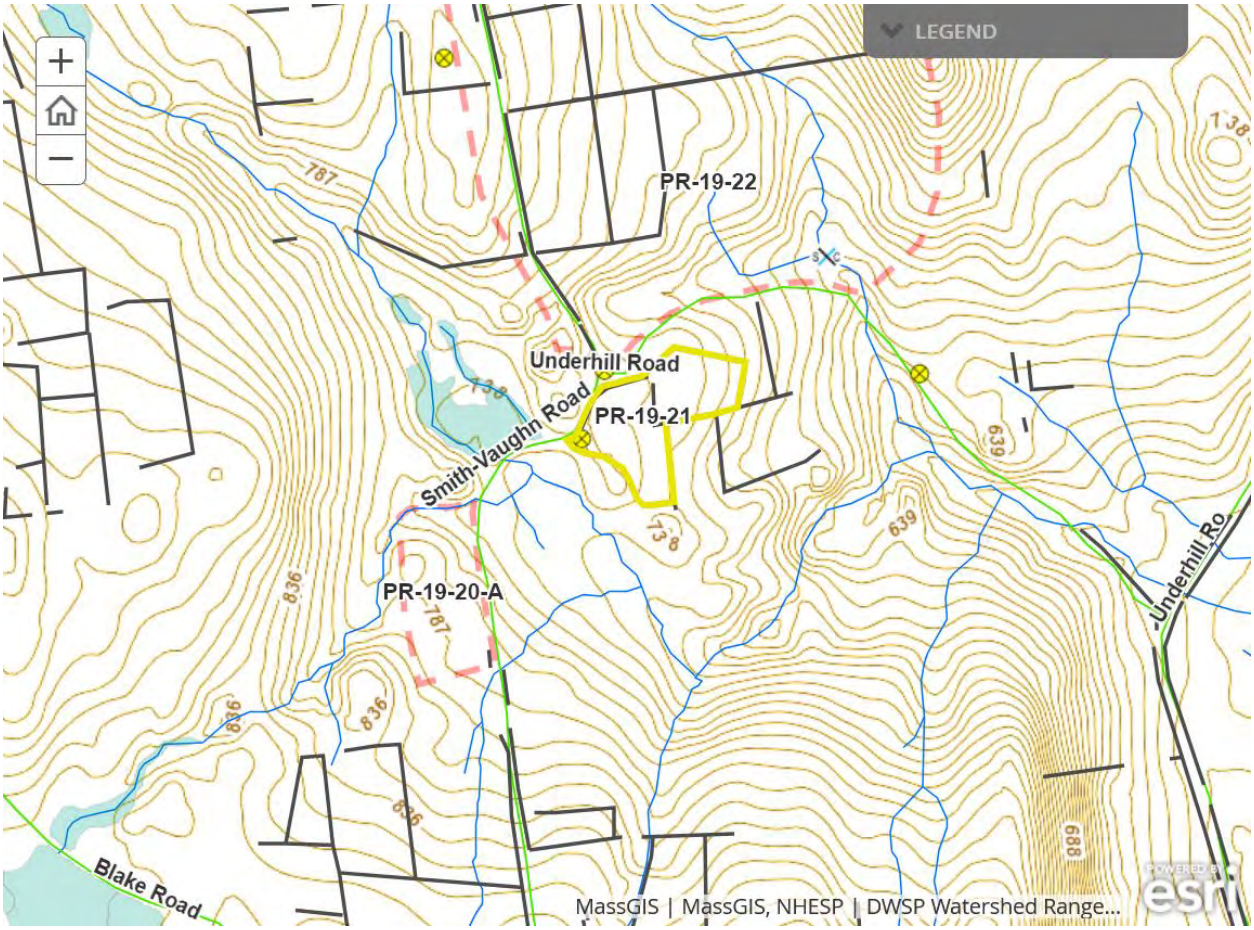


Wetlands

- Wetlands present? - **No**
- Streams present? - **Yes**
- 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? - **Yes**
- Is logging in wetlands planned? - **No**

Further comments on wetlands:

The west boundary of the proposal area is about 100 ft. from the west branch of Underhill Brook. A slight filter strip overlap is possible along the area's west boundary.



Silviculture

Acres in Intermediate cuts: **0**

Acres in prep/establishment cuts: 0

Acres in Regeneration cuts: **4**

Average regen opening size: **4**

Maximum regen opening size: **4**

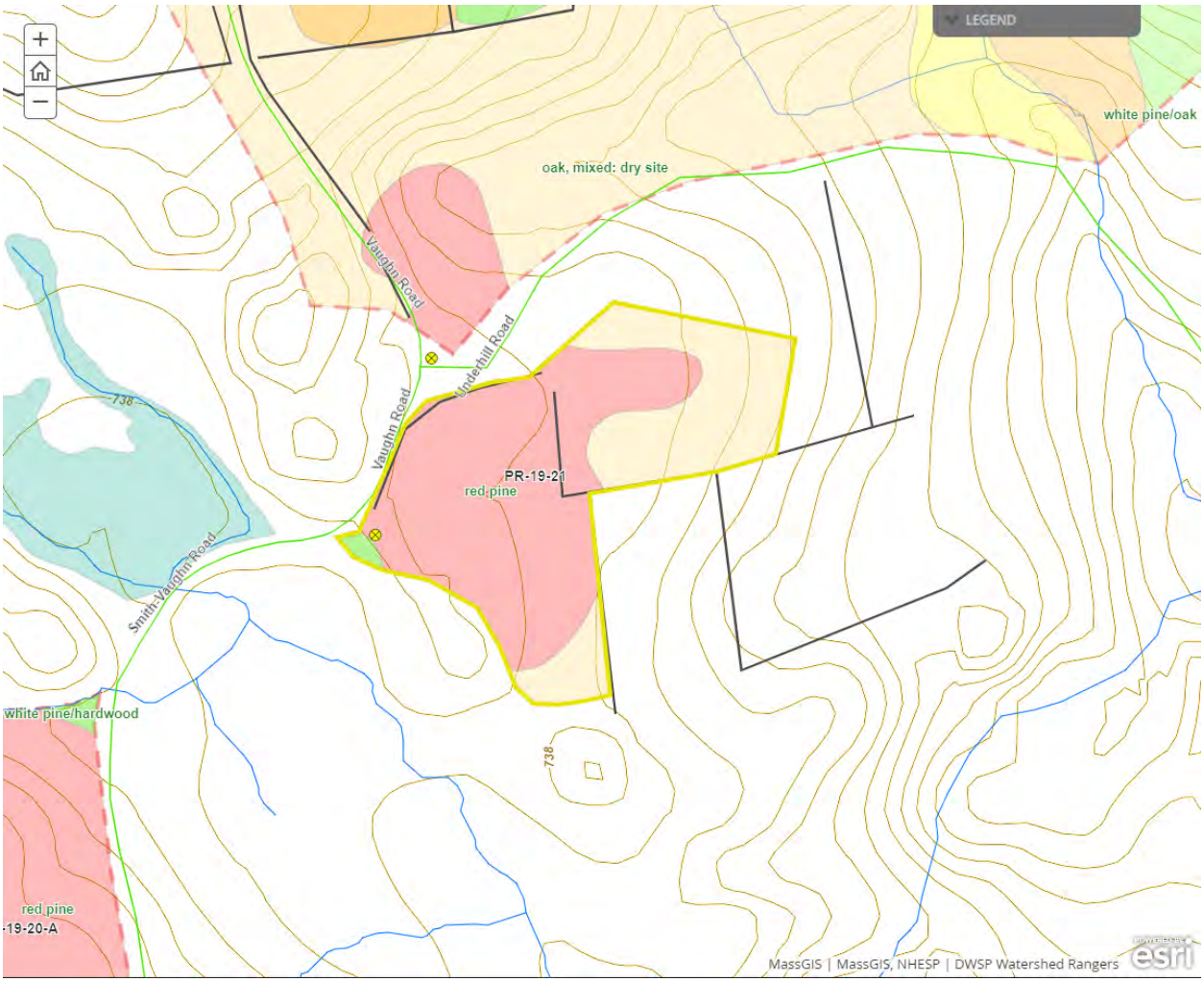
Description of advance regeneration in proposal area:

Mostly black birch that has been stagnating since crown closure likely 20 years ago.

General comments on silviculture proposed:

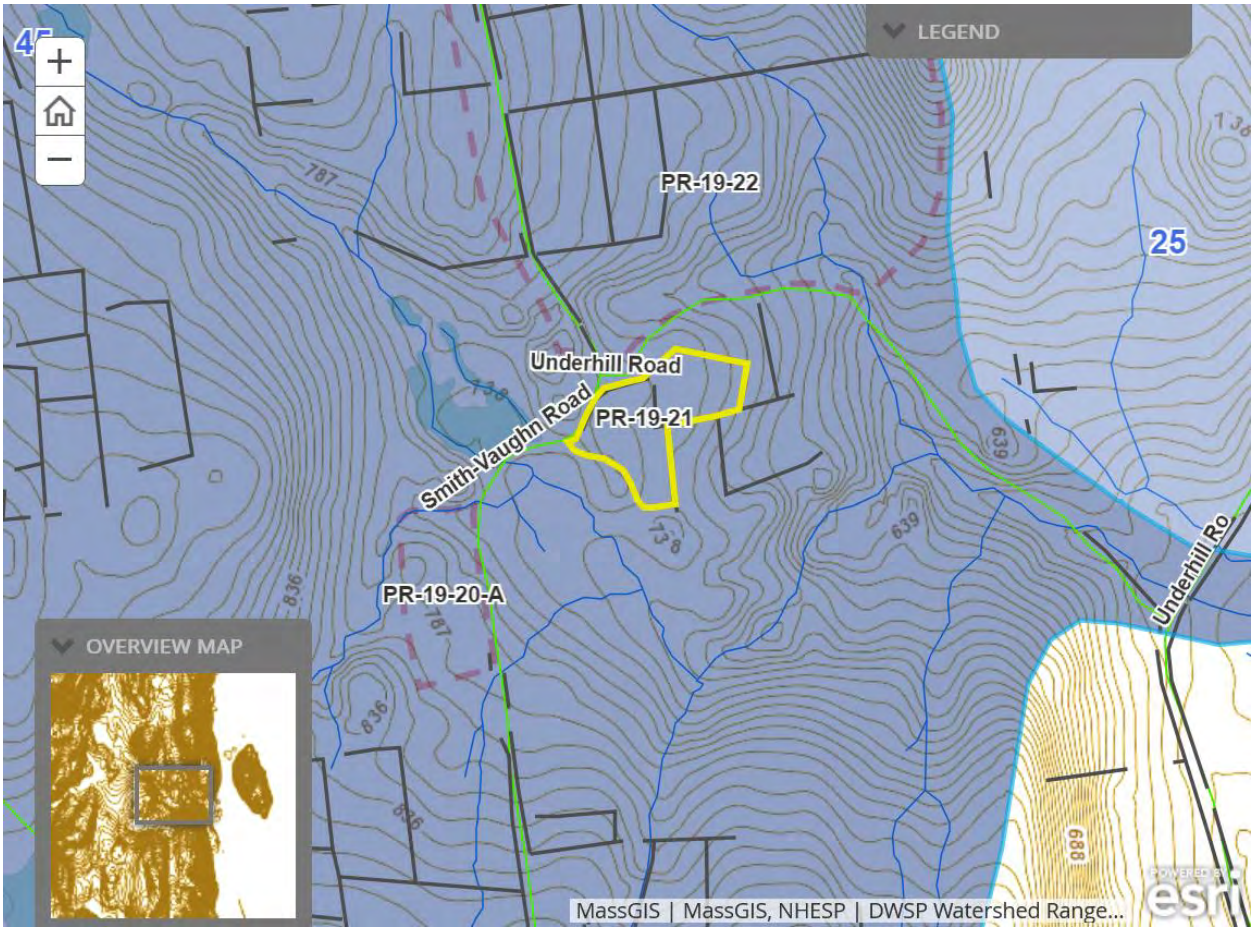
Removing red pine, the primary host of the Red Pine scale is the main silvicultural objective. The insect, originally found in Connecticut in the 1940s, has steadily moved northward and infested many red pine plantations throughout Massachusetts and southern New Hampshire. The microscopic beast completes 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.

The opening will be amid the red pine all of which will be harvested then range radially removing poor quality timber. The approach will create a feathered or thinned edge to the opening. As necessary, an appropriate width filter strip would be established along the west branch of Underhill Brook for maintenance of a shaded condition. Within the opening a residual basal area of no less than 5 sqr. ft. per acre will mostly be composed of well formed white pine, as well as live and dead snags. Day lighting the area should hopefully foster a diversity of native natural regeneration.



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
45	1119	32.5	248	4



Harvesting Limitations

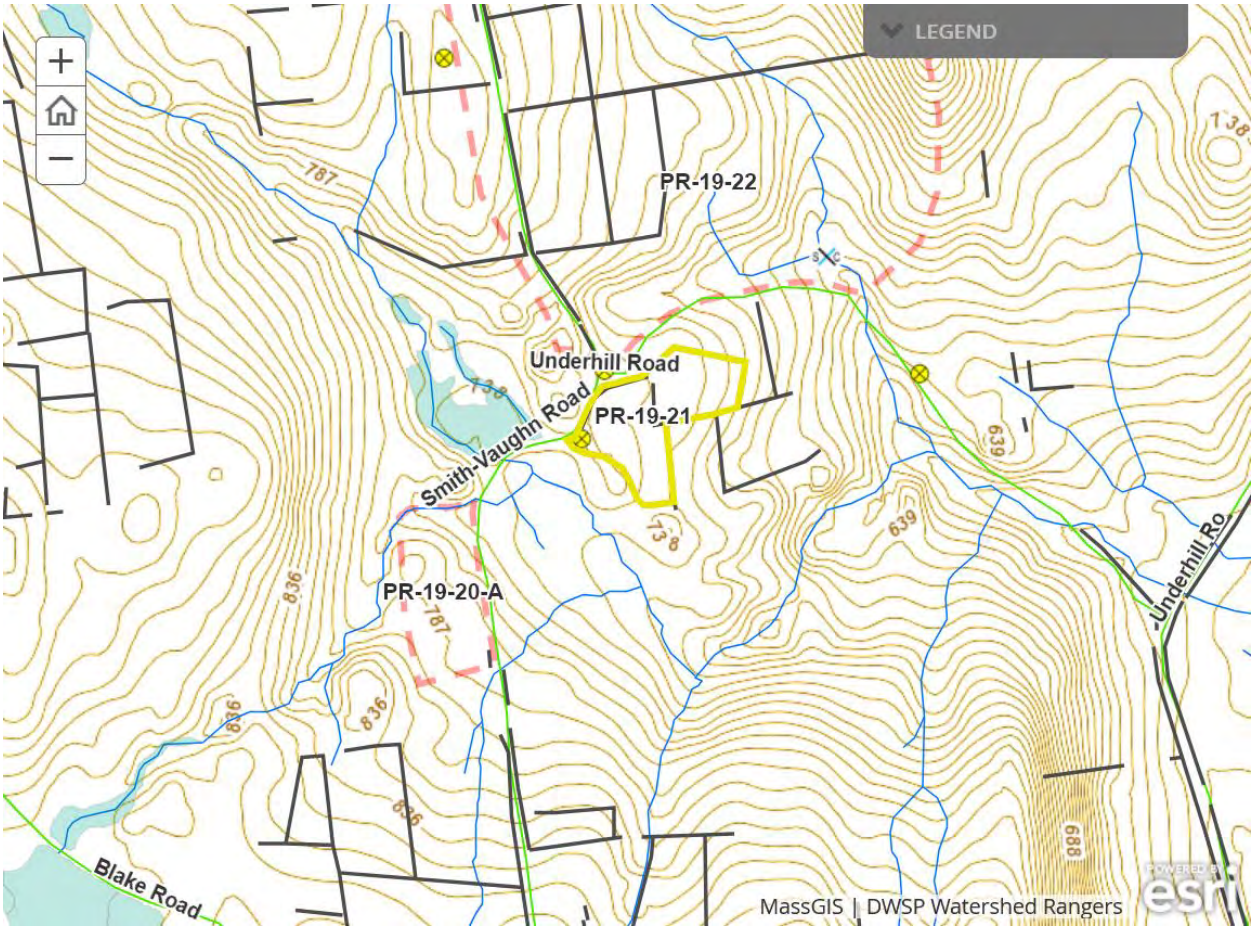
Forwarder required: **Yes**

Feller/processor required: **Yes**

Steep slopes present: **No**

Comments on harvesting limitations:

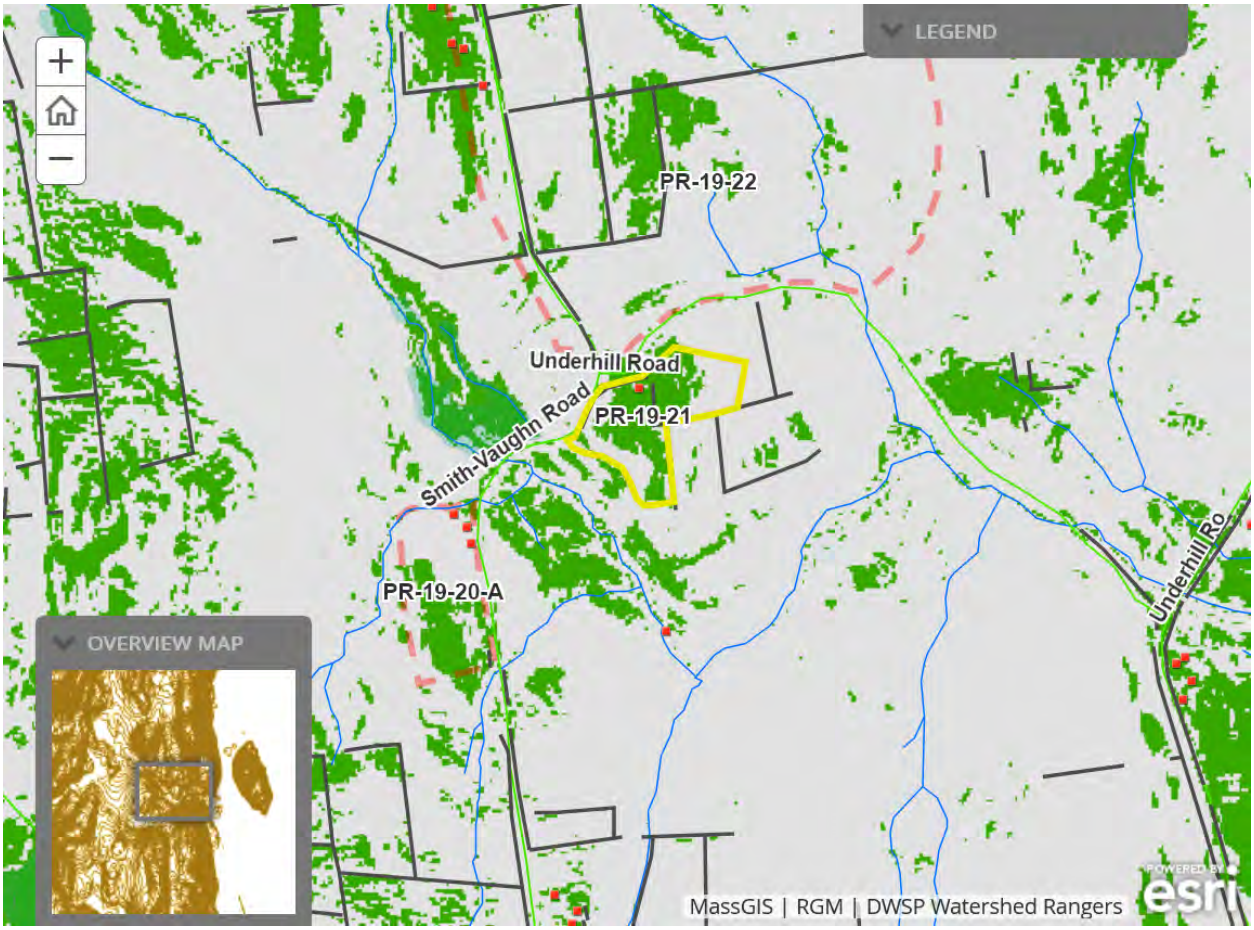
The Cut to Length logging system is ideal for red pine; the main forest product that would come from the area.



Cultural Resources

Comments on Cultural Resources:

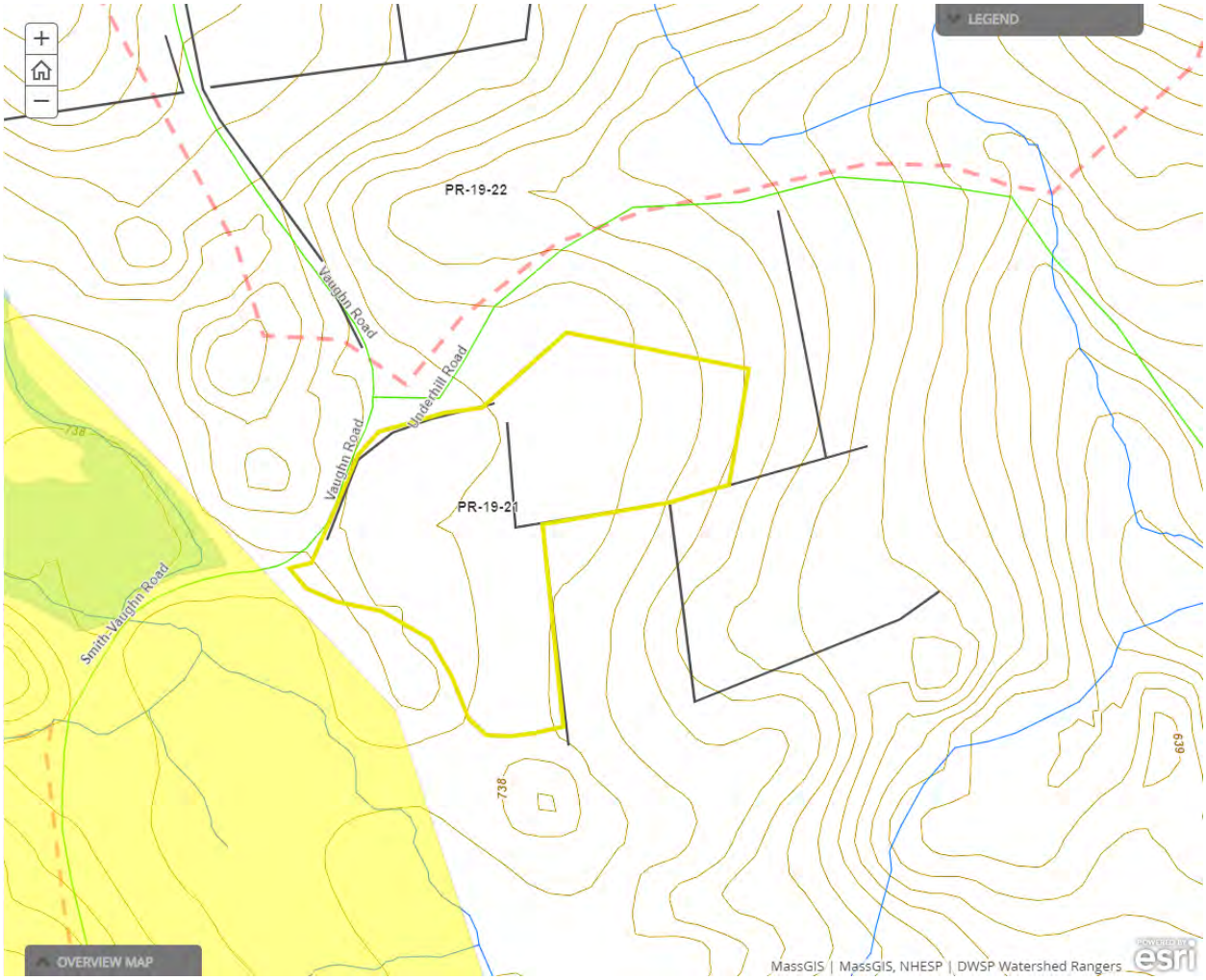
Existing barways in stone walls will be used where feasible and harvest layout will protect walls as much as possible. Wells and foundations will be flagged and avoided. If applicable DWSP will follow any additional recommendations from DCR's Archeologist regarding protection of sensitive sites.



Wildlife Resources & Rare and Endangered Species

Comments on Rare Species/Habitats:

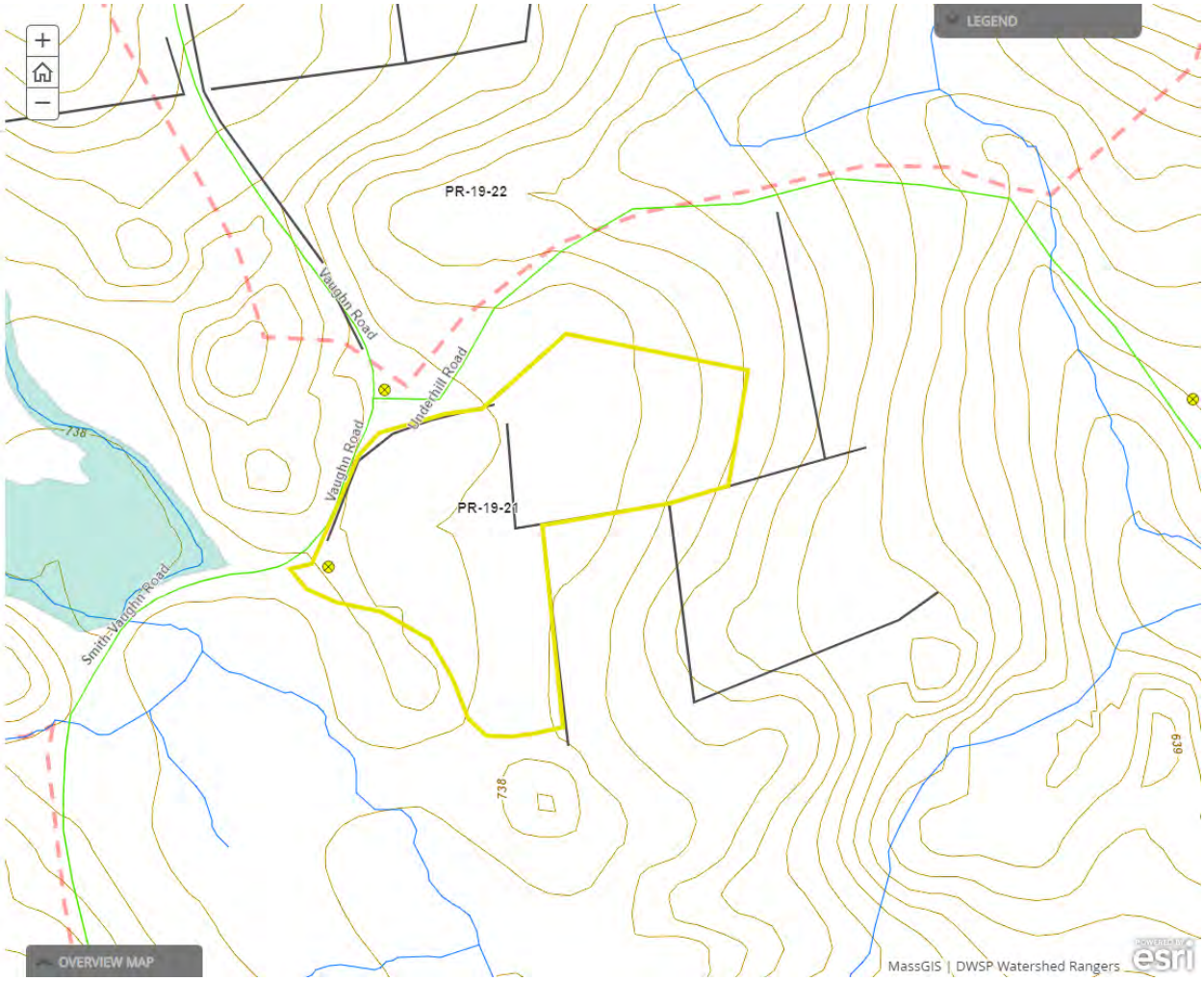
Cavity trees and potential/existing nest trees will be retained if possible. There are not any NHESP state-listed sensitive species or habitats within the lot proposal area. If any new information regarding sensitive species or habitats in the area is found DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed harvest.



Environmental Quality Engineering

Comments on EQ Issues:

No perennial stream crossings.



Forest Access Engineering

Gravel needed: No

Landing work needed: No

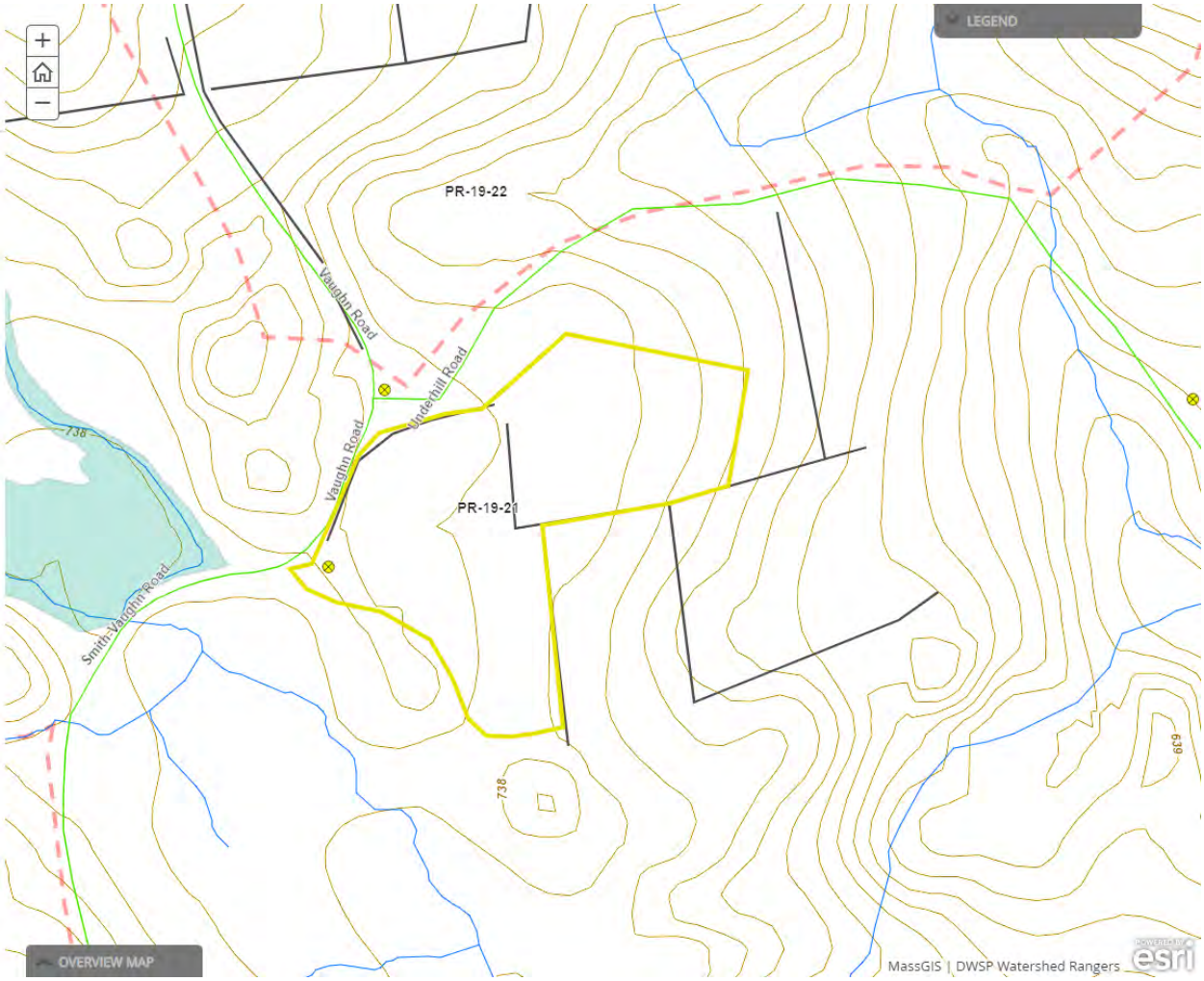
Culverts needed: No

Work needed on permanent bridges: No

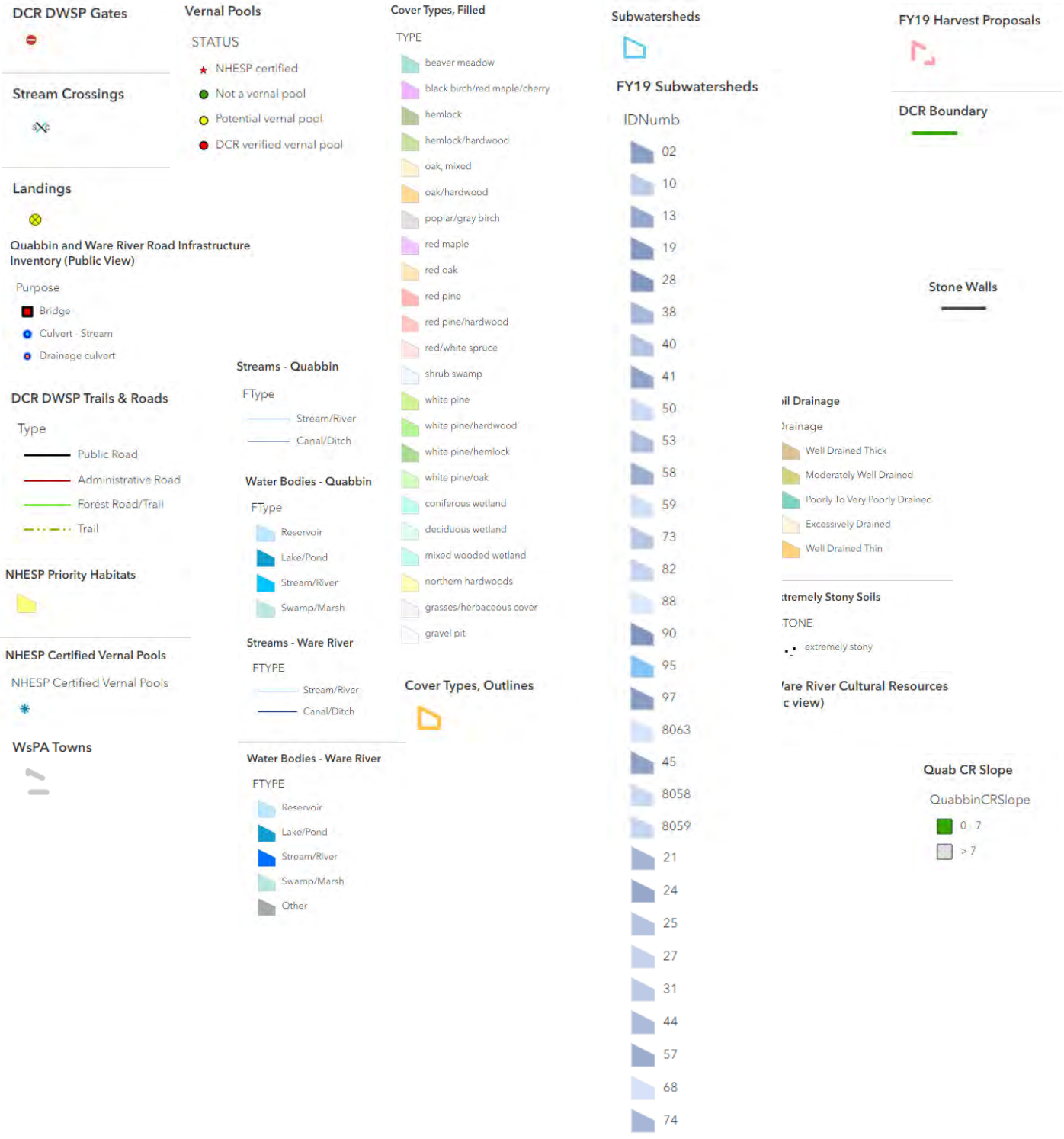
Beaver issue: No

Further comment on access needs:

None.


LEGEND
PR-19-22
PR-19-21
Vaughn Road
Vaughn Road
Underhill Road
Smith-Vaughn Road
738
738
639
OVERVIEW MAP
MassGIS | DWSP Watershed Rangers
esri

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



Quabbin Harvest Proposal PR-19-22

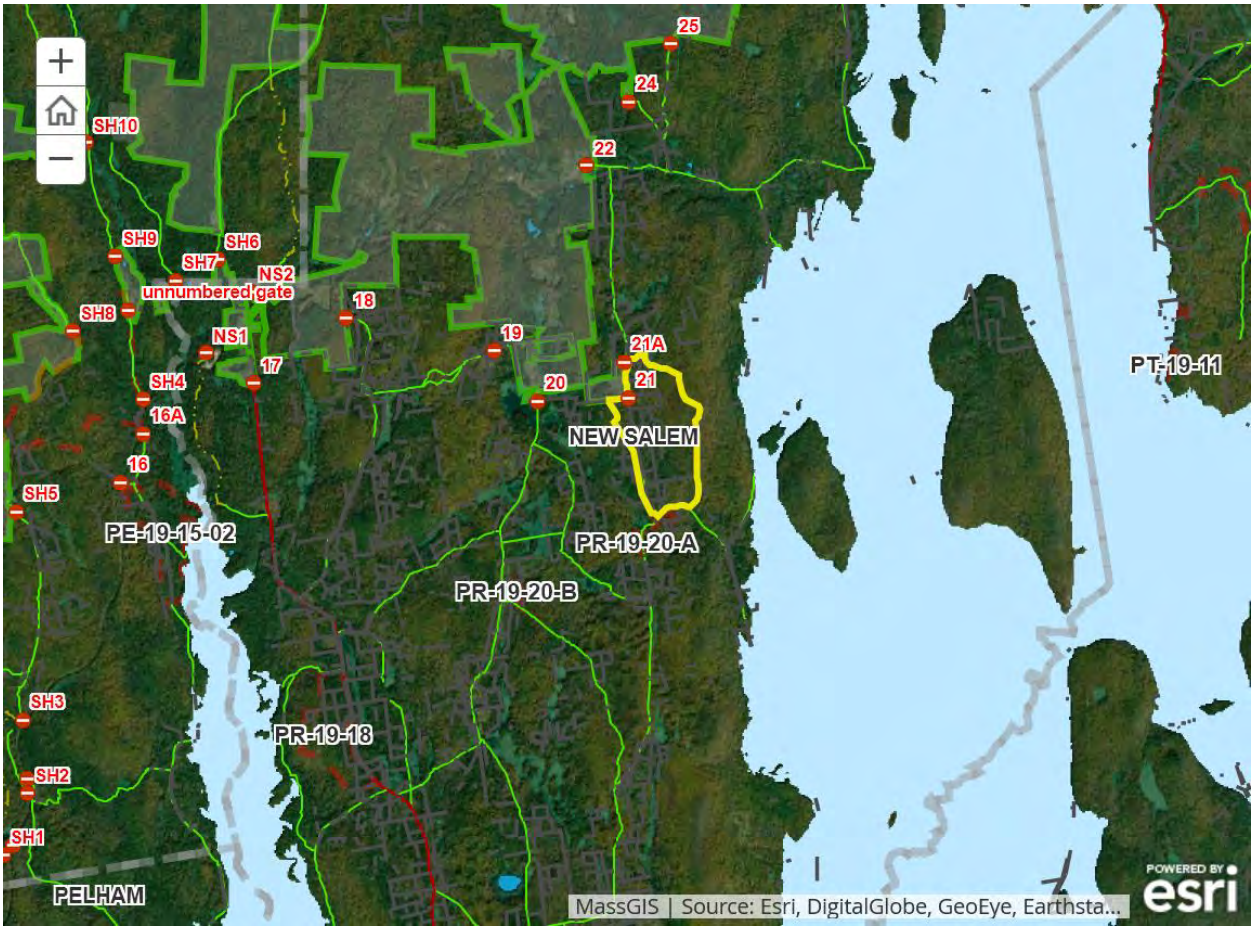
Proposal Goals

The purpose of the proposed project is to diversify forest structure and species. The majority of the area is fairly uniform high canopy forest. The proposed harvest will trigger a patchy young forest layer to development. A secondary goal is to further a long term DWSP research project that may inform future watershed forest management.

Proposal Location

The proposal area is located on the east side of Vaughn Rd (gate 21/gate 21A) south to intersection 21-1.

Total Acres: 170



General Description

	Overstory Type(s)	Acres
Dominant	Oak, mixed - dry site	66
Secondary	Oak/hardwood	48
Other	Mixed hardwoods	26

	Understory Type(s)
Dominant	Dry site - blueberry/huckleberry

Secondary	Mesic site - witch hazel, highbush blueberry

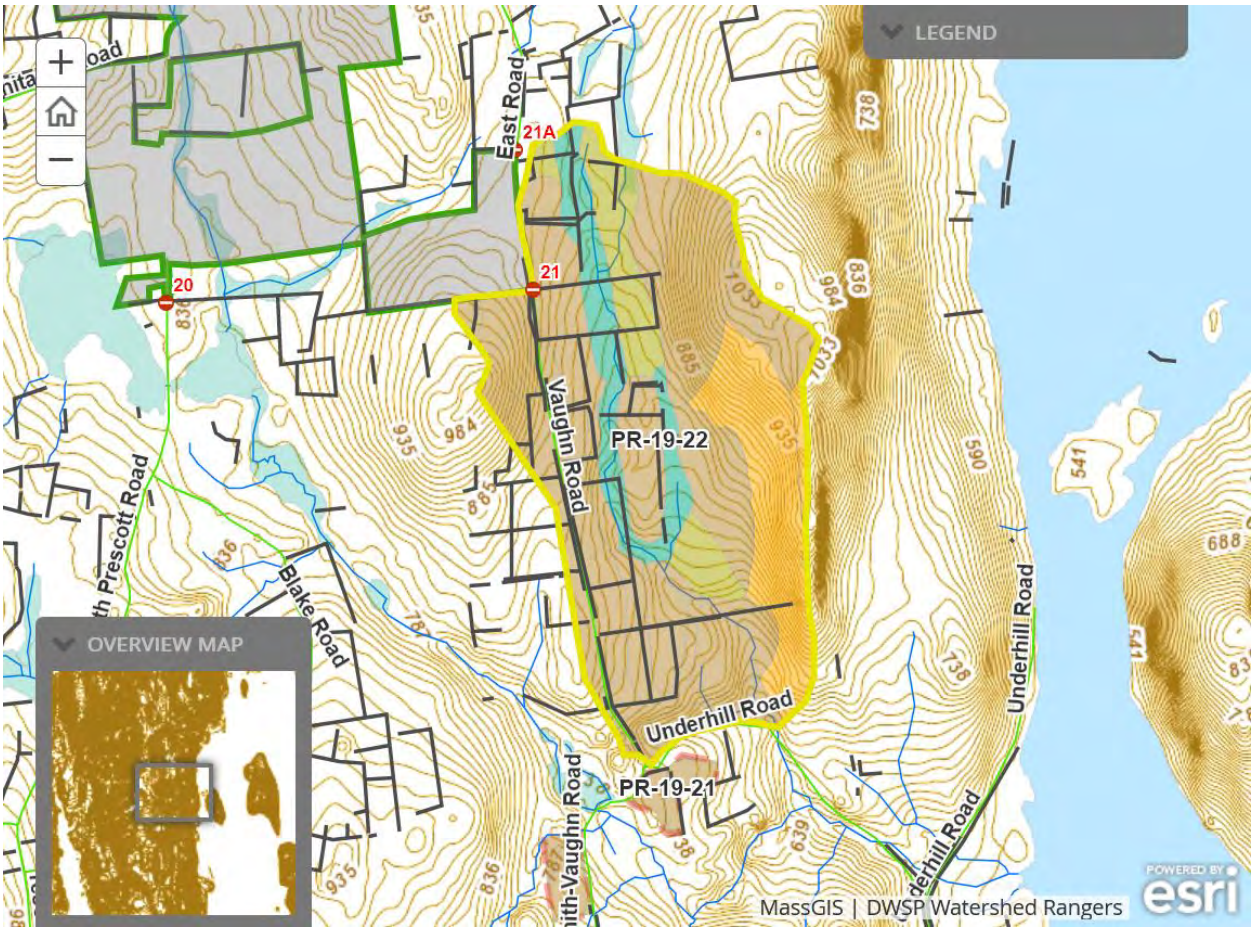
Description of forest composition/condition:

Recorded past land use (from real estate taking sheets) indicate about 27 acres of the sub watershed as arable (tillable). This area is aggregated along Smith Vaughn Rd, extending east to either side of the east branch of Underhill Brook. Sproutland, a designation ranging from cut off woodlands to improved pasture, covers the remainder of the watershed. Prior use has had a significant influence on present forest composition. Most of the arable land was open at the time of taking (1920-30s) and reforested via soft wood plantation (red pine, white pine, spruce or a mix). Sproutlands have naturally regenerated to a suite of native species(the oaks, maples, birches, ash, hickory and white pine) that vary by natural disturbance, soil type/topography and forest management. Scattered large oak along the toe of the west facing slope, survivors of the '38 hurricane, have large uphill basal scars indicative of fire damage. The fire(s) may have been instrumental in maintaining the area as an oak community(red, black, scarlet, white) which dominate the mid and upper slope. The lower slope has a mix of red/black oak, white pine, red maple, white ash, black birch, hickory and quaking aspen. Aspen is concentrated west of the brook along the publicly maintained portion of Smith Vaughn road. Vertical forest structure, given site variability, is tall/high canopy except for 3 sections of red pine (3, 2.5 and 2 acres) clearcut in 1980 and '86. Thinning in red pine during the same period, spurred what is now a sapling/pole size understory of black birch.

Soils

Drainage Class	%
Excessively Drained	9
Well Drained Thin	35
Well Drained Thick	10
Moderately Well Drained	37
Poorly to Very Poorly Drained	9

Montauk Fine Sandy Loam: A well drained gneiss derived friable loamy till over a firm sandy lodgement till
Chatfield-Hollis complex: A well drained rocky till derived from gneiss and schist found on uplands and upland slopes.
Chatfield-Canton complex: A well drained rocky till derived from gneiss and schist with a sub layer of sandy till found on uplands and upland slopes.
Canton fine sandy loam: Upland rocky well drained soil derived from gneiss and schist loam over a rock till
Scituate stony fine sandy loam: A moderately well drained gneiss derive friable loamy till over firm sandy lodgement till
Ridgebury gravel fine sandy loam: A poorly drained loamy lodgement till derived from gneiss and/or schist on depressions, drumlins and uplands
Whitman very stony mucky fine sandy loam: A very poorly drained gneiss/schist derived from loamy lodgement till



Wetlands

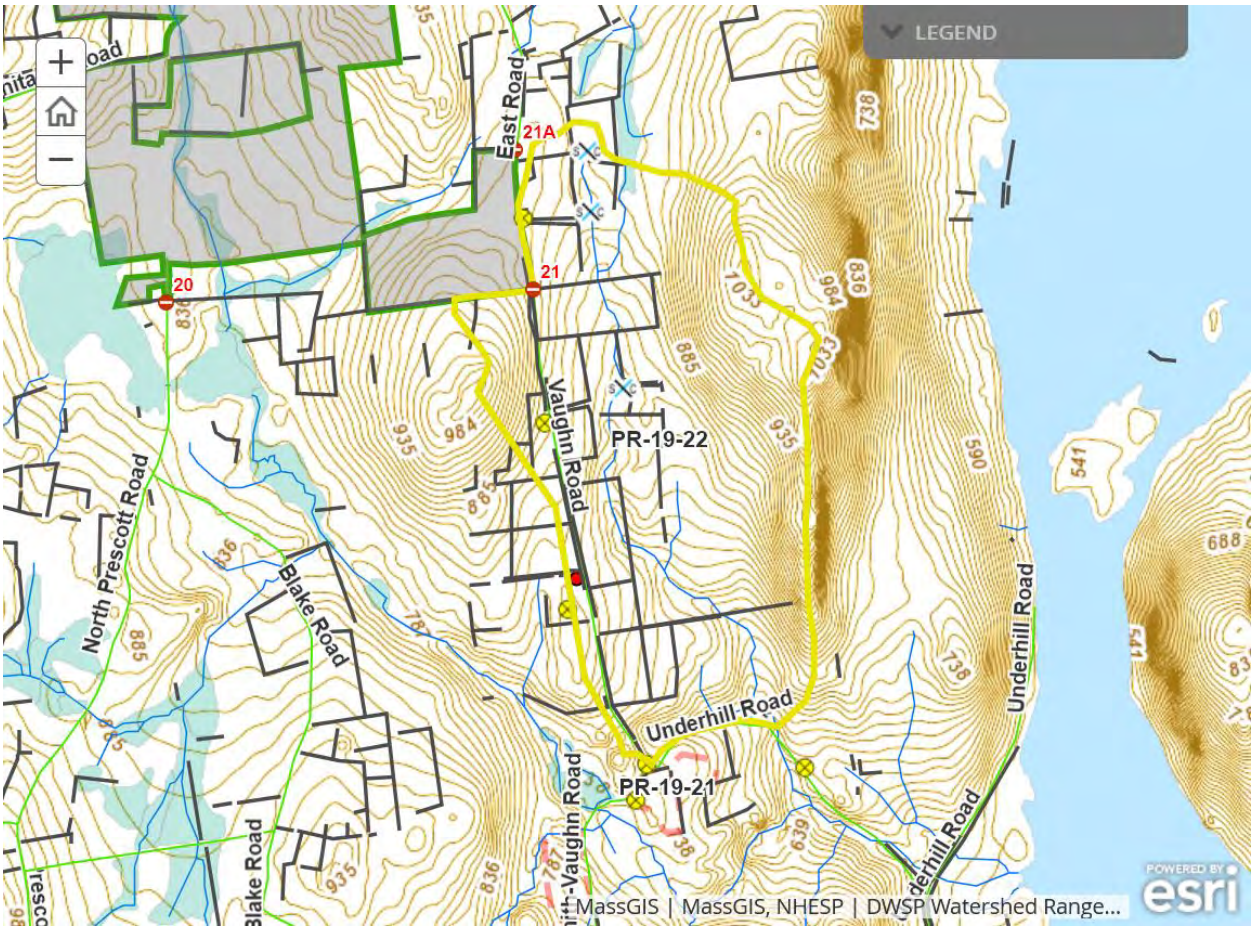
- Wetlands present? - **Yes**

- 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**

Further comments on wetlands:

There are 4 potential crossings. Three appear to be associated with old farm lanes that commence from Vaughn Road. The actual crossings are stone culverts usually flanked by cobble embankments. The fourth (most southerly) is an old bridge abutment associated with an abandoned road that traveled east/west on the north side of Underhill Brook.

All crossings would require temporary bridging.



Silviculture

Acres in Intermediate cuts: **0**

Acres in prep/establishment cuts: 1**0**

Acres in Regeneration cuts: **42**

Average regen opening size: **5**

Maximum regen opening size: **10**

Description of advance regeneration in proposal area:

Excluding areas clearcut in the 1980s, regeneration density is sparse averaging 1000 stems per acre. The most abundant species is black birch, followed by white pine, red maple, white ash, hickory and the oaks. Distribution of birch and pine is lot wide. Higher concentrations of pine and oak are found on upland areas versus red maple, birch and pine on lower slope and riparian areas. There was no assessment of browse; however experience suggests it's most likely light given it has been 30 years since the last timber harvest.

General comments on silviculture proposed:

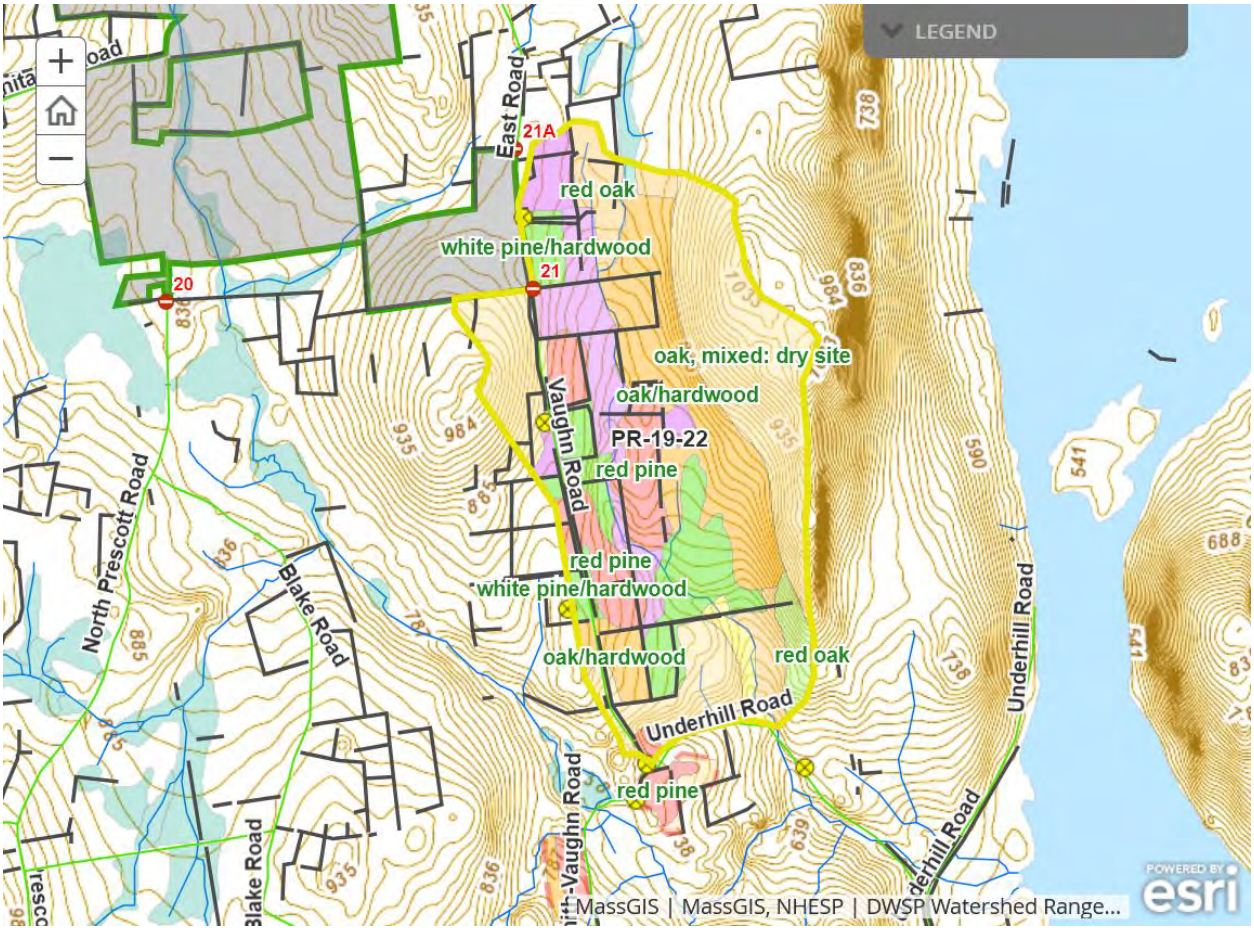
The main goal of the proposed harvest is to test the "25% rule". This hypothesis, born from a number of forested watershed studies in the eastern United States, asserts that "until approximately 25-30% of a watershed forest's stocking is removed (assuming nearly 100% forest cover), there is little to no detectable increase in water yield. And that a forested watershed harvested above the 30% stocking threshold may trigger a higher water yield, but generally reverts to its pre-harvest level within 3 to 10 years as the disturbance regenerates.

Testing the hypothesis requires determining the present forest stocking as well as the level forest harvesting over the preceding decade. Checking past harvest records indicates no harvesting has occurred on the sub watershed since 1986. Completion of a variable radius plot forest inventory suggests that the average basal area per acre, the standard measure of forest stocking, is around 112 square feet. Levels range from 0 to 240. The low corresponds with areas clearcut in the mid 80s and high with red pine plantations thinned once since inception (1940s).

A combination of area and volume (basal area) control will be used to reach targeted stocking reduction. The area control measure (acres harvested) is for regeneration cutting while intermediate cutting (thinning) would focus on reducing the basal area per acre by 25-30%. Another way to think about it is through a total sub watershed lens. The DWSP owned sub watershed is 170 acres; the average sub watershed stocking (basal area per acre) is 112 which equals a total basal area of roughly 19,000 square feet. Reducing the stocking by 25% or 4,760 square feet brings the total, post harvest, sub watershed stocking to 14,240 square feet. So regardless of harvest type, the basal area planned for removal (timber marked) can be precisely tracked so as not to exceed 4,760 square feet. A factor that may effect the calculation is the sub watershed's manageable acreage. Steep slopes (>20% for 200') cover roughly 40 acres. Factoring for this variable would reduce the total basal area removed.

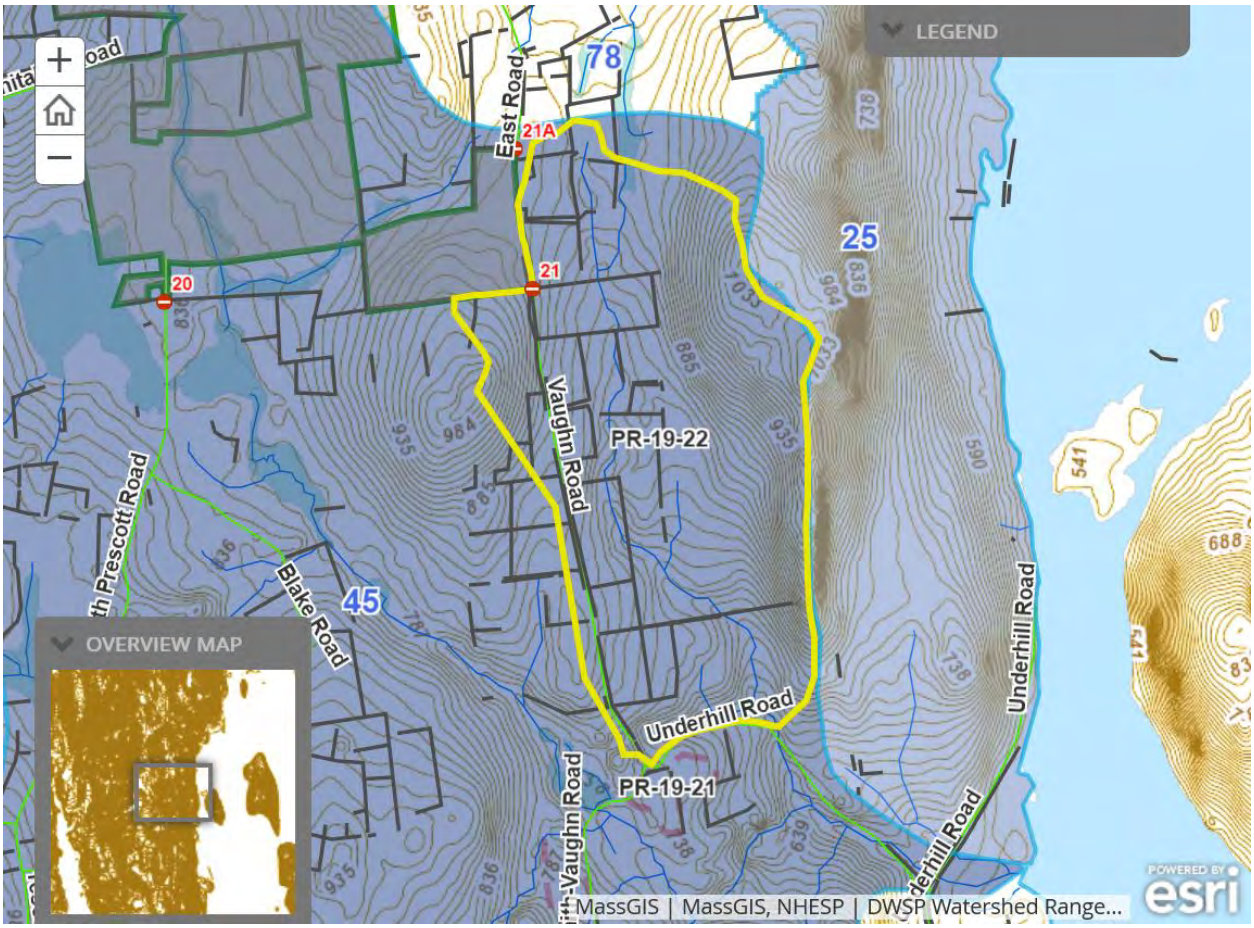
Harvest Priority should begin with full removal of red pine plantations spurring restoration of native species to these areas.

A secondary focus could be the drier site oak community inhabiting the upper west facing slope. Patch cutting would trigger structural diversity, development of seedling/sapling oak and early succession wildlife habitat for a short period (10-15 years). Another locale could be the northwest portion (west of Underhill brook) of the sub watershed which has a strong stocking of Aspen. Although here (aspen), its watershed wide representation is very low. Patch cutting in and slightly beyond the edge of the aspen will invigorate regeneration (aspen) and broaden watershed species diversity. Furthermore, groups of young aspen are ideal habitat for a variety of migratory songbirds, new england cottontail and ruffed grouse.
Lower priority areas would include the mesic lower slopes which generally are inhabited by higher quality timber. Harvesting in these areas could include small openings (half acre or less) and thinning. Ideally openings would be placed in areas with strong advanced regeneration. Harvesting in these areas may be unnecessary if stocking reduction is met by higher priority locales.



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
45	1185	7	289	170



Harvesting Limitations

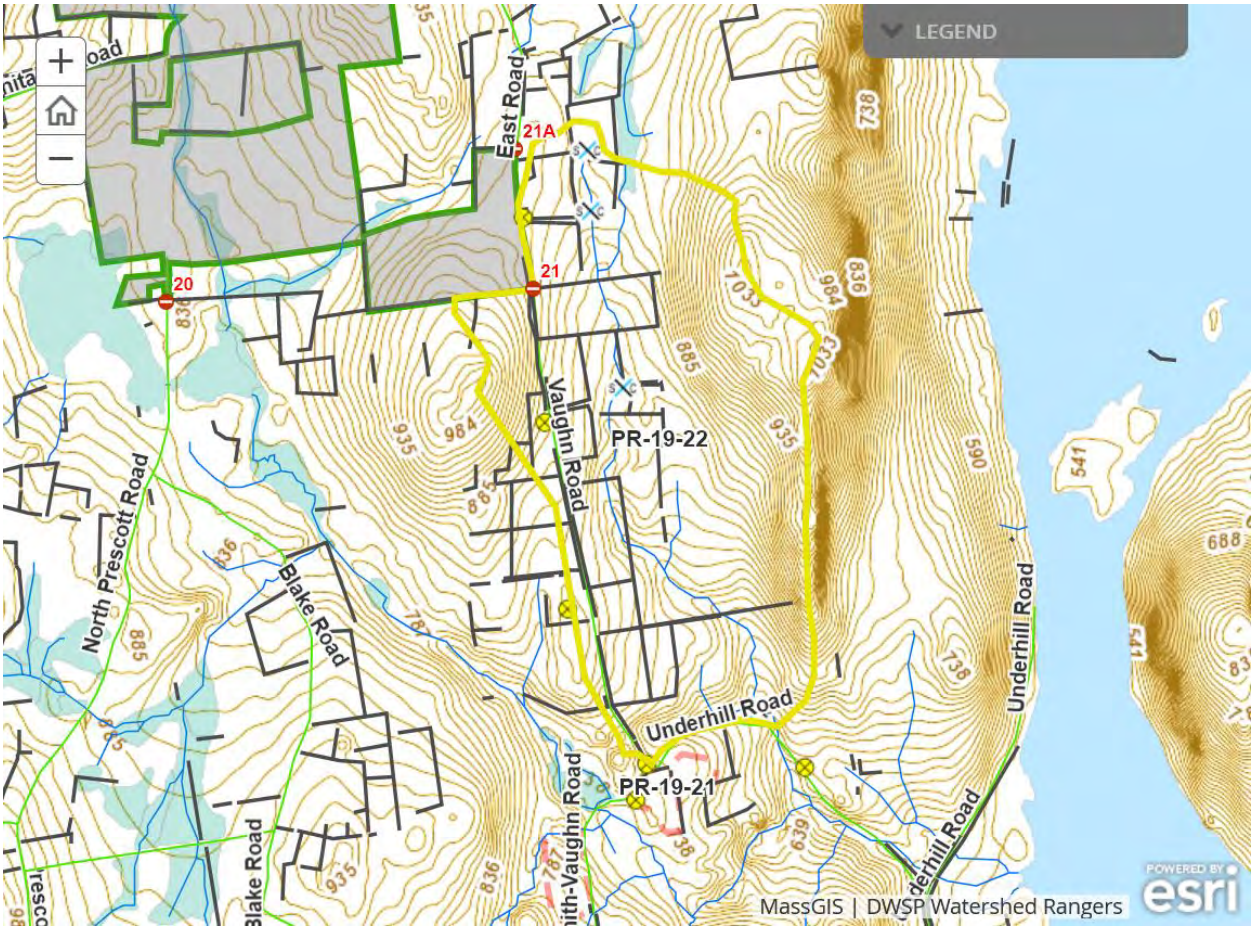
Forwarder required: **Yes**

Feller/processor required: **Yes**

Steep slopes present: **Yes**

Comments on harvesting limitations:

Majority of the area is the upper slope of Bials Hill.
Cut-to-length harvest system is required to efficiently remove red pine, reduce ground pressure and minimize stream crossing disturbance.



Cultural Resources

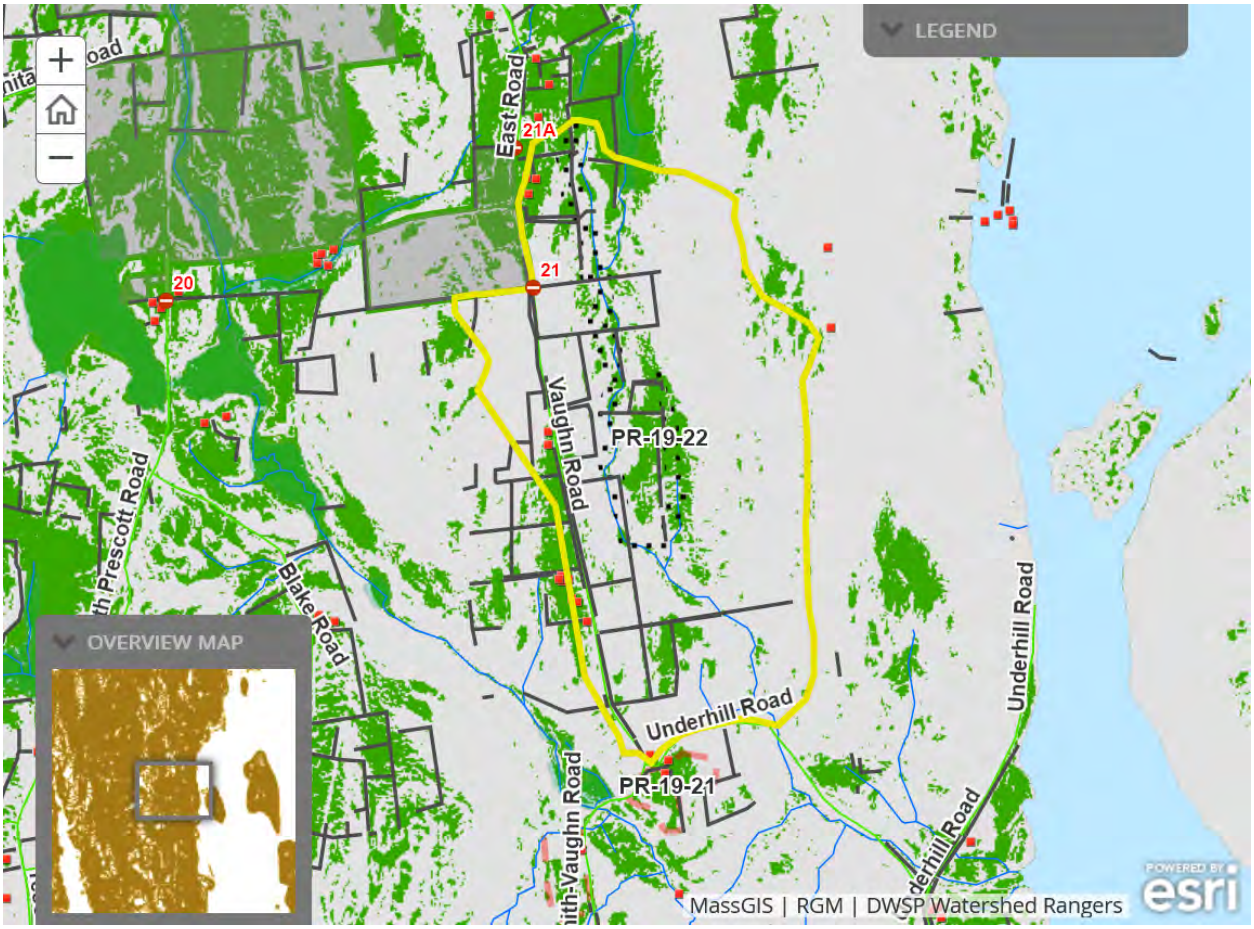
Comments on Cultural Resources:

Watershed taking maps indicate this area was farmed by (from north to south) Minnie William, Ellis Thayer, Walter and Flora Haskins and Thomas S. Mann Jr. All families have farmsteads along gate 21 road (Vaughn Road). The Williams farmstead was on the east side of the road (just south of Gate 21A). The Thayer homestead was on the west side of the road while the barn was on the east. The Haskins farmstead was all on the west side of the road. The Mann farm was located at the intersection of Vaughn Road and Underhill Road.

Outcrops and talus are scattered across the upper west facing slope of Bials Hill.

Stone walls exist throughout. Existing barways will be used where feasible and harvest layout will protect walls as much as possible. Wells and foundations will be flagged and avoided. If

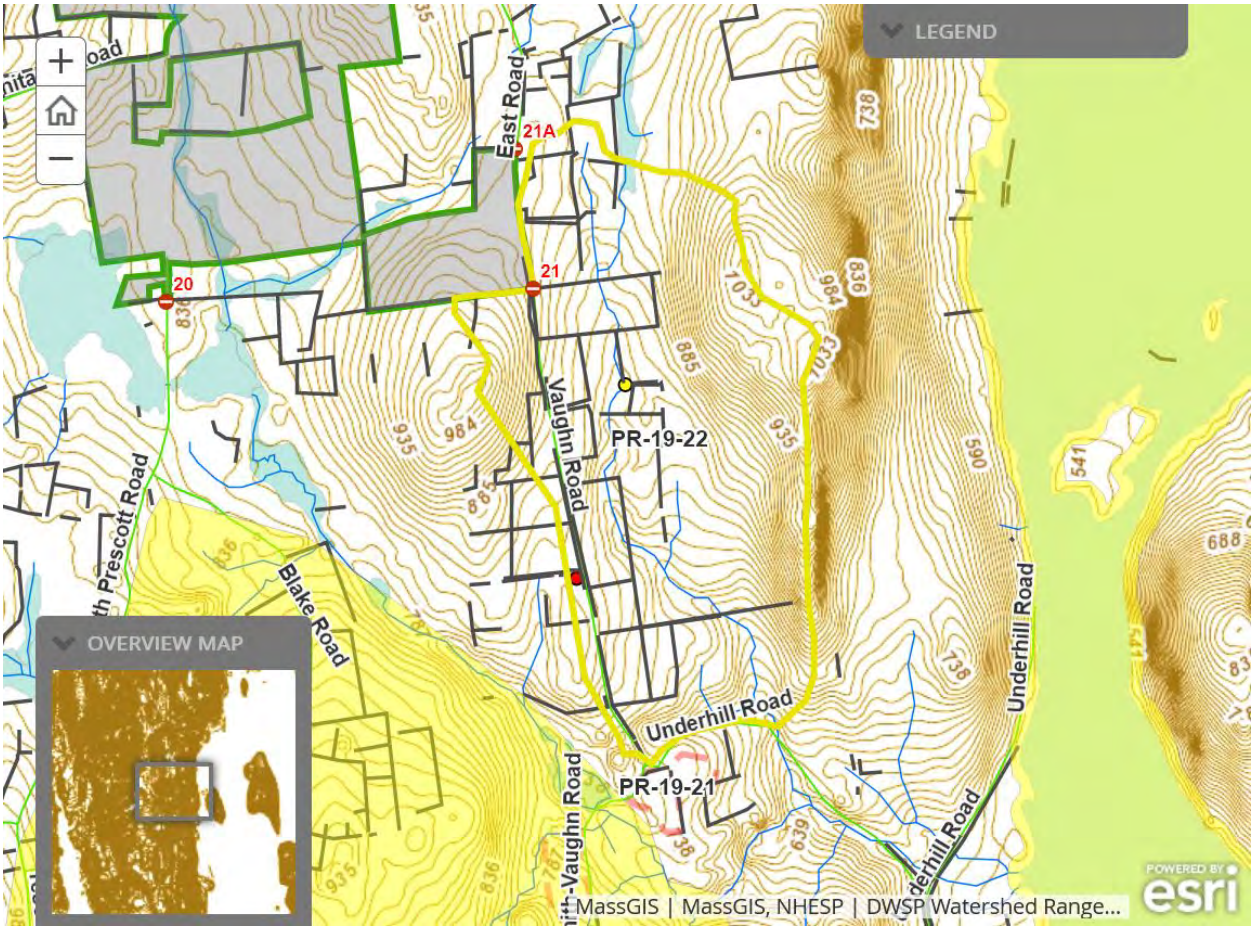
applicable DWSP will follow any additional recommendations from DCR's Archeologist regarding protection of sensitive sites.



Wildlife Resources & Rare and Endangered Species

Comments on Rare Species/Habitats:

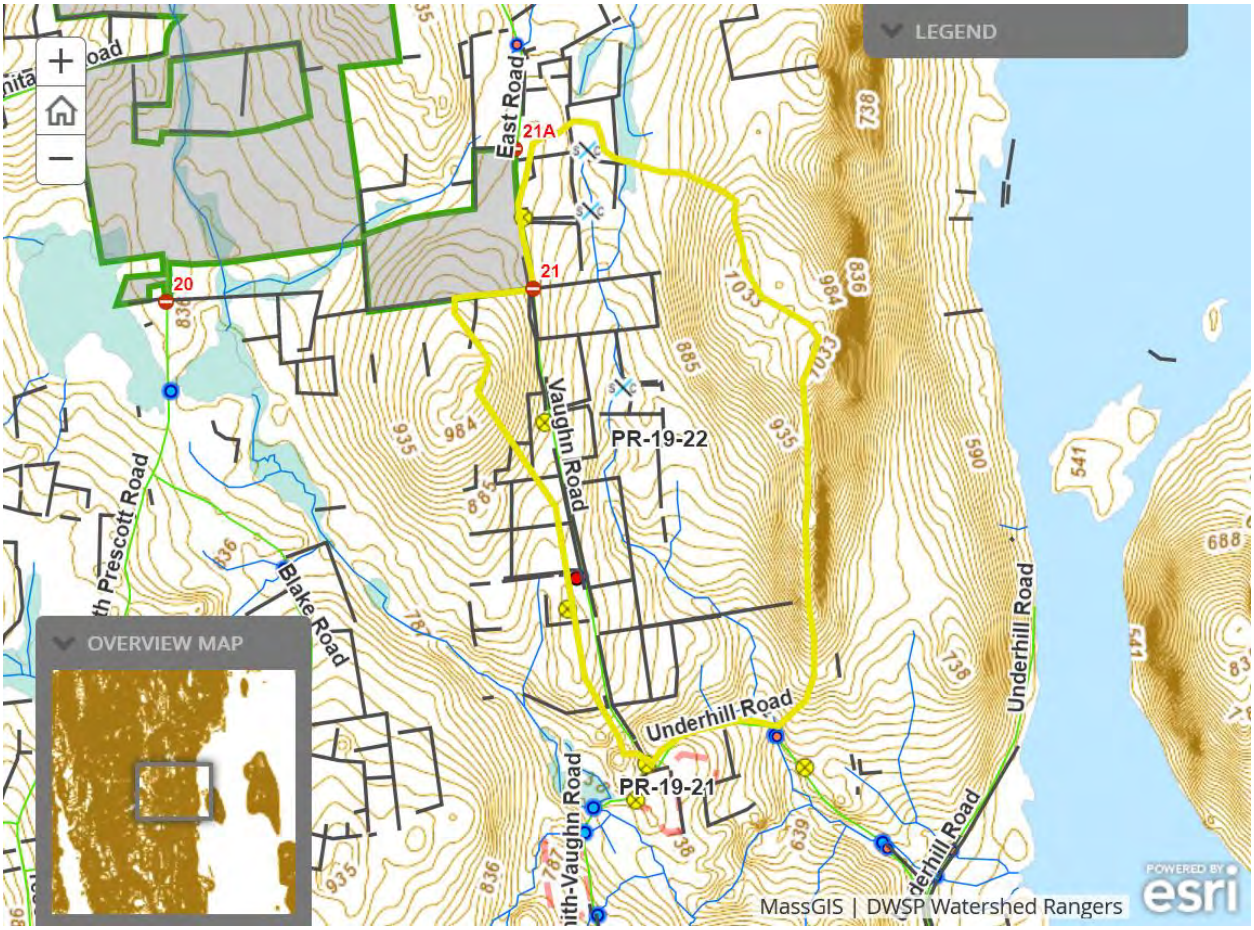
Cavity trees and potential/existing nest trees will be retained if possible. There are not any NHESP state-listed sensitive species or habitats within the lot proposal area. If any new information regarding sensitive species or habitats in the area is found DWSP will coordinate with NHESP and follow recommendations to protect these species during the proposed harvest.



Environmental Quality Engineering

Comments on EQ Issues:

There are three possible crossings from which to assess flow and potential turbidity as planned with DWSP's short term water quality monitoring associated with watershed timber harvesting projects.



Forest Access Engineering

Gravel needed: Yes

Landing work needed: Yes

Culverts needed: Yes

Work needed on permanent bridges: No

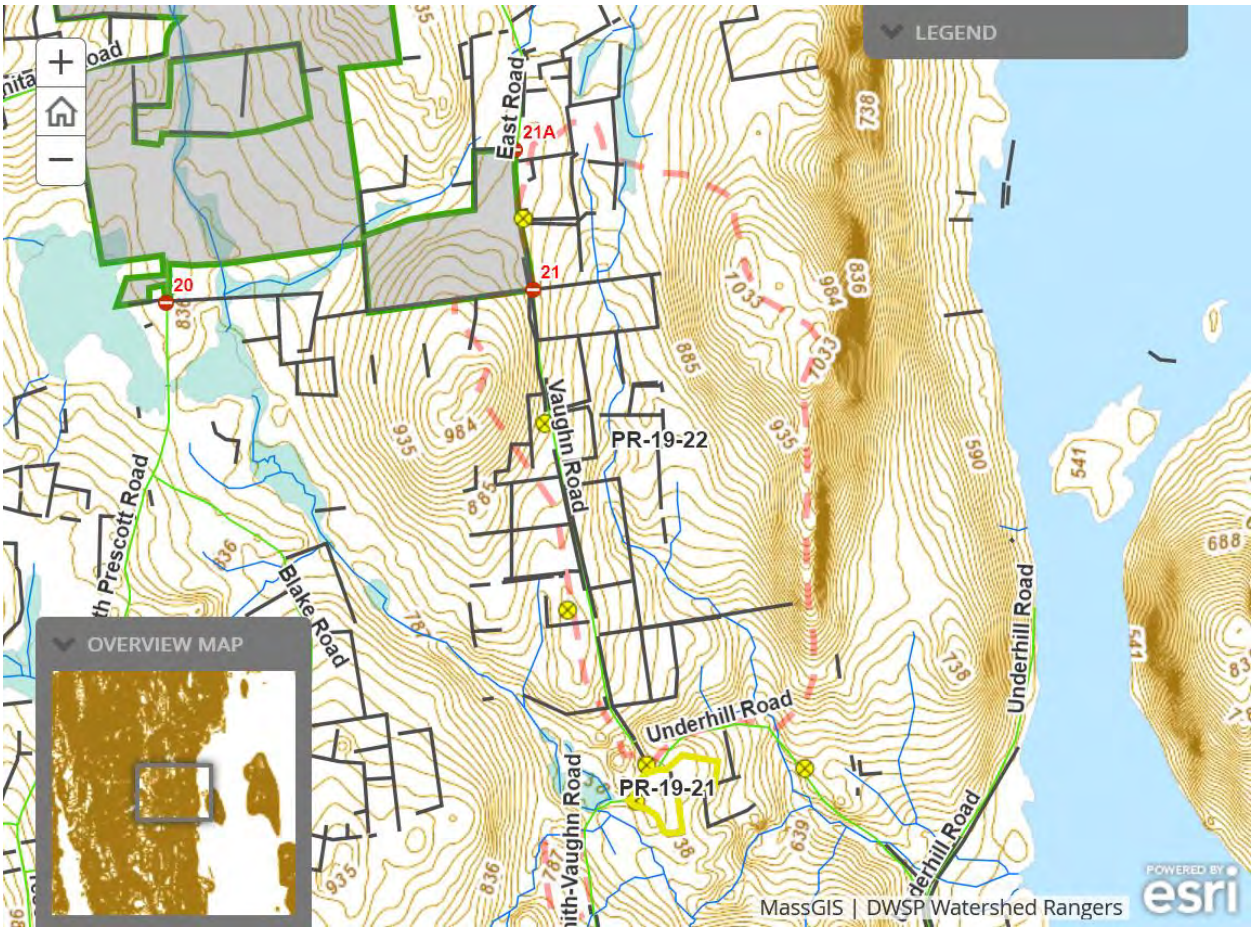
Beaver issue: No

Further comment on access needs:

Gravel may be need to stabilize ground frequented by logging equipment and logging trucks.

Gate 21: From gate to intersection with Blake Rd (a.k.a Woodcock Rd.); culvert drainage should be assessed. And appropriate action taken to rectify any drainage issues.

Gate 21A: Check road from gate to first intersection. Road to right from intersection leads to an old field which served as a triaxle landing in 2010. Minor improvement (clearing some trees and gravel) would likely upgrade this area for tractor trailer.



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