Quabbin Harvest Proposal NS-19-24BFA

Proposal Goals

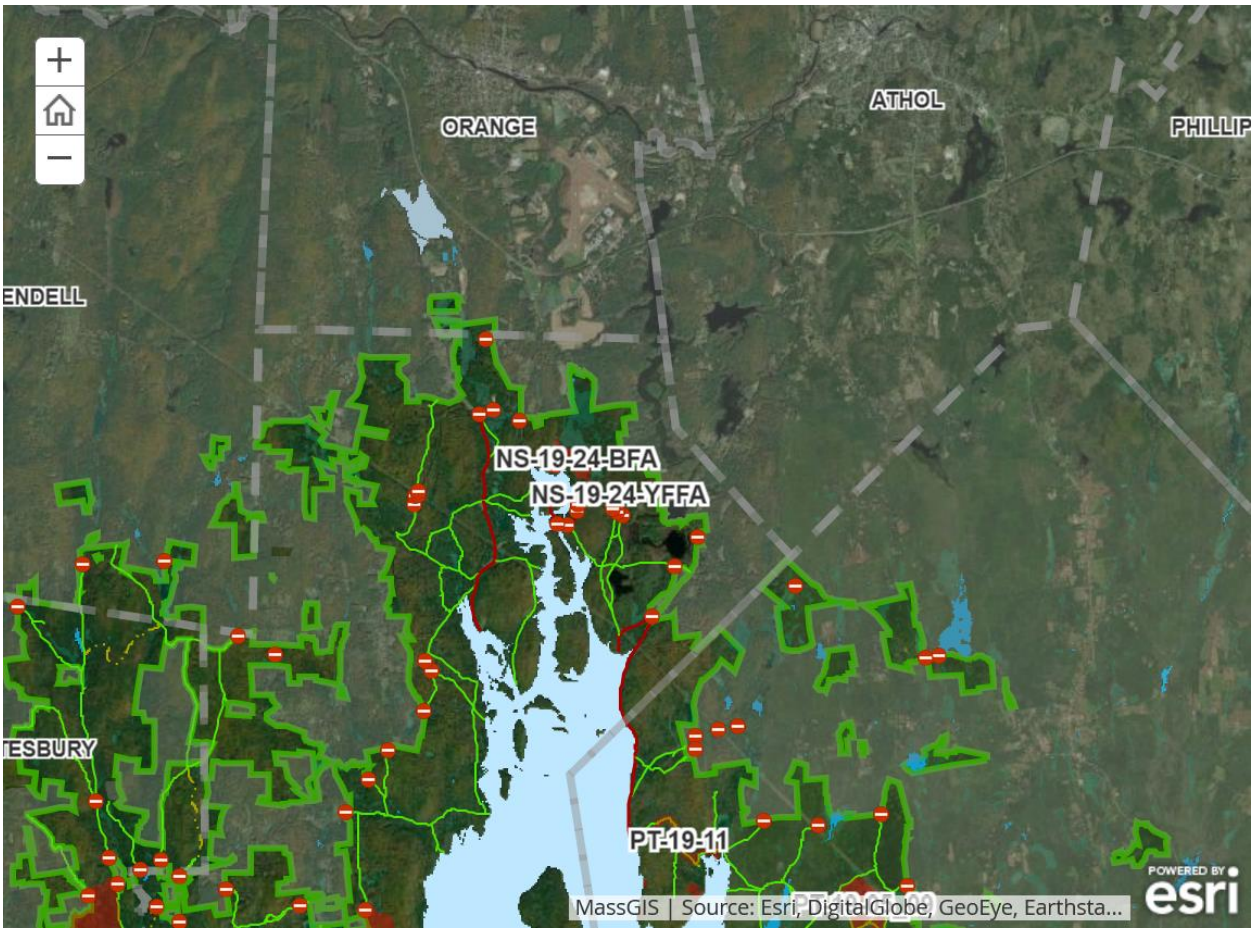
The goal of this proposal is to remove red pine before it's killed by red pine scale, and to create/restore this site to a pitch pine-oak barrens. This proposal is a revision of NS-18-24 to bring it into alignment with the 2017 DCR-DWSP Land Management Plan, which designates this location as a Barrens Focus Area.

Proposal Location

On the north side of Route 122, between Orange Road and Gays Hill in New Salem.

Total Acres: 66.2

Previously Reviewed as: NS-18-24



General Description

	Overstory Type(s)	Acres
Dominant	Oak, mixed - dry site	34.7
Secondary	White pine/oak	24
Secondary	Red pine	7.6

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

Description of forest composition/condition:

The area between the access road and Gays Hill has a mix of white, red, and pitch pine, sometimes in remarkably even proportions, with associates of hemlock, mixed oak, and red maple. The white pine is of variable quality, sometimes straight with large vigorous crowns and few, small branches, and other times branchy, weevilled, or overcrowded and lacking vigor. White pine needle drop is present in the region but does not seem to be a significant problem on this lot at this time, perhaps because the recent drought set back this suite of fungal diseases. The pitch pine appears to be healthy at this time, but southern pine beetle (Dendroctonus frontalis) is a looming threat with the potential to kill all pitch pines in the area.

Most of the red pine is in the area north of the gravel pit, but it is also present as a minor element within the other types on the lower slopes along Route 122. Red pine scale (Matsucoccus resinosae) does not seem to have infected this lot yet, but it is present on the opposite side of Route 122 and can be expected to move into the proposed area in the near future. When it arrives it is likely to cause 100% mortality within a few years.

Gays Hill is dominated by oaks mixed with red maple and other hardwoods. Oak species diversity is high, with red, black and white oak on the lower slopes transitioning to scarlet and chestnut oak on higher, drier terrain. White pine is common on the lower slopes, along with lesser numbers of hemlock and red and pitch pine. All of these conifers become less common as one ascends, almost dropping out completely on the summit. Other tree species present include small numbers of hickory, ash, beech, black cherry, paper birch and poplar. Most hardwoods are pole to small sawlog sized, with form ranging from poor to good.

The understory contains wintergreen, clubmoss, low bush blueberry, bracken fern, and hay scented fern. High bush blueberry is present on the lowest terrain near the swamp and streams.

Past DWSP harvests in this area include:

- A 17 acres of selection in the northwest corner in 2001 (Quabbin harvest #3004)
- 13 acres of selection along Route 122 in the southeast corner in 1998 (Quabbin harvest #773)
- 13 acres of selection in the northwest corner in 1994 (Quabbin harvest #663)
- 4 acres of shelterwood prep in the southeast corner in 1975 (Quabbin harvest #114)

About 44 acres of the proposed area has never been harvested by DWSP.

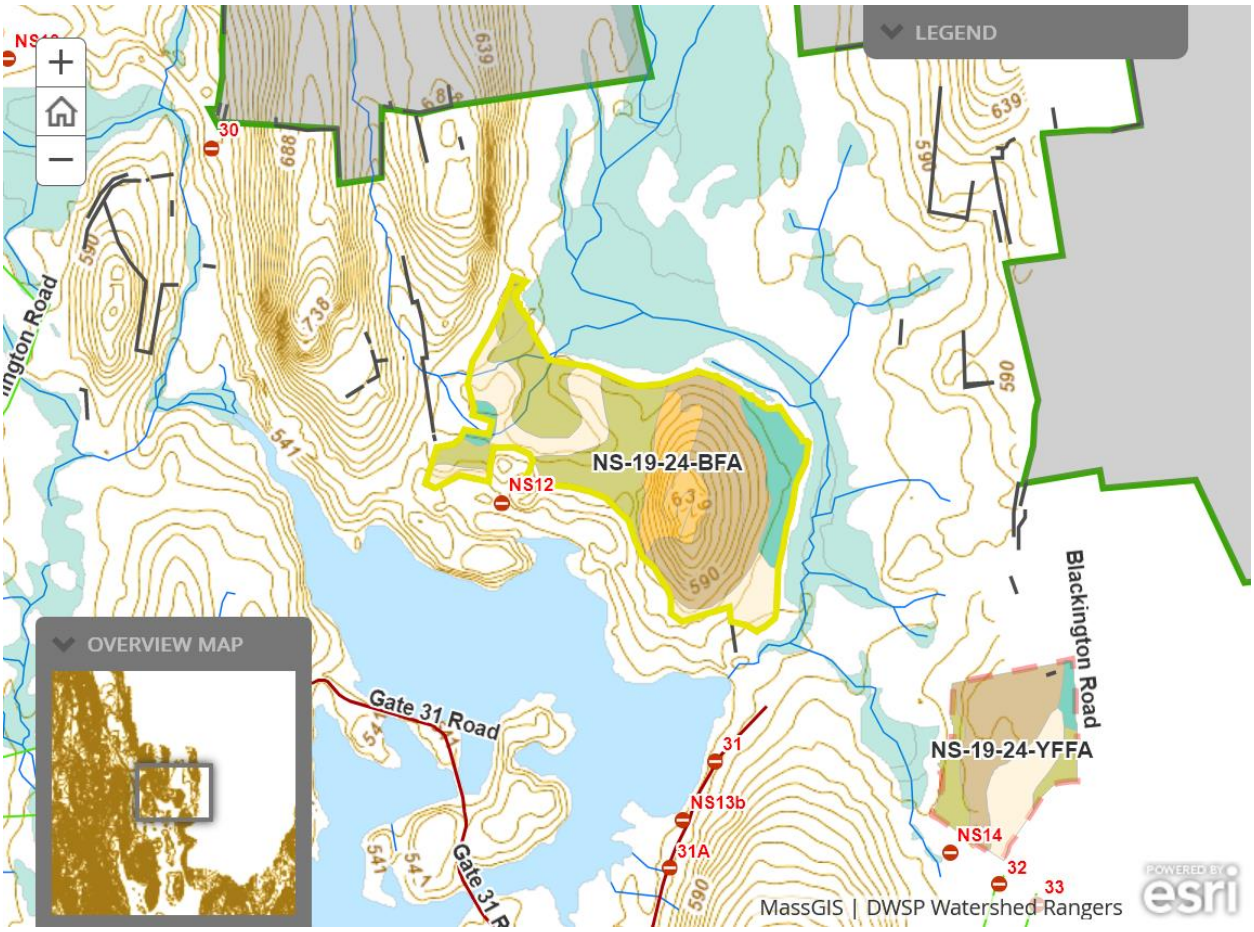
This area also has a history of wildfire, the most recent being in the mid-twentieth century. The dominance of oaks and unusually high presence of pitch pine indicates that fire has likely been an important part of this ecosystem for many centuries. It is hoped that it will continue to be so as part of barrens restoration.

Soils

Drainage Class	%
Excessively Drained	20
Well Drained Thin	12

Well Drained Thick	27
Moderately Well Drained	30
Poorly to Very Poorly Drained	11

The poorly drained soils are mostly concentrated along the northeast border of the proposed area, adjacent to Blackington Swamp. They are included in the proposal area only because NRCS soil maps are imprecise; barrens restoration will not be undertaken in areas where field observations find saturated soils, regardless of whether they concur with NRCS maps.



Wetlands

- Wetlands present? - **Yes**
- Streams present? - **Yes**

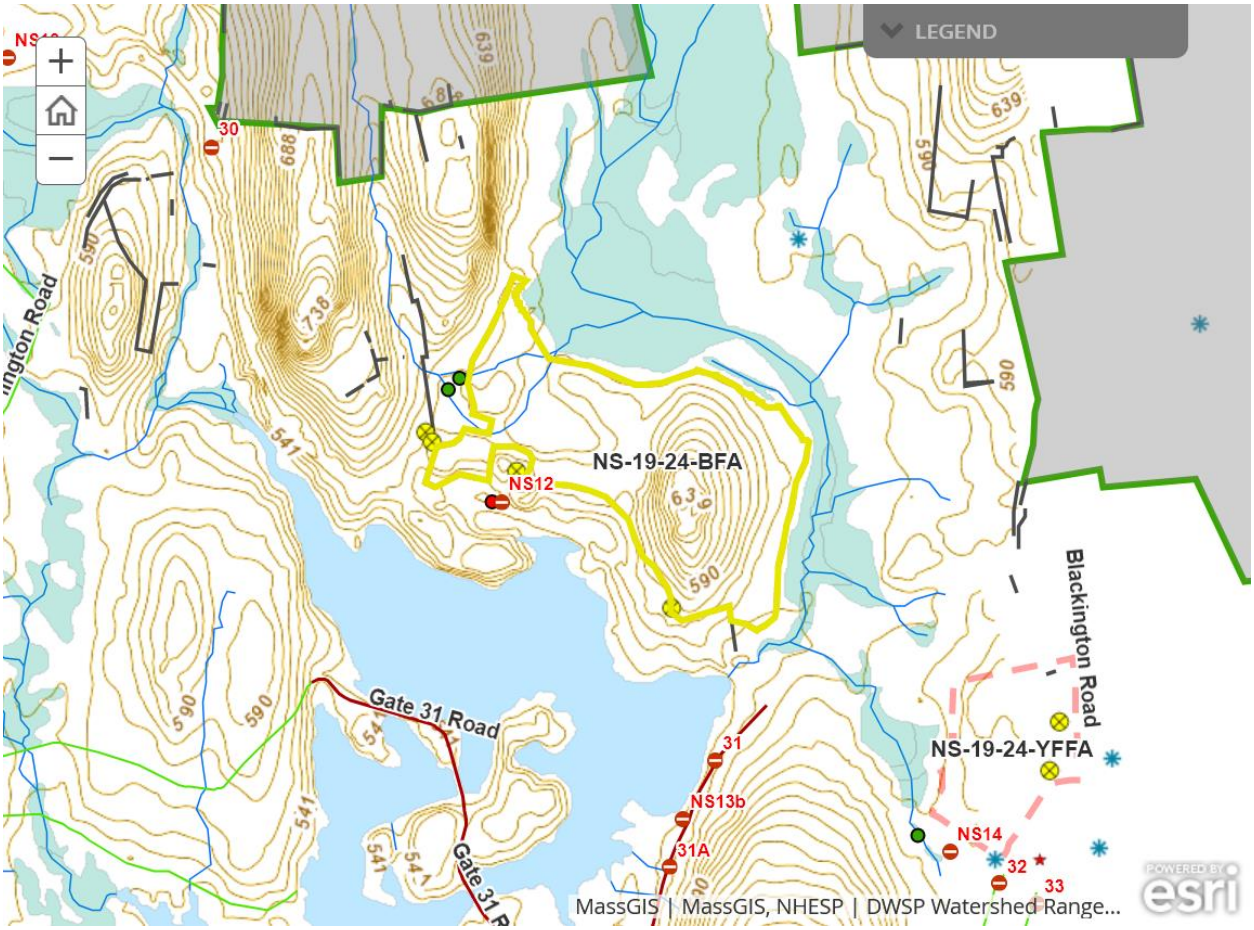
- Vernal pools present? - **Yes**
- Seeps present? - **None known**
- Are stream crossings required? - **Yes**
- Are wetland crossings required? - **No**
- Is logging in filter strips planned? - **No**
- Is logging in wetlands planned? - **No**

There are several wetlands outside the proposed area, but most of the interior is very dry. Blackington Swamp and associated streams border this proposal to the north and east. There are two small wetlands to the west, fed by drainage from Adams Hill on the other side of the access road. There's a verified vernal pool to the south, between the proposed area and Route 122, just west of the access road to the gravel pit.

An intermittent stream is shown within the northwest corner of proposed area on both the DEP and Quabbin streams layers, although in different locations for each source (the DEP layer associates it with one of the small wetlands, the Quabbin layer with Blackington Swamp). If these layers are correct, a stream crossing may be needed. However, no stream channel was located during field reconnaissance.

All of the above features, including those outside the proposed lot borders, will be protected with filter strips.

The DCR verified and NHESP certified vernal pools will be appropriately buffered according to DWSP policy and MA Forestry Best Management Practices.



Silviculture

Acres in Intermediate cuts: **10**

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

Acres in Regeneration cuts: **20**

Average regen opening size: **20**

Maximum regen opening size: **20**

Description of advance regeneration in proposal area:

Regeneration is present throughout the lot but generally not adequate in density. White pine seedlings and small saplings are most numerous, especially in the areas that received a selection

cut in 1998. White pine regeneration in the latter area is often badly weevilled. There is an unusually strong presence of oak regeneration throughout the lot, especially on higher terrain. Hemlock seedlings and saplings are present in a wide range of sizes, probably as a result of being released in various harvests over the years. Red maple stump sprouts are also common where there has been past harvesting. Black birch seedlings and saplings are present but much less common than in other places at the Quabbin.

General comments on silviculture proposed:

This proposal is the first step in the process of barrens restoration, as described on pages 117-127 of the 2017 DCR-DWSP Land Management Plan. The Gays Hill Barrens Focus Area is shown in Figure 4-10 on page 125 of the Management Plan.

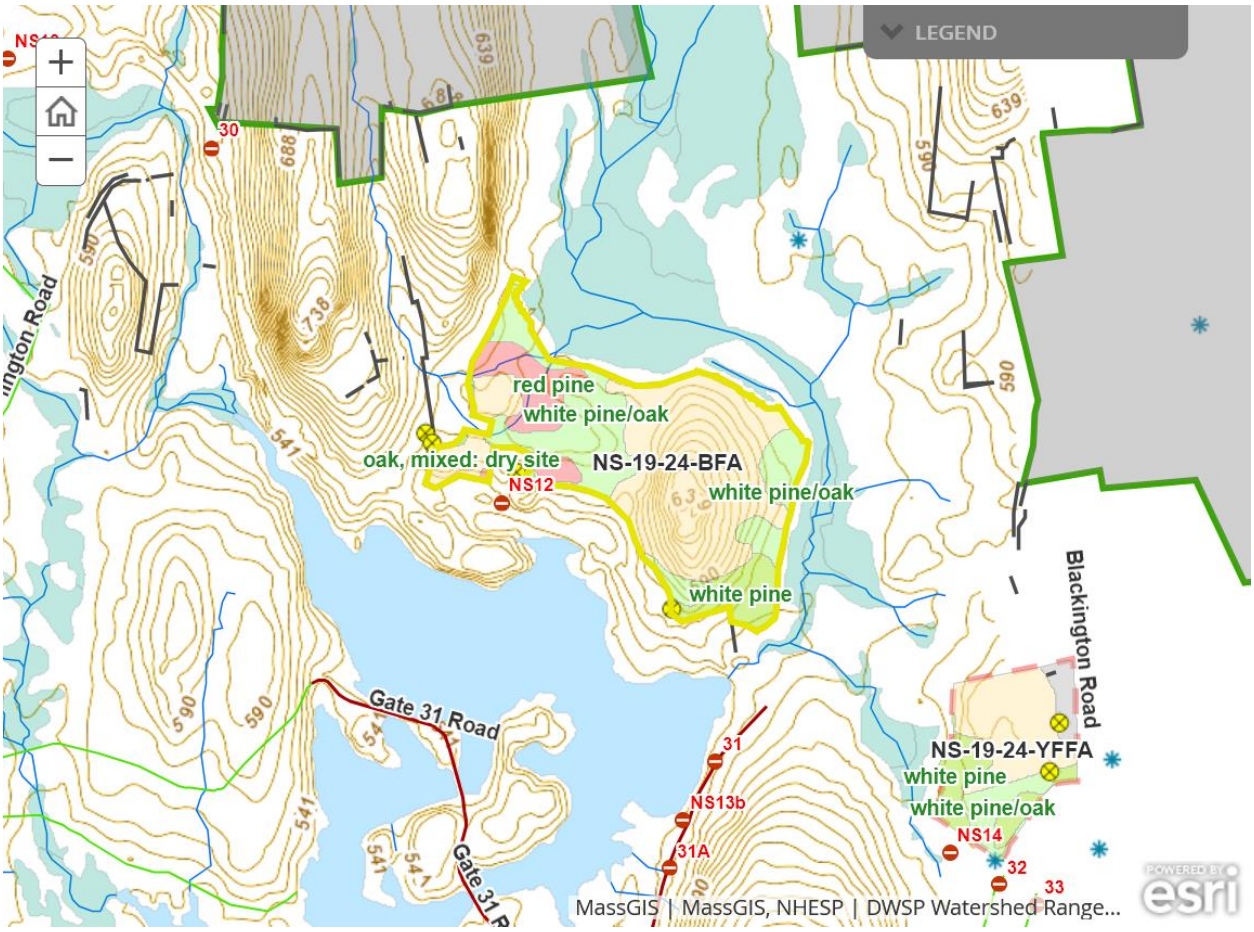
This harvest will take three silvicultural approaches to barrens restoration:

First, a 10 to 20 acre opening will be created, in an area with a high concentration of red pine (because it's expected to die of red pine scale), and a low concentration of pitch pine (because we want to retain as much of this barrens species as possible). Total basal area will be reduced to 10 ft2/acre, composed of healthy, vigorous pitch pines and oaks. Lower quality oaks will be cut in order to attain the target basal area, as will any white pine and hardwoods in the opening, including saplings. This is called regeneration cutting for the purposes of this proposal, because it's similar to smaller openings in other DWSP harvests.

Second, where red, white and pitch pine occur together and pitch pine stocking exceeds 10 ft2/acre, all red and white pine will be cut. Pitch pine will be retained at a stocking level of 80 ft2/acre or less, above which it would be at more risk of infestation by southern pine beetle. If hardwoods are also present, oak will be retained unless it's competing with pitch pine. Non-oak hardwoods will be cut. This will result in a small area of savannah-like forest, with spacious stocking of pitch pine and oak. This part of the harvest is called prep cutting for the purposes of this proposal, because post-harvest stocking levels will be similar to that of a shelterwood prep cut.

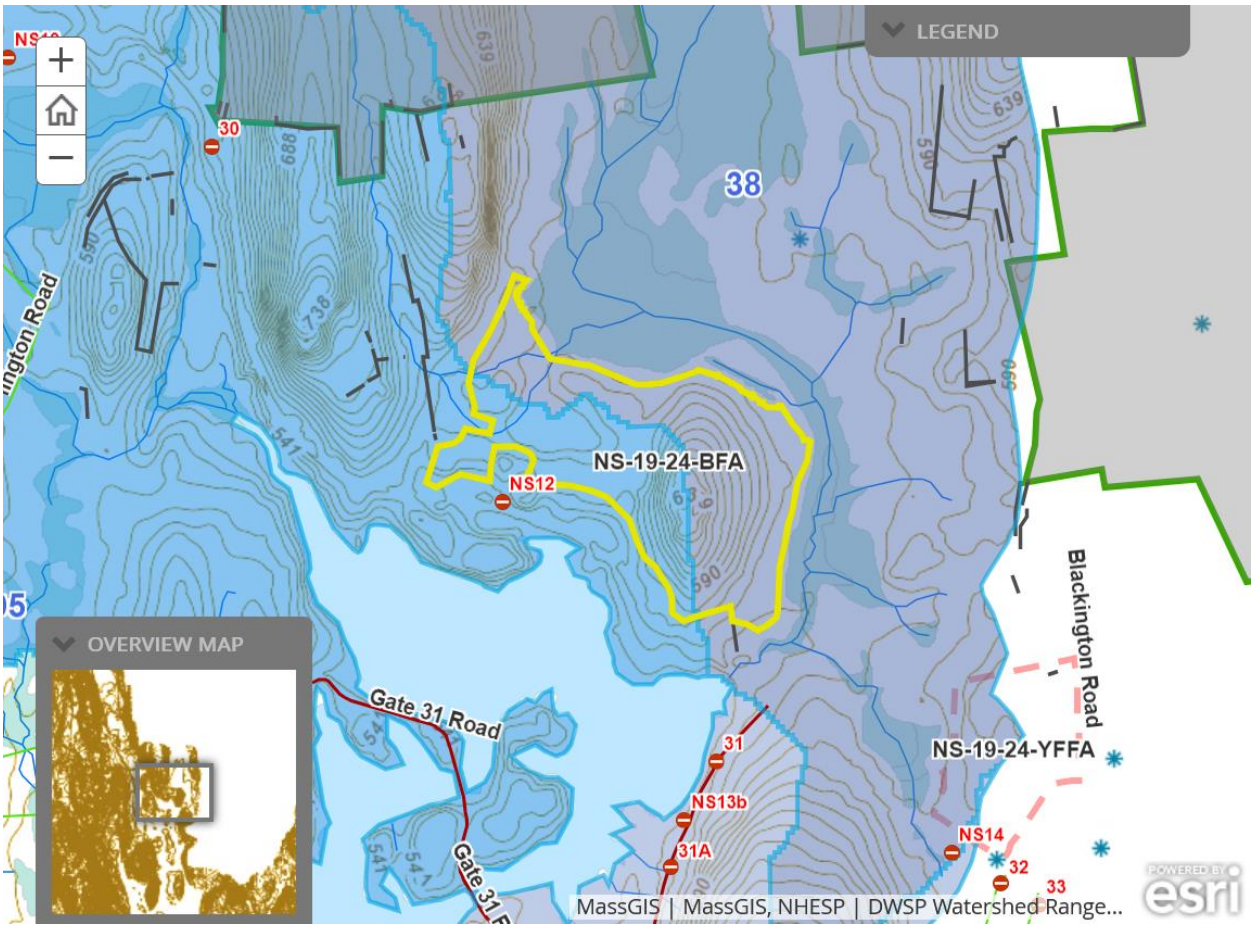
A third type of silviculture will be employed where red pine is scattered, and mixed with oak and/or white pine. In this case, all red pine will be cut. Most other species will be retained, unless they need to be cut to in order to access the red pine. If possible trees to be cut will be poor quality or in decline due to competition, disease, and/or poor stem structure. Silviculturally, this could be called a salvage cut, but for this proposal, it's called thinning because it will improve stand health and composition.

Acreages listed for these treatments are approximate and likely to change, but the regeneration opening will not exceed 20 acres. Note that portions of the earlier proposal (NS-18-24) that are outside the barrens restoration area may be cut at the same time as the barrens, in accordance with the silviculture described in the earlier proposal.



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
38	402.2	7.7	92.9	40.2
95	1079.1	20	337.4	26



Harvesting Limitations

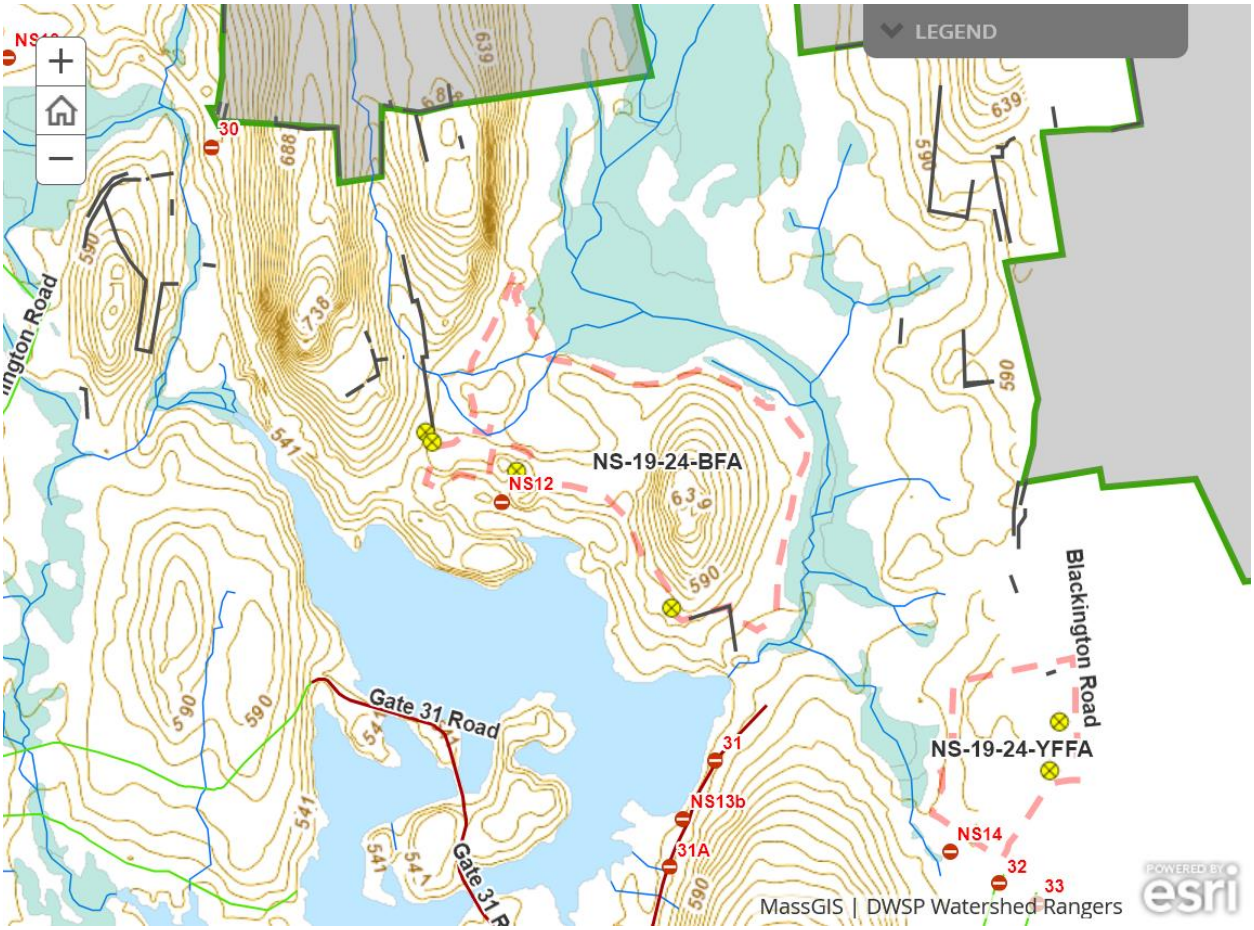
Forwarder required: **No**

Feller/processor required: **No**

Steep slopes present: **No**

Comments on harvesting limitations:

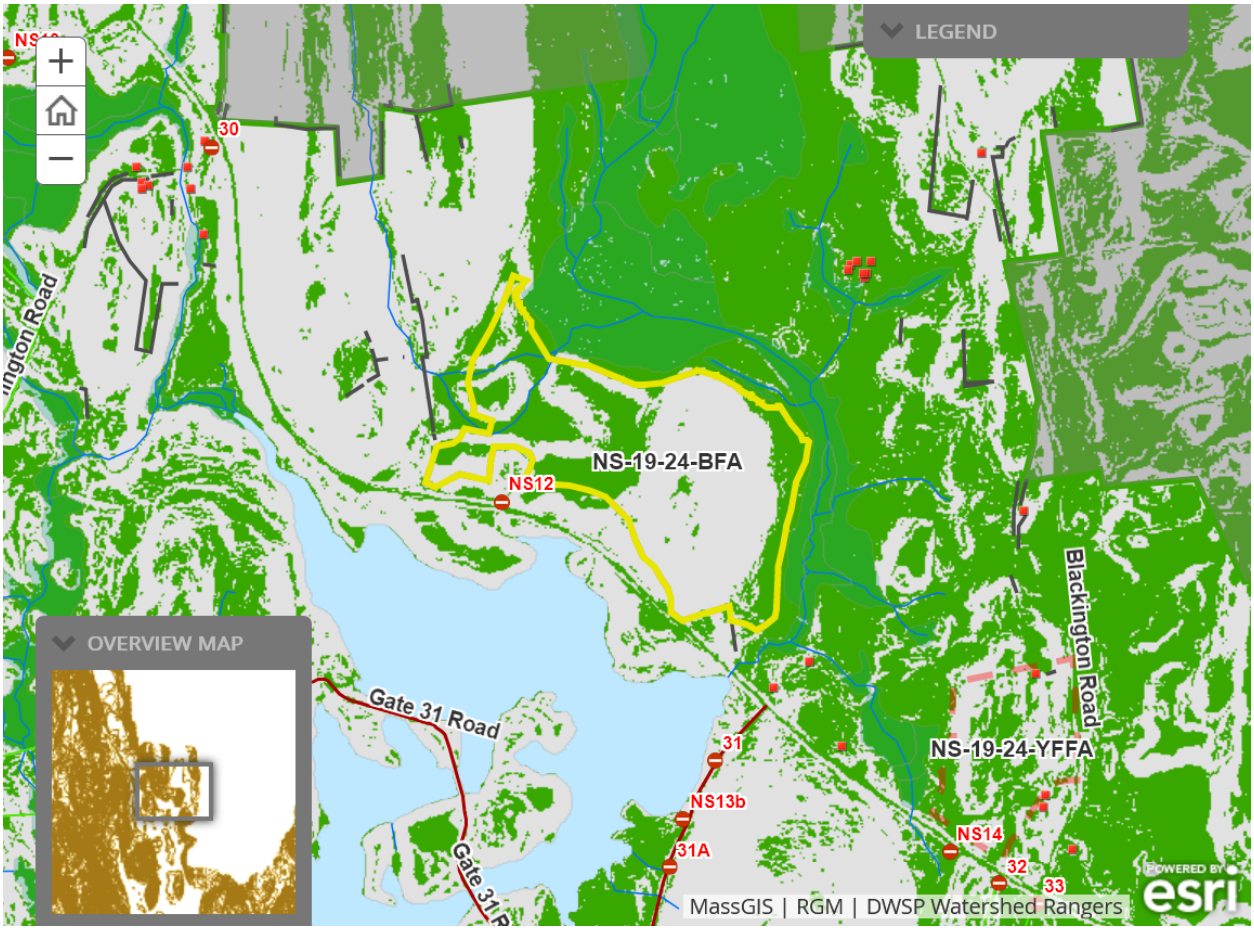
Ideally, this would be a whole tree operation, in order to minimize slash in anticipation of follow up with prescribed fire, and because barrens are nutrient poor and therefore don't need soil enrichment as a result of decaying slash. This will require creation of a large landing, probably on the unnamed access road to the west of the harvest area.



Cultural Resources

Comments on Cultural Resources:

There is a fieldstone just south of an iron pipe on the north side of Gays Hill, and “thrown” stone walls along a short portion of the southeast border of this lot. 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 Unique or Unusual Sites or Habitat:

According to the wildlife biologists at Mass. Wildlife, this area was historically a barrens, a type of ecosystem that is declining in Massachusetts due to suppression of fire and other disturbances. To counter habitat degradation, they recommend heavy harvesting, targeting white pine, hemlock and red maple for removal and protecting oak and pitch pine. This proposal is consistent with those recommendations.

There is a vernal pool about 100 feet south of the lot boundary, northwest of the intersection of the gravel pit access road and Route 122. This pool will be protected by the provisions in the DWSP Management Plan and the Massachusetts Forestry BMPs, including prevention of ruts greater than 6” deep within 200 feet of the pool.

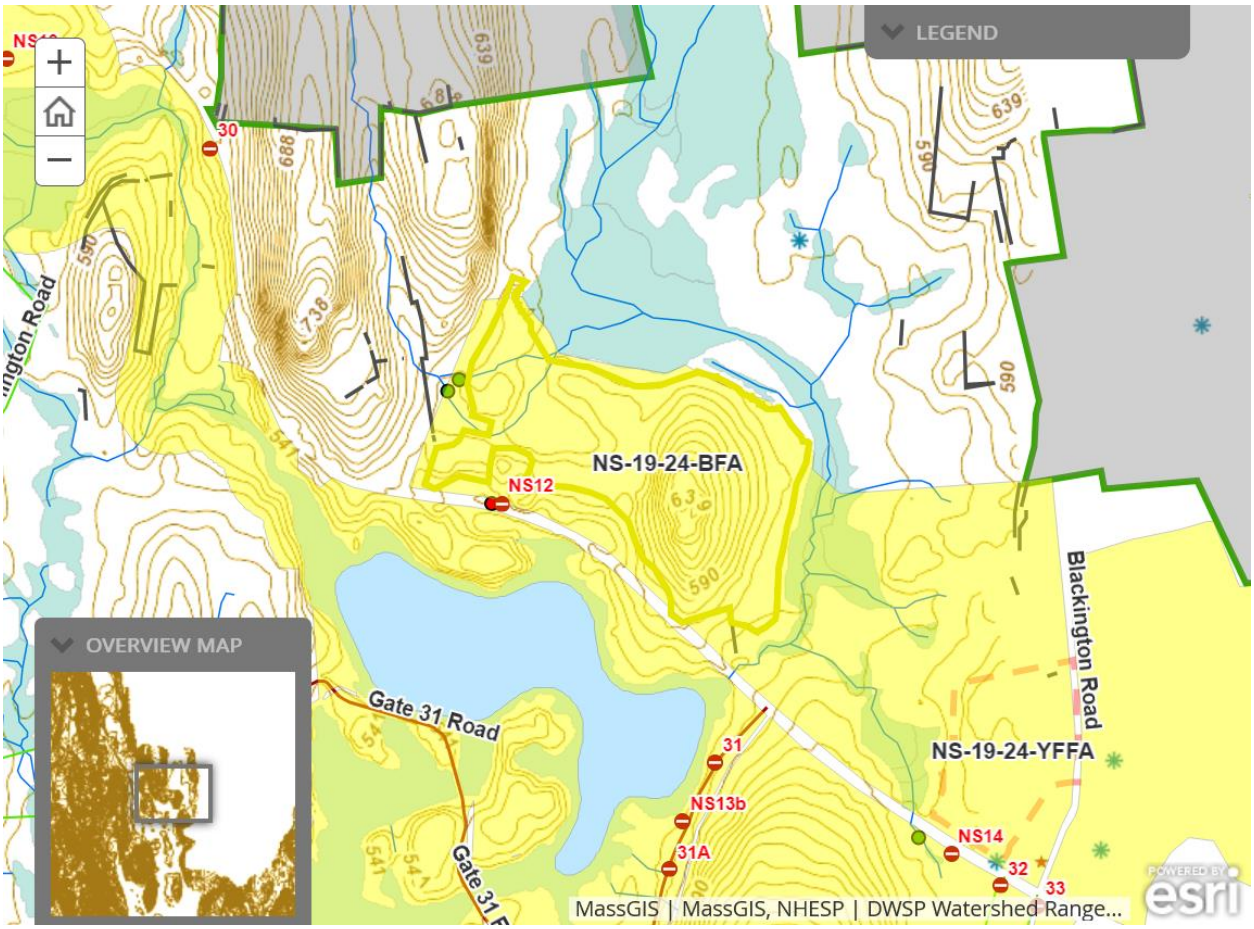
Blackington Swamp, which is just to the north of the lot, is mapped as a rare, unique and exemplary natural community, containing both blackgum (Nyssa sylvatica) and black spruce (Picea mariana). However, these communities are described as "marginal" and "scattered" at the east end of the Swamp, on the opposite side from this lot.

General Wildlife Comments:

The purpose of this harvest is to create barrens habitat for wildlife. Wildlife habitat features that are consistent with barrens will be protected wherever possible, including large diameter oak den trees and potential den trees, and large diameter logs and snags.

Comments on Rare Species/Habitats:

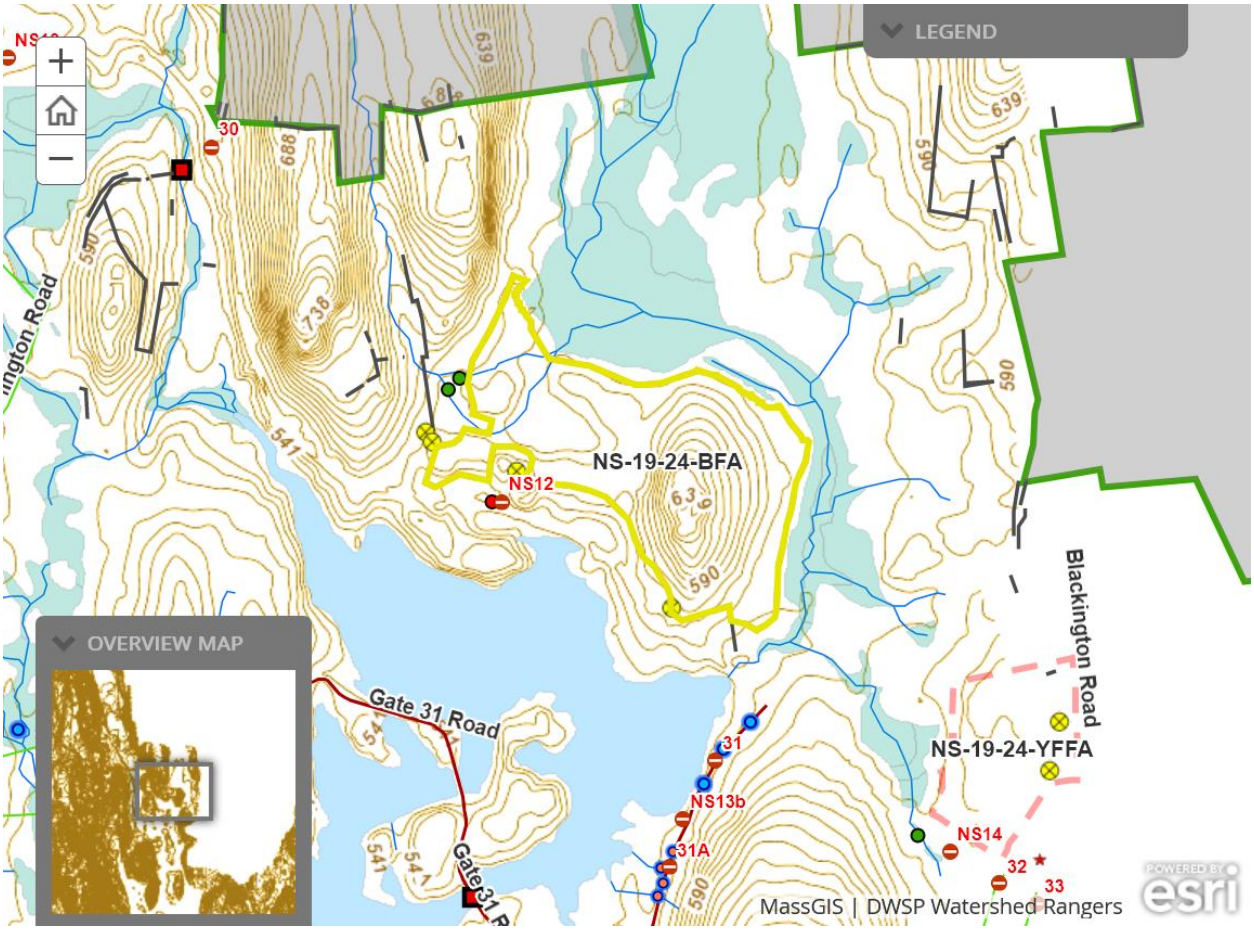
Cavity trees and potential/existing nest trees will be retained if possible. NHESP has determined that certain state-listed sensitive species or habitats may exist within the northern section of the lot proposal area. To protect them from unnecessary disturbance, detailed information regarding affected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

No perennial stream crossings.



Forest Access Engineering

Gravel needed: Yes

Landing work needed: Yes

Culverts needed: Yes

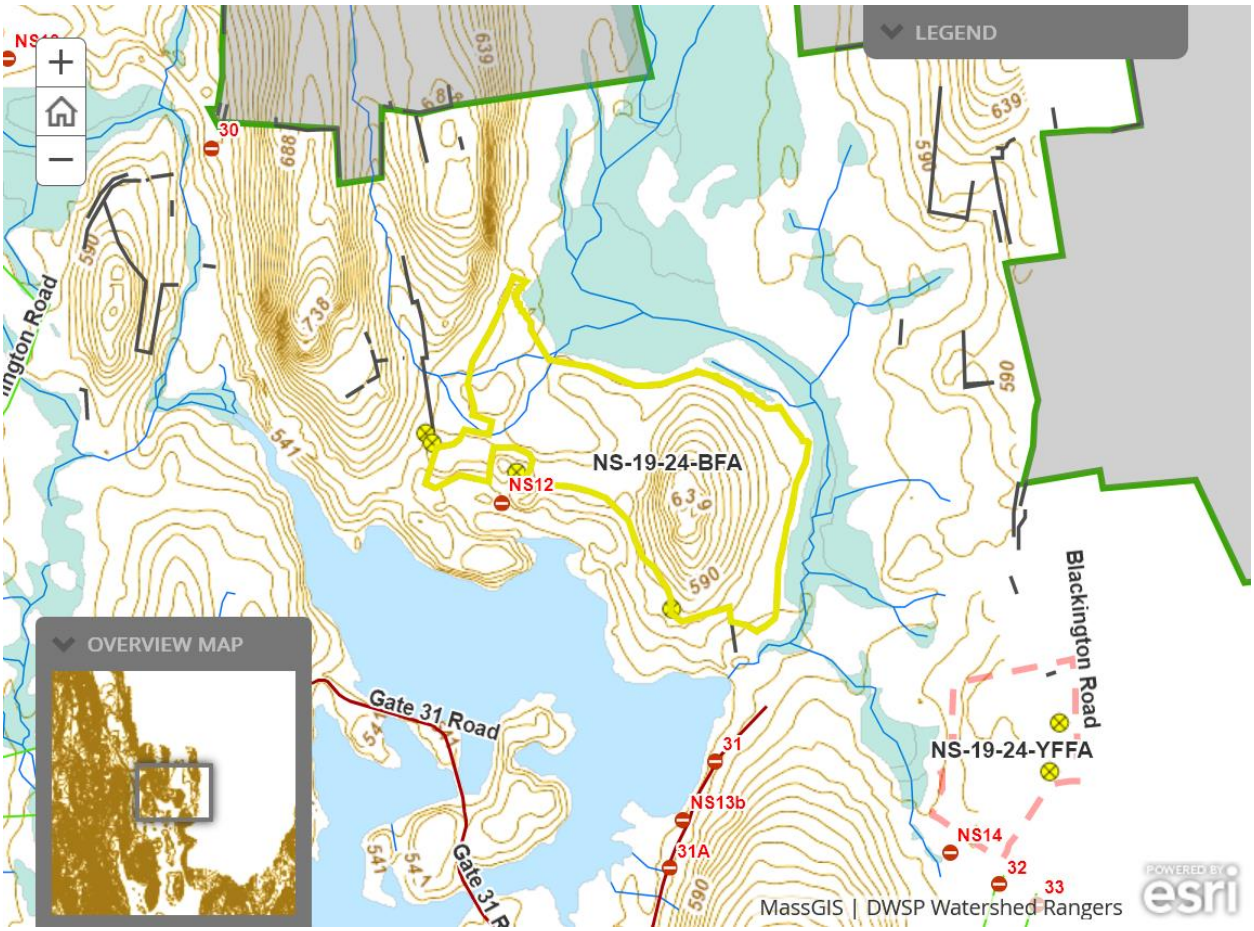
Work needed on permanent bridges: No

Beaver issue: No

Further comment on access needs:

A landing suitable for a chipping operation needs to be constructed to the south of Gays Hill. Gravel may be needed for parts of the access road as well as for the landing.

The culvert under the unnamed access road is broken in the center and crushed on the east end, and needs to be replaced for use during the harvest. A larger diameter culvert may be desirable to reduce backup of water on the west side. This work may require a Notice of Intent and Request for Determination to the New Salem Conservation Commission.



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