Massachusetts Department of Conservation and Recreation

Division of Water Supply Protection, Office of Watershed Management

Forest Management Project Proposal Summary for Public Comment

Location, goals, and summary of proposed forest management.

Proposal Summary Item	Item Information/Description
Lot Proposal ID	**PT-25-09**
Fiscal Year	2025
Watershed	**Quabbin**
Town(s)	**Petersham**
Forester	Helen Johnson
Total Acres	112.3
Block	Petersham
Compartment and/or Working Unit	9
Location and Boundary Description	Bounded to the southeast by Dugway Road; to the southwest by a high tension power line; to the west, northwest and northeast by stone walls; and to the east by the East Fever Brook/Dugway subwatershed divide, going slightly down over the top into Dugway subwatershed. Camels Hump Road runs north-south through the middle of the proposal area, and a side road connects Camels Hump Road to the power line.
Previous Proposal?	
Project Goals and Summary Description	This site was chosen for harvesting because lack of forest management since 1967 has resulted in low age diversity and extremely variable form and vigor. In addition, white pine is dominant in some parts of the overstory – a species that is highly vulnerable to breakage in high winds (see Hurricane Damage and Forests and One for the Ages: The Hurricane of 1938 Battered New England's Woods 75 Years Ago), which would result in exposure of soils and rapid loss of stored carbon. The primary goal for this harvest is to improve forest health, resilience, and structural diversity of the forest for the continued provision of outstanding quality drinking water. This will be accomplished by removing clusters of trees that are diseased, declining, or have poor stem structure, or where there are seedlings and saplings in need of more growing space, creating openings that provide sufficient light for young trees to survive and thrive. Where declining trees are scattered between openings, they will be removed in order to increase sunlight and nutrients for healthier adjacent trees. This process, known as thinning, is comparable to thinning a vegetable garden. The overall result will be a diverse, vigorous, climate-resilient forest that provides carbon storage and sequestration, and can recover, survive and thrive in the face of increasing rates and severity of disturbances.

Proposal Summary Item	Item Information/Description
Project Goals and Summary Description (cont.)	The above treatments will not be applied to the Norway spruce plantation near the high tension power line, due to the presence of numerous cultural features, several different species of invasive plants, and wet soils. Instead, the spruce will be left as habitat, its dense canopies providing thermal cover to wildlife. No harvesting will take place in the Norway spruce plantation, in order to protect the wet soils and cultural features in that area, and to prevent the spread of invasive plants; instead this uncommon cover type will be left to provide wildlife habitat. There will also be no harvesting in an old cemetery in the same area, from which all gravesites were removed during the creation of Quabbin Reservoir. Lastly, a nearby vernal pool will be protected by a nested series of buffers, as described on page 171 of the 2017 DWSP Land Management Plan.

Forest Cover Types and Acreages

Overstory Forest Types	Acres
oak, mixed - dry site	38.3
oak-hardwood	33.2
white pine-hardwood	29.3
white pine	4.1
Norway spruce	5.9
wooded wetland – deciduous	1.6

Understory Cover Types and Relative Importance

Understory Cover Type	**Relative area covered** (Dominant, Secondary, Minor, None)
Tree seedlings and saplings	Dominant
Mountain laurel	Minor
Mesic site - witch hazel, highbush blueberry	Minor
Dry site -Huckleberry, blueberry	Secondary
Mesic site - cinnamon fern, mixed hardwood	Secondary
Hayscented fern	Minor
Invasive shrubs/vines	Dominant near concentration of cultural features by powerline, minor on Camels Hump Road, none elsewhere.
Other	none

Forest Vegetation Description

Vegetation Topic	Description
General Description, Forest Composition, Stand History, and Harvest History	Much of the overall proposal area is dominated by white pine, either emergent over mixed oaks (red, black and white) and other hardwoods, or in pine-dominated patches. The most common associates are black birch, pignut hickory and red maple, with occasional hemlock, white ash, black cherry, sugar maple and aspen, mostly as midstory poles and small sawlogs. In the northwest corner of the proposal area and on the ridge to the east, white pine is less common and the overstory is dominated by oaks and other hardwoods. Along Camels Hump Road there are numerous large legacy hardwoods, including red oak, white oak, pignut hickory, black birch, white ash and sugar maple. At the intersection of the powerline and access road that intersects Camels Hump Road at 39-1A there's a six acre Norway spruce plantation in poor condition. Soils in this area tend to be wet, and there are numerous cultural resources and invasive plants. The understory contains numerous hardwood saplings, but relatively few seedlings, as described below. Witch hazel and cinnamon fern are present in the low, wet areas near the power line, and blueberry, huckleberry, wintergreen, partridgeberry, and clubmoss are common on the higher ground to the east. Witch hazel is present but not severe in the north, and hop hornbeam and hawthorne are present in the southeast. White pine form and vigor are highly variable. Some stems are straight and clear, with large, vigorous crowns, but defects are common, including forks (and less often crooks) due to past white pine weevil damage, thinning crowns due to white pine needle drop fungi, large branches and knots, stem wounds and cavities, and where white pine is densest, narrow crowns and low live crown ratio due to high competition. Black birch and red maple form and vigor are also highly variable; much of the black birch has nectria cankers, sometimes severe, and much of the red maple derived from stump sprouts. Red oak form and vigor is generally good; white is fair, and black oak has good vigor but poor to fair form. Spongy moth mortality is light to moderate in the northeast corner, and light to nonexistent elsewhere. Pignut hickories have good vigor, but sometimes have stem wounds and are visibly hollow. Red maple typically has good but variable form, much of it deriving from stump sprouts. White ash generally has good form but declining vigor. There are occasional overstory hemlocks with fair to good form and fair vigor, but most hemlocks are in the smaller and have very poor form and very thin crowns.
Advance Regeneration description	Black birch saplings are very common, dominating in the understory in some places, and in others mixed with other hardwoods, including red maple, oak and hickory. There's a vigorous patch of sugar maple regeneration just south of an old cemetery, a rarity in the north Quabbin area. Deer browse is low to moderate. Patchy, moderate density white pine seedlings are present but have poor vigor, and many are dead. Scattered hemlock seedlings and saplings have poor vigor and sometimes appear to have been browsed. Beech seedlings and saplings are present but uncommon.
Terrestrial Invasive Plants description	A moderate infestation of bittersweet and Japanese barberry is present around the cultural sites in the Norway Spruce plantation, spreading north and south along the power line. A much lighter infestation of multiflora rose is present along Camels Hump Road from intersection 39-1A to the north landing.

Description of Wetland Resources Present

Resource Type	Description of resources present
Wetlands	Two wetlands near the northwest corner of the proposal area and just south of the powerline drain west across the power line. There will be no harvesting in wetlands, and no wetland crossings. Much of the low area near the power line tends to be wetter than would be expected for the soil types. This area will be carefully checked during the growing season for wetland vegetation, and wetland boundaries will be ground-truthed, and re-mapped if necessary.
Streams	A stream drains northwest from Quabbin potential vernal pool 11, over a ridge to a wetland in the power line below. A second stream drains into the same wetland, starting at a stone wall about 300 feet to the north. There will be no stream crossings, and streams will be protected with variable width filter strips.
Vernal pools	Quabbin potential vernal pool 11 is about 250 feet from the power line and 1250 feet from Dugway Road, at the top of a ridge between the power line and Camels Hump Road. The wetland in the northwest has also been flagged to be checked for vernal pool activity. Both will be protected in accordance with the restrictions in the 2017 DWSP Land Management Plan unless definitively determined otherwise.
Seeps	There's a seep near the northwest boundary of the proposal area, which will be protected in accordance with the restrictions in the 2017 DWSP Land Management Plan.

Description of Soils by Hydric Class

Soil Hydric Classes	% of area	Soil series and any further comments
Excessively Drained	0	
Well-drained Thin	21.2	Charlton-Chatfield-Hollis association, very rocky
Well-drained thick	79.5	Montauk-Scituate-Canton association, extremely stony Montauk-Canton association, extremely stony Charlton-Chatfield association, extremely stony
Moderately well-drained	0	
Poorly to very poorly drained	0.2	Ridgebury-Whitman association, extremely stony

Proposed Silvicultural Activities

Topic	Description
Site Selection and Silvicultural Objectives	This site was chosen because of the dominance and variable condition of white pine, a species that is highly vulnerable to breakage in high winds (see Hurricane Damage and Forests and One for the Ages: The Hurricane of 1938 Battered New England's Woods 75 Years Ago).

Topic	Description
Silviculture Prescription	Openings of up to two acres each totaling up to 35 acres will be located where there are clusters of trees that are diseased, declining, or have poor stem structure, and where there is viable advance regeneration (especially oak and hickory saplings) in need of release. White pines with thin crowns, forked stems, and signs of weevil damage will be top priorities for removal. Healthy oaks and hickories will be favored for retention, as will species that are locally or regionally uncommon. Where declining trees are scattered between groups, they will be cut in order to increase sunlight and nutrients for healthier adjacent trees. Trees on the perimeter of openings will have large, healthy crowns (hence strong seed bearing potential), stable stem structure, and will be either vertical or leaning away from the openings so that they will not damage regeneration in the opening if they fall or are cut in the future. Thinning around openings will improve the vigor and seed production of perimeter trees, and will make them more windfirm after a few years. Cutting of all witch hazel, mountain laurel and trees under 6" dbh will be required in openings, except for healthy oak and hickory seedlings and saplings, which will be flagged or marked for retention. In 90% of openings over 0.5 acres, 5-10 ft^2 of basal area will be retained unless no longer required by DWSP. No harvesting will take place in the Norway spruce plantation, where there are numerous cultural features, invasive plants, and wet soils. There will also be no harvesting in the old cemetery at intersection 39-1A.

Climate Change Considerations: DWSP has determined that the decision to implement this project is consistent with EEA climate goals and guidelines and agency land management objectives. Carbon and climate change considerations specific to the activities proposed for this project are discussed below.

Proposed Activity	Alignment of Activity with Climate Oriented Strategies and Recommendations
Full overstory removal, partial stand, patch regeneration cut. **(*see page 4, Silvicultural Prescription, patch openings)***	Patch cutting is a regeneration technique that straddles the boundary between classic even-aged and uneven-aged forest management systems. Foresters select appropriate areas ('patches' or 'groups') covering a portion of the stand to harvest rather than removing the entire stand and then return periodically to repeat the process in other portions of the stand. In using patch cutting there is no final regeneration cut. Patch size and shape are determined by many different factors including overstory condition, desired species composition in the regeneration layer, other desirable herbaceous and woody vegetation, location, stand re-entry period, etc. Harvesting in patches aligns with many **climate-smart forestry practices**: • Increasing **structural diversity** improves resiliency by reducing the impact of age/size related disturbances. • Extending regeneration periods minimizes short term impacts to groundwater and nutrient cycling. • Partial stand overstory removals more closely align with **natural disturbance patterns**. • More **carbon is left on the landscape** for longer periods, and within-patch live tree, snag, and coarse debris retention allow for development of old forest characteristics. • Can also be used as opportunities to increase the stocking of **future climate adapted species, current climate imperiled species**, or other types of desirable vegetation.
Diffuse overstory removal, partial cut, late rotation regeneration related. **(*see page 4, Silvicultural Prescription, thinning around openings and improvement cutting in the Norway spruce plantation*)**	Partial cutting via single trees or small groups in a mature stand can advance a variety of management objectives as well as **climate-smart practices**. Single tree or very small group removals, if used exclusively and repeatedly, will perpetuate an **uneven-aged stand condition** with a species mix shifted towards higher shade tolerance. However, this type of harvest can also serve within an even-aged system to establish regeneration of species of lower shade tolerance under a partial canopy for subsequent release using larger group or patch cuts (irregular shelterwood) or complete-stand overstory removals. Advantages of partial overstory removals include, but not limited to: • Partial cutting **retains carbon on the landscape** for extended periods while regeneration develops. • Reducing competition for resources improves growth and **carbon sequestration** rates on residual trees. • Promotion of a diversity of age classes enhances overall forest **resiliency**. • Maintenance of continuous forest corridors provides for wildlife habitat. • As part of a regeneration system this method can be used to help guide species diversity towards more **future-adapted mixes**.
Additional Carbon and Climate Considerations	The primary purpose of forest management by the DCR Division of Water Supply Protection is to maintain and improve the **watershed forest resilience**,

Proposed Activity	Alignment of Activity with Climate Oriented Strategies and Recommendations
Additional Carbon and Climate Considerations (cont.)	i.e. the ability to resist and recover quickly from major disturbances, including climactic events such as hurricanes, tornados, microbursts, prolonged drought or excessive rainfall, as well as severe disease or insect infestations. DCR-DWSP conducts timber harvests on <1% of the forest per year in order to achieve that objective, which is accomplished by **fostering forest health and diversity at all levels, resulting in communities of vigorous, healthy trees of multiple species and at various stages of development** (seedlings through large legacy trees). Species diversity improves resistance by reducing canopy loss in the event of major disease or insect outbreaks, because most such forest health issues target a limited selection of species. Age diversity ensures that even if the taller trees are blown over by high force winds, younger trees will be present to continue to hold the soil. These measures, taken for the purpose of maintaining high quality drinking water in perpetuity, are also **highly adaptive for climate change** in that they increase forest **carbon resilience**, the maintenance of both carbon sequestration and carbon storage over time, and **climate resilience,** the ability of a forested ecosystem to survive and thrive despite major disturbances. Specifically, this harvest will improve carbon and climate resilience by: **Enhancing carbon sequestration:** ○ Initiating regeneration (fast-growing young trees) by increasing sunlight to the forest floor. ○ Thinning to increase growth rates of mature trees. **Protecting forest carbon:** ○ Retaining large legacy trees for their full lifespan. ○ Retaining the healthiest, most vigorous (fastest growing) trees. ○ Installing water bars to prevent loss of soil carbon to erosion. ○ Careful routing of skid trails to avoid sensitive soils. **Sustaining forest hydrology:** ○ Protecting riparian areas with filter strips of increasing width based on slope, and avoiding steep slopes altogether. ○ Avoiding stream and wetland crossings, and using Best Management Practices to reduce impact when crossings are necessary. ○ Refraining from harvesting in wetlands, unless absolutely necessary to protect overall forest health.

Proposed Activity	Alignment of Activity with Climate Oriented Strategies and Recommendations
Additional Carbon and Climate Considerations (cont.)	**Maintaining native plant biodiversity:** ○ Minimizing new introductions of invasive plants on vehicles and equipment, and removing existing invasive plants. ○ Ensuring the diversity of the next generation of trees by creating canopy gaps large enough to support the full breadth of tree species diversity. ○ Retaining the healthiest trees of all native species. **Preserving wildlife habitat:** ○ Retaining uncommon habitat features, such as large diameter logs, snags, and den trees. ○ Protecting current and potential nesting trees for raptors. ○ Maintaining 100 foot shade zones and 200 foot low ground disturbance zones around vernal pools. ○ Maintaining stream water temperature for aquatic species by preserving forested corridors along perennial streams and rivers. **Reducing impacts of severe disturbances:** ○ Improving overall forest health. ○ Favoring the tree species that are expected to be best adapted to future climate conditions, such as oak and hickory. Increasing age class diversity to allow rapid recovery after disruption of the forest canopy.

Equipment and Access Constraints and Considerations

Constraint Topic	Description and Considerations
Proposed Equipment requirements	Forwarder
Proposed wetland or stream crossings	None
Further wetland comments	None
Vernal Pools	If verified, vernal pools will be protected in accordance with the 2017 DWSP Land Management Plan.
Access improvements needed	None
Other EQ issues	None
In-kind Services	TSI will be required in groups. Restoration of Dugway and Doubleday Village Roads to their original condition will be required at lot completion.
Other Access Concerns (parking, trails, etc.)	none

Subwatershed Analysis

Sub-Watershed number/name	Total DCR-owned acres in this sub-watershed	Acres regenerated on DCR land in the last 10 years in this sub-watershed	Total DCR-owned acres remaining for regenerating up to the 25% per 10 year limit for this sub-watershed	Acres in this sub-watershed that are part of this proposed lot
East Fever Brook	2138.3	11.1	67.1	94.1
Dugway Road	337.1	0.4	83.9	7.1

Additional comments on Subwatershed analysis: No comments.

Wildlife and Habitat Observations and Considerations

Wildlife/Habitat	Observations and Considerations
Natural Heritage Priority Habitats?	The high tension power line is mapped as Priority Habitat, probably for early successional species that will make use of the young forest created by this harvest. However the overlap between the NHESP bubble and this proposal is only 2 acres along the long edge of this proposal – about 2/3 mile – so it's probably due to a slight mapping discrepancy, and may not have any effect on this harvest.
State Listed species present:	NHESP has determined that certain state-listed sensitive species or habitats may exist within 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 activity.
Rare Natural Communities:	None known
General Wildlife Comments	The decline of Norway spruce and hemlock, which normally have dense crowns, means loss of thermal cover for wildlife. Relatively healthy individuals of both species will be retained for habitat. Harvesting in spruce will be minimal due to invasives, cultural features, and wet soils. Stick nests are present and will be protected in accordance with the restrictions in the 2017 DWSP Land Management Plan. Browse of hardwood and hemlock seedlings is present but not severe.

Cultural Resources Description and proposed protection measures

Cultural Resource	Description and proposed protection measures
Historical features present; comments regarding protection	The DWSP Cultural Resources Inventory GIS layer shows a house site at the east end of the connecting road between Camels Hump Road and the power line, with a barn, a hen house, and three sheds. The Norway spruce plantation around these sites speaks to the open condition of the land when Quabbin Reservoir was created. Invasives in this area include bittersweet, Japanese barberry, and multiflora rose. Harvesting will be very limited in this area to protect the cultural sites and to preserve as much Norway spruce as possible. At the northwest corner of Camels Hump Road and the connecting road, thrown stone walls enclose 1/10 acre at the site of the former Williams Cemetery, which no longer has any grave markers. No harvesting will take place within the cemetery. A number of additional thrown stone walls are located around and within the proposal area, most likely from 19th century pastures. They will be avoided as much as possible, but where crossings are needed they will be located at existing barways, or where the walls have already been broken down by past crossings. Any additional cultural features that are located before or during the harvest will be mapped, photographed, flagged, avoided and protected, consistent with the guidelines set forth in the 2017 DWSP Land Management Plan.
Description of site characteristics in relation to Ancient sites modeling	Surface stone is common in this area, but microtopography is not pronounced. Slope varies widely from very gentle near the power line to 30-40% on the ridgetop to the east. If applicable, DWSP will follow the recommendations of DCR's Archeologist regarding protection of sensitive sites.

Massachusetts Department of Conservation & Recreation

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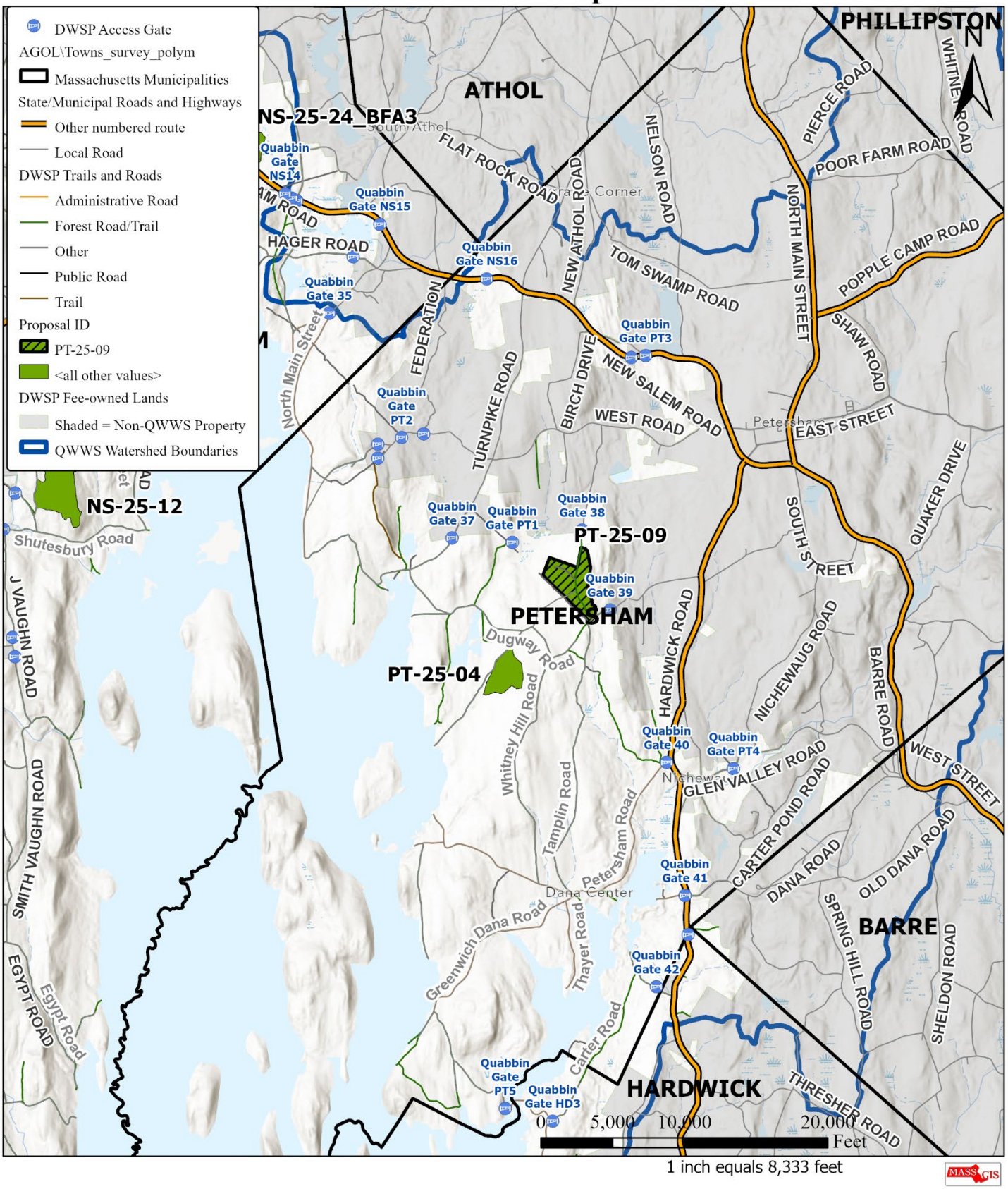
Office of Watershed Management

PT-25-09 -- Locus Map



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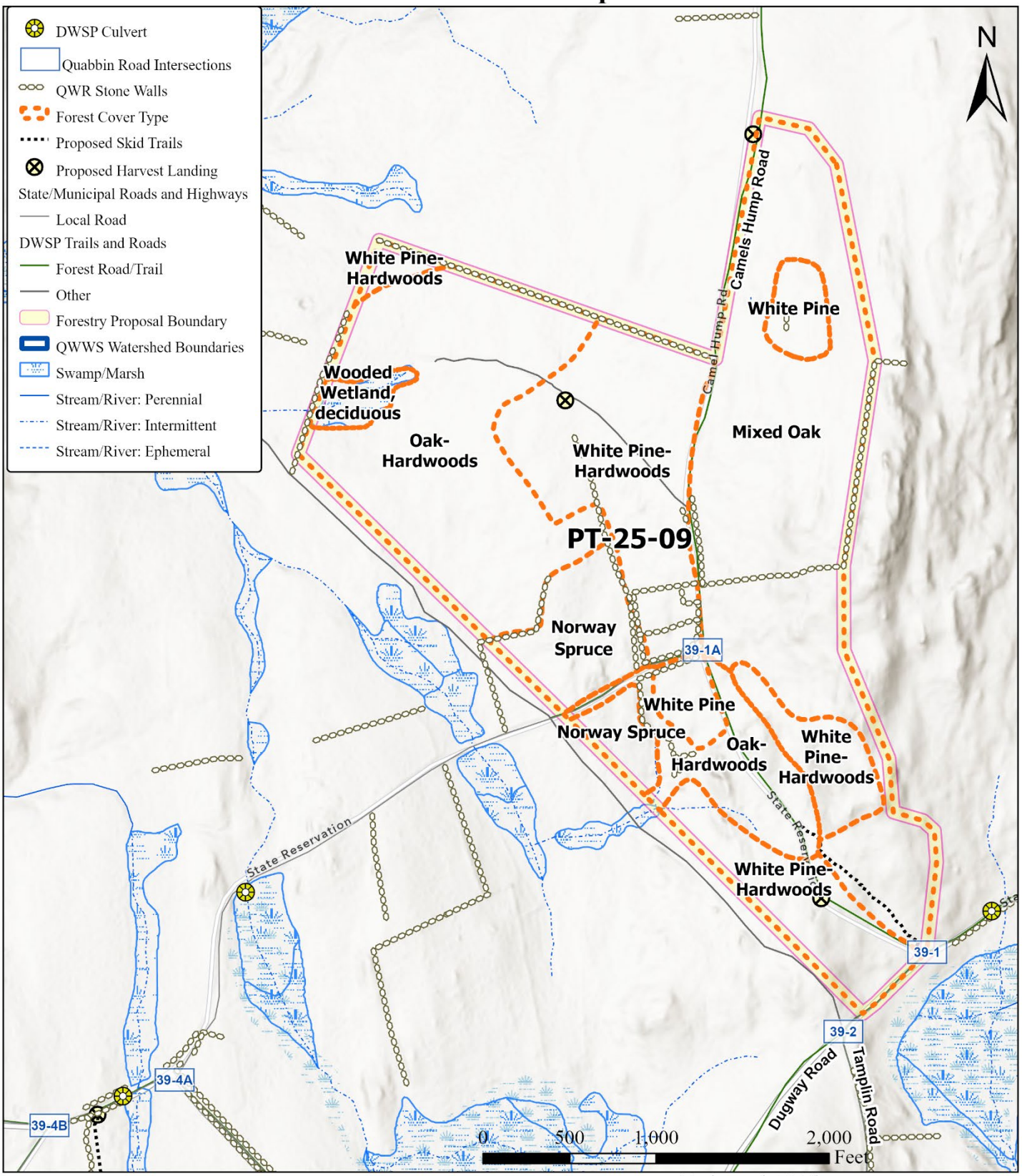
PT-25-09 -- Stand Map



1 inch equals 700 feet

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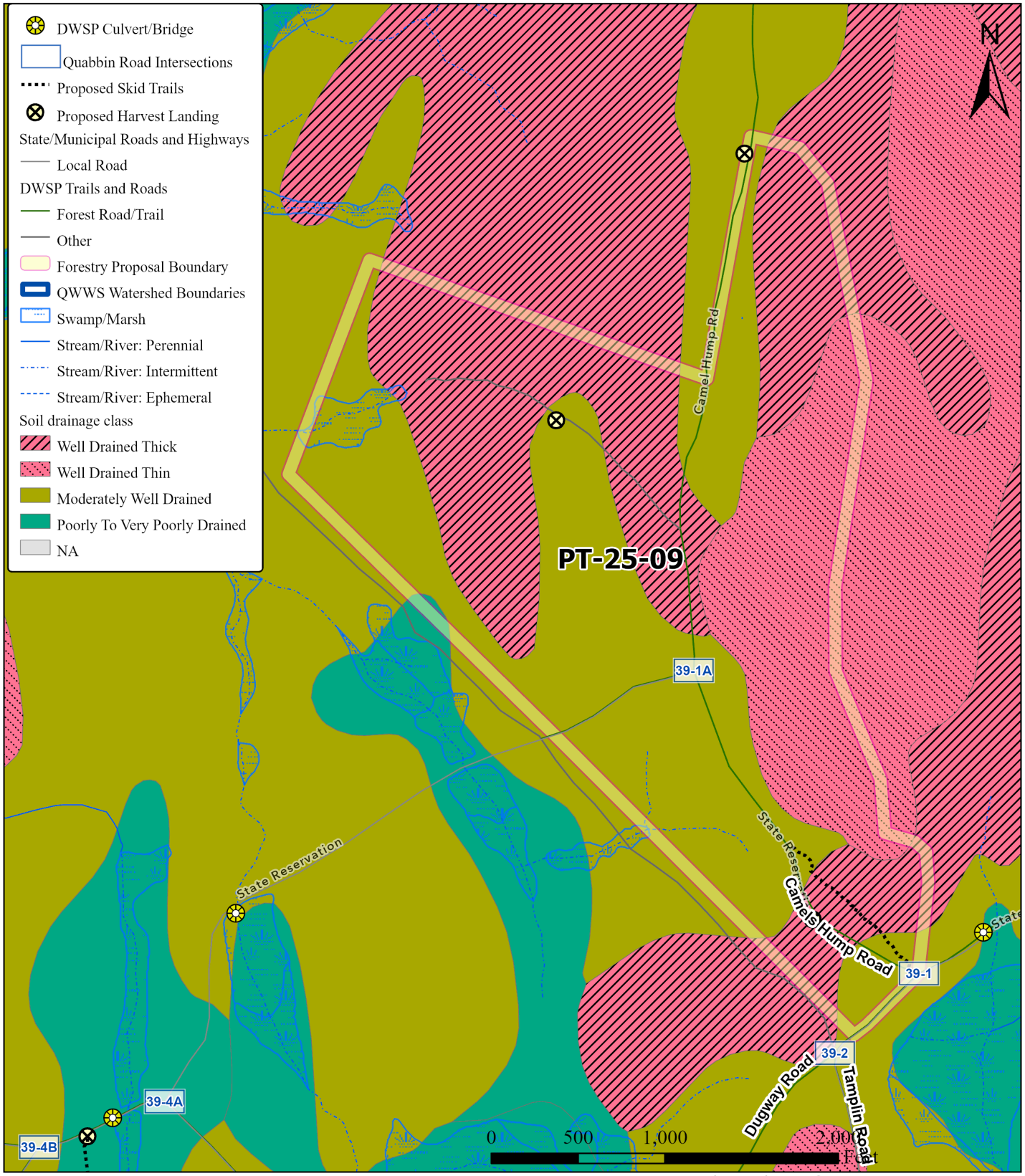
PT-25-09 -- Soil Drainage Class



1 inch equals 700 feet

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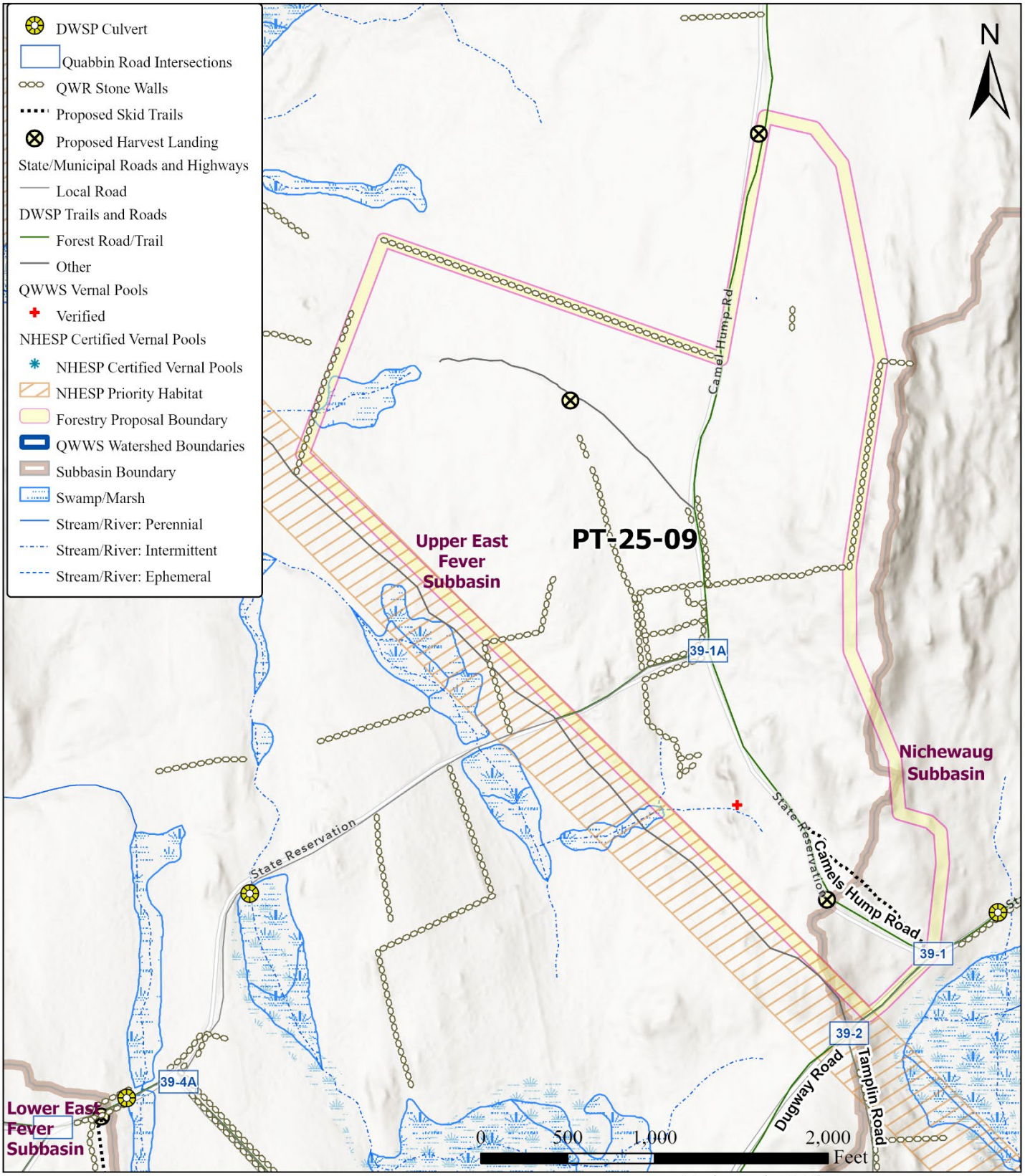
PT-25-09 -- Wetlands and Wildlife Resources



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PT-25-09 -- Cultural Resources and Landscape Characteristics