**Massachusetts Department of Conservation and Recreation**
**Bureau of Forest Fire Control and Forestry**
**Forest Management Proposal**
**Name: Erving State Forest – Microburst Clean- Up**

| | |
|---|---|
| **Region:** | Central |
| **Recreation District:** | Central Highlands |
| **Forest Management District:** | Eastern Connecticut Valley |
| **State Forest:** | Erving State Forest |
| **Closest Road:** | Laurel Lake Road |
| **Town** | Erving |


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**Overview of storm and extent of damage**

The National Weather Service confirmed a microburst within the towns of Erving and Warwick, Massachusetts on Thursday July 21, 2022 at approximately 3p.m. This event was estimated to have maximum wind speeds of 90 miles per hour. The path of this storm had a maximum width of 300 yards and spanned across approximately 2.1 miles.

The microburst passed over Erving State Forest, including the Laurel Lake Campground, as well as portions of Warwick State Forest, resulting in numerous acres of damage to overstory trees and the premature closure of the Laurel Lake Campground for the season. Initial mapping efforts were primarily conducted in areas subject to damage with a 'Woodland' and 'Parkland' landscape designation within Erving State Forest (Commonwealth of Massachusetts, 2012). As time allows, more focus on mapping damage within designated 'Reserves' in Warwick State Forest as well as future vegetation monitoring will be implemented.

**Mapping efforts**

Nearly all spatial data collected in the field to determine the extent of damage to guide salvage efforts was collected using a sub meter GPS unit. This includes, but is not limited to, areas depicting microburst damage, streams, wetlands, and campsites. Areas depicting storm damage which were mapped in the field are based on ocular estimates of approximately 25% canopy damage or greater. Mapped polygons do not include isolated (greater than +/-50 feet from closest polygon) instances of damage effecting individual tree crowns.

**Site Overview**

Erving State Forest consists of two separate parcels. Both parcels are located north of Route 2 in the town of Erving, Massachusetts. The parcel being described herein consists of approximately 1,970 acres of land which abuts both the Northfield State Forest to the north and Warwick State Forest to the east. The property encompasses a portion of Laurel Lake, which is partially owned by DCR, as well as a picnic area, boat ramp, and campground. These areas have a Parkland designation, while the remainder of the property is designated as Woodland, under DCR's Landscape Designations (Commonwealth of Massachusetts, 2012).

Approximately 115.2 acres are planned to undergo a salvage operation at this time. This does not reflect the total extent of the storm damage initially assessed and mapped. Some areas were omitted based on slope and the presence of wetland resource areas. Due to slopes present and the general layout of the damage, the installation of multiple landings and access points may be necessary; including landing areas within the Parkland.

Topography within the area to be salvaged varies slightly. In general, the slopes are slight to moderate with mainly a north facing aspect, with some areas of damage on west and east facing slopes. The majority of the soils for this area are moderately well drained to well drained (see Figure 1). Some areas contain large amounts of surface stones. Salvage operations are planned on portions of the site that are well suited for operability of harvesting equipment.

| Soil Name | Acreage within Damage Area | Percent of Acreage within Damage Area |
|---|---|---|
| Canton-Chatfield-Hollis complex, 8 to 15 percent slopes, rocky | 0.2 | 0.17 |
| Canton-Chatfield-Hollis complex, 15 to 35 percent slopes, rocky | 6 | 5.23 |
| Montauk fine sandy loam, 8 to 15 percent slopes, very stony | 19.6 | 17.07 |
| Henniker sandy loam, 3 to 8 percent slopes | 8.2 | 7.14 |
| Henniker sandy loam, 3 to 8 percent slopes, very stony | 8.5 | 7.40 |
| Henniker sandy loam, 8 to 15 percent slopes, very stony | 28.6 | 24.91 |
| Henniker sandy loam, 15 to 25 percent slopes, very stony | 4.2 | 3.66 |
| Metacomet fine sandy loam, 3 to 8 percent slopes | 11.6 | 10.10 |
| Canton fine sandy loam, 8 to 15 percent slopes, very stony | 15.4 | 13.41 |
| Gloucester sandy loam, 25 to 45 percent slopes, very stony | 0.2 | 0.17 |
| Chichester fine sandy loam, 3 to 8 percent slopes | 12.3 | 10.71 |
| **Totals** | **114.8** | **100.00** |

Figure 1. Approximate soil types and associated acreages underlying the storm damage area to be salvaged.

Forest conditions within the area impacted by the microburst consisted of an even aged 100-120 year old forest dominated by an overstory of northern red oak (*Quercus rubra)*, eastern white pine (*Pinus strobus)*, and eastern hemlock (*Tsuga canadensis*). Other species present include American beech (*Fagus grandifolia),* red maple (*Acer rubrum),* black birch (*Betula lenta),* white ash (*Fraxinus americana),* black oak (*Quercus velutina),* and paper birch (*Betula papyrifera)*, among others. Beech, birch, and hemlock dominate in the understory throughout most of the damage area.

There are several streams and wetlands located within or adjacent to the areas to be salvaged. These areas have been delineated in the field and mapped. Storm damage located within wetlands and stream filter strips will be left undisturbed.

**Salvage Operations Overview**

Parkland (Campground) - Stormwise/Windfirm Silviculture

Stormwise silviculture will be implemented within the campground (Ward et al, 2016). Clean up of existing damage is expected to occur where >25% of canopy damage has occurred, along with the removal of any trees deemed potentially hazardous within a 150 foot buffer of any campground infrastructure. The goal of this approach is to establish more wind firm, resilient forest conditions into the future. Strategic selection and removal of current and future hazard trees will allow for the establishment of a new cohort of trees which can be more strategically managed as they grow to increase wind firmness and resilience throughout the campground. DCR Forest Health experts identified the following forest pathogens and pests as having current and potential future impacts on tree health and safety on this site: hemlock woolly adelgid, hemlock looper, emerald ash borer, beech bark disease, and nectria canker. Efforts to mitigate these concerns were considered during stormwise silviculture planning.

Woodlands – Salvage Clean Up

Similarly, to the Parkland designation, salvage operations within the Woodland designation will focus on the removal of storm damaged trees where >25% of canopy damage has occurred. Healthy, undamaged native species will be marked for retention to provide age class and structural diversity into the future as well as to provide a seed source. Forest conditions in these areas has shifted from a mature forest to what is now considered areas of young forest. This change in habitat and growing conditions will provide species who rely on young forests, an opportunity to utilize this site for shelter, foraging, breeding, and nesting opportunities that would have otherwise been unavailable. Forest management efforts to continue diversifying forest age classes in this area will be considered in the future.

Warwick State Forest Reserves

Aerial mapping efforts have indicated areas of damage occurring within the Reserves, these will be better identified and mapped on the ground as time allows. Due to the time sensitive nature of salvage/clean up operations, mapping efforts will be undertaken within the Reserves once the salvage/clean up operations are under contract. At this point, there is no plan to implement salvage operations within designated Reserves. Future monitoring of these areas is expected to be implemented in the form of vegetation sampling within damaged/disturbed areas. No salvage operations are planned within Reserves at this time.

**Operations/Project Specifics**

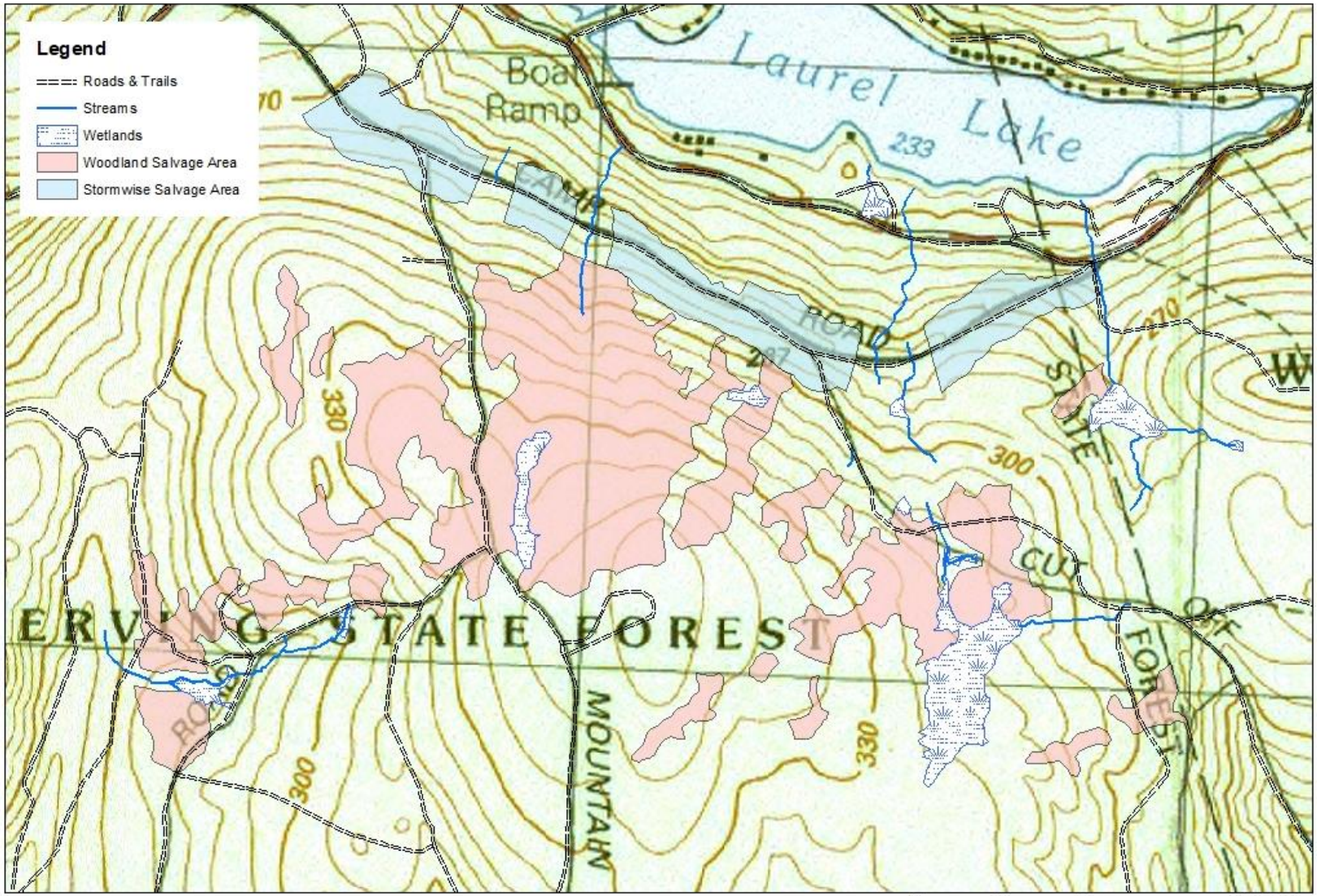
Whole tree removal is the preferred means of operation within the Parkland for aesthetic reasons to minimize slash presence. Tree tops and down woody debris will be less of a concern within the Woodland and coarse woody material minimum standards, as laid out in the current Landscape Designations and Management Guidelines document, will be implemented. The project perimeter and retention trees within the Woodlands will be delineated in the field using paint. Trees designated for removal will be painted within the greater campground area. Close coordination with DCR Forest Health and Operations staff will be required in planning the location of landing areas and designation of retention trees within the Parkland. All infrastructure within the Parkland will be flagged and identified in the field and mapped, with their current condition documented prior to the commencement of salvage operations.

**REFERENCES**

Commonwealth of Massachusetts. Department of Conservation and Recreation. Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines. March 2012.

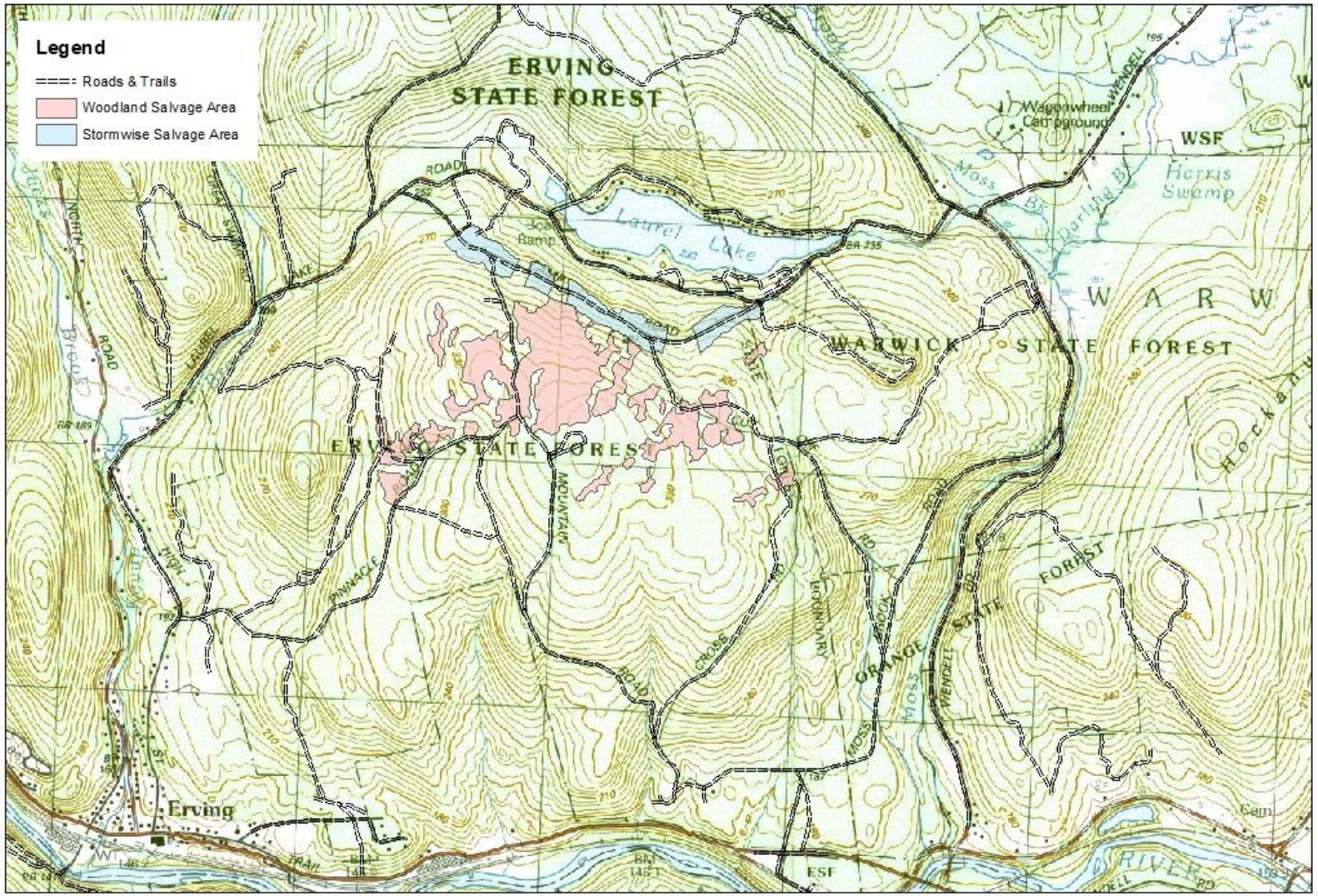
Ward, Jeffrey S.; Worthley, Thomas E.; Degnan, Thomas J.; Barsky, Joseph P. 2017. Stormwise: Integrating arboriculture and silviculture to create storm-resilient roadside forests. In: Kabrick, John M.; Dey, Daniel C.; Knapp, Benjamin O.; Larsen, David R.; Shifley, Stephen R.; Stelzer, Henry E., eds. Proceedings of the 20th Central Hardwood Forest Conference; 2016 March 28-April 1; Columbia, MO. General Technical Report NRS-P-167. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station: 119-132.

Erving State Forest
Laurel Lake Road - Erving, Massachusetts
Microburst Salvage Map




Map Prepared By: Joelle Vautour - DCR Forester - October 28, 2022

Erving State Forest
Laurel Lake Road - Erving, Massachusetts
Microburst Salvage - Locus Map

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