**DCR: DSPR Post-management monitoring** **September 2019**
**Marlboro-Sudbury State Forest – Goodale Lot**

**Overview:**

This post-harvest inventory was conducted on the ±35 acre harvest conducted in the winter of 2015-16 on the "Goodale Lot" located in the Marlboro-Sudbury State Forest in the Town of Hudson. The harvest was a preparation and seed cut as part of a shelterwood regeneration system to convert a red pine plantation to a mixed white pine and hardwood forest type more typical of the area. The harvesting was done with a tracked cut to length harvester and wheeled forwarder. Ample advance regeneration (white pine-hardwood) was present throughout the project area pre-harvest.

Post-harvest inventory was conducted at 12 points systematically located in the harvest area. At each point, overstory trees (≥ 1 in. DBH) were sampled using horizontal point sampling with a BAF $40_{ENGLISH}$ angle gauge; understory trees (< 1 in. DBH, ≥ 3 in. tall) were sampled using circular plots of fixed radius 3.7 ft.; and CWD was sampled using line intersect sampling with a single 10 ft. long transect at each point. Field inventory was conducted during August 2019, under dry summer conditions using standards set forth in the DCR: DSPR Post Management Inventory Protocol. Photographs were taken at 11 of these plots.

**Overstory observations**:

Other than small home fuel-wood projects no widespread or intensive silvicultural work had been completed on this property since planting of the red pine and white pine back in the 1930's under the Civilian Conservation Corps program. The 2015-16 harvest removed the bulk of the trees in the 6 in.to 10 in. DBH range, as they occupied the intermediate and suppressed canopy positions. Trees in other size classes were thinned as needed to remove lower grade, poor quality stems and small sawlogs. Hardwood trees (predominantly oaks) and white pines with good form were retained. The harvest resulted in an even distribution of softwood species across the project area with hardwood species scattered randomly within the stand.

A few overstory trees have been damaged post-harvest by wind events resulting in broken tops and a few blown over trees. The overall condition of the overstory is good however gypsy moth defoliation of oak trees in the area over the past few years has caused some mortality. White pine and red pine compose 83% of the 122 $ft^2$/ac basal area live of overstory trees. Approximately 35 snags per acre ≥ 5 in. DBH are present (all red pine).

**Understory observations**:

Prior to harvest, adequate conditions were available for a large cohort of white pine and various hardwood species to become established in the understory. Advantageous growing conditions due to openings in the overstory have allowed many saplings to grow >2 ft. per season. Sunlight penetration to the forest floor has allowed huckleberry, low-bush blueberry, and other herbaceous plants to flourish. Scattered populations of invasive buckthorn and oriental bittersweet have been observed in the understory as well. White pine and red oak compose 87% of the 10,972 trees per acre < 1 in. DBH.

**Coarse woody debris observations**:

Harvesting operations scattered CWD evenly throughout the project area. Slash was run over by equipment during harvesting and no observed piles exceed 2 ft. tall. Most of the FWD is in advanced stages of decay or non-existent. Bark is loose or sloughing off all larger pieces. 3,028 $ft^3$/ac of CWD were present, with 46% of that in pieces.

**Photographs:**



*Figure 1 View of uniform distribution of overstory trees and advance regeneration*



*Figure 2 Advance white pine regeneration growth response to harvest.*



*Figure 3 Diverse advance regeneration and shrubs. Decomposing course woody material in foreground.*

**STANDING LIVE TREES;**
**ALL SIZES -**
**STAND TABLE**

| COMMON NAME | red pine | | eastern white pine | | red maple | | quaking aspen | | white oak | |
|---|---|---|---|---|---|---|---|---|---|---|
| SPCD | 125 | 125 | 129 | 129 | 316 | 316 | 746 | 746 | 802 | 802 |
| HT (FT) / DBH (IN) CLASS | **BA** | **TPA** | **BA** | **TPA** | **BA** | **TPA** | **BA** | **TPA** | **BA** | **TPA** |
| 3.0 IN ≤ HT < 4.5 FT. | 0 | 84 | 0 | 5149 | 0 | 675 | 0 | 422 | 0 | 84 |
| 4.5 FT ≤ HT < 10.0 FT. | 0 | 0 | 1 | 338 | 0 | 0 | 0 | 84 | 0 | 84 |
| 10.0 FT ≤ HT > 15.0 FT. / < 1.0 IN. DBH | 0 | 0 | 1 | 84 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 7 | 35 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 23 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 20 | 26 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | 20 | 19 | 10 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | 0 | 0 | 13 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 42 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 46 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ≥50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTALS** | **63** | **172** | **42** | **5631** | **0** | **675** | **0** | **506** | **0** | **169** |

**STANDING LIVE TREES;**
**ALL SIZES -**
**STAND TABLE**

| **COMMON NAME** | northern red oak | | black oak | | | |
|---|---|---|---|---|---|---|
| **SPCD** | 833 | 833 | 837 | 837 | TOTAL | TOTAL |
| **HT (FT) / DBH (IN) CLASS** | **BA** | **TPA** | **BA** | **TPA** | **BA** | **TPA** |
| 3.0 IN ≤ HT < 4.5 FT. | 0 | 4558 | 0 | 0 | 0 | 10972 |
| 4.5 FT ≤ HT < 10.0 FT. | 0 | 0 | 0 | 0 | 1 | 506 |
| 10.0 FT ≤ HT > 15.0 FT. / < 1.0 IN. DBH | 0 | 0 | 0 | 0 | 1 | 84 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 7 | 35 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 23 | 43 |
| 12 | 0 | 0 | 0 | 0 | 23 | 30 |
| 14 | 0 | 0 | 7 | 6 | 37 | 34 |
| 16 | 0 | 0 | 10 | 7 | 23 | 17 |
| 18 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 0 | 0 | 0 | 0 | 3 | 2 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 0 | 0 | 3 | 1 |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 32 | 0 | 0 | 0 | 0 | 0 | 0 |
| 34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 36 | 0 | 0 | 0 | 0 | 0 | 0 |
| 38 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 | 0 | 0 | 0 | 0 | 0 | 0 |
| 42 | 0 | 0 | 0 | 0 | 0 | 0 |
| 44 | 0 | 0 | 0 | 0 | 0 | 0 |
| 46 | 0 | 0 | 0 | 0 | 0 | 0 |
| 48 | 0 | 0 | 0 | 0 | 0 | 0 |
| ≥50 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTALS** | **0** | **4558** | **17** | **13** | **122** | **11725** |

**STANDING DEAD TREES;**
**≥ 1 IN. DBH -**
**STAND TABLE**

| COMMON NAME | red pine | | eastern white pine | | red maple | | quaking aspen | | white oak | |
|---|---|---|---|---|---|---|---|---|---|---|
| SPCD | 125 | 125 | 129 | 129 | 316 | 316 | 746 | 746 | 802 | 802 |
| HT (FT) / DBH (IN) CLASS | **BA** | **TPA** | **BA** | **TPA** | **BA** | **TPA** | **BA** | **TPA** | **BA** | **TPA** |
| 3.0 IN ≤ HT < 4.5 FT. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.5 FT ≤ HT < 10.0 FT. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.0 FT ≤ HT > 15.0 FT. / < 1.0 IN. DBH | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 7 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 42 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 46 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ≥50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTALS** | **7** | **35** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

**STANDING DEAD TREES;**
**≥ 1 IN. DBH -**
**STAND TABLE**

| **COMMON NAME** | northern red oak | | black oak | | | |
|---|---|---|---|---|---|---|
| **SPCD** | 833 | 833 | 837 | 837 | TOTAL | TOTAL |
| **HT (FT) / DBH (IN) CLASS** | **BA** | **TPA** | **BA** | **TPA** | **BA** | **TPA** |
| 3.0 IN ≤ HT < 4.5 FT. | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.5 FT ≤ HT < 10.0 FT. | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.0 FT ≤ HT > 15.0 FT. / < 1.0 IN. DBH | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 7 | 35 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 32 | 0 | 0 | 0 | 0 | 0 | 0 |
| 34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 36 | 0 | 0 | 0 | 0 | 0 | 0 |
| 38 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 | 0 | 0 | 0 | 0 | 0 | 0 |
| 42 | 0 | 0 | 0 | 0 | 0 | 0 |
| 44 | 0 | 0 | 0 | 0 | 0 | 0 |
| 46 | 0 | 0 | 0 | 0 | 0 | 0 |
| 48 | 0 | 0 | 0 | 0 | 0 | 0 |
| ≥50 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTALS** | **0** | **0** | **0** | **0** | **7** | **35** |

**COARSE WOODY DEBRIS SUMMARY** (DEAD; >45° FROM VERTICAL; ≥ 3.0 IN DIA; ≥ 3.0 FT LENGTH)

| PIECES/ AC | PIECE CF/AC | PILES (DIMENSIONS)/AC | PILE CF/AC | PILE DEPTH CF/AC | TOTAL CWD CF/AC: PIECES + PILE DIMENSIONS | TOTAL CWD CF/AC: PIECES + PILE DEPTH |
|---|---|---|---|---|---|---|
| 1055.4 | 1394.7 | 0.0 | 0.0 | 1633.5 | 1394.7 | 3028.2 |