

DFW Post-Harvest Flora  
Peru WMA, Peru Massachusetts  
Tracy Camp Norway Spruce plantation conversion  
Date of survey: 9/14/2009  
Surveyed by: Brian Hawthorne, Tony Gola  
Location of lot(s): South of Middlefield Road, north of South Street.

### General Description and Setting

The stand was abandoned pasture on a low hill along Middlefield Road that had been planted to Norway spruce during the 1930's. There is a seasonal stream and associated forested wetlands at the base of the hill along Middlefield Road. Two stands were delineated as ST-1 and ST-2 on the cutting-plan map ([http://www.mass.gov/dfwele/dfw/habitat/management/bdi/forest\\_mgt/forest\\_cutting\\_plans.htm](http://www.mass.gov/dfwele/dfw/habitat/management/bdi/forest_mgt/forest_cutting_plans.htm)). Portions of ST-2 include the forested wetland and a filter strip, which were not marked for harvest. For convenience, the marked portions of ST-1 and ST-2 were inventoried prior to harvest as a single floristic unit; while the wetlands and buffer strip were inventoried separately prior to harvest. This post-harvest inventory includes only the treated area of ST-1 and ST-2.

Large Norway spruce formed most of the forest canopy throughout the stand prior to harvest. Individual spruce trees had died and had either fallen over or persisted as snags at the time of treatment. Occasional white pine, black cherry, and paper birch that occupied gaps in the spruce canopy were retained during the harvest, along with a few adjacent stems of Norway spruce, resulting in approximately 15% canopy retention aggregated in several large groups.

The understory and herb layers have responded dramatically since the overstory removal with total cover in the herbaceous and shrub layers increasing from just a few percent before harvest to over 75% following the second growing season after harvest. Tree species composition shifted from predominantly Norway spruce, with scattered overstory white pine and native hardwoods and understory regeneration dominated by Norway spruce, to a sapling forest dominated by black cherry and other native hardwoods. Understory herb and shrub species composition shifted from regionally common forest species before harvest to primarily open field species after harvest. Overall species diversity (total number of different species) remained approximately the same between pre-harvest and post-harvest, but abundance of individual species increased markedly post-harvest.

### Significant Flora and Habitats

No rare or unusual species or significant habitat types were found.

### Invasive Species

Several individual stems of shining buckthorn (*Rhamnus frangula*) were found within the harvest area and were removed by pulling. Garlic mustard (*Alliaria petiolata*) seedlings were found near the landing area in 2008 and were controlled by pulling. No other non-native invasive species were found at the site.

## Harvest Goals

With native red spruce forest well-established in the local landscape, the original intent of this treatment was to replace planted Norway spruce with a structurally diverse, two-aged stand dominated by early-successional northern hardwoods species such as cherry, birch, and aspen (about 85% cover) with remnant overstory of white pine, black cherry, white birch, and Norway spruce (about 15% cover). At the end of the second growing season, this goal appears to have been reached.

| <b>Stratum/life form</b> | <b>Height (ft)</b> | <b>Cover class</b> | <b>Cover Classes</b> |        |
|--------------------------|--------------------|--------------------|----------------------|--------|
| T1 Emergent Tree         |                    |                    | <b>+</b>             | <1%    |
| T2 Tree canopy           | 70'                | 2                  | <b>1</b>             | 1-5%   |
| T3 Tree sub-canopy       |                    |                    | <b>2</b>             | 6-25%  |
| S1 Tall shrub            | 8'                 | 4                  | <b>3</b>             | 26-50% |
| S2 Short shrub           | 3'                 | 3                  | <b>4</b>             | 51-75% |
| H Herbaceous             | 5'                 | 3                  | <b>5</b>             | >75%   |
| N Non-vascular           |                    |                    |                      |        |
| V Vine/liana             |                    | +                  |                      |        |

| <b>Stratum</b> | <b>Species</b>        | <b>Cover Class</b> |
|----------------|-----------------------|--------------------|
| T2             | Betula papyrifera     | 1                  |
| T2             | Picea abies           | 2                  |
| T2             | Pinus strobus         | 1                  |
| T2             | Prunus serotina       | +                  |
| S2             | Acer rubrum           | +                  |
| S1             | Acer pennsylvanicum   | +                  |
| S1             | Betula populifolia    | 1                  |
| S1             | Corulus cornuta       | +                  |
| S1             | Fagus grandifolia     | +                  |
| S1             | Populus grandifolia   | 1                  |
| S1             | Prunus serotina       | 4                  |
| S2             | Amelanchier sp        | +                  |
| S2             | Aronia melanocarpum   | +                  |
| S2             | Betula alleghaniensis | +                  |
| S2             | Betula populifolia    | +                  |
| S2             | Betula populifolia    | +                  |
| S2             | Carex crinita         | 1                  |
| S2             | Larix laricina        | +                  |
| S2             | Picea abies           | 1                  |
| S2             | Picea rubens          | +                  |
| S2             | Pinus strobus         | +                  |
| S2             | Populus tremuloides   | +                  |
| S2             | Prunus pennsylvanicum | 1                  |
| S2             | Quercus rubra         | +                  |
| S2             | Rhamnus frangula      | +                  |
| S2             | Rubus hispidus        | 2                  |

|    |                             |   |
|----|-----------------------------|---|
| S2 | Rubus spp                   | 1 |
| S2 | Salix bebbii                | + |
| S2 | Salix sericea               | + |
| S2 | Spirea latifolia            | 1 |
| S2 | Spirea tomentosa            | 1 |
| S2 | Vaccinium corumbosum        | + |
| H  | Agrostis hyemale            | + |
| H  | Agrostis sp                 | + |
| H  | Aralia hispida              | + |
| H  | Aralia nudicalis            | + |
| H  | Aster puniceus              | + |
| H  | Aster umbellatus/doloringea | + |
| H  | Bidens frondosa             | + |
| H  | Carex debilis               | + |
| H  | Carex lurida                | + |
| H  | Carex sp                    | + |
| H  | Carex sp (ovales?)          | 1 |
| H  | Danthania sp                | + |
| H  | Dennstaedtia punctilobula   | 1 |
| H  | Dicanthelium sp             | + |
| H  | Dryopteris carthusiana      | + |
| H  | Epilobium coloratum         | + |
| H  | Eupatorium maculatum        | + |
| H  | Euthamia graminifolia       | + |
| H  | Impatiens capensis          | + |
| H  | Juncus effusus              | 1 |
| H  | Juncus tenuis               | + |
| H  | Lactuca canadensis          | 1 |
| H  | Lobelia inflata             | 1 |
| H  | Maianthemum canadense       | + |
| H  | Onoclea sensibilis          | + |
| H  | Potentilla simplex          | + |
| H  | Scirpus atrovirens          | + |
| H  | Scirpus rubrocinctus        | + |
| H  | Solidago altissima          | 1 |
| H  | Solidago rugosa             | 1 |
| N  | Moss sp                     | 1 |
| N  | Sphagnum sp                 | + |
| V  | Polygonum cilinode          | + |



**Figure 1. Vigorous herbaceous and low shrub layer at Peru Tracy Camp, 2 ½ years after removal of Norway spruce plantation with aggregate retention of 15% of canopy trees. Regeneration of native tree species (white pine, red maple, cherries, and birches) is visible along with some regeneration of Norway spruce. Sept 14, 2009 photo by MassWildlife Forester Brian Hawthorne.**



**Figure 2. Dense high shrub layer in much of area at Peru Tracy Camp, 2 ½ years after removal of Norway spruce plantation with aggregate retention of 15% of canopy trees. More than 50% of the treatment area has 6-8' cherries, primarily *Prunus serotina*. Mt. Greylock is visible on the horizon. Sept 14, 2009 photo by MassWildlife Forester Brian Hawthorne.**