

2011 Restoration Planting Project Plan & As-Built Report



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The 2011 Restoration Planting Project Plan is a summary of 2011 planting related projects, prescriptions, and accomplishments occurring in the Cedar River Municipal Watershed

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1.0 Background

The goal of the Upland Forest Restoration Planting Program is to diversify plant species composition and to reestablish a resilient community of native species in the Cedar River Municipal Watershed (CRMW). Attention will be paid to where species diversity has been decreased by past harvest and/or where dispersal is limited. Planting projects will utilize site-specific knowledge to identify priority areas and species for restoration work (Upland Restoration Planting Plan, 2004).

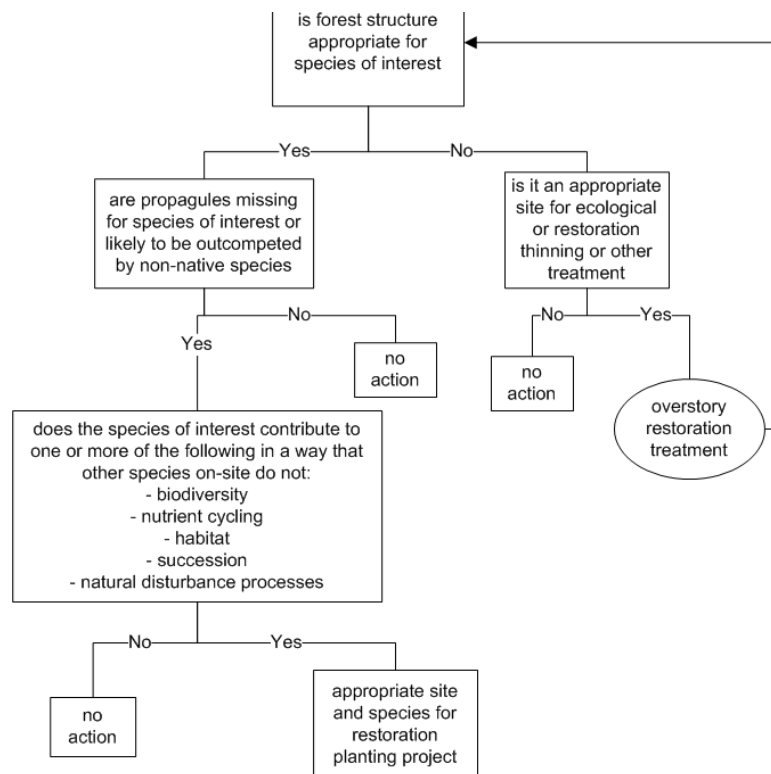
1.1 Goals and Objectives

Planting projects will be implemented that contribute to the ecosystem as a whole (rather than individual species restoration). Characteristics that will be considered include:

- the contribution of the species to the surrounding habitat
- on-going natural successional processes
- presence/absence of appropriate seed source – parent material
- acquiring appropriate plant material for CRMW planting projects
- opportunities to use native vegetation to inhibit the spread of invasive weeds.

We created decision tree for selecting appropriate sites and species for upland planting (Figure 1). It emphasizes that planting should only occur where appropriate structure exists and propagules are absent, and planting should utilize species that contribute to ecosystem processes in a way not already addressed by on-site species. (Upland Restoration Planting Plan, 2004)

Figure 1: Decision tree for upland planting species and site selection.



2.0 Planting Project Overview – 2011

Restoration planting in 2011 focused on planting seedlings on decommissioned roads and in ecologically thinned areas. In addition we evaluated restoration thinning areas for planting. The largest restoration planting projects in 2011 focused on seedling establishment on decommissioned roadbeds. Approximately 39,666 linear feet of decommissioned road was planted with a mix of site appropriate species. Based on an average road width of 10 feet, approximately 9.1 acres of decommissioned road was planted.

Information about planting decisions is provided in this section and individual project descriptions are provided in section 4.0.

2.1 Decommissioned Road Projects

Planting projects were installed in both spring and fall in 2011. The majority of the plant material was planted on recently decommissioned roads. These roads were selected for planting from a pool of decommissioned roadbeds based on the following:

- Absence of seed source in proximity of decommissioned road surface. In the case of the decommissioned 70 & 75 Roads, the surrounding developing forest is young with a dominant population of densely growing silver fir trees.
- Opportunity to improve species diversity and contribute to future wetland habitat and function. In the case of the decommissioned 55 & 57 Roads, the surrounding forest is mature second growth dominated by Douglas fir and western hemlock. The planting project re-introduced tree species and supplemented less common species to this former road bed.
- Opportunity to use developing seedlings to inhibit the spread of invasive weeds. In the case of the decommissioned 812, 70, and 75 Roads, small areas of invasive hawkweed persist. These projects planted seedlings adjacent to the hawkweed concentrations at a relatively close spacing with the goal that shade produced from these developing seedlings may limit the growth and spread of this invasive species.

Of the 9.1 acres of decommissioned roads that were planted in the spring and fall of 2011, approximately one acre focused on invasive species.

2.2 Ecological Thinning

Additionally in 2011, eight created forest gaps (2.5 acres) were planted as part of an ecological thinning project. This site is located in the upland forest on the north shore of Chester Morse Lake. These gaps were selected for planting based on the following:

- Opportunity to improve species diversity at a small scale.
- Opportunity to promote understory re-initiation following forest canopy manipulation on a dry, south facing site.

2.3 Restoration Thinning

Opportunities to perform restoration planting in conjunction with restoration thinning were investigated in 2011. Restoration thinning units identified in the previous year (2010) as having restoration planting potential, as well as 2011 restoration thinning units, were considered. Based on the goals and objectives of the restoration planting program, and the decision tree, there were no ideal candidates from this pool for restoration planting. Integrating restoration planting and restoration thinning will continue to be investigated in future years where appropriate.

3.0 Species Planted and Associated Costs

Expenses relating to restoration planting include both the cost of purchasing the seedlings and the labor to plant the seedlings.

3.1 Seedlings

We planted approximately 7,155 seedlings during the 2011 spring and fall planting seasons. About 4% of these seedlings were planted as part of a larger ecological thinning project with the remaining 96% being planted as a restoration effort associated with road decommissioning. Information is provided in Table 1 about the seedlings and planting costs.

Table1. Project, date planted, seedling and labor information

| Project & Install Date (2011) | Species | Number of Seedlings | Stock Type | Seedling Cost | Labor Cost ** |
|--|--------------------|----------------------------|-------------------|----------------------|----------------------|
| 55 & 57 Road | Black Cottonwood | 145 | Stake | \$130.19 | |
| May 11 | Western Red Cedar* | 922 | Plug+1 | \$442.56 | |
| | Western White Pine | 663 | Plug+1 | \$344.76 | |
| | Shore Pine | 150 | 2+0 | \$129.06 | external |
| Total | | 1,880 | | \$1,046.57 | \$1,028.50 |
| 121.1 Road Gaps | Western Red Cedar | 50 | Plug+1 | \$23.76 | |
| May 19 | Western White Pine | 125 | Plug+1 | \$64.67 | |
| | Douglas Maple | 100 | Bare root | \$78.87 | internal |
| Total | | 275 | | \$167.30 | \$1,566.84 |
| 812 Road | Western Red Cedar | 200 | Plug | \$108.00 | |
| October 25 | Noble Fir | 690 | Plug | \$372.60 | |
| | Douglas Fir | 320 | Plug | \$172.80 | external |
| Total | | 1,210 | | \$653.40 | \$624.00 |
| 70 Road | Western Red Cedar | 640 | Plug | \$345.60 | |
| October 25 | Noble Fir | 1,760 | Plug | \$950.40 | |
| | Douglas Fir | 520 | Plug | \$280.80 | external |
| Total | | 2,920 | | \$1,576.80 | \$1,248.00 |
| 75 Road | Western Red Cedar | 160 | Plug | \$86.40 | |
| October 25 | Noble Fir | 550 | Plug | \$297.00 | |
| | Douglas Fir | 160 | Plug | \$86.40 | external |
| Total | | 870 | | \$469.80 | \$460.00 |

*netting and stakes were added to approximately 1/3 of the western red cedar as browse protection

** external indicates a crew was contracted to plant seedlings; internal indicates Ecosystem staff planted the seedlings

3.2 Labor Costs

We used contract labor crews on the majority of the 2011 restoration planting projects. These crews are paid on an hourly basis, \$29.00/hour for a crew member and \$34.00/hour for a supervisor.

4.0 Restoration Project Descriptions and Prescriptions

Information about site conditions and justifications for the particular planting prescriptions follow. Maps of these planting units are included in Appendix A.

4.1 Unit 55 & 57 Road – Decommissioned Road Planting Project

The 55 & 57 Roads are located in the lower CRMW on relatively flat ground, at an approximate elevation of 800 feet. These two roads were decommissioned in late 2010 through early 2011. Small portions of the former road bisected small forested wetlands. Decommissioning these roads reconnected these wetlands. The majority of the decommissioned roadbed runs through a second growth Douglas fir forest.

Four different species of trees were selected for restoration planting on the disturbed roadbed:

-Western white pine (blister rust resistant) was planted in the upland areas of the roadbed. Including western white pine in the prescription provides an opportunity to re-introduce the species on a small scale in a landscape where historical data indicates it previously existed. (35% of seedlings planted)

-Black cottonwood stakes were planted in the wet areas. Including black cottonwood in this prescription provided an opportunity to supplement the naturally occurring cottonwood population. This is the first attempt in the restoration planting program of planting cottonwood stakes. These plantings will be monitored and future use of cottonwood stakes will depend on the success rate. (8% of seedlings planted)

-Western red cedar was planted to supplement the existing population. Western red cedar is a minority tree species in the adjacent forest. Protective netting supported by bamboo stakes was installed during planting to provide browse protection for the cedar seedlings. (49% of seedlings planted)

-Shore pine was planted in the upland areas of the road bed. Shore pine occurs rarely in the forests of the CRMW, and would be appropriate as a minority member of the forest population at this elevation. (8% of seedlings planted)

4.2 Unit 812 Road – Decommissioned Road Planting Project

The 812 Road is located in the upper CRMW, at approximate elevation 3,000 feet. This mid-slope road was decommissioned in 2011. The last 0.25 miles of the road had been previously decommissioned and provided an example of natural vegetation recovery.

The decommissioned road bed bisects a section of young Douglas-fir and silver fir forest as well as a section of old-growth forest. The section of road that runs through young forest was planted while the section of road that runs through older forest was left to re-vegetate naturally. The decision to plant particular sections was based on the following:

- 1) The young fir forest is not yet consistently producing tree seed. We planted seedlings in these sections because planting seedlings may improve road-bed stability and vegetation recovery;

- 2) The older forest is regularly producing tree seeds. We did not plant these sections because promoting a native, naturally established seedling has value genetically and ecologically;
- 3) Hawkweed, a non-native invasive plant, is present in sections of the 812 Road. We planted seedlings densely in these sections with the goal that the planted seedlings will provide future shade and help control of the hawkweed.

Three different species of trees were selected for restoration planting on the disturbed roadbed:

- Western red cedar was planted to supplement the existing population. Western red cedar is a minority tree species in the adjacent forest. (17% of seedlings planted)
- Noble fir was planted to supplement the existing population. Noble fir is a minority tree species in the adjacent forest. (57% of seedlings planted)
- Douglas fir was planted to supplement the existing population. Douglas fir is strongly present in the nearby older forest however the younger forest, adjacent to the planting, is not producing seed of in significant quantities to assure Douglas fir reestablishment on the existing roadbed. (26% of seedlings planted)

4.3 Unit 70 & 75 – Decommissioned Road Planting Project

The 70 and 75 Roads are located in the upper CRMW at approximate elevations 4,000 and 3,200 feet. The decommissioned end of the 70 road is a ridge top road and the 75 road is a mid slope road. Both roads were decommissioned in 2010.

The decision to plant these two road beds was based on the following reasons:

- 1) The young forest adjacent to both roads is dominated by silver fir. We planted seedlings in these sections because planted seedlings may improve species diversity and may improve road-bed stability and vegetation recovery.
- 2) Hawkweed, a non-native invasive plant, is present in sections of both roads. It is hoped that the planted seedlings will provide future shade, limit spread, and contribute to the control of hawkweed in this location.

Three different species of trees were selected for restoration planting on the disturbed roadbed:

- Western red cedar was planted to supplement the existing population. Western red cedar is a minority tree species in the adjacent forest. (70 road 22% of the seedlings planted; 75 road 18% of the seedlings planted)
- Noble fir was planted to supplement the existing population. Noble fir is a minority tree species in the adjacent forest. (70 road 60% of the seedlings planted; 75 road 64% of the seedlings planted)
- Douglas fir was planted to supplement the existing population. Douglas fir is a valuable older forest tree species and it is hoped that these seedlings will survive and compliment the current tree population and provide valuable habitat in the future. (70 road 18% of the seedlings planted; 75 road 18% of the seedlings planted)

5.0 Looking Forward

Restoration planting is an “upland forest restoration cost and performance commitment” included in the CRMW Habitat Conservation Plan (HCP). Restoration planting installations will occur throughout the 50-year life of the HCP, unlike restoration thinning, which has a 15-year commitment in the HCP. The cost commitment for restoration planting does decrease over time, with a cost commitment of approximately \$10,000 annually occurring through year 2015 and decreasing to approximately \$5,000 annually through year 2050 (all in 1996 dollars – no inflation applied). Information provided in Table 2 provides HCP cost commitment information.

Table 2. CRMW HCP Cost Commitments

| Years | Total 50 year | 1-10 | 11-15 | 16-20 | 21-30 | 31-40 | 41-50 |
|----------------------|---------------|----------|----------|----------|----------|----------|----------|
| Restoration planting | \$300,000 | \$93,800 | \$46,880 | \$27,020 | \$44,120 | \$44,120 | \$41,120 |

*from HCP 5.3-5 in 1996 dollars

5.1 Future Opportunities

There are many opportunities to continue restoration planting work in the CRMW:

- Continue evaluating restoration planting as a compliment to road decommissioning, utilizing the restoration planting flow chart as a decision making tool. The road decommissioning program cost commitment is complete in 2021.
- Continue evaluating and implementing restoration planting as a compliment to restoration thinning. The restoration thinning program cost commitment is complete in 2016.
- Continue evaluating and implementing restoration planting as a compliment to ecological thinning. The ecological thinning program cost commitment is complete in 2050.
- Explore opportunities for contract growing and utilization of plant material using seed collected from the CRMW.
- Explore opportunities for contract growing and utilization of ‘double plugs.’ Double plugs will be more robust (larger caliper, healthy root system) than a typical plug and also more expensive than a typical plug. Larger plugs may provide higher survival for fall planting in the higher elevation areas and decommissioned roadbeds in the CRMW.
- Explore opportunities for enhancing mycorrhizae populations in disturbed areas with nearby native material, in conjunction with planting. Design an experiment utilizing native mycorrhizae and purchased mycorrhizae in combination with planting. A good location may be a decommissioned road bed where the assumption is that beneficial mycorrhizae populations are minimal or absent.
- Continue western white pine blister rust resistant seedling relationship with USFS Dorena nursery. Incorporate western white pine seedlings in annual planting installations where appropriate.
- Continue seedling survival surveys and evaluations. Supplement plantings where appropriate and utilize adaptive management principles in future installations.

Appendix 1: 2011 Unit Maps

