

SEATTLE PUBLIC UTILITIES

# 2010 Restoration Planting Project Plan & As-Built Report

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*The 2010 Restoration Planting Project Plan and As-Built Report is a summary of 2010 planting related projects, prescriptions, and accomplishments within the Cedar River Municipal Watershed*

## Table of Contents

Introduction.....	3
1.0 Tree Planting Project Report Summary – 72.5 Road.....	4
2.0 Tree Planting Project Report Summary - 80 Road .....	6
3.0 Tree Planting Project Report Summary – Unit 14.2 & 14.3.....	8
4.0 Tree Planting Project Report Summary Unit 15.1 .....	10
5.0 Tree Planting Project Report Summary Units 29.2 & 29.3 .....	12
6.0 Tree Planting Project Report Summary Unit 54 .....	14
7.0 Tree Planting Project Report Summary Unit 14 .....	16
8.0 Lessons Learned.....	18
Appendix A Survival Surveys .....	19
Appendix B Maps of 2010 Restoration Planting Units .....	20

## **Introduction**

The purpose of this report is to provide information about the areas that were planted in the Cedar River Municipal Watershed in 2010. Restoration planting in 2010 focused on planting tree seedlings on decommissioned road beds and in previously thinned restoration thinning units.

The justification for considering restoration planting on decommissioned roads is that in some cases decommissioned roads re-vegetate naturally and in other cases there is very little natural vegetation a number of years after the decommissioning activity took place. For example, in the case of the 72.5 Road there was very little evidence of any natural regeneration occurring five years after the decommissioning took place. Another justification for considering restoration planting on decommissioned roads is to supplement a previous planting. For example, in the case of the 80 Road, the 2010 planting was intended to supplement a marginally successful previous planting.

The justification for considering restoration planting in restoration thinning units is to promote species diversity in silver fir dominated young forests and to increase seedling numbers in areas that were sparsely populated with trees.

## 1.0 Tree Planting Project Report Summary – 72.5 Road

April 10, 2010

### Decommissioned Road Restoration

- Location: 72.5 Road, Lower Watershed
- Elevation: 1,400 feet
- Seedling Source: Washington Conservation District – Bow Nursery (WACD Plant Materials Center)
- Labor: Volunteers coordinated by the Friends of the Cedar River Watershed (a not for profit organization)

#### Seedling Description

Species	Zone-elevation	Size	Number	Expense
Thuja plicata	412-1.5 (1,500')	P-1	550	\$308.00
Picea sitchensis	BC-500'	P-1	300	\$198.00
Shipping and tax				\$126.46
Totals			850	\$632.46

#### Project Description

The 72.5 Road is approximately 4,000 feet in length and was decommissioned in 2005. The decommissioned road runs through an older second growth forest (north half) and through a 'new forestry' harvest unit (south half). The north half of the road was dominated by grass that presumably had been planted in conjunction with the road decommissioning. The south half was occupied by a mix of grass, red alder seedlings, and salmonberry. The variability of vegetation on the road surface is primarily due to the amount of light available; there is considerable shade where the decommissioned road runs through the older second growth (north half) and much less shade where it runs through the new forestry harvest unit (south half).

The decommissioned 72.5 Road is a frequent travel route for deer and perhaps elk, based on a wildlife trail, numerous tracks and scat.

#### Project Details & Prescription

On April 10, 2010 a group of approximately 20 volunteers, coordinated by the Friends of the Cedar River Watershed, assembled and were transported to the north end of the 72.5 Road. The group received on site planting instructions and a planting demonstration.

The planting prescription specified that a western red cedar and a Sitka spruce were to be planted in the same planting hole (two seedlings planted in one hole). A total of 300 seedlings were planted together, one cedar and one spruce, in the same planting hole. The intent was that the

stiff needles of the spruce would discourage deer and elk from browsing on the cedar. Additionally, 250 western red cedar were planted solo (without a spruce in the same planting hole). When planting these 'solo' cedar, attempts were made to establish planting holes within salmonberry patches, and in areas less traveled by wildlife on and adjacent to the decommissioned road bed. The prescribed spacing between seedlings was approximately ten feet, which allowed the tree planters to establish a good planting hole.

### **Accomplishment**

Approximately 2,700 feet of the 72.5 road surface (the north half) was planted during the volunteer event. The south half had a sufficient variety of native vegetation, and so was not planted.

### **Follow-up**

Survival of the planted seedlings should be checked in the winter of 2010 or spring of 2011 and follow-up treatment recommended (either none needed or replant). After approximately five to ten years of growing in the same planting hole, the cedar and spruce should be checked. In cases where the cedar has survived and is above browse height for deer or elk the Sitka spruce should be eliminated.

## 2.0 Tree Planting Project Report Summary - 80 Road

May 8, 2010

### Decommissioned Road Restoration

- Location: portion of the 80 Road, Lower Watershed
- Elevation: 1,400 feet
- Seedling Source: Washington Conservation District – Bow Nursery (WACD Plant Materials Center)
- Labor: Volunteers coordinated by the Friends of the Cedar River Watershed (a not for profit organization)

#### Seedling Description

Species	Zone-elevation	Size	Number	Expense
Thuja plicata	King County 412-1.5 (1,500')	P-1	150	\$84.00
Thuja plicata	Skagit County 403-1.5 (1,500')	P-1	400	\$244.00
Picea sitchensis	Grays Harbor County (500')	2-0	75	\$49.50
Picea sitchensis	King County 412-1.5 (1,500')	P-1	125	\$103.75
Picea sitchensis	BC (500')	P-1	300	\$198.00
Shipping and tax				\$212.48
Totals			1050	\$891.73

#### Project Description

The portion of the 80 Road that runs parallel to Taylor Creek (approximately 1.5 miles) was decommissioned in 2005. There are frequent wet areas associated with this decommissioned road and the adjacent landscape, with seasonal seeps and springs draining across the road into Taylor Creek and its associated wetlands. This section of the 80 Road is adjacent to second growth forest containing Douglas fir, western hemlock, western red cedar, red alder, and big leaf maple. It is a frequent travel route for deer and perhaps elk, based on a road surface wildlife trail, numerous tracks and scat. This road is bisected by numerous deep water bars and purposely felled larger diameter conifers.

The decommissioned road was previously planted with potted trees (Douglas fir, Sitka spruce, grand fir), which are either thriving, damaged by wildlife (generally antler rubbing), or dead. This volunteer planting project was intended to augment the previous restoration planting that occurred on the 80 Road.

### **Project Details & Prescription**

On May 8, 2010 a group of twelve volunteers, coordinated by the Friends of the Cedar River Watershed, assembled and were transported to the north end of the 80 Road. The group received on site planting instructions and a planting demonstration.

The planting prescription specified that a western red cedar and a Sitka spruce were to be planted in the same planting hole (two seedlings planted in one hole). A total of 500 seedlings were planted together, one cedar and one spruce, in the same planting hole. The intent was that the stiff needles of the spruce would discourage the deer and elk from browsing on the cedar. Additionally, 50 western red cedar were planted solo (without a spruce in the same planting hole). When planting these 'solo' cedar, attempts were made to establish planting holes within salmonberry patches, and in areas less traveled by wildlife on and adjacent to the decommissioned road bed. The prescribed spacing between seedlings was approximately ten feet, which allowed the tree planters to establish a good planting hole. The planters were also advised to allow ten feet between the seedlings they were planting and any existing healthy previously planted tree.

### **Accomplishment**

Approximately 4,000 feet of the 80 Road surface was planted during the volunteer event.

### **Follow-up**

Survival of the planted seedlings should be checked in the winter of 2010 or spring of 2011 and follow-up treatment recommended (either none needed or replant). After approximately five to ten years of growing in the same planting hole, the cedar and spruce should be checked. In cases where the cedar has survived and is above browse height for deer or elk the Sitka spruce should be eliminated.

### 3.0 Tree Planting Project Report Summary – Unit 14.2 & 14.3

October 27, 2010

#### Restoration Thinning Units 14.2 & 14.3 Gaps Restoration Planting

- Location: Unit 14.2 & 14.3 is located at adjacent to and north of the 121.1 Road in the upper watershed
- Elevation: 3,000 feet
- Seedling Source: Weyerhaeuser Rochester Nursery for the noble fir; USFS Dorena Nursery for the western white pine.
- Labor: Contractor = Ramon Coronel Reforestation Inc., Chehalis

#### Seedling Description

Species	Zone-elevation	Size	Number	Expense
Abies procera	SW Centralia (3,000+)	P+0	600	\$204.00
Pinus monticola	Sourced from Dorena nursery	P+	90	donated
Labor cost (approx.)	Ramon Coronel Reforestation Inc.	\$0.52 per seedling	690 seedlings planted	\$358.80
Tax				\$17.54
Totals			690	\$580.34

#### ***Project Description***

This is a gap planting project in a Douglas fir dominated restoration thinning unit. These two units were previously restoration thinned with a traditional spacing prescription in the late 1990s and retreated with a ‘gap only’ prescription in 2010. The recently created gaps were restoration planted with noble fir and western white pine.

This planting project was intended to improve the diversity of tree species within the created gaps. The noble fir and western white pine seedlings, along with the already present Douglas fir, will serve as future seed sources and should help promote a more resilient forested environment in the future, relative to climate change. Pine was historically found in small numbers in the Cedar River Watershed as indicated from historic cruise data, but most pine was killed by blister rust. The USFS Dorena Nursery provided western white pine plugs which appear to be blister rust resistant. The seed was collected from western white pine growing naturally and believed to have survived blister rust exposure.

The fall plant was designed to increase seedling survival by allowing the seedlings time for root growth following planting. In addition they should benefit from spring moisture regimes prior to heading into the hot dry conditions typically experienced during summer in upper elevation forests occupying south facing slopes. Planting plug sized stock was intended to improve the seedling survival relative to snow loads.

**Project Prescription**

The prescription called for planting in sixteen 0.10<sup>th</sup> acre gaps (ten gaps in unit 14.2 and six gaps in unit 14.3). The spacing prescription within a gap is 10x10 feet or approximately 43 seedlings per gap.

**Accomplishment**

Contractors planted 600 noble fir and 90 western white pine in the sixteen gaps located in units 14.2 & 14.3.

**Follow-up**

Survival of the planted seedlings should be checked in late summer or fall 2011 and follow-up treatment recommended (either none needed or replant). This follow-up inspection may prove problematic, however, with the planned decommissioning of the mid-slope 121.1 road

## 4.0 Tree Planting Project Report Summary Unit 15.1

November 1, 2010

### Restoration Thinning Unit 15.1 Restoration Planting

- Location: Unit 15.1 is located at the end of the 730 Road in the upper watershed
- Elevation: 3,600 feet
- Seedling Source: Washington Department of Natural Resources, Webster Nursery Olympia for the Douglas fir; Weyerhaeuser Rochester Nursery for the noble fir; USFS Dorena Nursery for the western white pine.
- Labor: Contractor = Ramon Coronel Reforestation Inc., Chehalis

#### Seedling Description

Species	Zone-elevation	Size	Number	Expense
Pseudotsuga menziesii	Yakima (3,000-4,000')	P+0	1,280	\$640.00
Abies procera	SW Centralia (3,000+)	P+0	1,350	\$459.00
Pinus monticola	Sourced from Dorena nursery	P+	90	donated
Labor cost (approx.)	Ramon Coronel Reforestation Inc.	\$0.52 per seedling	2,720 seedlings planted	\$1,407.44
Tax				\$90.03
Totals			2,720	\$2,596.47

#### Project Description

This planting unit was clear-cut harvested approximately 30 years ago. Unit 15.1 is part of a multi-unit restoration thinning project and was thinned in 2009 (the year prior to this planting). The area was sparsely populated with trees and dominated by silver fir. This area is problematic to reforest due to the relatively high elevation and access issues (snow can linger into May or June). Unit 15.1 shares a short segment of boundary with older forest, adjacent and to the north.

This planting project was intended to improve the diversity of tree species and increase the tree density within the unit. The increased species diversity should help promote a more resilient forested environment in the future, relative to climate change. Pine was historically found in small numbers in the Cedar River Watershed as indicated from historic cruise data, but most pine was killed by blister rust. The USFS Dorena Nursery provided western white pine plugs which appear to be blister rust resistant. The seed was collected from western white pine growing naturally and believed to have survived blister rust exposure.

The fall plant was designed to increase seedling survival by allowing the seedlings time for root growth following planting. In addition they should benefit from spring moisture regimes prior to heading into the hot dry conditions typically experienced during summer in upper elevation forests. Planting plug sized stock was intended to improve the seedling survival relative to snow loads.

### **Project Prescription**

The prescription called for planting 100 trees per acre. Additionally the prescription specified planting a seedling approximately 20 feet away from any healthy existing tree in the unit. The tree planters were instructed to mix Douglas fir and noble fir (approximately 50:50) and to mix the small number of white pine seedlings in where appropriate.

### **Accomplishment**

Contractors planted 1,280 Douglas fir, 1,350 noble fir, and 90 western white pine.

### **Follow-up**

Survival of the planted seedlings should be checked in late summer or fall 2011 and follow-up treatment recommended (either none needed or replant).

## 5.0 Tree Planting Project Report Summary Units 29.2 & 29.3

October 21, 2010

### Restoration Thinning Units 29.2 & 29.3 Restoration Planting

- Location: Unit 29.2 is located adjacent to and to the north (above) of the decommissioned 546 Road and Unit 29.3 is located adjacent to and to the south (below) of the decommissioned 546 Road
- Elevation: 3,600 feet
- Seedling Source: Washington Department of Natural Resources, Webster Nursery Olympia for the Douglas fir; Weyerhaeuser Rochester Nursery for the noble fir.
- Labor: Contractor = Ramon Coronel Reforestation Inc., Chehalis

#### Seedling Description

Species	Zone-elevation	Size	Number	Expense
Pseudotsuga menziesii	Yakima (3,000-4,000')	P+0	2,220	\$1,110.00
Abies procera	SW Centralia (3,000+)	P+0	3,900	\$1,386.00
Labor cost (approx.)	Ramon Coronel Reforestation Inc.	\$0.52 per seedling	6,120 seedlings planted	\$3,182.40
tax				\$206.89
Totals			6,120	\$5,885.29

#### Project Description

These two planting units were clear-cut harvested approximately 30 years ago. The area is currently sparsely populated with trees, however the number of stumps present in these units indicates a relatively robust former tree population. This is a difficult area to re-forest due to low site quality (site index 5), and south facing, relatively high elevation location. These two units have older forests growing adjacent.

This planting project was intended to improve the diversity of tree species and increase the tree density within the unit. The increased species diversity should help promote a more resilient forested environment in the future, relative to climate change.

The fall plant was designed to increase seedling survival by allowing the seedlings time for root growth following planting. In addition they should benefit from spring moisture regimes prior to heading into the hot dry conditions typically experienced during summer in upper elevation

forests. Planting plug sized stock was intended to improve the seedling survival relative to snow loads.

**Project Prescription**

The prescription called for planting 100 trees per acre in the units. Additionally the prescription called for planting a seedling approximately 20 feet away from any healthy existing tree in the units. The tree planters were instructed to mix Douglas fir and noble fir (approximately 50:50) in unit 29.3 (the lower elevation unit) and plant a higher concentration of noble fir in the northern portion of unit 29.3 (the higher elevation unit). Planters were instructed to use or create shade on the south-side (down-hill) of the planted seedlings.

**Accomplishment**

Contractors planted 2,220 Douglas fir and 3,900 noble fir in units 29.2 & 29.3.

**Follow-up**

Survival of the planted seedlings should be checked in late summer or fall 2011 and follow-up treatment recommended (either none needed or replant).

## 6.0 Tree Planting Project Report Summary Unit 54

November 8, 2010

### Restoration Thinning Units 54.1, 54.2, 54.4 & Gaps Restoration Planting

- Location: Unit 54 is located at the end of the 750 and 751 Roads
- Elevation: 4,000 feet
- Seedling Source: Weyerhaeuser Rochester Nursery for the noble fir; Wabash Farms in Enumclaw for the mountain hemlock, USFS Dorena Nursery for the western white pine.
- Labor: Contractor = Ramon Coronel Reforestation Inc., Chehalis

#### Seedling Description

Species	Zone-elevation	Size	Number	Expense
Tsuga mertensiana	Unknown, plug sourced from 4 <sup>th</sup> Corner nursery	2 gallon pot	69	\$483.00
Abies procera	SW Centralia (3,000+)	P+0	2,400	\$816.00
Pinus monticola	Sourced from Dorena nursery	P+	90	donated
Labor cost (approx.)	Ramon Coronel Reforestation Inc.	\$0.52 per seedling	2,559 seedlings planted	\$1,330.68
Tax				\$111.72
Totals			2,559	\$2,741.40

#### Project Description

These ridge-top planting units were clear-cut harvested approximately 30 years ago. All of these units are part of a larger multi unit restoration thinning project that was thinned in 2010 (preceding the planting). The area, prior to this fall planting, was sparsely populated with trees and dominated by silver fir. This area is problematic to reforest due to high elevation (4,000 feet), access issues (snow often lingers through May or June), and harsh growing conditions that are often hot and dry during summer.

This planting project was intended to improve the diversity of tree species and increase the tree density within the units and within gaps. The increased species diversity should help promote a more resilient forested environment in the future, relative to climate change. Planting potted mountain hemlock stock may improve this species survival in this harsh growing environment.

Pine was historically found in small numbers in the Cedar River Watershed as indicated from historic cruise data, but most pine was killed by blister rust. The USFS Dorena Nursery provided western white pine plugs which appear to be blister rust resistant. The seed was collected from western white pine growing naturally and believed to have survived blister rust exposure.

The fall plant was designed to increase seedling survival by allowing the seedlings time for root growth following planting. In addition they should benefit from spring moisture regimes prior to heading into the hot dry conditions typically experienced during summer in upper elevation forests. Planting plug sized stock was intended to improve the seedling survival relative to snow loads.

### **Project Prescription**

The prescription called for planting 100 trees per acre in the areas within units 54.1, 54.2, and 54.4 that were under-populated with trees. Several gaps were also identified for planting, with the spacing prescription within a gap being 10x10 feet. Additionally the prescription called for planting seedlings approximately 20 feet away from any healthy existing tree in the units. The tree planters were instructed to plant the mountain hemlock fairly close to the roads, due to the operational difficulties in transporting potted stock in a forested environment.

### **Accomplishment**

Contractors planted 2,400 noble fir, 90 western white pine, and 69 mountain hemlock in portions of units 54.1, 54.2, 54.4 and gaps.

### **Follow-up**

Survival of the planted seedlings should be checked in late summer or fall 2011 and follow-up treatment recommended (none needed or replant).

## 7.0 Tree Planting Project Report Summary Unit 14

October 27 28, 2010

### Restoration Thinning Units 14.2 & 14.3 Gaps Restoration Planting

- Location: Unit 90.2 & 90.3 is located at adjacent to bisected by the 121.1 Road
- Elevation: 3000 feet
- Seedling Source: Weyerhaeuser Rochester Nursery for the noble fir; USFS Dorena Nursery for the western white pine.
- Labor: Contractor = Ramon Coronel Reforestation Inc., Chehalis

#### Seedling Description

Species	Zone-elevation	Size	Number	Expense
Abies procera	SW Centralia (3,000+)	P+0	750	\$255.00
Pinus monticola	Sourced from Dorena nursery	P+	90	donated
Labor cost (approx.)	Ramon Coronel Reforestation Inc.	\$0.52 per seedling	840 seedlings planted	\$436.80
Tax				\$21.93
Totals			840	\$713.73

#### Project Description

This is a gap planting in a Douglas fir dominated restoration thinning unit. These two units were previously thinned with a traditional spacing prescription in the late 1990s and retreated with a 'gap only' prescription in 2010.

This planting project was intended to improve the diversity of tree species within the unit. The increased species diversity should help promote a more resilient forested environment in the future, relative to climate change. Pine was historically found in small numbers in the Cedar River Watershed as indicated from historic cruise data, but most pine was killed by blister rust. The USFS Dorena Nursery provided western white pine plugs which appear to be blister rust resistant. The seed was collected from western white pine growing naturally and believed to have survived blister rust exposure.

The fall plant was designed to increase seedling survival by allowing the seedlings time for root growth following planting. In addition they should benefit from spring moisture regimes prior to heading into the hot dry conditions typically experienced during summer in upper elevation

forests. Planting plug sized stock was intended to improve the seedling survival relative to snow loads.

**Project Prescription**

The prescription called for planting twenty-two 0.10<sup>th</sup> acre gaps (six gaps in unit 90.2 and 16 gaps in unit 90.3). The spacing prescription within a gap is 10x10 feet or approximately 43 seedlings per gap.

**Accomplishment**

Contractors planted 840 noble fir and 90 western white pine in the 22 gaps located in units 90.2 & 90.3.

**Follow-up**

Survival of the planted seedlings should be checked in late summer or fall 2011 and follow-up treatment recommended (either none needed or replant). This follow-up inspection may prove problematic with the planned decommissioning of the mid-slope 121.1 road

## **8.0 Lessons Learned**

- Being prepared to plant in early to mid-October may be a better approach for fall planting. We planted in late October and early November which resulted in our planting being interrupted by one week due to early snow. The ultimate goal is maximizing planted stock survival, which can be tricky in the fall. Ideally the soil should be warm enough to encourage root growth and the weather should be intermittently rainy to provide adequate soil moisture for the planted stock.
- Forecasting seedling needs approximately one year prior to actual planting would be ideal. Plugs require less than one year to be sown and lifted. The City could specify the seed source and/or zone and have the seedlings contract grown.
- Perhaps inoculating with mycorrhizal fungi, or spores would be beneficial to seedling establishment on previously clear-cut harvested areas.
- Requiring the contractor to create or take advantage of shade on the south side of a plug seedling could be beneficial to seedling survival, particularly on south facing slopes.
- Requiring the contractor to gently flag the planted seedlings will help greatly with planting compliance and follow-up survival surveys. Plug sized seedlings are difficult to see, because of their size, and when planted at a wide 20x spacing, it is difficult to see the plugs in a landscape setting.
- Contract growing could provide seedlings for City projects, particularly those species that are often in demand like western red cedar, when the species desired for a project is ‘sold out’ from ‘over-the-counter’ nursery sources.

## Appendix A Survival Surveys

Survival surveys, for the purpose of this report, are field inspection and data collection in areas that were planted in 2010. Basically the surveyor is performing a field inspection to determine if the planted seedlings have survived and whether or not these seedlings appear to be healthy or unhealthy.

The following table is intended to provide a reference for follow-up survival surveys for the areas planted in 2010. The data provided in these follow-up surveys will be used to evaluate the success of the 2010 planting efforts. The survival survey data will also be used to determine if additional planting in these areas is recommended.

Table 4. Survival Surveys recommended to be performed in 2011

Unit	Acres	Survival survey	Comments
72.5	0.6	2011 anytime	Decommissioned road
80	1	2011 anytime	Decommissioned road
14	1.6	Late summer/fall 2011	Gaps, 121.1 access road scheduled for decommissioning
15.1	29	Late summer/fall 2011	Planted seedlings close to road have been flagged
29	68	Late summer/fall 2011	Planted seedlings close to road have been flagged
54	26	Late summer/fall 2011	Planted seedlings close to road have been flagged
90	1.9	Late summer/fall 2011	Gaps, 121.1 access road scheduled for decommissioning

Note: survival surveys should consist of a walk through examination rather than an intense systematic grid examination. The decommissioned road planted seedlings will be easy to locate because of their size and close spacing. The spacing in the other units is variable and relatively wide: approximately 100 seedlings planted per acre. Plugs (small stock) were planted in the units, care will be necessary in locating these infrequent small seedlings during the survival surveys.

## Appendix B Maps of 2010 Restoration Planting Units









