City of Puyallup, WA – Peck Riparian Planting
Project Design Document

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PROJECT OVERVIEW

Basic Project Details

Riparian tree planting project along Clarks Creek in Puyallup, Washington. Clarks Creek is impaired for many water quality parameters, including temperature and dissolved oxygen. A recommendation to improve water temperature and dissolved oxygen, which this project directly implements.

Project Name: City of Puyallup, WA – Peck Riparian Planting
Project Number: 007
Project Type: Planting
Project Start Date: March 25, 2020
Project Location *(property name and city, town, or jurisdiction)***:** City of Puyallup
Project Operator Name: Pierce Conservation District (PCD)
Project Operator Contact Information:
Ryan Mello, Executive Director, RyanM@piercecd.org, 253-845-9770 ext 107
Melissa Buckingham, Water Quality Director, MelissaB@piercecd.org, 253-845-9770 ext 109

Project Description

Pierce Conservation District (PCD) works with cities and towns across Pierce County to improve riparian habitat and water quality through streamside plantings with native trees and shrubs. PCD is working with the City of Puyallup to remove invasive species and replant forested buffers on City-owned property, and currently manages nearly 40 acres of open space across the city. The Peck Riparian Planting Project is located on a 3.75 acre parcel along Clarks Creek in Puyallup, Washington. Clarks Creek is a salmon bearing stream supporting chinook, coho, and chum salmon, steelhead, and cutthroat trout that is impaired for many parameters, including temperature and dissolved oxygen. The recommendation in many Clarks Creek management plans is to vegetate the streamside to provide shade that will decrease temperature and increase dissolved oxygen.

The planting project area includes 1.5 acres of the site. Prior to planting in Fall 2020, PCD will need to remove invasive plants including reed canary grass and blackberry. PCD will plant 655 trees, including western red cedar, douglas fir, big leaf maple, sitka spruce, alder, cottonwood, and Oregon ash. The City of Puyallup will fund a professional crew to work on this site through establishment, which is typically 3 years. At that time PCD will install shrubs to complement the trees and will continue to look over the site to ensure success.

LOCATION AND OWNERSHIP OF PROJECT AREA (Section 1.3, 2)

Location Eligibility

Project Areas must be located in parcels within or along the boundary of at least one of the following criteria. Describe how the Project Area(s) meet the location criteria.

A) *The Urban Area boundary ("Urban Area"), defined by the most recent publication of the United States Census Bureau*
B) *The boundary of any incorporated city or town created under the law of its state;*

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C) The boundary of any unincorporated city, town, or unincorporated urban area created or designated under the law of its state;
D) The boundary of land owned, designated, and used by a municipal or quasi-municipal entity such as a utility for source water or water shed protection;
E) A transportation, power transmission, or utility right of way, provided the right of way begins, ends, or passes through some portion of A through D above.

The City of Puyallup, WA – Peck Riparian Planting project meets the following eligibility requirements:

A) The Urban Area boundary ("Urban Area"), defined by the most recent publication of the United States Census Bureau
B) The boundary of any incorporated city or town created under the law of its state
C) The boundary of any unincorporated city, town, or unincorporated urban area created or designated under the law of its state
D) The boundary of land owned, designated, and used by a municipal or quasi-municipal entity such as a utility for source water or water shed protection

Ownership Eligibility
Project Operator must demonstrate ownership of property and eligibility to receive potential credits by meeting at least one of the following:
A) Own the land, the trees, and potential credits upon which the Project trees are located; or
B) Own an easement or equivalent property interest for a public right of way within which Project trees are located, own the Project trees and credits within that easement, and accept ownership of those Project trees by assuming responsibility for maintenance and liability for them; or
C) Have a written and signed agreement from the landowner granting ownership to the Project Operator of any credits for carbon storage or other benefits delivered by Project trees on that landowner's land. If Project trees are on private property, this agreement must be recorded in the property records of the county in which the land containing Project trees is located.

The City of Puyallup, WA – Peck Riparian Planting project meets the following ownership requirements:

C. Have a written and signed agreement from the landowner granting ownership to the Project Operator of any credits for carbon storage or other benefits delivered by Project trees on that landowner's land. If Project trees are on private property, this agreement must be recorded in the property records of the county in which the land containing Project trees is located.

Project Area Location
Describe where the Project Area is located and how it meets the location criteria.

The City of Puyallup, WA – Peck Riparian Planting project is located along Clarks Creek in the City of Puyallup, an incorporated city in Pierce County. The City of Puyallup owns this property and several other properties along the Clarks Creek system. Pierce Conservation District manages these open space properties with the goal to revegetate them to improve stream water quality health.

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We are in the process of receiving a signed landowner agreement. The proposal needs Council approval, which has been delayed due to COVID-19.

Project Area Ownership and Right to Receive Credits

Describe the property ownership and include relevant documentation including title/filename as an attachment (Declaration of Land Ownership or Agreement from Owner to Transfer Credits.)

The City of Puyallup owns this property and an executed Agreement to Transfer Credits document will be provided prior to request to issue credits.

Maps

Provide a detailed map of the Project Area. Also provide a map that shows the Project Area within the context of relevant urban/town boundaries. Include title/filename of relevant attachments.

1) **Map of Project Area**
   Peck Site Map.pdf

2) **Regional-scale map of Project Area**
   Peck Regional Map.pdf

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PLANTING DESIGN

Plant design follows the riparian planting approach of planting 655 trees 10' on-center with high expected mortality due to lack of summer watering over the first three years of establishment. PCD plans to reduce mortality by providing spring and late summer maintenance days where crews will clear activity growing reed canary grass from around small trees to allow for maximization of photosynthesis during growing months. Crews will also monitor for other invasive species entering the site and will clear those.

After initial planting PCD's WCC crew will catalog each installed tree. Over the first three years PCD staff will monitor the health of each individual tree in the late summer after crews have cleared reed canary grass. At three years each surviving tree will be cataloged in GIS to compare initial planting to established trees. At five years each surviving tree will again be cataloged in GIS to compare with initial and three-year survivability. Using ArcGIS the site will be analyzed for canopy coverage at 25 years, assuming each tree that survives 5 years will survive until maturity. If needed, PCD will plant for gaps in canopy coverage.

PROJECT BENEFITS

Provide a short narrative to describe the project benefits. Examples include information about equity for underserved or disadvantaged communities, flood control, open space preservation, watershed protection, human health, bird or wildlife habitat, etc.

Clarks Creek is located in the lower Puyallup River watershed. Tributaries include Rody, Diru, Woodland, and Meeker Creeks. Clarks Creek is impaired due to low dissolved oxygen and excess sediment.
Fish and other aquatic life need oxygen dissolved in healthy water to "breathe" in order to survive. Oxygen is also necessary to help decompose organic matter in the water and bottom sediments, as well as for other biological and chemical processes.

Excess sediment loading contributes in a variety of ways to the dissolved oxygen problems in Clarks Creek. Sediment accumulation is an important factor in promoting dense growths of elodea (aquatic plant) that adversely impact dissolved oxygen concentrations. Elodea growth in turn slows flows in the creek, which worsens the problem of sediment accumulation and leads to flooding problems. Sediment loads may also contain elevated nutrient concentrations that promote plant and bacterial growth. Sediment can be improved by controlling stormwater runoff and by adding or maintaining vegetation on stream banks, which this project aims to do.

In May 2015, EPA approved the Clarks Creek Dissolved Oxygen and Sediment Total Maximum Daily Load Water Quality Improvement Report and Implementation Plan where streamside planting, especially with tall evergreen trees, is recommended for water quality improvement.

The Peck property planting is part of a larger restoration effort in the lower part of Meeker Creek as it flows into Clarks Creek and Clarks Creek itself. The City owns and is restoring seven adjacent parcels for a total of over 80 acres. This project will connect to this larger effort, increasing the impact of the riparian buffer and associated ecosystem benefits.

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MONITORING AND REPORTING PLANS

PCD will submit annual monitoring reports containing the required information using the template provided by City Forest Credits and in conformance with the CFC Planting Riparian Quantification and Monitoring Standards PNW document. The monitoring reports will become due one year from the date of the Verification Report submitted by the third-party verifier and continue for the duration of the project.

CARBON AND CO-BENEFITS QUANTIFICATION DOCUMENTATION (Section 12 and Appendix B)

Describe which quantification approach you anticipate using. When requesting credits after planting or in Years 4 or 6, attach one of the three documents below and provide the data you have collected for Project Trees.

1) *Single Tree Quantification Tool*
2) *Canopy Quantification Tool*
3) *Riparian Quantification with CO2 calculated per acre*

If your project is a riparian planting, provide the following:

- *General location of plantings on a map*
- *Most common 4 or 5 species and numbers of trees to be planted*
- *Approximate number of trees per acre*
- *Total acreage planted*

For the initial Peck property estimate provided on March 19, 2020, CFC used the riparian quantification approach focusing on the property size (in acres) and forest type mix ratio to determine the total carbon stored by the 655 trees to be planted. This approach uses carbon index tables (GTR tables) to calculate the total carbon to be stored, which would result in approximately 286 Carbon+ Credits (or 190.81 credits per acre). CFC applies a 5% deduction to the total number of credits to fund a program-wide buffer pool to insure against catastrophic loss of trees. After the buffer pool deduction, 272 Carbon+ Credits would be issued to PCD under this quantification approach.

The assumptions made when creating estimates for riparian-type plantings is that the trees will be densely planted and have a high rate of mortality (greater than 20% and up to 75%). The goal in these riparian plantings is to generate canopy. A diverse palette of species is planted to generate canopy. The smaller and faster-growing species screen sun-loving invasives from light and are in time out-competed by larger species, with the intended result being multi-storied, diverse, and healthy forest ecosystems.

The trees in the Peck project will be planted 10 foot on-center and a have a lower rate of expected mortality due to continuous spring and summer maintenance and monitoring. PCD's Washington Conservation Crew will catalog each tree and its growth will be charted over time.

After further discussion with CFC forest scientists in light of the differences between the Austin riparian planting and maintenance methods and the methods proposed for the Peck property, we have completed new quantification estimates based on an approach that we believe to be more accurate.

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Due to the density and the additional care of the trees in the critical first five years of establishment in the Peck project, CFC forest scientists determined that the most accurate quantification method would be a tool the scientists developed that is called the "Single Tree" tool. This tool calculates CO2 based on the species and numbers of trees planted, and it includes a mortality deduction. The use of the Single Tree tool does not require you to change your proposed species, your numbers, your planting methods, or your tracking and maintenance. The Single Tree tool in fact more accurately reflects or captures your proposed methods. Use of the Single Tree tool does result in a higher carbon total than the prior riparian quantification approach. Using this quantification approach does not alter the monitoring requirements set forth in the Pierce Conservation District Riparian Planting Quantification Estimates document previously shared with the PCD team. PCD can use imaging at Years 4 and 6 to show progress in canopy generation. PCD does not have to obtain a GPS coordinate for each tree planted and does not have to visit a sample of individual trees in Years 4 and 6 to determine survival rates.

Per the Single Tree Quantification Approach, this project is estimated to generate 829.30 credits.

Attachment – PCD_EstimatingQuantTool_Peck_20Percent.xls

Tree Species:
Bigleaf maple – *Acer macrophyllum* – 65
Red alder – *Alnus rubra* – 110
Oregon ash – *Fraxinus latifolia* – 70
Sitka spruce – *Picea sitchensis* – 130
Black cottonwood – *Populus balsamifera ssp. trichocarpa* – 90
Douglas fir – *Pseudotsuga menziesii* – 90
Western red cedar – *Thuja plicata* - 100

Total Trees Planted:
655

Total Acreage Planted:
1.50

Number of Trees per Acre
436/acre

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Mortality Deduction (%):	20%

Table 3. Credits are based on 10%, 40% and 30% at Years 1, 3 and 5 after planting, respectively, of the projected CO2 stored by live trees 25-years after planting. These values account for anticipated tree losses and the 5% buffer pool deduction.

						10%	40%	30%
	No. Sites Planted	No. Live Trees	Mortality Deduction (%)	25-yr CO_2 stored (kg/tree)	Tot. 25-yr CO_2 stored w/ losses and 5% deduction (t)	10% CO_2 (t)	40% CO_2 (t)	30% CO_2 (t)
BDL	225	180	0.20	2,062.82	352.7	35.27	141.10	105.82
BDM	110	88	0.20	1,277.75	106.8	10.68	42.73	32.05
BDS	0	0	0.20	0.00	0.0	0.00	0.00	0.00
BEL	0	0	0.20	0.00	0.0	0.00	0.00	0.00
BEM	0	0	0.20	0.00	0.0	0.00	0.00	0.00
BES	0	0	0.20	0.00	0.0	0.00	0.00	0.00
CEL	320	256	0.20	1,520.44	369.8	36.98	147.91	110.93
CEM	0	0	0.20	0.00	0.0	0.00	0.00	0.00
CES	0	0	0.20	0.00	0.0	0.00	0.00	0.00
	655	524		4,861.0	829.3	82.93	331.73	248.80

Using the information you provide and background data, the tool provides estimates of co-benefits after 25 years in Resource Units per year and $ per year.

Table 7. Co-Benefits (avoided costs) per year after 25 years (live trees, includes tree losses)

Ecosystem Services	Resource Units Totals	Resource Unit/site	Total Value ($)	Value ($)/site
Rain Interception (m3/yr)	3,797.05	5.80	$27,875.47	$42.558
CO2 Avoided (t, $20/t/yr)	35.15	0.05	$703.01	$1.073
Air Quality (t/yr)				
O3	0.1135	0.0002	$235.30	$0.359
NOx	0.0366	0.0001	$75.85	$0.116
PM10	0.0648	0.0001	$238.62	$0.364
Net VOCs	-0.4061	-0.0006	-$313.36	-$0.478
Air Quality Total	-0.1912	-0.0003	$236.41	$0.36
Energy (kWh/yr & kBtu/yr)				
Cooling - Electricity	38,385.87	58.60	$1,965.36	$3.00
Heating - Natural Gas	113,798.65	173.74	$1,295.45	$1.98
Energy Total ($/yr)			$3,260.80	$4.98
Grand Total ($/yr)			$32,075.68	$48.97

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ADDITIONAL INFORMATION (OPTIONAL)

Include additional noteworthy aspects of the project. Examples include collaborative partnerships, community engagement, or project investors.

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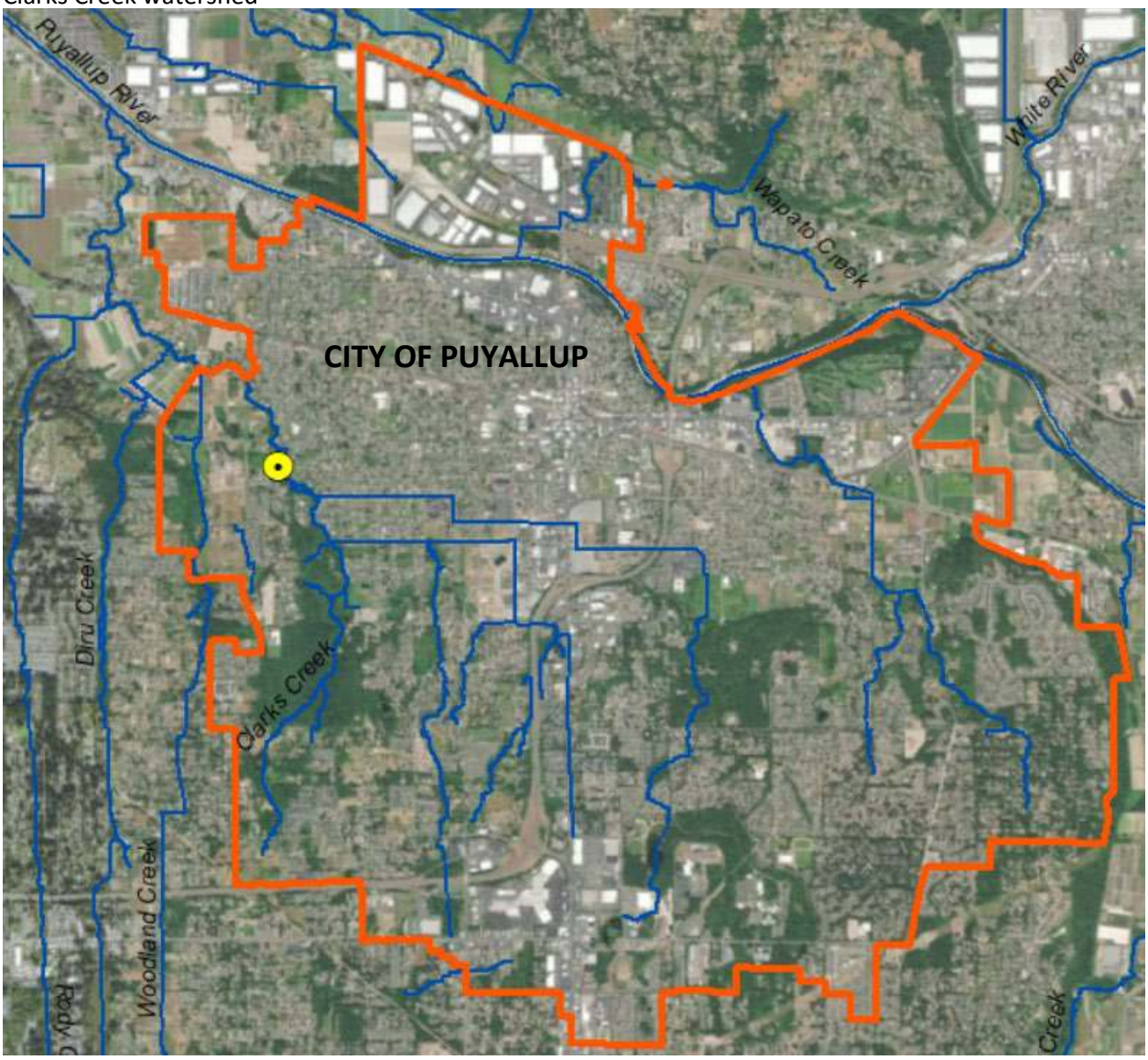
City of Puyallup, WA - Peck Riparian Planting
Approx. 1.5 acres
Clarks Creek watershed



City of Puyallup, WA - Peck Riparian Planting
Approx. 1.5 acres
Suggested Trees: Sitka Spruce, Big Leaf Maple, Oregon Ash, Douglas Fir