



## 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@pierced.org, 253-845-9770 ext 107

Melissa Buckingham, Water Quality Director, MelissaB@pierced.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;*

- 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.

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

## 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.

## 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 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.

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

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.**

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

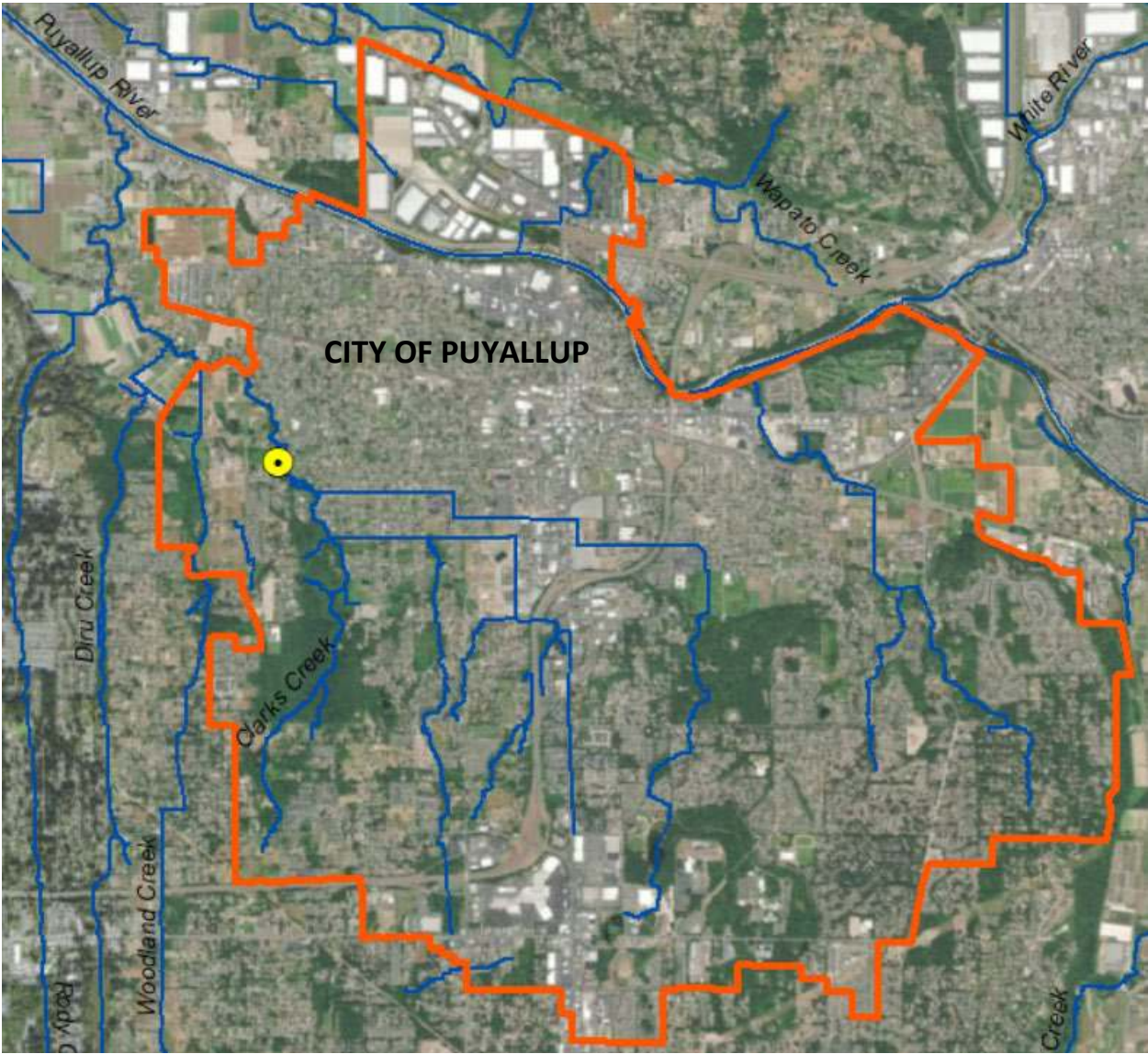
Ecosystem Services	Resource Units Totals	Resource Unit/site	Total Value (\$)	Value (\$)/site
<b>Rain Interception (m3/yr)</b>	3,797.05	5.80	\$27,875.47	\$42.558
<b>CO2 Avoided (t, \$20/t/yr)</b>	35.15	0.05	\$703.01	\$1.073
<b>Air Quality (t/yr)</b>				
<b>O3</b>	0.1135	0.0002	\$235.30	\$0.359
<b>NOx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



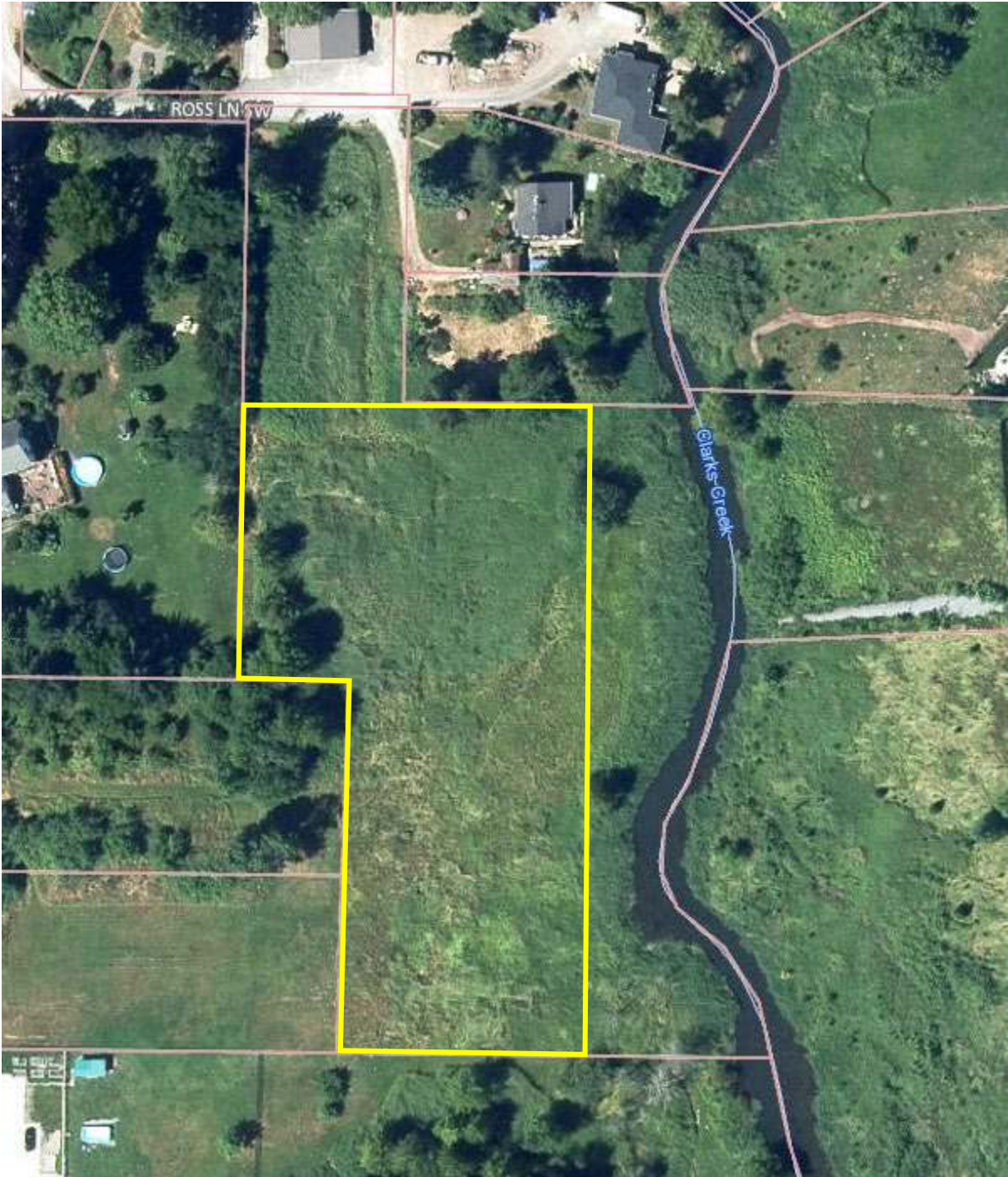
**ADDITIONAL INFORMATION (OPTIONAL)**

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

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





**Pierce Conservation District Reforestation Carbon Program – 2020 Projects  
Site #2: South Prairie Creek Preserve – Interior Floodplain Planting  
Project Design Document**

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## PROJECT OVERVIEW

### Basic Project Details

**Project Name:** Pierce Conservation District Reforestation Carbon Program – 2020 Projects, Site #2: South Prairie Creek Preserve – Interior Floodplain Planting

**Project Number:** 007

**Project Type:** Planting

**Project Start Date:** November 19, 2020

**Project Location:** South Prairie, Pierce County, WA

**Project Operator Name:** Pierce Conservation District

**Project Operator Contact Information:** Jayme Gordon; [jaymeg@pierced.org](mailto:jaymeg@pierced.org); (253) 845-9770 ext. 102

### Project Description

*Include details of where the project will take place, how many trees will be planted, what type of planting, partners, overall project goals, and any other relevant information.*

This riparian planting project will restore native vegetation to an estimated 7.65 acres of floodplain habitat along South Prairie Creek, a tributary to the Carbon River in the Puyallup-White River watershed. Planting will take place in an area owned by Pierce Conservation District and Pierce County that lies between a newly constructed, half-mile long side channel and the right bank of South Prairie Creek.

This planting is part of a larger project to improve salmon habitat and restore floodplain processes. The project site had been utilized as pasture for many decades and is characterized by a mix of mostly non-native grasses and invasive weeds. Ultimately, a total of approximately 40 acres will be planted. Prior to excavation and in-stream construction, 9.8 acres were planted Fall 2017-Spring 2020, and the remainder of the site will be planted over the course of two planting seasons. This application represents the planting scheduled to occur in the 2020-2021 season. The remainder of the site expected to be planted 2021-2022 will be submitted in the 2021 application and documentation.

## 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;*
- 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 watershed 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.*

### **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.*

### **Project Area Location**

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

This project is eligible per the definition of Option A: The Urban Area boundary ("Urban Area"), defined by the most recent publication of the United States Census Bureau.

The project area is located between RM 4.0 and 4.5 on South Prairie Creek in east Pierce County, WA. It is located approximately one mile west of the town of South Prairie on property known as the "South Prairie Creek Preserve." Reference address is 13518 Pioneer Way East, Orting WA 98360.

### **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.)*

This project is eligible under conditions A & C: The Pierce Conservation District (PCD) owns the land, trees, and credits on part of the project area. Pierce County (PC) owns the land on the other part of the project area. There is an agreement between PC and PCD for the site prep and planting of trees for the salmon recovery project. We have attached a *Declaration of Ownership* for PCD-owned land and *Agreement to Transfer Credits* between PCD and PC.

The property is comprised of six Pierce County tax parcels. Parcels 0519132700, 0519132017, and 0519131030 are owned by PCD; parcels 0519132027, 0519132028, and 0519132029 are owned by Pierce County Surface Water Management. Pierce County and PCD have a landowner agreement for the planting work associated with the salmon recovery project.

- 1 - PCD South Prairie Declaration of Ownership
- 2 - PCD and PC South Prairie Agreement to Transfer 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

*Title/filename of relevant attachment(s)*

SPCP Interior Floodplain Map

### 2) Regional-scale map of Project Area

*Title/filename of relevant attachment(s)*

SPCP Vicinity Map

## PLANTING DESIGN

*Describe planting design. Will the trees be planted as scattered single trees, clustered groups like parks plantings, or closely spaced such as riparian plantings?*

The trees are planted throughout the project site following the CFC riparian planting method. For the 7.65-acre project area, a planting density of 401 plants/acre was used as a general guideline; this equates to 3,065 trees. They are planted throughout the site on an average of 10' spacing. Nine species of trees and woody shrubs native to the Puget Sound lowlands were selected for this site. Microtopography and specific site features influenced species selection and planting design.

*Describe your data collection on Project Trees. For example, Project Operator can use the data collection sheet contained in the CFC quantification tool or your own method.*

Data collection on project trees will follow the planting Monitoring Manual developed by Pierce Conservation District Habitat Improvement staff. The monitoring manual describes the protocol used to establish monitoring plots and transects within the planting area; methodology for collecting line point intercept data; and noting qualitative observations about plant conditions. We will incorporate the Forest Ecosystem modification to the traditional Tree Canopy Approach for riparian tree planting projects as described in the "City Forest Credits Planting Protocol – Riparian Planting Quantification and Monitoring, Standards and Requirements in the Pacific Northwest" document into our monitoring protocol at this project site.

## MONITORING AND REPORTING PLANS

*Project Operator is required to submit an annual monitoring report. The report must contain any changes in eligibility status of the Project Operator and any significant tree loss. Confirm and describe your plans for annual monitoring of this project.*

As mentioned above, the Pierce Conservation District's Habitat Improvement team already utilizes a monitoring protocol. Revegetation monitoring is conducted annually via a series of randomized plots

that aim to sample 2%-5% of the planting area and 10%-20% of the installed plants. Data collected via line point intercept, photo monitoring, and vegetation height/DBH allows us to assess plant survival, species diversity, and other changes in site characteristics we expect to see over time. Also monitored within each plot is general plant health and vigor (by species). Tree canopy monitoring, as described in the “City Forest Credits Planting Protocol – Riparian Planting Quantification and Monitoring, Standards and Requirements in the Pacific Northwest” document, will be added to our monitoring protocol for Years 3, 5, and 25. Aerial imagery obtained via drone or publicly available GIS imaging will be used to assess tree canopy coverage.

The District will submit a copy of its annual monitoring report for this site to CFC. In addition to data collected by the District, any other information required by CFC will be incorporated into the report as needed.

**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*

**Total Trees Planted:**

3,065

**Total Acreage Planted:**

7.65

**Number of Trees per Acre:**

401/acre



Row Labels	Sum of No. Sites Planted
bigleaf maple	485
black cottonwood	650
black hawthorn	150
Douglas fir	110
Oregon ash	150
red alder	300
Sitka spruce	200
vine maple	220
western red cedar	800
<b>Grand Total</b>	<b>3065</b>

Table 3. Credits are based on 10%, 40%, and 30% at Years 1, 3, and 5 after planting, respectively, of the projected CO<sub>2</sub> 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 <sub>2</sub> stored (kg/tree)	Tot. 25-yr CO <sub>2</sub> stored w/ losses and 5% deduction (t)	10% CO <sub>2</sub> (t)	40% CO <sub>2</sub> (t)	30% CO <sub>2</sub> (t)
BDL	1285	1028	0.20	2,062.82	2014.6	201.46	805.82	604.37
BDM	300	240	0.20	1,277.75	291.3	29.13	116.53	87.40
BDS	370	296	0.20	604.21	169.9	16.99	67.96	50.97
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	1110	888	0.20	1,520.44	1282.6	128.26	513.06	384.79
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
	3065	2452		5,465.2	3758.4	375.84	1503.37	1127.53

**Co-Benefits PER YEAR after 25 years (all live trees, includes tree losses)**

Ecosystem Services	Resource Units Totals	Res Unit/site	Total \$	\$/site
Rain Interception (m3/yr)	15,616.68	5.10	\$114,647.41	\$37.405
CO <sub>2</sub> Avoided (t, \$20/t/yr)	150.04	0.05	\$3,000.84	\$0.979
Air Quality (t/yr)				
O <sub>3</sub>	0.4719	0.0002	\$977.87	\$0.319
NO <sub>x</sub>	0.1527	0.0000	\$316.34	\$0.103
PM <sub>10</sub>	0.2602	0.0001	\$957.89	\$0.313
Net VOCs	-1.3956	-0.0005	-\$1,076.85	-\$0.351
Air Quality Total	-0.5109	-0.0002	\$1,175.25	\$0.38
Energy (kWh/yr & kBtu/yr)				
Cooling - Elec.	163,853.41	53.46	\$8,389.29	\$2.74
Heating - Nat. Gas	512,906.98	167.34	\$5,838.77	\$1.90
Energy Total (\$/yr)			\$14,228.06	\$4.64
Grand Total (\$/yr)			\$133,051.56	\$43.41

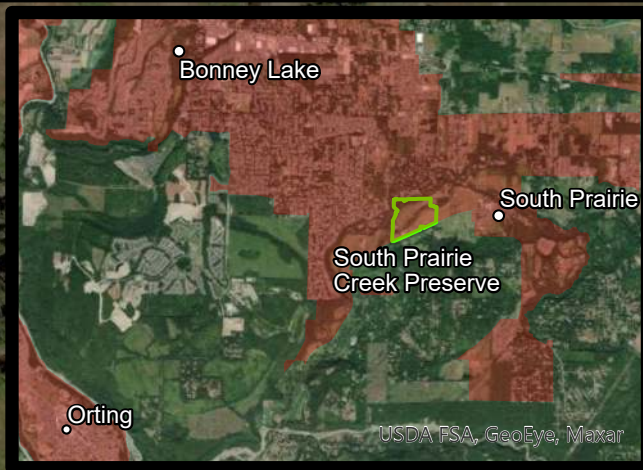
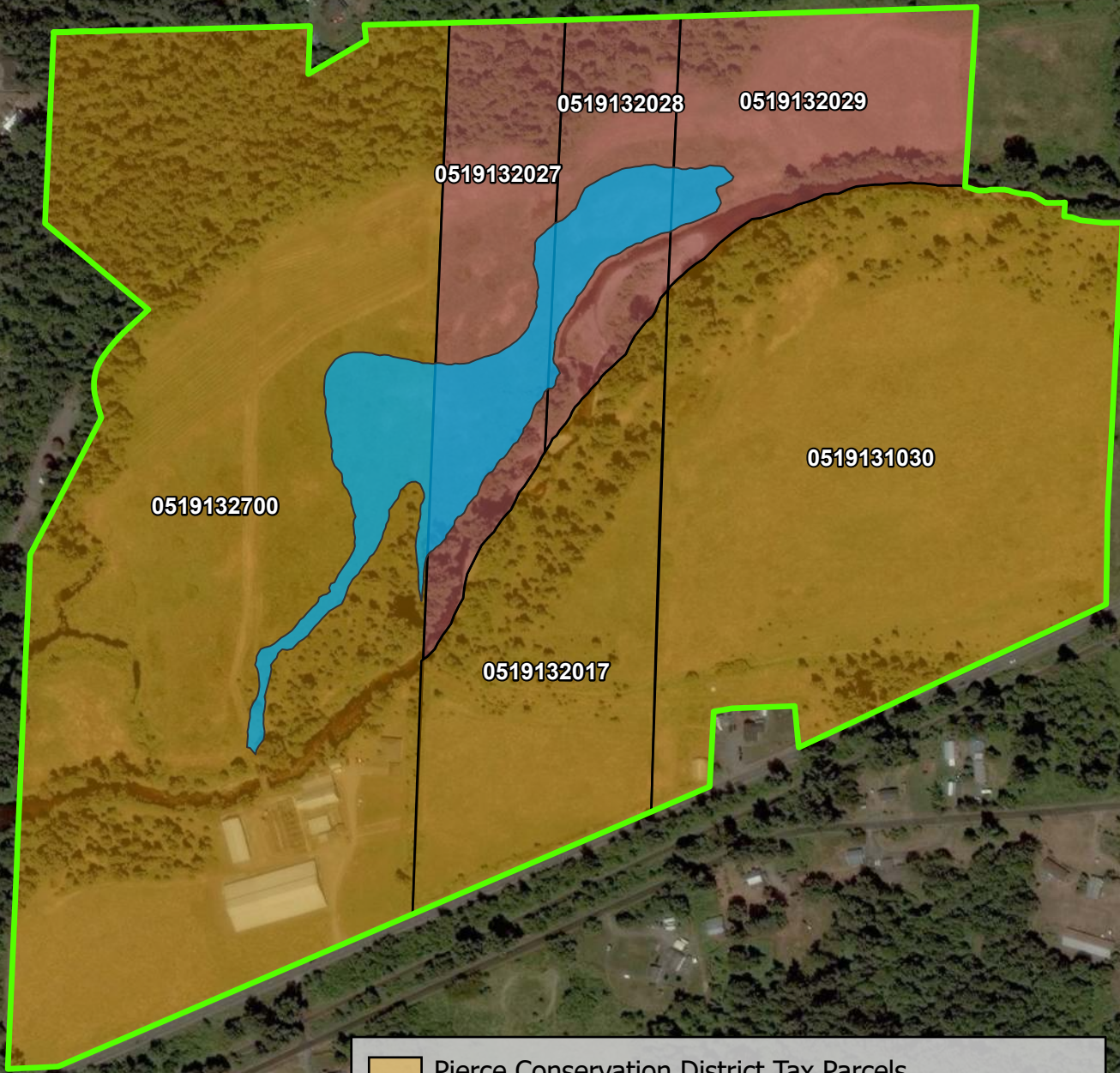
**ADDITIONAL INFORMATION (OPTIONAL)**

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

This planting occurs on contiguous properties totaling 129 acres owned by both Pierce County and the Pierce Conservation District, and the project as a whole is done in partnership with Pierce County, the Puyallup Tribe of Indians, and the South Puget Sound Salmon Enhancement Group. This project is the culmination of a multi-year effort by these partners and others to identify high-priority opportunities to improve endemic salmonid populations, many of which are threatened and endangered.

This planting is part of a larger project to improve salmon habitat and restore floodplain processes in a high priority stretch of South Prairie Creek. Construction of a half-mile side channel and instream improvements to a half-mile of South Prairie Creek are intended to support adult to juvenile out-migrant survival and productivity for spawning, rearing, foraging, migrating, and overwintering life history stages for fall Chinook, Steelhead, Coho, Chum, Pink, and Cutthroat and Bull Trout.

However, the long-term success of this project – and the long-term achievement of self-sustaining ecosystem processes – depends on establishment of riparian and floodplain plant communities throughout the project site. This planting effort is the final piece of the project. Over time, the trees planted now will provide erosion control; floodplain and riparian habitat and ecosystem processes; shade to lower water temperatures; and contribute to instream habitat diversity, in addition to carbon sequestration.



## South Prairie Creek Preserve Parcel Map

ORGANIZATION: Pierce Conservation District  
 CARTOGRAPHER: RyanB  
 DATE: 1/29/2021

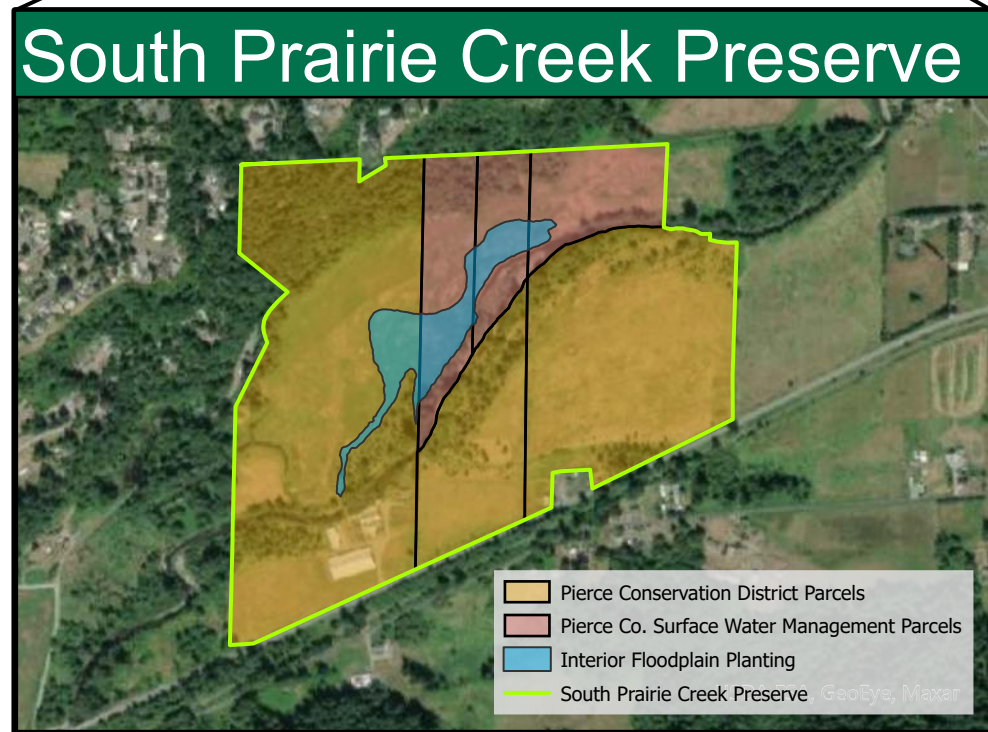
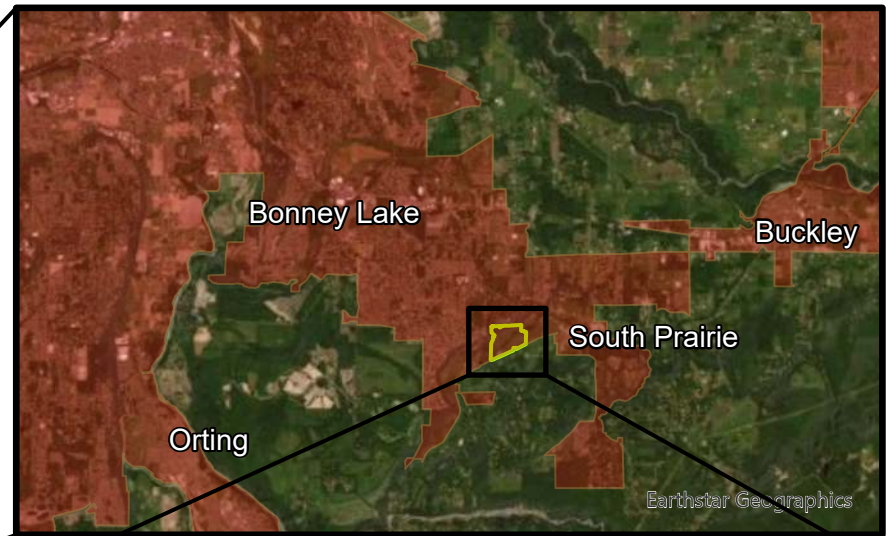
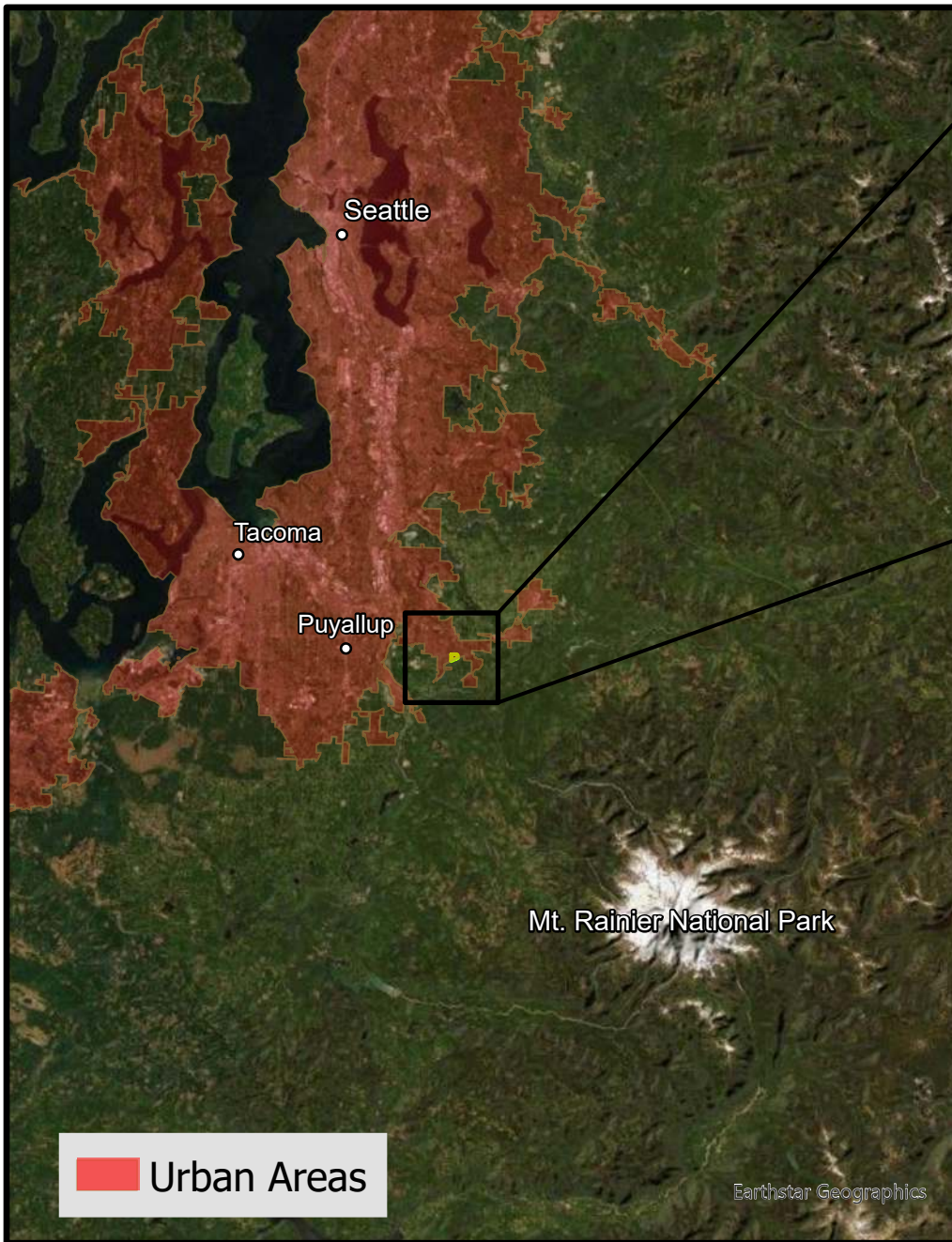
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- Pierce Conservation District Tax Parcels
- Pierce County Surface Water Management Tax Parcels
- Interior Floodplain Planting
- Urban Areas

**PIERCE CONSERVATION DISTRICT**  
*Over 70 Years of Conservation*

0 0.04 0.07 0.14 Miles



### South Prairie Creek Preserve Vicinity Map

ORGANIZATION: Pierce Conservation District

CARTOGRAPHER: RyanB

DATE: 2/9/2021

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0 0.13 0.25 0.5 Miles

