Pierce Conservation District Reforestation Program – 2020
Project Design Document – Year 4

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INSTRUCTIONS

Project Operators must complete and submit this Project Design Document (PDD) to request credits after the third anniversary of the Credit Commencement Date. City Forest Credits then reviews this PDD as part of the validation process along with all other required project documents. An approved third-party verifier then does an independent check of all documents and compliance with the Protocol, known as verification. An updated PDD will need to be submitted for future verification at Year 6 and After Year 25.

Project Operators should enter data and supporting attachments starting on page 3 under Project Overview where you find "[Enter text here]" as thoroughly as possible and provide numbered attachments for maps and other documentation (ex: 1 – Regional Map). Keep all instructions in the document.

Below is a list of documents that are needed to complete a successful Year 4 Project Design Document:

<u>For the Single Tree Planting Design:</u>

- Carbon Quantification Year 4 Credit tool
- Tree Sampling Data
- Geocoded photos
- Project geospatial data, if there have been changes (KML file or shapefile)

<u>For the Cluster Planting Design</u>

- Project Area imaging from any telemetry, imaging, or remote sensing service
- i-Tree Canopy report
- i-Tree Canopy source data
- Project geospatial data, if there have been changes (KML file or shapefile)
- Carbon Quantification Year 4 Credit tool

<u>For the Area Reforestation Planting Design (previously Canopy Design)</u>:

- Either:
    - Project Area imaging from any telemetry, imaging, or remote sensing service
    - i-Tree Canopy report
    - i-Tree Canopy source data
- Or:
    - Tree plot sampling data
- Project geospatial data, if there have been changes (KML file or shapefile)
- Carbon Quantification Year 4 Credit tool
- Summary of approach to quantifying the local CO_2 index

PROJECT OVERVIEW

Project Name: Pierce Conservation District Reforestation Program - 2020
Project Number: 007
Project Type: Planting Project (under the Planting Protocol – Version 6, August 11, 2018)
Project Start Date: March 8, 2021
Project Location: Puyallup, WA and South Prairie, Pierce County, WA
Project Operator Name: Pierce Conservation District
Project Operator Contact Information: Ryan Bird, Habitat Restoration Manager, 253-225-0306, RyanB@piercecd.org

PROJECT AND PLANTING DESIGN UPDATES

Include information on changes to the project including tree survival, ownership, or other relevant updates.

For the original 7.65-acre South Prairie Creek project area, and for the 1.5-acre Peck Riparian project area, a planting density of 401 plants/acre was used to plant 3,065 trees, using the riparian planting design. Based on the version of the protocol when the project started, Planting Protocol Version 6, the riparian method was available. Moving forward the project will be monitored using aerial imagery, per the cluster planting method; the initial crediting quantification method aligns with the cluster method. The trees were planted throughout the sites on an average of 10' spacing. Trees were planted on both sites to restore riparian areas as vegetated stream buffers. Trees were planted from October 2020 through March 2021.

There have been no changes in the ownership of the site. Pierce Conservation District (PCD) has maintained and monitored the sites since trees were planted. Maintenance actions on installed vegetation is completed by restoration crews, volunteer events, and staff time. Monitoring is completed using PCD's revegetation monitoring protocol, which includes collecting plant health data. Drone imagery is also collected on a quarterly basis each year to create orthomosaics which assist in measuring tree growth, canopy, and change over time.

Since the original planting, there has been an estimated 40% loss of trees based on monitoring estimates. However, 1,400 trees have been replanted throughout both sites to remediate loss. Replanting efforts since the original planting have included planting 125 trees in 2022, 750 trees in 2023, and 525 trees in 2024. The estimated 40% loss of trees is due to multiple factors, including the heat dome of 2021, where Washington State saw extremely high temperatures which resulted in uncommonly high mortality in young trees. Another factor includes the summer drought conditions of 2022 and 2023 that caused young tree mortality. Lastly, winter flooding and channel migration of South Prairie Creek, caused mortality of young trees. Note, due to flooding, the South Prairie Creek total project area decreased by 0.35 acres, and is now 7.3 total acres. The Peck Riparian site remains at 1.37 acres.

CARBON QUANTIFICATION DOCUMENTATION (Section 12 and Appendix B)

Describe and summarize the planting design, sampling, and appropriate quantification/measurement method for the project – Single Tree, Clustered, or Area Reforestation. Include the project's climate zone and method of data collection. Outline the estimated total number of credits to be issued to the project over 25 years as well as the amount to be issued upon successful validation and verification in Year 4. Attach the quantification tool and appropriate sampling tool.

List of quantification Tools by planting method (CFC to provide guidance and resources):

1) *Single Tree - single tree quantification tool*
2) *Clustered - cluster quantification tool*
3) *Area Reforestation - quantification with CO_2 calculated per acre*

To ensure performance of the credits, Project Operators must commit to the following at Year 4, with additional requirements at Year 6 and after Year 25 based on the appropriate quantification method.

1) *Single Tree*
    a. *<u>Year 4:</u> Project Operators must generate a random sample of project tree sites using the Single Tree Quantification Tool. Project Operators must visit those sampled tree sites and collect data on whether the sample contains a live tree, standing dead tree, or no tree. Provide geocoded photos or imaging of a minimum sample of 20% of the trees. The tracking file includes a column where each tree is assigned a unique serial number to help with tracking each coordinate and tree picture or image.*
        i. *Based on this data, the number and species of project trees is adjusted and a new CO_2 projected amount by after Year 25 is generated.*

2) *Clustered*
    a. *<u>Year 4</u>: Project Operators provide images of the Project Area from any telemetry, imaging, remote sensing, i-Tree Canopy, or UAV service, such as Google Earth and estimate the area in tree canopy cover (acres). Imaging from Google Earth with leaf-on may be used. Project Operators will calculate the percent of canopy cover from the Google Earth imaging. Projects can use i-Tree Canopy and point sampling to calculate canopy cover. Using i-Tree Canopy, continue adding points until the standard error of the estimate for both the tree and non-tree cover is less than 5%. i-Tree Canopy will supply you with the standard errors. If tree canopy cover is determined using another approach, such as image classification, a short description of the approach should be provided, as well as the QA/QC measures that were used. A tree cover classification accuracy assessment should be conducted, as with randomly placed points, and the percentage tree cover classification accuracy reported.*
        i. *If the canopy coverage equals or exceeds 2.8% (400 trees per acre with an average canopy area of 3.14 square feet per tree (2-foot diameter of canopy) is 2.8% of an acre), then the credits projected in the Clustered Quantification Tool may be issued. If canopy coverage is below 2.8%, then the number of credits issued is reduced by the same percentage as the canopy coverage falls below*

2.8%.

3) *Area Reforestation (formerly Canopy planting design)*
    a. *<u>Year 4</u>: Project Operators must either conduct a physical tree count using plots or use imaging to determine canopy coverage at Year 4.*
        i. *If the canopy coverage equals or exceeds 2.8% (400 trees per acre with an average canopy area of 3.14 square feet per tree (2-foot diameter of canopy) is 2.8% of an acre), then the credits projected in the Quantification Tool may be issued. If canopy coverage is below 2.8%, then the number of credits issued is reduced by the same percentage as the canopy coverage falls below 2.8%.*

Overview

The original 7.65-acre South Prairie Creek project area included planting 3,065 trees. Since the original planting, the South Prairie Creek has shifted and migrated onto approximately 0.35 acres of the project area. This loss of 0.35 acres means that the project area is now 7.30 acres. During the planting seasons of 2022, 2023, and 2024, 1,400 new trees have been planted in the project area. The original 1.5-acre Peck Riparian project area was clipped, upon Year 4 investigation, to exclude areas where trees were present prior to the first planting, and is now 1.37-acres. The Peck Riparian project area included planting 655 trees, which is still intact. No major changes have occurred within the Peck planting area, and the area has been maintained. The Project Operator used the cluster method design to collect canopy coverage data via imagery to determine overall canopy growth in year 4.

Data Collection

PCD utilizes a monitoring protocol and conducts annual monitoring via 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. Also monitored within each plot is general plant health and vigor. As mentioned above, there has been an estimated 40% mortality of the original plantings in 2021, though infill plantings have occurred since then, and the surviving trees have grown quickly. This is shown by the canopy coverage imagery analysis; the percent tree canopy at year 4 is 10.40%.

To determine canopy growth at Year 4, PCD uploaded drone imagery to ArcGIS and conducted a random point sample of the project area. For 150 points on the Peck Riparian site, PCD collected whether each point's cover class was "tree" or "non-tree." At the South Prairie Creek site, PCD collected 250 points, assigning cover class the same way. PCD found tree cover to be 14.67% at the Peck Riparian site, and 9.60% at the South Prairie Creek site; when averaged together, this constitutes an 10.40% tree canopy cover value, overall (see attachment 11). This is greater than the 2.8% canopy cover goal for Year 4. Additionally, though 0.35 acres of the South Prairie Creek site was lost due to the creek shifting and migrating, this only accounts for about 3.77% of the total trees planted, which is well under the 20% mortality rate that was built into the project at the initial crediting stage.

Attachments:
1 PCD Peck 2024 Geocoded Photos

2 PCD Peck Tree Planting Area Shapefile
3 PCD Peck Random Points Sample Shapefile
4 PCD Peck High Resolution Aerial Imagery
5 PCD Peck Project Map with Cover Class Points
6 PCD SPC 2024 Geocoded Photos
7 PCD SPC Tree Planting Area Shapefile
8 PCD SPC Random Points Sample Shapefile
9 PCD SPC High Resolution Aerial Imagery
10 PCD SPC Project Map with Cover Class Points
11 PCD 2020 Canopy Change Workbook – Year 4

Carbon Quantification

Total number of trees planted (including replacements)	5,120
Project area (acres), if applicable	8.67
Total number of trees per acre, if applicable	~401
Credits attributed to the project (tCO2e)	6,037
Credits after mortality deduction (20% or insert observed mortality, if greater)	4,829
Contribution to Registry Reversal Pool Account (5%) (tCO2e)	241
Total credits to be issued to the Project Operator (tCO2e)	4,588
Total credits requested to be issued at Year 4	1,835

GHG Assertion:
Project Operator asserts that the Project results in GHG emissions mitigation of 4,588 tons CO_2e over the 25-year Project Duration. Project Operator asserts that, per Protocol guidelines, 40% of the Project GHG emissions mitigation is issued at Year 4, or 1,835 tons CO_2e.

As explained in the Data Collection section above, the Year 4 credits do not need adjustment from the initial crediting stage as the percent canopy cover, and tree loss, do not exceed the 20% mortality rate built in at the time of initial crediting.

The updated Projected CO_2 stored and credit issuance over 26 years is outlined below:

Credits Issued	Projection at Initial Crediting	Updated Projection at Year 4
Total credits issued at Initial Crediting (10% CO2 (t))	459	459
Total credits to be issued at Year 4 (40% CO2 (t))	1,835	1,835
Total credits to be issued at Year 6 (30% CO2 (t))	1,376	1,376
Total credits to be issued at Year 26 (20% CO2 (t))	918	918
Total credits to be issued (tCO2e)	**4,588**	**4,588**

Attachment:
12 PCD 2020 Carbon Quantification – Year 4

CO-BENEFITS QUANTIFICATION DOCUMENTATION (Section 12 and Appendix A)

Summarize co-benefit quantification and provide supporting documentation. If necessary, update the CFC-provided Co-Benefits Quantification spreadsheet to calculate updated rainfall interception, reduction of certain air compounds, and energy savings.

Ecosystem Services	***Resource Units***	***Value***
Rainfall Interception (m3/yr)	19,413.73	$142,522.88
Air Quality (t/yr)	-0.7020	$1,411.65
Cooling – Electricity (kWh/yr)	40,447.86	$2,070.93
Heating – Natural Gas (kBtu/yr)	125,341.13	$1,426.84
Grand Total ($/yr)		$151,136.15

Attachment:
12 PCD 2020 Carbon Quantification – Year 4

ADDITIONALITY (Section 4)

Complete and attach the Attestation of Additionality.

Additionality is demonstrated by Project Operators per the Protocol in the following ways and in the Attestation of Additionality. The Attestation of Additionality was not required to be signed in the Tree Planting Protocol Version 6; however Project Operator met the requirements and is submitting the Attestation with this Project Design Document update. The Attestation of Additionality was signed on November 8, 2024.

- Project trees are not required by law or ordinance to be planted (Protocol Section 2.2). See Attestation of Planting.
- The Project did not plant trees on sites that were forested and then cleared of trees within the prior ten years
- Project trees are additional based on a project specific baseline or the Performance Standard Baseline attached to this PDD.
- Project Operator has signed a Project Implementation Agreement with City Forest Credits for 25 years.
- The 25-year Project Duration commitment is additional to and longer than any commitment the Project Operator makes to non-carbon project tree plantings.
- Project Operator has signed the Attestation of Additionality.

Attachment:
13 PCD 2020 Planting Project Attestation of Additionality

ATTESTATION OF NO DOUBLE COUNTING OF CREDITS AND NO NET HARM (Section 5)

Complete and attach the following attestation: Attestation of No Double Counting of Credits and Attestation of No Net Harm. Provide a map that includes both the Project Area and the closest registered urban forest afforestation or reforestation project based on the registered urban forest planting project database KML/Shapefile provided by CFC to demonstrate that the Project does not overlap with any existing urban forest carbon projects.

The Attestation of No Double Counting of Credits and No Net Harm was not required to be signed in the Tree Planting Protocol Version Planting Protocol – Version 6, however Project Operator met the requirements and is submitting the Attestation with this Project Design Document update. Project Operator has signed the Attestation of No Double Counting of Credits and No Net Harm on October 23, 2024.

Project Operator has mapped the Project Trees against the registered urban forest planting project database and determined that there is no overlap of Project Trees with any registered urban forest afforestation or reforestation carbon project.

Attachment:
14 PCD 2020 Planting Project Attestation of No Double Counting and No Net Harm
15 PCD 2020 Planting Project No Double Counting Proof

ADDITIONAL INFORMATION

Include additional information on changes to monitoring and reporting plans since the Initial Credit Planting Design Document was submitted.

PCD will continue to monitor and assess planting areas based on tree mortality and other factors such as South Prairie Creek forming new channels. Areas where excess mortality is observed will have infill planting to bolster numbers to the original densities. Drone imagery will continue to be captured on a quarterly basis each year to inform decisions on planting based on the changing channels.

SIGNATURE

Signed on 1/30/25, by Heather Green, Habitat Improvement Program Director for Pierce Conservation District.

Heather Green
_____
Signature

HeatherGreen
_____
Printed Name

253-231-0252
_____
Phone

heatherg@piercecd.org
_____
Email

ATTACHMENTS

For the Single Tree Planting Design:

1 - Carbon Quantification Year 4 Credit tool
2 - Tree Sampling Data
3 - Geocoded photos
4 - Project geospatial data (KML file or shapefile)

For the Cluster Planting Design

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For the Area Reforestation Planting Design (previously Canopy Design):

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