



Pierce Conservation District Reforestation Program – 2020
Project Design Document – Year 6

Table of Contents

INSTRUCTIONS.....	2
PROJECT OVERVIEW	3
PROJECT AND PLANTING DESIGN UPDATES	3
CARBON QUANTIFICATION DOCUMENTATION (Section 9 and Appendix B)	4
CO-BENEFITS QUANTIFICATION DOCUMENTATION (Section 9 and Appendix B)	7
ADDITIONAL INFORMATION.....	7
SIGNATURE.....	7
ATTACHMENTS	8

INSTRUCTIONS

Project Operators must complete and submit this Project Design Document (PDD) to request credits after the fifth 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 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 6 Project Design Document:

For the Single Tree Planting Design:

- Carbon Quantification Year 6 Credit tool
- Tree Sampling Data
- Geocoded photos
- Project geospatial data, if there have been changes (KML file or shapefile)

For the Cluster Planting Design

- 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 6 Credit tool

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

- 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 6 Credit tool
- Summary of approach to quantifying the local CO₂ 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@pierced.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.

Since the original planting, there has been an estimated 40% loss of trees based on monitoring estimates. However, 1,400 trees were replanted throughout both sites between 2022 and 2024 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. Additionally, 1201 trees were installed in 2025, and 375 trees were installed in 2026 to mitigate plant loss. 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 causes mortality of young trees virtually every year. Note, due to flooding, the South Prairie Creek total project area decreased by 0.35 acres, and is now 7.3 total acres. During the winter 2025-2026 floods, large amounts of sediment were deposited on the SPCP property which can be seen from aerial imagery. However, this did not change the total project area. The Peck Riparian site remains at 1.37 acres

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 are 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

CARBON QUANTIFICATION DOCUMENTATION (Section 9 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 6. 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 CO₂ calculated per acre*

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

1) Single Tree

- a. Year 6: 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 CO₂ projected amount by after Year 25 is generated.*

2) Clustered

- a. Year 6: 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 11.5% (400 trees per acre with an average canopy area of 12.56 square feet per tree (4-foot diameter of canopy) is 11.5% of an acre), then the credits projected in the Clustered Quantification Tool*

may be issued. If canopy coverage is below 11.5%, then the number of credits issued is reduced by the same percentage as the canopy coverage falls below 11.5%.

3) *Area Reforestation (formerly Canopy planting design)*

a. *Year 6: Project Operators must either conduct a physical tree count using plots or use imaging to determine canopy coverage at Year 6.*

i. *If the canopy coverage equals or exceeds 11.5% (400 trees per acre with an average canopy area of 12.56square feet per tree (4-foot diameter of canopy) is 11.5% of an acre), then the credits projected in the Quantification Tool may be issued. If canopy coverage is below 11.5%, then the number of credits issued is reduced by the same percentage as the canopy coverage falls below 11.5%.*

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, 2024, 2025, and 2026, 2,976 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 6.

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 6 based on the canopy change workbook calculations is 14.87%

To determine canopy growth at Year 6, 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 28.00% at the Peck Riparian site, and 12.40% at the South Prairie Creek site; when averaged together with area data, this constitutes a 14.87% tree canopy cover value, overall (see Canopy Change Workbook attachment).

Attachments:

3_PeckRandomPoints2026.zip
4_PeckHighRes.tif
5_PeckMap_CoverClass_2026.pdf
7_SPCPRandomPoints2026.zip
8_SPCPHighRes.tif
9_SPCPMap_CoverClass_2026.pdf
10_PCD 2020-21 Canopy Change Workbook - Year 6.xlsx
11_PCD 2020-21 Carbon Quantification - Year 6.xlsx

Carbon Quantification

Total number of trees planted	3720
Project area (acres), if applicable	8.67
Total number of trees per acre, if applicable	~401
Credits attributed to the project (tCO ₂ e)	6,037
Credits after mortality deduction (20% or insert observed mortality, if greater)	4829
Contribution to Registry Reversal Pool Account (5%) (tCO ₂ e)	241
Total credits to be issued to the Project Operator (tCO₂e)	4588
Total credits requested to be issued at Year 6	1376

GHG Assertion:

Project Operator asserts that the Project results in GHG emissions mitigation of 4588 tons CO₂e over the 25-year Project Duration. Project Operator asserts that, per Protocol guidelines, 30% of the Project GHG emissions mitigation is issued at Year 6, or 1376 tons CO₂e.

The updated Projected CO₂ stored and credit issuance over 26 years is outlined below:

Single Tree Plantings	Projection at Initial Crediting	Updated Projection at Year 4	Updated Projection at Year 6
Total credits issued at Initial Crediting (10% CO ₂ (t))	459	459	459
Total credits issued at Year 4 (40% CO ₂ (t))	1835	1835	1835
Total credits to be issued at Year 6 (30% CO ₂ (t))	1376	1376	1376
Total credits to be issued at Year 26 (20% CO ₂ (t))	918	918	918
Total credits to be issued (tCO₂e)	4588	4588	4588

Attachment: 11_PCD 2020-21 Carbon Quantification - Year 6

CO-BENEFITS QUANTIFICATION DOCUMENTATION (Section 9 and Appendix B)

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: 11_PCD 2020-21 Carbon Quantification - Year 6

ADDITIONAL INFORMATION

Include additional information on changes to monitoring and reporting plans since the Year 4 Planting Design Document was submitted.

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.

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

SIGNATURE

Signed on June 18th in 2026, by Ryan Bird, Habitat Restoration Manager, for Pierce Conservation District.

Ryan Bird

Signature

Ryan Bird

Printed Name

2532250306

Phone

ryanb@pierced.org

Email

ATTACHMENTS

- 2_Peck Tree Planting Area Shapefile
- 3_PeckRandomPoints2026.zip
- 4_PeckHighRes.tif
- 5_PeckMap_CoverClass_2026.pdf
- 6_SPCR Tree Planting Area Shapefile
- 7_SPCPRandomPoints2026.zip
- 8_SPCPHighRes.tif
- 9_SPCPMap_CoverClass_2026.pdf
- 10_PCD 2020-21 Canopy Change Workbook - Year 6.xlsx
- 11_PCD 2020-21 Carbon Quantification - Year 6.xlsx

Peck Random Points

CoverClass

● Non-tree

● Tree

□ Tree Planting Area



Peck Property

City Forest Credits Cover Class Map

ORGANIZATION: Pierce Conservation District

CARTOGRAPHER: RyanB

DATE: 5/28/2026

DISCLAIMER: While every precaution was taken in preparing this map, the publisher disclaims any warranty of fitness or accuracy of the data. The map is approximate in nature, based on compilation of data from multiple sources, and should not be relied upon or referenced in legal documents, including property deeds, title reports, and contract documents, nor substituted for appropriate survey and/or engineering analysis. The user of the map acknowledges its limitations, assumes all responsibility for its use, and agrees to hold the publisher harmless for any damages that may result from the use of this map. This map is subject to change without notice.

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0 0 0.01 0.02 Miles



Legend

 Tree Planting Area

SPCPRandomPoints2026

CoverClass

 Non-tree

 Tree

South Prairie Creek Preserve Interior Floodplain City Forest Credits Cover Class Map

ORGANIZATION: Pierce Conservation District

CARTOGRAPHER: RyanB

DATE: 6/18/2026

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0 0.02 0.04 0.07 Miles



N



		Year 6				
		Percentage			Area	
	Acres	Tree	Non-Tree	SE	Tree	Non-Tree
Site 1 (Peck)	1.37	28.00%	72.00%	3.67%	0.3836	0.9864
Site 2 (South Prairie Creek)	7.3	12.40%	87.60%	2.08%	0.9052	6.3948
Total	8.67	14.87%	85.13%	2.25%	1.2888	7.3812

Cover Class Options: "Tree" OR "Non-Tree"

ID	Cover Class	Latitude	Longitude
1	Non-tree	47.188202	-122.323997
1	Non-tree	47.188499	-122.323997
1	Tree	47.188202	-122.323997
1	Tree	47.188702	-122.323997
1	Tree	47.188202	-122.323997
1	Non-tree	47.188	-122.323997
1	Non-tree	47.188099	-122.323997
1	Tree	47.187901	-122.323997
1	Tree	47.188202	-122.323997
1	Tree	47.188202	-122.323997
1	Non-tree	47.188599	-122.323997
1	Non-tree	47.188099	-122.323997
1	Non-tree	47.188499	-122.323997
1	Non-tree	47.188099	-122.323997
1	Non-tree	47.187901	-122.323997
1	Tree	47.188499	-122.323997
1	Non-tree	47.188702	-122.323997
1	Tree	47.188801	-122.323997
1	Non-tree	47.188	-122.323997
1	Non-tree	47.188801	-122.323997
1	Non-tree	47.1884	-122.323997
1	Non-tree	47.1889	-122.323997
1	Non-tree	47.188702	-122.323997
1	Non-tree	47.188599	-122.323997
1	Tree	47.188099	-122.323997
1	Non-tree	47.188202	-122.323997
1	Non-tree	47.1889	-122.323997
1	Non-tree	47.1884	-122.323997
1	Non-tree	47.188499	-122.323997
1	Tree	47.188301	-122.323997
1	Non-tree	47.188801	-122.323997
1	Non-tree	47.188801	-122.323997
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1	Non-tree	47.187901	-122.323997
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1 Non-tree	47.1889	-122.323997
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1 Non-tree	47.188702	-122.323997
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1 Tree	47.188801	-122.323997
1 Tree	47.188801	-122.323997
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1 Tree	47.188599	-122.323997
1 Non-tree	47.1884	-122.323997
1 Non-tree	47.187901	-122.323997

1 Tree	47.1884	-122.322998
1 Non-tree	47.188301	-122.323997
1 Non-tree	47.188202	-122.323997
1 Non-tree	47.188099	-122.322998
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1 Non-tree	47.188599	-122.323997
1 Non-tree	47.188202	-122.323997
1 Non-tree	47.187901	-122.323997
1 Tree	47.187901	-122.323997
1 Non-tree	47.188702	-122.323997
1 Tree	47.188301	-122.322998
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1 Non-tree	47.1889	-122.323997
1 Non-tree	47.188202	-122.323997
1 Non-tree	47.188801	-122.323997
1 Tree	47.188499	-122.323997
1 Tree	47.188801	-122.323997
1 Non-tree	47.188301	-122.323997
1 Tree	47.1884	-122.323997
1 Non-tree	47.188702	-122.323997
1 Non-tree	47.188202	-122.323997
1 Tree	47.1884	-122.323997

Cover Class Options: "Tree" OR "Non-Tree"

ID	Cover Class	Latitude	Longitude
1	Non-tree	47.1367	-122.119652
2	Non-tree	47.13813	-122.117798
3	Non-tree	47.137409	-122.12014
4	Non-tree	47.136986	-122.119141
5	Tree	47.138275	-122.117607
6	Non-tree	47.135998	-122.120049
7	Non-tree	47.135059	-122.120903
8	Non-tree	47.138557	-122.117577
9	Tree	47.137177	-122.118721
10	Non-tree	47.13884	-122.117622
11	Non-tree	47.137024	-122.120125
12	Non-tree	47.138809	-122.116936
13	Non-tree	47.135761	-122.120422
14	Non-tree	47.137569	-122.120163
15	Non-tree	47.136513	-122.11985
16	Non-tree	47.135643	-122.120613
17	Non-tree	47.138935	-122.116722
18	Tree	47.139091	-122.116264
19	Non-tree	47.136906	-122.119011
20	Non-tree	47.138363	-122.117989
21	Non-tree	47.137131	-122.119553
22	Non-tree	47.13847	-122.117928
23	Non-tree	47.137478	-122.119194
24	Non-tree	47.138767	-122.117317
25	Non-tree	47.137119	-122.119843
26	Non-tree	47.137356	-122.119652
27	Non-tree	47.138268	-122.11763
28	Non-tree	47.136444	-122.11985
29	Non-tree	47.137329	-122.118996
30	Non-tree	47.136963	-122.119965
31	Non-tree	47.137508	-122.118118
32	Non-tree	47.136868	-122.119812
33	Non-tree	47.138741	-122.116608
34	Non-tree	47.136887	-122.118668
35	Non-tree	47.137424	-122.119469
36	Non-tree	47.136677	-122.119484
37	Non-tree	47.13673	-122.119499
38	Tree	47.139084	-122.116684
39	Non-tree	47.137257	-122.118637
40	Non-tree	47.137154	-122.119751

41 Non-tree	47.136871	-122.119881
42 Non-tree	47.13723	-122.119461
43 Non-tree	47.138832	-122.1175
44 Non-tree	47.136059	-122.120064
45 Non-tree	47.137558	-122.120171
46 Non-tree	47.136974	-122.120049
47 Non-tree	47.138325	-122.117699
48 Non-tree	47.138988	-122.117287
49 Non-tree	47.136612	-122.119171
50 Non-tree	47.138725	-122.117096
51 Non-tree	47.137493	-122.118225
52 Non-tree	47.136955	-122.119987
53 Non-tree	47.137527	-122.120064
54 Non-tree	47.138115	-122.117729
55 Tree	47.13765	-122.119034
56 Non-tree	47.13805	-122.117783
57 Non-tree	47.135574	-122.120728
58 Non-tree	47.137299	-122.119804
59 Non-tree	47.137501	-122.119431
60 Tree	47.138882	-122.116425
61 Non-tree	47.137405	-122.1194
62 Non-tree	47.138973	-122.116898
63 Tree	47.138676	-122.116913
64 Non-tree	47.137363	-122.119629
65 Non-tree	47.138847	-122.116943
66 Tree	47.137608	-122.11969
67 Non-tree	47.137234	-122.119278
68 Non-tree	47.13752	-122.117966
69 Non-tree	47.136688	-122.119789
70 Non-tree	47.137417	-122.118942
71 Tree	47.138683	-122.117783
72 Non-tree	47.137081	-122.119392
73 Non-tree	47.137501	-122.120155
74 Non-tree	47.136131	-122.119186
75 Non-tree	47.138702	-122.117096
76 Non-tree	47.135208	-122.12088
77 Non-tree	47.137184	-122.118256
78 Non-tree	47.137012	-122.119835
79 Non-tree	47.136726	-122.119125
80 Non-tree	47.137081	-122.11953
81 Non-tree	47.137138	-122.11982
82 Non-tree	47.136959	-122.11882
83 Non-tree	47.137589	-122.118095
84 Non-tree	47.138596	-122.117447

85 Tree	47.13847	-122.118065
86 Tree	47.138691	-122.117767
87 Non-tree	47.138771	-122.117424
88 Non-tree	47.137009	-122.118752
89 Non-tree	47.136726	-122.119873
90 Non-tree	47.137314	-122.119316
91 Non-tree	47.138775	-122.117538
92 Non-tree	47.137531	-122.119186
93 Non-tree	47.138584	-122.117714
94 Non-tree	47.136726	-122.119919
95 Non-tree	47.136761	-122.119148
96 Non-tree	47.136421	-122.119827
97 Non-tree	47.135994	-122.120117
98 Non-tree	47.137318	-122.119316
99 Non-tree	47.137554	-122.120117
100 Tree	47.138763	-122.116524
101 Non-tree	47.136463	-122.119743
102 Non-tree	47.137074	-122.119675
103 Non-tree	47.138905	-122.117081
104 Non-tree	47.136314	-122.119225
105 Non-tree	47.1371	-122.120102
106 Non-tree	47.137463	-122.119743
107 Non-tree	47.136837	-122.119049
108 Non-tree	47.138916	-122.117355
109 Non-tree	47.13509	-122.120834
110 Tree	47.13876	-122.116684
111 Non-tree	47.137302	-122.118469
112 Non-tree	47.13868	-122.117287
113 Non-tree	47.137665	-122.119698
114 Tree	47.138786	-122.116676
115 Tree	47.137814	-122.117989
116 Non-tree	47.137665	-122.118294
117 Tree	47.138702	-122.117455
118 Non-tree	47.137096	-122.119225
119 Non-tree	47.136318	-122.119148
120 Non-tree	47.138454	-122.117661
121 Non-tree	47.137085	-122.118988
122 Tree	47.138039	-122.117798
123 Non-tree	47.137508	-122.119476
124 Non-tree	47.137375	-122.1185
125 Non-tree	47.137669	-122.118004
126 Non-tree	47.136978	-122.118919
127 Non-tree	47.136772	-122.119995
128 Non-tree	47.136883	-122.119598

129 Non-tree	47.137344	-122.119797
130 Non-tree	47.137356	-122.119148
131 Non-tree	47.137211	-122.11956
132 Non-tree	47.137127	-122.118355
133 Non-tree	47.1366	-122.119797
134 Non-tree	47.137508	-122.119659
135 Non-tree	47.135899	-122.120201
136 Non-tree	47.138912	-122.116661
137 Non-tree	47.138882	-122.116516
138 Non-tree	47.139038	-122.116432
139 Tree	47.138638	-122.116745
140 Non-tree	47.13707	-122.119728
141 Tree	47.138897	-122.11657
142 Non-tree	47.138565	-122.117752
143 Tree	47.13728	-122.119949
144 Non-tree	47.138889	-122.116875
145 Non-tree	47.137516	-122.118645
146 Non-tree	47.135674	-122.120476
147 Non-tree	47.138958	-122.116302
148 Non-tree	47.138657	-122.117584
149 Non-tree	47.136669	-122.119637
150 Tree	47.138321	-122.117523
151 Non-tree	47.137421	-122.119736
152 Non-tree	47.137234	-122.118279
153 Tree	47.137669	-122.119812
154 Non-tree	47.137985	-122.118034
155 Non-tree	47.136757	-122.119576
156 Non-tree	47.137653	-122.119568
157 Non-tree	47.137581	-122.119041
158 Non-tree	47.138309	-122.117935
159 Non-tree	47.13887	-122.117447
160 Non-tree	47.138596	-122.116943
161 Non-tree	47.139	-122.116524
162 Non-tree	47.138519	-122.117882
163 Non-tree	47.138584	-122.117073
164 Non-tree	47.135777	-122.120354
165 Non-tree	47.138733	-122.117455
166 Tree	47.137161	-122.118179
167 Non-tree	47.137459	-122.119202
168 Non-tree	47.137257	-122.12014
169 Non-tree	47.136883	-122.119675
170 Non-tree	47.137058	-122.118713
171 Non-tree	47.13876	-122.116997
172 Non-tree	47.136703	-122.118774

173 Non-tree	47.138866	-122.116547
174 Non-tree	47.138771	-122.116463
175 Non-tree	47.13895	-122.116905
176 Non-tree	47.138218	-122.117737
177 Non-tree	47.13625	-122.119217
178 Tree	47.137306	-122.120148
179 Non-tree	47.136917	-122.119606
180 Non-tree	47.137329	-122.118202
181 Non-tree	47.137196	-122.119423
182 Non-tree	47.1376	-122.118568
183 Non-tree	47.137859	-122.117958
184 Non-tree	47.13863	-122.116959
185 Non-tree	47.137611	-122.11927
186 Non-tree	47.13702	-122.118919
187 Non-tree	47.137508	-122.118347
188 Non-tree	47.137234	-122.118805
189 Non-tree	47.137093	-122.118599
190 Non-tree	47.137302	-122.118095
191 Non-tree	47.137455	-122.119415
192 Non-tree	47.137661	-122.119972
193 Non-tree	47.138653	-122.116943
194 Non-tree	47.13739	-122.118225
195 Non-tree	47.138409	-122.117615
196 Tree	47.137493	-122.118248
197 Non-tree	47.136311	-122.119179
198 Non-tree	47.137161	-122.119247
199 Tree	47.137402	-122.118073
200 Non-tree	47.137157	-122.118866
201 Non-tree	47.137371	-122.118362
202 Non-tree	47.137192	-122.119026
203 Non-tree	47.137852	-122.11795
204 Non-tree	47.137764	-122.117935
205 Non-tree	47.139015	-122.117279
206 Non-tree	47.138866	-122.117119
207 Non-tree	47.135357	-122.120789
208 Tree	47.137482	-122.11908
209 Non-tree	47.139065	-122.116982
210 Non-tree	47.137402	-122.118858
211 Non-tree	47.136818	-122.118912
212 Non-tree	47.138412	-122.118027
213 Non-tree	47.137184	-122.119057
214 Non-tree	47.137585	-122.119347
215 Non-tree	47.136955	-122.118652
216 Tree	47.139095	-122.116859

217 Non-tree	47.137356	-122.119316
218 Non-tree	47.138729	-122.116402
219 Non-tree	47.137272	-122.120033
220 Tree	47.138733	-122.117546
221 Non-tree	47.138935	-122.117119
222 Non-tree	47.1376	-122.119736
223 Tree	47.138062	-122.117897
224 Non-tree	47.137142	-122.119781
225 Non-tree	47.13903	-122.117226
226 Non-tree	47.137691	-122.119812
227 Non-tree	47.137455	-122.119774
228 Non-tree	47.138481	-122.117966
229 Non-tree	47.1367	-122.119942
230 Non-tree	47.136894	-122.11998
231 Non-tree	47.138329	-122.117653
232 Non-tree	47.13755	-122.120041
233 Non-tree	47.138237	-122.117889
234 Non-tree	47.139027	-122.117142
235 Non-tree	47.138653	-122.116959
236 Non-tree	47.137383	-122.119324
237 Non-tree	47.137619	-122.118782
238 Non-tree	47.136784	-122.118874
239 Non-tree	47.137241	-122.118713
240 Non-tree	47.139	-122.116241
241 Non-tree	47.138824	-122.116287
242 Non-tree	47.138119	-122.117897
243 Non-tree	47.136982	-122.118423
244 Non-tree	47.137188	-122.120018
245 Non-tree	47.138744	-122.11705
246 Non-tree	47.136906	-122.118752
247 Non-tree	47.136761	-122.118629
248 Non-tree	47.138409	-122.117905
249 Non-tree	47.137638	-122.117996
250 Tree	47.136826	-122.11869

	The Program Planning Tool for 10' or Greater Riparian Planting in the Pacific Northwest Climate Zone															
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	This tool is intended for riparian projects with tree spacing of 10' or greater. The analyst can use this method to forecast the amount of CO2 (in metric tonnes, t) estimated to be stored by live project trees after 25 years for crediting. Credits based on the estimated CO2 storage can be issued at three points in time – 10% within one year after planting, 40% after year 3, and 30% after year 5, minus 5% that will go into a program-wide buffer pool to insure against catastrophic loss of trees. At the end of the project, in year 25, Operators will receive credits for all CO2 stored, minus Credits already issued.															
	Project Operators will follow the Steps listed below to obtain an initial forecast. When a user wishes to seek Credits at one of the first points in time after planting, they will use this tool to calculate credit amounts and to supply verification data to the Registry. Users will submit this spreadsheet to the Registry with other documentation so the Registry can verify the planting. Sampled data will be used to obtain Credits at subsequent points in time.															
	Steps															
	1) Compile data on the numbers of trees planted by species to fill in the Planting List (Table 1).															
	2) Enter data on the anticipated mortality rate (% of planted sites without trees in 25 years) into Cell D6 on the Credits sheet.															
	3) Credits will be automatically calculated in Table 6 of the CO2 Summary sheet, incorporating tree losses and the 5% buffer pool deduction.															
	4) Table 4 in the Total CO2 sheet automatically infers the amount of CO ₂ stored after 25 years from the sample to the population of live trees.															
	5) For planning purposes only, users can enter a low and high price of CO ₂ (\$ per t) in Table 5. Table 6 incorporates error estimates of ±15% to calculate low and high amounts of CO ₂ stored. Both of these tables are located in the CO2 Summary sheet.															
	6) Table 7, in the Co-Benefits sheet, automatically provides estimates of co-benefits for live trees after 25 years in Resource Units (e.g., kWh) per year and \$ per year.															

Directions
1) In Table 1 record the number of sites planted for each tree species.
2) If species are not listed, add them to the bottom of Table 1.

Table 1. Planting List

ScientificName	CommonName
<i>Abies grandis</i>	grand fir
<i>Abies lasiocarpa</i>	subalpine fir
<i>Abies magnifica</i>	California red fir
<i>Abies pinsapo</i>	abeto de Espana
<i>Abies procera</i>	noble fir
<i>Acer buergerianum</i>	trident maple
<i>Acer circinatum</i>	vine maple
<i>Acer macrophyllum</i>	bigleaf maple
<i>Acer negundo</i>	boxelder
<i>Acer palmatum</i>	Japanese maple
<i>Acer palmatum 'Dissectum'</i>	lace-leaf maple
<i>Acer platanoides</i>	Norway maple
<i>Acer platanoides 'Fairview'</i>	Norway maple 'Fairveiw'
<i>Acer platanoides 'Emerald Queen'</i>	Norway maple 'Queen Elizabeth'
<i>Acer platanoides 'Schwedleri'</i>	Norway maple 'Schwedler'
<i>Acer pseudoplatanus</i>	sycamore maple
<i>Acer rubrum</i>	red maple
<i>Acer rubrum 'Morgan'</i>	red maple 'Morgan'
<i>Acer saccharinum</i>	silver maple
<i>Acer saccharum</i>	sugar maple
<i>Acer species</i>	maple
<i>Aesculus hippocastanum</i>	horsechestnut
<i>Ailanthus altissima</i>	tree of heaven
<i>Albizia julibrissin</i>	mimosa
<i>Alnus rubra</i>	red alder
<i>Betula nigra</i>	river birch
<i>Betula pendula</i>	European white birch
<i>Broadleaf Deciduous Large</i>	broadleaf deciduous large
<i>Broadleaf Deciduous Medium</i>	broadleaf deciduous medium
<i>Broadleaf Deciduous Small</i>	broadleaf deciduous small
<i>Broadleaf Evergreen Large</i>	broadleaf evergreen large
<i>Broadleaf Evergreen Medium</i>	broadleaf evergreen medium
<i>Broadleaf Evergreen Small</i>	broadleaf evergreen small
<i>Calocedrus decurrens</i>	incense cedar
<i>Calodendrum capense</i>	Cape chestnut
<i>Carpinus betulus 'Fastigiata'</i>	hornbeam 'fastigiata'
<i>Carya illinoensis</i>	pecan
<i>Catalpa speciosa</i>	northern catalpa

<i>Cedrus atlantica</i>	Atlas cedar
<i>Cedrus deodara</i>	deodar cedar
<i>Celtis occidentalis</i>	northern hackberry
<i>Celtis sinensis</i>	Chinese hackberry
<i>Cercidiphyllum japonicum</i>	katsura tree
<i>Chamaecyparis lawsoniana</i>	Port Orford cedar
<i>Chamaecyparis nootkatensis</i>	Alaska cedar
<i>Chamaecyparis obtusa</i>	Hinoki cypress
<i>Chamaecyparis pisifera</i>	Sawara false cypress
<i>Chamaecyparis thyoides</i>	Atlantic white cedar
<i>Conifer Evergreen Large</i>	conifer evergreen large
<i>Conifer Evergreen Medium</i>	conifer evergreen medium
<i>Conifer Evergreen Small</i>	conifer evergreen small
<i>Cornus florida</i>	flowering dogwood
<i>Cornus nuttallii</i>	Pacific dogwood
<i>Corylus maxima</i> var. <i>purpurea</i>	purple giant filbert
<i>Crataegus douglasii</i>	black hawthorn
<i>Crataegus laevigata</i>	smooth hawthorn
<i>Crataegus phaenopyrum</i>	Washington hawthorn
<i>Crataegus x lavalleyi</i>	Carriere hawthorn
<i>Cunninghamia lanceolata</i>	blue Chinese fir
<i>Fagus sylvatica</i>	European beech
<i>Fagus sylvatica</i> 'Atropunicea'	purple-leaf beech
<i>Fraxinus americana</i>	white ash
<i>Fraxinus holotricha</i>	Moraine ash
<i>Fraxinus latifolia</i>	Oregon ash
<i>Fraxinus oxycarpa</i>	Caucasian ash
<i>Fraxinus pennsylvanica</i> 'Sherwood Glen'	green ash 'sherwood glen'
<i>Fraxinus pennsylvanica</i> 'Marshall'	Marshall green ash
<i>Fraxinus velutina</i>	velvet ash
<i>Ginkgo biloba</i>	ginkgo
<i>Gleditsia triacanthos</i>	honeylocust
<i>Ilex aquifolium</i>	English holly
<i>Ilex opaca</i>	American holly
<i>Juglans regia</i>	English walnut
<i>Juniperus chinensis</i>	Chinese juniper
<i>Koelreuteria paniculata</i>	goldenrain tree
<i>Laburnum anagyroides</i>	golden chain tree
<i>Larix decidua</i>	European larch
<i>Larix decidua</i> 'Pendula'	European larch 'pendula'
<i>Liquidambar orientalis</i>	Oriental sweetgum
<i>Liquidambar styraciflua</i>	sweetgum
<i>Liriodendron tulipifera</i>	tulip tree
<i>Magnolia grandiflora</i>	southern magnolia
<i>Magnolia macrophylla</i>	bigleaf magnolia
<i>Magnolia x soulangiana</i>	Chinese magnolia; saucer magnolia

<i>Malus angustifolia</i>	southern crabapple
<i>Malus floribunda</i>	Japanese flowering crabapple
<i>Malus ioensis</i> var. <i>plena</i>	Bechtel crabapple
<i>Malus sylvestris</i>	common crabapple
<i>Malus x purpurea</i> var <i>eleyi</i>	Eleyi crabapple
<i>Morus alba</i>	white mulberry
<i>Palm Evergreen Large</i>	palm evergreen large
<i>Palm Evergreen Medium</i>	palm evergreen medium
<i>Palm Evergreen Small</i>	palm evergreen small
<i>Parrotia persica</i>	Persian ironwood
<i>Paulownia tomentosa</i>	royal paulownia
<i>Phoenix canariensis</i>	Canary Island date palm
<i>Phoenix dactylifera</i>	date palm
<i>Photinia x fraseri</i>	Fraser photinia
<i>Picea abies</i>	Norway spruce
<i>Picea glauca</i>	white spruce
<i>Picea pungens</i>	blue spruce
<i>Picea sitchensis</i>	Sitka spruce
<i>Pinus aristata</i>	bristlecone pine
<i>Pinus contorta</i>	lodgepole pine
<i>Pinus contorta</i> var. <i>latifolia</i>	tall lodgepole pine
<i>Pinus densiflora</i>	Japanese red pine
<i>Pinus mugo</i>	sweet mountain pine
<i>Pinus pinea</i>	Italian stone pine
<i>Pinus ponderosa</i>	ponderosa pine
<i>Pinus sylvestris</i>	Scotch pine
<i>Pinus thunbergiana</i>	Japanese black pine
<i>Platanus hybrida</i>	London planetree
<i>Populus alba</i>	white poplar
<i>Populus alba</i> 'Pyramidalis'	white poplar 'pyramidalis'
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>	black cottonwood
<i>Populus nigra</i>	black poplar
<i>Populus tremuloides</i>	quaking aspen
<i>Prunus avium</i>	sweet cherry
<i>Prunus blireiana</i>	Blierana plum
<i>Prunus cerasifera</i>	cherry plum
<i>Prunus cerasifera</i> 'Thundercloud'	thundercloud purple plum
<i>Prunus domestica</i>	common plum
<i>Prunus laurocerasus</i>	common cherry laurel
<i>Prunus persica</i>	peach
<i>Prunus serrulata</i>	Kwanzan cherry
<i>Prunus serrulata</i> 'Amanogawa'	Amanogawa cherry
<i>Prunus serrulata</i> 'Shirofugen'	Shirofugen cherry
<i>Prunus serrulata</i> 'Shirotae'	Shirotae cherry
<i>Prunus subhirtella</i>	Higan cherry
<i>Prunus yedoensis</i>	Yoshino flowering cherry
<i>Pseudotsuga menziesii</i>	Douglas fir

<i>Pyrus calleryana</i> 'Cleveland'	Cleveland pear
<i>Pyrus communis</i>	common pear
<i>Pyrus kawakamii</i>	evergreen pear
<i>Quercus agrifolia</i>	coastal live oak; California live oak
<i>Quercus alba</i>	white oak
<i>Quercus coccinea</i>	scarlet oak
<i>Quercus macrocarpa</i>	bur oak
<i>Quercus palustris</i>	pin oak
<i>Quercus rubra</i>	northern red oak
<i>Rhus glabra</i>	smooth sumac
<i>Rhus hirta</i>	staghorn sumac
<i>Robinia pseudoacacia</i>	black locust
<i>Salix amygdaloides</i>	peachleaf willow
<i>Salix matsudana</i>	corkscrew willow
<i>Salix scouleriana</i>	Scouler willow
<i>Salix x sepulcralis</i> Simonkai	weeping willow
<i>Sambucus caerulea</i> var. <i>neomexicana</i>	neomexican blue elderberry
<i>Sciadopitys verticillata</i>	umbrella pine
<i>Sequoia sempervirens</i>	coast redwood
<i>Sequoiadendron giganteum</i>	giant sequoia
<i>Sorbus aucuparia</i>	European mountain ash
<i>Syringa reticulata</i>	Japanese tree lilac
<i>Syringa vulgaris</i>	common lilac
<i>Taxodium distichum</i>	bald cypress
<i>Taxus baccata</i>	English yew
<i>Taxus brevifolia</i>	Pacific yew
<i>Thuja occidentalis</i>	northern white cedar
<i>Thuja plicata</i>	western red cedar
<i>Tilia americana</i>	American basswood
<i>Tilia americana</i> var. <i>heterophylla</i>	white basswood
<i>Tilia cordata</i>	littleleaf linden
<i>Tsuga heterophylla</i>	western hemlock
<i>Tsuga mertensiana</i>	mountain hemlock
<i>Ulmus americana</i> 'Liberty'	liberty elm
<i>Ulmus americana</i>	American elm
<i>Ulmus procera</i>	English elm
<i>Ulmus pumila</i>	Siberian elm
Unknown species	unknown
<i>Washingtonia robusta</i>	Mexican fan palm
<i>Wisteria sinensis</i>	purple wisteria
<i>Cornus sericea</i>	red osier dogwood
<i>Corylus cornuta</i>	beaked hazelnut
<i>Amelanchier alnifolia</i>	serviceberry
<i>Oemleria cerasiformis</i>	indian plum (osoberry)
<i>Sambucus racemosa</i>	red elderberry
<i>Physocarpus capitatus</i>	pacific ninebark

<i>Rubus parviflorus</i>	thimbleberry
<i>Rubus spectabilis</i>	salmonberry
<i>Symphoricarpos alba</i>	snowberry
<i>Rosa nutkana</i>	nootka rose
<i>Rhamnus purshiana</i>	Cascara

Tree-Type Abbreviation	No. Sites Planted
CEL	
CEL	
CEL	
CEL	
CEL	
BDS	
BDS	220
BDL	550
BDL	
BDS	
BDS	
BDM	
BDM	
BDM	
BDL	
BDL	
BDM	
BDM	
BDL	
BDL	
BDL	
BDL	
BDM	
BDS	
BDM	410
BDM	
BDM	
BDL	
BDM	
BDS	
BEL	
BEM	
BES	
CEM	
BDM	
BDM	
BDL	
BDL	

Table 2. Summary of Planting Sites

Tree-Type	Tree-Type Abbreviation
Brdlf Decid Large (>50 ft)	BDL
Brdlf Decid Med (30-50 ft)	BDM
Brdlf Decid Small (<30 ft)	BDS
Brdlf Evgrn Large (>50 ft)	BEL
Brdlf Evgrn Med (30-50 ft)	BEM
Brdlf Evgrn Small (<30 ft)	BES
Conif Evgrn Large (>50 ft)	CEL
Conif Evgrn Med (30-50 ft)	CEM
Conif Evgrn Small (<30 ft)	CES
Total Sites Planted	

CEL	
CEL	
BDL	
BDL	
BDM	
CEL	
CEL	
CEL	
CES	
CEM	
CEL	
CEM	
CES	
BDS	
BDM	
BDS	
BDS	150
BDS	
BDS	
BDS	
CEL	
BDL	
BDL	
BDL	
BDM	
BDL	220
BDM	
BDL	
BDM	
BDL	
BDL	
BDL	
BES	
BEM	
BDL	
CES	
BDM	
BDS	
BDL	
BDS	
BDM	
BDM	
BDL	
BEL	
BDM	
BDS	

BDS	
BDS	
BDS	
BDS	
BDS	
BDM	
PEL	
PEM	
PES	
BDM	
BDM	
PEL	
PEM	
BES	
CEL	
CEL	
CEL	
CEL	330
CES	
CES	
CEL	
CEM	
CES	
CEM	
CEL	
CEM	
CEL	
BDL	
BDL	
BDL	
BDL	740
BDL	
BDL	
BDM	
BDS	
BDS	
BDS	
BDS	
BES	
BDS	
BDS	
BDS	
BDS	
BDS	
BDS	
BDM	
CEL	200

BDM	
BDM	
BES	
BEL	
BDL	
BDL	
BDL	
BDL	
BDL	
BDS	
BDS	
BDL	
BDM	
BDS	
BDL	
BDL	
BDS	
CEM	
CEL	
CEL	
BDM	
BDS	
BDS	
BDL	
CEM	
CEM	
CEL	
CEL	900
BDM	
BDL	
BDM	
CEL	
CEM	
BDL	
BDL	
BDL	
BDL	
BDM OTHER	
PES	
BDS	
	100
	170
	50
	350
	250
	225

	375
	100
	300
	100
	100

5840

No. Sites Planted
1510
410
370
0
0
0
1430
0
0
3720

Directions

1) In Table 3 record the acreage lost and the planting density (trees/acre)

2) In Table 4 record the canopy cover measured on i-Tree Canopy

Table 3. Acreage Loss and Mortality Calculations

Acres Lost (acres)	0.35
Planting Density (trees/acre)	401
Estimated Number of Trees Lost	140.35
Estimated Mortality (%)	3.77%
Credit Adjustment Needed	NO

YES - if C10 > 20% mortality deduction; NO - C10 < 20% mortality deduction

If Credit Adjustment is needed, update mortality deduction (Credits!E11 - E19) accordingly

Table 4. Canopy Cover Observed (i-Tree Canopy)

Percent Tree Canopy (%)	23.0%
Year 6 Canopy Goal (%)	11.5%
Credit Adjustment Needed	NO

If Canopy Adjustment Needed:

Canopy Coverage Discrepancy	1
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Directions

Enter data on the anticipated mortality rate (% of planted sites without trees in 25 years) into cell D6. Using the information you provide and background data, the tool calculates the amount of Credits that could be issued at years 1 (10%), 3 (40%), and 5 (30%) after planting. A mortality deductions (% loss) is applied to account for anticipated tree losses. A 5% buffer pool deduction is applied that will go into a program-wide pool to insure against catastrophic loss of trees.

Mortality Deduction (%): 20%

Table 5. 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	1510	1208	0.20	2,062.82	2367.3	236.73	946.92	710.19
BDM	410	328	0.20	1,277.75	398.1	39.81	159.26	119.44
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	1430	1144	0.20	1,520.44	1652.4	165.24	660.97	495.72
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
	3720	2976		5,465.2	4587.8	458.78	1835.10	1376.33
				Canopy-Adjusted Credits	4587.8	458.78	1835.10	1376.33
				Credits issued	4588	459	1835	1376

20%	
20% CO ₂ (t)	
473.46	
79.63	
33.98	
0.00	
0.00	
0.00	
330.48	
0.00	
0.00	
917.55	
917.55	sumcheck
918	4588

	In Table 6 the tool infers the amount of CO ₂ stored after 25 years based on the anticipated population of live trees. Values in column H account for anticipated tree losses and the 5% buffer pool deduction.						
	Table 6. Grand Total CO₂ Stored after 25 years (all live trees, includes tree losses and buffer pool deduction)						
	Tree-Type	No. Sites Planted	Mortality Deduction (%)	Total Live Trees After Mortality	25-yr CO₂ stored (kg/tree)	CO₂ Tot. - No Deductions (t)	Grand Total CO₂ w/ Deductions (t)
	Brdlf Decid Large (>50 ft)	1510	0.20	1208	2,062.82	3,114.9	2,367.3
	Brdlf Decid Med (30-50 ft)	410	0.20	328	1,277.75	523.9	398.1
	Brdlf Decid Small (<30 ft)	370	0.20	296	604.21	223.6	169.9
	Brdlf Evgrn Large (>50 ft)	0	0.20	0	0.00	0.0	0.0
	Brdlf Evgrn Med (30-50 ft)	0	0.20	0	0.00	0.0	0.0
	Brdlf Evgrn Small (<30 ft)	0	0.20	0	0.00	0.0	0.0
	Conif Evgrn Large (>50 ft)	1430	0.20	1144	1,520.44	2,174.2	1,652.4
	Conif Evgrn Med (30-50 ft)	0	0.20	0	0.00	0.0	0.0
	Conif Evgrn Small (<30 ft)	0	0.20	0	0.00	0.0	0.0
		3720		2976	5,465.2	6,036.5	4,587.76

	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.				
	Co-Benefits <u>PER YEAR</u> after 25 years (all live trees, includes tree losses)				
	Ecosystem Services	Resource Units Totals	Res Unit/site	Total \$	\$/site
	Rain Interception (m3/yr)	19,413.73	5.22	\$142,522.88	\$38.313
	CO2 Avoided (t, \$20/t/yr)	185.19	0.05	\$3,703.84	\$0.996
	Air Quality (t/yr)				
	O3	0.5854	0.0002	\$1,213.17	\$0.326
	NOx	0.1893	0.0001	\$392.19	\$0.105
	PM10	0.3250	0.0001	\$1,196.51	\$0.322
	Net VOCs	-1.8017	-0.0005	-\$1,390.22	-\$0.374
	Air Quality Total	-0.7020	-0.0002	\$1,411.65	\$0.38
	Energy (kWh/yr & kBtu/yr)				
	Cooling - Elec.	40,447.86	10.87	\$2,070.93	\$0.56
	Heating - Nat. Gas	125,341.13	33.69	\$1,426.84	\$0.38
	Energy Total (\$/yr)			\$3,497.77	\$0.94
	Grand Total (\$/yr)			\$151,136.15	\$40.63