

# City of Astoria

## Bear Creek Watershed Forest Carbon Project Background

### *Project Purpose*

In 2015 the City of Astoria entered into a voluntary carbon project that sold carbon credits from the Bear Creek Watershed. The purpose of this forest carbon project was to generate non-timber revenue that diversified income streams from the Bear Creek watershed. The initial payment for carbon credits was \$2,111,535 and generated net revenue to the City of \$1,898,699.

### *Project Location*

The forest carbon project is located within the City of Astoria's Bear Creek watershed. The watershed is comprised of approximately 3,700 acres of forestland which provides high quality drinking water to city residents while also providing timber harvest revenue that supports City services.

### *Bear Creek Watershed Forest Management*

The forest management of the Bear Creek watershed is guided by a Forest Resource Management Plan. This plan was updated in January 2014 and can be reviewed online at:

[http://astoria.or.us/Assets/dept\\_9/pm/pdf/2014%20plan%20\(12-14-15%20update\).pdf](http://astoria.or.us/Assets/dept_9/pm/pdf/2014%20plan%20(12-14-15%20update).pdf)

The 2014 Forest Management Plan identified the opportunity to develop a forest carbon project and that the project would be based on a commitment to maintain harvests below a level that would otherwise meet all federal and state legal requirements.

The management of the Bear Creek watershed is independently third-party certified through the Forest Stewardship Council (FSC). This certification validates that the City's management activities conform to the highest environmental and social standards of forestry practices around the world.

The Bear Creek Watershed Forest Resource Management Plan is currently being updated for 2020 in order to comply with the FSC certification and to better reflect the carbon project that was initiated in 2015.

### *Forest Inventory*

As a requirement to maintain FSC certification, a new forest inventory of the Bear Creek watershed was completed in December 2013 by Mason Bruce & Girard (MB&G) - a large forestry consulting firm based in Portland, Oregon. This inventory was designed to provide information on merchantable volumes of commercial timber, as well as an estimate of the amount of carbon stored within the watershed. The inventory identified greater amounts of standing merchantable tree volume than was estimated prior to the inventory.

The 2013 forest inventory determined that the Bear Creek watershed contained a standing volume of 100 million board feet (MM BF). Conservative projections indicate an annual growth rate of 4%. MB&G determined that an annual harvest rate of 3 MMBF per year would maintain the current standing volume

into perpetuity. The average annual harvest level over the past 15 years has been approximately 800 thousand board feet per year.

Based on the 2013 inventory, the current harvest level could be increased while still achieving the objectives of high-quality drinking water, maintaining FSC certification, and meeting the requirements of federal law and the State's forest practices law. However, with the emergence of a carbon market over the past decade, the City chose to pursue this alternative way to generate a new and diverse stream of revenue while continuing to manage the Bear Creek watershed with the primary goal of protecting water quality and mitigating risks to the water source.

The 2013 inventory is now 6 years old and must be re-done after 10 years. Re-inventory at 10 years is both a requirement of the carbon project and common best practice for forest management. It is proposed to move the inventory up to align with the re-verification of the carbon project in 2020. The reasons for re-inventory in 2019 or 2020 is that the original inventory did not permanently mark inventory plots, making the data difficult to verify in the field. In addition, a new inventory may identify higher than anticipated carbon stocks on the property due to growth or sampling error. If this is the case, the City will be able to transact additional credits as part of a larger transaction.

### *2015 Carbon Project Background*

The City of Astoria began exploring the potential of a forest carbon project in 2012. In consultation with now retired City forester Mike Barnes and L&C Carbon - a nationally recognized Oregon-based forest carbon consulting firm - the carbon offset potential of the Bear Creek watershed was evaluated. The analysis indicated that the Bear Creek watershed was an excellent candidate for a forest carbon project due to well-stocked forest stands across the watershed and the City's long-term sustainable management practices.

Of the various voluntary and compliance carbon registries, the American Carbon Registry (ACR) was selected as the only registry with a protocol appropriate for Bear Creek Watershed project. ACR, a nonprofit enterprise of Winrock International, was founded in 1996 as the first private voluntary greenhouse gas registry in the world. Winrock operates ACR to create confidence in the environmental and scientific integrity of carbon offsets in order to accelerate transformational emission reduction actions. As a pioneer in harnessing the power of markets to improve the environment, ACR has set the bar for offset quality that is the market standard today and continues to lead market innovations.

### *Project Methodology*

The forest carbon project was developed under ACR's approved forest carbon methodology - Improved Forest Management Methodology for Quantifying GHG Removals and Emission Reductions through Increased Forest Carbon Sequestration on Non-Federal U.S. Forestlands. ACR published this methodology in September 2011. L&C Carbon led the development of this new methodology to create access to carbon markets for non-federal public lands and family woodlands. The methodology can be reviewed online at: <https://americancarbonregistry.org/carbon-accounting/standards-methodologies/improved-forest-management-ifm-methodology-for-non-federal-u-s-forestlands>

This methodology is designed to quantify greenhouse gas (GHG) emission reductions resulting from forest carbon projects that reduce emissions by exceeding common (baseline) forest management practices. This means that carbon offsets are generated by a landowner agreeing to harvest less timber than is legally permissible over an agreed number of years (crediting period). Thus, the landowner gets paid to maintain

more carbon stocking in the forest than what is considered the common practice (harvest rates) of neighboring forest land.

Carbon offsets are referred to in this methodology as Emission Reduction Tons (ERTs). To determine the number of ERTs that can be generated and sold from a forest carbon project, a project scenario (what you plan to harvest) is compared to a baseline scenario (what you can legally harvest). The difference between these two harvest forecasts is the basis for determining carbon impacts and ERTs attributable to the project. The City's project scenario was based on a harvest level of about 800 thousand board feet per year, which has been accurate through 2018.

### *ACR Requirements & Commitments*

To qualify and participate in a forest carbon project under ACR, the landowner must meet a set of requirements and agree to a set of commitments. The City met these requirements in 2015, when the Bear Creek project was verified, and continues to meet these requirements. Following is a summary of the ACR requirements and commitments.

#### *Requirements*

A forest carbon project must meet ACR's eligibility requirements, demonstrate that carbon produced from the project is additional and meet ACR's permanence standard.

Eligibility- the City meets all eligibility requirements; including the ability to document clear land title, demonstrate lands within the project boundary are subject to commercial timber harvesting activities, and the property's forest management is third -party certified.

Additionally- ACR requires that a carbon project demonstrate forest practices exceed all legally mandated requirements, exceed the common practice in the forestry sector and geographic region, and that carbon revenue will incentivize implementing the carbon project.

Permanence -ACR requires landowners to commit to a minimum crediting period of 20 years. After the initial 20 years, the landowner can choose to commit to one additional 20 year crediting period. The total project term is 40 years. In addition, the project must address risk mitigation through the establishment and maintenance of carbon offsets contributed to a buffer pool account held by ACR.

#### *Commitments*

A landowner entering into a forest carbon project commits to maintaining or increasing carbon stocks within the project boundary over the project term. In the case of the Bear Creek watershed project, the City agreed to, at minimum, maintain the carbon stocks that currently exist within the watershed during the project life.

In 2015 the watershed contained 100 MMBF of timber. Thus, the City agreed to maintain at least that level of timber stocking over the project term. The chart below illustrates that based on a conservative annual growth rate (2.5%) and current harvest levels (0.8 to 1.0 MMBF) over the next 16 years, the Bear Creek watershed inventory will grow to over 160 MMBF by 2034.

Thus, over the next 16 years, the City will maintain significant flexibility to either increase harvests beyond the current level - as long as the stocking never goes below the current level (100 MMBF) - or sell additional carbon credits that equal a maximum of the difference of annual growth minus harvest.

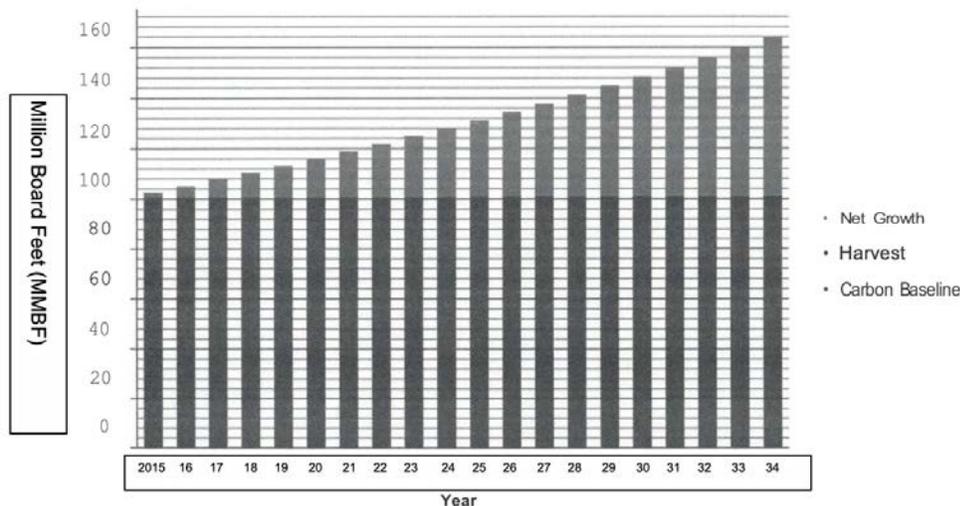
Once a forest carbon project is listed, developed, third-party verified, and registered by ACR, the landowner commits to the following:

An Annual Attestation that confirms the continuance of the project, confirms the ownership remains unchanged, and discloses any significant unanticipated changes to the carbon stocks within the project boundary.

An Annual Desk Audit in years the landowner monetizes ERTs that is performed by a third-party verifier.

A Field Audit every five years that is performed by a third-party auditor that confirms the ERTs claimed are still present.

A New Inventory every 10 years that updates the standing timber volume and carbon stocks, in addition to updating the project scenario model. Any ERT true-up adjustments must be made and third-party verified.



### The Climate Trust - A Contract to Buy ERTs

In the summer of 2014, the City issued a RFP to gauge the interest of potential carbon buyers in purchasing offsets generated by a forest carbon project in the Bear Creek watershed. The Climate Trust (TCT) expressed an interest in this proposed project. This interest led to a negotiated Term Sheet that was approved by the City Council at its December 15, 2014 meeting.

TCT is a 501(3)(c) Portland, Oregon-based nonprofit that is a pioneer and nationally recognized leader in the carbon market. The Climate Trust's mission is transforming the economy to value our climate. One-way TCT achieves its mission is to purchase quality carbon offsets from projects that meet its stringent quality standards.

In 2015, the City of Astoria signed a contract to deliver 247,000 ERTs to TCT in two separate deliveries. Due to uncertainty in the verification of the project, 220,000 ERTs were sold on a firm delivery basis with an additional 25,000 ERTs on a unit contingent (optional) basis. This contract was negotiated between the City

and TCT and reviewed by City Attorney Blair Henningsgaard, and outside environmental counsel, Christine Hein of Ring Bender Law. The contract detailed the sale terms of ERTs generated by the Bear Creek watershed forest carbon project, including the number of ERTs, price per unit, and delivery schedule over a two-year period.

The City successfully delivered the credits agreed to in the 2015 contract with TCT and was paid accordingly. In the fall of 2018, City forester Ben Hayes was approached by TCT about another 145,000 ERTs that will become available from the Bear Creek Watershed carbon project in 2020. These conversations initiated the current consideration of transacting an additional 145,000 – 225,000 ERTs.

#### *Project Development Steps (Completed in 2015)*

For the City to be in a position to deliver ERTs to TCT from the Bear Creek watershed carbon project, the following activities had to be completed. All activities were completed and credits were successfully delivered in 2015 and 2016. Reverification and sale of additional credits in 2020 would not require all steps outlined below:

#### *Activity 1- List the Project with the American Carbon Registry*

- Open a registry account with the American Carbon Registry (ACR)
- Complete the project listing documentation and submit it to ACR
- Respond to questions and information requests by ACR generated by the review and approval process

#### *Activity 2 - Project Development*

- Define and map project boundary
- Model growth and yield scenarios based on MB&G inventory
- Determine project baseline through modeling to maximize 100-year harvest within all legal constraints
- Select and model management scenarios to compare against project baseline
- Finalize ERT forecasts
- Complete ERT quantification worksheets
- Assemble landowner information, documents, and maps
- Complete the Greenhouse Gas Management Project Plan (GHG) and Project Development Document

#### *Activity 3 - Third -Party Verification*

- Develop and distribute a Request for Qualifications (RFQ) for completing a third-party verification to ACR-approved verification bodies.
- Select a qualified verifier that can meet the required project timeline, and execute a contract for verification services
- Schedule a visit to verify and provide all requested documents to verifier
- Participate in the verification field visit
- Review verification findings and complete required changes in the project documentation to obtain a positive verification finding

#### *Activity 4 - ERT Registration*

- Complete and submit all required project documentation to ACR
- Submit positive third-party verification report to ACR
- Respond to questions and information requests by ACR generated by the review and approval of project registration

#### *Activity 5 - Distribution of ERTs to Buyer*

- Confirm verified ERTs are in the City of Astoria 's ACR account
- Pay account and ERT issuance fees
- Transfer year 1 verified ERTs to buyer' s ACR account
- Invoice buyer for transferred ERTs

#### *Project Revenue & Cost (2015)*

Based on TCTs' 2015 Purchase Agreement, gross revenue for the sale of 2015 vintage ERTs was \$2,111,535.10.

It should be noted that in 2015 TCT indicated an interest in purchasing additional ERTs generated from the Bear Creek watershed project after the initial Purchase Agreement was completed. This would result in additional revenue to the City and has resulted in the current proposed purchase of 2020 vintage and buffer pool credits.

#### *Project Development Costs (2015)*

Prior to selling ERTs generated by a forest carbon project, the project proponent must list, develop, and verify the project. Once the project is verified, it must be registered on the ACR Registry before ERTs can be sold and transferred to a buyer. These steps were all undertaken in 2015, however any additional credits issues to the project would require additional project development costs, outlined in the current City Council Memo.

The project development costs are incurred in the first year of the project. Following are the approximate year one (2015) project development costs.

#### *Year 1 Approximate Project Development Costs*

Year 1 development costs included listing and project development, third party verification, ACR registry and issuance fees, and consultant costs. These costs did not include the inventory, and totaled \$212,835.71.

Once all development activities were complete and the project was registered with ACR, further project expenditures are required to meet ACR project compliance requirements, including:

Annual Attestation - required each year, the City must submit an attestation document to ACR that confirms the continuance of the project, confirms the ownership remains unchanged, and discloses any significant unanticipated changes to the carbon stocks - estimated to cost about \$500.

Desk Audits - required only in years that project ERTs are sold, a third-party verifier must complete a desk audit to confirm the credits are available from the project - estimated to cost about \$5,000.

Field Audit - required every five years, a third-party verifier must complete a field audit to confirm the ERTs claimed are present - estimated to cost about \$25,000-35,000.

Updated Inventory- required at least every ten years, the project proponent must complete a new inventory of the project area and update the project scenario models. Any ERT true-up adjusts must be made and verified by a third-party verifier. In 2015 this was estimated to cost about \$30,00, however due to current carbon project demand, the cost could be as high as \$40,000-60,000. Sampling design will account for \$12,000-14,000 of this cost with the remainder being plot data collection. Outside of this carbon project requirement, re-inventorying your forest at least every 10 years is a standard business practice of forest landowners across the country. Investing in new inventory data on a regular basis reaps a return on this investment by providing land managers current data to drive better decision making.

The costs associated with the second year of the project were approximately \$32,210. These were primarily ACR reporting costs (\$5,260) and ERT issuance fees (\$26,950.) Thus, over the first two years the total project costs were approximately \$245,045.71.

Regarding years 6-20 expenses, the estimates included above are still valid in 2015 dollars. The total expense of the project through 2034 is \$108,500 regardless of whether the City sells any additional credits. Opportunities to sell credits will decrease in the future as the net ERTs generated by the project are limited to growth of standing timber in the watershed, whereas the 2015 and 2020 ERT sales are generated by the quantification of the existing standing timber on the watershed. Future growth is not anticipated to generate the level of ERTs that would be attractive to a prospective buyer or cover the additional costs of selling the carbon credits.

<b>Ongoing Costs</b>	
Attestation	\$ 7,000.00
Desk Audit	\$ 1,500.00
Inventory	\$ 50,000.00
Field Audit	\$ 50,000.00
<b>Total 2021-2034</b>	<b>\$ 108,500.00</b>

*Estimated ongoing project costs for years 6-20 of the carbon project- in 2019 dollars.*

*Net Project Revenue Projection for 2020 Credit Sale.*

The table below details the net generated by the sale of ERTs in 2020 at a price of \$7 per ERT. In addition, this table shows the gross revenue generated from the sale of 2015-2020 buffer pool credits, as well as the cost of purchasing replacement buffer pool credits at \$4 / ERT.

Expenses in this table are estimated based on 2015 estimates updated to 2019 dollars. In addition, the cost of inventory has increased and ACR fees were estimated. The contract with TCT includes a significantly higher gross revenue in order to allow the City to sell any additional credits generated through the re-inventory process.

<b>Income</b>			
	Units	Price	Income / Expense
Sale of 2020 Credits	145000	\$ 7.00	\$ 1,015,000.00
Sale of 2015-2020 Buffer	55000	\$ 7.00	\$ 385,000.00
Gross Revenue			<b>\$ 1,400,000.00</b>
<b>Expense</b>			
Inventory			\$ (50,000.00)
Project Development			\$ (25,000.00)
Purchase of Buffer Pool Replacement	55000	\$ 4.00	\$ (220,000.00)
Field Verification			\$ (20,000.00)
ACR Fees			\$ (30,000.00)
Total Expenses			<b>\$ (345,000.00)</b>
Net Revenue			<b>\$ 1,055,000.00</b>