

**Forest Trust Land Advisory Committee Meeting**  
**Department of Forestry**  
**February 18, 2022**  
**2 – 4:30 pm**

Join Zoom Meeting

<https://odf.zoom.us/j/99038264170>

- 2:00-2:30      **Chair Opening Remarks, David Yamamoto, Chair**
- Introductions
  - Public Comment
  - Comments from BOF Chair and State Forester
  - Approval of December 3, 2021 FTLAC meeting – video link  
<https://www.youtube.com/watch?v=8lKadpv9M2k>
- 2:30-3:00      **American Forest and Santiam State Forest Carbon Project, Ben Rushakoff**
- 3:00-3:45      **County Revenue and Distribution, David Yamamoto**
- 3:45-4:00      **March Board of Forestry Topic: Endangered Species Management Plan, Nick Palazotto**
- 4:00-4:15      **HCP and FMP timeline updates, Mike Wilson**
- 4:15-4:30      **FTLAC Upcoming Meetings and Closing Remarks, David Yamamoto and Kate Skinner**
- March Meeting Cancellation
  - April Meeting – HCP Draft EIS focus
  - May BOF Workshop
- 4:30            **Adjourn**

## Santiam State Forest Carbon Reforestation Project Summary

Winter Update 2021

### Background

American Forests proposes to partner with Oregon Department of Forestry to pilot the Reforest America Carbon Program (RACP) by reforesting 1,000 acres of severely burned forestland on Santiam State Forest. Together, American Forests (AF) and ODF will pilot a novel approach to carbon-financed reforestation using Verra's Projected Carbon Unit (PCU) and forthcoming Afforestation, Reforestation, and Revegetation (ARR) methodology. As reforestation is the largest and lowest cost carbon removal technology, and Santiam State Forest is situated within the most carbon-dense ecosystem in the United States, this project is an ideal illustration of how carbon-financed reforestation yields real positive outcomes for the landscape as well as for surrounding communities. The RACP, as demonstrated by ODF's pilot project, amplifies innovative carbon market mechanisms, including Verra's PCU to suit unique reforestation project needs.

At its core, the Reforest America Carbon Program employs an innovative forward crediting approach to carbon finance by providing corporate buyers with third-party validated carbon that can be claimed against future emissions that will eventually be converted to verified ex post reportable credits. Given the high cost of reforestation activities, this early validation step serves as the basis for early carbon finance critical to initiating the reforestation project. The estimated carbon is priced to meet landowners' needs, covering a vast majority, if not all, project-related costs including site preparation, seedlings, planting labor, administration, monitoring, reporting, registry fees, validation, and eventual verification. In baking these costs directly into the price of carbon, neither ODF nor Marion County pay for reforestation actions or carbon project management – those costs are covered by carbon revenues. If the negotiated price exceeds this break-even point, carbon 'profits' can be split among stakeholders.

### Project Snapshot

**Project Developer:** American Forests

**Project Owner:** Santiam State Forest, Oregon Department of Forestry, State of Oregon

**Location:** Lyons, Oregon

**Start Up Date:** Spring 2022

**Planting Completion Date:** Spring 2024

**Project Term:** Between 30 and 40 years under the reforestation methodology, plus an additional 40-100 years under an Improved Forest Management (IFM) methodology

**Project Type:** Post-Fire Reforestation

**Standard:** Verra's forthcoming Afforestation, Reforestation, and Revegetation methodology in concert with their novel Projected Carbon Unit (PCU) forward financing mechanism. Post-reforestation term, the project could transition to an Improved Forest Management project using Verra's IFM methodology.

**Carbon Sequestered\*:** After accounting for a 20% risk reduction (buffer pool contribution), the project is estimated to generate between 123,410 and 224,828 mtCO<sub>2</sub>e in live trees depending on the management scenario during a forty-year reforestation project term. An additional estimated 173,000 to 235,000 mtCO<sub>2</sub>e would be stored during the project's second forty years under an IFM methodology (see Table 1 below).

**Total Carbon Revenue:** Price will be negotiated at the beginning of the project once a management scenario has been selected. The minimum price required to cover project costs (site preparation, planting labor and materials, administration costs, registry fees, validation, and verification, monitoring and reporting) is between \$7.50 for the grow-only scenario and \$14.50/tonne for the lower scenarios depending on site prep costs and management scenarios,

\*Note that we are currently drafting an MOU with Verra and will be using their forthcoming Afforestation, Reforestation, and Revegetation methodology. We expect similar carbon numbers and will conform to the same RACP requirements that the price per credit cover all reforestation project costs. Nevertheless, the numbers presented in this document are subject to change.

Updated December 14, 2021

including the more climate-smart reforestation plans (see Table 2 below). The numbers in Table 2 only consider carbon stored in the first 40 years under the reforestation methodology. Also note that the forward credits will likely be priced between \$15 and \$20/tonne generating excess revenue for ODF and Marion County.

*Table 1: Cumulative Verified Carbon Removals (VCRs) at 20, 40, 60, and 80 years for different management scenarios. Note that estimations for years 60 and 80 are generated using a conservative regional average baseline of 146 mtCO<sub>2</sub>e/acre based on the Assessment Area Data File from CA Air Resources Board. The project baseline for IFM would be determined based on ODF's BAU management which may be above or below the 146 mtCO<sub>2</sub>e/acre baseline included for this analysis.*

	Scenario Description	Cumulative VCRs generated over time (not per acre)			
		20 years [2041]	40 years [2061]	60 years [2081]	80 years [2101]
CAR1	Plant with 360 TPA. Thinning treatments at 60% SDI to 35% SDI every 20 years	38,302	141,099	196,599	314,312
CAR2	Plant with 360 TPA. Complex structure – early thinning at 45% SDI to 25% SDI, followed by thin at 60% SDI to 35% SDI	38,302	123,410	239,809	358,114
CAR3	Plant with 360 TPA. Regen harvest at CMAI. Replant with 360 TPA. [essentially grow-only scenario for first 40+ yrs]	38,302	224,828	323,647	438,918
CAR4	Lower density planting (250 TPA) with thinnings at 60% SDI to 35% SDI every 20 years	25,703	126,750	232,079	322,162

*Table 2: Price per PCU and total carbon revenue associated with that pricing level for the various carbon management scenarios and site preparation costs. Note that the CAR3 scenario (grow only) stores the most carbon and has the lowest cost per PCU whereas CAR2 stores the least carbon and has the highest cost. The climate-adaptation forward scenario (CAR4) generates a moderate number of forward credits and is associated with moderate costs. All prices per PCU are within current market rates for innovative forest carbon projects.*

	Scenario Description	If site prep is \$750/acre		If site prep is \$500/acre	
		Breakeven \$/PCU	Total Carbon Revenue	Breakeven \$/PCU	Total Carbon Revenue
CAR1	Plant with 360 TPA. Thinning treatments at 60% SDI to 35% SDI every 20 years	\$13	\$1,821,054	\$11	\$1,552,089
CAR2	Plant with 360 TPA. Complex structure – early thinning at 45% SDI to 25% SDI, followed by thin at 60% SDI to 35% SDI	\$14.50	\$1,789,445	\$12.50	\$1,542,625
CAR3	Plant with 360 TPA. Regen harvest at CMAI. Replant with 360 TPA. [essentially grow-only scenario for first 40+ yrs]	\$8.50	\$2,115,038	\$7.50	\$1,866,210
CAR4	Lower density planting (250 TPA) with thinnings at 60% SDI to 35% SDI every 20 years	\$13.75	\$1,742,812	\$11.75	\$1,489,312

## Project Details

The 1,000-acre project area is within a severely burned fire scar from the 2020 Beachie Creek Fire. The fire severity limits the ability of the forest to recover on its own, and site conditions make this area a low priority on ODF's restoration list. Therefore, reforestation is needed to jumpstart the recovery of the forests and the benefits they provide. And the benefits they provide are substantial:

- **Carbon Storage:** The forests of the Santiam State Forest are some of the most productive in the United States and are nationally significant components to the country's overall carbon sink.

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- **Soil Carbon:** In this ecoregion, high-severity wildfires result in significant forest soil carbon losses and reforestation is vital to preventing further soil carbon loss and accelerating the accumulation of above ground carbon in the live tree carbon pool.
- **Water Quality:** Forest soils after fires are more impermeable for a period leading to increased runoff and erosion. This is important to many community drinking water systems that can be impaired with eroding sediment. This service is especially important on the Santiam State Forest as it lies in one of the most important forest regions for drinking water in the Pacific Northwest according to the USDA Forest Service, serving Salem, Oregon (population ~170,000) and several other smaller communities<sup>1</sup>. For instance, the community of Gates, Oregon exists right between the two large blocks of the Santiam State Forest. Even prior to the erosion caused by the fire, the city was facing significant financial costs associated with a wastewater treatment infrastructure upgrade, these costs may now increase if sedimentation persists.
- **Recreation:** The project area is the second most important recreation area on the forest, featuring a trail leading to a natural arch feature. Delayed or failed regeneration will have consequences for this recreation amenity.

In partnership with the Oregon Department of Forestry (ODF), American Forests proposes to reforest 1,000 acres of Douglas-fir, noble fir, western hemlock, and western red cedar forests. The reforestation will be designed to enhance the resilience of the next forest to severe fire, drought and other climate-induced threats. Specific actions will include:

- Limit competition to newly planted seedlings from shrubs and grasses;
- Plant tree species and genetics at densities that may be more resilient to climate impacts like drought and extreme weather events;
- Plant trees in ways that mimic natural and post-fire regeneration forest conditions; and
- Restore forests that result in a mix of forest conditions at regional scales to improve resilience to fire, pests, and other emergent stressors.

### Projected Carbon Storage

Following ACR’s reforestation methodology and using Forest Vegetation Simulator (FVS) to project growth and yield tables, preliminary timber and carbon calculations allow for estimated total carbon storage and timber revenue over the proposed 40-year reforestation project term. Note that Verra’s methodology (to be released for public comment 1/16/2021) may yield slightly different carbon numbers. Figures 1 and 2, below, show the estimated carbon accumulation per acre in mtCO<sub>2</sub>e over the 40 years from 2021 to 2061 and 2021 to 2081. The *total carbon* includes carbon stored in live trees both above and below ground. Harvested wood products are excluded in this initial analysis but will be included in more thorough carbon accounting shortly.

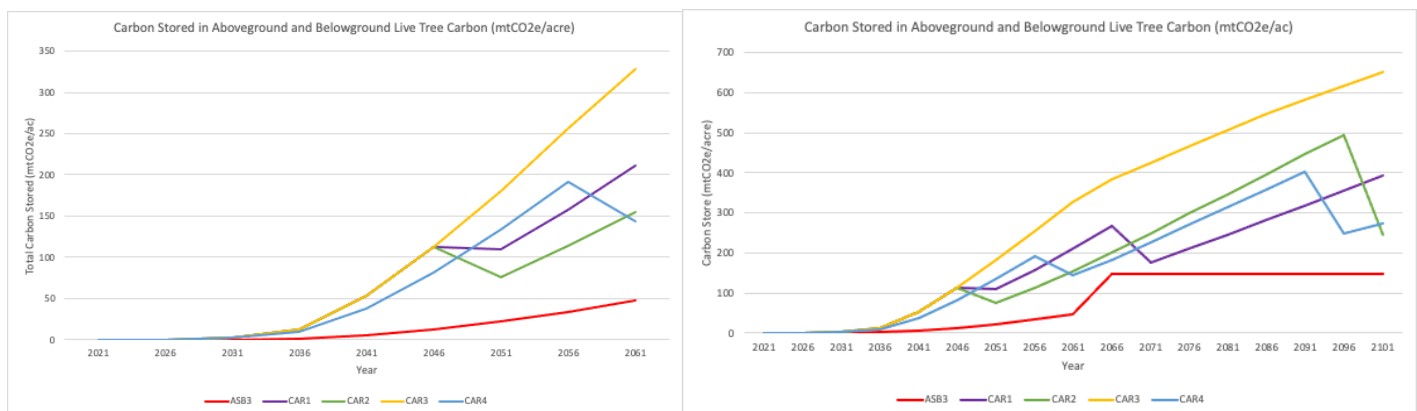


Figure 1 & 2: Total carbon (aboveground live, belowground live) in mtCO<sub>2</sub>e/acre for both the ASB3 baseline scenario and carbon scenario forecasts for 40 years from 2021 to 2061. The figure on the right illustrates total carbon (aboveground live, belowground live) in mtCO<sub>2</sub>e/acre for both ASB3 IFM-corrected baseline scenario and forecasts for 80 years from 2021 to 2101.

<sup>1</sup> <https://usfs.maps.arcgis.com/apps/MapSeries/index.html?appid=e84fc83c8be542079d3c1d489d45be21#>

## Timber Revenue

Beyond carbon revenues, the management scenarios yield substantial timber volume and revenue through active management whereas the baseline scenario does not grow enough volume to produce harvest revenue (see Table 3 below). Using information provided by ODF, DF timber values were averaged across log grades to \$608/MBF, WH was averaged to \$503/MBF, and logging costs are conservatively estimated as \$300/MBF. In the first 40 years, CAR scenarios 1, 2, and 4 generate \$1.4, \$2.2, and \$3 million in net timber revenue respectively.

*Table 3: Total timber volume and revenue produced from each management scenario in BF/ac, \$/ac, and \$/project for the 40-year reforestation project term. \*\*Note that for scenario CAR3, the timber revenue is not produced until year 85 when the stand undergoes a regeneration harvest which yields 88,782 BF/acre, \$27,228/acre, or \$27,228,000 in the 1000-acre project area.*

40-year Timber Revenue			
	Timber volume (BF/acre)	Net Timber Revenue (\$/acre)	Net Timber Revenue (\$/project)
CAR1	4,890	\$1,471	\$1,471,000
CAR2	7,095	\$2,196	\$2,196,000
CAR3**	0	0	0
CAR4	10,097	\$3,058	\$3,058,000

Though the initial reforestation project would only span up to 40 years, we modeled out the carbon and timber projections for 80 years as well (see Table 4 below). It should be noted that CAR3 does not trigger a regeneration harvest until CMAI which occurs just outside of the 80-year timeframe at year 85. Though the above analysis shows that CAR1 and CAR4 have similar carbon totals at year 80, the below revenue chart illustrates that CAR4 generates nearly double the timber volume and revenue as CAR1 due to the timing and intensity of harvests.

*Table 4: Total timber volume and revenue produced from each management scenario in BF/ac, \$/ac, and \$/project for the 80-year project term. \*\*Note that for scenario CAR3, the timber revenue is not produced until year 85 when the stand undergoes a regeneration harvest which yields 88,782 BF/acre, \$27,228/acre, or \$27,228,000 in the 1000-acre project area.*

80-year Timber Revenue			
	Timber volume (BF/acre)	Net Timber Revenue (\$/acre)	Net Timber Revenue (\$/project)
CAR1	20,425	\$6,411	\$6,411,000
CAR2	50,433	\$15,715	\$15,715,000
CAR3**	0	0	0
CAR4	38,058	\$11,950	\$11,950,000

For more information regarding the Santiam State Forest Reforestation Carbon Project, please contact:  
 Ben Rushakoff, Senior Manager of Carbon Finance  
[brushakoff@americanforests.org](mailto:brushakoff@americanforests.org)

# Santiam State Forest Reforestation Pilot Project

Reforest America Carbon Program  
Winter 2021-22





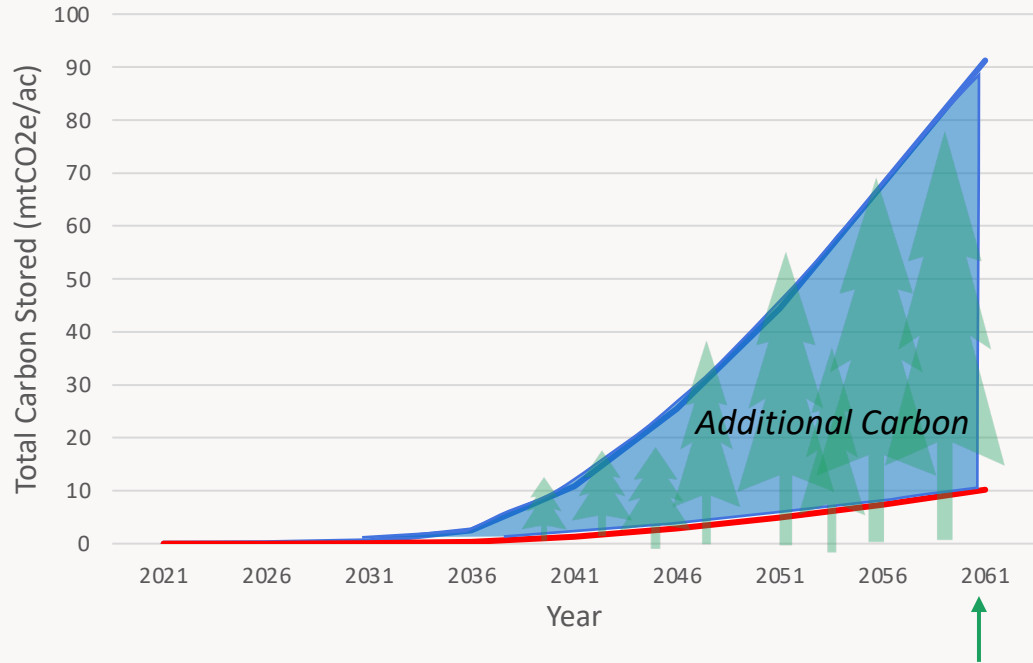
# Overview

- Background
- Pilot Project Details
- Remaining Hurdles
- Next Steps



## Key Concept: *ex post* crediting vs. forward crediting

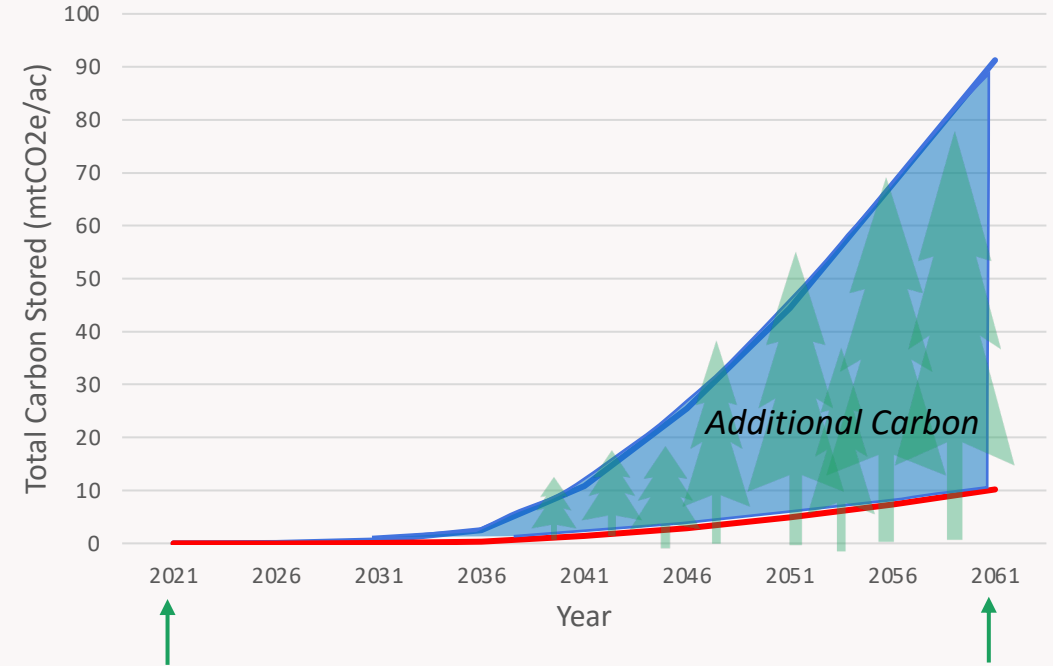
Carbon Stored in Aboveground and Belowground Live Tree  
Carbon (mtCO<sub>2</sub>e/acre)



*Ex post* credits are issued **after** existing carbon storage is verified

Buyer pays **2061 price** for ex-post credits

Carbon Stored in Aboveground and Belowground Live Tree  
Carbon (mtCO<sub>2</sub>e/acre)



Forward, *validated* credits are issued **before** carbon is stored

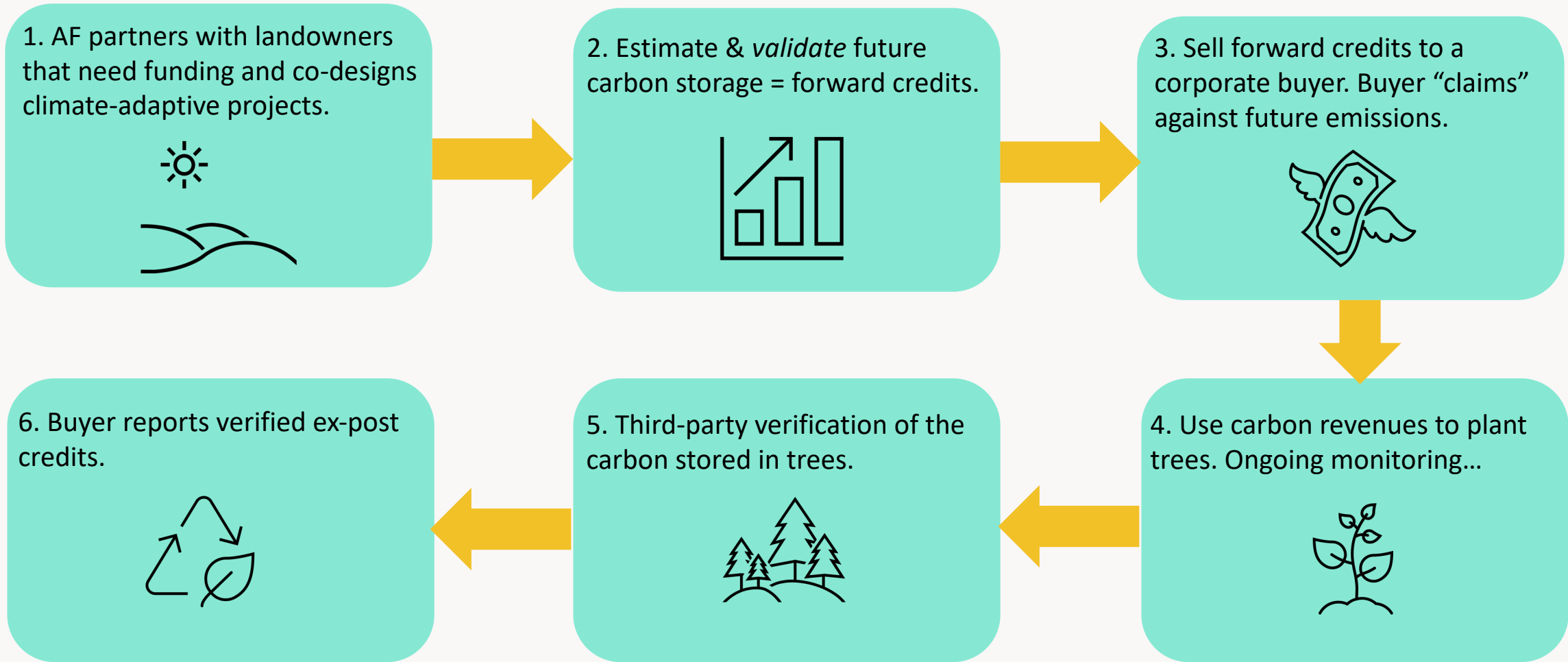
Buyer and seller negotiate pricing based on **2021 prices**

*Ex post* credits are issued when existing carbon storage is verified

**Forward crediting: same carbon, different timing, lower pricing**



## How Reforest America Carbon Program works



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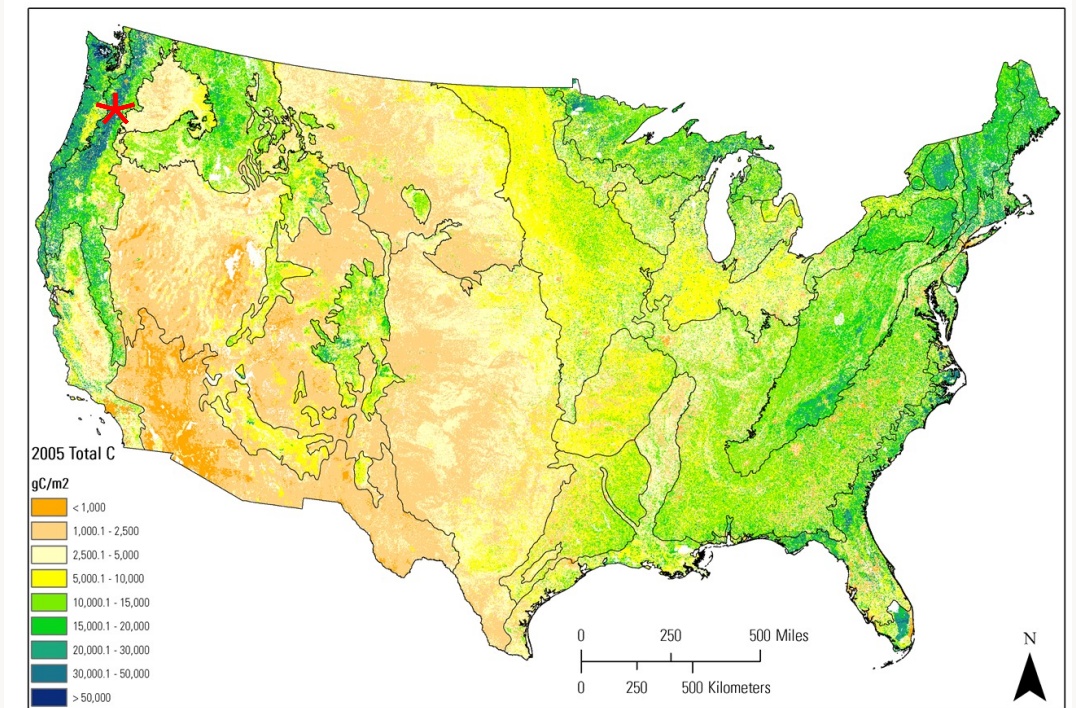
## Santiam State Forest Reforestation Project

### 2020 Labor Day Fires

- Burned 16,000 acres of Santiam State Forest
- Large areas of high-severity, stand-replacing fire

### Santiam State Forest

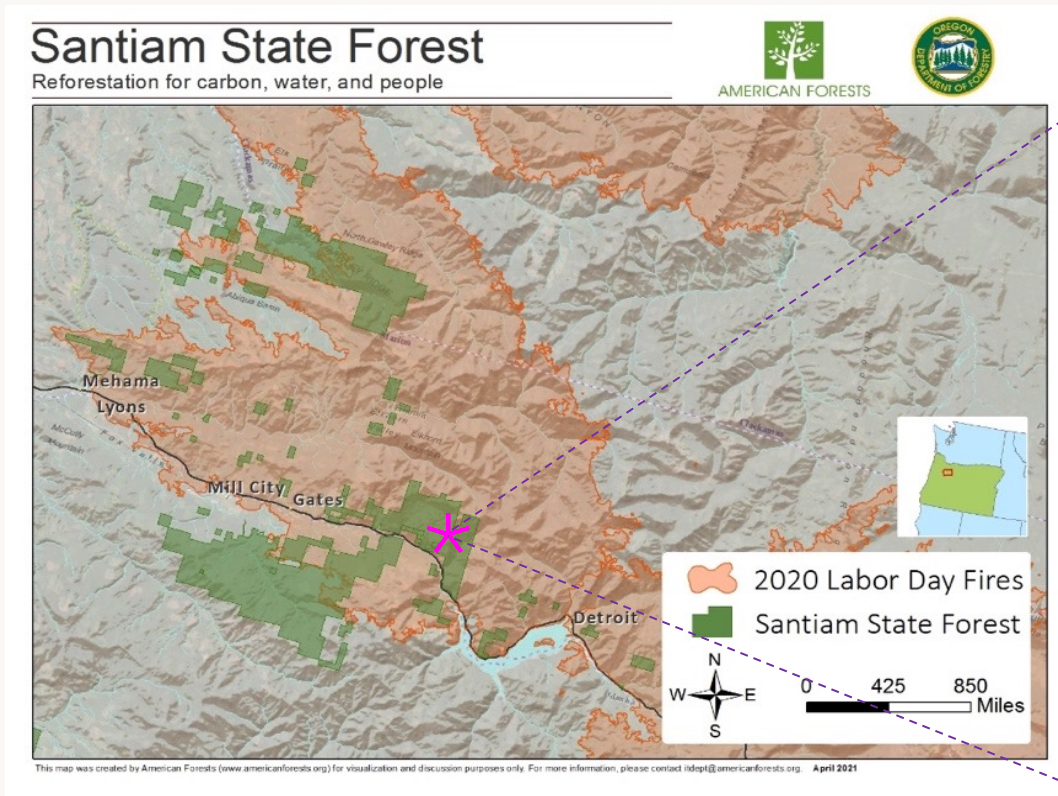
- Managed for multiple uses by Oregon Department of Forestry (ODF)
- Provides **timber** revenue to counties to pay for public services
- Located within watershed that serves Salem, Oregon (population ~170K) and local **communities** also affected by the fires
- One of the most productive forests in the United States, critical to the country's **carbon sink**
- Critical **habitat** area for wildlife including game species



Map of total forest carbon in gC/m<sup>2</sup> across the U.S. Santiam State Forest is indicated by the red star in one of the most carbon-rich forest types in the States. Source: USFS, 2010

The reforestation needs are expansive, carbon sequestration potential are immense, and benefits to communities and ecology are cascading.

## Santiam State Forest Reforestation Project



2020 Beachie Creek Fire

Santiam State Forest project area, June 2021 (photo: Ben Rushakoff)





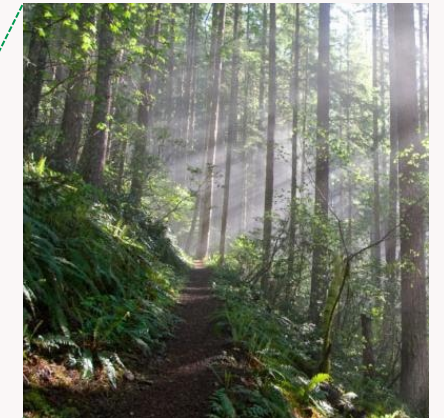
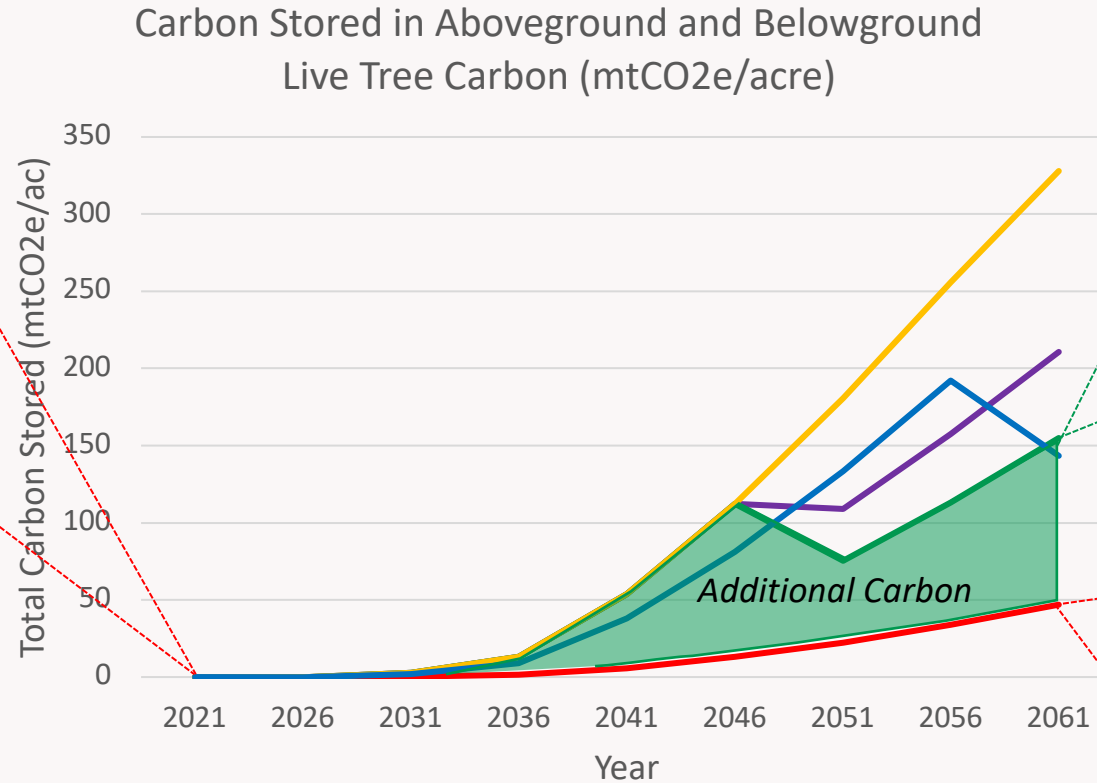
Present Forest

- Severely-burned
- Not regenerating
- Far from seed sources
- No commercial value

Planting intervention required

**BUT**

Low priority site, insufficient ODF budget, preventatively high site-prep and reforestation costs

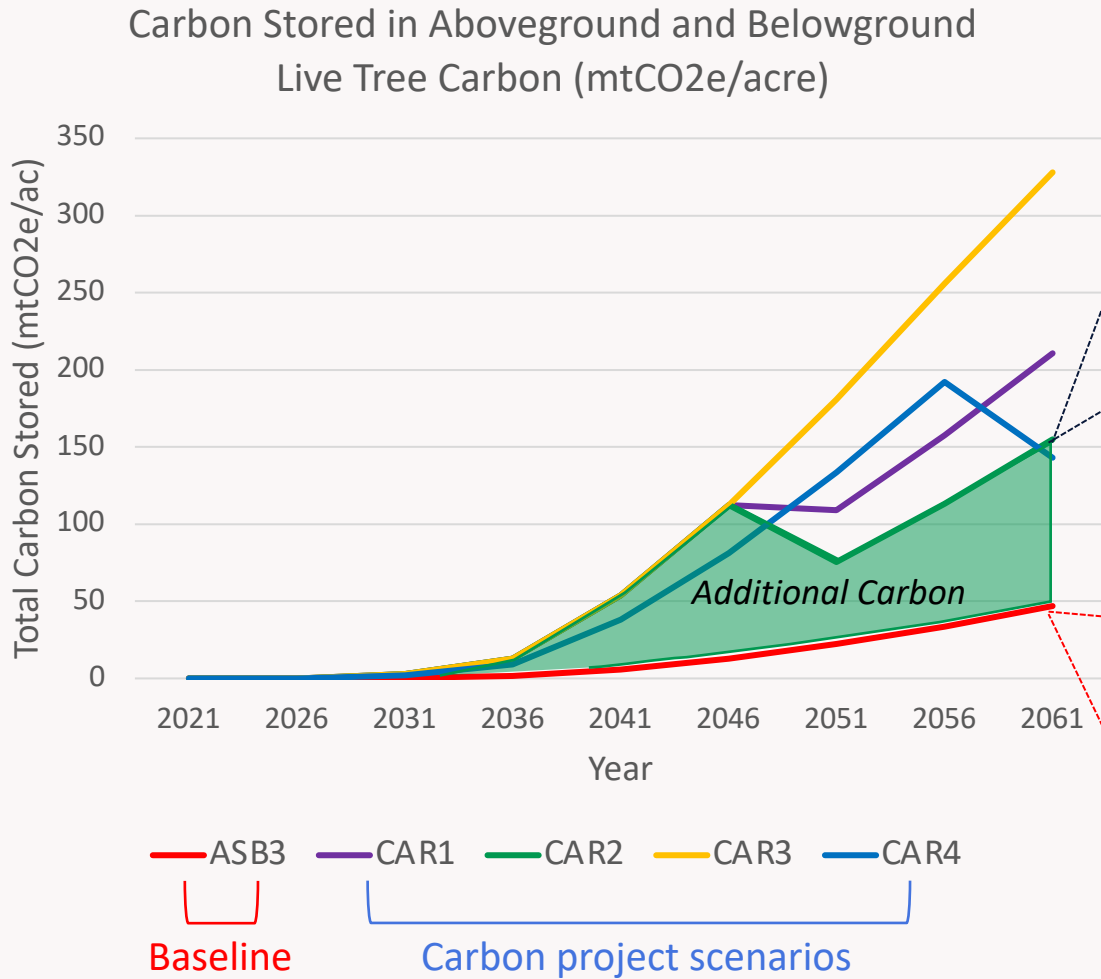


Desired Future Forest  
Carbon-dense and productive



Baseline Future Forest  
Understocked





Desired Future Forest  
Carbon-dense and productive



Baseline Future Forest  
Understocked

**CAR2, 'Complex structure':**  
 Plant 360 TPA in 2021, 80% survival  
 commercial thinning in 2046 (age 25)

*Additional Carbon: 123.4 mtCO<sub>2</sub>e/acre\**  
 Carbon revenue (\$15/credit): \$1,851/acre  
 Timber (BF/ac): 7,095/ac  
 Timber (net revenue): \$2,196/acre

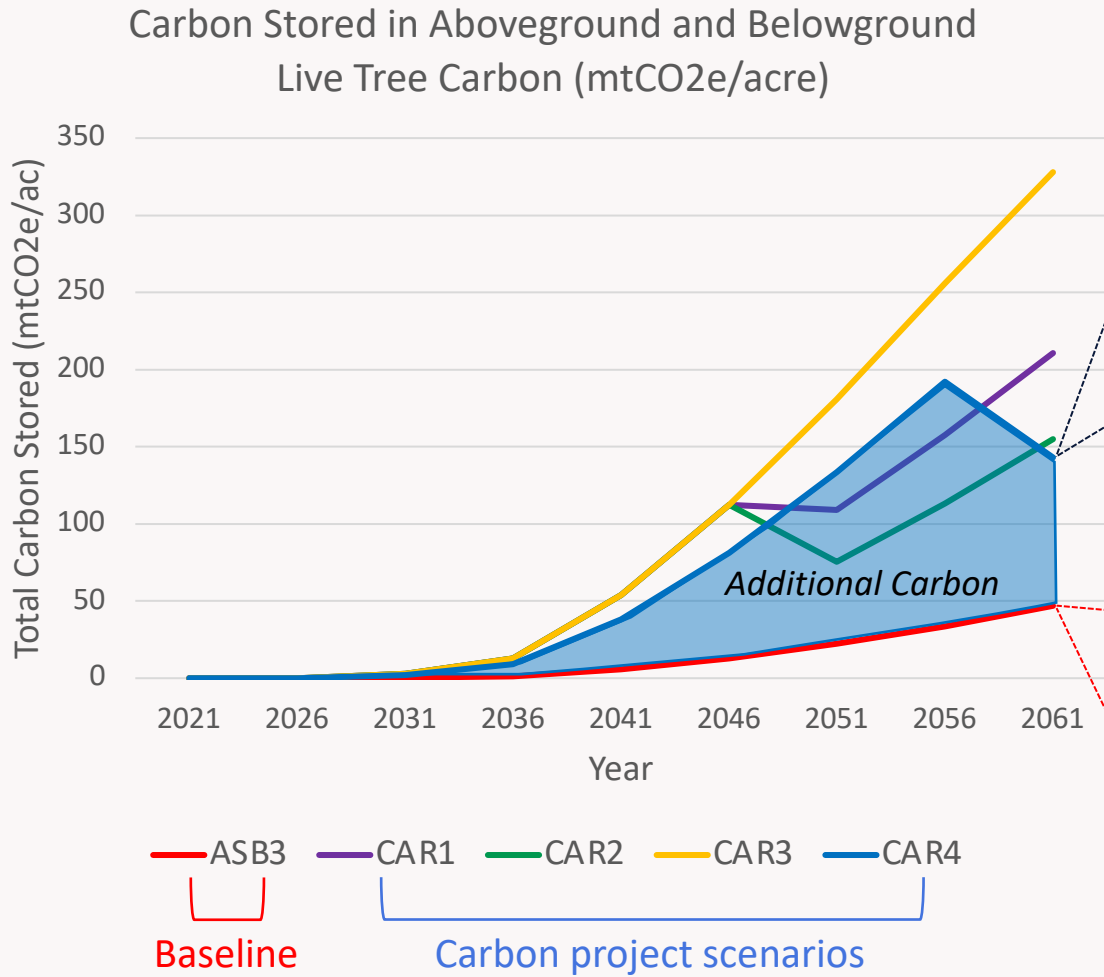
For 1,000-acre project:  
**Carbon revenue: \$1,851,000**  
**Timber revenue: \$2,196,000, 2/3 to county**  
**Total project revenue: \$4,047,000**

Cost to carbon buyer: \$1,851,000  
 Cost to ODF: \$0  
 Cost to Marion County: \$0

**ASB3, 'Baseline':**  
 Aerial seed 2,500 TPA in 2021, 1% survival

Total project revenue in 2061 is  
 \$0/acre; \$0 for 1,000 acres

\*HWP adds 8.67 mtCO<sub>2</sub>e/ac



Desired Future Forest  
Carbon-dense and productive



Baseline Future Forest  
Understocked

**CAR4, 'Lower-density Planting':**  
 Plant 250 TPA in 2021, 80% survival  
 commercial thinning in 2056 (age 35)

*Additional Carbon: 126.8 mtCO<sub>2</sub>e/acre\**  
 Carbon revenue (\$15/credit): \$1,902/acre  
 Timber (BF/ac): 10,097/ac  
 Timber (net revenue): \$3,058/acre

For 1,000-acre project:  
**Carbon revenue: \$1,902,000**  
**Timber revenue: \$3,058,000, 2/3 to county**  
**Total project revenue: \$4,903,000**

Cost to carbon buyer: \$1,902,000  
 Cost to ODF: \$0  
 Cost to Marion County: \$0

**ASB3, 'Baseline':**  
 Aerial seed 2,500 TPA in 2021, 1% survival

Total project revenue in 2061 is  
 \$0/acre; \$0 for 1,000 acres

\*HWP adds 10.31 mtCO<sub>2</sub>e/ac

# What does the carbon finance pay for?

## Initial expenses

- Site prep (\$500,000-\$750,000)
- Planning and Logistics (\$85,000)
- Seedlings (\$125,000-\$180,000)
- Labor (\$175,000)
- Registry fees (\$35,000)
- Insurance (\$350,000)

## Ongoing costs

- Monitoring & Reporting (\$1,500/yr)
- Project admin (\$1,500/yr)

## Verification costs

- Inventory (\$30,000)
- Verification (\$30,000)
- Registry fees (\$25,000)
- Admin (\$30,000)

Total project costs: \$1,155,000 to \$1,810,000

The entire project cost is baked into the price per carbon credit. Any carbon revenue in excess of the project costs will be split between Marion County (66%), ODF and American Forests

# Climate Adaptation

We are excited to promote long-term carbon and ecological resilience via our joint adaptation *and* mitigation approach

Santiam SF will achieve a climate-adapted forest by:

- Prioritizing diversity (age-, size-class diversity, spatial heterogeneity, species diversity)
- Restoring native species expected to be adapted to future conditions
- Using seeds from across a greater geographic range
- Reducing vegetation competition for moisture, nutrients, and light
- Mitigating fire risk with density management and fuel reduction treatments



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# Risk Mitigation Options

In addition to reducing risk via climate adaptation measures and conservative carbon accounting, we are exploring new avenues to ensure forward credit purchases result in permanent verified emission reductions.

## Option 1: AF-held credit Replenishment Pool

AF purchases over-the-counter credits (likely older nature-based vintages) into an AF-held Replenishment Pool. In the event of credit under-delivery at time of verification, credits from the Replenishment Pool would be transferred to the buyer. As projects mature, a portion of their credits would be placed into the Replenishment Pool.

American Forests is currently developing this idea with corporate partners and leading philanthropists.

## Option 2: Transition to traditional reforestation project

If trees fail to establish, the project likely has enough carbon-based revenue to cover the cost of replanting the site. Depending on the total revenue, the project may still have enough revenue to cover ongoing carbon project monitoring and eventual verification, but if not, it could transition to a more traditional reforestation project with unverified carbon using the funds that were initially intended for monitoring, verification, and registry fees etc.

This is a backup plan built into each forward financed project. Corporate partners are aware that the projects are experimental by nature.

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# Next Steps

## Registry Partnership

AF is currently drafting an MOU with leading registry to partner on forward financed units & methodology.

## Corporate Partnership

AF is hosting a corporate working group to begin January 2022 to line up buyers for projects including Santiam.

## ODF

AF is prepared to present to wider ODF audience, Board of Forestry, county councils, other stakeholders; will support ODF partners with whatever information is useful.

# Thank you!

Questions? Please reach out to learn more about Reforest America Carbon Program:

Ben Rushakoff, Senior Manager of Carbon Finance  
[brushakoff@americanforests.org](mailto:brushakoff@americanforests.org)





# Working FMP – HCP – NEPA Timeline

● BOF Presentation / Decision

