

**Bluesource – Blue Ridge
Escarpment
Improved Forest Management
Project**

May 16, 2022

ACR 590

Naturaland Trust

Developed by: Bluesource, LLC



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A. PROJECT OVERVIEW

A1. PROJECT TITLE

The project title is “Bluesource – Blue Ridge Escarpment Improved Forest Management Project.”

A2. PROJECT TYPE

This project is to be registered under the American Carbon Registry Standard¹ (ACR, July 2019) as an Improved Forest Management (IFM) project and an approved ACR Improved Forest Management Methodology.²

A3. PROOF OF PROJECT ELIGIBILITY

Eligibility for this Improved Forest Management project has been determined with reference to the ACR Standard Version 6.0 and the Improved Forest Management Methodology for Quantifying GHG Removals and Emission Reductions through Increased Forest Carbon Sequestration on Non-Federal U.S. Forestlands, Version 1.3.

The Bluesource – Blue Ridge Escarpment Improved Forest Management Project meets all relevant eligibility requirements as described in Table A3.1 below.

Table A3.1. Project Eligibility Requirements

Eligibility Requirements	Proof of Eligibility	Reference
Ownership Type	The project ownership is private non-federal U.S. forestland.	Section G1. Proof of Title
Project Proponent has third-party certification or no commercial timber harvesting	There are no ongoing commercial timber harvests, and therefore the project does not require certification.	Section A5.1. Background Information
Project area meets the definition of Forestland condition as per USFS FIA program definition	Per the ACR Standard 6.0 the project meets the definition of forestland through a minimum of 10% forest cover (or equivalent stocking) by live trees of any size.	Section A4. Location

¹ ACR. 2019. American Carbon Registry Standard, Version 6.0. American Carbon Registry, Arlington, VA, USA.

² ACR. 2018. Improved Forest Management Methodology for Quantifying GHG Removals and Emission Reductions through Increased Forest Carbon Sequestration on Non-Federal Forestlands, Version 1.3, April 2018, American Carbon Registry, Arlington, VA, USA.

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Project start date	The project start date of August 13, 2020 coincides with the signing of the Carbon Marketing & Development Agreement between the Naturaland Trust) and Bluesource, provided separately for verification purposes. This complies with Start Date requirements of the ACR Standard Version 6.0, that the project must have a validated/verified Start Date of January 1, 2000 or after.	Section H1. Start Date
Project term	The Project Proponent commits to maintain the carbon project scenario stocking levels on the project area at least for the required Project Term of 40 years.	Section H2. Project Timeline
Crediting Period	In compliance with ACR Standard Version 6.0 (July 2019) and the Improved Forest Management Methodology for Quantifying GHG Removals and Emission Reductions through Increased Forest Carbon Sequestration on Non-Federal U.S. Forestlands, Version 1.3, the crediting period for the project is 20 years.	Section H2. Project Timeline
Real	GHG removals are quantified based on inventory of the standing stock in the project area at the time of verification.	See also Section D. Monitoring Plan and Section E. Quantification
Land Title	For all areas included in the project, long term land titles have been issued and ownership is thus clear, unique, and uncontested.	See provided Deeds and Title documents, provided separately.
Direct Emissions/ Offset Title	GHG emission reductions generated by the project activity are generated from forest carbon sources and sinks over which Naturaland Trust has all management and ownership rights. Naturaland Trust holds offset title to all	Section G2. Chain of Custody

	lands in the project area (see Section G. Ownership and Title) and all rights to carbon credits/offsets produced through management of forests in the project area (attestation provided separately for verification purposes).	
Additionality	Additionality for the project has been shown through a regulatory surplus test, a common practice test, and an implementation barrier test.	Section C. Additionality
Permanent	The long-term setup, risk analysis, and buffer establishment assure permanence of the project benefits.	Section B8. Permanence
Net of Leakage	Possible leakage effects due to activity shifts are quantified and deducted from the GHG benefits.	Section E3. Leakage
Independently Validated and Verified	In accordance with ACR methodology, the project benefits will be verified by FRST Corp.	
Community and Environmental Impacts	Impacts on community and environment were analyzed in accordance with the ACR Standard Version 6.0, and net positive impacts were confirmed.	Section F. Community & Environmental Impacts

A4. LOCATION

A GIS shapefile of the project area, was provided separately for verification. This shapefile gives unique identification and delineation of the specific extent of the project. Figures on the following pages provide additional details.

- [Figure A-1.](#) Vicinity map that shows project location, including latitude/longitude coordinates.
- [Figure A-2.](#) Hydrological map that shows hydrology for the project area.
- [Figure A-3.](#) Canopy cover map that shows where project areas meet the US Forest Service definition of forestland (at least 10% tree cover). Non-forested acres were removed.
- [Figure A-4.](#) Topographical map of the project area.
- [Figure A-5.](#) Road map that shows both public and private roads near and on the project area. There are no major roads in the project area. Existing foot trails may be unmapped.
- [Figure A-6.](#) Ownership map that shows the parcel owned by The Naturaland Trust.

Figure A-1. Vicinity Map with Latitude and Longitude

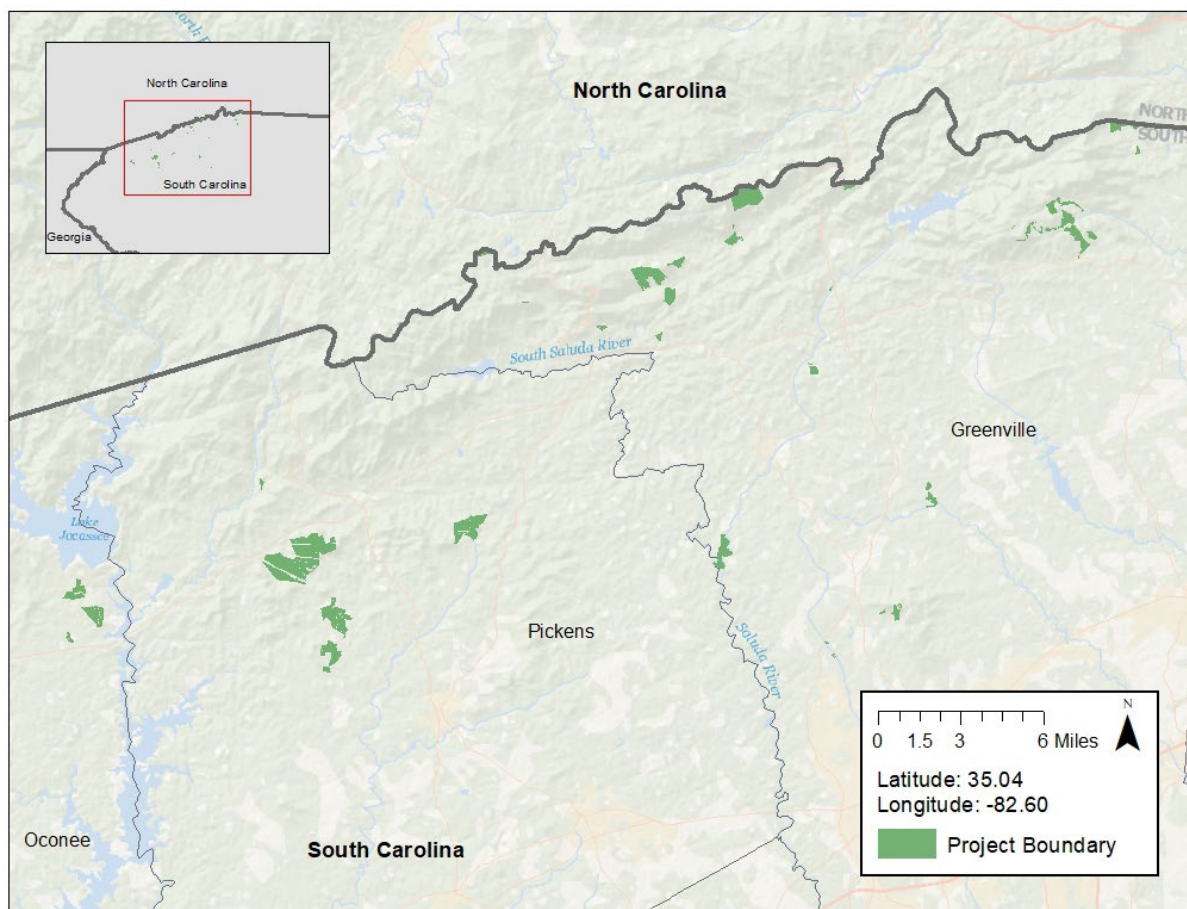


Figure A-2. Regional Hydrology Map

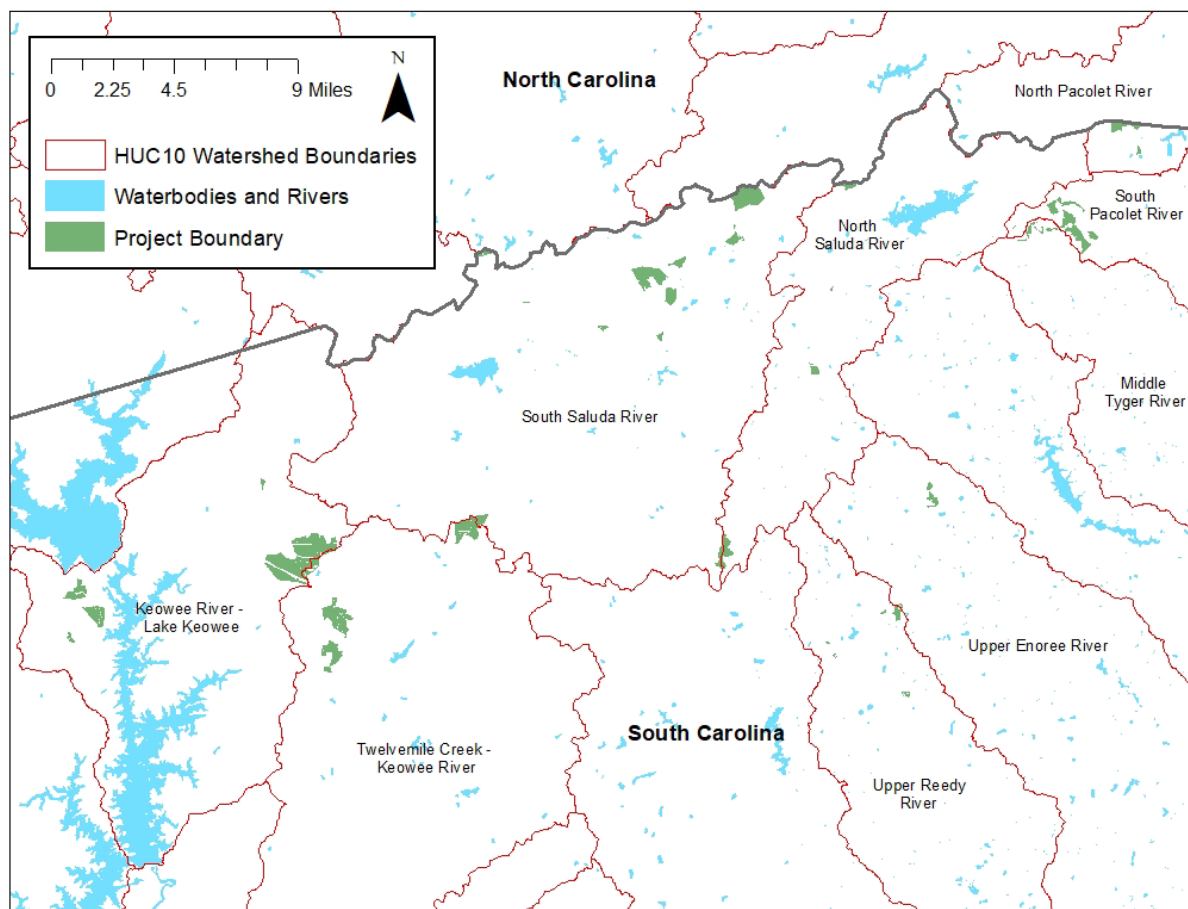


Figure A-3. Canopy Cover Map depicting greater than 10% canopy cover.

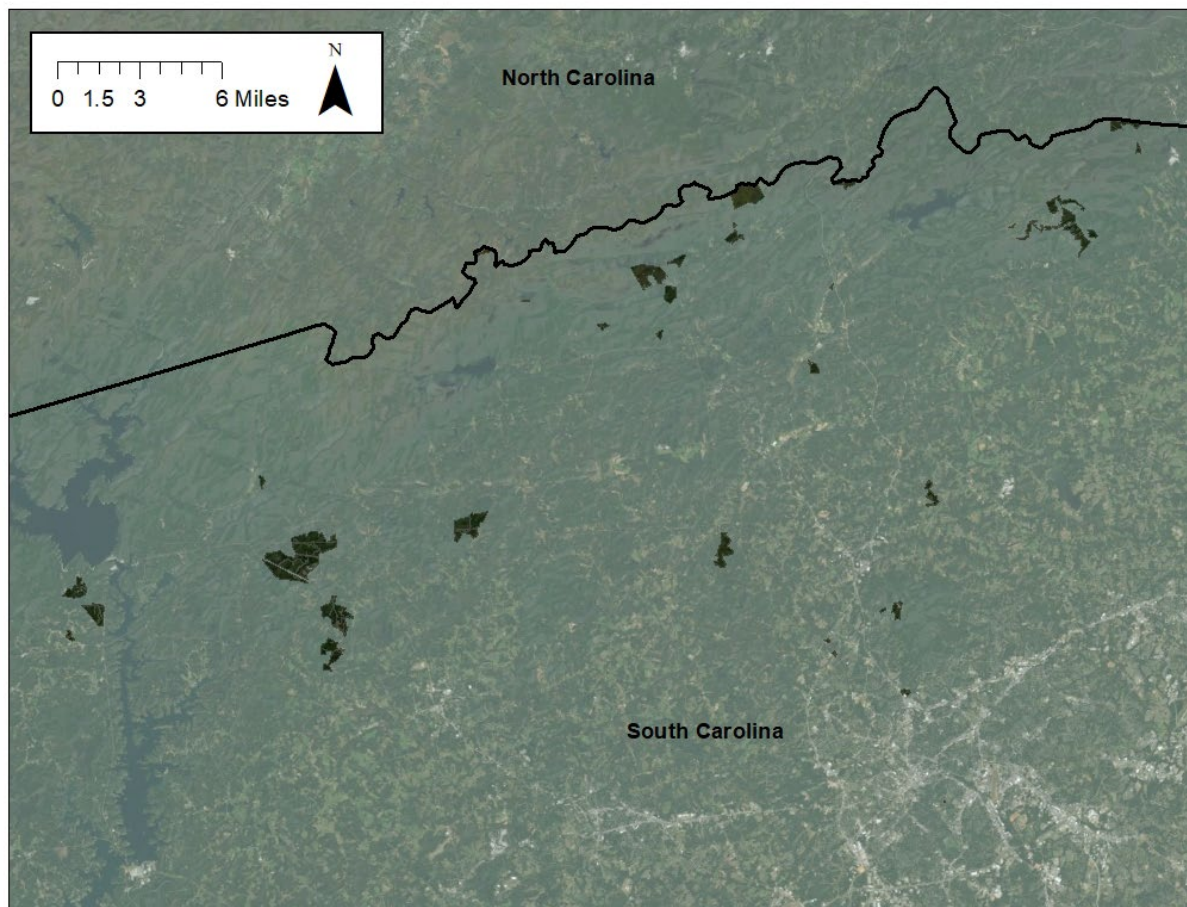


Figure A-4. Topography Map

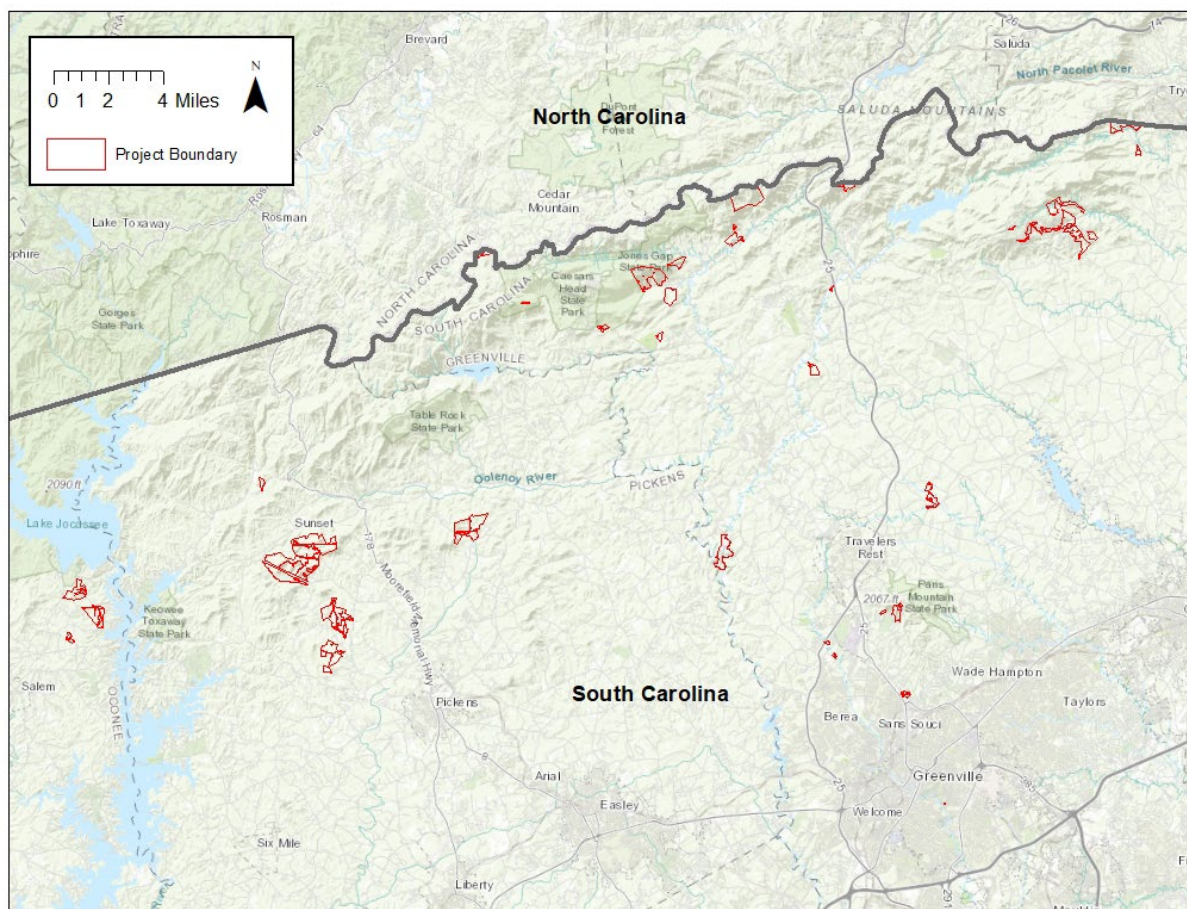


Figure A-5. Roads Map

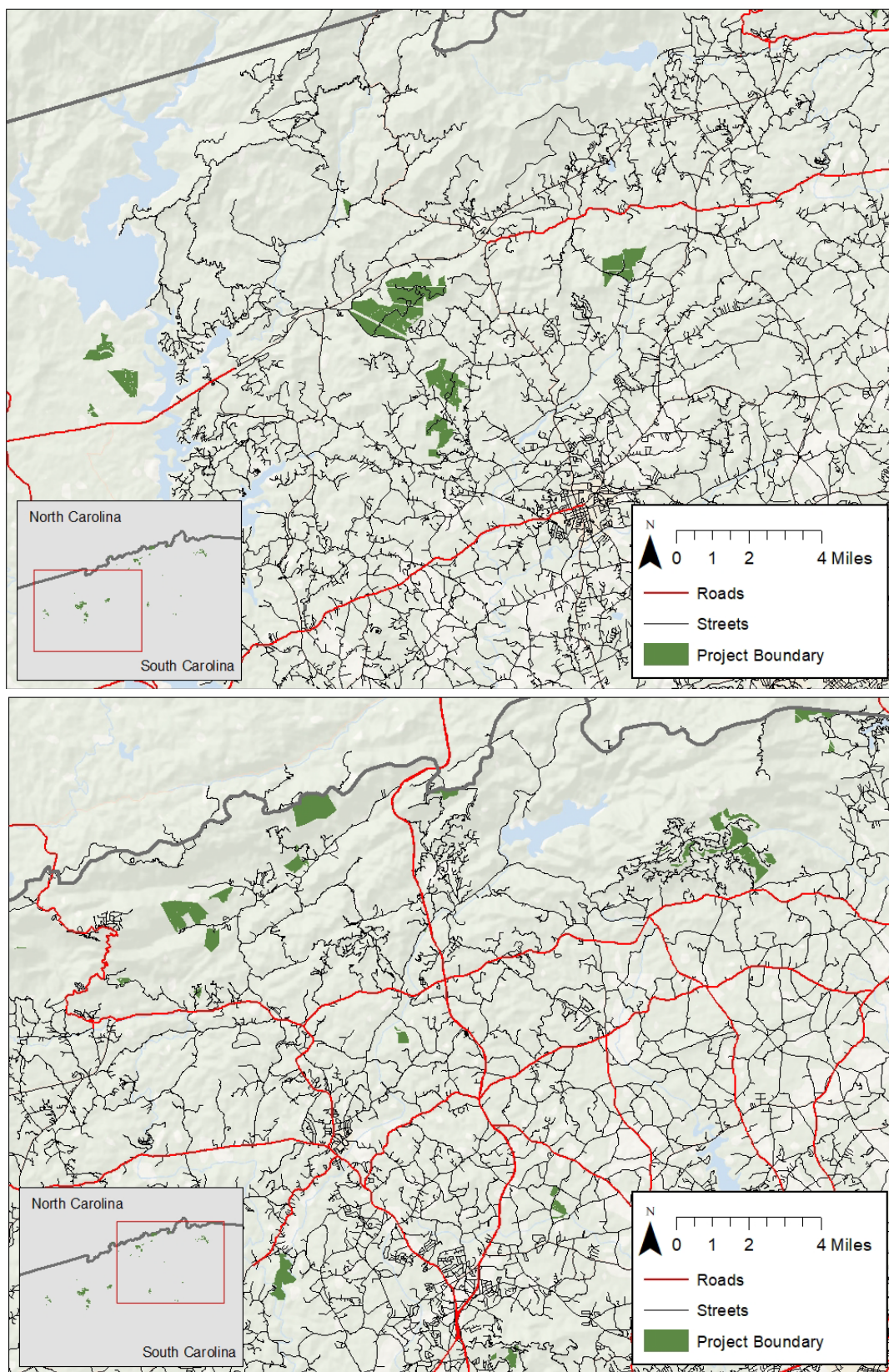
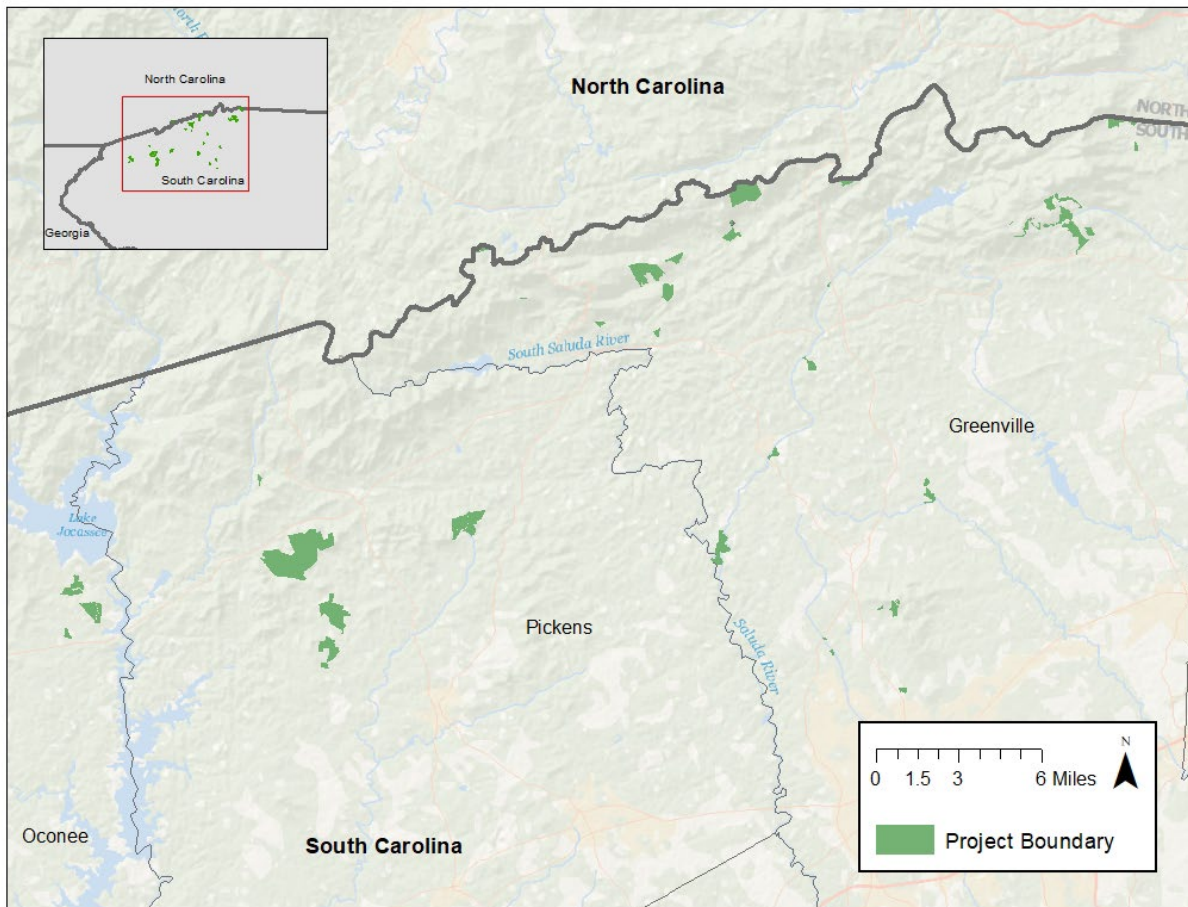


Figure A-6. Ownership Map



A5. BRIEF SUMMARY OF PROJECT

A5.1 Background Information

The Blue Ridge Escarpment Improved Forest Management Project is located on 5,794.8 acres of southern hardwood and pine forests in the Blue Ridge mountains of upstate South Carolina. The land was acquired over time to protect water resources, rare and endangered species, and provide recreational opportunities for the community. By committing to maintain forest CO₂ stocks above the regional baseline, the project will provide significant climate benefits through carbon sequestration. Blue Ridge Escarpment spans across Oconee, Pickens and Greenville counties. The Blue Ridge Escarpment project supports extraordinary and endangered species unique to the region, such as the iconic Oconee Bell (*Shorti galacifolia*).

A5.2 Description of Project Activity

The project activity is Improved Forest Management, with Naturaland Trust's forest management practices which represents a significant improvement in the carbon storage and conservation value compared to a

more typical management regime in the area. A typical management regime may be more aggressive and result in higher return management regimes, which are characterized by shorter, even-aged rotations. Management decisions of the forest focus on sustainable, natural forest growth and non-commercial forest maintenance for essential activities and forest health. The project ensures long-term sustainable management of the forests, which could otherwise undergo significant commercial timber harvesting.

A5.3 Project Purpose and Objectives

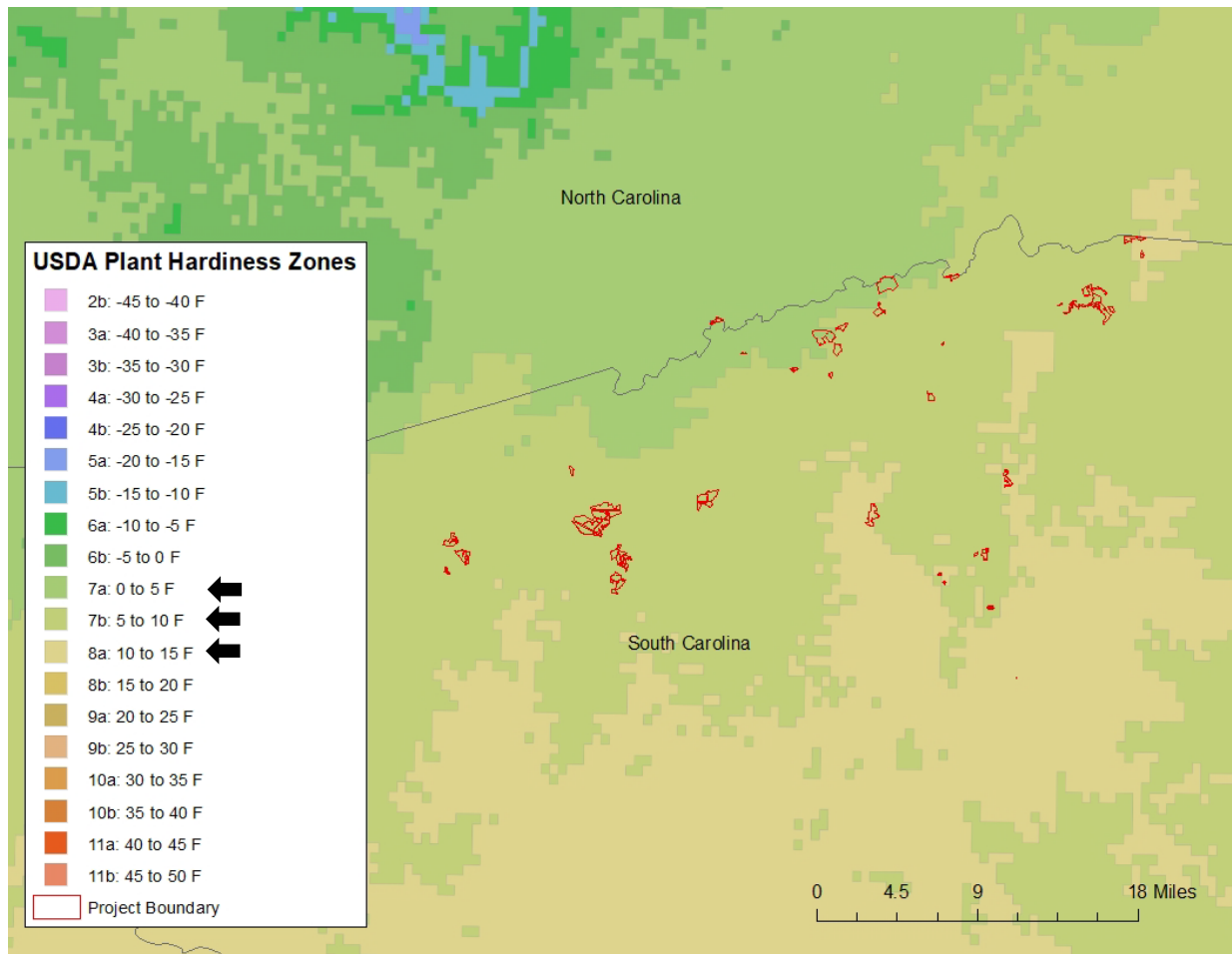
By committing to maintain forest CO₂ stocks above the regional baseline level, the project will provide significant climate benefits through carbon sequestration. The aim of this project is also to ensure long-term continuance of all environmental benefits provided by the conservation of this forestland.

A6. PROJECT ACTION

A6.1 Prior Physical Conditions

Climactic Zone

The project is located in upstate South Carolina, which falls within zones 7 and 8 on the USDA plant hardiness zone map. Average annual extreme minimum temperatures for zone 7 and 8 are 0 to 15 degrees Fahrenheit.



Ecosystem/Vegetation

The landscape surrounding Blue Ridge Escarpment contains large blocks of publicly owned mountainous forestland, as well as encroaching urban areas. The natural community types are southern hardwoods including White oak, Red Oak, Yellow Poplar and other mixed hardwoods. A small percentage of the volume is made up of a pine plantation, which was acquired for the purpose of conservation and restoration to a natural species composition.

Forest Pests and Diseases

The USDA Forest Insect and Disease Conditions in the United States 2018 Report indicates there are several pests and diseases in the project region. Damage from emerald ash borer and oak decline were both reported in Oconee county in 2017, but there have been no reports in Pickens or Greenville counties. Southern pine beetle damage has been documented in Oconee county in both 2017 and 2018, while previous but not recent damage has been reported in Pickens and Greenville counties. However, only 8% of forests within the project area lie within Oconee county. None of these major pests or diseases are currently reported as having a significant effect within the project area or within 30 miles of the project area.

Land Use

The current use is as a conservation and carbon sequestration forest. Naturaland Trust’s management style is focused on preservation and restoration, while promoting low-impact public recreation. This property will follow those principles. The project area is an amalgamation of properties acquired by Naturaland Trust over time, with varying historical land uses.

A6.2 Description of Project Technologies, Products, Services, and Expected Level of Activity

No commercial harvesting will take place during the first reporting period. Future harvesting may take place in the plantations to restore more natural forest composition and for forest health.

A6.3 Project Action

By committing to maintain forest CO₂ stocks above the baseline level, the project will provide significant climate benefits through carbon sequestration. The project action will allow the forest to progress naturally with harvesting only to improve forest health or to restore natural stands. Bluesource – Blue Ridge Escarpment Improved Forest Management Project will achieve GHG removals by sequestering more atmospheric CO₂ than a baseline scenario in live aboveground biomass, belowground biomass, and standing dead wood.

A7. EX-ANTE OFFSET PROJECTION

Total projected GHG removal is 504,896.6 mtCO₂e (without risk buffer deduction) over the first crediting period of 20 years (including GHG removal from long-term wood products). Table A7.1 lists the estimates of GHG emissions reductions per year:

Table A7-1. Estimated of Net ERTs by Year

Project Year	Calendar Year	Estimated GHG emission reductions t CO₂e
0	2020	0.00
1	2021	61,730
2	2022	53,093
3	2023	53,093
4	2024	53,093
5	2025	53,093
6	2026	27,590
7	2027	27,590
8	2028	50,681
9	2029	11,447
10	2030	11,447

Project Year	Calendar Year	Estimated GHG emission reductions t CO2e
11	2031	10,816
12	2032	10,816
13	2033	10,816
14	2034	10,816
15	2035	10,816
16	2036	10,180
17	2037	10,180
18	2038	10,180
19	2039	10,180
20	2040	10,180

A8. PARTIES

The project was implemented by Naturaland Trust, the landowner, and Bluesource, LLC, a carbon offsets project developer and technical modeler. Project verification was completed by SCS Global Services and the forest carbon inventory was conducted by Landmark Forestry, LLC.

Table A-3. Project Partners & Responsibilities

Project Parties	Personnel/Point of Contact	Roles and Responsibilities	Contact Information
Naturaland Trust	Mac Stone Executive Director Naturaland Trust	Project Proponent – financing and implementation of long-term project management, landowner, and title holder	Naturaland Trust PO Box 728 Greenville, SC 29602 Phone: 864-837-6079
Bluesource, LLC	Josh Strauss Vice President	Offset Developer – coordination of project implementation, modeling,	Bluesource LLC 2825 E. Cottonwood Parkway, Suite 400 Cottonwood Heights, UT 84121

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			Phone: 949-233-1501
SCS Global Services	Christie Pollet-Young, Director, GHG Verification	Verifier	SCS Global Services 2000 Powell Street Emeryville, CA 94608 Phone: 510-452-8000

B. METHODOLOGY

B1. APPROVED METHODOLOGY

The methodology used for the Bluesource - Blue Ridge Escarpment Forest Management Project is the American Carbon Registry Improved Forest Management Methodology for Quantifying GHG Removals and Emission Reductions through Increased Forest Carbon Sequestration on Non-Federal U.S. Forestlands, Version 1.3. (April 2018)

(hereinafter called the “methodology”)

B2. METHODOLOGY JUSTIFICATION

All applicability criteria of the selected methodology are fulfilled by the Bluesource – Blue Ridge Escarpment Improved Forest Management Project:

1. *This methodology is applicable only on non-federally owned forestland within the United States*

Blue Ridge Escarpment is non-federally owned private forestland.

2. *The methodology applies to lands that can be legally harvested by entities owning or controlling timber rights on forestland*

Naturaland Trust controls the timber rights on the forestland and can legally harvest (Appendix I2. Land Owner and Contracts).

3. *Private or non-governmental organization ownerships subject to commercial timber harvesting at the project Start Date in the with-project scenario must be certified by FSC, SFI, or ATFS or become certified within one year of the project Start Date. If there are no ongoing harvests at the project Start Date, but harvests occur later in the project life cycle, the project area must become certified before any commercial timber harvesting can occur*

There is no commercial timber harvesting occurring on or after the project Start Date.

4. *All Tribal lands in the United States, except those lands that are managed or administered by the Bureau of Indian Affairs, are eligible under this methodology, provided that they meet ACR requirements for Tribal lands*

N/A. Bluesource – Blue Ridge Escarpment Improved Forest Management Project is not on tribal lands.

5. *Public non-federal ownerships currently subject to commercial timber harvesting in the with-project scenario must:*
 - *be certified by FSC, SFI, or ATFS or become certified within one year of the project Start Date;*
or

- *have its forest management plan sanctioned by a unit of elected government officials within a state, or a state agency, or a federal agency*
 - *Please note that any such forest management plans must be updated at minimum every 10 years*
- *If there are no ongoing harvests on a public non-federal ownership at the project Start Date, but harvests occur later in the project life cycle, the project area must become certified by FSC, SFI, or ATFS, or develop a sanctioned management plan before any commercial timber harvesting can occur.*

N/A. Blue Ridge Escarpment Improved Forest Management Project is not on public non-federal lands.

6. *Use of non-native species is prohibited where adequately stocked native stands were converted for forestry or other land uses after 1997*

There is no use of non-native species where adequately stocked native stands were converted for forestry or other land uses after 1997.

7. *Draining or flooding of wetlands is prohibited*

There is no draining or flooding of wetlands on or after the project Start Date.

8. *Project Proponent must demonstrate its ownership or control of timber rights at the project start date*

See attached Deeds (Appendix A)

9. *The project must demonstrate an increase in on-site stocking levels above the baseline condition by the end of the Crediting Period*

Stocking levels increase well above the baseline conditions for the duration of the project and by the end of the Crediting Period (see [Section E1. Baseline](#)).

B3. PROJECT BOUNDARIES

The physical project boundaries include 5,794.8 acres of forestland, shown in the maps and in the shapefile provided separately for verification.

See [Section H2. Project Timeline](#) for the temporal boundaries of the project.

B4. IDENTIFICATION OF GHG SOURCES AND SINKS

Carbon pools	Included / Optional / Excluded	Justification / Explanation of Choice
Above-ground biomass carbon	Included	Major carbon pool subjected to the project activity.
Below-ground biomass carbon	Included	Major carbon pool subjected to the project activity.
Standing dead wood	Included/Optional	Major carbon pool in unmanaged stands subjected to the project activity. Project Proponents may also elect to include the pool in managed stands. Where included, the pool must be estimated in both the baseline and with project cases. For this project, standing dead wood will be included in all stands.
Lying dead wood	Optional	Project Proponents may elect to include the pool. Where included, the pool must be estimate in both the baseline and with project cases. For this project, lying dead wood will not be included.
Harvested wood products	Included	Major carbon pool subjected to the project activity.
Litter/Forest Floor	Excluded	Changes in the litter pool are considered <i>de minimis</i> as a result of project implementation.
Soil organic carbon	Excluded	Changes in the litter pool are considered <i>de minimis</i> as a result of project implementation.

Gas	Source	Included / Excluded	Justification / Explanation of choice
CO ₂	Burning of biomass	Excluded	However, carbon stock decreases due to burning are accounted as a carbon stock change.
CH ₄	Burning of biomass	Included	Non-CO ₂ gas emitted from biomass burning.
N ₂ O	Burning of biomass	Excluded	Potential emissions are negligible.

Leakage Source		Included / Optional / Excluded	Justification/ Explanation of Choice
Activity-Shifting	Timber Harvesting	Excluded	Project Proponent must demonstrate no activity-shifting leakage beyond the <i>de minimis</i> threshold will occur as a result of project implementation
	Crops	Excluded	Forestland eligible for this methodology do not produce agricultural crops that could cause activity shifting
	Livestock	Excluded	Grazing activities, if occurring in the baseline scenario, are assumed to continue at the same levels under the project scenario and thus there are no leakage impacts
Market Effects	Timber	Included	Reductions in project outputs due to project activity may be compensated by other entities in the marketplace. Those emissions must be included in the quantification of project benefits.

B5. BASELINE

The baseline scenario represents a relatively aggressive harvest regime, targeted to maximize net present value at a 4% discount rate (for NGO forestland) typical of practices in the project region. Derivation and justification for the baseline is detailed in [Section E. Quantification](#).

B6. PROJECT SCENARIO

The project scenario consists of managing the forestland for natural growth with no commercial harvesting, and only non-commercial pruning for forest health and wildlife habitat promotion, as described in [Section A6. Project Action](#).

B7. REDUCTIONS AND ENHANCED REMOVALS

The project will achieve greenhouse gas reductions through natural growth of forestland on lands that otherwise could be heavily cut in the baseline scenario. The existing carbon stocks will be preserved as there is no commercial harvesting and the stocks will increase as a result of the growth occurring in the absence of commercial harvesting.

B8. PERMANENCE

Project Proponents must conduct their risk assessment using the *ACR Tool for Risk Analysis and Buffer Determination*. All Project types must claim a value from risk categories A, B and C. Additional values that must be selected by project type include:

Forestry projects claim one value from each:

- D Conservation Easement (if applicable)

- E Fire
- F Disease/pest
- G Levee failure/water table changes (required only if forested wetlands comprise more than 60% of project area)
- H Other natural disaster risk scores.

1. Management and Governance Risks: All project types must select one value from each risk category that applies:

A Financial	<ul style="list-style-type: none"> 4% Default Value 3% US Public and Tribal Lands
B Project Management	<ul style="list-style-type: none"> 4% Default Value 3% US Public and Tribal Lands
C Social/Policy	<ul style="list-style-type: none"> 2% Default Value 5% if project is located outside of the US 3% if project is located outside of the US and demonstrates community engagements through ACR-approved mechanism
D Conservation Easement Deduction	<ul style="list-style-type: none"> -2% Default value -3% if there is regular onsite monitoring of activities related to carbon-specific conservation activities

2. Natural Disaster Risks: Select one value from each risk category that applies:

E Fire	<ul style="list-style-type: none"> 8% if project is located in an area where fire greater than 1000 acres has occurred within 30 mile radius of project area in prior 12 months 4% if project is located in high fire risk region 2% if project is located in low fire risk region (verifiable evidence must be provided) 1% for agriculture and grassland projects only
F Diseases and Pests	<ul style="list-style-type: none"> 8% if epidemic disease or infestation is present within project area, or within 30 mile radius of project area 4% Default Value
G Levee Failure and Water Table Changes	<ul style="list-style-type: none"> 2% Default for all wetland projects (and for forest projects where more than 60% of the project area is a forested wetland)
H Other Natural Disaster Events	<ul style="list-style-type: none"> 2% Default Value for all sequestration projects

Calculated Risk Score

Section 1 (A + B + C + D) + Section 2 (E + F + G + H) = Total Risk score %

Section 1 (4 + 4 + 2 + 0) + Section 2 (2 + 4 + 0 + 2) = 18%

Fire Risk (E) According to the Wildfire Hazard Potential (WHP) map, a publicly available map provided by the USFS.

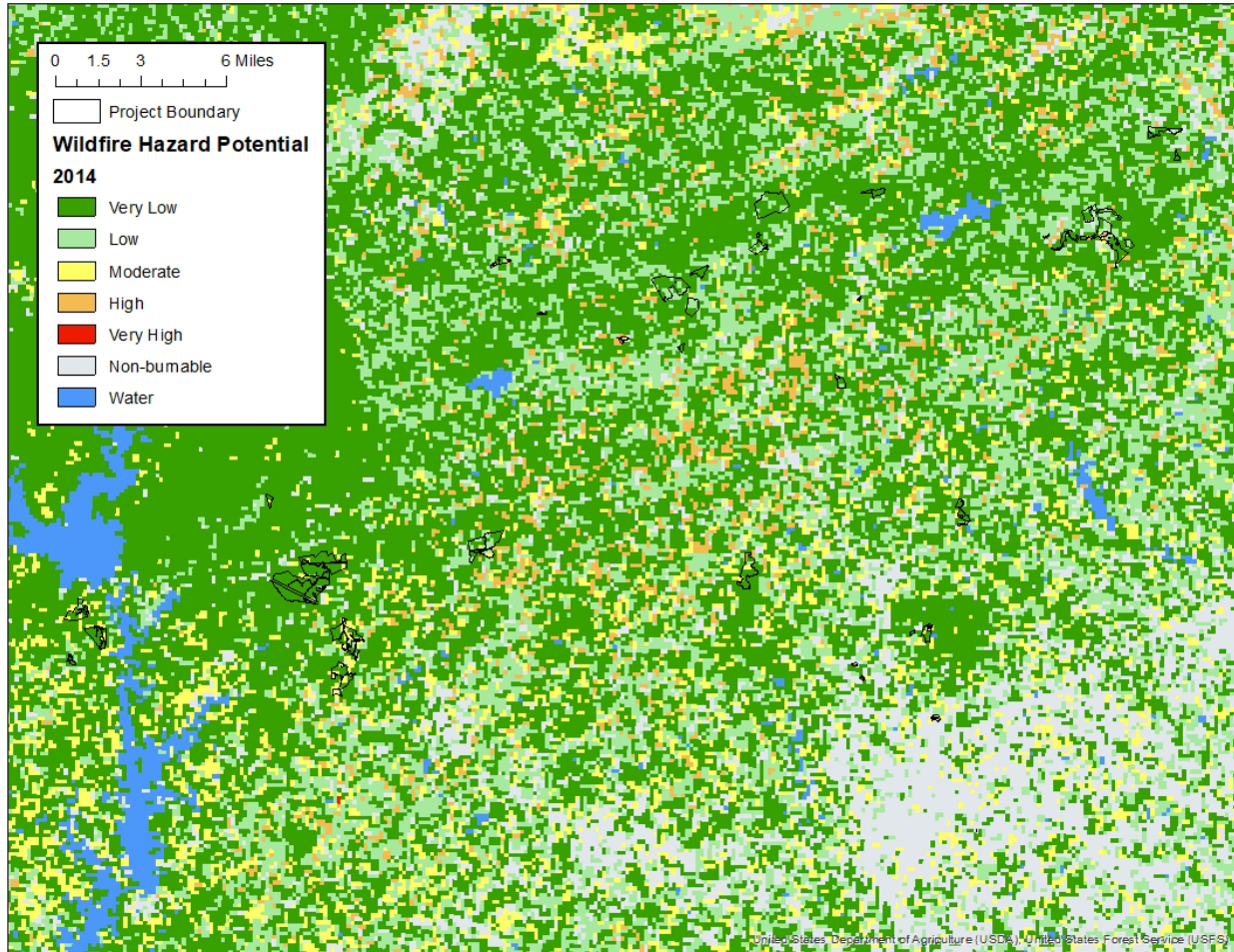


Figure B8. Wildfire risk map using Wildfire Hazard Potential, Version 2014 from USDA Forest Service

Pest and Disease Risk (F). Blue Ridge Escarpment hasn't experienced any epidemic diseases or infestations.

C. ADDITIONALITY

C1. REGULATORY SURPLUS TEST

Relevant laws, regulations, statutes, legal rulings, and other regulatory frameworks that affect the project activity:

National laws, regulations and policies.

- Clean Water Act
- Endangered Species Act
- Fair Labor Standards Act (1938) (amended)
- Multiple-Use Sustained-Yield Act of 1960
- National Environmental Policy Act (NEPA)
- National Forest Management Act (NFMA)
- Resources Planning Act (RPA)
- Wilderness Act
- The Logger’s Guide to the New OSHA Logging Safety Standards, 1995
- OSHA Federal Occupational Safety and Health Act

State & Local laws.

- South Carolina Code of Laws Section 50 Chapter 2: Forest Management Protection Act, 2000

Binding International Agreements.

- Kyoto Protocol, 1997 (signed, not ratified)
- United Nations Framework Convention on Climate Change, 1992
- United Nations Convention on Biological Diversity, 1992 (signed, not ratified)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973
- UNESCO World Heritage Convention, 1972

None of the above or any other existing law, regulation, statute, legal ruling, or other regulatory framework in effect as of the Start Date August 13, 2020 effectively requires the forest carbon project activity and its associated GHG emissions reductions/removal enhancements. Consequently, the project passes the Regulatory Surplus test.

C2. COMMON PRACTICE TEST

The geographic region includes upstate South Carolina. Wood products including sawtimber and pulpwood are distributed to mills throughout this region. Throughout the geographic region, private forestland is heavily cut and managed for maximizing NPV of the forest investment. If the Bluesource – Blue Ridge Escarpment Improved Forest Management Project was not implemented, the forest management could feasibly resemble that of any other private forestland ownership in the region. Instead, the project will exceed the common practice as described in [Section A6. Project Action](#).

C3. IMPLEMENTATION BARRIERS TEST

- *Financial*
- *Technological*
- *Institutional*

Implementation Barriers	Choose one of the following three:
Financial	Does the project face capital constraints that carbon revenues can potentially address; or is carbon funding reasonably expected to incentivize the project's implementation; or are carbon revenues a key element to maintaining the project action's ongoing economic viability after its implementation? Yes = Pass; No = Fail
Technological	Does the project face significant technological barriers such as R&D deployment risk, uncorrected market failures, lack of trained personnel and supporting infrastructure for technology implementation, or lack of knowledge on practice/activity, and are carbon market incentives a key element in overcoming these barriers? Yes = Pass; No = Fail
Institutional	Does this project face significant organizational, cultural, or social barriers to implementation, and are carbon market incentives a key element in overcoming these barriers? Yes = Pass; No = Fail
If the project passes the Regulatory Surplus and Common Practice tests, and at least one Implementation Barrier test, ACR considers the project additional.	

Carbon funding is reasonably expected to incentivize the project's implementation. The implementation of the carbon project represents an opportunity cost to lost revenue associated with the potential timber harvesting that could legally and feasibly occur on the property in the lifetime of the carbon project. A financial feasibility assessment is provided separately for verification demonstrating the financial barrier carbon funding overcomes in project implementation.

C4. PERFORMANCE STANDARD TEST

The Bluesource – Blue Ridge Escarpment Improved Forest Management Project uses the three-pronged approach; therefore, this step is not required.

D. MONITORING PLAN

D1. MONITORED DATA AND PARAMETERS

Data or Parameter Monitored	A ₁
Unit of Measurement	Acres
Description	Area of IFM Project
Data Source	GIS shape file derived from GPS coordinates
Measurement Methodology	Strata area figures adjusted based on stocking levels and species distribution projected in modeling and verified through inventory updates
Monitoring Frequency	Every 5 years, following with inventory update
Value applied:	5,794.8
Reporting Procedure	Handheld GPS unit, GIS software
QA/QC Procedure	Meta data is kept current and uncorrupted
Purpose of Data	Calculation of project emissions
Calculation method:	Calculated in ArcGIS
Notes	

Data or Parameter Monitored	T
Unit of Measurement	Year
Description	Number of years between monitoring time t and t ₁ ($T = t_2 - t_1$)
Data Source	Monitoring reports
Measurement Methodology	

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Monitoring Frequency	Yearly
Value applied:	Calendar
Reporting Procedure	
QA/QC Procedure	All calculations double checked for accuracy prior to submission for verification
Purpose of Data	Calculation of project emissions
Calculation method:	Subtraction
Notes	

Data or Parameter Monitored	Diameter at breast height of tree
Unit of Measurement	Inches (to 1/10 th inch)
Description	Tree diameter measure 4.5 feet above ground
Data Source	Field measurement
Measurement Methodology	Measured with loggers tape or calipers
Monitoring Frequency	Every 5 years after the first inventory
Value applied:	
Reporting Procedure	Handheld GPS unit or cruise tally sheet
QA/QC Procedure	Equipment will be maintained in excellent condition. Breast height marked with permanent paint on all record trees > 5" diameter
Purpose of Data	Calculations of project emissions
Calculation method:	N/A
Notes	

Data or Parameter Monitored	H
Unit of Measurement	Feet

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Description	Total height of tree and phantom height for broken tops
Data Source	Field measurement
Measurement Methodology	Measured with clinometer or hypsometer
Monitoring Frequency	Every 5 years after the first inventory
Value applied:	
Reporting Procedure	Handheld GPS unit or cruise tally sheet
QA/QC Procedure	Equipment will be maintained in excellent condition. All heights will be double checked for reasonableness prior to submission for verification.
Purpose of Data	Calculations of project emissions
Calculation method:	N/A
Notes	

Data or Parameter Monitored	Decay Class
Unit of Measurement	
Description	Qualitative degree of decomposition
Data Source	Forest Inventory
Measurement Methodology	Qualitative assessment of dead tree into 1 of 4 decay classes based on class descriptions
Data Uncertainty	None
Monitoring Frequency	Every 5 years after the first inventory
Value applied:	
Reporting Procedure	Handheld GPS unit or cruise tally sheet
QA/QC Procedure	Equipment will be maintained in excellent condition. All decay classes will be double checked

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	for reasonableness prior to submission for verification
Purpose of Data	
Calculation method:	
Notes	

Data or Parameter Monitored	Tree Live/Dead Status
Unit of Measurement	
Description	Live or Dead
Data Source	Forest Inventory
Measurement Methodology	Measured per the Blue Ridge Escarpment Carbon Plot Methodology
Data Uncertainty	None
Monitoring Frequency	Every 5 years after the first inventory
Value applied:	
Reporting Procedure	Handheld GPS unit or cruise tally sheet
QA/QC Procedure	Equipment will be maintained in excellent condition. All tree statuses will be double checked for reasonableness prior to submission for verification
Purpose of Data	
Calculation method:	
Notes	

Data or Parameter Monitored	Defect
Unit of Measurement	%

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Description	Qualitative percent of missing biomass
Data Source	Forest Inventory
Measurement Methodology	Tree defect is qualitatively assessed for missing biomass in the bole from 1 ft stump to total height. The exception is for broken tops below 4" DOB when the percent biomass missing is calculated from 1 ft stump to broken top. Top height and phantom height are measured and missing biomass in the broken portion is calculated post-inventory.
Data Uncertainty	None
Monitoring Frequency	Every 5 years after the first inventory
Value applied:	Tree-specific
Reporting Procedure	Handheld GPS unit or cruise tally sheet
QA/QC Procedure	Equipment will be maintained in excellent condition. All tree defects will be double checked for reasonableness prior to submission for verification.
Purpose of Data	
Calculation method:	
Notes	

Data or Parameter Monitored	Species Composition
Unit of Measurement	%
Description	Spp. composition as a percentage of basal area
Data Source	Forest Inventory
Measurement Methodology	Derived from basal area calculations from inventory data.
Data Uncertainty	None

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Monitoring Frequency	Every 5 years after the first inventory
Value applied:	
Reporting Procedure	
QA/QC Procedure	Species identification is confirmed at verification.
Purpose of Data	Calculation of project emissions
Calculation method:	Basal Area = $0.005454 * DBH^2$
Notes	

Data or Parameter Monitored	Harvested Wood Products
Unit of Measurement	Metric tons CO ₂
Description	Carbon remaining in stored wood products 40 years after harvest for the project in year t.
Data Source	Project Proponent
Measurement Methodology	Pre-harvest cruise reports and volume estimates, scale slips or mill slips, as available
Data Uncertainty	None
Monitoring Frequency	Annual data summed for the monitoring period, applied as average annual for the monitoring period
Value applied:	
Reporting Procedure	Self-reported by Project Proponent and incorporated into annual calculations by Bluesource
QA/QC Procedure	Harvested areas are visited to assess affected plots for removed trees. Aerial imagery review and subsequent site visits will confirm harvested areas conform to those written in harvest plans.
Purpose of Data	Calculation of project emissions
Calculation method:	Described in Section E
Notes	

Data or Parameter Monitored	Forest Carbon
Unit of Measurement	Metric tons of CO ₂
Description	Carbon stores in above and below ground live trees at the beginning of the year t
Data Source	Forest Inventory
Measurement Methodology	Consistent with 'Blueridge_CarbonPlot_Methodology.pdf'
Data Uncertainty	To be calculated as the mean +/- 90% confidence interval
Monitoring Frequency	Every 5 years or less, or at request for ERT issuance
Value applied:	
Reporting Procedure	
QA/QC Procedure	Consistent with 'Blueridge_CarbonPlot_Methodology.pdf' - The inventory will use a random sample design and re-measure the same permanent plots, which targeted a precision level of +/- 10% of the mean live tree biomass with 90% confidence.
Purpose of Data	
Calculation method:	
Notes	

D2. MONITORING PLAN

Each year, the Project Proponent shall submit a signed Attestation that:

- Confirms the continuance of project activities;
- Confirms that ownership remains clear and uncontested;
- Discloses any negative environmental or community impacts or claims of negative environmental and community impacts, and documents plans to mitigate any reported negative environmental or community impacts;

- Addresses any significant change in external conditions that would affect the quality or environmental integrity of the project.

The following material outlines the monitoring plan to be followed during the decade following the initial project validation and verification.

General Monitoring Method

In the year prior to validation/initial verification, a representative sample of 145 fixed radius permanent inventory plots were established across the project area. All permanent plots will be re-inventoried at least twice over the following decade to calibrate forest growth models and improve carbon sequestration projections.

The heavily monumented and well-maintained plot design gives forest managers the opportunity to consistently track the growth and development of specific trees over an extended timeline and allows for improved ease of plot location during field work and site verifications. All plots will be re-measured in a manner consistent with the Inventory Methodology, provided separately for verification.³

In addition to the full inventory update of the entire property that will be conducted on all plots every 5 years, inventories of select portions of the Project Area will be updated periodically in response to natural disturbance or significant forest management activities. Following natural disturbance events, affected project stands will be assessed for damage. If damage is significant, the affected areas will be re-inventoried and project scenario models will be adjusted to reflect onsite carbon stocks.

In years in which forest plots are not re-inventoried carbon stocks will be monitored through forest growth and yield modeling.

In addition to inventory sampling, management staff will consistently monitor the general health and condition of the forest throughout the course of normal forest management activities (e.g., road maintenance, ecological studies, boundary marking), reducing the risk of reversal by disease, pest invasion, and unauthorized timber removal.

Bluesource LLC (“Bluesource”) will oversee the execution and reporting of all project reporting, modeling, and monitoring activities on behalf of the landowner. The landowner will be responsible for “on the ground” forest management activities on the project area, and a contractor will conduct inventory measurements and data collection. After forest inventory data collection, the forestry contractor will report results to Bluesource for processing and updating of modeling projections. After processing is complete Bluesource will house all data and submit the necessary documentation for compliance with ACR standards. Bluesource will ultimately store project data for at least ten years after the conclusion of the project.

³ The details of the carbon inventory methodology are considered commercially sensitive material as the methodology is the result of considerable investment of Blue Source LLC’s resources.

Data Processing and Storage

Manually and electronically filed data are stored and archived. Backup copies of all electronically stored data are maintained in a separate data center with scheduled archiving to assure data protection. Future revisions to project documents after initial verification and registration will be clearly identified by saving them as separate files and including the date of revision in any modified documents. All data will be stored on Dropbox or similar online cloud storage service and kept by Bluesource for a minimum of 10 years.

QA/QC Field Procedures

Field Procedures

At the end of each field day, individual foresters email their plots from the data recorders to the senior forester. The senior forester then looks for irregularities in the data and asks the field crew to confirm the data or remeasure any plots that cannot be reconciled. The senior forester then adds all the data to a master spread sheet.

At least 5% of the plots are checked by a different forester than cruised the plot, specifically by someone senior to the field crew. This involves full plot measurement to identify any problems with determining in/out trees, species calls, defect measurements, DBH measurements, and height measurements. Any errors noted during the check cruise are used to update the master spread sheet file. Any consistent height, species, DBH, or defect errors are resolved by talking with the foresters and removing crew members as needed.

Desk Procedures

The following QA/QC approach was designed to ensure that field data, once inputted, was appropriately managed and maintained, and that subsequent calculations using that data to determine onsite carbon stocks and associated ARBOC issuance were correctly implemented.

A three-stage QA/QC process with a defined review group for the project was established, engaging both personnel intimately familiar with all project files and documentation, as well as independent reviewers who are able to bring “fresh eyes” to key outputs.

Independent Forester Review: Initial data checks are conducted prior to modeling as a part of the Bluesource QA/QC process. Once the inventory data is sent to Bluesource by the contracted inventory crew, Bluesource runs a series of data checks to look for abnormalities in the data including outlier searches for height/DBH/species, histograms looking for normal or expected distributions of data, and null or missing data entries. Additional data checks include looking for duplicate information within plots, and duplicate information across plots. Information searches include both text, values, and total carbon stocks per plots. Any missing plot data found during these checks results in Bluesource requesting clarification or additional field measurements from the inventory contractor.

The project implementation team (Bluesource) has a team of foresters with intimate knowledge of the files, models and documents. The development of quantitative components, such as Access databases, FVS model runs and Excel workbooks, are led by one of these foresters. Prior to model finalization, a second forester who did not lead development of that component is tasked with a QA/QC review including random examinations and data checks to identify and fix any errors.

Technical Review: Once quantitative outputs are finalized, exported from Access/FVS to Excel, and are ready to be transferred into the Greenhouse Gas (GHG) Plan and other project documents, an independent manager reviews these outputs. This individual performs data checks by tracing key outputs back from final ARBOC calculations through the chain of Excel documents to the underlying Access/FVS database.

Senior Management Review: Once outputs have been transferred from Excel to the GHG Plan and other project documents, a senior manager reviews these documents and checks that all quantitative elements have been correctly exported from the underlying workbook. At this stage, the senior manager (or other individual not involved in document preparation) also reviews text, grammar and formatting for presentation and accuracy.

E. QUANTIFICATION

E1. BASELINE

Inventory development overview

The carbon inventory of the project area was conducted from 2021-04-12 - 2021-04-16. The inventory employed a sample of 145 nested, fixed-radius circular plots installed in a random distribution across the project area. The nested plots consist of a 1/15th acre plot recording trees $\geq 5''$ and a 1/200th acre plot recording trees $\geq 1''$ and $< 5''$ DBH. The entire project area (5,794.8 acres) was assigned to 2 strata, as shown in Table E1-1. See the Baseline Stratification section below for details.

Table E1-1. Area by Strata

Strata	Project Area (acres)	Constrained Area (acres)	Number of Plots
H	5,093.98	179.48	130
S	700.85	41.55	15
Total	5,794.84	221.03	145

*Sums may not total due to rounding

Growth model overview

Field measurement protocols are documented separately in a field methodology.

The ACR protocol requires Improved Forest Management (IFM) projects to establish a baseline harvest scenario against which to measure carbon accumulation attributable to the project. The ACR protocol defines this baseline as the mix of silvicultural practices that maximizes the net present value (NPV) of timber revenues over the 100-yr project lifespan. We used the Forest Vegetation Simulator (FVS), an empirical forest growth and yield model developed by the US Forest Service (USFS), to project carbon stocks and timber revenues under the range of harvest scenarios considered in the baseline. We selected the FVS-SN variant of the FVS growth and yield model, which encompasses South Carolina, with model equations for each plot regionally calibrated to the US National Forest located nearest to the Blue Ridge Escarpment project, as shown in Table E1-2.

Table E1-2. Plot Location for FVS Calibration

Nearest National Forest Region	FVS Location Code	Number of Plots
Sumter National Forest - Enoree District	81201	8
Sumter National Forest - Andrew Pickens District	81202	137

We used the regionally calibrated FVS to ‘degrow’ the inventory from the plot-specific inventory date to the project start date (August 13, 2020), because the plots were inventoried after the project start date. We first initialized FVS with the original inventory measured on the plot’s inventory date and projected the model forward with no harvest in order to estimate tree-level annual growth rates. We ran a single 5-year FVS projection cycle, the default cycle length for the SN FVS variant. We then computed height and diameter growth for each tree over this 5-year interval and divided by 5 to estimate annual growth. Using a monthly growth schedule derived in consultation with a local forester, we determined the fraction of annual growth that had occurred between the project start date and the inventory date and multiplied annual growth for each tree by this fraction. Finally, we subtracted this estimated height and diameter growth for each tree from the observations recorded in the original inventory. We used this growth-adjusted inventory to determine CO₂e stocks on the project start date (August 13, 2020). We similarly estimated CO₂e stocks on the project reporting period end date (August 12, 2021) by ‘growing’ the inventory from the plot-specific inventory date to the Reporting Period Date. We added estimated height and diameter growth according to the months that had elapsed between the inventory and the project reporting period end date.

Total aboveground biomass carbon was estimated from inventory data applying species group-specific allometric equations sourced from Jenkins et al 2003⁴. Root biomass was then estimated from total aboveground biomass using component ratios from Jenkins et al 2003, to produce total live tree biomass. Total live tree biomass was converted from pounds to metric tons, multiplied by 0.5 to estimate carbon fraction, then multiplied by 3.664 to calculate t CO₂e.

Carbon in standing dead wood was estimated in the same way as live trees, with deductions for decay class recorded in the field. Decay classes were recorded according to the ACR standard using the methodology-defined Decay Class (Table E1-3).

Table E1-3. ACR decay classes (applied to dead trees)

Decay Class	Decay Factor	Description
1	0.97	Tree with branches and twigs that resembles a live tree (except for leaves)
2	0.95	Tree with no twigs but with persistent small and large branches
3	0.90	Tree with large branches only
4	0.80	Bole only, no branches

Growth and Yield Simulation

The FVS model requires an individual species code and site index for each forest plot simulated. The site index is a location-specific measure of forest productivity. These estimates were calculated using tree cores. One dominant or co-dominant tree with a DBH of less than 30 inches within the overstory plot was selected as a site index tree for each plot. Site Index was calculated from tree cores taken in the field and processed by Rocky Mountain Tree Ring Research. The available outputs following processing tree cores included tree species, DBH, Height, Pith Date (calendar year), DBH Age (years). From these outputs, Site

⁴ Jenkins, J.C., Chojnacky, D.C., Heath, L.S. and R.A. Birdsey. 2003. National-scale biomass estimators for United States tree species. *Forest Science* 49:12-35

Index was calculated using species-specific site index curves ⁵. If a plot had no species that were cored, we assigned the plot the average site index of the tree species in the species list with the highest basal area in the entire project area.

The FVS “NoTriple” command was entered to avoid excessive tree records and speed processing.

Initial carbon stock estimates for the project start date were back-modeled via FVS-SN with the approach outlined below.

- Inventory Start Date -End Date data were entered into FVS-SN and grown for 10 years with no management (with “NoTriple” keyworded to track individual trees and permit cross-referencing to raw inventory dataset).
- For each live tree (ascribed a unique identifier), annual diameter growth was derived assuming linear growth during the 10-year projection interval (i.e., for DBH, annual growth calculated as DBH at end of 10-year interval *minus* DBH at beginning of 10-year interval, reported in the FVS Treelist output, *divided by* 10).
- For each live tree, diameter data from the Inventory Start Date - End Date inventory were degrown referencing the annual rates derived in step 2 above, subtracting one-year annual growth (i.e. one growing season) from the Inventory Start Date - End Date measurement value.
- Initial carbon stocks were recalculated using the degrown data. No harvests or significant disturbances took place during the intervening period. Diameter of standing dead trees were assumed to be constant through the period.
- The baseline scenarios were subsequently modeled entering the degrown inventory data into FVS-SN.

Table E1-4. De-grown results for live aboveground and belowground tree biomass

Strata	Avg Live CO2e	Std Dev Live CO2e	Number of Plots	Acres	Acres %	Std Error	Total Live CO2e	Uncertainty %
H	164.79	90.18	130	5,093.98	87.91	7.91	839,439.55	7.90
S	116.78	50.44	15	700.85	12.09	13.02	81,843.03	18.35
Total	158.98	0.00	145	5,794.84	100.00	0.00	921,282.58	7.38

Table E1-5. De-grown results for dead aboveground and belowground tree biomass

Strata	Avg Dead CO2e	Std Dev Dead CO2e	Number of Plots	Acres	Acres %	Std Error	Total Dead CO2e	Uncertainty %
H	3.13	8.09	130	5,093.98	87.91	0.71	15,936.47	37.29
S	0.48	1.29	15	700.85	12.09	0.33	336.08	113.91

⁵ Carmean, W. H., Hahn, J. T., & Jacobs, R. D. (1989). Site index curves for forest tree species in the eastern United States. General Technical Report NC-128. St. Paul, MN: US Dept. of Agriculture, Forest Service, North Central Forest Experiment Station, 128.

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Strata	Avg Dead CO2e	Std Dev Dead CO2e	Number of Plots	Acres	Acres %	Std Error	Total Dead CO2e	Uncertainty %
Total	2.81	-	145	5,794.84	100.00	-	16,272.55	36.59

Table E1-6. De-grown results for total tree biomass

Strata	Avg Total CO2e	Std Dev Total CO2e	Number of Plots	Acres	Acres %	Std Error	Total Total CO2e	Uncertainty %
H	167.92	90.41	130	5,093.98	87.91	7.93	855,376.02	7.77
S	117.26	50.97	15	700.85	12.09	13.16	82,179.11	18.46
Total	161.79	-	145	5,794.84	100.00	N/A	937,555.13	7.27

Baseline Stratification

Project is stratified into two forest types, mainly: Hardwoods and Softwoods.

Baseline Harvest Schedule Scenario Overview

The Baseline Scenario represents an aggressive harvest regime designed to maximize the annual cashflows from a 100-year Net Present Value (NPV) at a 4% discount rate, subject to operational considerations in the region. Only volume from merchantable species count toward costs and revenue for regeneration harvest i.e., hardwood species are not included). The area selection for each prescription by plot was determined using a linear programming model (*lpSolve* package), which found the combination of prescriptions that maximizes the NPV over 100 years. There are 4 silvicultural prescriptions in the linear programming model, shown in Table E1-7.

Table E1-7. Silvicultural prescriptions used for the baseline harvest schedule

Prescription	Prescription Description
GROW	Grow stand through end of baseline projection, with no silvicultural treatment. Allow existing stocks to grow 100 years. This prescription applies to all constrained acres (i.e., RMZ areas).
SHW60 (Shelterwood)	Residual basal area for shelterwood=60 square feet; Overstory removal occurs 5 years after shelterwood cut: Retain trees that are less than 5 inches DBH: Natural sprouting and regeneration; Stand basal area > 100 square feet per acre; Merchantable timber > 25 tons per acre; subsequent removal of trees > 100 square feet per acre; Constrained to occur every 60 years .
STS50BA10 (Single Tree Selection)	Harvest to basal area of 50 square feet; Q-factor = 1.4; Subsequent removal of all trees > 40 inches DBH; Natural sprouting and regeneration; Stand basal area> 100 square feet; Constrained to occur at most every 10 years; Merchantable timber > 25 tons per acre. This prescription applies to all constrained acres (i.e., RMZ areas).
CC (clearcut)	Residual basal area for clearcut=0; No residual overstory trees; Natural sprouting and regeneration. Stand basal area > 100 square feet per acre; Merchantable timber > 25 tons per acre; Constrained to occur at most every 30 years. Retain trees that are less than 5 inches DBH. Commercial thin 15 years after the first cut to residual basal area of 80 square feet per acre. This prescription applies only to softwood strata. Constrained to occur only 100 acres per year.

Prescription	Prescription Description
CC1 (clearcut)	Residual basal area for clearcut=0; No residual overstory trees; Natural sprouting and regeneration. Stand basal area > 100 square feet per acre; Merchantable timber > 25 tons per acre; Constrained to occur at most every 60 years. Retain trees that are less than 5 inches DBH. Commercial thin 40 years after the first cut to residual basal area of 80 square feet per acre. This prescription applies only to hardwood strata. Constrained to occur only 100 acres per year.

Volume yields were output for 100-year projection from FVS-SN, with annual yields interpolated between 10-year cycle outputs.

We then projected the revenues from sawlogs and pulp using the average stumpage price for each species, as provided separately. Stumpage prices were sourced from Timber Mart South. Diameter thresholds for sawlogs and pulpwood use the default merchantable diameters in FVS-SN variant.

Cost Assumptions

To estimate net revenue from timber harvest, stumpage by species was used by taking an average from Timber Mart South report. It is assumed that all variable management costs are included in the stumpage estimate. Fixed cost estimates for the property were provided by the landowner.

Ultimately, the financial analysis shows that the baseline harvest activities would be financially viable over a 100-year term using the cost and pricing estimates cited above.

Baseline Constraints

Management regimes in the baseline scenario under legal constraints including the South Carolina's Best Management Practices dictating the size and management constraints around SMZ Buffers. SMZs were developed by buffering the streams based on the guidelines outlined in the BMPs. The streams were derived from the National Hydrography Data set .

ERT Calculation Overview

The ERTs were computed based on the equations and coefficients provided in ACR's Improved Forest Management Methodology for Quantifying GHG Removals and Emission Reductions through Increased Forest Carbon Sequestration on Non-Federal U.S. Forestlands, Version 1.3.

The baseline and project scenarios were projected in FVS-SN for 100 years. Projections were annualized using linear interpolation. Direct biomass carbon estimates for live trees were output via FVS FFE carbon reports⁶, using Jenkins et al. 2003 biomass predictions in metric tons of carbon per acre, matching the calculations applied to the forest inventory measurements.

Standing dead wood was modeled using the Fire and Fuels Extension of FVS (FVS FFE) to produce detailed snag lists for each model cycle. Biomass carbon of each snag was estimated using model output cubic foot volumes of hard and soft components of dead wood, multiplied by dead wood density. Dead wood densities were referenced from the US Forest Service Wood Handbook or from Miles and Smith 2009, and incorporated deductions for decay classes corresponding to the hard and soft dead wood components output from the FVS FFE model and summarized in the table below. Belowground biomass was estimated

⁶ Rebain et al. (2012). FVS Fire and Fuels Extension.

for hard classes of standing dead wood applying component ratios from Jenkins et al 2003. Standing dead biomass was converted to carbon applying a carbon fraction of 0.5, and carbon converted to carbon dioxide equivalent (CO₂e) applying a conversion factor of 3.664.

Harvested wood products were incorporated into ERT calculations following the below steps:

Step 1:

Long-term storage in wood products was calculated from FVS projections of removals. Projected harvested volumes were broken out into the following categories: softwood sawlog, softwood pulp, hardwood pulp and hardwood sawlog. Pulp/saw breakdowns referenced merchantability standards in the FVS-SN variant ⁷.

Volumes were converted to biomass by applying species-level specific gravities referenced from the USFS Wood Handbook 2010 Table 5-3a or from Miles and Smith 2009. Biomass was converted to carbon applying a carbon fraction of 0.5, and then converting to t CO₂e by multiplying by 3.664. Harvest t CO₂e/acre (before delivery to mill) for each modeled group (i.e. baseline stratum) were summed for two categories: hardwood sawtimber and softwood sawtimber.

Step 2:

Carbon transformed to wood products was estimated applying mill efficiency values referenced from the ARB 2015 forest protocol “Regional Mill Efficiency Data.xls” database⁸, for the region specified in Table E1-8. The mill efficiencies are broken down by species group (hardwood vs. softwood) and wood product (pulp vs. sawlog). However, since FVS provides no estimates of carbon by species or wood product, we determined species and product estimates from the ACR wood product class distribution for the project’s Supersection, as defined by the California ARB 2015 Forest Protocol, shown below in Table E1-9.

Steps 3 and 4:

Transformed carbon was summed across the hardwood/softwood/pulp/sawtimber categories and then distributed among a range of end wood product classes. Distributions of end wood product classes reference ARB 2015 forest protocol values derived from the supersection (Table E1-9).

Wood product amounts retained in storage for 100 years in in-use wood products and landfills were then calculated referencing end wood product class-specific 100-year average storage factors provided in the methodology⁹, shown in Table E1-10.

Step 5:

⁷ Dixon, Gary E.; Keyser, Chad E., comps. 2008 (revised November 2, 2020). Southern (SN) Variant Overview – Forest Vegetation Simulator. Internal Rep. Fort Collins, CO: U. S. Department of Agriculture, Forest Service, Forest Management Service Center. 82p.

⁸ Sourced at: https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects_2015.htm

⁹ Sourced from Smith JE, Heath LS, Skog KE, Birdsey RA (2006) Methods for calculating forest ecosystem and harvested carbon with standard estimates for forest types of the United States. In: General Technical Report NE-343 (eds USDAFSUSDAFS), PP. 218. USDA Forest Service, Washington, DC, USA.

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Carbon in long-term storage was then summed across in-use wood products and landfills and across modeled groups/baseline strata to produce annual total t CO₂e stored in in-use wood products and landfills after 100 years from wood harvested in a given year.

Emissions due to burning logging slash are conservatively assumed in the baseline to be zero. Thus, parameter BS_{BSL} equals zero and the outcome of equation 4 of the methodology, parameter GHG_{BSL}, equals zero.

Table E1-8. Regional Mill Efficiency for Wood Products

Mill Region	Hardwood Sawlog Efficiency	Hardwood Pulp Efficiency	Softwood Sawlog Efficiency	Softwood Pulp Efficiency
Southeast (SE)	0.609	0.591	0.636	0.553

Table E1-9. Wood Product Class Distribution

Supersection	Softwood lumber	Hardwood lumber	Plywood	Oriented strand board	Non-structural panels	Miscellaneous	Paper	Alaskan Exports
SE Middle Mixed Forest Piedmont	44.22	16.94	9.14	10.27	2.62	1.22	15.59	0
Blue Ridge Mountains	30.81	53.15	0.69	2.24	10.98	1.73	0.41	0

Table E1-10. 100-Year Storage Factors

Category	In-Use	Landfills
Softwood Lumber	0.234	0.405
Hardwood Lumber	0.064	0.49
Plywood	0.245	0.4
Oriented Strand Board	0.349	0.347
Non-structural panels	0.138	0.454
Misc	0.003	0.518
Paper	0	0.151

Baseline Harvest Mix

Table E1-11 includes the baseline mix of harvest practices that maximizes the net present value (NPV) of annual cash flows over a 100-year projection.

Table E1-11. Baseline and Project Prescription Acreages.

RX	Baseline Optimized Area	Project Optimized Area
CC_2020	0.00	0.00
CC_2025	87.91	0.00
CC_2030	43.95	0.00
CC_2035	43.95	0.00
CC_2040	131.86	0.00
CC1_2020	500.00	0.00
CC1_2025	412.09	0.00
CC1_2030	456.05	0.00
CC1_2035	340.23	0.00
CC1_2040	415.84	0.00
GROW	41.95	5,505.09
SHW60_2020	1,509.75	0.00
SHW60_2025	459.80	0.00
SHW60_2030	226.82	0.00
STS50BA10	1,124.63	289.74

Projections of live tree, standing dead wood and harvested wood products carbon stocks in the project area in the baseline scenario for the first crediting period from 2020 - 2040 are as shown in Table E1-12.

Table E1-12. Baseline CO₂e Stocks

Year	Total Live CO₂e (t/ac)	Standing Dead CO₂e (t/ac)	Harvested Wood Products CO₂e (t/ac)
2020	158.98	2.81	1.22
2021	144.78	2.51	1.22
2022	130.57	2.21	1.22
2023	116.36	1.92	1.22
2024	102.15	1.62	1.22
2025	87.95	1.32	1.22
2026	82.21	1.19	1.22
2027	76.47	1.06	1.22
2028	70.73	0.94	1.22
2029	64.99	0.81	1.22
2030	59.25	0.68	1.22
2031	57.69	0.62	1.22
2032	56.14	0.55	1.22

Year	Total Live CO2e (t/ac)	Standing Dead CO2e (t/ac)	Harvested Wood Products CO2e (t/ac)
2033	54.58	0.49	1.22
2034	53.02	0.43	1.22
2035	51.46	0.37	1.22
2036	50.67	0.34	1.22
2037	49.88	0.31	1.22
2038	49.08	0.28	1.22
2039	48.29	0.26	1.22
2040	47.50	0.23	1.22

The figure below depicts the projected baseline stocks, average baseline stock for the first crediting period, and projected with-project stocks (see below for derivation of with-project stock projections).

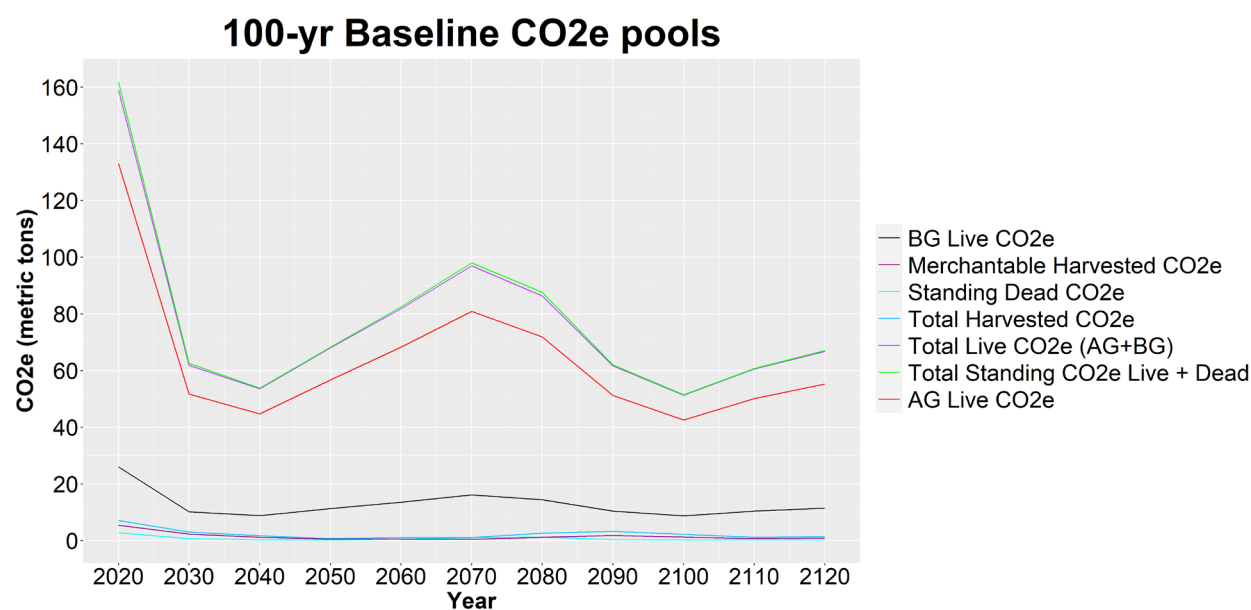


Figure E1-1 Total standing (Live+Dead) CO₂e under baseline and project scenarios

E2. PROJECT SCENARIO

The actual project scenario is measured through future inventories over the course of the project lifetime. However, we produce an ex-ante projection of the project scenario assuming the landowner will conduct the harvest types described in Section A6.2.

E3. LEAKAGE

Quantification of leakage is limited to market leakage, as no activity-shifting leakage is allowed by the methodology beyond *de minimis* levels.

The Naturaland Trust Forest Management plan adheres to an ACR approved long-term forest management plan as specified in section A.2. The Forest Management Plan demonstrates that there is no leakage within the project proponent’s operations.

Market leakage was determined by quantifying the merchantable carbon removed in both the baseline and with-project cases. Carbon in long-term storage in in-use wood products and landfills, calculated above, was used to assess relative amounts of “total wood products produced” in the two scenarios. The decrease in wood production relative to the baseline was then calculated and the applicable market leakage discount factor was determined.

Table E3-1. Baseline leakage factors

Period	Total HWP stored for 20 yr crediting period Baseline Scenario (tCO ₂ e)	Total HWP stored for 20 yr crediting period Project Scenario (tCO ₂ e)	Decrease in Wood Products as Percentage of Baseline Stocks	Applicable Leakage Factor (%)
2020 - 2040	141,918	4,902	96.55	40

E4. UNCERTAINTY

We computed uncertainty in project and baseline CO₂e according to equations 10 and 18 of the ACR protocol. As required by ACR equations 10 and 18, these error terms (e_{TREE} and e_{DEAD}), estimated from the most recent inventory data, are used for computing total CO₂e uncertainty in both the project and baseline scenarios. The ACR protocol also specifies that the error term for live CO₂e (e_{TREE}) be used as the uncertainty estimate for CO₂e stored in wood products. No slash burning is anticipated, so expected greenhouse gas emissions (GHG) under both the project and baseline scenarios are zero. Total uncertainty in combined baseline CO₂e stocks (ACR equation 10) is described in Tables E1-4 – E1-6.

E5. REDUCTIONS AND REMOVAL ENHANCEMENTS

Table E5.a shows estimated net reductions and removal enhancements attributable to the Blue Ridge Escarpment project over the first 20-year crediting period (2020 - 2040). As the annual project-level uncertainty was below the 10% threshold required by the ACR protocol, no uncertainty deduction was applied to the annual Emission Reduction Tons (ERTs) generated by the project. ERTs presented in Table A7-1 incorporate the assumed 40% market leakage. ERTs are dated beginning on August 13, 2020, the project Start Date. Annual values in Table A7-1 correspond to the 1-year interval ending on August 12 of each year.

E6. EX-ANTE ESTIMATION METHODS

Table E6-1 shows projected CO₂e stocks under the project scenario described in Sections A6.2 and E2.

Table E3-1. Project CO₂e Stocks

Year	Total Live CO ₂ e (t/ac)	Standing Dead CO ₂ e (t/ac)	Harvested Wood Products CO ₂ e (t/ac)
2020	158.98	2.81	0
2021	163.46	2.81	0
2022	165.40	2.81	0
2023	167.35	2.81	0
2024	169.29	2.81	0
2025	171.24	2.81	0
2026	174.49	2.81	0
2027	177.73	2.81	0
2028	180.98	2.81	0
2029	184.23	2.81	0
2030	187.48	2.81	0
2031	190.54	2.81	0
2032	193.61	2.81	0
2033	196.68	2.81	0
2034	199.74	2.81	0
2035	202.81	2.81	0
2036	205.69	2.81	0
2037	208.58	2.81	0
2038	211.46	2.81	0
2039	214.34	2.81	0
2040	217.23	2.81	0

F. COMMUNITY & ENVIRONMENTAL IMPACTS

F1. NET POSITIVE IMPACTS

Community and Environmental Assessment

1. *An overview of the Project Activity and geographic location.*

See [Section A5. Brief Summary of Project](#) and [Section A4. Location](#).

2. *Applicable laws, regulations, rules, and procedures and the associated oversight institutions.*

See [Section C1. Regulatory Surplus Test](#).

3. No formal stakeholder consultation was conducted in advance of the project, nor was any required because Blue Ridge Escarpment is a privately held property. If Project Proponent is contacted by any persons regarding the project, Project Proponent will provide references to the publicly available documentation for the project.

4.

Impact	Carbon sequestration
Risk Category	Positive
Monitoring Plan (how, how often, by whom)	Monitoring for the carbon project is described in Section D2. Monitoring Plan .
If negative, describe aversion, reduction, mitigation, or compensation strategy:	N/A

Impact	Habitat protection for wildlife, plant species, and trees in the forested communities.
Risk Category	Positive
Monitoring Plan (how, how often, by whom)	Monitoring for the carbon project is described in Section D2. Monitoring Plan .
If negative, describe aversion, reduction, mitigation, or compensation strategy:	N/A

Impact	Water quality protection
Risk Category	Positive
Monitoring Plan (how, how often, by whom)	Monitoring for the carbon project is described in Section D2. Monitoring Plan .

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If negative, describe aversion, reduction, mitigation, or compensation strategy:	N/A
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Impact	Protection from soil erosion and degradation
Risk Category	Positive
Monitoring Plan (how, how often, by whom)	Monitoring for the carbon project is described in Section D2. Monitoring Plan .
If negative, describe aversion, reduction, mitigation, or compensation strategy:	N/A

Impact	Protects area as community resource for education, research, and recreation
Risk Category	Positive
Monitoring Plan (how, how often, by whom)	Monitoring for the carbon project is described in Section D2. Monitoring Plan .
If negative, describe aversion, reduction, mitigation, or compensation strategy:	N/A

Bluesource – Blue Ridge Escarpment Improved Forest Management Project has no anticipated negative community or environmental impacts. Annual attestations confirming this assessment will be provided separately for verification purposes.

5. Bluesource – Blue Ridge Escarpment Improved Forest Management Project is not a community-based project.

Sustainable Development Goal	Target	Project Action
6. Clean Water and Sanitation	6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.	The watershed protection goals of the project proponent can be found detailed in Section 2.2.3 “Water” in the Forest Management Plan.

13. Climate Action	<p>13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.</p> <p>13.2 Integrate climate change measures into national policies, strategies and planning.</p>	<p>The goal of the project proponent in committing to sustainable forest management practices will be to continually sequester and prevent intensive forest management as described in both Section B6 and in Section E of this GHG Plan, respectively.</p>
15. Life on Land	<p>15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.</p> <p>15.2. By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.</p> <p>15.a. Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems.</p>	<p>The conservation goals of the project proponent can be found detailed in Section 3. “Desired Future Conditions and Benefits” section of the Forest Management Plan.</p>

F2. STAKEHOLDER COMMENTS

N/A. The Project Proponent, Naturaland Trust is a private non-profit forestland owner, and adhered to their internally agreed upon practices of project consultation and notification on associated decision making. Naturaland Trust will provide references to the publicly available documentation for the project.

G. OWNERSHIP AND TITLE

G1. PROOF OF TITLE

G1.1 Ownership of forestlands

Forestlands included in the project are owned directly by the Project Proponent, Naturaland Trust, which hold full legal titles and thus have long term control of the land.

G1.2 Emission reduction rights

Emissions reductions rights are owned by the Project Proponent.

G2. CHAIN OF CUSTODY

No sales or purchasing of offsets was conducted prior to project registration.

G3. PRIOR APPLICATION

The Bluesource – Blue Ridge Escarpment Improved Forest Management Project has not previously applied or been registered under any GHG emission trading system or program.

H. PROJECT TIMELINE

H1. START DATE

The Bluesource – Blue Ridge Escarpment Improved Forest Management Project has a project start date of August 13, 2020, the date of the contractual signing agreement between the Project Proponent and the Offset Developer. This start date is appropriate and consistent with the ACR Standard Version 6.0.

H2. PROJECT TIMELINE

Below is a schedule of the project activities in chronological order for important aspects of the Bluesource – Blue Ridge Escarpment Improved Forest Management Project.

Project Activity	Date	Source/Notes
Project Start Date (Initiation of project activities)	August 13, 2020	CDMA contract signing
Frequency of monitoring, reporting and verification		Every 5 years after the first verification
Length of First Crediting period	Through August 12, 2040	20 years
Expected project longevity	Minimum Project Term of at least 40 Years	40 years