



CHESTNUT CARBON CONSERVATION PROJECT



Document Prepared by Forest Carbon Works, PBC

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1 PROJECT DETAILS

1.1 Summary Description of the Project

The United States is home to over 700 million acres of forestland; this is nearly 7.5% of the world's forests, providing clean water, recreation, and other life sustaining resources to Americans. The importance of American forests to the global ecosystem and climate is central to the work of Chestnut Carbon, LLC, a US-based company that seeks to conserve and restore functional forestland throughout the United States for the primary purpose of increasing carbon sequestration. By the year 2030, Chestnut Carbon anticipates acquiring 500,000 acres of land to be locked into durable conservation easements for 125 years of permanent carbon storage. This ambitious plan contrasts with regional common practice among the sellers of these lands prior to project implementation: extractive timber harvesting to compensate for decreasing revenues from adjacent agricultural and ranching operations over time due to soil compaction and degradation. By extending rotation ages on these at-risk forests, the project increases carbon storage relative to the baseline case, as well as increases biodiversity and diversity in forest structure. Diverse forest age classes and heterogeneity across landscapes are proven to increase forest resiliency to disturbances such as wildfire, landslides, and insect or disease outbreak (*Stephens 2016*).

To generate GHG emissions reductions across the project area, the project activity includes transitioning forestland into sustainable, uneven-aged silvicultural systems, where appropriate. These transition activities include the application of special silvicultural treatments that accelerate the recruitment of trees into standing dead wood, among other treatments. Sponsored by Chestnut Carbon in relation to this project, university research indicates that the promotion of standing deadwood through these treatments significantly increases total carbon storage over time, as compared to no treatment or extractive timber harvesting. Estimated average GHG emission reductions are 221,312 tons CO₂ equivalent per year, with total reductions over the first project crediting period of 5,532,801 tCO₂e. At document submission, the project area is 1,742 acres.

PAIs will be located across the contiguous United States and southern Alaska. To ensure sustainability in management, Forest Carbon Works requires PAI forestland to be certified by the Forest Stewardship Council (FSC) under the group certificate managed by Forest Carbon Works (SCS-FM/COC-009247). Approved management plans shall meet both FSC requirements and the requirements specified by the management policies of Forest Carbon Works related to the promotion of uneven-aged management, biodiversity, water quality and wildlife habitat.

1.2 Sectoral Scope and Project Type

The Chestnut Conservation Project falls under the sectoral scope 14; Agriculture, Forestry and Other Land Use (AFOLU). Within the AFOLU sectoral scope, the project category is Improved Forest Management, activity is Extended Rotation Age (IFM ERA) and the methodology applied is VM0003 v1.2. This is a grouped project.

1.3 Project Eligibility

The Chestnut Carbon Conservation Project will meet all applicable rules and requirements laid out in the VCS Standard and abide by all regional laws, per Eligibility Criterion 3e (see Section 1.4.1). The approved VCS methodology VM0003- Methodology for Improved Forest Management Through Extension of Rotation Age (IFM ERA) will be used for project development. This methodology was selected as most appropriate because the PAIs are currently managed using harvest techniques such as clear cuts, patch cuts, seed tree, continuous thinning, or group selection practices per Eligibility Criterion 7. All instances in the grouped project will be FSC-certified per Eligibility Criterion 8 (see Section 1.4.1).

A performance method will be used to quantify GHG emission reductions. This method was selected as most appropriate because performance benchmark metrics will be established through the development of the baseline model. The project baseline will be reassessed every ten years and the project proponent will ensure that the project activities that lead to the intended GHG benefit will be implemented during the verification period.

The project is not located in a jurisdiction covered by the REDD+ program. Additionally, the project will not drain, convert, or degrade native ecosystems for the purpose of generating GHG credits. The project proponent, Forest Carbon Works, PBC, maintains a harvest policy that prohibits activities that could change the proportion of wetlands in any PAI. Per the Eligibility Criterion 2 (see Section 1.4.1), the project area does not encompass any peat forests. There will be no activity-shifting leakage as a result of the project, per Eligibility Criteria 3d and 6 (see Section 1.4.1); all forested lands will be enrolled in the project. Eligibility Criterion 6 prohibits harvesting on any forested lands, whether or not enrolled in the project, while Eligibility Criterion 3d ultimately requires all forested lands to be enrolled in the project.

1.4 Project Design

- The project includes a single location or installation only
- The project includes multiple locations or project activity instances, but is not being developed as a grouped project
- The project is a grouped project

Initial project activity instances

This project is a grouped project that will consist of multiple Project Activity Instances (PAIs) within the contiguous United States and southern Alaska. The initial project activity instances are called the *Chestnut Properties* and are described in the table below.

Instance Number	Instance Name	Instance State
1	Saline Bluff	AR
2	Fourche La Fave	AR
3	Hickls	AR
4	Rooks Ranch	AL
5	Black River	AR
6	Harding/Freed	AR
7	Dickson	AR
8	El Ranchos	AR

Addition of new PAIs will meet all eligibility criteria defined in Section 1.4.1. Carbon sequestration will be increased through the extension of forest rotation age and retention of standing dead trees as described in Section 1.11.

1.4.1 Eligibility Criteria

The Chestnut Carbon Conservation Project initial Chestnut Properties and all new PAIs will meet all applicability conditions for and abide by all federal, state, and regional laws per Eligibility Criterion 3e.

The following eligibility criteria shall apply to for all PAIs added to the project:

1	<p>The PAI shall be entirely forest for not less than 10 years before the addition of the PAI to the grouped project, as demonstrated by the interpretation of historical imagery.</p> <ul style="list-style-type: none"> a. The FAO defines forest as “land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ” (<i>FAO 2020</i>)
2	<p>The PAI shall not encompass managed peat forests as demonstrated by consultation with local, regional or national databases.</p>
3	<p>The landowner of the PAI shall execute an agreement providing for the following:</p> <ul style="list-style-type: none"> a. require that the landowner hold all timber and carbon sequestration rights; b. convey the right to claim all GHG emissions reductions or removals for the project activity to the project proponent; c. vest legal title to the forest, rights of access to the sequestered carbon (or avoided carbon emissions), current land tenure, and forest management to the project proponent; d. require that the landowner enroll all forested areas in the project, resulting in no activity shifting leakage; e. require that project proponent shall abide by all federal, state, and local regulations; f. be enforceable by law.
4	<p>Applying FVS, the PAI shall have modeled projections of management practices in the baseline and project scenarios. In both scenarios, actual and modeled harvests shall follow maximum recommended water quality protection measures and all applicable laws. The models shall show a higher volume of harvesting in the project scenario as compared to the baseline scenario.</p>
5	<p>The PAI shall fall inside the designated geographic area of the contiguous United States including southern Alaska, and each discrete area of land shall have a unique geographic identifier.</p>
6	<p>The landowner of the PAI shall execute an agreement prohibit harvesting without the prior consent of the project proponent where the project proponent maintains a policy that limits approval of harvesting to techniques that promote the extension of rotation age and prohibits changing the proportion of wetland.</p>

7	The PAI shall have a baseline scenario demonstrating that common practice is even-aged management, without the extension of rotation age, as demonstrated by the provision of a timber harvest plan (THP) from sites comparable, and in the same geographic/regulatory region, to the PAI. The requirements of the California Air Resource Board Compliance Offset Protocol U.S. Forest Projects section 5.2.1(e)(2)(B) shall be used to define a comparable.
8	The PAI shall be certified to the Forest Stewardship Council (FSC).

Any new PAIs shall be validated, based on the information reported in the monitoring report, against the applicable set of eligibility criteria.

1.5 Project Proponent

Organization name	Forest Carbon Works, PBC
Contact person	Julian Bauer
Title	Director, Conserve
Address	Highlight Center 807 Broadway St NE, Suite 280 Minneapolis, MN 55413
Telephone	1 (800) 399-5246
Email	julian@forestcarbonworks.com

1.6 Other Entities Involved in the Project

Organization name	Chestnut Carbon, LLC c/o Kimmeridge
Role in the project	Property owner
Contact person	Joseph Byrnes
Title	Investment Associate
Address	412 West 15th Street, 11th Floor New York, NY 1001
Telephone	1-646-517-7259
Email	joe.byrnes@kimmeridge.com

Per VCS Standard 3.2.3, the implementation partner's roles and responsibilities are defined in Appendix A.

1.7 Ownership

Timber and carbon sequestration rights shall be owned in fee and the right to claim GHG emissions reductions or removals shall be assigned to the project proponent as required by Eligibility Criterion 3b (see Section 1.4.1).

1.8 Project Start Date

The project start date is 5 July 2022, the date of signature of the first PAI license agreement by the landowner and the date on which emissions reduction and removals first occurred, per Eligibility Criterion 6 (see Section 1.4.1), and as described in Section 1.11. The date of the license agreement confirms that the landowner commits to end commercial harvesting on the PAI, thus moving away from the common practice baseline, and begin ERA project activity. Further, the landowner shall meet the requirement of Eligibility Criterion 6 (see Section 1.4.1), which requires ERA activity for the duration of the crediting period.

1.9 Project Crediting Period

The crediting period for the project is 25 years. The start of the project crediting period coincides with the start date for the project, 5 July 2022, and the end date of the Project Crediting period is therefore 4 July 2047. The crediting period can be renewed as may be allowed under VCS.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

The estimated annual GHG emission reductions/removals of the project are:

- <20,000 tCO₂e/year
- 20,000 – 100,000 tCO₂e/year
- 100,001 – 1,000,000 tCO₂e/year
- >1,000,000 tCO₂e/year

Project Scale	
Project	X
Large project	

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
2022	1,296
2023	36,196
2024	68,226
2025	100,255
2026	132,285
2027	164,314
2028	196,344
2029	228,373

2030	260,403
2031	260,403
2032	260,403
2033	260,403
2034	260,403
2035	260,403
2036	260,403
2037	260,403
2038	260,403
2039	260,403
2040	260,403
2041	260,403
2042	260,403
2043	260,403
2044	260,403
2045	260,403

2046	260,403
2047	178,665
Total estimated ERs	5,532,801
Total number of crediting years	25
Average annual ERs	221,312

1.11 Description of the Project Activity

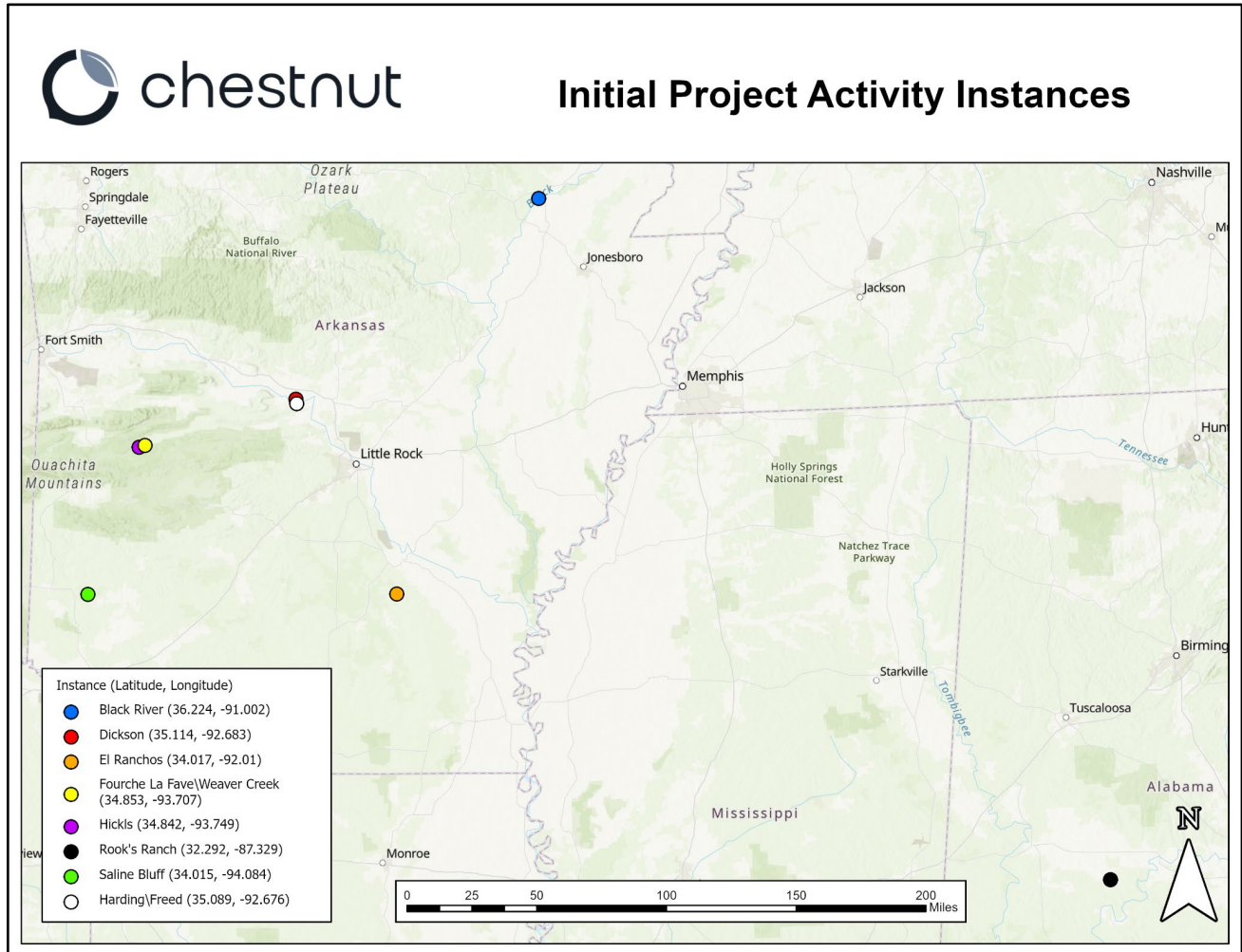
The Chestnut Carbon Conservation Project will achieve GHG emission reductions and removals by applying the measure of Improved Forest Management (IFM), Extension of Rotation Age (ERA). Forest management will shift from even-aged rotations prioritizing timber production to silviculture that will sequester more carbon than in the baseline scenario. Per Eligibility Criteria 6 and 6 (see Section 1.4.1), harvesting in PAIs is prohibited without the consent of the project proponent, Forest Carbon Works, PBC. Forest Carbon Works, PBC, maintains a policy that limits the application of harvesting to techniques that promote ERA as demonstrated by an FSC-compliant forest management plan.

The project has a goal of long-term forest health and carbon sequestration; this includes *inter alia* silviculture for mixed-age classes, increased biodiversity, forest resiliency, sensitive habitat protection, and watershed security.

The project is not located in a REDD+ jurisdictional area.

1.12 Project Location

As described in Section 1.4.1, Eligibility Criterion 5, the geographic area for the grouped project is the contiguous United States and southern Alaska. Centroid of this geography is approximately 44°58'2.07622"N 103°46'17.60283"W. As defined in Section 1.4.1, a KML file of the initial Chestnut Properties (see Section 1.4.1) has been provided to the Verra Registry. The KML file will be maintained with the Verra Registry upon the addition of PAIs to the grouped project.



1.13 Conditions Prior to Project Initiation

- **Ecosystem type:** The United States has many different ecosystem types, among others, ranging from dry conifer forest, temperate rainforest, to hardwood dominant forests.
- **Current and historical land-use:** Forest land will have not been cleared in the last 10 years as evidenced by historical satellite imagery analysis, is and has been managed for timber and other forest resources.

Has the land been cleared of native ecosystems within 10 years of the project start date?

Yes No

The baseline scenario as described in section 3.4 reflects conditions prior to project implementation, conditions that are required by Eligibility Criterion 7 (see Section 1.4.1). Per Eligibility Criterion 1 (see Section 1.4.1), that PAI has been forested for the last 10 years, will be confirmed using historical aerial imagery analysis over the decade prior to project start date.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

Forest Carbon Works, PBC has policies and procedures in place to maintain compliance with all laws listed below. Additionally, project Eligibility Criterion 3e (see Section 1.4.1) mandates all PAIs to comply with all relevant local and state laws not listed.

The following federal laws and regulations are relevant to the project proponent:

- Occupational Health and Safety Act (29 U.S.C. § 651 *et seq.*) establishes health standards for the workplace.
- Fair Labor Standards Act (29 U.S.C. § 201 *et seq.*) establishes labor standards, including minimum wage and overtime.
- Civil Rights Act of 1964 (Public Law 88-352, 78 Statute 241) prohibits discrimination based on race, color, religion, sex, or national origin.
- Americans with Disabilities Act (42 U.S.C. § 12101 *et seq.*) prohibits discrimination based on disability.

Both the baseline and project scenarios follow all relevant regulations and laws, per Eligibility Criteria 3e and 4. The following laws and regulations are relevant to the project:

- Federal Water Pollution Control Act (33 U.S.C § 1251 *et seq.*) establishes objectives for improving water quality and regulates pollution into waterways. Project activities encourage the ongoing improvement of stream water quality, and forest management plans intend to follow maximum state forestry recommendations for watershed quality protection, as required per Eligibility Criteria 3e and 4 (see Section 1.4.1).
- National Environmental Policy Act (42 U.S.C. § 4321 *et seq.*) establishes national goals for protection and enhancement of the environment.
- Endangered Species Act (16 U.S.C. § 1531 *et seq.*) protects threatened and endangered species and regulates management of their habitats. Project proponent shall check sensitive species database prior to harvest, if occurring.

The project goal is to increase carbon storage on the landscape while improving the health, diversity, productivity, and ecological functions of the forests under management.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The project is not registered, and will not seek registration, under any other GHG programs.

1.15.2 Projects Rejected by Other GHG Programs

The project has not been rejected by any other GHG programs.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

Does the project reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading?

Yes No

The project does not reduce GHG emissions from an emissions trading program, nor does it have any intention to.

1.16.2 Other Forms of Environmental Credit

Has the project sought or received another form of GHG-related credit, including renewable energy certificates?

Yes No

The project has not sought or received any other forms of GHG-related credit, including renewable energy certificates. If, under the Verra regulatory framework, other programs arise that the project is eligible to participate in, FCW will communicate to Verra immediately to comply with any rules and regulations forthwith. Other programs or carbon registries in which the Project may be eligible to participate include, among others, the California Air Resources Board Program, American Carbon Registry, and the Climate Action Reserve.

1.17 Sustainable Development Contributions

The Chestnut Carbon Conservation Project will contribute to sustainable development in the United States as defined by and monitored against the United Nations Sustainable Development Goals (SDGs). The project activities will contribute to at least the following SDGs:

SDG 3: Good Health and Wellbeing

Project activities retain forest natural ecosystem services such as air and water purification, healthy soil, and biodiversity. Access to natural ecosystems is shown to improve the lives of those nearby.

SDG 6: Clean Water and Sanitation

Project activities will work to conserve forest ecosystems through improved forest management, extended rotation intervals. Forest ecosystems are imperative to clean water supply. PAIs may also be certified under a rigorous third-party forest certification standard with external annual audits. This certification requires monitoring and management activities to be implemented that ensures the protection of water quality within project areas.

SDG 11: Sustainable Cities and Communities

Project activities will leave trees on the landscape; this is proven to reduce temperature fluctuations due to climate change, thus reducing the need for heating and cooling resource use for neighbors. This may improve air quality as well as reduce resource consumption generally. Forests also improve water quality, directly impacting nearby communities who rely on these watersheds.

SDG 13: Climate Action

Project activities will generate GHG reductions and removals by increasing carbon storage across all PAIs through improved forest management, increased rotation intervals, and reduction of emissions produced by commercial logging.

SDG 15: Life on Land

Project activities will safeguard life on land through forest conservation. Forests conservation aids in combating desertification, halts and reverses land degradation and halts biodiversity loss. PAIs may also be certified under a rigorous third-party forest certification standard with external annual audits. This certification requires monitoring and management activities to be implemented that conserve biological diversity and ecological functions of the project areas.

1.18 Additional Information Relevant to the Project

Leakage Management

No activity-shifting leakage will occur in the project per Eligibility Criteria 3d and 6 (see Section 1.4.1); all forested lands will be enrolled in the project. Eligibility Criterion 6 prohibits harvesting on any forested lands, whether or not enrolled in the project, while Eligibility Criterion 3d requires all forested lands to be enrolled in the project. Market effects leakage will be monitored regionally, see section 4.3.

Commercially Sensitive Information

The monitoring protocol for the project is considered commercially sensitive. This will be provided for validation and verification purposes.

Further Information

N/A.

2 SAFEGUARDS

2.1 No Net Harm

The project is not expected to cause any negative environmental impacts. Because the project activity limits commercial harvesting to FSC-certified plans, the project will have positive outcomes for both climate change mitigation due to increased carbon storage and sequestration as well as biodiversity impacts through the preservation of key habitats. In order to reduce unintentional negative environmental impacts, the project will not introduce any invasive species or allow any existing invasive species to thrive as a result of project activity (VCS Standard 3.17.16). Additionally, while only native species are intended to be promoted, the project proponent will justify any use of non-native species, if necessary, as well as the use of fertilizers, chemical pesticides, biological control agents and other inputs used.

The project proponent does not expect any negative socio-economic impacts. The project proponent will recognize, respect, and support local stakeholders' property rights. The project will not encroach on private, stakeholder or government property.

2.2 Local Stakeholder Consultation

Project proponent will invite all relevant (local, affected and interested) stakeholders for consultations and comments, including, but not limited to, the categories mentioned below:

- a. Local people, communities and/or representatives who are expected to be directly or indirectly affected (adversely affected or beneficiaries) by the project or may have an interest in the project.
- b. Stakeholders with land-tenure rights within or adjacent to the project and marginalized individuals and groups.
- c. Local policymakers and representatives of local authorities.
- d. National government officials or National Focal Point.
- e. Local non-governmental organizations (NGOs), Women Groups working on topics relevant to the project or working with communities who are likely to be affected by the project.

The stakeholders invited under these criteria will represent a diversity of social, economic, and cultural backgrounds within areas impacted by the project. They span from individual adjacent landowners to national organizations and federal agencies. Given this background, there is a large amount of diversity in the financial resources available to stakeholders. There are no significant changes expected in the makeup of local stakeholders over time.

As per VCS Standard 3.17.17, the project proponent shall take all appropriate measures to communicate and consult with local stakeholders in an ongoing process for the life of the project. The project proponent shall communicate the following information by posting the following

material on the stakeholders' page of the project proponent's website:

<https://forestcarbonworks.org/stakeholders/>

1. The project design and implementation, including the results of monitoring.
2. The risks, costs and benefits the project may bring to local stakeholders.
3. All relevant laws and regulations covering workers' rights in the host country.
4. The process of VCS Program validation and verification and the validation/verification body's site visit

Additionally, as per VCS Standard 3.17.19, all communication and consultation will be performed in a culturally appropriate manner, including language and gender sensitivity, directly with local stakeholders or their legitimate representatives when appropriate. The results of implementation shall be provided in a timely manner and consultation shall be performed prior to design decisions or implementation to allow stakeholders adequate time to respond to the proposed design or action. Prior to validation, the project proponent will conduct a local stakeholder consultation to inform project design and maximize participation on December 2nd, 2022 (VCS Standard 3.17.3). The project proponent will take due account of all input received during the local stakeholder consultation and through ongoing communications, and either update the project design or justify why updates are not appropriate (VCS Standard 3.17.5).

Community input is highly valued in the project, as can be seen in community meetings and opportunities for community members to express opinions about the project and its benefits. Project proponent maintains mailing lists and considers direct feedback from stakeholders through multiple channels, including comments submitted through the project proponent's website. Periodically, the project proponent will send mail updates and surveys to registered stakeholders (VCS Standard 3.17.4).

The project has developed a robust grievance structure should community members have complaints or comments (see Section 2.5), which will help ensure community satisfaction with the project and mitigate any unforeseen negative impacts. In the event there are any ongoing or unresolved conflicts over property rights, usage or resources, the project shall undertake no activity that could exacerbate the conflict or influence the outcome of an unresolved dispute (VCS Standard 3.17.16).

2.3 Environmental Impact

Project proponent plans to assess the environmental impact according to small and low intensity managed forest guidance for indicator 6.1.a of the FSC US Forest Management standard. These include an evaluation of water resources and riparian habitats, state and federally listed threatened and endangered species, natural heritage database consultation, and soil resources. In principle, FCW plans to enhance biodiversity and improve forest health with the goal of increased species diversity, age-class heterogeneity, spatial arrangement heterogeneity, and standing deadwood recruitment. These hallmarks of a healthy forest inherently promote wildlife diversity,

soil, and water quality improvements due to variation in forage availability, improved habitat, and reduced erosion potential.

If sensitive species or habitats are found during these assessments, FCW will prepare a strategy to reduce or avoid net harm.

If harvesting is approved for specific PAIs, forest management plans will ensure that all recommended state erosion control measures are followed when implementing harvest activities, as required by FSC certification per Eligibility Criterion 8 (see Section 1.4.1). Forest Carbon Works plans to follow maximum no-touch measures in riparian areas, going above and beyond all state recommendations to ensure quality management in conformance with FSC requirements.

2.4 Public Comments

During the 30-day public comment period, any comments shall be submitted to Verra at secretariat@verra.org and respondents shall provide their name, organization, country, and email address. At the end of the public comment period, Verra will provide all and any comments received to the project proponent.

Upon receipt of public comment, FCW will review and assess comments for addition to project design. A comment form will be available on the Forest Carbon Works website, in addition to hardcopy mail-in comments and voicemails directly to the FCW office. All comments will be recorded and addressed per VCS Standard v4.2. At the time of writing, no comments have been received thus far.

2.5 AFOLU-Specific Safeguards

There are some possible natural and human-induced risks to local stakeholders as a result of the project. The project activities could increase property values for the project area neighbors, leading to increased property taxes and potentially posing financial difficulties. Project activities could also lead to changes in the wildlife habitat that impact the makeup and distribution of local wildlife species, which could impact stakeholders with an interest in the conservation or recreational value of wildlife.

Grievance Redress Procedure

The project proponent maintains a grievance redress procedure to address disputes with local stakeholders that may arise during project planning and implementation. The project proponent will have multiple culturally appropriate methods for submitting a grievance: self-identified, confidential, or anonymous procedures that all stakeholders will be made aware of in advance of project implementation. The project proponent will have a form to submit grievances available on their website, which can be submitted with or without the complainant's identity attached. Additionally, the project proponent will accept grievances submitted by mail to their office, the

address of which is publicly available, and will designate a central point of contact to compile all the letters received. All grievances received will be publicly available on the project proponent's website after submission and the complainant will receive confirmation of receipt if contact information is available.

The grievance redress procedure is made publicly available on the stakeholders' page of the project proponent's website, directed to: <https://forestcarbonworks.org/grievence-procedure>.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

Title: Methodology for IFM through Extension of Rotation Age

Reference: VM0003

Version: 1.2

The following tools were utilized for the development of this project:

Title: UNFCCC CDM Tool for the demonstration and assessment of additionality

Version: 7.0.0

Title: AFOLU Non-Permanence Risk Tool

Version: 4.0

Title: Calculation of the number of sample plots for measurements within A/R CDM project activities

Version: 02

Title: Tool for testing significance of GHG emissions in A/R CDM project activities

Version: 01

3.2 Applicability of Methodology

VM0003 Applicability Conditions	Project Conditions
Forest management in both the baseline and project scenario involves harvesting techniques such as clear cuts, patch cuts, seed tree, continuous thinning or group selection practices.	Per Eligibility Criterion 7 (see Section 1.4.1), the baseline scenario must be even-aged management which requires harvesting techniques.
Forests which are not subject to timber harvesting or managed without an objective for earning revenue through timber harvesting in the baseline scenario are not eligible under this methodology.	Per Eligibility Criterion 7 (see Section 1.4.1), the baseline scenario is common practice to the region.
Forests must be certified by the Forest Stewardship Council (FSC) by the start of the project crediting period. FSC certification must be demonstrated no later than at the time of the first verification event.	Per Eligibility Criterion 8 (see Section 1.4.1), all PAIs will be certified by the FSC.

Project proponents must define the minimum project length in their project description document.	The minimum project length is 25 years, as stated in section 1.9.
The project does not encompass managed peat forests and the proportion of wetlands are not expected to change as part of the project.	Per Eligibility Criterion 2 (see Section 1.4.1), no peat forests will be included in the project, nor will the proportion of wetlands change as part of project activity.
Project proponents must have a projection of management practices in both with and without project scenarios.	Per Eligibility Criterion 4 (see Section 1.4.1), a projection of project scenario and baseline scenario shall be modeled.
If fire is used as part of forest management then fire control measures, such as installation of fire-breaks or back-burning, must be taken to ensure fire does not spread outside the project area—that is, no biomass burning must be permitted to occur beyond the project area due to forest management activities.	The project proponent maintains a policy that if fire is used as part of forest management then fire control measures, such as installation of fire-breaks or back-burning, must be taken to ensure fire does not spread outside the project area.
There may be no leakage through activity shifting to other lands owned or managed by project proponents outside the bounds of the project area.	Per Eligibility Criterion 3d and 6 (see Section 1.4.1), the project does not allow for activity shifting leakage.

3.3 Project Boundary

Source	Gas	Included ?	Justification/Explanation
Baseline	Burning of Biomass	CO ₂	No Excluded per Section 5.1 of the VM0003 Methodology
		CH ₄	No Conservatively excluded per Section 5.1 of the VM0003 Methodology
		N ₂ O	No Excluded per Section 5.1 of the VM0003 Methodology
		Other	N/A N/A
Project	Burning of Biomass	CO ₂	No Excluded per Section 5.1 of the VM0003 Methodology
		CH ₄	No Conservatively excluded per Section 5.1 of the VM0003 Methodology
		N ₂ O	No Excluded per Section 5.1 of the VM0003 Methodology
		Other	N/A N/A

Carbon pools	Selected	Justification / Explanation of choice
Above-ground biomass	Yes	Major carbon pool subjected to the project activity
Below-ground biomass	Yes	Below-ground biomass stock is expected to increase due to the implementation of the VCS IFM project activity. Below-ground

		biomass subsequent to harvest is not assessed with the conservative assumption of immediate emission.
Dead wood	Yes	Included per Section 5.1 of the VM0003 Methodology.
Litter	No	Changes in the litter pool will be <i>de minimis</i> as a result of rotation extension.
Soil organic carbon	No	Changes in the soil organic carbon pool will be <i>de minimis</i> as a result of rotation extension.
Wood products	Yes	This stock may increase or decrease (relative to the baseline due to implementation of the project activity).

A map of the initial project area is provided in Section 1.12.

3.4 Baseline Scenario

According to the VM003 methodology section 6.3 “Determination of Baseline Scenario”, four credible alternative forest management scenarios must be evaluated to determine the Baseline Scenario. These scenarios are as follows:

- Continuation of the pre-project forest management (Historical Baseline),
- Legal requirements for forest management in the region (Legal Baseline),
- Common practice forest management in the region (Common Practice Baseline), and
- Forest management as modeled under the project but in the absence of registration as an IFM project activity.

Per VCS Standard 3.5.13, all factors relevant to the determination of the baseline scenario have been assessed across the entire grouped project geographic area.

Historical Baseline: Some Chestnut Properties (defined in Section 1.4) have been subject to moderate forest management in the past from previous landowners. However, historical records of forest management for the 20 years proceeding project start date have not been found. Per the VM0003 Methodology, if these records are not available “the project must be developed using the Legal or Common Practice Baselines.”

Legal and Common Practice Baseline: The common practice within geographic regions in which the Chestnut Properties are located is to maximize net present value to the landowner by utilizing even-aged harvesting while complying with all relevant laws and regulations. As this is the same scenario as the Legal Baseline, Common Practice and Legal Baselines are considered to be identical.

To validate the baseline scenario, a comparable timber harvesting plan (THP) is required for each PAI as demonstration of common practice per Eligibility Criterion 7 (see Section 1.4.1).

Prior to the subsequent addition and verification of any new PAIs to the grouped project, the legality and plausibility of the baseline scenario for each added PAIs shall be confirmed by an independent forest consulting entity in order to comply with the guidance for defining the legal baseline in Section 6.3 of VM0003. The independent forest consulting entity shall render an

attestation of substantive form to Appendix B. An independent forest consulting entity is any person not directly involved with the project and is qualified to practice forestry in the United States. Independent forest consulting entities may include those qualified individuals working for industry, university, non-profit, federal, state, county, or local government, or that identify as a forestry consultant.

With respect to the Chestnut Properties (see Section 1.4), it is common practice to apply even-aged rotation forestry, as demonstrated by conformance with Eligibility Criterion 7. Following harvest, site prep typically involves chemical herbicide treatment prior to the replanting of seedlings.

Forest management modeled under project in absence of registration as IFM project: As per Eligibility Criterion 4 (see Section 1.4.1), forest management of the baseline and project scenarios shall be modeled over a 100-year period using the US Forest Service Forest Vegetation Simulator (FVS) software. FVS is a forest growth and yield model that allows for region-specific parameterization across the United States.

Assuming a fixed stumpage price across scenarios, then comparison of revenues between the baseline and project scenarios is equivalent to the comparison of harvest volumes across scenarios. Then to demonstrate that revenue generated from ERA selective harvest is lower than the common practice baseline scenario, it is sufficient to demonstrate that harvest volumes in the project scenario are lower than the baseline scenario.

For the Chestnut Properties, the expected harvest volume in the project scenario is lower than the baseline scenario, and therefore the expected revenue from harvesting in the project scenario is lower than the baseline scenario as demonstrated by conformance with Eligibility Criterion 4.

To comply with VCS Standard V4.2 Section 3.2.7, the baseline will be reassessed every 10 years. The baseline model will be rerun using the best available inventory data to reflect new and existing operational constraints. The modeling horizon will be through 2122, which is 100 years from the project start date.

3.5 Additionality

Additionality was determined using version 7.0.0 of the UNFCCC CDM Tool for the demonstration and assessment of additionality.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

As determined in Section 1.4 above, all Chestnut Properties shall meet listed eligibility criteria to demonstrate additionality. All properties shall meet Eligibility Criterion 7, that the baseline scenario is common practice for the region which excludes extension of rotation age (IFM ERA).

Sub-step 1a: Define alternatives to the project activity

Alternative scenarios include:

- a. The proposed activity is undertaken without being registered as a CDM project activity. Without carbon revenue from the sale of certified emissions reductions, there is no financial incentive for the project proponent to participate in forest management.
- b. Other alternative scenarios to the project activity that deliver outputs with comparable quality. Activities similar to the project activity occur on at least part of the land within the project area resulting from legal requirements.
 - i. It is possible, although unlikely, that local or federal government could instate laws banning the common practice scenario.
- c. Continuation of pre-project land use. This alternative scenario reflects the baseline scenario, where the Project Area continues to be used for common practice even-aged forest management.

Stub-step 1b: Consistency with mandatory laws and regulations

All scenarios above will be in compliance with applicable state and federal legal requirements. Per Eligibility Criterion 3e, the project proponent will abide by all federal, state, and local regulations. See Section 1.14 for a comprehensive list of all laws relevant to the project activity and project proponent.

Step 2: Investment Analysis

Sub-step 2a: Determine appropriate analysis method

Per Eligibility Criterion 7, the baseline scenario is common practice, so by methodology definition of common practice, the goal was to “maximize net present value to the landowner by utilizing even-aged harvesting while complying with all relevant laws and regulations.” The chosen analysis method is investment comparison approach using Net Present Value (NPV) to be outlined in subsequent steps 2b through 2d. Reference workbooks with calculations will be provided at verification.

Sub-step 2b & 2c: Application & calculation and comparison of financial indicators

Standard market parameters are based on regional data provided by foresters familiar with local data. Project proponents estimated costs based on previous project estimates. Real discount rate was estimated to be 7%.

The timeline for analysis reflects the 25-year crediting period, which roughly equates to two cycles of thinning in the baseline scenario, one at 15 years as recommended by a regional forester. The NPV for the baseline scenario was \$580,445.64 while the NPV for the project scenario was (\$724,753). The difference in NPV between the two scenarios was driven largely by the carbon project development costs and reduced harvest volumes in the project scenario. According to regional foresters, uneven-aged management as described in the project scenario in the Southeast is uncommon. In the project scenario, harvest removals were modeled at 1-ton green

fiber per acre, once during the 25-year period, conservatively at Year 1. Current stumpage prices for pulp and sawlogs were provided by the University of Arkansas agriculture extension. Road and gravel prices are estimated by regional foresters familiar with the costs for the area.

The NPV difference between the project and baseline scenarios is quite dramatic, indicating that the project activity is not the most financially attractive option compared to the baseline scenario.

Sub-step 2d: Sensitivity analysis

Sensitivity analysis for the above NPV indicator was calculated with a range of 10% change in costs and revenues for each scenario. The optimistic scenario used an assumption of an additional 10% revenue in harvested products, and 10% less upfront costs. The pessimistic scenario assumed a negative 10% change in harvest revenue, and an additional 10% initial cost. The real discount rate stayed constant at 7%.

	Pessimistic	Assumed	Optimistic
Harvest Volume	-10%	0%	+10%
Costs	+10%	0%	-10%
Discount Rate	7%	7%	7%
Project Scenario	(\$835,052.63)	(\$724,753.02)	(\$683,224.88)
Alternative Scenario	\$482,969.79	\$580,445.64	\$653,141.82

The results of the sensitivity analysis show that the proposed project activity is less financially attractive than the baseline scenario of common practice management. Workbooks with all financial calculations shall be provided at verification.

Step 3: Barrier Analysis

Optional, skipped to step 4.

Step 4: Common practice analysis

Sub-step 4a: The proposed CDM project activity applies measures that are listed in the definitions section above

Per Eligibility Criterion 6, the project activity cannot apply any of the measures that are listed in the definitions section above as the only permitted measure is IFM ERA. Does not apply, skipped to Sub-step 4b.

Sub-step 4b: The proposed CDM project activity does not apply any of the measures that are listed in the definitions section above

According to a regional forester, there are no other project activities in the region similar to the project scenario due to its use of uneven-aged forest management. Since this activity is unique to the region, the project is considered additional.

3.6 Methodology Deviations

The project is not requesting any deviations from the methodology.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Baseline GHG emissions estimated according to VM0003 Section 8.4, Equation 6:

$$GHG_{BSL,E} = \sum_{t=1}^{t^*} (E_{BSL,BiomassBurn,t})$$

where:

$GHG_{BSL,E}$	Greenhouse gas emissions as a result of forest management activities within the project area in the baseline, t CO ₂ -e
$E_{BSL, BiomassBurn,t}$	Non-CO ₂ emissions due to biomass burning as part of forest management during the year t in the baseline, t CO ₂ -e
t	1, 2, 3 ...t* years elapsed since the start of the IFM project activity, years

Logging slash (biomass burning) in the baseline scenarios is excluded according to the methodology. Baseline scenario emissions are calculated as zero.

4.2 Project Emissions

From VM0003 Methodology section 8.5.2, Equation 36, the change in GHG emissions as a result of the implementation of the proposed IFM project activity within the project area can be estimated as:

$$GHG_{PS,E} = \sum_{t=1}^{t^*} (E_{PS,BiomassBurn,t})$$

where:

$GHG_{PS,E}$	Greenhouse gas emissions as a result of forest management activities within the project area in the project scenario; t CO ₂ -e
$E_{PS, BiomassBurn,t}$	Non-CO ₂ emissions due to biomass burning as part of forest management during the year t in the project scenario; t CO ₂ -e

t	1, 2, 3 ...t years elapsed since the start of the IFM project activity
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Because the only GHG emitting activity considered by the methodology is biomass burning, and no biomass burning will take place within the Project Area for the duration of the project, the emissions as a result of the project will be zero.

4.3 Leakage

Under the VM0003 methodology, leakage emissions are quantified as the GHG emissions due to market effects resulting from a shift in harvest through time. Leakage is estimated using VM0003 Methodology Section 8.6, Equation 40:

$$LK = LK_{MarketEffects}$$

where:

LK	Total GHG emissions due to leakage; tCO ₂ e
LK _{Market Effects}	Total GHG emissions due to impacts of project on timber supply and demand; tCO ₂ e

Leakage due to market effects will be calculated from VM0003 Methodology Section 8.6.1, Equation 42:

$$LK_{MarketEffects} = LF_{ME} * (\Delta C_{ACTUAL} - \Delta C_{BSL})$$

where:

LK _{Market Effects}	Total GHG emissions due to market- effects leakage through decreased timber harvest; t CO ₂ -e
LF _{ME}	Leakage factor for market-effects calculations; dimensionless
ΔC _{ACTUAL}	Actual net greenhouse gas removals by sinks; t CO ₂ -e
ΔC _{BSL}	Baseline net greenhouse gas removals by sinks; t CO ₂ -e

The leakage factor (LF_{ME}) will be determined by using regional FIA data for all PAIs and the locations to where harvesting would likely be displaced. Within each stratum, the proportion of total biomass in merchantable species (PMP_i) will be calculated and compared with the mean proportion of total merchantable biomass for each forest type (PML_{FT}). Values for the merchantable biomass as a proportion of total biomass by forest type (PML_{FT}) were obtained from section 9.1 of the VM0003 methodology. Merchantable biomass is defined as total gross biomass (including bark) of a tree 5 inches (12.7 cm) DBH or larger from a 1-foot (30.48 cm) stump to either the minimum of 4 inches top DOB of the central stem or the highest merchantable height of the central stem. Trees are not considered merchantable if they are not a species that is commercially harvested in the region or have bole forms that would prevent efficient milling of wood products from taking place.

After PMP_i and PML_{FT} are calculated, the following deduction factors (LF_{ME}) will be used:

Where:

PML_{FT} is equal (\mp 15%) to PMP_i , $LF_{ME} = 0.4$

PML_{FT} is > 15% less than PMP_i , $LF_{ME} = 0.7$

PML_{FT} is >15% greater than PMP_i , $LF_{ME} = 0.2$

Where:

PML_{FT}	Mean merchantable biomass as a proportion of total aboveground tree biomass for each forest type; % (default values see parameter table)
PMP_i	Merchantable biomass as a proportion of total aboveground tree biomass for stratum i within the project boundaries; %
LF_{ME}	Leakage factor for market-effects calculations; dimensionless

An applicability condition of using the VM0003 Methodology is that the project will not have any leakage because of activity shifting to lands owned by the project proponent that are outside the project area. Per Eligibility Criteria 3d and 6, there will be no leakage due to activity shifting. Market leakage assessments will occur at validation and verification and the appropriate market leakage discount factor will be applied (VCS Standards 3.14.8 & 3.14.9).

4.4 Net GHG Emission Reductions and Removals

The Chestnut Properties underwent an inventory in 2022.

Quantification of onsite carbon stocking shall be carried out by following the allometric method approach defined in VM0003. The volume and biomass equations and references were sourced

from the US Forest Inventory & Analysis (FIA) program, which are also used in both the California Air Resources Board and Climate Action Reserve programs, and available on both of these programs' websites. Biomass equations were compiled in proprietary visual basic analysis code (VBA) in Microsoft Excel and data analysis software. Data analysis determines tree species, DBH, height, decay, and region-specific equation decisions to give carbon estimates in tonnes of CO₂ equivalent. Carbon is only calculated for trees above 5 inches at DBH and above.

Belowground carbon stocks were estimated using the IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry suggested root-to-shoot ratio (R) of .23 for conifer forests with biomass above 150 tonnes per hectare.

Both the project and baseline models shall utilize the same underlying forest inventory data for future projections of both scenarios modeled using the Forest Vegetation Simulator (FVS). Outputs from these models determine the project and baseline values for the purposes of GHG emissions reductions and removals accounting. Both the project and baseline models utilize a 100-year time horizon. Wood products have been conservatively estimated per the VCS Standard v4.2. Per the methodology, no activity-shifting leakage shall be permitted during the span of the project.

Table below forecasts the ex-ante GHG removals and reductions over the first crediting period.

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
2022	(126)	1,494	324	1,296
2023	(3,515)	41,730	9,049	36,196
2024	(6,626)	78,656	17,056	68,226
2025	(9,737)	115,582	25,064	100,255
2026	(12,847)	152,509	33,071	132,285
2027	(15,958)	189,435	41,079	164,314
2028	(19,069)	226,361	49,086	196,344
2029	(22,179)	263,287	57,093	228,373
2030	(25,290)	300,214	65,101	260,403
2031	(25,290)	300,214	65,101	260,403
2032	(25,290)	300,214	65,101	260,403

2033	(25,290)	300,214	65,101	260,403
2034	(25,290)	300,214	65,101	260,403
2035	(25,290)	300,214	65,101	260,403
2036	(25,290)	300,214	65,101	260,403
2037	(25,290)	300,214	65,101	260,403
2038	(25,290)	300,214	65,101	260,403
2039	(25,290)	300,214	65,101	260,403
2040	(25,290)	300,214	65,101	260,403
2041	(25,290)	300,214	65,101	260,403
2042	(25,290)	300,214	65,101	260,403
2043	(25,290)	300,214	65,101	260,403
2044	(25,290)	300,214	65,101	260,403
2045	(25,290)	300,214	65,101	260,403
2046	(25,290)	300,214	65,101	260,403
2047	(17,352)	205,980	44,666	178,665
Total	(537,336)	6,378,666	1,383,200	5,532,801

Quantification of Uncertainty

The determination of sampling error for the purposes of calculating the uncertainty deduction will be assessed at the project-level using a 90 percent confidence interval, per the requirements of Section 8.7.1 of VM0003. Stratum-level sampling variances will be combined to a single project-level sampling variance, weighted by stratum acreage relative to the total project acreage (w_{ij}) as is standard for stratified samples. Following from Lohr (2014), the project-level sampling variance will be estimated as

$$var(\bar{x}) = \sum_{i=1}^M \sum_{j=1}^{L_i} (w_{ij})^2 var(x_{ij})$$

where M is the total number of PAI at any given time and L_i is the number of strata in the i^{th} PAI subject to the constraint that $\sum_{i=1}^M \sum_{j=1}^{L_i} w_{ij} = 1$.

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	$A_{BSL, i}$
Data unit	Acres
Description	Area of baseline stratum, i
Source of data	GIS analysis, county data
Value Applied	
Justification of choice of data or description of measurement	
Purpose of data	Determination of baseline scenario
Comments	

Data / Parameter	BEF
Data unit	Dimensionless
Description	Biomass expansion factor for conversion of annual net increment in stem biomass to total above-ground tree biomass increment for species j
Source of data	VM0003 Methodology v1.2 Section 8.5.1.1
Value Applied	
Justification of choice of data or description of measurement methods and procedures applied	Calculation process detailed in VM0003 Methodology v1.2 Section 8.5.1.1
Purpose of data	Determination of baseline scenario
Comments	

Data / Parameter	CF_j
Data unit	tCt^{-1} d.m.

Description	Carbon fraction of dry matter
Source of data	Default value used
Value Applied	0.5 tCt ⁻¹ dry matter
Justification of choice of data or description of measurement methods and procedures applied	Recommended in VM0003
Purpose of data	Calculation of baseline emissions
Comments	

Data / Parameter	D _j
Data unit	T d.m. ft ⁻³
Description	Basic wood density of species j
Source of data	California Air Resources Board Compliance Offset Protocol U.S. Forest Projects appendices
Value Applied	Species and region specific
Justification of choice of data or description of measurement methods and procedures applied	
Purpose of data	Calculation of baseline emissions
Comments	

Data / Parameter	D _{DW}
Data unit	T d.m. ft ⁻³
Description	Basic wood density of dead wood in the density class- sound (1), intermediate (2), and rotten (3)
Source of data	Harmon et al. (2011)
Value Applied	
Justification of choice of data or description of	Data published and used by the United States Forest Service

measurement methods and procedures applied	
Purpose of data	Determination of baseline scenario
Comments	Dead wood pool conservatively excluded

Data / Parameter	$f_j(\text{DBH}, H)$
Data unit	T d.m. tree ⁻³
Description	Allometric equation for species j linking diameter at breast height (DBH) and possible height (H) to above-ground biomass of living trees
Source of data	California Air Resources Board Compliance Offset Protocol U.S. Forest Projects appendices
Value Applied	Species and region specific
Justification of choice of data or description of measurement methods and procedures applied	Equations selected are specific to all PAI regions.
Purpose of data	Determination of baseline scenario
Comments	

Data / Parameter	OF, WW
Data unit	Kg kg ⁻¹
Description	OF = Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years after production; WW = Fraction of extracted biomass effectively emitted to the atmosphere during production
Source of data	Winjum et al, 1998
Value Applied	OF = Value of 0.62 given by VM0003 v1.2 for both sawwood and paper and paperboard WW = Value of 0.19 given by VM0003 v1.2 for developed countries
Justification of choice of data or description of measurement methods and procedures applied	Values provided by VM0003 Methodology v1.2 Section 8.1.5.3 Equation 32.
Purpose of data	Calculation of project emissions

Comments	
Data / Parameter	PML _{FT}
Data unit	%
Description	Mean merchantable biomass as a proportion of total aboveground tree biomass for each forest type
Source of data	VM0003 Methodology v1.2 Section 8.6.1
Value Applied	
Justification of choice of data or description of measurement methods and procedures applied	Recommended in VM0003 Methodology v1.2.
Purpose of data	Calculation of leakage
Comments	

Data / Parameter	R
Data unit	Kg kg ⁻¹
Description	Root-shoot ratio appropriate for biomass increment of forest type/biome
Source of data	IPCC, Good Practice Guidance for Land Use, Land -Use Change and Forestry, 2003
Value Applied	
Justification of choice of data or description of measurement methods and procedures applied	Recommended per VM0003 Methodology v1.2
Purpose of data	Determination of baseline scenario
Comments	

Data / Parameter	SLF
Data unit	Unitless
Description	Short-lived fraction- proportion of wood products that oxidize immediately in the first three years after harvesting

Source of data	Winjum et al., 1998
Value Applied	
Justification of choice of data or description of measurement methods and procedures applied	Recommended per VM0003 Methodology v1.2.
Purpose of data	Calculation of project emissions
Comments	

Data / Parameter	MLF
Data unit	Unitless
Description	Medium-lived fraction- Proportion of wood products that decay over a 20 year period after harvest
Source of data	Winjum et al., 1998
Value Applied	
Justification of choice of data or description of measurement methods and procedures applied	Recommended per VM0003 Methodology v1.2.
Purpose of data	Calculation of project emissions
Comments	

Data / Parameter	LLF
Data unit	Unitless
Description	Long-lived fraction- proportion of wood products that remain stored for 100 years after harvest
Source of data	Winjum et al., 1998
Value Applied	
Justification of choice of data or description of measurement methods and procedures applied	Recommended per VM0003 Methodology v1.2.

Purpose of data	Calculation of project emissions
Comments	

5.2 Data and Parameters Monitored

Data/ Parameter	A1
Data unit	Acres
Description	Area of stratum 1
Source of data	GIS acreage
Description of measurement methods and procedures to be applied	Area defined by property boundaries, watershed boundaries, and operational unit boundaries
Frequency of monitoring/ recording	Annually
Value applied	
Monitoring equipment	ArcGIS software
QA/QC procedures to be applied	Project shapefiles are kept current and backed up
Purpose of data	Expand carbon per acre to carbon per strata
Calculation method	ArcGIS "Calculate Geometry" tool
Comments	

Data/ Parameter	Ap
Data unit	Acres
Description	Area of sample plot
Source of data	
Description of measurement methods and procedures to be applied	Plots measured in accordance with standard forest measurement practices

Frequency of monitoring/ recording	
Value applied	Varies by stand
Monitoring equipment	Measuring tape, laser or equivalent to establish plot radius
QA/QC procedures to be applied	Equipment will be kept in excellent working condition. Measuring devices will be calibrated before use.
Purpose of data	Expand from carbon per plot to carbon per acre
Calculation method	Varies by stand
Comments	Fixed radius plot design

Data/ Parameter	$D_{n,i,t}$
Data unit	In.
Description	Diameter of piece n of dead wood along the transect in stratum i , at time t
Source of data	Field measurement in sample transects
Description of measurement methods and procedures to be applied	See Inventory Protocol
Frequency of monitoring/ recording	At least prior to baseline reassessment
Value applied	
Monitoring equipment	Logger tape or laser
QA/QC procedures to be applied	Equipment will be kept in excellent working condition. Measuring devices will be calibrated before use.
Purpose of data	Used to calculate carbon of dead wood pool
Calculation method	Measured
Comments	Dead wood pool conservatively excluded

Data/ Parameter	DBH
Data unit	In.

Description	Diameter at breast height of tree (4.5 ft.)
Source of data	Field measurements in sample plots
Description of measurement methods and procedures to be applied	See Inventory Protocol
Frequency of monitoring/ recording	At least prior to baseline reassessment
Value applied	
Monitoring equipment	Logging tape, biltmore stock, caliper or equivalent
QA/QC procedures to be applied	Equipment will be kept in excellent working condition. Measuring devices will be calibrated before use.
Purpose of data	Used in allometric equations to calculate carbon in aboveground living carbon pool
Calculation method	Measured prior to baseline reassessment, otherwise modeled using FVS
Comments	

Data/ Parameter	H
Data unit	Ft.
Description	Height of tree
Source of data	Field measurements in sample plots
Description of measurement methods and procedures to be applied	See Inventory Protocol
Frequency of monitoring/ recording	At least prior to baseline reassessment
Value applied	
Monitoring equipment	Biltmore stick, clinometer, hypsometer or equivalent
QA/QC procedures to be applied	Equipment will be kept in excellent working condition. Measuring devices will be calibrated before use.
Purpose of data	Used in allometric equations to calculate carbon in aboveground living carbon pool
Calculation method	Measured prior to baseline reassessment, otherwise modeled using FVS

Comments	Heights of trees on “estimate plots” estimated using regression function built into FPS software
Data/ Parameter	L
Data unit	Ft.
Description	Length of the transect to determine volume of lying dead wood
Source of data	Field measurements in sample transects
Description of measurement methods and procedures to be applied	See Inventory Protocol
Frequency of monitoring/ recording	At least prior to baseline reassessment
Value applied	
Monitoring equipment	Logger tape or laser
QA/QC procedures to be applied	Equipment will be kept in excellent working condition. Measuring devices will be calibrated before use.
Purpose of data	
Calculation method	Measured
Comments	Dead wood pool conservatively excluded

Data/ Parameter	N
Data unit	Dimensionless
Description	Total number of wood pieces intersecting the transect
Source of data	Field measurements in sample transects
Description of measurement methods and procedures to be applied	See Inventory Protocol
Frequency of monitoring/ recording	At least prior to baseline reassessment
Value applied	

Monitoring equipment	
QA/QC procedures to be applied	
Purpose of data	Used to calculate carbon of dead wood pool
Calculation method	Measured
Comments	Dead wood pool conservatively excluded

Data/ Parameter	PMP_i
Data unit	%
Description	Merchantable biomass as a proportion of total aboveground tree biomass for stratum <i>i</i> within the project boundaries
Source of data	Inventory data
Description of measurement methods and procedures to be applied	Calculate merchantable biomass and total aboveground biomass following methodology
Frequency of monitoring/ recording	At least prior to baseline reassessment
Value applied	
Monitoring equipment	
QA/QC procedures to be applied	Calculations are double checked for accuracy
Purpose of data	Used to determine market effects leakage factor
Calculation method	Divide merchantable biomass by the total aboveground biomass
Comments	

Data/ Parameter	T
Data unit	year
Description	Number of years between monitoring period time t and $t1$ ($T = t2 - t1$)
Source of data	Monitoring reports

Description of measurement methods and procedures to be applied	
Frequency of monitoring/recording	Each reporting period
Value applied	
Monitoring equipment	Calendar
QA/QC procedures to be applied	Calculations are double checked for accuracy
Purpose of data	Used to calculate change between reporting periods
Calculation method	$T = t_2 - t_1$
Comments	

5.3 Monitoring Plan

The objective of the monitoring plan is to provide an overview of the procedures and timing planned for the collection, organization, and processing of relevant data and parameters listed in Section 5.2.

Following Section 1.18, the specific protocol for the implementation of monitoring activities is commercially sensitive and will be provided to Verra in a separate document.

The protocol describes the sampling approaches used, selection of sample site locations and detailed measurement methods while the frequency of measurement is specified in Section 5.2, and collectively with this section, are the monitoring plan. The sample approach used is a stratified simple random sample of measurement plots and sample site locations are determined using a chance device to ensure randomness in selection.

Two factors could significantly influence the accuracy of estimates, resulting in potentially biased estimates: dropping sampled plot locations from the sample frame due to inaccessibility and failing to use random sampling in the selection of sample sites. With respect to the first, the protocol specifies that unreachable areas shall be excluded from the sampling frame and the project area; all areas of the project must be subject to sampling. With respect to the second, the protocol requires the use of a random chance device to spatially allocate plots for measurement using GIS and a second level of chance device in the field to randomly locate the plot center at the approximate allocated point.

Where non-conformances with the validated monitoring plan exist at the time of any verification, the project proponent shall justify any non-conformances of the plan as a project description deviation according to the requirements of Section 3.19 of the VCS Standard.

The Project Proponent, Forest Carbon Works (FCW), will continue managing the project throughout the project lifetime, including the ongoing monitoring, reporting, and verification of underlying data and parameters that contribute to the quantification of project greenhouse gas emission reductions and removals through the life of the project's crediting period. FCW will oversee inventory updates, data collection and processing, to ensure continued project reporting and monitoring activities. All data will be saved to secure cloud-based servers regularly. Data collected as part of the Chestnut Conserve Carbon Project monitoring activities shall be maintained for at least 2 years following the end of the project.

Forest Carbon Works is a project developer with expertise in the technical aspects of carbon offset project design, planning, and development with a focus on forest biometrics, carbon accounting methodologies, and remote sensing. Key personnel at FCW have extensive experience validating and verifying projects under the Verified Carbon Standard (VCS), California Air Resources Board (ARB), Climate Action Reserve (CAR) Standard, and Climate Community & Biodiversity (CCB) Standard.

6 APPENDICIES

APPENDIX A

- The implementation partner must comply with all local, state, and federal laws, including payment of property taxes.
- The implementation partner must consent to a credit check.
- The implementation partner must maintain the timber rights to the forest.
- The implementation partner may not plant non-native trees in the forest.
- The implementation partner may not employ broadcast fertilization within the forest.
- The implementation partner must coordinate with Forest Carbon Works if a conservation easement is placed on the forest.
- The implementation partner must notify Forest Carbon Works if they are planning to enroll in any state-administered tax program.
- The implementation partner must disclose any unexamined legal encumbrances on the forest prior to signing the Membership Lease Agreement, including right-of-way easements.
- The implementation partner must provide Forest Carbon Works staff with periodic access to the forest (with reasonable prior notification).
- The implementation partner must fill out an online form each year detailing any major updates related to the forest, including disturbances, harvests, firewood collection, changes in ownership or potential changes in ownership.
- The implementation partner must maintain their forest during the 100-year Legacy Period.
- Any harvests must be approved by FCW and follow an FSC-approved management plan.
- The implementation partner must promptly notify Forest Carbon Works of forest disturbances including damage by fire, wind, pest, or disease.
- If choosing to commercially harvest at any time, harvests must be approved by Forest Carbon Works and have an FSC-certified (Forest Stewardship Council) forest management plan in place. Forest Carbon Works will assist in making this possible at no cost.

APPENDIX B**ATTESTATION**

Date: _____

I, _____, am qualified to practice forestry in the United States and have confirmed the legality and plausibility of the specific management practices modeled as the baseline scenario for each of the following Project Activity Instances, listed below by unique identifier:

For each Project Activity Instance, I have confirmed that the model for the following elements of forest management is common practice for the region in which it resides:

- Harvest rotations
- Harvest methods
- Species harvested and planted
- Riparian management areas
- Areas of steep slope or unstable soils
- Maximum patch cut areas

Signature of attestation:

