
Forest Project Verification Report

Verification under the Climate Action Reserve (CAR) v3.2

Reporter/Forest Owner: Coastal Ridges, LLC

Technical Consultant: North Coast Resource Management

Project: Willits Woods, CAR661

Reporting Period Verified: January 1, 2004—December 31, 2011

Scientific Certification Systems

Lead Verifier: Robert Hrubes

Technical Reviewer: Ryan Anderson

Site Visit Date: December 14-16, 2010

Report Date: June 7, 2012

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1 Summary

This report presents the findings of the verification assessment of the Willits Woods improved forest management project. The project was developed by Coastal Ridges, LLC (the Forest Owner) with the assistance of North Coast Resource Management. This verification assessment covers the Willits Woods forest carbon project's greenhouse gas ("GHG") emission reductions reported to the Climate Action Reserve ("the Reserve") for the initial reporting period of January 1, 2004 through December 31, 2011. The verification was undertaken to evaluate the Project Design Document and assess whether the compiled data conforms to the Climate Action Reserve Forest Project Protocol, Version 3.2 ("the FPP"; August 2010).

The assessment was undertaken using the verification guidance described in the FPP as well as the verification methodology developed by SCS for forest carbon offset projects submitted to the Reserve.

In the course of the verification assessment that is reported herein, the SCS verifiers developed findings which included *New Information Requests (NIRs)*, *Non-Conformity Reports (NCRs)* and *Opportunities for Improvement (OFIs)*. As of the date of this report, all NIRs and NCRs that were issued by the SCS verifiers during the course of the verification assessment have been adequately responded to by Coastal Ridges, LLC, resulting in their closure.

On the basis of the information provided to SCS and the analyses completed by the verification team, SCS was able to reach a decision on the initial emissions reductions reported by the Forest Owner¹ to the Reserve. SCS verified the adequacy of the information provided in the Project Design Document confirmed that this document meets the requirements of the Climate Action Reserve standards. Further, SCS was able to reach a positive opinion on the claimed emission reductions and removals presented in the Project Design Document and on the Reserve website by Coastal Ridges, LLC. Thus, SCS has verified 840,931 Climate Reserve Tonnes ("CRTs") of CO₂e reductions and removals from the Willits Woods improved forest management project for the initial reporting period.

2 Introduction

This report covers verification of the CO₂e reductions and removals claimed for the Willits Woods improved forest management project for the initial reporting period that have been submitted by Coastal Ridges, LLC to the Reserve. This report presents the findings of the verification assessment and provides a description of the steps involved in the verification process. This is the first verification of emission reductions and removals reporting for the Willits Woods forest carbon project.

¹ Coastal Ridges, LLC

3 Project Description

The Willits Woods improved forest management project is intended to create additional carbon stocks in the project area through increased carbon stocking relative to baseline practices.

The Willits Woods improved forest management project is comprised primarily of highly productive timberland. Terrain is of moderate to steep slope. Elevation is from 600 feet to 2,500 feet above sea level. Primary conifer species are coastal redwood and Douglas-fir. The principal hardwood species is tanoak with a mixture of madrone, true oak, California laurel, and other California hardwoods.

The Willits Woods Forest improved forest management project is comprised of 18,008 acres of timberland on the larger 19,008 acre ownership block.

Since 2003, there has been no commercial timber harvesting within the Project Area, leading to a significant increase in carbon stocks. According to Section 10 of the Project Design Document, “the forest owner intends to allow conifer stocking levels to develop on the property in excess of the minimum requirements of the California Forest Practice Rules. The projected target stand condition for the Willits Woods improved forest management project 20-years from now, will be characterized by a multi-aged conifer stand containing between 180 to 210 square feet of conifer basal area per acre, and approximately 32,000 board feet per acre of conifer volume. At that time hardwoods will comprise approximately 35% of the stand basal area.” The forest condition targeted in the project scenario would carry significantly more carbon than would occur in a financially and legally feasible baseline scenario.

4 Verification

SCS is a global leader in third-party certification, auditing, testing services, and standards. Established as an independent third-party certification firm in 1984, our goal is to recognize the highest levels of performance in environmental protection and social responsibility in the private and public sectors, and to stimulate continuous improvement in sustainable development.

SCS is currently accredited to ISO 14065 for GHG Validation and Verification by the American National Standards Institute (ANSI) and offers verification under the Voluntary Carbon Standard (VCS) and the Climate Action Reserve (CAR). SCS also offers verification services for the Chicago Climate Exchange (CCX) and the Climate, Community and Biodiversity (CCB) standards. To date, SCS has verified over 42,000 acres of forest under the Climate Action Reserve and California Climate Action Registry’s Forest Protocols. SCS has been verifying forest carbon offsets for over four years and conducted the first verifications of Forest Carbon Projects under the California Climate Action Registry (CCAR) Forest Sector Protocols. The Greenhouse Gas Verification Program draws upon SCS’s established expertise in field forestry, biometrics, and verification activities to serve the global forest carbon market.

SCS launched its forest management certification program in 1991. In 1995, SCS’s Forest Conservation Program was accredited as one of the first Forest Stewardship Council (FSC) endorsed

certification bodies. Since that time, SCS has become a global leader in forest management and wood products certification. Our diverse set of certification services provides forestry operators and manufacturers with a full range of quality services.

4.1 Verification Objectives

The purposes of the verification assessment that is the subject of this report were to:

- Evaluate conformance with the verification criteria as defined in the Climate Action Reserve protocols;
- Assess the likelihood that the GHG project has resulted in the GHG emissions reductions and removals stated in the project documents;
- Evaluate the project information and documentation, including the baseline determination, field inventory, quality assurance and control, and monitoring; and
- Evaluate reported net GHG emission reductions and removals.

4.2 Level of Assurance

SCS performed the core verification activities set forth by the Reserve in the FPP to determine whether the verification team could achieve a reasonable level of assurance that the project's GHG removals and reductions are materially correct. SCS used the Reserve's criteria to determine if the Project Design Document addressed each requirement in the FPP. Only projects in compliance with the Climate Action Reserve FPP are verified.

4.3 Treatment of Materiality

For the forest inventory, a material misstatement must be declared if the reported forest inventory does not appropriately describe the forest area and if it differs significantly from the verifier's assessment of the inventory, changes in stocks, and emissions reductions estimates as described in more detail in the FPP.

To meet the Reserve's minimum quality standard, Coastal Ridges, LLC's inventory data was compared to the verifier's inventory data, following procedures described in Section 10.3.5 of the FPP (see pages 86-87). Specifically:

Each plot set is installed by the verification body, or a consultant hired by the verification body, for an identified area and compared to the Forest Owner's reported inventory for the same area. The comparison is analyzed using a paired T-test at the 80 percent confidence interval to determine if the inventory is within the same population as the inventory submitted by the Forest Owner. A plot set will either support or raise concerns about the accuracy of the Forest Owner's inventory. A Forest Owner receiving an 80 percent score or better has demonstrated that their inventory is sound.

Estimates that do not fall within this threshold are considered materially inaccurate.

In addition, SCS evaluated whether the emissions reductions reported by Coastal Ridges, LLC contained any material misstatements of a quantitative or qualitative nature. In defining the quantitative materiality threshold, Section 1.6.4 of the Verification Program Manual (December 20,

2010) states that “Projects registering more than 100,000 CRTs (expressed in terms of CO₂e) annually shall achieve greater than +99% accuracy level (less than 1% error) relative to the verification body’s calculated emission reductions.” Therefore, the Willits Woods improved forest management project was evaluated against a 1% quantitative materiality threshold. A qualitative misstatement is defined in Section 1.6.5 as a non-conformity to the stated requirements of the applicable protocol. Any qualitative misstatement was deemed to be material.

4.4 Verification Scope

The scope of this verification encompasses desk and site verification activities for the Willits Woods forest carbon project against the following requirements of the Climate Action Reserve:

- Forest Project Protocol, Version 3.2, August 31, 2010;
- Program Manual (October 26, 2011);
- Verification Program Manual (December 20, 2010).

The verification was performed using the client-supplied Project Design Document and other supporting documentation.

The verification process involved:

- Assessment of completeness of the inventory;
- Verification of emissions reductions and removals reported online to the Reserve;
- Assessment of baseline methodology and determination;
- Verification that a measurement and monitoring system is in place that is capable of delivering high quality carbon stock data;
- Assessment of data accuracy and any assumptions made in the manipulation of that data;
- Verification that the organization is operating according to the methodology approved by the Climate Action Reserve;
- Verification that the reported carbon stocks are real; and
- Conclusions developed on the declared CRTs for registration on the Reserve.

4.5 Verification Team

Lead Verifier: Dr. Robert J. Hrubes, SCS Senior Vice President

Dr. Hrubes, as California Registered Professional Forester, holds a Ph.D. in Wildland Resource Science from UC-Berkeley, an M.A. in Economics from University of California, Berkeley, a M.S. in Resource Systems Management from the University of Michigan, Ann Arbor, and a B.S. in Forest Management and Outdoor Recreation Management from Iowa State University, Ames. Dr. Hrubes was employed for 14 years by the USDA Forest Service in a variety of field management, research and land management planning positions. Subsequently, Dr. Hrubes spent 12 years in private consulting, focusing primarily on forest management certification and natural resource economics, and has over 30 years of professional experience in both public and private forest management issues. Dr. Hrubes was lead architect of the programmatic protocols that guide all SCS Forest Conservation Program evaluations. He also provides executive oversight and has direct

involvement in the SCS Forest Carbon Program. Dr. Hrubes served as lead auditor on the first three forest carbon projects that have been registered under the California Climate Action Registry (CCAR), and also sits on the CCAR Forest Protocol Working Group tasked with developing revised forest protocols for CCAR, now CAR. He has been the Senior Vice President at SCS since 2000.

Verifier: Zane Haxton, SCS GHG Verification Forester

Mr. Haxton holds a M.S. in Forest Resources from Oregon State University and a B.S. from The Evergreen State College. A well-rounded forestry professional, Mr. Haxton held a wide variety of positions in forest research and management before coming to SCS, ranging from work on logging and tree planting crews to experience as a wildland firefighter and research assistant. A specialist in forest inventory, Mr. Haxton holds significant expertise in sampling design, inventory management and growth modeling. Mr. Haxton is well versed in a wide variety of methodological approaches for forest carbon accounting, and is currently a verifier under the Climate Action Reserve, the Verified Carbon Standard and the Climate, Community and Biodiversity Standard.

Verifier: Joseph McGuire, Contract Forestry Verifier

Joseph McGuire has nearly thirty years of forestry experience in California working in silvicultural research, forest management, appraisal, remote sensing and GIS. After earning a Bachelor of Science from Tufts University, McGuire worked eight years with the USFS-PSW lab in Redding, California and the Mi-Wok District of the Stanislaus NF. After earning a Master of Forestry degree from the University of California, Berkeley he became a Registered Professional Forester and began thirteen years of work with Pacific Meridian Resources, a remote sensing and forestry consulting firm. In 2003, McGuire co-founded Buena Vista Services. BVS services include appraisals, timber and carbon inventories and timber management. Clients include open space districts, land trusts, industrial and non-industrial landowners throughout northern California. McGuire is qualified to act as a Forest Project Lead Verifier (CAR Ver. 3.2).

Technical Reviewer: Ryan Anderson, Contract Forestry Verifier

Ryan Anderson holds a BS in Environmental Science from the University of Denver and an MS in Natural Resource Science and Management(Forestry) from the University of Minnesota with emphasis in forest biometrics and remote sensing. He is an approved CAR lead verifier and has experience assessing forest carbon projects against the CCBA, VCS, and CAR standards. He is currently pursuing a Ph. D. in Forestry with the University of Montana's Numerical Terradynamic Simulation Group, where his research focuses on the development and application of physiologically-based models of terrestrial ecosystem carbon, nitrogen, and water cycles.

5 Verification Process

The verification process for the Willits Woods forest carbon project can be divided into five stages:

5.1 Desk Assessment

In the first stage, SCS received and reviewed the Project Design Document, submittals to the Reserve, and supporting documentation to assess initial conformance with the data requirements of the FPP. Key factors that impact the reported emission reductions and removals were identified, and a Verification Plan was created to focus on the critical elements presenting potential risk for errors. These elements included inventory data collection and handling, assumptions underlying

the baseline characterizations, application of the growth and yield model, and compliance with the California Forest Practice Rules.

Prior to the field visit, the verification team conducted a desk review of the documentation which included the Project Design Document, submittals to the Reserve, and supporting reports. SCS found the documentation submitted by Coastal Ridges, LLC for the Willits Woods forest carbon project to be adequate to proceed with the site visit.

5.2 Site Visit

Following the desk review, the auditors conducted an on-site audit of the project area on January 15-16, 2011. The site visit was used to verify the Project Design Document, tour the ownership for reconnaissance and ground-truthing, and to conduct a field review of Coastal Ridges, LLC's sampling methodology. During and following the site visit, 20 inventory plots were selected by SCS and re-measured by a cruising firm retained by SCS. The collected data was used to confirm that proper field measurement techniques were used by the inventory personnel retained by Coastal Ridges, LLC. General descriptions of the forested area were also confirmed as part of the general reconnaissance of the project area. During this process, the verification team looked for evidence of recent harvesting, wildfire or large unstocked areas that were not reported by the Forest Owner. SCS determined that the forest condition, structure and carbon stocking levels of the project area were consistent with the claims made in the Project Design Document.

5.3 Quantitative Review

The third stage of the verification process focused on the quantitative analyses undertaken by North Coast Resource Management to convert the raw inventory data into estimates of standing volume of woody biomass and then to translate volumetric measures into estimated tons of carbon, for both the baseline and the project activity. Discussed in detail in Section 7, this entailed the following activities:

- Generating per acre estimates of standing woody volume from the re-measured plots in order to assess the accuracy of the base year inventory and carbon stocks for the project area; and
- Reviewing the baseline growth and harvesting projections of carbon stocks over the 100-year project period.

Subsequent to the positive verification opinion rendered by SCS regarding the GHG emission reductions and removals reported by the Forest Owner for an initial reporting period from January 1, 2004—December 31, 2010, a decision was made by the Forest owner to lengthen the initial reporting period to include an additional year. Therefore, SCS conducted additional desk verification activities to determine whether a positive verification opinion could be rendered with respect to the GHG emission reductions and removals reported by the Forest Owner for the period January 1, 2011—December 31, 2011. Thus, the verification activities described in this report were adequate to render a verification opinion with respect to the GHG emission reductions and removals reported by the Forest Owner for the entirety of the initial reporting period from January 1, 2004—December 31, 2011.

5.4 Findings

Throughout the verification process, there was an iterative exchange between SCS and North Coast Resource Management to gather additional information for review and examination. This exchange included Findings—New Information Requests, Non-Conformity Reports and Opportunities for Improvement—that were issued by SCS to the Forest Owner. The Forest Owner was required to respond to NIRs and NCRs in order for SCS to render a verification opinion. As of the date of this report, all findings have been appropriately addressed by the Forest Owner and subsequently closed by SCS.

The findings from the verification of the Willits Woods improved forest management project are compiled in a “List of Findings” and available under separate cover. The List of Findings is a confidential document between the Forest Owner and its consultants, the verifier, and the Reserve; it is not publicly available.

5.5 Documentation and Verification Statement

The last step in the verification process included a final review of the submitted data, completion of the verification activity log, and drafting of the Verification Statement and supporting Verification Report. A draft Verification Statement and Report were completed based on the results of the verification assessment. The draft report was presented to an internal SCS Technical Reviewer who determined whether the Verification Statement was justified given the evidence presented. The Verification Report and Verification Statement were then presented to the Forest Owner for review and comment. SCS has been given approval by the Forest Owner to upload these documents to the Reserve website for institutional review by the Reserve. Given the positive opinion rendered, SCS suggests that the Reserve register the emissions reductions for the forest carbon project and issue CRTs for the initial reporting period.

The Project Design Document for the Willits Woods improved forest management project meets the requirements of the FPP. SCS approved the Project Design Document for the Willits Woods improved forest management project and this approved Project Design Document will be attached to the Project Implementation Agreement (PIA), executed between the Reserve and the Forest Owner. Once the PIA was signed, SCS will verify its successful execution² and upload the final Verification Statement. If the Reserve renders a positive review of all of the documentation for the Willits Woods improved forest management project, the emissions reductions can be registered for the reporting period of the verification assessment.

6 CAR Forest Project Requirements

SCS verified the Willits Woods improved forest management project against the requirements of the FPP. The following sections of the report detail the most essential aspects of the verification of the Willits Woods improved forest management project.

² Filed at the Office of the Clerk-Recorder in Mendocino County, CA on June 6, 2012 as 2012-08546.

6.1 Project Type

The Willits Woods improved forest management project is in compliance with the project eligibility requirements set forth in Section 2.1.2 of the FPP. The project is eligible because:

1. **The project takes place on land that has greater than 10 percent tree canopy cover.** This requirement was verified through observation of remote sensing imagery, as well as during field reconnaissance activities during the site visit.
2. **The project employs natural forest management practices, as defined in Section 3 of the FPP.** Verification of this requirement is documented in Section 6.8 of this report.
3. **The project does not employ broadcast fertilization.** An attestation to this effect was provided by the Forest Owner in Section 2.2 of the Project Design Document, and SCS observed no evidence of broadcast fertilization activities during the site visit.
4. **The project does not take place on land that was part of a previously registered Climate Action Reserve Forest Project.** Since SCS has verified every Climate Action Reserve Forest Project registered thus far within the state of California, SCS can attest that this is the case.

The Willits Woods forest carbon project has been defined as an improved forest management project.

6.2 Project Start Date and Reporting Period

The Willits Woods improved forest management project commenced on December 22, 2003 and the initial reporting period for GHG reductions and removals is January 1, 2004 – December 31, 2011. As is reported in Section 2.1 of the Project Design Document, carbon sequestration during the last 10 days of 2003 has not been claimed for crediting in order to simplify calculations. Therefore, the beginning of the initial reporting period does not correspond exactly with the start date of the project.

Section 3.2 of the FPP states that “an Improved Forest Management project’s start date must be linked to a discrete, verifiable action that delineates a change in practice relative to the project’s baseline” and suggests that, if transfer of property ownership is identified as the action that delineates a change in practice, the project start date is the date of property transfer. Coastal Ridges, LLC provided a letter from Redwood Empire Title Company of Mendocino County indicating that the property was acquired on December 22, 2003.

The Forest Owner is required to sign the Climate Action Reserve’s revised Attestation of Title form which affirms that they have an exclusive ownership claim to the GHG reductions and removals achieved by the Willits Woods improved forest management project. This document has been signed and uploaded to the Reserve website. The Forest Owner’s ownership of the various parcels which comprise the Willits Woods improved forest management project was confirmed by contacting the Assessor’s Office of Mendocino County. As SCS is aware of no evidence indicating such a transaction between the Forest Owner and other parties in which the carbon rights have been severed from fee simple ownership of the project area, we conclude that there is no basis to question the Forest Owner’s attestation of ownership of the GHG reductions for the Willits Woods improved forest management project.

6.3 Additionality

Climate Action Reserve Forest Projects must be additional to qualify for registration. SCS has found that the Willits Woods improved forest management project is additional because it meets both a legal requirement and a performance test.

Regarding legal requirements, the project is additional because the carbon emission reductions and removals from the Willits Woods improved forest management project are in excess of those required under the California Forest Practices Act, as is further described in Section 7.1. The Forest Owner is required to sign the Climate Action Reserve's revised Attestation of Voluntary Implementation form which affirms that the Project was implemented voluntarily. This document has been signed and uploaded to the Reserve website. Additional interviews with staff support the voluntary impetus of the Willits Woods carbon project to engage in the improved forest management activities that characterize the project. The additional carbon being sequestered in the project scenario is not legally required or mandated.

Regarding the performance test, the carbon emission reductions and removals from the Willits Woods improved forest management project are in excess of "business-as-usual" practices because they result from the Forest Owner's decision to remove less carbon in the form of merchantable volume in the project scenario than could have been removed in the baseline scenario. In fact, the Forest Owner has conducted no commercial harvesting since the project's start date, although a number of Timber Harvest Plans for the Project Area have been approved by the California Department of Forestry and Fire Protection.

The Forest Owner is required to sign the Climate Action Reserve's revised Attestation of Regulatory Compliance form which attests to the Project's regulatory compliance throughout the initial reporting period. This document has been signed and uploaded to the Reserve website. SCS verified that the Project is in compliance with the California Forest Practice Rules. During the site reconnaissance and desk review verification activities, SCS encountered no evidence suggesting violations of local, state or federal laws. Additionally, SCS contacted Cal Fire Forest Practice Inspector, Anthony Lukacic, who confirmed that there have been no forest practice violations in the project area since the project start date. SCS concludes that there is no basis to question the Forest Owner's attestation of regulatory compliance for the Willits Woods improved forest management project.

6.4 Permanence

The Reserve requires Forest Owners to enter into a Project Implementation Agreement (PIA) with the Reserve to ensure the permanence of forest carbon reductions and removals through the forest owner's long-term commitment to comply with the Forest Project Protocol. Prior to issuance of CRTs, SCS will verify that the PIA has been recorded in Mendocino County, California and communicate such verification to the Reserve.

The Reserve administers a Buffer Pool, which is a general insurance mechanism and holding account for CRTs. All registered forest projects are required to contribute a portion of their CRTs from GHG reductions and removals to the buffer pool to compensate for reversals, avoidable or unavoidable,

which could negatively impact forest carbon projects. Contributions to the Reserve's CRT Buffer Pool are determined by the Willits Woods forest carbon project's reversal risk rating procedure in Appendix D of the Forest Project Protocol and Exhibit F of the Project Implementation Agreement. The Willits Woods forest carbon project calculated their reversal risk rating at 20.937%. The risk rating was calculated under the assumption that a Qualified Deed Restriction or Qualified Conservation Easement would not be employed. In addition, it was assumed that a Type 1 subordination clause (which states that any encumbrance on or affecting the Project Area that arises subsequent to the date of the PIA is subordinate to the PIA) would be opted for in the PIA. Therefore, a financial risk of 7% (the summation of the 5% default risk and a 2% additional risk due to the adoption of a PIA with a Type 1 subordination clause) was used. In all cases, the project proponent appropriately used the default values for projects on private land that do not employ a Qualified Deed Restriction or Qualified Conservation Easement. Prior to submission of the verification for final approval by the Reserve, SCS verified that a Type 1 subordination clause was opted for, as defined by Exhibit E of the recorded PIA.

6.5 Included Carbon Pools

The project includes the following carbon pools:

- IFM-1: standing live carbon (carbon in all portions of living trees);
- IFM-3: standing dead carbon (carbon in all portions of dead, standing trees);
- IFM-7: carbon in in-use forest products;
- IFM-8: forest product carbon in landfills (included in years in which project harvesting volumes are below baseline levels);
- IFM-9: biological emissions from site preparation activities in the project scenario; and
- IFM-14: biological emissions/removals from changes in harvesting on forestland outside the Project Area.

These carbon pools are required by Section 5.2 of the FPP; no optional carbon pools were reported for this forest project.

6.6 Sustainable Harvesting Practices

Section 3.10.1 of the FPP requires that "at the time commercial harvesting is either planned or initiated within the Project Area, the Forest Owner must employ and demonstrate sustainable long-term harvesting practices on all of its forest landholdings, including the Project Area." The Forest Owner demonstrated conformance with the second criterion for sustainable management, which states:

"The Forest Owner must adhere to a renewable long-term management plan that demonstrates harvest levels which can be permanently sustained over time and that is sanctioned and monitored by a state or federal agency."

The Forest Owner demonstrated compliance with the second criterion by providing a planning document entitled "A Plan for meeting MSP under Option A" (henceforth known as the "Option A

document”). The Forest Owner provided evidence that this document was approved by William E. Snyder of the California Department of Forestry and Fire Protection (Cal Fire) on October 18, 2006. This document refers to the “Willits Woods” tract (comprising the present-day Willits Woods improved forest management project area) and the “Longview” tract (comprising the present-day Gualala River Forest improved forest management project area, which was formerly under the ownership of the Forest Owner but is now owned by a different entity, as well as what is now referred to as the “Brandt” tract by the Forest Owner, which has been and continues to be owned by the Forest Owner). The Willits Woods and Brandt tracts comprise all of the holdings owned by Coastal Ridges, LLC.

6.7 Natural Forest Management

The Reserve requires all forest projects to practice natural forest management to promote and maintain native forests which are diverse in terms of landscape scale, species composition, and age-class. Additionally, projects are required to maintain forest types which are native to the Project Area. The native forest type of the Willits Woods forest carbon project is conifer forest. The project is located in the Coast Redwood/Douglas-fir Mixed Conifer Assessment Area. The Willits Woods forest carbon project meets the native species requirement that forest projects must consist of at least 95% native species based on the sum of carbon in the standing live carbon pool. The project is composed of 95% native species by carbon, although some knobcone-Monterey pine cross (KMX) has been observed within the project area. This is appropriately documented in Section 2.4 of the Project Design Document.

The Willits Woods forest carbon project also complies with the requirement for the Assessment Area that no single native species comprise more than 60% of the project’s basal area, the threshold for single species composition in this forest type, as defined by the Assessment Area Data File on the Reserve website. Comprising just over 36% of total basal area tanoak is the species with the highest basal area in the project area.

The Forest Owner is not required to demonstrate conformance with the “Distribution of Age Classes/Sustainable Management” criterion in Table 3.2 of the FPP, as they apply only when the first regeneration harvest occurs in the project scenario and, in this case, no harvest (regeneration or otherwise) has occurred since the project’s start date. Nonetheless, the Willits Woods forest carbon project meets the requirement of Table 3.2 of the FPP by maintaining less than 40 percent of the project area in ages less than 20 years “on a watershed scale up to 10,000 acres (or the project area, whichever is smaller)”. While this requirement was difficult to verify, given the uneven aged nature of the project area, SCS found no evidence of large areas of trees younger than 20 years old during the site visit. The Forest Owner provided justification regarding this requirement in Section 2.4 of the Project Design Document.

Finally, the natural forest management requirements of the FPP require that structural elements, in the form of standing and lying dead wood, are retained in sufficient quantities in the project area. During the site visit, the audit team discovered no evidence that lying dead wood was being actively removed, and therefore the quantity of lying dead wood appeared to be commensurate with recruitment from standing dead trees. In this case, the FPP requires projects to demonstrate the

higher of either: 1) at least 1% of standing live carbon stocks in standing dead wood or 2) at least one metric tonne of carbon in standing dead wood per acre (whichever is higher), or to demonstrate ongoing progress toward said objectives. In the Willits Woods forest carbon project, the standing dead pool comprised about 0.76% of standing carbon stocks and averaged 0.292 metric tonnes per acre. A commitment to making progress toward meeting objectives for standing dead wood is memorialized in Section 2.4 of the Project Design Document.

6.8 Summary Assertion of Project Eligibility

Upon review of the previously mentioned criteria, **SCS has determined that the Coastal Ridges, LLC meets all eligibility requirements for the Willits Woods improved forest management project.**

7 Quantitative Review of GHG Reductions and Removals

SCS devoted a portion of the verification assessment to a review of the manner of Coastal Ridges, LLC's quantification of the net GHG reductions and removals from the Willits Woods forest carbon project. This assessment included a review of the baseline determination for carbon stocks, including harvested wood products, as well as an analysis of the raw data collected from the Forest Owner's field inventory within the project area. Finally, SCS assessed how these data were converted into GHG reduction and removal estimates.

SCS verified that all calculations for the Willits Woods improved forest management project were performed correctly. From the baseline determination to the estimate of onsite carbon stocks, SCS reviewed all calculations associated with the project's estimate of GHG reductions and removals and verified them to be accurate. Furthermore, all values presented in the Annual Monitoring Report were determined to be correct and to meet all of the requirements of the FPP.

7.1 Baseline Determination

The FPP requires the Forest Owner to create a baseline, an estimate of carbon stocks in the absence of the forest project. The baseline is generated through a growth and yield simulation over the project's crediting period of 100 years. As confirmed during the verification assessment, the Forest Owner followed the applicable guidelines in Section 6.2.1 of the FPP as follows:

Step 1 – Determine the Common Practice Carbon Stocks for the Project's Assessment Area

In Section 9.1 of the Project Design Document, the Forest Owner indicated that the project area was comprised of both high and low site classes within the Coast Redwood/Douglas-fir Mixed Conifer Assessment Area. The *common practice* statistic for the high site class was 51 metric tonnes of carbon per acre, and the *common practice* statistic for the low site class was 45 metric tonnes of carbon per acre.

Step 2 – Determine if Initial Above-Ground Standing Live Carbon Stocks Are Above or Below Common Practice

As of the project start date, the Willits Woods improved forest management project is projected (using the methodology documented in Attachment C of the Project Design Document) to have

contained 36.75 metric tonnes of above-ground standing live carbon per acre, as described in Section 9.1 of the Project Design Document. Therefore, the initial carbon stocks are below the *common practice* statistics for both the high and low site classes.

Step 3 – Determine Baseline Above-Ground Standing Live Carbon Stocks

The Forest Owner was required to identify the *minimum baseline level*, which sets the minimum average carbon stocking that could be reached in the baseline scenario. Following guidance in the FPP, Equation 6.6 was used to compute the *minimum baseline level*, as initial above-ground standing live carbon stocks per acre were below *common practice*. This equation required incorporation of both the *high stocking reference* and the weighted carbon stocks in the project's *logical management unit* (LMU).

The *high stocking reference* is defined as “80 percent of the highest value for above-ground standing live carbon stocks per acre within the Project Area during the preceding 10-year period. To determine the *high stocking reference*, the Forest Owner must document changes in the Project Area's above-ground standing live carbon stocks over the preceding 10 years, or for as long as the Forest Owner has had control of the stocks, whichever is shorter”. For the Willits Woods improved forest management project, the purchase of the Project Area coincided with the start date of the Project. However, upon discussion with North Coast Resource Management personnel, the audit team learned that similarities existed between the ownership structure of Coastal Ridges, LLC and one or more entities that had owned portions of the Project Area in the 10-year period preceding the Project's start date. Subsequent guidance from the Reserve, in an email communication dated March 21, 2011 and memorialized in a document entitled “REQ-VER-CAR660-661_10yrhist_31511.pdf,” indicated that the *high stocking reference* should be considered equivalent to the above-ground standing live carbon stocks per acre at the Project's start date.

In order to avoid inclusion of carbon stocks on additional lands owned by the Forest Owner in the *minimum baseline level*, the Proponent is required by Section 6.2.1.1 of the FPP to demonstrate that the Project Area is an independent LMU. The FPP states that “LMUs are generally characterized by having unique biological, geographical, and/or geological attributes, are generally delimited by watershed boundaries and/or elevational zones, and contain unique road networks”, and three criteria are set for establishment of independent LMU status. An independent LMU must:

- Be a sustainable planning subunit as demonstrated by inventory reports and growth and harvest projections for the LMU.
- Demonstrate that the proportion of the LMU harvested in the past 10 years (averaged for either volume or area on an annual basis) is within 20 percent of the annualized area or volume projected for harvest (a valid projection must be between 10 years and 30 years). If the LMU was acquired less than 10 years previously, the demonstration must include whatever history exists and extend out 20 to 30 years.
- Where uneven aged management is utilized, have between 33 percent and 66 percent of the forested stands exceeding the retention standards identified in the growth and harvest projections by a minimum of 25 percent (basal area).

Field observations indicated that the two project areas are spatially distinct, largely contiguous in extent, served by independent road networks and of sufficient size to enable them to be effectively managed as independent management units. Since the Option A document submitted by the proponent did not have separate yield streams for the Willits Woods improved forest management project area, questions arose during the office visit as to the proponent's ability to demonstrate conformity to the first criterion. During that discussion, Jim Clark of North Coast Resource Management indicated that the yield streams had originally been modeled separately for the "Willits Woods" and "Longview" tracts and combined for reporting in the Option A document. As a follow-up, the proponent provided separate growth-and-yield analyses for the Willits Woods and Gualala River Forest carbon projects. A review of these documents indicated that the two project areas could be managed as separate sustained yield units over a 100-year period.

In an e-mail from Reserve staff dated February 1, 2011, SCS received guidance indicating that the intent of the second criterion was for the proponent to use whatever history exists under the current Forest Owner. However, it was still unclear how conformance with the second criterion could be demonstrated, since no harvesting has occurred in the Project Area since the Project's start date. It was also unclear to the verification team how the Forest Owner could demonstrate conformance with the third criterion. However, in guidance communicated on July 12, 2011 and memorialized in a document entitled "CAR-Forestry_CR_LMUguidance_071211.pdf", it was indicated that the Reserve considered each of the Gualala River Forest and Willits Woods Project Areas to be distinct Logical Management Units.

Therefore, the verification team concluded that the *minimum baseline level* was appropriately set equal to the above-ground standing live carbon stocks per acre at the Project's start date.

Having established the *minimum baseline level*, the proponent determined the baseline above-ground standing live carbon stocks by modeling above-ground standing live carbon stocks through a series of growth and harvesting scenarios over 100 years and averaging the model results over the 100-year timeframe, so that the baseline is expressed as a single (average) value for above-ground standing live carbon stocks per acre in every year.

Section 6.2.1.2 of the FPP requires that the baseline modeled by the Forest Owner must incorporate all applicable legal constraints and obligations. The Forest Owner satisfied this requirement by modeling the basal area retention standards and harvesting restrictions required by the California Forest Practices Rules as well as constraints associated with northern spotted owl centers and Watercourse and Lake Protection Zone (WLPZ) areas. The FPP also requires that, for forest projects located within California, "the baseline must be modeled to reflect all silvicultural treatments associated with timber harvest plans (THPs) active within the Project Area at the time of the project's initiation." A number of THPs have been approved for the Project Area since the project start date; however, no THPs were active as of the project start date. Therefore, the verification team has determined that the proponent is not required to model the constraints associated with the currently active THPs, including the proponent's Option A document, in the baseline. However, the proponent has voluntarily chosen to model some of the constraints associated with the Option A document in the baseline.

The FPP states that “For portions of the Project Area not subject to THPs (or over time periods for which THPs will not be active), baseline carbon stocks must be modeled by taking into account any applicable requirements of the California Forest Practice Rules and all other applicable laws, regulations, and legally binding commitments that could affect onsite carbon stocks.” SCS determined that the silvicultural regime modeled in the baseline scenario accurately reflects all applicable laws, regulations, and legally binding commitments that could affect onsite carbon stocks.

As described in Section 10 of the Project Design Document, the target stocking in the project scenario is “180 to 210 square feet of conifer basal area per acre, and approximately 32,000 board feet per acre of conifer volume”. This is approximately twice the conifer basal area and conifer board foot volume that has been modeled to occur by the end of the 100-year crediting period under the baseline scenario. Interestingly, the target condition under the project scenario is very similar to that which is projected to occur under the Option A document. Interviews with Coastal Ridges, LLC’s staff have revealed that the large differences in carbon stocking between the baseline and projected project scenarios are driven predominately by the fact that basal area retention standards in the baseline scenario are set to the minimum allowed by the California Forest Practices Rules, whereas the basal area retention standards in the Option A modeling are generally higher. The proponent has affirmed that the higher basal area retention standards were a voluntary decision by Coastal Ridges, LLC and were not a condition of the Option A document’s approval by the California Department of Forestry and Fire Protection.

Because not all of the Willits Woods project area was available for timber harvest, a “constraint analysis” was conducted. As described in Attachment C of the Project Design Document, it is the Forest Owner’s policy not to harvest within 25 feet of Class I watercourses. It was determined that 111 acres are located within 25 feet of a Class I watercourse, and thus unavailable for harvest. In addition, known spotted owl centers were given a 1,000-foot buffer, and 639 acres of spotted owl buffer exists within the project area. Finally, a 60-acre segment of the project area is unavailable for harvest by deed restriction. The total constrained area is thus 810 acres. Following completion of the “harvest baseline” modeling, the constrained acreage was accounted for by growing the inventory data forward, without harvest, to produce a “no-harvest baseline” for the 100 years of the crediting period. For each 10-year period, the area-weighted average of the “harvest baseline” and the “no-harvest” baseline was computed. These values were then averaged to produce the average baseline value reported in Section 9.3 of the Project Design Document.

Therefore, SCS has determined that the modeling scenario of the improved forest management project accounted for all of the laws, regulations, and legally-binding commitments applicable to the Project Area.

The baseline modeling was performed using Visual CRYPTOS, a front end for CRYPTOS, which is a Reserve-approved growth model (see Appendix B.1 of the FPP). In an email communication dated January 20, 2011, Reserve staff indicated that models that are a CRYPTOS front end are considered approved by the Reserve.

SCS verified the baseline modeling by interviewing Coastal Ridges, LLC personnel regarding the baseline modeling, reviewing the scripts that were used to drive the baseline model, and reviewing model output and confirming that it is comparable to what would be expected.

7.2 Harvested Wood Products

Carbon stored in harvested wood products in the baseline scenario that would have remained in use or in landfills for at least 100 years was accounted for according to the guidance in Appendix C of the FPP. All of the values included in the project's reporting spreadsheet were verified to be correct. Because carbon in harvested wood products in the baseline scenario was greater than carbon in harvested wood products in the project scenario, it was required that this value be deducted from the project's carbon benefits.

The Forest Owner calculated carbon in harvested wood products by converting the cubic-foot volume in harvested conifer trees to metric tonnes of carbon using the wood density values from Table C.1 of the FPP and appropriate conversion factors. The mill efficiency factor of 0.675 was then applied (taken from the "Mill Efficiencies by Region" section of the Assessment Area Data File). The carbon storage over 100 years in in-use wood products, and the carbon storage over 100 years for wood products in landfills, were calculated using weighted average factors taken from Sections C.3 and C.4 (weighted by the estimated proportion of carbon in each product class). SCS has verified the accuracy of these calculations.

7.3 Secondary Effects

Estimated annual secondary effects were also computed for the Willits Woods forest carbon project. This value was determined to be 20% of the difference between the actual and baseline carbon in harvested wood products, should this difference be negative. In the case of the Willits Woods forest carbon project, the annual difference between the actual and baseline carbon in harvested wood products was negative. The secondary effect adjustment was calculated to be 18,627 metric tonnes of CO₂e per year. This value was subtracted from the annual estimate of quantified GHG reductions and removals for each of the vintages of the reporting period.

7.4 Verification Cruise

On December 15-18, 2010, Davey Resource Group, a contract cruising firm retained by SCS, visited the Willits Woods forest carbon project to re-measure a selected number of plots for verification. These plots were selected using a cluster sampling procedure that is fully described in a report that is available under separate cover. The cruising firm was instructed to measure the plots using the sampling design employed by Coastal Ridges, LLC. Per the verification criteria elaborated by the Climate Action Reserve Forest Project Protocol, SCS verified the inventory estimates of onsite carbon stocks by cruising five clusters of four plots each. The tools used by the SCS contractors to complete the re-measurements were:

- Compasses, adjusted for the declination of the project area;

- Laser Rangefinder/Hypsometer for measuring distances and tree heights;
- Logger tape for diameter at breast height (DBH) and distance measurements; and
- Fiberglass tape for distance measurements.

While all trees larger than 0.6 inches DBH were measured in the Forest Owner's inventory, only trees larger than 2.5 inches DBH were used in the carbon estimate, and therefore only trees larger than 2.5 inches DBH were considered for inventory verification. Every reasonable effort was made to replicate the Forest Owner's measurement protocol where appropriate, and a special effort was made to number trees according to the manner in which they were most likely numbered in Coastal Ridges, LLC's inventory. Time was dedicated during the site visit conducted by the audit team to monitor the work of the contract cruising firm to ensure that the work was conducted according to SCS quality standards and to identify and mitigate any possible issues. During this time, the proponent expressed some concern that, because the verification inventory was conducted 2.5 years after the original inventory, in-growth into the sample plots and the damage and death of some standing trees would be sufficient to cause a statistically significant difference between the SCS inventory and the Forest Owner's inventory, even if the Forest Owner's measurements were taken without error. Therefore, both the SCS tree list and the Forest Owner's tree list were modified as described in a report that is attached as Appendix II. The most important modifications made are summarized as following:

- The Forest Owner used CRYPTOS to model expected diameter increment, over 2.5 growing seasons, by species and diameter class. These increments were confirmed to be reasonable by Joe McGuire, Registered Professional Forester.
- For all trees that were suspected to have grown into one of the nested plots over 2.5 years, the tree's diameter in 2010 was subtracted by the appropriate increment. If this "back-grown" diameter was less than the diameter cut-off for the plot in which the tree was sampled in 2010, the tree was placed in the smaller plot size (if the tree was suspected of having grown from a smaller plot into a larger plot) or stripped from the dataset (if the tree was suspected of having grown into the sample).
- Trees that were suspected as having died or experienced breakage since the 2008 inventory were converted to live trees or trees without breakage, as appropriate.

Only a subset of heights were measured in the Willits Woods inventory (as described in Attachment B to the Project Design Document), and a species-specific series of diameter-height regression equations was created from this dataset to impute heights to the trees for which heights were not measured. It was realized that, if SCS implemented this methodology on the subset of plots visited, different diameter-height relationships, and thus different height measurements, would result even if the height measurements taken by SCS and the Forest Owner on individual trees were equal. Therefore, SCS measured heights on the trees where height was measured by the Forest Owner only to confirm that the height measurements taken by the Forest Owner were within reasonable margins of error (an example of a reasonable margin of error would be 10-15 feet on a mature redwood). Once this was confirmed, SCS adopted the diameter-height regression equations created by Forest Owner to impute height values to all trees prior to performing the t-test.

Following these modifications, SCS compared its data to that of Coastal Ridges, LLC for the Willits Woods forest carbon project. Per Section 10.3.5 the FPP, SCS conducted this comparison using a paired t-test at an 80% confidence level (i.e. $\alpha=0.2$) to determine if its inventory was within the same population as the inventory conducted by Coastal Ridges, LLC. The t-test was performed using cubic foot volume as its metric of comparison and the Willits Woods forest carbon project inventory passed ($p=0.78$), demonstrating the soundness of Coastal Ridges, LLC's inventory. The results of the t-test confirmed SCS' impression in the field that the inventory was of high quality. The average difference between the Forest Owner's estimates and SCS' estimates on the subset of inventory plots visited was 128 cubic feet per acre, or 1.4 % of SCS' estimates.

A secondary purpose of the verification cruise was to determine whether the sampling methodology for forest inventory employed for the Willits Woods forest carbon project met the requirements of Table A.2 of the FPP. A discrepancy between the requirements of Table A.2 and the inventory specifications was discovered with regard to the measurement of standing dead trees. Table A.2 requires that the stated minimum DBH for standing dead trees be no greater than 5 inches, and that the minimum height of standing dead trees be no less than 15 feet. The inventory protocol for standing dead trees specified a minimum DBH of 10.5 inches and a minimum height of 20 feet for inclusion in the inventory. Guidance from the Reserve, in an e-mail dated January 20, 2011, indicated that an ad-hoc approach to adjusting carbon stocks in dead trees would be an acceptable means of accounting for this discrepancy, and SCS accepted the ad-hoc solution proposed by the Forest Owner. This solution necessitated a slight upward adjustment to carbon stocks in standing dead trees.

Following this adjustment, SCS can attest that all of the required carbon pools were accounted for adequately and correctly. Section 4.5 of the Project Design Document describes monitoring processes for forest inventory measurements, growth and yield projections, and following disturbance events, which are in conformance with the Reserve's Forest Project Protocols.

7.5 Verification Plot

SCS reviewed the carbon estimates developed from the Willits Woods forest carbon project inventory and species-specific biomass equations. Following the guidance of Section 10.3.5 of the FPP, SCS provided Coastal Ridges, LLC with a 'verification plot' which consisted of all of the tree species in the project area of varying diameters and heights. This plot consisted of trees from the 2008 inventory that were grown forward to 2011. Given the special methodology utilized by the proponent to calculate carbon mass of standing dead trees, standing dead trees were given special emphasis in the construction of the verification plot.

Coastal Ridges, LLC calculated the carbon tonnes for this plot and SCS confirmed that all of the conversions, expansions, and calculations for standing live trees were performed correctly, matching SCS's calculation using the same formulae and tools used by Coastal Ridges, LLC. Therefore, SCS has attained a reasonable level of assurance that no material errors exist in the calculations of carbon for the Willits Woods forest carbon project.

7.6 Computations

The methodology used by the Forest Owner to grow carbon stocks backward from the summer of 2008 to the winter of 2004 was complex, and therefore considerable effort was put forth reviewing the Forest Owner's computations and any assumptions made. SCS verified the inventory in sections. First, the 2008 plot data grown forward to 2011 was verified. The computations for individual trees were verified during the Verification Plot exercise detailed in Section 7.5. Following this exercise, the entire list of trees grown backward to January 1, 2004, and the entire list of trees grown forward to December 31, 2011, was checked to determine that no errors had occurred in applying the Forest Owner's stated methodology. The inventory estimate, growth estimates and sampling error were computed using a combination of CRYPTOS modeling, SQL queries and Excel spreadsheets. SCS thoroughly reviewed all lines of computer code and SQL statements used to compute these estimates. SCS also verified the actual computations for the estimate of sampling error. No material misstatements were discovered during this review.

7.7 Confidence Deduction

The Climate Action Reserve Forest Project Protocols require all forest projects to account for the statistical uncertainty of the forest carbon inventory estimates. Using the 2008 sample plot data grown forward to December 2010, Coastal Ridges, LLC calculated the sampling error for the forest project which is defined as a percentage of the mean inventory estimate from field sampling at a 90% confidence interval. The sampling error is reported to be 6.94%, yielding a confidence deduction (rounded to the nearest 0.1%) of 1.9%. This determination was verified to be accurate by SCS. The confidence deduction can be updated with an on-site verification, remaining unchanged between verification site visits.

8 Verification Opinion

SCS was able to arrive at a positive opinion on the accuracy of the calculated emission reductions and removals from the Willits Woods forest carbon project through a review of the Project Design Document, additional requested information, the site verification, and office visit with the Coastal Ridges', LLC team. SCS confirmed the soundness of the data regarding project eligibility, inventory procedures, baseline and project characterization, and methodologies related to the calculation of carbon stocks and GHG reductions and removals. Through the verification assessment, SCS has determined that the Willits Woods forest carbon project, developed by Coastal Ridges, LLC, is in conformance with the Climate Action Reserve Forest Project Protocols. Furthermore, all issues identified during the verification were resolved and found to be in conformance with Reserve standards. The Project Design Document and data are considered accurate, complete, transparent, and free of material misstatements.

Therefore, SCS is able to issue a positive Verification Opinion for the 1,000,803 metric tonnes of CO₂e emission reductions and removals (CRTs) by the Willits Woods forest carbon project for the initial reporting period. While SCS suggests that all 1,000,803 CRTs be issued, 20.937% of the project's CO₂e emission reductions and removals (209,537 metric tonnes of CO₂e) should be set aside in the Reserve's buffer pool. As such, SCS suggests that the Willits Woods forest carbon

project be issued a total of 791,266 CRTs, net of buffer pool deduction, for the initial reporting period. The Climate Reserve Tonnes identified in this verification report are consistent with those claimed by the Forest Owner in the Project Design Document and on the Reserve website, and can be broken down by year (net of buffer pool deduction) as follows:

Emission Year	GHG emission reductions/removals, before buffer pool deduction (CRTs)	Buffer pool deduction (CRTs)	CRTs suggested to be issued to Forest Owner (CRTs)
2004	45,859	9,602	36,257
2005	108,940	22,809	86,131
2006	117,275	24,554	92,721
2007	126,078	26,397	99,681
2008	135,375	28,343	107,032
2009	145,194	30,399	114,795
2010	155,565	32,570	122,995
2011	166,517	34,863	131,654
Total	1,000,803	209,537	791,266

Abbreviations and Acronyms

C	Carbon
CH ₄	Methane
CO ₂	Carbon dioxide
CRT	Climate Reserve Tonne
FIA	Forest Inventory and Analysis
FPP	Forest Project Protocol
FRAP	CAL FIRE Fire and Resource Assessment Program
GHG	Greenhouse gas
lb	Pound
IFM	Improved Forest Management
N ₂ O	Nitrous oxide
PF	Professional Forester, in the case of California a 'Registered Professional Forester'
PIA	Project Implementation Agreement
Reserve	Climate Action Reserve
RPF	Registered Professional Forester, a person registered to practice professional forestry in California
USFS	United States Forest Service

Appendix I:
Scientific Certification Systems (SCS)
Verification Audit Agenda
Willits Woods
CAR Improved Forest Management Verification

Time	Process, Department or Function
Tuesday, December 14, 2010	
	Opening Meeting To be held at the office of North Coast Resource Management
9:00 am	Introductions Review and finalize the audit itinerary Brief Project Presentation To be given by North Coast Resource Management on the design of the project
9:30 am	Modeling Discussion regarding FPP Verification Checklists 5.1, 5.2, 5.6 • Documentation (FPP 6.2) • Baseline conditions (FPP 6.2.1) • Simulation (FPP 6.2.1, Appendix B.1) • Assumptions (FPP Appendix B) • Constraints (FPP 6.2)
12:00 pm	Lunch (eaten in-office; to be provided by client)
12:30 pm	Inventory Discussion regarding FPP Verification Checklists 5.2, 5.3, 5.5, 5.7 • Selected pools • Procedure • Estimation • Accuracy • Wood products
2:30 am	Project Activities Discussion regarding FPP Verification Checklists 5.1, 5.2, 5.4, 5.8 • Eligibility • Definition of Project Area • Management Activities • Natural Forest Management • Risk ratings
4:00 pm	Private Review of Findings Auditors to hold a private meeting
4:30 pm	Closing Meeting Discuss findings and next steps

Time	Process, Department or Function
5:00 pm	Adjourn
Wednesday, December 15, 2010	
7:00 am	Cruising overview Meet check cruisers from Davey Resource Group at intersection of Hwy 20 and Grouse Ridge Rd • Presentation by Verifiers on methodology for plot selection and compilation of results • Observation of re-measurement of plots 62 and 63 by check cruisers • Discussion of any Issues that surface regarding accuracy of 2008 inventory
12:00 pm	Lunch (eaten in woods; Verifiers will provide own food)
12:30 pm	Tour of project area Sites will be visited at discretion of Lead Verifier
4:30 pm	Closing meeting Review of additional findings (if any) and next steps
5:00 pm	Adjourn

Scientific Certification Systems (SCS) Verification Audit Plan

Auditor/ Audit Team:

Roles of the Audit Team (and accompanying persons):

Lead Auditor:	Robert J. Hrubes, Ph.D. Senior Vice President, SCS Qualified CAR Forest and Urban Forest Project Lead Verifier Lead Auditor will coordinate verification activities, issue findings, write Verification Report and issue the Verification Opinion.
Auditor:	Zane Haxton GHG Verification Forester, SCS Auditor will assist with verification activities, suggest findings, and contribute to the Verification Report.
Auditor:	Joe McGuire Forestry Consultant, Contractor to SCS Qualified CAR Forest and Urban Forest Project Lead Verifier Auditor will assist with verification activities, suggest findings, and contribute to the Verification Report.
Technical Reviewer:	Ryan Anderson Contract Verification Forester, SCS Technical Reviewer will review verification activities, findings, Verification Report and Verification Opinion.

Verification Details:

Verification Scope:

The scope of this audit encompasses desk and site verification activities for the proposed project against the following requirements of the Climate Action Reserve:

- Forest Project Protocol Version 3.2, August 31, 2010
- Program Manual (March 2010)
- Verification Program Manual (June 2009)

The verification will be performed using the client-supplied project design documents and other supporting documentation.

Scope Statement

The organizational and geographical boundaries of the project have been identified as follows: Physical boundary of Willits Woods project

The physical infrastructure, activities and/or technologies of the project are understood as follows: Forest carbon sequestration through improved forest management

The GHG sources, sinks and/or reservoirs have been identified as follows: Pools IFM-1, IFM-3, IFM-7, IFM-8, IFM-9, IFM-14, and IFM-17 as defined by the Forest Project Protocol, version 3.2.

Greenhouse gases included in the evaluation are CO₂

Verification Objectives:

- Evaluate conformance with the forest project criteria as defined in the Climate Action Reserve Forest Project Protocol;
- Determine with a reasonable level of assurance whether the GHG project has resulted in the GHG emissions reductions and/or removals as stated in the project documents;
- Evaluate the project planning information and documentation, including the baseline and inventory carbon estimates, buffer pool contributions, monitoring, and natural forest management requirements.

Verification Criteria:

SCS shall assess the completeness of the project document to ensure that all requirements of the CAR protocols have been addressed. SCS shall assess whether or not the project document respects the principles of the CAR protocols.

Level of Assurance:

SCS will perform the core verification activities described by CAR in the Forest Project Protocol to determine whether it has the reasonable level of assurance that the proposed project's GHG removals or reductions are materially correct. SCS will use CAR's criteria to determine if there exists reasonable assurance that the project documentation addresses each requirement in the Forest Project Protocol. Only projects in compliance with the CAR Forest Project Protocol will be verified.

Treatment of Materiality:

For the forest inventory, a material misstatement must be declared if the reported forest inventory does not appropriately describe the forest area and differs greatly from the verifier's assessment of the inventory, changes in stocks, and emissions reductions estimates as described in more detail in the CAR Forest Project Protocol.

To meet the CAR minimum quality standard, the forest entity's inventory data will be compared to the verifier's inventory data as described in section 10.3.5 of the CAR Forest Project Protocol Version 3.2. Specifically:

"Each plot set is installed by the verification body, or a consultant hired by the verification body, for an identified area and compared to the Forest Owner's reported inventory for the same area. The comparison is analyzed using a paired T-test at the 80 percent confidence interval to determine if the inventory is within the same population as the inventory submitted by the Forest Owner. A plot set will either support or raise concerns about the accuracy of the Forest Owner's inventory. A Forest Owner receiving an 80 percent score or better has demonstrated that their inventory is sound."

Estimates that do not fall within this threshold will be considered materially inaccurate.

Methodology for On-Site Control Systems Review:

Site visit, interviews with North Coast Resource Management personnel, North Coast Resource Management presentation.

Sample size:

16 verification plots, as determined using checklist 5.5 of the Forest Verification Protocol, Version 3.2.

Methodologies for Data Testing and Crosschecking:

Desk and site review of data, interviews with North Coast Resource Management personnel

Methods for Quantitative and Qualitative analysis:

Desk and site verification activities, risk-based analysis, interviews with North Coast Resource Management personnel

As lead verifier I, Robert J. Hrubes, approve this verification plan.

Initial: 

Date: 12/10/2010

Appendix II: Data management processes for the Coastal Ridges t-tests and their rationale

By Zane Haxton
Verification Forester, SCS
January 14, 2010

Introduction

The Climate Action Reserve forest project protocol v3.2 requires that (Sec. 10.3.5):

“The verification body shall allocate the verification plot sets... each plot set is installed by the verification body, or a consultant hired by the verification body, for an identified area and compared to the Forest Owner’s reported inventory for that same area. The comparison is analyzed using a paired T-test at the 80 percent confidence interval [i.e. an alpha value of 0.2] to determine if the inventory is within the same population as the inventory submitted by the Forest Owner.”

When verification plots are installed immediately after completion of the Forest Owner’s inventory, no modification of the above procedure is necessary. However, certain issues arise when verification plots are installed some time after the original inventory. This is especially the case when the trees in the Forest Owner’s inventory were sampled with a probability proportional to the tree’s diameter.

In the Forest Owner’s inventory for the Gualala River Forest and Willits Woods IFM projects (hereafter collectively known as the Coastal Ridges projects), trees were initially sampled with the following nested fixed plot scheme: a 1/250th ac plot was used for conifers 2.5-3.4” DBH; a 1/50th ac plot was used for conifers 3.5-10.4” DBH and hardwoods 3.5” DBH and larger; and a 1/5th ac plot was used for conifers 10.5” DBH and larger. Trees less than 2.5” DBH were originally sampled by the Forest Owner but have been ignored in the verification plots since they were not included in the carbon estimate.

The Forest Owners’ inventory was completed in the summer of 2008. When SCS staff observed verification plots being installed along with staff of North Coast Resource Management (the landowner’s representative), the following potential problems with the t-test methodology were identified:

Diameter at breast height (DBH) values were initially taken to the nearest inch, and then grown forward with the CYPTOS growth-and-yield software. Two sources of error are caused by this procedure: rounding error caused by taking DBH to the nearest inch, and modeling error caused by growing the trees forward in CRYPTOS.

In addition, it was observed that trees likely grew into larger diameter classes since the 2008 measurements. This was observed with several trees during the first day of verification cruising. The effect of this problem is different depending on whether the tree was sampled in 2008 or not. If the tree was sampled in a smaller plot in 2008 but switched to a larger plot in 2010, the expansion factor for that tree would decrease (e.g. a tree moving from a 1/50th ac plot to a 1/5th ac plot would have its per-acre expansion factor change from 50 to 5) and the tree would contain much less carbon on a per-acre basis. All other things being equal, this would cause lower carbon values in SCS-measured plots as compared to 2008 Forest Owner plots grown to 2010. Alternatively, the tree might have been too far away from plot center to be sampled in 2008. In this case, all other things being equal, its inclusion would cause higher carbon values in SCS plots as compared to 2008 Forest Owner plots grown forward.

A final issue arose because the Forest Owner sampled only a subset of trees measured in 2008 for height in the Willits Woods inventory. The first of each species on the plot encountered on a clockwise swing from north (0°) was measured for height, and species-specific height-diameter regression equations were created from this height data. Measuring the first tree from north is a sampling scheme with known theoretical bias³, but the practical effect of this bias is likely to be negligible in the short term. The article referenced below states that “generally speaking, this method tends to favor trees on the outside of clumps, and those which are isolated.” If that is the case, and given that more open-grown trees tend to have a greater diameter for a given height, use of this sampling scheme may result in a slight underestimation of height, leading to more conservative carbon stock estimates.

SCS generally strives to replicate measurement techniques used by the Forest Owner, but a difficulty was created by the fact that SCS would be measuring only a subset of trees originally measured by the Forest Owner. Even if SCS’s measurements for this subset were identical to those of the Forest Owner, a different set of regression equations would result, and this different set of equations could cause differences in carbon stock estimates even if the Forest Owner’s measurement techniques were sound.

Procedure

Because the objective of the t-test procedure is to determine the soundness of the inventory installed by the Forest Owner, it is important to ensure (to the extent reasonable) that the test is not complicated by rounding error, tree growth, and other problems that are not related to the quality of the Forest Owner’s measurements. In response to the aforementioned issues, the SCS data will be processed in the following manner prior to the t-test:

1. Trees that are in the SCS dataset that were not recorded by the Forest Owner in 2008 will be tested to see if they count as ingrowth. This will be done by taking the SCS-measured DBH

³ For more information, see “Is it true that... the first tree from north is a random tree?” (<http://www.proaxis.com/~johnbell/iitt/iitt35a.htm>). This article is from the online version of the John Bell & Associates Inventory & Cruising Newsletter, a well-respected source of practical forest inventory information.

and subtracting the expected diameter increment over 2.5 years (given by species and DBH class in Tables 1 and 2 below)⁴. Since SCS does not have authoritative data on the tree's diameter in 2008, the assumption is that the tree in question is one diameter class less than the minimum DBH for each given sub-plot in 2008. Thus a tree being tested for ingrowth onto the 1/5th acre plot would utilize the calculated diameter increment value for the 10-11" DBH class, and trees being tested with regard to the 1/50th acre plot would use the calculated diameter increment value for the 2-3" DBH class. If the resulting value, rounded (using the ROUND function in Excel) to the nearest 0.1 inch, is less than the minimum DBH for inclusion in the sample, that tree will be determined to be ingrowth and given an expansion factor of 0 (i.e. removed from the SCS dataset). Otherwise the trees will be retained in the SCS dataset using the expansion factor determined by SCS contractors.

2. Trees that are in both the SCS and Forest Owner datasets but are in a larger plot in the SCS dataset will be similarly tested. If it is determined that a tree grew into a larger plot using the procedure described above, that tree will be given the per-acre expansion factor it held in the Forest Owner inventory. Otherwise, the expansion factor will be unchanged.
3. Following the ingrowth analysis, all DBH values in the SCS dataset will be rounded to the nearest inch.
4. All trees in the Willits Woods verification plots will have their height predicted using DBH-height regressions developed by the Forest Owner. This is justified by the fact that SCS-measured heights were generally within 10 feet of Forest-Owner measured heights for the trees measured for height in Willits Woods, and therefore it is determined that the Forest Owner's height measurement procedure was sound. Predicted height values will be rounded (using the ROUND function in Excel) to the nearest 1 foot.
5. All SCS-measured trees in the Gualala River Forest verification plots will be processed using the SCS-measured height, as rounded (using the ROUND function in Excel) to the nearest 1 foot.

Table 1. Expected diameter growth over 2.5 years (inches) by species and DBH class for the Willits Woods project area.

DBH	RW	DF	OC	TO	OH
2-3	0.210	0.365	0.963	0.217	0.034
4-5	0.275	0.376	0.563	0.221	0.079
6-7	0.313	0.471	0.604	0.241	0.034
8-9	0.385	0.593	0.937	0.348	0.113
10-11	0.419	0.667	0.814	0.409	0.199
12-13	0.471	0.815	0.625	0.428	0.196
14-15	0.554	0.972	0.681	0.499	0.067
16-17	0.704	1.057	0.848	0.426	0.211
18-19	0.864	1.087	0.959	0.423	0.098

⁴ These values have been provided by Jim Clark of North Coast Resource Management and vetted as reasonable by Joe McGuire of Buena Vista Services, RPF.

20-21	1.037	1.155	0.955	0.297	0.189
22+	1.000	1.018	0.980	0.323	0.138

Table 2. Expected diameter growth over 2.5 years (inches) by species and DBH class for the Gualala River Forest project area.

DBH	RW	DF	OC	TO	OH
2-3	0.092	0.203	0.223	0.007	0.136
4-5	0.132	0.376	0.323	0.093	0.048
6-7	0.231	0.331	0.604	0.156	0.064
8-9	0.338	0.487	0.608	0.210	0.263
10-11	0.323	0.631	0.978	0.334	0.141
12-13	0.410	0.758	1.062	0.100	0.199
14-15	0.496	0.854	1.127	0.313	0.311
16-17	0.569	0.925	0.907	0.205	0.115
18-19	0.777	0.967	1.361	0.018	0.305
20-21	0.918	0.965	1.368	0.111	0.179
22+	0.827	0.842	1.335	0.048	0.188

The inventory measurements provided by the Forest Owner will be processed as follows:

1. DBH measurements as taken by the Forest Owner and grown forward to 2010 using CRYPTOS will be rounded to the nearest 1 inch.
2. Trees with DBH less than 2.5" will be given an expansion factor of 0 (i.e. removed from the dataset).

The metric used for the t-test will be total stem cubic foot volume (CVTS) per acre. This is a preferred metric because it has a high correlation with biomass for a given species and allows verification of both diameter and height measurements while simultaneously being a metric familiar to both the Forest Owner and SCS staff. CVTS will be calculated for each tree using the FIA equations listed in Table 3. CVTS for dead trees will be computed using the methodology given in the Forest Owner's project design description.

Table 3. FIA equations used by species for cubic foot volume estimation.

Species	Equation
Redwood	24
Douglas-fir	3
Sugar pine	20
Tanoak	34
Other hardwood	40

Appendices A (for Willits Woods) and B (for the Gualala River Forest) outline tree-specific procedures to be implemented to account for tree death, breakage and other “problem trees”. These procedures will be implemented before the general data processing procedures described previously.

Tree-specific modification for Willits Woods plots

Because the verification plots for the Coastal Ridges audits have been installed 2.5 years after the original cruise, some changes in the condition of individual trees have been detected. Tree mortality and breakage has been the most common cause of change. Because the objective of the t-test is to verify the inventory at the time of its installation, the Forest Owner is being given the benefit of the doubt where discrepancies in the status (live or dead), or the potential for tree breakage, are found.

The following trees will be modified in the SCS dataset:

- a. Tree 1 on plot 62 is a snag which has fallen over since 2008. This tree will be included in the verification sample as a 15” 58’ tall snag.
- b. Tree 5 on plot 86 died since the 2008 inventory. This tree will be included in the verification sample as a live tree.
- c. Tree 12 on plot 145 died since the 2008 inventory. This tree will be included in the verification sample as a live tree.
- d. Tree 2 on plot 245 has been shattered at DBH since it was measured in 2008. This tree will be included in the verification sample as a 14” DBH tree.