RUBY CANYON ENVIRONMENTAL

&

FORST CORP

# Offset Verification Report

CAFR5011-CAR993 Yurok Tribe/Forest Carbon Partners CKGG Improved Forest Management Project

Reporting Period:
April 1, 2019 – March 31, 2020

Prepared for:

The Yurok Tribe

November 4, 2022

Ruby Canyon Environmental, Inc.
743 Horizon Ct. Suite 385
Grand Junction, Colorado 81506
(970) 241-9298
www.rubycanyonenv.com

# Table of Contents

Table of Contents ..... ii
1.0 Introduction ..... 1
1.1 Project Background & Site Description ..... 1
1.2 Responsible Parties ..... 1
1.3 Verification Team ..... 1
1.4 Objectives ..... 1
1.5 Scope ..... 1
1.6 Verification Criteria ..... 2
2.0 Verification Activities Summary ..... 2
3.0 Project Overview ..... 5
3.1 Assessment of the GHG Reduction Project Operations ..... 5
3.2 GHG Project Boundary (sources, sinks and/or reservoirs) ..... 5
3.3 Project Type – Improved Forest Management ..... 5
4.0 Eligibility Rules and Other Requirements ..... 6
4.1 Additionality ..... 6
4.2 Offset Project Commencement, Crediting Period and Project Life ..... 6
4.3 Project Location and Project Area ..... 6
4.4 Regulatory Compliance ..... 7
4.5 Forest Owner & OPO ..... 7
4.6 Sustainable Harvesting Practices ..... 7
4.7 Natural Forest Management ..... 7
4.9 Balancing Age and Habitat Classes ..... 7
5.0 Interviews ..... 7
6.0 Quantitative Review of Emission Reductions/Removals Enhancements Assertion ..... 8
6.1 Baseline Modeling ..... 8
6.2 Inventory and Modeling Updates ..... 8
6.3 Actual Harvested Wood Product ..... 8
6.4 On-site Inventory Verification Check ..... 8
6.5 Inventory and Calculation Review ..... 8
6.6 Forest Offset Reversal ..... 8
6.7 Project Reversal Risk Rating ..... 9
6.8 Assessment of GHG Emissions Reductions Calculation and OPDR ..... 9
6.9 Offset Project Data Report ..... 9
7.0 Issues Log ..... 9
8.0 Conclusion ..... 9
Appendix A – Verification Plan ..... 11
Appendix B – SSR Ranking and Review ..... 14
Appendix C – Documents/Files Reviewed ..... 15
Appendix D – Recalculations ..... 17
Appendix E – Issues Log ..... 18

# 1.0 Introduction

Ruby Canyon Environmental, Inc. (RCE) was contracted to perform the verification of the CAFR5011-CAR993 Yurok Tribe/Forest Carbon Partners CKGG Improved Forest Management Project (Project) for the reporting period from April 1, 2019 – March 31, 2020 to the California Air Resource Board's (ARB) Compliance Offset Protocol for U.S. Forest Projects (October 20, 2011) (Protocol). RCE is an accredited verification body (H2-19-008) under the California Cap-and-Trade Program and this verification was conducted under Regulation requirements in addition to the requirements of the Protocol. The Project is currently listed on the Climate Action Reserve (Reserve), an ARB-approved Offset Project Registry (OPR).

RCE teamed with FRST Corporation (FRST) as subcontractors to assist in the completion of this verification.

## *1.1 Project Background & Site Description*

The Project entails improved forest management (IFM) on 7,660 acres located within and near the Yurok Reservation in Humboldt County, CA. The Project area includes Douglas-fir and tanoak primarily, along with other native conifers and hardwoods.

## *1.2 Responsible Parties*

Offset Project Operator (OPO)
The Yurok Tribe (Yurok Tribe)
190 Klamath Blvd
Klamath, CA 95548

Technical Consultant (TC)
BBW & Associates, Inc. (BBW)
PO Box 702
Arcata, CA 95518

## *1.3 Verification Team*

The RCE Verification Team consisted of the following individuals:

Lead Verifier: Zach Eyler, RCE (H2-19-116)
Biometrician: Andrea Eggleton, FRST (CA RPF ID: 3003, SAF CF ID: 169646, ARB ID: H2-20-194)
Professional Forester, Project Specialist: Christian Eggleton, FRST (CA RPF ID: 3073, ARB ID: H2-18-220)
Team Members: Tim Facemire, FRST (ARB ID: H2-20-248), Andrew Russo, FRST, Anna Woodall, FRST
Independent Reviewer: Phillip Cunningham, RCE (ARB ID: H2-20-186)

## *1.4 Objectives*

The goal of the verification activities was to ensure that the OPO's total reported GHG reductions are free of offset material misstatement (as defined in the Regulation §95802(a)(244)), and that the Forest Project Monitoring Report and the Offset Project Data Report (OPDR) conforms to the requirements of the Protocol and the Regulation.

## *1.5 Scope*

The scope of the verification consisted of the following independent and objective activities:

- Review the Project documentation against the Verification Criteria listed in Table 1 and develop a verification plan and sampling plan

- Review Project ownership documentation
- Review Project eligibility
- Check calculation results and methods to assess the correctness of the emission reductions from sequestration activities
- Desktop Verification Activities:
    - Review data management and monitoring systems
    - Check calculation results and methods to assess the correctness of the baseline and emission reductions claimed
    - Review records and additional documentation (permits, legal documentation, harvest support data, etc.)
    - Assess Project for compliance to the Protocol and the Regulation
    - Review Offset Project Data Report for compliance to the Protocol and the Regulation
- Submit requests for corrective actions, non-material findings, additional documentation and clarifications, as necessary, and document all items in the Issues Log; and,
- Issue an Offset Verification Report (OVR), Issues Log, and Offset Verification Statement (OVS) to the OPO/TC and Reserve.

## *1.6 Verification Criteria*

**Table 1 – Verification Criteria**

| Criteria | Details |
|---|---|
| **Standard of Verification** | • Compliance Offset Protocol for U.S. Forest Projects (October 20, 2011)<br>• Final Regulation Order, Subchapter 10 Climate Change, Article 5, Title 17, California Code of Regulations, Sections 95800-96022 (April 1, 2019) |
| **Guidance Documents** | • ARB Technical Guidance for Offset Verifiers Verification of Offset Project Data Reports (October 2013)<br>• Compliance Offset Program for U.S. Forest Offset Protocol Frequently Asked Questions (October 29, 2013) |
| **Level of Assurance** | Reasonable assurance |
| **Inventory Minimum Quality Standard** | Inventory must pass the sequential sampling requirements found in Section 10 of the Protocol. |
| **Offset Material Misstatement (ARB)** | A discrepancy, omission, misreporting, or aggregation of the three, identified in the course of offset verification services that leads an offset verification team to believe that an OPDR contains errors resulting in an overstatement of the reported total GHG emission reductions or GHG removal enhancements greater than 5 percent.<br><br>Forest Projects are not eligible to receive a qualified positive verification statement. |

# 2.0 Verification Activities Summary

As the first step in verification activities, RCE developed a verification plan (Appendix A) to be followed throughout the verification. The verification plan consisted of the following activities:

- RCE submitted the COI and NOVS forms to the Reserve, ARB and the OPO. The Reserve approved the forms on April 15, 2022. RCE submitted revised forms during the verification process.
- RCE held a verification kickoff meeting with Yurok Tribe on April 27, 2022. This meeting was the start of verification activities and was after the OPDR was submitted. During the kickoff meeting, RCE reviewed the verification objectives, verification process, and the verification schedule. This meeting was attended by:
    - Ruby Canyon Environmental
        - Zach Eyler
    - FRST
        - Christian Eggleton
        - Tim Facemire
        - Andrew Russo
    - Yurok Tribe
        - Javier Kinney
        - Tim Hayden
    - BBW
        - April Sahara
        - Ben Aufdermaur
        - Paul Harper
- The Verification Team performed a strategic review and risk assessment of the received data and support documents in order to understand the scope and areas of potential risk in the GHG emissions reductions. Specifically, the Verification Team determined the following risks:

**Table 2 – Risk Identification**

| # | Identified areas of risk: | Qualitative narrative for reason that risk exists | Level of Risk (high, med, low) |
|---|---|---|---|
| 1 | Data acquisition equipment | Risk is more related to human error/inconsistencies in using measuring equipment (clinometers/ dbh tape, etc.) than in the equipment itself. | Medium |
| 2 | Data sampling and frequency | Plot data must be updated on a 12-year basis, or up to 18-years given certain restrictions. | Medium |
| 3 | Data processing and tracking | Data tracking is complex and involves several steps. Info taken by hand in electronic devices, transferred into databases and excel, which is transformed into CO2 data through calculations | Medium |
| 4 | Project baseline and annual GHG emissions, GHG reductions, and GHG removal enhancement calculations | Were calculations performed according to Protocol equations? | Medium |
| 5 | Data reporting | Has the project provided all the required documentation for verification to the OPR and ARB? | Low |

| | | | |
|---|---|---|---|
| 6 | Nat. forest mgmt. requirements | Must meet NFM requirements provided in protocol. | Low |
| 7 | Sustainable harvest requirements | No active harvesting. | Low |
| 8 | Management policies or practices in developing Offset Project Data Reports | Does the report contain any material misstatements? Does it contain all required sections? | Medium |
| 9 | Regulatory Compliance | Were there any violations during the reporting period? | Low |
| 10 | Harvesting | No active harvesting. | Low |
| 11 | Reversals | No reversals at this time. | Low |

- Pursuant to §95977.1(b)(3)(G)(2) of the Regulation, the Verification Team developed a ranking of GHG emissions sources, GHG sinks, and GHG reservoirs (SSRs) within the offset Project boundary by percent contribution to total $CO_2e$ emissions, GHG reductions, and GHG removal enhancements. The Verification Team also ranked GHG emissions sources, GHG sinks, and GHG reservoirs by calculation uncertainty. RCE used these rankings to target areas for document reviews and data checks. The methods of the reviews and checks were noted, and the information analyzed was summarized in the sampling plan. The full SSR table in the sampling plan can be found in Appendix B.
- Pursuant to §95977.1(b)(3)(G) of the Regulation, RCE developed a risk-based sampling plan based upon the strategic review and risk assessment. The verification plan and sampling plan were used throughout the verification and were revised as needed based upon additional risk assessments.
- The Verification Team reviewed a variety of documents and files provided by Yurok Tribe and BBW throughout the verification process. These documents were provided at the start of verification activities or were provided to RCE in response to items noted in the Issues Log. All documents and files reviewed by the Verification Team as part of the verification can be found in Appendix C. RCE retains all material and sampling plans for a minimum of 15 years, per §95977.1(b)(3)(K) of the regulation.
- Pursuant to §95977.1(b)(3)(D)(2)(f) of the Regulation, the Verification Team performed a comprehensive desk review of the submitted verification documents and relevant regulations to confirm that the Project complied at all times with all local, state, or federal environmental regulatory requirements, including health and safety regulations.
- Pursuant to §95977.1(b)(3)(L), the Verification Team performed data checks (more detail on data checks performed is provided in following report sections). The minimum data checks pursuant to section 95977.1(b)(3)(L)(3) were completed.
- Pursuant to §95977.1(b)(3)(O) and 95977.1(b)(3)(M) of the Regulation, the Verification Team submitted corrective action requests (CARs), non-material findings (NMs), additional documentation requests (ADRs) and clarification requests (CRs) to BBW as necessary throughout the verification and all requests are documented in the Issues Log.
- Pursuant to §95977.1(b)(3)(R)(2) of the Regulation, RCE's Independent Reviewer conducted a review of all verification activities, verification sampling, data checks, verification Issues Log, OVR, and OVS. The Independent Reviewer maintained independence from the offset verification services prior to conducting the review.

- The Verification Team produced a final OVR and OVS.
- Pursuant to §95977.1(b)(3)(D)(4)(d) of the Regulation, RCE held a verification exit meeting with BBW.

# 3.0 Project Overview

## *3.1 Assessment of the GHG Reduction Project Operations*

The Project entails improved forest management (IFM) on 7,660 acres located within and near the Yurok Reservation in Humboldt County, CA. The Project area includes primarily Douglas-fir and tanoak, along with other native conifers and hardwoods.

## *3.2 GHG Project Boundary (sources, sinks and/or reservoirs)*

GHG emission reductions for the Project are quantified by comparing actual onsite carbon stocks against modeled baseline onsite carbon stocks and baseline carbon in harvested wood products. The difference in these Project and baseline carbon stocks year over year is the basis for calculating the Project's primary goal of maintaining and enhancing forest GHG pools. Secondary effects made up of un-intentional GHG emissions from the Project (e.g. harvest leakage to non-Project lands) are also taken into account. Net GHG reductions and removals for each year are the sum of the Project's primary and secondary effects.

According to the Protocol, carbon dioxide ($CO_2$) is the only GHG considered within the boundary for the baseline and Project activities. Table 3 lists the sources of GHG emissions that RCE confirmed during the verification of the Project as required by the Protocol and §95977.1(b)(3)(D)(2)(a) of the Regulation.

**Table 3 Project GHG Sources, Sinks, and Reservoirs for IFM Projects**

| Activity | GHG Sources, Sinks & Reservoirs |
|---|---|
| **Baseline** | • IFM-1: Modeled standing live carbon ($CO_2$) in all portions of living trees.<br>• IFM-3: Modeled standing dead carbon ($CO_2$) in all portions of dead, standing trees.<br>• IFM-7: Modeled estimates of carbon ($CO_2$) in in-use forest products (100-yr average).<br>• IFM-8: Modeled estimates of carbon ($CO_2$) from forest products stored in landfills (100-yr average).<br>• IFM-17: Biological emissions from decomposition of forest products. |
| **Project** | • IFM-1: Measured standing live carbon ($CO_2$) in all portions of living trees.<br>• IFM-3: Measured standing dead carbon ($CO_2$) in all portions of dead, standing trees.<br>• IFM-7: Estimates of carbon ($CO_2$) in in-use forest products (100-yr average).<br>• IFM-8: Estimates of carbon ($CO_2$) from forest products stored in landfills (100-yr average). (Included as harvesting is below the baseline)<br>• IFM-14: Biological emissions from changes in harvesting on forestland outside the Project area (default 20% leakage).<br>• IFM-17: Biological emissions from decomposition of forest products. |

## *3.3 Project Type – Improved Forest Management*

The Project meets the definition and requirements of an IFM Project as specified in the Protocol. It meets the requirements because:

1. The Project takes place on land that has greater than 10 percent canopy cover.
    a. This was verified through on-site reconnaissance during the verification site visit, review of aerial photography, and verification sampling of the inventory.
2. The Project employs natural forest management practices, as defined in the Protocol.
    a. See Sections 4.6 and 4.7 of this report for documented verification of this requirement.
3. The Project does not employ broadcast fertilization.
    a. The Yurok Tribe has attested to this in the Listing Form. Further, FRST witnessed no evidence of broadcast fertilization during the verification site visit.

# 4.0 Eligibility Rules and Other Requirements

The Protocol specifies eligibility rules and other requirements that a Forest Project must meet in order to register reductions with ARB: Additionality, Offset Project Commencement, Project Crediting Period, Project Life and minimum Time Commitment, Project Location, Regulatory Compliance, Sustainable Harvesting Practices, and Natural Forest Management. The Project meets all the rules specified in the Protocol. Below is a summary of the Project's compliance to each requirement.

## *4.1 Additionality*

IFM Projects are considered additional if they meet the legal requirement and the performance tests. The Legal Requirement Test requires that forest Projects achieve GHG reductions and removals beyond those that would result from state, federal or local laws, regulations and ordinances. There are no legal requirements requiring activities that maintain or enhance forest carbon stocks in California. By passing the Protocol's legal requirement test, the Project also meets the regulatory additionality requirements pursuant to §95973(a)(2)(A) of the Regulation.

The Performance Test requires all Improved Forest Management Projects to achieve GHG reductions and removals beyond those resulting from "business as usual" activities defined in the Protocol. Under the Protocol, all IFM Projects that meet the requirements for baseline estimation pass the performance standard test. This Project meets the Protocol baseline estimation requirements (see Section 6.1 of this report), so the Project passes the performance test.

## *4.2 Offset Project Commencement, Crediting Period and Project Life*

The initial inventory for the Project was conducted on March 31, 2012, which is a qualifying action for offset project commencement. The Project was never previously registered as an early action project. Project crediting period and Project life are tied to the initial reporting period under the Compliance Protocol and the Project's crediting period is 3/31/2012 to 3/30/2037.

## *4.3 Project Location and Project Area*

RCE/FRST verified that the Project is located in and near the Yurok Reservation in Humboldt County, CA. RCE/FRST confirmed that the land is "Indian lands" of a Tribe, as defined by 25 U.S.C. §81(a)(1) and that The Yurok Tribe and ARB have signed a waiver of sovereign immunity document. RCE/FRST also reviewed maps submitted to the OPR as part of the Application for Listing documentation to confirm that the maps provided meet Protocol requirements.

## 4.4 Regulatory Compliance

Section 3.7 of the Protocol and §95977.1(b)(3)(D)(2)(f) of the Regulation require that all Projects follow applicable laws during all periods for which they attempt to claim credit. RCE confirmed that the Project received no violations during the reporting period through a review of EPA ECHO and OSHA databases.

## 4.5 Forest Owner & OPO

RCE/FRST reviewed documents demonstrating The Yurok Tribe ownership of the Project land and timber, thus documenting they had the authority to operate as the OPO.

## 4.6 Sustainable Harvesting Practices

The Protocol requires that, at the time commercial harvesting is either planned or initiated within a Project area, that the Project meets certain sustainable harvest requirements. The verification team confirmed that there was no harvesting performed during the reporting period.

## 4.7 Natural Forest Management

The Protocol requires that all Projects promote and maintain a diversity of native species and utilize management practices that promote native, natural forests diverse in structure, species composition and age class.

RCE/FRST confirmed that the Project meets the native species requirement that forest projects must consist of at least 95% native species based on a review of the inventory tree list. Additionally, RCE/FRST confirmed the Project has met the requirement that no single species exceeds the "Species Diversity Index" value.

RCE/FRST confirmed that the Project meets the "Distribution of Age Classes/Sustainable Management" requirement in Table 3.1 of the Protocol through field observation on the site visit, review of satellite imagery, and confirmation that no harvesting has occurred since project commencement.

RCE/FRST confirmed that the Project meets the requirement for age distribution during the site visit and through aerial imagery for this reporting period.

Finally, RCE/FRST confirmed that the Project meets the requirements for diversity of natural structural elements across the forested landscape, manifested by maintaining sufficient levels of standing and lying dead wood. The Project demonstrated that current standing dead stock is 1.64 mt C/acre and 2.1% of standing live carbon stocks, meeting the Protocol requirements.

## 4.9 Balancing Age and Habitat Classes

RCE/FRST confirmed that the Project area meets the requirements of the Protocol because age classes were confirmed on the site visit, and the project meets the COP sustainable harvesting practices requirements as described in Section 4.6.

# 5.0 Interviews

RCE and FRST held a number of interviews with Yurok Tribe, BBW, and technical consultants throughout the verification process. Discussions included an overview of their data management system, their inventory calculations, and modeling, pursuant to §95977.1(b)(3)(D)(2)(b) and §95977.1(b)(3)(D)(2)(c) of the Regulation. These overviews enabled the Verification Team to undertake an independent review of their modeling procedure, inventory process and calculations. These interviews allowed FRST to ground-

truth elements of inventory data management and modeling, Project management, non-Project activities that may affect carbon stocking, and application of the inventory field methodology.

# 6.0 Quantitative Review of Emission Reductions/Removals Enhancements Assertion

Pursuant to §95977.1(b)(3)(L) of the Regulation, several elements of the Project were reviewed by RCE/FRST to ensure Project compliance with the Protocol's guidance for determining emission reduction and removal enhancements. The primary components of this review are confirmation of on-site inventory sequential sampling, inventory and project carbon calculation review, review of the risk of reversal rating, assessment of GHG emission reduction calculations, and the assertions made in the OPDR. Each of these elements is described below.

## *6.1 Baseline Modeling*

The baseline modeling was not reviewed in this verification. The baseline values remained unchanged from RP1 and the initial verification.

## *6.2 Inventory and Modeling Updates*

The Project's carbon stocks were updated using the inventory completed in 2016 and 2017. Individual tree modeled measurements were then used to calculate carbon based on the Protocol's required species-specific equation. The live tree values per plot were grown forward 10 years using FVS, incrementalized to a yearly plot level growth rate, and then properly allocated from each inventory date to the end of this RP. RCE and FRST independently calculated the quantity of carbon for all trees with the RP8 end of reporting period measurements.

## *6.3 Actual Harvested Wood Product*

RCE and FRST confirmed that there no harvesting during the reporting period.

## *6.4 On-site Inventory Verification Check*

The current reporting period was a less intensive verification and was completed as part of the full verification with site visit for reporting period 10.

## *6.5 Inventory and Calculation Review*

RCE and FRST conducted a risk-based review of the Project inventory and emission reduction calculations to ensure conformance with Protocol requirements and agreement with emission reductions/removals reported in the OPDR. Tree volumes are converted to biomass and carbon $CO_2$ equivalents based on the suite of equations provided by ARB or separately approved by ARB in cases where equation documentation/versioning varies. RCE/FRST confirmed that the baseline values were correct.

RCE and FRST confirmed proper calculation of inventory sampling error (6.0% at the 90% confidence interval), requiring a 1.0% confidence deduction.

## *6.6 Forest Offset Reversal*

RCE/FRST confirmed that the Project did not have a reversal for this reporting period.

## *6.7 Project Reversal Risk Rating*

RCE and FRST reviewed the eight individual types of risk identified in the Protocol; ensuring the correct default or assessment area-specific factors were applied and then recalculated the Project's reversal risk rating. RCE/FRST confirmed the Project's use of 15.8% reversal risk rating.

## *6.8 Assessment of GHG Emissions Reductions Calculation and OPDR*

Pursuant to §95977.1(b)(3)(L) of the Regulation, RCE and FRST used data checks to ensure that the appropriate methodologies and GHG emission factors were applied in calculating the Project's baseline GHG emissions, annual GHG emissions, Project emissions, and GHG reductions. RCE and FRST's emission reduction calculations assessment included a check of the inputs into the Offset Project Data Report uploaded to the OPR for the reporting period. RCE and FRST confirmed that BBW appropriately filled out the worksheet based on its baseline and Project calculations for all required pools. RCE and FRST separately recalculated the total GHG emission reductions and compared the results to the Project's calculations. See Appendix D for recalculations. RCE and FRST found small discrepancies due to deviations in volume equations, truncation of heights and rounding discrepancies resulting in a non-material difference in calculations. RCE concludes that the Project's emission reductions calculation and OPDR is free of any Offset Material Misstatement.

<u>RCE/FRST Recalculations</u>
Total emission reductions/removals confirmed: 8,200 $tCO_2e$

Buffer Pool Contribution: 1,296 $tCO_2e$

Net emission reductions: 6,904 $tCO_2e$

% Error = ([∑Discrepancies+∑Omissions+∑Misreporting] x 100%) / Total Reported Emission Reductions and Removal Enhancements

% Error = [23.3 + 0 + 0] x 100% / 8,223 $tCO_2e$ = **0.28%**

## *6.9 Offset Project Data Report*

RCE/FRST confirmed that the OPDR was submitted by The Yurok Tribe within four months of the end of the reporting period. During the verification, the Yurok Tribe submitted one update to the originally submitted OPDR. RCE/FRST reviewed the Listing Form and final version of the OPDR to confirm its accuracy.

# 7.0 Issues Log

During the verification process, RCE/FRST submitted corrective action requests (CARs), non-material findings (NMs), additional documentation requests (ADRs), and clarification requests (CRs) to BBW. BBW sufficiently addressed all items and the details of the requests are documented in the Issues Log shown in Appendix E. The Issues Log for reporting periods 5-10 were combined.

# 8.0 Conclusion

RCE conducted a risk-based analysis of the CAFR5011-CAR993 Yurok Tribe/Forest Carbon Partners CKGG Improved Forest Management Project including a strategic review of the Project data and evidence. Based upon the processes and procedures and the evidence reviewed, RCE concludes with a reasonable level of assurance that the Project emission reductions resulting from the Project activities during the reporting period from April 1, 2019 through March 31, 2020 are:

- In conformance with the ARB's Compliance Offset Protocol for U.S. Forest Projects (October 20, 2011)
- In conformance with Final Regulation Order, Subchapter 10 Climate Change, Article 5, Title 17, California Code of Regulations, Sections 95800-96022,
- Without Offset Material Misstatement, and
- Verified to a reasonable level of assurance.

**Table 4 – GHG Reductions & Removal Enhancements ($tCO_2e$)**

| Reporting Period | Total GHGs |
|---|---|
| April 1, 2019 – March 31, 2020 | 8,223 |

**Lead Verifier Signature**

**Zach Eyler**

**Independent Reviewer Signature**

**Phillip Cunningham**

# Appendix A – Verification Plan

| CAFR5011-CAR993 Yurok Tribe/Forest Carbon Partners CKGG Improved Forest Management Project<br>Verification Sampling Plan for Reporting Period 4/1/2019 – 3/31/2020 |
|---|

| Timing of Offset Verification Services | Proposed Date |
|---|---|
| Contract award | 2/18/2022 |
| Submit COI and NOVS forms to OPR/ARB | 4/14/2022 |
| Planning meeting | 4/27/2022 |
| Site visit | 6/14-15/2022 |
| Provide Issues Log to OPO | Late June 2022 |
| Complete Issues Log | Early September 2022 |
| Provide draft deliverables to OPO | Late September 2022 |
| Final meeting and submittal of deliverables to OPR/ARB | Late September 2022 |

| Information Requirement | Information Provided by the OPO/APD |
|---|---|
| Information to allow the offset verification team to develop a general understanding of offset project boundaries, operations, project baseline emissions, and annual GHG reductions and GHG removal enhancements | Growth model, OPDRs, other supporting documentation. |
| Information regarding the training or qualifications of personnel involved in developing the Offset Project Data Report | Javier Kinney and Earl Jackson |
| The name and date of the Compliance Offset Protocol used to quantify and report project baselines, GHG reductions, GHG removal enhancements, and other required data as applicable in the Compliance Offset Protocol; | US Forest Projects, 2011 |
| Information about any data management system, offset project monitoring system, and models used to track project baselines, GHG reductions, GHG removal enhancements, and other required data as applicable in the Compliance Offset Protocol. | Growth model, OPDRs, other supporting documentation. |

| Pre-Engagement | |
|---|---|
| RCE Management has completed and signed the V&V team selection form | Complete |
| Complete the Evaluation of Conflict of Interest for Offset Projects form and submit to Offset Project Registry | Complete |
| Individual COIs for all team members (and subcontractors) are in the folder for this client | Complete |
| Save COI-Determination letter and or renewal email received from the OPR/ARB | Complete |

| | |
|---|---|
| Send the Notice of Offset Verification Services form to the OPR and ARB at least 10 days prior to beginning verification | Complete |
| Non-Disclosure Agreement (NDA) - execute agreement (Both parties agree to the NDA) | N/A |
| **Create Verification Service Agreement (VRSA)** | |
| The original proposal is included as an exhibit with the correct scope of work defined in the Assumptions table. | Complete |
| Both parties agree to and sign the VRSA | Complete |
| **Planning meeting and required documents** | |
| OPDR has been uploaded to the Registry website | Complete |
| Planning meeting agenda sent to client | Complete |
| Verification Process Overview (with terms and definitions table correctly completed) | Complete |
| Team Roster | Complete |
| Schedule provided to client | Complete |
| Request data and supporting documentation (if applicable) | Complete |
| Record minutes of planning meeting & save in Project file | Complete |
| **Verification Plan and Sampling Plan** | |
| Created sampling plan based on the project assumptions | Complete |
| Ranking of GHG emission sources, GHG sinks, and GHG reservoirs | Complete |
| Qualitative narrative of uncertainty risk assessment | Complete |
| Identification of sources, sinks, and reservoirs targeted for document reviews and explanation of why they were chosen | Complete |
| Summary of information analyzed in data checks and document reviews | Complete |
| Samples identified in the sampling plan | Complete |
| Data checks | Complete |
| Verification of GHG assertion with any discrepancies identified and percent error calculated | Complete |
| Approved and protected by the Lead Verifier | Complete |
| **Issues Log** | |
| All Corrective Actions are closed or the status is marked appropriately | Complete |
| All Clarifications are addressed | Complete |
| All document requests are received | Complete |
| **Verification Documents** | |
| Issue Verification Report and Statement | Complete |
| Emission totals match in Report and Statement | Complete |

| | |
|---|---|
| Report and Statement signed by both Lead Verifier and Independent Reviewer | Complete |
| **Independent Review** | |
| Mandatory items approved and all findings closed by Independent Reviewer | Complete |

# Appendix B – SSR Ranking and Review

| SSR # | SSR Description | Ranking and Reason | Ranking for Uncertainty | Selected for Document Review | Selected for Data Checks/Calc Review | Method | Summary of Review | Quantity of Data Reviewed | Documents Reviewed | Discrepancies Identified | Discrepancy Description & Reason |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **IFM Reservoir** | | | | | | | | | | | |
| IFM - 1 | Standing live carbon in all portions of living trees | #1 This SSR generates the majority of project emission reductions (~97.5%) and presents permanence risks. | 1 | Yes | Yes | Review all tree lists for project from RP4/5 measurement. Assess date of measure and appropriate amount of growth based on stand table projection to the end of RP8. | IFM-1 was recalculated from the project inventory data. | 100% of inventory data | Inventory methodology and sampling design. Growth databases. Carbon calculation databases. | Yes | Pillsbury volume calculation truncation in FVS; Inconsistent use of the EstHt field; Minor rounding discrepancies; |
| IFM - 3 | Standing dead carbon in all portions of dead, standing trees | #2 This SSR can be significant based on forest type (~2%) | 2 | Yes | Yes | Review all tree lists for project from RP4/5. | IFM-3 was recalculated from the project inventory data. | 100% of inventory data | Inventory methodology and sampling design. Growth databases. Carbon calculation databases. | Yes | Pillsbury volume calculation truncation in FVS; Inconsistent use of the EstHt field; Minor rounding discrepancies. |
| IFM - 7 | Carbon in in-use forest products | N/A | | No | No | | No harvesting. | N/A | None | None. | N/A |
| IFM - 8 | Forest product carbon in landfill | N/A | | No | No | | No harvesting. | N/A | None | None. | N/A |
| Sources | | | | | | | | | | | |
| IFM - 14 | Biological emissions/ removals from changes in harvesting on forestland outside the Project Area | #5 This SSR is not significant (<1%). | 3 | Yes | Yes | ARBOC calc sheet automatically calculates. | Concurrence between OPO and verifier for all calcs. | All calculations in ARBOC sheet. | Calculation workbooks. | None. | N/A |
| **Sinks** | | | | | | | | | | | |
| N/A | | | | | | | | | | | |

# Appendix C – Documents/Files Reviewed

| # | Document | Reviewed By | Reviewed At |
|---|---|---|---|
| 1 | CK_Prop_Multipart_Adjusted shapefile | Verification Team | Desk review |
| 2 | CKGG 2016 Inv carbon calculations series | Verification Team | Desk review |
| 3 | CKGG 2017 current stocks calculation series | Verification Team | Desk review |
| 4 | CKGG 2017 Inventory Interpolation with Burn plots remeasured series | Verification Team | Desk review |
| 5 | CKGG 2018 current stocks calculation series | Verification Team | Desk review |
| 6 | CKGG 2018 RP6 Inventory Interpolation with Burn plots remeasured series | Verification Team | Desk review |
| 7 | CKGG 2019 current stocks calculation series | Verification Team | Desk review |
| 8 | CKGG 2019 Inventory Interpolation with Burn plots remeasured series | Verification Team | Desk review |
| 9 | CKGG 2020 current stocks calculation series | Verification Team | Desk review |
| 10 | CKGG 2020 RP8 Inventory Interpolation with Burn plots remeasured series | Verification Team | Desk review |
| 11 | CKGG 2021 current stocks calculation series | Verification Team | Desk review |
| 12 | CKGG 2021 inventory QAQC 20220302 | Verification Team | Desk review |
| 13 | CKGG 2021 RP9 Inventory Interpolation with Burn plots remeasured series | Verification Team | Desk review |
| 14 | CKGG 2022 Inv carbon calculations series | Verification Team | Desk review |
| 15 | CKGG 2022 Snags_carbon_calcs series | Verification Team | Desk review |
| 16 | CKGG carbon yields RP10 series | Verification Team | Desk review |
| 17 | CKGG OPDR RP9 | Verification Team | Desk review |
| 18 | ckgg project area summary series | Verification Team | Desk review |
| 19 | CKGG RP4 remeasurement SNAG data | Verification Team | Desk review |
| 20 | CKGG snags analysis series | Verification Team | Desk review |
| 21 | CKGG Tully fire SNAG carbon calculations series | Verification Team | Desk review |
| 22 | CKGG_5-10_record of transmission | Verification Team | Desk review |
| 23 | CKGG_AllPlotsInOrder_20211221 | Verification Team | Desk review |
| 24 | CKGG_projarea7660_20131210 shapefile | Verification Team | Desk review |
| 25 | ckgg_spa_series shapefile | Verification Team | Desk review |
| 26 | CKGG2017 Snags Analysis | Verification Team | Desk review |
| 27 | ckgg-2017-opdr5 series | Verification Team | Desk review |
| 28 | ckgg-2018-opdr6 series | Verification Team | Desk review |
| 29 | ckgg-2019-opdr7 series | Verification Team | Desk review |
| 30 | ckgg-2020-opdr8 series | Verification Team | Desk review |
| 31 | ckgg-2021-opdr9 series | Verification Team | Desk review |
| 32 | ckgg-2022-opdr10 series | Verification Team | Desk review |
| 33 | ckgg-inv-methods-2021_20210819 | Verification Team | Desk review |
| 34 | ckgg-plots_series shapefile | Verification Team | Desk review |
| 35 | ckgg-rp9-invmethods-arb-approval | Verification Team | Desk review |
| 36 | Fire plots AGLC 2017 | Verification Team | Desk review |
| 37 | Fire plots AGLC 2018 interpolation | Verification Team | Desk review |
| 38 | Fire plots AGLC 2019 interpolation | Verification Team | Desk review |
| 39 | Fire plots AGLC 2020 interpolation | Verification Team | Desk review |
| 40 | Fire plots AGLC 2021 interpolation | Verification Team | Desk review |
| 41 | Fwd Completion of Inventory Methodology Update Verification - CAR93_CAFR5011 | Verification Team | Desk review |

| # | Document | Reviewed By | Reviewed At |
|---|---|---|---|
| 42 | HuschBeersKershaw2003 | Verification Team | Desk review |
| 43 | Inventory Manual CKGG 20210812_02 | Verification Team | Desk review |
| 44 | Monserud_1981 | Verification Team | Desk review |
| 45 | Remeasure2016_20160205 shapefile | Verification Team | Desk review |
| 46 | Yurok CKGG Annual OPDR RP005 | Verification Team | Desk review |
| 47 | Yurok CKGG Annual OPDR RP006 | Verification Team | Desk review |
| 48 | Yurok CKGG Annual OPDR RP007 | Verification Team | Desk review |
| 49 | Yurok CKGG Annual OPDR RP008 | Verification Team | Desk review |
| 50 | Yurok_CKGG_CRT_worksheet_RP9v2_series | Verification Team | Desk review |

# Appendix D – Recalculations

| Calculating GHG Reductions/Removals for Onsite Carbon Stocks - All Project Types | OPO/TC | RCE/FRST |
|---|---|---|
| Sampled Onsite Carbon Stocks (metric tons CO2e) | 2,235,372 | 2,235,319 |
| Confidence Deduction | 1.0% | 1.0% |
| Adjusted Sampled Onsite Carbon Stocks (adjusted for confidence deduction) (metric tons CO2e) | 2,213,018 | 2,212,966 |
| Soil Carbon Emissions | - | - |
| Increment in Actual Onsite Carbon Stocks (metric tons CO2e) | 25,673 | 25,649 |
| Baseline Onsite Carbon Stocks (metric tons CO2e) | 1,057,474 | 1,057,474 |
| Increment in Baseline Onsite Carbon Stocks (metric tons CO2e) | - | - |
| Quantified GHG Reductions / Removals for Onsite Carbon Stocks (metric tons CO2e) | 25,672 | 25,649 |
| **Calculating Carbon Stored in Wood Products Including Market Effects and Leakage - All Project Types** | | |
| Actual Carbon in Trees Harvested for Wood Products (metric tons CO2e) | - | - |
| Baseline Carbon in Trees Harvested for Wood Products (metric tons CO2e) | 52,444 | 52,444 |
| Actual Carbon in Harvested Wood Delivered to Mills (metric tons CO2e) | - | - |
| Baseline Carbon in Harvested Wood Delivered to Mills (metric tons CO2e) | 17,055 | 17,055 |
| Actual Carbon Stored Long-term in Wood Products (tonnes CO2e) - Excl Landfill | - | - |
| Actual Carbon Stored Long-term in Wood Products (tonnes CO2e) - Incl Landfill | - | - |
| Baseline Carbon Stored Long-term in Wood Products (tonnes CO2e) - Excl Landfill | 5,305 | 5,305 |
| Baseline Carbon Stored Long-term in Wood Products (tonnes CO2e) - Incl Landfill | 8,700 | 8,700 |
| Diff Between Actual and Baseline Carbon in Harvested Wood (tonnes CO2e) - Excl Landfill | (5,305) | (5,305) |
| Difference Between Actual and Baseline Carbon in Harvested Wood (tonnes CO2e) - Incl Landfill | (8,701) | (8,700) |
| Difference in Actual and Baseline Carbon Stored in Wood Products (tonnes CO2e) - Landfill Adj | (8,701) | (8,700) |
| GHG Reductions / Removals for Carbon Stored in Wood Products (tonnes CO2e) w/ mkt response | (6,961) | (6,960) |
| **Calculating Other Secondary Effects - Improved Forest Management Projects** | | |
| Difference Between Actual and Baseline Carbon in Trees Harvested for Wood Products (tonnes $CO_2e$) | (52,443) | (52,444) |
| Other Secondary Effects Emissions (shifting activities/materials) IFM Projects (tonnes $CO_2e$) | (10,489) | (10,489) |
| **Quantified GHG Reductions and Removals** | | |
| Annual GHG Reductions/Removals Net of Discounts and Secondary Effects (tonnes $CO_2e$) | 8,223 | 8,200 |
| Cumulative GHG Reductions/Removals; not including negative carryover or reversals (tonnes $CO_2e$) | 1,015,954 | 1,015,901 |
| Cumulative Negative Carryover from Prior Year (tonnes $CO_2e$) | 0 | 0 |
| ARBOCs Issued - Net of Negative Carryover, bef. Buffer or adjust for Reversals (tonnes CO2e) | 8,223 | 8,200 |
| **Calculation of Buffer Pool Contribution** | | |
| Project Specific Reversal Risk Rating | 15.8% | 15.8% |
| Buffer Pool Contribution | 1,299 | 1,296 |
| **Accounting for Reversals** | | |
| Annual Reversals (metric tons CO2e) | 0 | 0 |
| Total "Intentional Reversals" to be compensated by the OPO (metric tons CO2e) | - | - |
| **Offset Credits Issued to Offset Project Operator** | | |
| Annual Offset Credits Issued to Offset Project Operator (metric tons CO2e) | 6,924 | 6,904 |

# Appendix E – Issues Log

| Corrective Action Request, Non-Material Finding, Additional Documentation Request, or Clarification Request ID# | Finding | Section of Regulation or COP | Offset Material Misstatement (OMM) or Conformance (C) | OPO/APD response | RCE response | Additional OPO/APD response | Additional RCE response | Open or Closed |
|---|---|---|---|---|---|---|---|---|
| **CAR 1** | The carbon quantification constants in 'CKGG 2022 Inv carbon calculations 20220404' on the Density tab appear to reflect the 2011 values. For the dead tree quantification, the values captured in 'CKGG snags analysis 20220404' on the 'Harmon2011 DRFs' tab, those values appear to be from 2014/2015.<br><br>For example, Douglas-fir in 2011 has a specific gravity of 0.46 and wood density of 28.7, these values match the access database for live calculation. In 2014/2015 Douglas-fir's specific gravity is 0.45 and wood density is 28.08, which matches the values in the dead quantification excel.<br><br>Incorporating updated ARB constants and volumetric equations is encouraged/allowed if done correctly. Consistent quantification between live and dead is required. | 10.2.2.1.f | C | Changes have been made to meet the 2011 protocol. | Thank you for making these changes, this item may be closed. | | | Closed |
| | | | | | | | | |
| **NM 1** | In comparing the documents of 'CKGG 20XX RPX Inventory Interpolation results 20200714' series, the 'Acres' values captured in cells N35:N48 of the 'Access_Import' tab are inconsistent. In RP6, RP8, and RP9 they appear to be rounded to the tenth or hundredth place albeit inconsistently, but in RP5, and RP7, they appear to have all associated significant figures. Of note, RP10 acreages appear to be rounded to the thousandth value as seen on 'Statistics' tab of 'CKGG carbon yields RP10 20220525'. Consistency is requested. | 10.2.2.1 | C | We have made changes in the inventory results workbooks for RP5-9 so that acres are consistent across all these reporting periods. They have been rounded to the hundredths place. The workbooks are being provided with these responses. | Thank you for making this change, it has been confirmed. This item may be closed. | | | Closed |
| **NM 2** | In 'CKGG carbon yields RP10 20220818' on the 'Plot Calcs' tab, the value captured in the AG_CO2e Live column F for Plot 839, 528.111 does not appear to match previous revisions of this document (20220525) or the verifier's calculations.<br><br>It appears that this underestimation of carbon on plot 839 leads to a ~3,000 tonne understatement, which for RP10 is immaterial. | 10.2.2.1.f | C | We mistakenly used an earlier version of the RP10 spreadsheet when copying in the new values for RP5-9 in the credits tab of the worksheet. Consequently there were probably more inconsistencies than just plot 839, and providing a correct version is definitely appropriate. There is a new version of the carbon yields spreadsheet for RP10 called "CKGG carbon yields RP10 20220824.xlsx". The revisions to the credit calculation tab should be the only difference from the 20220525 version of the file. | Thank you for the correction, the new values match verifier quantities. This item may be closed. | | | Closed |
| **NM 3** | In RP10 there are 3 dogwood being quantified using the 'TCuFt' output of FVS for volume. It does not appear that the equation used by FVS to calculate TCuFt volume matches the required equation from the COP 2011 ARB website page, nor is the required equation a 'Pillsbury' species like the other 'TCuFt' trees. As a nonmaterial error is generated from this inconsistency, this issues log item may be closed pending OPO agreement. | 10.2.2.1.f | C | Had a phone call with Paul Harper of BBW 8/25/2022, he confirmed that this error will not be corrected at this time. | This item may be closed. | | | Closed |
| | | | | | | | | |
| **ADR 1** | The calculations needed to independently quantify RP5 to RP9 are requested. This includes information on plot/tree incrementalization, 10 year calculations, growth, stats for each year, etc. | 10.2.2.1.f | C | All the relevant workbooks and calculation databases are provided in the folder CKGG_BBWResponseDocs20220701 | Thank you for this information. The full dead treelist from RP4 is needed, particularly the phantom heights on broken topped trees, or the calculation method for estimating phantom heights based off of diameter and taper methods. | The snags for RP4 and RP5 and have been recalculated using a very similar method to RP10. However, broken topped snags used the FVS generated regressed heights since these were not estimated in the field in the RP4 inventory, and they had to be pasted into the Ht field so the calculations in the database would work. New files include: "CKGG RP4 remeasurement SNAG data 20220714.xlsx", "CKGG 2017 Snags_carbon_calcs 20220714.accdb", "CKGG RP5 snags analysis 20220714.xlsx" & "CKGG Tully fire 2017 carbon calculations 20220714.accdb" | Thank you for this additional information. Further issues are tracked in other IL items. This item may be closed. | Closed |
| **ADR 2** | After review of 'CKGG_AllPlotsInOrder_20211221' there appear to be 26 'Check plots' which meets the requirement for 5% of total plot count checked. Were there instances of cruiser failure as described in chapter 4 of the 'Forest Carbon Inventory Field Manual', and was there appropriate follow up completed? | A.3.4 | C | There were instances of cruiser failure on plots. In the instance that a plot failed that cruiser was given feedback as well as tips and tricks to help with increasing the accuracy of their cruising. Further check cruising focused on the cruisers whose plots had failed in order to ensure that their work was improving. | Thank you for this clarification, this item may be closed. | | | Closed |
| **ADR 3** | Please provide the information of the licensed forester who is signing off on the calculations. | 9.1 | C | The OPDRs state in the following places that Paul Harper, California RPF #2672, oversaw all calculations:<br>RP 5: page 8<br>RPs 6-9: page 7<br>RP 10: page 1 | Thank you for this clarification, this item may be closed. | | | Closed |
| **ADR 4** | The document 'ckgg-inv-methods-2021_20210819' section 1 lists changes to the Inventory Design and Sampling Process. Please provide additional documentation (methods change approval memo) for the plot grid and randomization of sampling as described in this section. | 10.2.2.1.a | C | We are including two files:<br>1) "Fwd Completion of Inventory Methodology Update Verification - CAR93_CAFR5011.pdf" is an email from the VB who completed the review to CARB staff indicating that they had reviewed the changes and had signed off on them.<br>2) "ckgg-rp9-invmethods-arb-approval.pdf" is an email from CARB indicating that the changes had been approved. | Thank you for providing these documents, this item may be closed. | | | Closed |
| **ADR 5** | Please provide the previous shapefiles for RP5-9. This includes stratification, boundary, and plot layers. | 10.2.2.1.f | C | The shapefiles have been provided. | Thank you for providing these documents, this item may be closed. | | | Closed |
| | | | | | | | | |
| **CR 1** | In the quantification of Pillsbury tree species (GC, MA, TO, etc.), the 'CKGG 2022 Inv carbon calculations 20220404' access database appears to be pulling the TCuFt value as calculated from FVS. In the instance of truncated heights, how is the volume equation impacted for TCuFt from FVS? Compared to the replicated ARB verifier calculations and the other BBW volume calculations, it appears to be inconsistent. | 10.2.2.1.f | C | The TCuFt value calculated by FVS for Pillsbury tree species with broken tops appears to be about 30-35% higher than it would be if calculated using our method which is applied to all other species. This affects 60 out 3299 live trees in the inventory. This makes sense because our method of simply reducing the total volume of the unbroken tree by the ratio of TruncHt to the unbroken height substantially underestimates the tree volume making it very conservative. It essentially assumes the tree is a cylinder whereas FVS must use a taper equation to more accurately capture the greater volume in the lower portion of the bole. | Thank you for the clarification, this mirrors the relative difference in calculation the verifier was finding.<br><br>It is our intention to be able to replicate all calculations outside of FVS in order to ensure conformance with the requirements of A.3 of the 2011 COP and assess any discrepancy (including rounding) between the published ARB equations and those used within FVS. Please provide the a description of the equation(s) and reference for the broken top methods being implemented by FVS that are used by the project.<br><br>We will replicate all calculations manually for all trees, including the two different broken-top tree methods. | FVS uses a Behre's hyperboloid to determine the volume of broken-top trees, specifically by calculating a ratio between the Behre's hyperboloid with a truncated height (this is the volume below truncation) to the total Behre's hyperboloid (total volume). This gives a volume ratio that is applied to any volume equation - in this instance the FIA specified Pillsbury volume equation. The reference is Monserud 1981 and is provided in the shared documents folder. Specifically, FVS estimates two Behre taper curve parameters A and B in a subroutine (see the file behprm.f in the FVS code repository). The estimated parameters Â and B̂ are then used to calculate the volume of a solid of revolution described by a Behre taper curve. The formula is evaluated at the limits of integration $L_1$ and $L_2$ where $L_1$=0 for an unbroken tree (the tip) and $L_2$=1 (the base). In FVS, for broken-top trees $L_1$ is represented by PHT (height proportion = 1.0-ht at truncation/estimated ht). In order to calculate broken-top tree volumes the same as FVS, the vb will need to refer to the FVS code repository (publicly available on Github at https://github.com/USDAForestService/ForestVegetationSimulator) and calculate the Behre's hyperboloid volumes stated above as well as the other called variables.<br><br>We find no statement in our review of §A.3 in COP 2011 that requires the vb to replicate any and all calculations outside of FVS. Section A.3.3. states "[d]documentation of all analytic methods and biomass equations used to translate field measurements into volume or biomass carbon estimates" is required. Section A3.5. states the "[d]description of data management systems and processes, including the collection, storage and analysis of inventory related data analytical methods to translate field measurements into volume and/or biomass estimates" is required. Section A.3 also states that "[i]nventory methods and sampling procedures, once established, must be consistent over the life of the project." It is clearly stated in our inventory methods document **§7. Analytic and Calculation Methods** how FVS is used to calculate volume for Pillsbury hardwoods, including those with broken tops, which satisfies the requirements above. The same methods are described in the initial inventory methods for the project, as well as a recent update to the methods. Both methods were approved by a third-party vb and ARB. The most recent inventory document was approved by a vb in August 2021 and by ARB in January of this year (2022). | Thank you for this description. The source code has been found on github.<br><br>This item may be closed. | Closed |
| **CR 2** | It appears that defect is only being incorporated into dead tree carbon, not live tree carbon. Is this inconsistency intended? | 10.2.2.1.f | C | Yes. The 2011 FOP did not require defect deductions for live trees other than for missing tops. Since that is the way the CKGG project trees have been calculated for all previous reporting periods, our methodology continues in the same manner. | Thank you for the confirmation, this matches verifier calculations. This item may be closed. | | | Closed |
| **CR 3** | As seen in 'CKGG 2022 Inv carbon calculations 20220404' for live tree broken tops, the access database is querying an FVS generated 'EstHt' instead of the cruiser predicted Phantom Heights. Is this appropriate? | 10.2.2.1.f | C | Changes have been made. | Thank you for incorporating this change. Please make the same change in the access database used for RP5-9. | The inventory done in 2016 did not include field estimated unbroken heights for trees with missing tops (except in a few instances when the cruiser did despite the manual instructions). Since FVS makes EstHt = Ht when there is a value in the Ht field, the calculations used the EstHt value so they would work for both broken and unbroken trees. Therefore, the database queries should remain as they are for live trees. | Thank you for this clarification. The verifier is now using the EstHt field for quantification. This item may be closed. | Closed |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **CR 4** | In 'CKGG 2022 Inv carbon calculations 20220404' in the 'AGLC small trees' query the calculation of AGLC is not incorporating missing biomass for truncated trees. This applies to RA, PC, DF, WH, since these species do not calculate off of TCuFt. | 10.2.2.1.f | C | This change was made prior to the site visit in the revised calculation database 'CKGG 2022 Inv carbon calculations 20220525'. The 'AGLC small trees' query now accounts for missing biomass in truncated trees. | Thank you for making this change. Please make the same change in the access database used for RP5-9. | This change has been made in the database "CKGG 2016 Inv carbon calculations 20220714.accdb" so that new tables for small trees 2016 and 2021 were created. These tables populate the current stocks calculations databases for RP5-9. | Thank you for making this change, this item may be closed. | Closed |
| **CR 5** | On the site visit, plot 899 was labeled as a walkthrough plot with one tree being double counted. Per the plot and strata shapefiles, the closest point to the project boundary is 107 feet, more than double the distance to meet the qualifications needed for a walkthrough plot. This distance was confirmed by 3 different verifier GIS devices, and it was determined that utilizing the walkthrough method would be inappropriate as the boundary and subsequent acreage is fully quantified.<br><br>It was observed that the cruiser placed flagging delineating a 300' boundary for the watercourse which was not visible from the slope, this line fell inside the project boundary at the edge of a walkthrough condition of the plot. Thus per the cruiser, it would be appropriate to use the walkthrough method. The project boundary and acreage upon which credits are calculated do not match the flagged boundary of the cruiser, so double counting trees using the walkthrough method is compensating for project area that isn't missing. Please clarify the appropriateness of the implementation of the walkthrough method for this occurrence. | 10.2.2.1.h | C | Because the project boundary, in this case the edge of a 300' buffer extending from the Klamath River, could not be definitively identified and established in the field in any replicable or verifiable way as per section 1.12 in the field manual, the walkthrough method should not have been applied to this plot. | Thank you for confirmation, has the tree in question been removed from the inventory as a walkthrough tree? | Plot errors discovered during sequential sampling are not incorporated into the inventory being verified. The change was not material and did not affect sequential sampling results, therefore tree was not removed from the inventory calculations.<br>Internally, a note was made to the inventory data so the correct method will be applied during future re-measurements. | Thank you for this clarification. This item may be closed. | Closed |
| **CR 6** | Upon review of the 'CKGG 2021 inventory QAQC 20220302' document, the 'Header Data' tab shows the RP10 inventory was completed from 09/09/2021 to 12/16/2021. RP10 ends March 31st, 2022, is there any growth that needs to be incorporated to account for the time between the inventory date and RP end date? | 10.2.2.1.g | C | The mid-point of the inventory was 10/28/2021. According to the seasonal growth allocation reference that we commonly use, there would be approximately 10% of annual growth between this date and the end of the reporting period. We have chosen to forego this small fraction of growth and consider the data as measured to represent the end of the reporting period. This is conservative and will make data management and future annual growth increments more straightforward. | Thank you for the concise clarification. The verifier finds this acceptable, this item may be closed. | | | Closed |
| **CR 7** | Upon review of the 'CKGG 2021 inventory QAQC 20220302' document, the 'Tree Data' tab there is one plot where it appears that the walkthrough method might have been used where it is not appropriate (041-042) at a distance of 82'.<br><br>There are also 8 plots that are located very close to the boundary which do not have any trees that qualify for walkthrough. Please confirm that walkthrough was not missed on these plots (Plot_Distance in ft): 579_3, 843_3, 455_35, 559_33, 103-029_3, 211_10, 539_44, and 723_5. | 10.2.2.1.c | C | For the purpose of determining walk-through trees on a plot and whether a plot is in or out of the project, boundaries are determined in the field. Many of the project boundaries are stream buffers, which can be directly measured in the field but in GIS are determined from the mapped location of the streams, which is commonly only a rough approximation. Instructions for applying walkthrough methods begin on page 7 of the field inventory manual (page 10-7 of the inventory methods document).<br><br>The plot card for #041-042 shows with a diagram that the boundary is 41' from plot center making the walk-through trees correct.<br><br>The plot cards for plots 211, 455, 539, 579, 723, 843, 103-029 have notes about project boundaries being either too far away for the walkthrough method to apply, or that potential boundaries are indiscernible in the field.<br><br>Plot 559 has a note about having one candidate walkthrough tree that ended up being too far from the project boundary in relation to plot center to be double-counted. | Thank you for the follow-up information and addressing the plots in question. This item may be closed. | | | Closed |
| **CR 8** | Similar to CR3, in 'CKGG2017 Snags Analysis 20170825' the CVTS of the trees are being calculated off the EstHt, and the correction for a broken top is also using Est Ht, despite the fact that there are cruiser measured values in the Total height column. Why is the cruiser being overruled by the model? | 10.2.2.1.f | C | The cruiser is not being overruled by the model. The field manual instructions state that tree height for all snags is to be recorded in the TaperHt field regardless of brokentop status. Unless TaperDiam = 0, the snag was assumed to have a broken top. Please see the response to ADR1 for explanation and list of new standing dead calc files.<br><br>After the dead treelist was run through FVS (see table in "CKGG RP4 remeasurement SNAG data 20220714.xlsx"), the field Ht was made equal to the field EstHt unless TaperDiam = 0 in which case the measured height was left in the Ht field. | Thank you for the description. There are instances where the Ht value is not equal to the Est Ht value for snags: PLT207_95 and PLT207_96 for example. The calculation of the broken top reduction is based off the ratio between the 'Ht' value and the 'TruncHt' value, not off the CVTS used EstHt and TruncHt values.<br><br>In the described example PLT207_95, CVTS is being calculated using EstHt of 58.04, but Ht and TruncHt are 54' and the bole, bark and branch kg values are not consistently reduced by the ratio of 54/58.04.<br><br>This error is likely nonmaterial, and may be ignored by the OPO if this is the case. | An updated CRT worksheet has been created for RP5-9 with the new revised values from all the recent changes so that the VB can make any necessary comparisons for materiality. These use the confidence deduction particular to the calculations in each reporting period, as allowed under the 2011 COP. | Although not explicitly stated, this issue has been ignored by the OPO as it is nonmaterial. This item may be closed. | Closed |
| **CR 9** | There appear to be inconsistencies in Snag calculation for RP4, the three decay classes DRFs are being calculated differently.<br><br>In one instance (CKGG RP4 remeasurement SNAG data):<br>Sound Decay Class (DC) 1 = Harmon DRF 1<br>Intermediate DC 2 = Harmon DRF 3<br>Rotten DC 3 = Harmon DRF 5<br><br>In the other (CKGG2017 Snags Analysis 20170825):<br>Sound DC 1 = (Harmon 1+Harmon 2) / 2<br>Intermediate DC 2 = Harmon 3<br>Rotten DC 3 = (Harmon 4+Harmon 5)/2<br><br>Why are these dead trees quantified in the same RP being calculated differently? | 10.2.2.1.f | C | The 75 dead trees from RP4 & 5 have now been calculated in a consistent manner and the results used in RP5-9. The decay class translation is:<br>Sound Decay Class (DC) 1 = Harmon DRF 1<br>Intermediate DC 2 = Harmon DRF 3<br>Rotten DC 3 = Harmon DRF 5 | Thank you for consistent use of DRFs within each respective reporting period. This item may be closed. | | | Closed |
| **CR 10** | For all RPs quantification, the Canyon Live Oak (805) bark biomass equation (Eq. 31) is being neglected from the calculations. This corresponds to later COP (2014, 2015) guidance but contradicts the 2011 COP. Is this intentional? | 10.2.2.1 | C | Yes, this is intentional. We believe the table on page 8 in the biomass equations pdf from 2011 is incorrect in including eq 31 for canyon live oak (805). The text on page 11 of the same document makes the error clear.<br>"SPECIES 312, 330, 361, 431, 492, 600, 631, 801, 805, 807, 811, 815, 818, 821, 839, 920, and 981 hardwood volumes are calculated with Pillsbury equations; this means that total stem volume includes branches and bark, thus bark biomass and live branch biomass are not available as separate components of biomass." | Thank you for the clarification. The verifier agrees with this assessment. This item may be closed. | | | Closed |