

| <b>U.S. FOREST OFFSET PROJECT DATA REPORT</b><br><b>INITIAL REPORTING PERIOD - IMPROVED FOREST MANAGEMENT</b>                                                                                                                                                                                                                                                                                                                             |                                                              |                                                              |                                                 |                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>OPR<br/>Staff<br/>Use<br/>Only</b>                                                                                                                                                                                                                                                                                                                                                                                                     | Date Report Received:                                        | OPR Tracking Number:                                         | Date Report Reviewed:                           | <b>OPR<br/>Staff<br/>Use<br/>Only</b>                                                 |
| <i>Entities submitting the project's first Offset Project Data Report must submit the information requested in both <b>Initial Reporting Period</b> and the <b>Annual Reporting</b> forms to the appropriate Offset Project Registry. For every reporting year thereafter, submit only the information requested in the Annual Reporting form.</i>                                                                                        |                                                              |                                                              |                                                 |                                                                                       |
| <b>PART I. ENTITY SUBMITTING REPORT</b>                                                                                                                                                                                                                                                                                                                                                                                                   |                                                              |                                                              |                                                 |                                                                                       |
| <b>Is this form being submitted by the Offset Project Operator (OPO) or by the Authorized Project Designee (APD)?</b> <i>Note: The person completing this form should be an OPO/APD employee.</i>                                                                                                                                                                                                                                         |                                                              |                                                              |                                                 | <input checked="" type="checkbox"/> <b>OPO</b><br><input type="checkbox"/> <b>APD</b> |
| <b>Name of Person Completing Form:</b><br>Lauren Fety                                                                                                                                                                                                                                                                                                                                                                                     |                                                              | <b>Organization, if applicable:</b><br>The Conservation Fund |                                                 |                                                                                       |
| <b>Date Form Completed:</b><br>Jan 31 2017; Jan 11, 2017, Jan 9, 2017; Dec 28, 2016; Dec 12, 2016; Nov 28, 2016; Nov 21, 2016; Nov 3, 2016; Aug 17, 2016                                                                                                                                                                                                                                                                                  | <b>Phone Number:</b><br>541-727-2094                         | <b>Email Address:</b><br>lfety@conservationfund.org          |                                                 |                                                                                       |
| <b>PART II. OFFSET PROJECT INFORMATION</b>                                                                                                                                                                                                                                                                                                                                                                                                |                                                              |                                                              |                                                 |                                                                                       |
| <b>Offset Project Name:</b><br>Garcia River Forest - ARB                                                                                                                                                                                                                                                                                                                                                                                  |                                                              | <b>OPR Project ID#:</b><br>CAR 1098                          | <b>ARB Project ID# (if known):</b><br>CAFR 5141 |                                                                                       |
| <b>Offset Project Commencement Date:</b><br>February 2, 2004                                                                                                                                                                                                                                                                                                                                                                              | <b>First Reporting Period Start Date:</b><br>January 1, 2015 | <b>First Reporting Period End Date:</b><br>February 14, 2016 |                                                 |                                                                                       |
| <b>Provide an explanation and justification for the commencement date. Specify the action(s) that identify the offset project commencement date.</b><br>The Garcia River Forest has been registered through CAR as a Conservation Based Forestry Project, protocol version 2.1 from 2/1/2004 through 12/31/2014. This Initial OPDR is intended to transition the project to an ARB Improved Forest Management Project beginning 1/1/2015. |                                                              |                                                              |                                                 |                                                                                       |
| <b>Optional:</b> Provide the nearest town/city to the Project Area:<br>Manchester, CA.                                                                                                                                                                                                                                                                                                                                                    |                                                              |                                                              |                                                 |                                                                                       |
| <b>PART III. OPO / APD INFORMATION</b>                                                                                                                                                                                                                                                                                                                                                                                                    |                                                              |                                                              |                                                 |                                                                                       |
| <b>A. OPO</b>                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                              |                                                              |                                                 |                                                                                       |
| <b>OPO Name:</b><br>The Conservation Fund                                                                                                                                                                                                                                                                                                                                                                                                 |                                                              |                                                              | <b>OPO's CITSS ID#:</b><br>CA 1597              |                                                                                       |
| <b>Mailing Address:</b><br>215 West Standley, Suite 11                                                                                                                                                                                                                                                                                                                                                                                    |                                                              | <b>City:</b><br>Ukiah                                        | <b>State:</b><br>CA                             | <b>Zip:</b><br>95482                                                                  |
| <b>Contact Person:</b><br>Lauren Fety                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Phone Number:</b><br>541-727-2094                         | <b>Email Address:</b><br>lfety@conservationfund.org          |                                                 |                                                                                       |
| <b>B. APD (if applicable)</b>                                                                                                                                                                                                                                                                                                                                                                                                             |                                                              |                                                              |                                                 | <input checked="" type="checkbox"/> <b>No APD / Not Applicable</b>                    |
| <b>APD Name:</b><br>NA                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                              |                                                              | <b>APD's CITSS ID#:</b><br>CA _ _ _ _           |                                                                                       |
| <b>Mailing Address:</b>                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                              | <b>City:</b>                                                 | <b>State:</b>                                   | <b>Zip:</b>                                                                           |

|                        |                      |                       |
|------------------------|----------------------|-----------------------|
| <b>Contact Person:</b> | <b>Phone Number:</b> | <b>Email Address:</b> |
|------------------------|----------------------|-----------------------|

**PART IV. LAND OWNERSHIP**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <b>A. Is the Offset Project Operator (OPO) the owner in fee for the Project Area?</b><br><i>Further documentation is required for all projects. Submit as attachment labeled "Attachment A." See Part X of this OPDR document for more information.</i><br><b>If "no," explain how the entity identified as the OPO has the right to undertake and list the project.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <input checked="checked" type="checkbox"/> <b>Yes</b><br><input type="checkbox"/> <b>No</b>         |
| <b>B. Optional:</b> List all Forest Owners. This includes owners in fee as well as third parties with existing property interests within the Project Area that affect the trees and standing timber located in the Project Area (e.g. mineral rights, timber rights, easements, rights of way, leases, etc.).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                     |
| <b>C. Does the offset project occur on public or private lands?</b><br><i>If the project occurs on public lands, proceed to questions C1 and C2. Otherwise, skip to question D. Further documentation is required if project occurs on public lands. Submit copies of documentation demonstrating explicit approval of the project's management activities and baseline, as well as the public vetting process used; attachment should be labeled "Attachment B." See Part X of this document for more information.</i>                                                                                                                                                                                                                                                                                                                                                    | <input checked="checked" type="checkbox"/> <b>Private</b><br><input type="checkbox"/> <b>Public</b> |
| <b>1. Describe the public process that was used to evaluate the forest management activities and policy decisions concerning the offset project.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                     |
| <b>2. Describe the explicit approval process used by the public entity to initiate and maintain this offset project, including the offset project's management activities and baseline.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                     |
| <b>D. Does the project employ a Qualified Conservation Easement (QCE)?</b><br><i>If employing a QCE, proceed to questions D1, D2, and D3. Otherwise, skip to question E. Supporting documentation for a QCE is required. Submit as attachment labeled "Attachment C." See Part X of this document for more information.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <input type="checkbox"/> <b>QCE</b><br><input type="checkbox"/> <b>Public Ownership</b>             |
| <b>1. Date that the QCE was recorded.</b><br>N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                     |
| <b>2. Optional:</b> Is the project located in a state that requires third-party beneficiaries to sign the easement (i.e., to "accept and record that acceptance"), such as Arizona, Pennsylvania, or West Virginia?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <input type="checkbox"/> <b>Yes</b><br><input type="checkbox"/> <b>No</b>                           |
| <b>3. Provide the terms within the easement that affect forest management.</b><br>Project is covered by a CE, which is not qualified, see Report section IV.D.3 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                     |
| <b>E. Does the offset project occur on any of the following categories of land? (check all that apply)</b><br><input type="checkbox"/> Land that is owned by, or subject to, an ownership of possessory interest of a Tribe<br><input type="checkbox"/> Land that is "Indian lands" of a Tribe as defined by 25 U.S.C. §81(a)(1)<br><input type="checkbox"/> Land that is owned by any person, entity, or Tribe, within the external borders of such Indian lands<br><input checked="checked" type="checkbox"/> <b>None of the above</b><br><i>If "none of the above," skip to Part V. Otherwise, proceed to Optional questions E1 and E2. Further documentation is required for projects occurring on land listed in the first three categories. Submit supporting documents as attachments labeled "Attachment D." See Part X of this document for more information.</i> |                                                                                                     |
| <b>1. Optional:</b> Does a limited waiver of sovereign immunity between ARB and the governing body of the Tribe exist?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <input type="checkbox"/> <b>Yes</b><br><input checked="checked" type="checkbox"/> <b>No</b>         |
| <b>2. Optional:</b> Provide a description of land ownership within the Project Area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                     |

**PART V. OFFSET PROJECT AREA**

|                                                                                                                                                                                                                                                                                    |                                                            |                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------|
| <b>Maps depicting specific elements of the Project Area are required for all projects.</b><br><i>Submit supporting documentation as attachments labeled "Attachment E." See Part X of this document for more information.</i>                                                      |                                                            |                                              |
| <b>Latitude of Offset Project Location:</b><br>38.90532                                                                                                                                                                                                                            | <b>Longitude of Offset Project Location:</b><br>-123.51248 | <b>Project Area Total Acreage:</b><br>23,780 |
| <b>A. Identify the assessment area (or assessment areas, if project crosses more than one) that contain Project Area lands and list the acreage of project lands within each assessment area.</b><br>Coast Redwood/Doug-fir Mixed Conifer & Northern California Mixed Oak Woodland |                                                            |                                              |
| <b>B. Identify and describe the governing jurisdiction(s) applicable to the Project Area.</b><br>The Project is located in Mendocino County, California.                                                                                                                           |                                                            |                                              |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C. Describe how the Project Area was determined.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| The project area is the full extent of the property purchased by The Conservation Fund in 2004. The acreage is based on the GIS shapefile seen in attachment E.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>D. Describe the existing land cover, and land use of the Project Area.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| The GRF is predominantly timberland with small natural opening of grass and rock out croppings. The property is zoned for timber production.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>E. Describe the forest vegetation types within the Project Area boundary.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| The GRF is made up of mostly Redwood / Douglas-fir / Tanoak trees. There are also mixed oak woodlands and grasslands within the project area boundary.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>F. Describe the site classes within the Project Area boundary.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| The property is primarily Dunning's Site Index III; the FIA productivity classes used for this project is "high site".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>G. Describe the land pressures and climate zone /classification applicable to the Project Area.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| The primary land pressures within the project vicinity are vineyard development and subdivision for second home development and hobby ranches. The GRF is part of a forested watershed influenced by its proximity to the coast in the lower half of the drainage. Located within the Oregonian Biotic Province, the watershed has a Mediterranean climate, characterized by a pattern of low-intensity rainfall in the winter and cool, dry summers with coastal fog. Mean annual precipitation is 30 inches at the coast and up to 100 inches per year on the inland peaks. 90% of this precipitation generally falls as rain between October and April with the highest average precipitation in January.                                                                                                                          |
| <b>H. Describe the historical land uses, current zoning, and projected land use within the Project Area and surrounding areas.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| The property has a history of forest management that has resulted in the current forest conditions, which can be characterized as a young redwood Douglas-fir forest with a high component of tanoak. Compared to pre-settlement conditions, the forest is relatively young, structurally simplified, and contains a relatively high density of hardwoods. Almost all of the old growth was logged in the 1960's, with ground-based harvesting practices that were damaging to streams. Subsequent harvests removed all the residual old growth and most of the large second-growth. The project is currently zoned as a Timber Production Zone (TPZ). Future land use in this forest area will continue to be forest management.                                                                                                     |
| <b>I. Describe the forest conditions within the Project Area, including species composition, age class distribution, and management history.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| The GRF is a 23,780 acre forest located in Mendocino County, CA east of Point Arena, CA and west of Boonville, CA. There are over 35 miles of fish bearing streams located in this primarily redwood / Douglas-fir forest with a minor component of sugar pine. Major hardwood species include tanoak and madrone, other hardwoods include chinquapin, black oak, white oak and sheeve oak in addition many other minor species exist in small numbers. In the 1980s and 1990s, the majority of the property was harvested using aggressive selection techniques, often resulting in young stands (40 to 60 years old) with heavy competition from tanoak. The forest conditions also vary based on aspect, soils, and proximity to the coast, supporting both very productive redwood forest and drier oak woodlands and grasslands. |

## PART VI. OFFSET PROJECT ELIGIBILITY

|                                                                                                                                                                                                                                     |                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>A. Does the Project Area have a canopy cover that is greater than 10 percent?</b><br><i>Supporting documentation is required. Submit as attachment labeled "Attachment F." See Part X of this document for more information.</i> | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No |
| <b>B. Optional:</b> Are the associated project lands currently in compliance with all local, state, and federal regulatory requirements?                                                                                            | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No |
| <b>Optional:</b> If no, provide an explanation of the non-compliance.                                                                                                                                                               |                                                                        |
| <b>C. Does the entity submitting this report declare that the offset project <u>has not</u> and <u>does not</u> employ broadcast fertilization?</b>                                                                                 | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>D. Indicate how the offset project meets the definition of Natural Forest Management per Table 3.2 in the U.S. Forest protocol:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                        |
| <b>1. Native species:</b><br><b>a) Does the project consist of at least 95 % native species based on the estimated sum of carbon in the standing live carbon pool? Improved Forest Management Projects are assessed using estimates of basal area per acre.</b><br><i>If "no," proceed to question 1b. Otherwise, skip to question D2.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No |
| <b>b) Describe how the project will meet this requirement.</b><br>See report section VI.D1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                        |
| <b>2. Composition of native species:</b><br><b>a) Does the Project Area naturally consist of a mixed species distribution where no single species' prevalence, measured as the percent of basal area of all live trees in the Project Area, exceeds the percentage value of standing live carbon shown under the heading 'Species Diversity Index' in the Assessment Area Data File?</b><br><i>If "no," proceed to questions 2b and 2c. Otherwise skip to question D3.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No |
| <b>b) Explain how the project will demonstrate a trend toward achieving the Species Diversity Index of native species and meet this requirement within 25 years.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                        |
| <b>c) If the Project Area does not naturally consist of a mixed species distribution: Will or have you provided a written statement from the government agency in charge of forestry regulation in the state where the project is located stipulating that the Project site is not capable of meeting the requirement of mixed species distribution?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <input type="checkbox"/> Yes<br><input type="checkbox"/> No            |
| <b>3. Distribution of age classes/sustainable management:</b><br><b>a) Indicate how the project will meet the requirement for sustainable management if regeneration or commercial harvesting is either planned or initiated within the Project Area demonstrating sustainable long-term harvesting practices. This applies to all forest landholdings of the Forest Owner(s)</b><br>(check one of the boxes).<br><input type="checkbox"/> Not applicable; no commercial harvesting is occurring within the Project Area.<br><input type="checkbox"/> Third party certification under the Forest Stewardship Council, Sustainable Forestry Initiative, or Tree Farm System, whose certification standards require adherence to and verification of harvest levels which can be permanently sustained over time.<br><input type="checkbox"/> Adherence 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.<br><input checked="" type="checkbox"/> Employ uneven-aged silvicultural practices and maintain canopy retention averaging at least 40 % across the forest, as measured on any 20 acres within the entire forestland owned by the Forest Owner, including land within and outside of the Project Area (areas impacted by Significant Disturbance may be excluded from this test). |                                                                        |
| <b>b) On a watershed scale up to 10,000 acres (or the Project Area, whichever is smaller), projects must maintain, or make progress toward maintaining, a maximum of 40 % of the project's forest lands in ages that are less than 20 years old. (Areas impacted by Significant Disturbance are exempt from this test until 20 years after reforestation of such areas.) Does the acreage within this project meet this requirement?</b><br><i>If "no," proceed to question 3c. Otherwise, skip to question D4.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No |
| <b>c) If the project does not meet the age class requirement at this time, explain how the project intends to demonstrate progress to meet this requirement over time; such that forest lands in ages less than 20 years old are reduced and make up no more than 40 % of the Project Area.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                        |
| <b>4. Structural elements (standing and lying dead wood):</b><br><b>How does the project ensure that structural elements are retained in sufficient quantities throughout the project life?</b><br>Structural elements will be retained and recruited as would naturally occur in any forest. When timber harvesting occurs, the silviculture will retain standing dead wood in the form of snags for wildlife trees. Tops will be left in woods during harvesting to increase down wood recruitment; lying dead wood will not be removed from the forest.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                        |
| <b>E. Describe the management activities that will result in increased carbon stocks in the Project Area, compared to the baseline.</b><br>See report section VI.E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                        |
| <b>F. Is this project being implemented and conducted as the result of any law, statute, regulation, court order, or other legally binding mandate?</b><br>If "yes," explain:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No |

|                                                                                                                                                                                                                                                                                       |                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>G. Does the offset project take place on land that was part of a previously listed and registered Forest Offset Project?</b><br><i>This question is applicable to both voluntary and compliance markets. If "yes" proceed to questions G1 and G2. Otherwise, skip to Part VII.</i> | <input checked="" type="checkbox"/> <b>Yes</b><br><input type="checkbox"/> <b>No</b> |
| <b>1. Optional:</b> Was the previous Forest Offset Project terminated due to an Unintentional Reversal?                                                                                                                                                                               | <input type="checkbox"/> <b>Yes</b><br><input checked="" type="checkbox"/> <b>No</b> |
| <b>2. Optional:</b> Has this project transitioned to the Compliance Offset Protocol U.S. Forest Projects after previously being listed as an early action offset project?                                                                                                             | <input checked="" type="checkbox"/> <b>Yes</b><br><input type="checkbox"/> <b>No</b> |

**PART VII. CARBON STOCK INVENTORY**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A. Provide a description of the inventory methodology used to quantify carbon stocks for each required carbon pool in the forest project's offset boundary. The inventory methodology must describe the information required in Appendix A.3 of either the Compliance Offset Protocol U.S. Forest Projects, October 20, 2011 or the Compliance Offset Protocol U.S. Forest Projects, November 14, 2014.</b><br><b>IFM-1 Standing Live:</b><br>See report section VIIA<br><b>IFM-3 Standing Dead:</b><br>See report section VIIA<br><b>IFM-6 Soil (if applicable):</b><br>NA<br><b>IFM-7 Carbon in in-use forest products:</b><br>See report section VIIA<br><b>IFM-8 Forest product carbon in landfills (if applicable):</b><br>See report section VIIA<br><b>IFM- 9 Biological emissions from site preparation:</b><br>NA<br><b>IFM-14 Biological emissions/removals from change in harvesting on forestland outside project area:</b><br>See report section VIIA<br><b>IFM-17 Biological emissions from decomposition of forest products:</b><br>See report section VIIA |
| <b>B. Describe the calculation methodologies used to determine metric tons per acre for each of the carbon pools included in the Offset Project Data Report.</b><br><b>IFM-1 Standing Live:</b><br>See report section VIIB<br><b>IFM-3 Standing Dead:</b><br>See report section VIIB<br><b>IFM-6 Soil (if applicable):</b><br>NA<br><b>IFM-7 Carbon in in-use forest products:</b><br>See report section VIIB<br><b>IFM-8 Forest product carbon in landfills (if applicable):</b><br>See report section VIIB<br><b>IFM- 9 Biological emissions from site preparation:</b><br>NA<br><b>IFM-14 Biological emissions/removals from change in harvesting on forestland outside project area:</b><br>See report section VIIB<br><b>IFM-17 Biological emissions from decomposition of forest products:</b><br>See report section VIIB                                                                                                                                                                                                                                               |
| <b>C. Provide a summary of the inventory of carbon stocks for each carbon pool (or approach used, if inventory is not applicable).</b><br><b>IFM-1 Standing Live:</b><br>5,260,894 MtCO <sub>2</sub> e<br><b>IFM-3 Standing Dead:</b><br>72,901 MtCO <sub>2</sub> e<br><b>IFM-6 Soil (if applicable):</b><br>NA<br><b>IFM-7 Carbon in in-use forest products:</b><br>1,161 MtCO <sub>2</sub> e                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <b>IFM-8 Forest product carbon in landfills (if applicable):</b><br>750 MtCO <sub>2</sub> e<br><b>IFM- 9 Biological emissions from site preparation:</b><br>NA<br><b>IFM-14 Biological emissions/removals from change in harvesting on forestland outside project area:</b><br>-11,414 MtCO <sub>2</sub> e<br><b>IFM-17 Biological emissions from decomposition of forest products:</b><br>Calculated as part of IFM-7 & IFM-8                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                             |
| <b>D. Provide a summary of inventory confidence statistics.</b><br>The inventory has a sampling error of 3.0% at the 90% confidence interval; no confidence deduction was required. See modeling plan for calculations, and Report section VII D for values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                             |
| <b>E. Provide the calculation of the offset project's reversal risk rating and contribution to the Forest Buffer Account.</b><br>The project's reversal risk rating is 19.236%; 19,652 credits for reporting period 1. See Report section VIIE for calculations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                             |
| <b>PART VIII. OFFSET PROJECT BASELINE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                             |
| <b>A. Required for <u>ALL</u> Improved Forest Management Projects</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                             |
| <b>1. Describe the project's modeling plan, following the requirements and methods in Appendix B, Section B.3 of the U.S. Forest protocol.</b><br>See OPDR Report section VIIB & additional information in the modeling plan, Appendix B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                             |
| <b>2. Describe and estimate the project's baseline onsite carbon stocks. Explain any annual changes in baseline carbon stocks over time.</b><br><i>A graph of the baseline onsite carbon stocks, labeled "Attachment G," must be portrayed depicting time on the x-axis and metric tons CO<sub>2</sub>-e on the y-axis. Include a written characterization describing any annual change in baseline carbon stocks over time. See Part X of this document for more information. A diagram of the baseline incorporating all required carbon stocks, labeled "Attachment H," is also required.</i><br>See report section VIII.A.2; Attachments H & G                                                                                                                                                                                                    |                                                                             |
| <b>3. Optional:</b> Identify the approved growth model that will be used for the project.<br>FORSEE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                             |
| <b>4. Harvest Planning</b><br><b>a. Is harvesting planned in the Project Area?</b><br><i>If "yes," proceed to question 4b. Otherwise, skip to question A5.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No      |
| <b>b. Optional:</b> Does the project use a harvest schedule model?<br><i>If "yes," proceed to question 4c. Otherwise, skip to question A5.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No      |
| <b>c. Optional:</b> Explain how you are addressing age class and stratification as part of your harvest scheduling?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                             |
| <b>5. Provide an estimate of carbon that will be stored long-term in harvested wood products in the baseline.</b><br>14,716 MtCO <sub>2</sub> e/year                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                             |
| <b>6. Provide a projection of baseline and actual harvesting volumes from the Project Area over 100 years.</b><br><i>A projection may be provided in an attachment, labeled "Attachment I". Include a narrative with a clear explanation of how the OPO/APD arrived at the baseline and actual harvest volumes is determined</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                             |
| <b>B. Required for Improved Forest Management Projects on <u>Private Lands ONLY</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                             |
| <b>1. Provide the initial above ground standing live carbon stock (per acre) for the project.</b><br>127.68 MtCO <sub>2</sub> e/acre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                             |
| <b>2. Provide the Common Practice statistic (per acre) associated with the Project Area.</b><br>176.75 MtCO <sub>2</sub> e/acre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                             |
| <b>3. Summarize how the Project's initial above-ground standing live carbon stock compares to Common Practice.</b><br>The initial live stocks are below common practice<br><b>Are the initial above-ground standing live carbon stocks above or below Common Practice?</b><br>Below common practice<br><b>If below Common Practice, what is the High Stocking Reference for the Project Area? Describe the Project Area's live tree carbon stocks over the previous 10 years.</b><br><i>Further documentation is required if project is below Common Practice. Submit supporting documents as attachments labeled "Attachment J." See Part X of this document for more information. An affidavit must be submitted testifying that the inventory depicted over the past 10 years is reasonably accurate.</i><br>See Initial OPDR Report, Attachment J | <input type="checkbox"/> Above<br><input checked="" type="checkbox"/> Below |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                          |                                                                                                            |                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <b>4. Optional:</b> Does the Forest Owner(s) and its affiliate(s) own land in fee or hold timber rights on land outside the Project Area?<br>If "no," skip to question B.5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No                                     |                                                                           |
| <b>Optional:</b> If "yes" does the Protocol require the use of a weighted average carbon stock on lands in the same Logical Management Unit (LMU, as defined in Section 6.2.1.1)?<br>If "no," skip to question B.5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                          | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No                                     |                                                                           |
| <b>Optional:</b> If "yes," is inventory data available for the LMU or will the OPO use a stratified vegetation analysis?<br>If "no," skip to question B.5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                          | <input type="checkbox"/> Data available for LMU<br><input type="checkbox"/> Stratified Vegetation Analysis |                                                                           |
| <b>Optional:</b> Identify the Minimum Baseline Level for above-ground standing live carbon stocks for the Project Area:<br>127.68 MtCO <sub>2</sub> e/acre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                          |                                                                                                            |                                                                           |
| <b>5. Provide a description of any and all legal constraints affecting forest management activities in the Project Area. Include documentation of legal constraints and a description of each constraint (referring to Section 6.2.1.2); for each constraint provide a narrative that constraint has on forest management.</b><br><i>Submit supporting documents as attachment labeled "Attachment K". See Part X of this reporting document for more information.</i><br>See Initial OPDR Report, Attachment K                                                                                                                                                                                                                                                                                                                                                                                                                         |                                          |                                                                                                            |                                                                           |
| <b>6. Provide a description of the modeling techniques used to simulate the effect of any constraints on carbon stocks.</b><br>See Initial OPDR Report section VIIB & Appendix B: Modeling Plan<br><b>Optional:</b> Provide a description of the modeling techniques used to simulate forest management activities that may affect carbon stocks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                          |                                                                                                            |                                                                           |
| <b>7. How does the OPO demonstrate financial feasibility of the growth and harvesting regime assumed for the baseline?</b> (check one of the boxes)<br><input checked="" type="checkbox"/> Conducting a financial analysis of the anticipated growth and harvesting regime that captures all relevant costs and returns, taking into consideration all legal, physical, and biological constraints, using regional norms or documented costs and returns for the project area or other properties in the Forest Project's Assessment Area<br><input type="checkbox"/> Providing evidence that activities similar to the proposed baseline growth and harvesting regime have taken place on other properties within the Forest Project's Assessment Area within the past 15 years<br><i>Supporting documentation is required. Submit as attachment labeled "Attachment L." See Part X of this listing document for more information.</i> |                                          |                                                                                                            |                                                                           |
| <b>C. Required for Improved Forest Management Projects on <u>Public Lands ONLY</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                          |                                                                                                            |                                                                           |
| <b>1. Provide a projection of future changes to Project Area forest carbon stocks extrapolating from historical trends.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                            |                                                                           |
| <b>2. Explain how current public policy affects onsite carbon stocks and how the baseline modeling incorporates constraints imposed by all applicable statutes, regulations, policies, plans, and activity-based funding.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          |                                                                                                            |                                                                           |
| <b>3. Have carbon stocks in the Project Area been increasing or declining over the preceding ten-year period?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                          |                                                                                                            | <input type="checkbox"/> Increasing<br><input type="checkbox"/> Declining |
| <b>PART IX. OTHER OFFSET PROGRAMS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                          |                                                                                                            |                                                                           |
| <b>A. Have any GHG reductions or GHG removal enhancements associated with the Project Lands ever been listed or registered with, or otherwise claimed by, another registry or program, or sold to a third party prior to listing?</b><br><i>If "yes," identify the registry or program and provide details on the issued credits below.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                                            | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No    |
| <b>B. Have any lands within the Project Area ever been listed or registered with an offset project registry or program in the past?</b><br><i>If "yes," identify the registry or program and provide details on the issued credits below.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          |                                                                                                            | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No    |
| <b>C. Have greenhouse gas emission reductions or removal enhancements associated with lands within the Project Area been credited or claimed for the purpose of greenhouse gas mitigation or reduction goals, whether in a voluntary or regulatory context?</b><br><i>If "yes," identify the goal(s) and provide details on the reductions and removal enhancements (under "Number of Credits Issued") below.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                          |                                                                                                            | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No    |
| <b>Registry / Program / Goal(s):</b><br>Climate Action Reserve                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Reporting Period(s):</b><br>2004-2014 | <b>Vintage(s):</b><br>2005-2014                                                                            | <b>Number of Credits Issued:</b><br>1,849,397                             |
| <b>PART X. ATTACHMENTS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                          |                                                                                                            |                                                                           |
| <b>A. If the answer to Part IV.A is "yes," provide documentation (e.g., deed of trust, title report, etc.) showing the OPO's ownership interest in the property and its interest in the trees and standing timber on the property. If the answer to Part IV.A is "no," provide documentation supporting the explanation of the OPO's right to undertake and list the project.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                          |                                                                                                            |                                                                           |

- B. If the answer to Part IV.C is "public," provide documentation demonstrating explicit approval of the offset project's management activities and baseline including any public vetting processes necessary to evaluate management and policy decisions concerning the offset project. If the project is a private lands project, mark "N/A" in the box below. The OPO may provide an "Attachment B" page with a "This Page Left Intentionally Blank - Private Lands Project" notation on the page. ☒ N/A
- C. If a Qualified Conservation Easement (QCE) has been recorded, provide a copy. The information contained in this form and the documents attached to it will be submitted to ARB so submitting a copy of the QCE as an attachment to this document fulfills the requirement in 9.1.1.1(18)(a) of the U.S. Forest protocol to provide ARB with a copy. ☒ N/A
- D. If the project is located on one of the categories of Tribal land listed in Part IV.E, provide documentation demonstrating that the land within the Project Area is owned by a tribe or private entity. Also provide documentation that demonstrates the existence of a limited waiver of sovereign immunity between ARB and the governing body of the Tribe entered into pursuant to section 95975(I) of the Cap-and-Trade Regulation. ☒ N/A
- E. Attach map(s) of the Project Area including:
1. Public and private roads
  2. Towns
  3. Major watercourses (4<sup>th</sup> order or greater), water bodies, and watersheds
  4. Topography
  5. Townships, ranges, and sections or latitude and longitude
  6. Existing land cover and land use (optional)
  7. Forest vegetation types (optional)
  8. Site classes (optional)
  9. Land pressures and climate zone/classification (optional)
  10. Historical land uses, current zoning, and projected land use within the Project Area (optional)
  11. A georeferenced shape file (or other electronic file that can be read in a geographic information system) that clearly identifies the Project Area and boundaries. *Note that the georeferenced shape file may constitute the required map if it includes the required map information listed above.*
- F. Provide supporting documentation demonstrating that the offset project takes places on land that has greater than 10 percent tree canopy cover.
- G. Attach a graph portraying the baseline onsite carbon stocks with time depicted on the x-axis and metric tons CO<sub>2</sub>e depicted on the y-axis.
- H. Attach a diagram of the final baseline incorporating all required carbon stocks.
- I. Provide a projection of baseline and actual harvesting volumes from the Project Area over 100 years.
- J. For IFM projects on private lands ONLY: If the Project Area's initial above-ground standing live carbon stocks are below Common Practice, submit an affidavit testifying that the inventory depicted over the past 10 years (used to determine the High Stocking Reference for the Project Area) is reasonably accurate. Also include a summary of volume harvested over the past 10 years. ☐ N/A
- K. For IFM projects on private lands ONLY: Attach supporting documentation identifying the legal constraints within the Project Area. A 'constraints' table with the following categories may be provided for simplicity with the following information: narrative of legal constraint, identification of specific governing law guiding the constraint, acreage, silviculture method, retention strategy. ☐ N/A
- L. For projects on private lands ONLY: Provide a description and supporting evidence, if applicable, that the growth and harvesting regime assumed for the baseline is financially feasible based on the qualifications in Section 6.2.1.3 of the Protocol. ☐ N/A

## PART XI. OPO/APD SIGNATURE

*Note: The person signing this Initial Reporting Period report should be the same person signing the accompanying U.S. Forest Offset Project Data Report Annual Reporting Period – All Project Types report.*

In signing this form, I certify under penalty of perjury of the laws of California that the information contained in this form is true, accurate, and complete. I further certify that I am an Account Representative of the Offset Project Operator (OPO).

SIGNATURE:

*Lauren Fety*

PRINTED NAME:

Lauren Fety

TITLE:

Primary Account Representative, Forest Analyst

DATE:

January 31, 2017

## **Background for U.S. Forest Offset Project Data Report Initial Reporting Period – Improved Forest Management**

---

Section 95976(d) of the Cap-and-Trade Regulation specifies reporting requirements for offset projects participating in the Compliance Offset Program. Offset Project Operators (OPO) or Authorized Project Designees (APD) are required to submit an Offset Project Data Report (OPDR) within four months of the end of each (annual) Reporting Period. The Compliance Offset Protocol U.S. Forest Projects, October 20, 2011 and Compliance Offset Protocol U.S. Forest Projects, November 14, 2014 both require additional information to be included with the initial OPDR. This form is designed to help OPOs and APDs provide the extra information required for an initial OPDR by U.S. Forest offset projects. The information in this form is submitted to the approved Offset Project Registry that is listing the offset project and should also be provided to the ARB-accredited verification body that will be verifying the Offset Project Data Report.

The information to be provided in this form closely mirrors information provided in the application for listing a U.S. Forest offset project. OPOs and APDs may wish to copy the information in their project's application for listing to the extent that the information provided at the time of that application has not changed.

### **Where to Submit Information Contained in This Form**

---

Please complete the information on the form using your computer. Then print, sign, and scan the form. The completed and signed information and all supporting documentation should be submitted to the appropriate [Offset Project Registry](#).

Copies of this form can be downloaded from the ARB website at:  
<http://www.arb.ca.gov/cc/capandtrade/offsets/forms/forms.htm>

## **Detailed Instructions for U.S. Forest Offset Project Data Report Initial Reporting Period – Improved Forest Management**

---

This form is protected with restricted editing to facilitate completing the form. If the applicant wishes to unprotect the form, the password is "form".

### **Part I. Entity Submitting Report:**

- Indicate whether the Offset Project Operator (OPO) or Authorized Project Designee (APD) is submitting the Offset Project Data Report.
- List the name, organization, phone number, and email address of the person submitting the information. This person should be an employee of the OPO or APD, whichever entity is making the submission. The person submitting the information need not be the same person as the contact person listed for the OPO or APD in Part III and also need not be the person signing the form in Part XI.
- The person submitting the information should indicate the date the form is completed.

### **Part II. Offset Project Information:**

- Provide the name for the offset project. Also provide the project's identification number from the approved Offset Project Registry listing the project. The ARB project identification number may also be provided if known.
- Indicate the offset project commencement date and the start and end dates of the first reporting period. Unlike with the listing form, approximations are no longer acceptable for these dates since precise dates should be known.
- Project commencement for an Improved Forest Management Project must be linked to a discrete, verifiable action that delineates a change in practice that increases sequestration and/or decreases emissions relative to the forest project's baseline. This date could be triggered by the transfer of property ownership, recordation of a conservation easement on the Project Area, or when submitting the offset project listing information.

### **Part III. OPO/APD Information:**

- Enter contact information for the OPO and APD submitting the report. Every offset project will have an OPO. If an offset project does not have an APD, please mark the box indicating the Offset Project does not have an APD and leave the remaining fields blank.

- For both the OPO and, if applicable, the APD, enter the entity's name, its mailing address, and the name, phone number, and email address of a contact person for the entity. Also include its CITSS ID number. The CITSS ID is six characters in length, with two letters followed by four numbers (e.g., "CA1234"). **DO NOT PROVIDE THE CONFIDENTIAL CITSS ACCOUNT NUMBER**, which begins with the CITSS ID number followed by a hyphen and more numbers.

#### **Part IV. Land Ownership:**

- This part includes questions regarding land ownership and property interests.
- Further documentation is required based on the responses to some questions. See Part X of this report for more information on the precise requirements.

#### **Part V. Offset Project Area:**

- This part asks for qualitative descriptions of the offset Project Area.
- Maps are required to complement the descriptions provided in this part. See Part X of this report for more information on the precise requirements.
- The Project Area should be determined following the requirements of Section 4 of the U.S. Forest protocol.
- Assessment areas shall be determined by referencing the Assessment Area Data File available at: <http://www.arb.ca.gov/cc/capandtrade/protocols/usforestprojects.htm>

#### **Part VI. Offset Project Eligibility:**

- The questions in this part are designed to facilitate the determination of project eligibility for Improved Forest Management Projects.
- Further documentation is required based on the responses to some questions. See Part X of this report for more information on the precise requirements.
- Details on the eligibility requirements for Improved Forest Management Projects can be found in Sections 2.1.2, 3.1, and 3.8 of the U.S. Forest protocol.
- Details on the Natural Forest Management criteria can be found in Table 3.2 in the U.S. Forest protocol.

#### **Part VII. Carbon Stock Inventory:**

- Projects are required to have completed a full carbon stock inventory for the initial Offset Project Data Report. Unlike the inventory provided at the time of listing, a general description of the project's inventory methods with preliminary best estimates is no longer sufficient to meet the regulatory requirements. If the project's inventory methodology changed between the time of listing and submission of the initial OPDR, this change should be reported as a change to the information submitted at project listing when submitting the first OPDR.
- Section 6.2 of either the Compliance Offset Protocol U.S. Forest Projects, October 20, 2011 or the Compliance Offset Protocol U.S. Forest Projects, November 14, 2014 outlines the approved quantification methodologies for Improved Forest Management Projects. Further details on completing a forest project carbon inventory can be found in Appendix A of the Protocol. (There are some differences in section 6.2 and Appendix A between the two versions.)
- Follow the steps in Appendix D of the U.S. Forest protocol to quantify the project's reversal risk rating.
- The project's expected contribution to the Forest Buffer Account is determined annually based upon the project's risk of reversal and is calculated by multiplying the project specific reversal risk rating by the total net GHG reductions/removals achieved by the project. Unlike the listing application, for this OPDR an approximation of the contribution to the Forest Buffer Account is not acceptable.

#### **Part VIII. Offset Project Baseline:**

- For this OPDR, unlike the project listing application, projects are required to have a finalized baseline. A modeling plan with preliminary best estimates is no longer sufficient to meet the regulatory requirements. If the project's modeling plan or baseline estimates changed between the time of listing and submission of the initial OPDR, this change should be reported as a change to the information submitted at project listing when submitting the first OPDR.
- Note that IFM projects located on public land must present documentation demonstrating explicit approval of the offset project's management activities and baseline. These projects may report changes to the baseline within the initial OPDR if the changes have gone through a public review process and meet the Protocol requirements regarding explicit approval of the project's baseline.
- This part is divided into three sections: questions required for all Improved Forest Management Projects; questions for Improved Forest Management Projects on private lands; and questions for Improved Forest Management Projects on public lands. Answer the questions applicable to the project.

**Submit the information in this form to  
the Climate Action Reserve**

- A diagram and graph are required to complement the descriptions provided in this part. See Part X of this report for more information on the precise requirements.
- Section 6.2 of either the Compliance Offset Protocol U.S. Forest Projects, October 20, 2011 or the Compliance Offset Protocol U.S. Forest Projects, November 14, 2014 outlines the approved quantification methodologies for Improved Forest Management Projects. Instructions for considering legal and financial constraints can be found in Sections 6.2.1.2 and 6.2.1.3, respectively. Further details on modeling carbon stocks can be found in Appendix B. (There are some differences in section 6.2 and Appendix B between the two versions.)
- ARB approved growth models can be found in Appendix B, Section B.1 of either the Compliance Offset Protocol U.S. Forest Projects, October 20, 2011 or the Compliance Offset Protocol U.S. Forest Projects, November 14, 2014. (There are some differences in Appendix B between the two versions.)

**Part IX. Other Offset Programs:**

- Answer all questions. If the answer to any question is “yes,” identify the registry or program and provide details on the issued credits in the space provided.

**Part X. Attachments:**

- Provide each attachment on a separate sheet of paper and submit along with the completed Initial Reporting Period-Offset Project Data Reporting Form.
- To aid with tracking each attachment, it is recommended that the attachments are labeled to correspond with the letter in Part X that they refer to (e.g. “Attachment B”).
- When an attachment is not applicable to the project being listed, please select the “N/A” (Not Applicable) checkbox next to the requirement so that it is clear that the attachment was not inadvertently left off.

**Part XI. OPO/APD Signature:**

- The individual signing the document must be registered in CITSS as the OPO’s Primary Account Representative or Alternate Account Representative for the entity submitting the information. The individual signing the document may be an APD employee and/or representative; but to sign the document, the individual must be an Account Representative on the OPO’s CITSS account.
- Please provide the individual’s signature, printed name, corporate title, and date signed.
- There are no attestations for this report. The attestations required for the Offset Project Data Report are included in the form U.S. Forest Offset Project Data Report Annual Reporting Period – All Project Types.

Please contact your Offset Project Registry with any questions regarding the OPDR.

Garcia River Forest  
Offset Project Data Report v 1.7  
California Air Resources Board

---

*Forest Owner and Offset Project Operator:*  
*The Conservation Fund*

Offset Project Owner: The Conservation Fund  
Offset Project Name: Garcia River Forest – ARB  
OPR Project ID#: CAR 1098  
ARB Project ID#: CAFR 5141  
OPO CITSS ID#: CA 1597

Compliance Offset Protocol – U.S. Forest Projects – Adopted: November 14, 2014  
Initial Reporting Period: 1/1/2015 – 2/14/2016

OPO Representative Registered with CITSS: Lauren Fety  
Registered Professional Forester: Scott Kelly, RPF#2408

## Table of Contents:

|                                                                                                                                  |    |
|----------------------------------------------------------------------------------------------------------------------------------|----|
| <i>Table of Contents:</i> .....                                                                                                  | 2  |
| <i>Tables &amp; Figures</i> .....                                                                                                | 3  |
| <i>Attachments (end of this document unless specified)</i> .....                                                                 | 4  |
| <i>Appendices (separate document TCF_GRF_InitialOPDR_appendices)</i> .....                                                       | 5  |
| <i>Introduction</i> .....                                                                                                        | 6  |
| <i>IV.D.3 Terms Within the Easement That Effect Forest Management</i> .....                                                      | 8  |
| <i>V.A Assessment Area</i> .....                                                                                                 | 8  |
| <i>V.F Site Class</i> .....                                                                                                      | 8  |
| <i>VI.B Legal Constraints Affecting Forest Management</i> .....                                                                  | 8  |
| <i>VI.D.1 Native Species</i> .....                                                                                               | 9  |
| <i>VI.D.3.a Sustainable Management</i> .....                                                                                     | 10 |
| <i>VI.D.3.b Age Class Distribution / Sustainable Management</i> .....                                                            | 10 |
| <i>VI.D.4 Structural Elements</i> .....                                                                                          | 11 |
| <i>VI.G Previously Listed</i> .....                                                                                              | 12 |
| <i>VII.A Carbon Stock Inventory</i> .....                                                                                        | 12 |
| <i>VII B Calculation Methodologies</i> .....                                                                                     | 19 |
| <i>VII.C Summary of Carbon Stocks</i> .....                                                                                      | 24 |
| <i>VII.D Summary of Inventory Confidence Statistics</i> .....                                                                    | 25 |
| <i>VII.E Risk of Reversal Calculation</i> .....                                                                                  | 26 |
| <i>VIII.A.2 Baseline Carbon Stocks</i> .....                                                                                     | 26 |
| <i>VIII.A.5 Carbon Stored Long Term</i> .....                                                                                    | 29 |
| <i>VIII.B.4 LMU &amp; WCS</i> .....                                                                                              | 30 |
| <i>Attachment A: Ownership Interest in Garcia River Forest</i> .....                                                             | 32 |
| <i>Attachment E: Map of the Project Area</i> .....                                                                               | 33 |
| <i>Attachment F: Canopy Cover of Garcia River Forest</i> .....                                                                   | 34 |
| <i>Attachment G: Graph of baseline onsite carbon stocks</i> .....                                                                | 35 |
| <i>Attachment H: Diagram of the baseline including all required carbon stocks</i> .....                                          | 36 |
| <i>Attachment I: Projections of baseline and actual harvesting volumes from the Project Area over the Planning Horizon</i> ..... | 37 |
| <i>Attachment J: High Stocking Reference Analysis</i> .....                                                                      | 42 |
| <i>Attachment K: Legal Constraints</i> .....                                                                                     | 44 |
| <i>Attachment L: Financial Feasibility Estimate</i> .....                                                                        | 45 |
| <i>Attachment N: Management Buffers</i> .....                                                                                    | 46 |

## Tables & Figures

|                                                                                                                          |    |
|--------------------------------------------------------------------------------------------------------------------------|----|
| Figure 1: General Overview map of the GRF.....                                                                           | 7  |
| Table 1: % BA by Species at Reporting Period 1 End - (2/14/2016).....                                                    | 9  |
| Table 2: Average forest age by watershed.....                                                                            | 11 |
| Figure 2: Average Site Tree Age by Watershed.....                                                                        | 11 |
| Table 3: Strata Descriptions.....                                                                                        | 14 |
| Figure 3: Strata Types.....                                                                                              | 15 |
| Figure 4: Forested Areas in GRF.....                                                                                     | 16 |
| Table 4: Volume, Biomass, and Density Equations and Coefficients by Species.....                                         | 20 |
| Table 5: Volume basis for biomass calculation of snags.....                                                              | 21 |
| Table 6: Relative density factors ( $Mt/m^3$ ) from Harmon et al (2011) .....                                            | 22 |
| Table 7: Standing live and dead carbon stocks (metric tons) for initial reporting period:<br>2/14/16.....                | 24 |
| Table 8: Calculation of sampling error.....                                                                              | 25 |
| Table 9A Standing Live Carbon: Summary of 2015 Inventory.....                                                            | 25 |
| Table 9B Standing Dead Carbon: Summary of 2015 Inventory.....                                                            | 26 |
| Table 10: Reversal Risk Rating and Buffer Pool Contribution Calculation.....                                             | 26 |
| Figure 5: Attachment G - Baseline Model .....                                                                            | 28 |
| Figure 6: Attachment H, Baseline graph .....                                                                             | 29 |
| Table 11: Harvested Wood Product Summary - Annual Addition by Product Class.....                                         | 30 |
| Table 12: The Conservation Fund's LMUs .....                                                                             | 31 |
| Table 13: Baseline carbon stocks ( $MtCO_2e/acre$ ).....                                                                 | 37 |
| Table 14: Baseline carbon stocks for the Garcia River Project ( $MtCO_2e$ ).....                                         | 38 |
| Table 15: Baseline modeled harvests .....                                                                                | 39 |
| Table 16: Projected Annual Harvesting under Sustained Yield (Actual) Management and<br>Baseline Management Scenario..... | 40 |
| Table 17: Actual Harvested Volumes on the Project since Commencement in February 2004.....                               | 41 |
| Table 19: Historical Canopy Cover of GRF .....                                                                           | 42 |
| Table 20: THP Silviculture from 1994-2004.....                                                                           | 43 |
| Table 21: GRF Historic Growth .....                                                                                      | 43 |

**Attachments** (end of this document unless specified)

- Attachment A - Ownership Interest in Garcia River Forest (separate documents)
- Attachment B - omitted N/A
- Attachment C - omitted N/A
- Attachment D - omitted N/A
- Attachment E - Map of the Project Area (separate geodatabase)
- Attachment F - Map of Canopy Cover of Garcia River Forest
- Attachment G - Graph of Baseline Carbon stocks
- Attachment H - Graph of Final Baseline with all Carbon Pools
- Attachment I - Projected Baseline and Actual Harvested Volumes
- Attachment J - High Stocking Reference Assessment
- Attachment K - Legal Constraints
- Attachment L - Financial Feasibility Analysis (separate worksheet)

**Appendices** (separate document TCF\_GRF\_InitialOPDR\_appendices)

- Appendix A – Forest Inventory Cruise Specifications
- Appendix B – Garcia River Forest Modeling Plan
- Appendix C – Calculation of GHG Reductions and GHG Removals
- Appendix D – Demonstration of Sustainable Long Term Management

## Introduction

The Garcia River Forest is owned and managed by the Conservation Fund (TCF). TCF is a non-profit land conservation organization whose mission is to both protect and conserve land in the USA and also to promote and sustain rural economies. TCF acquired the GRF in February 2004. The Garcia River Forest carbon project was listed with the California Climate Action Registry (CCAR) in 2005 using version 2.1 of the Forest Project Protocol (FPP). The start date of the project was the date of the property acquisition: February 2<sup>nd</sup>, 2004. The first successful verification and registration occurred in 2007 and included carbon offset vintages for years 2005, 2006, and 2007.

Since the first verification and registration with CCAR, TCF has successfully completed full verifications for the 2008-2014 vintage years. During this time, CCAR became the Climate Action Reserve (CAR) and new versions of the Forest Project Protocol have been released. The project is now transitioning to the California Air Resources Board (ARB) compliance program following the Compliance Offset Protocol – U.S. Forest Projects – Adopted: November 14, 2014.

This document is prepared in accordance with the Cap and Trade regulation section 95990(k) and fully describes the Garcia River Forest Carbon Offset Project (“GRF” or “Project”). It will serve as the GRF Initial OPDR Report (supplementing the Initial OPDR Form) and will be a living document that is updated as there are changes in the GRF. This document will also serve as a change log for relevant updates and will contain a full history of the GRF Project design since its inception in 2015; changes since the listing document are detailed in the modeling plan change log and in Addendum V of the Annual OPDR. This Initial OPDR Report is intended to be accompanied by an Annual OPDR reporting form for each Reporting Period. Subsequent Reporting Periods will start the 15<sup>th</sup> of February and conclude the 14<sup>th</sup> of February of the following year. (Reporting Period 1 runs from January 1, 2015 through February 14, 2016.) The crediting period for the Project is January 1, 2015 through December 31, 2039.

The GRF is a 23,780 acre forest located in Mendocino County, CA east of Point Arena, CA and west of Boonville, CA (Figure 1). There are over 35 miles of fish bearing streams located in this primarily redwood / Douglas-fir forest. In the 1980s and 1990s, the majority of the property was harvested using aggressive selection techniques, often resulting in young stands with heavy competition from tanoak. The forest conditions vary based on aspect, soils, and proximity to the coast, supporting both very productive redwood forest and drier oak woodlands and grasslands.

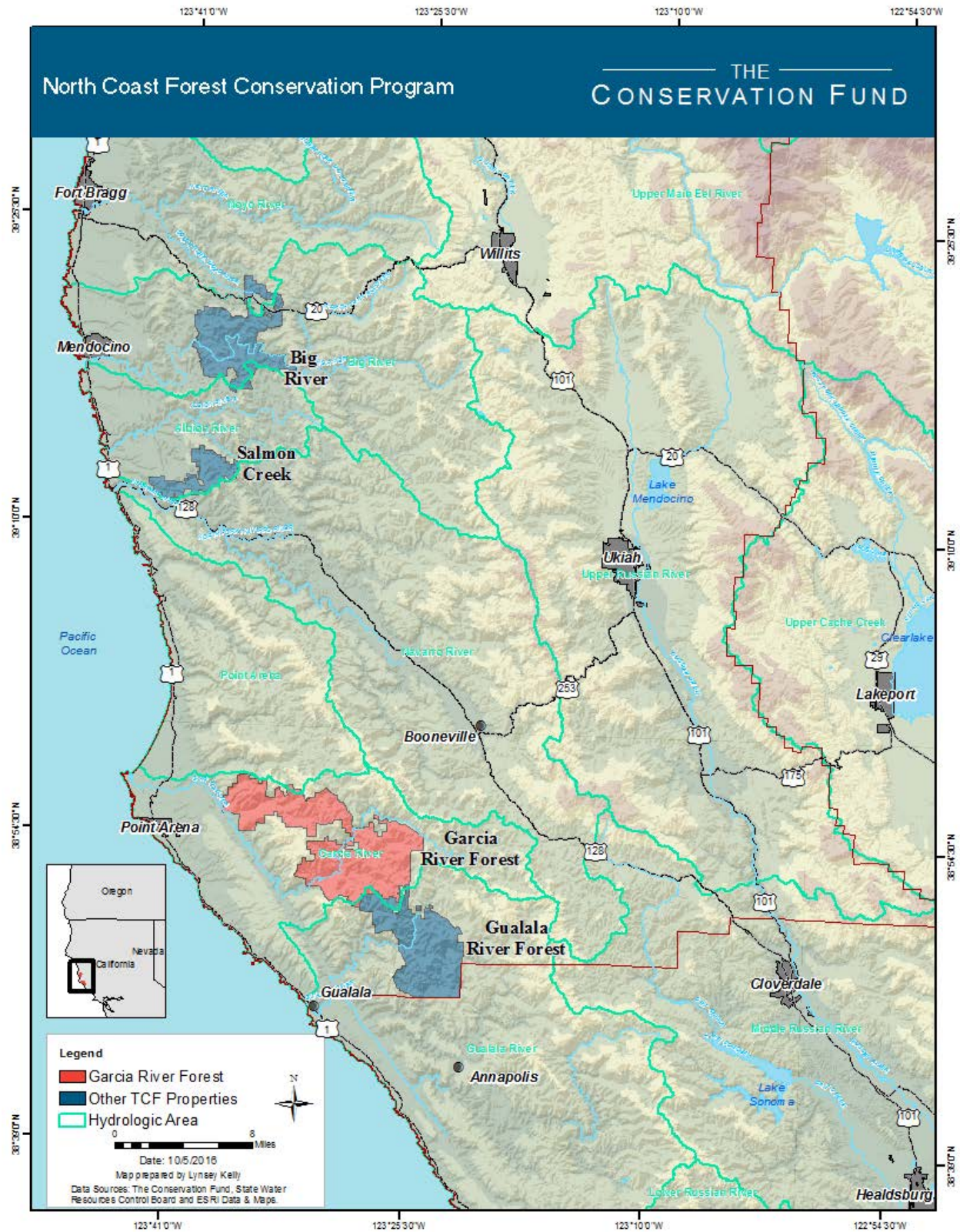


Figure 1: General Overview map of the GRF

#### **IV.D.3 Terms Within the Easement That Effect Forest Management**

The Nature Conservancy holds a conservation easement that restricts the management of the GRF and prevents future subdivision and development of this property. One of the conditions of the easement is that approximately 1/3 of the property has been designated as an Ecological Reserve (“Reserve”) where timber harvesting is designed to promote the development of a forest with late seral characteristics. This easement is not considered to be qualified according to the Compliance Offset Protocol U.S. Forest Project adopted by the California Air Resources Board. The conservation easement sale occurred on February 2, 2004. Because the sale of the easement occurred within a year of with the purchase of the property, the conservation easement is not a legally binding mandate that must be incorporated into the baseline modeling per section 3.4.1(b)(2) of the Protocol.

#### **V.A Assessment Area**

For the common practice baseline calculation, the vegetation types of the GRF consists of both the Coast Redwood / Douglas-fir Mixed Conifer (CRDFMC) assessment area and the Northern California Coast Mixed Oak Woodland assessment area (NCCMOW). The CRDFMC is 20,118 acres (85% of the area) and the NCCMOW is 3,128 acres (13% of the area). The remaining acres are dominated by grasslands. These assessment area acreages were calculated based on the California Wildlife Habitat Relationship Types Life Form criterion. Conifer forest (WHR\_CON) and Mixed Forest (WHR\_MIX) were considered part of the CRDFMC assessment area. Hardwood forest (WHR\_HDW) was considered part of the NCCMOW assessment area. Herbaceous (WHR\_HEB), Shrubs (WHR\_SHB), and non-forested areas (WHR\_NFO) were 534 acres (2% of the area) and not considered as part of the common practice calculation.<sup>1</sup>

#### **V.F Site Class**

The Forest Inventory and Analysis (FIA) site class for the project area is “high” (FIA site productivity class code 1-3). The Dunning’s timber site class for the property is predominantly class III. Site tree information used in forest modeling was collected during the 2015 inventory effort.

#### **VI.B Legal Constraints Affecting Forest Management**

The GRF project has been in compliance with all local, state, and federal regulatory requirements during this reporting period (1/1/2015-2/14/2016).

---

<sup>1</sup> Habitat Classification Rules. California Wildlife Habitat Relationships System. 2005. 46 pages. California Department of Fish and Game California Interagency Wildlife Task Group, Sacramento, CA. Standards and Guidelines for CWHR Species Models. 2000. 43 pages. California Department of Fish and Game California Interagency Wildlife Task Group, Sacramento, CA.

Please see Attachment K: Legal Constraints for a complete list of the legal constraints that affect forest management.

#### **VI.D.1 Native Species**

Since the project start, more than 95% of the standing carbon on the GRF is found in native species.<sup>2</sup> Additionally, no individual species represents more than 60% of the total basal area (BA) across the project area<sup>3</sup>. The Conservation Fund intends to manage the timber stands to maintain species diversity, ensuring that the Project continues to meet the requirements for composition of native species under Table 3.2 (page 20) of the Protocol by maintaining species' basal area percentage below 60%, the Species Diversity Index from the Assessment Area Data File.

**Table 1: % BA by Species at Reporting Period 1 End - (2/14/2016)**

| <b>Species</b>            | <b>% BA</b> |
|---------------------------|-------------|
| <b>Ash</b>                | 0.04%       |
| <b>Big Leaf Maple</b>     | 0.67%       |
| <b>Black Oak</b>          | 0.17%       |
| <b>Bishop Pine</b>        | 0.01%       |
| <b>California Bay</b>     | 0.81%       |
| <b>Canyon Live Oak</b>    | 0.87%       |
| <b>California Buckeye</b> | 0.04%       |
| <b>Douglas-fir</b>        | 27.18%      |
| <b>Giant Chinquapin</b>   | 0.15%       |
| <b>Grand Fir</b>          | 0.41%       |
| <b>Interior Live Oak</b>  | 1.51%       |
| <b>California Nutmeg</b>  | 0.17%       |
| <b>Pacific Madrone</b>    | 3.93%       |
| <b>Pacific Yew</b>        | 0.00%       |
| <b>Red Alder</b>          | 0.37%       |
| <b>Redwood</b>            | 21.97%      |
| <b>Shreve's Oak</b>       | 1.19%       |
| <b>Sugar Pine</b>         | 3.14%       |
| <b>Tanoak</b>             | 35.64%      |
| <b>Unknown</b>            | 0.06%       |
| <b>Western Hemlock</b>    | 0.76%       |
| <b>Wax Myrtle</b>         | 0.76%       |
| <b>White Oak</b>          | 0.14%       |

<sup>2</sup> This criterion is based on the language found in Table 3.2 of the Protocol.

<sup>3</sup> Following the Species Diversity guidelines outlined for the Northern California Coast Supersection Assessment Area  
[http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects\\_2014.htm/assessment\\_area\\_data\\_file.xlsx](http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects_2014.htm/assessment_area_data_file.xlsx)

### **VI.D.3.a Sustainable Management**

Section 3.8.1 of the Compliance Offset Protocol for US Forest Projects requires that the OPO demonstrate that the Forest Owner employs and demonstrates sustainable long-term harvesting practices on all of its forest landholdings, including the Project Area.

The GRF was certified under both the Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI) in 2007 and has maintained certification in good standing through 2/14/2016. All lands currently owned by TCF in the California redwood region are also certified under both standards. On a larger, organization-wide scale, all forests owned by TCF for 5 years or more were successfully certified to the SFI Forest Management Standard in 2015 (certificate issued April 2016).

Because the SFI certificate was not issued until April 2016, the initial reporting period of GRF uses the third option listed in section 3.8.1 to demonstrate sustainable harvesting practices.

The Conservation Fund uses uneven-age management on all of its holdings within the Northern California Coast Supersection Assessment Area. TCF has not created any openings in excess of 1 acre through timber management activities. Excluding grasslands and other natural openings, there are not any areas on TCF Northern California Coastal forests where the canopy has been reduced through timber management activities below 40% canopy cover in any 20 acre area. In areas where timber management has not occurred, the forest canopy cover is generally 90% or more. See Appendix D “Demonstration of Sustainable Management” for details of the analysis.

### **VI.D.3.b Age Class Distribution / Sustainable Management**

Within each sub-watershed (specified by the Cal Water Planning Watersheds) covered by the Project, no more than 40% of the area has trees less than 20 years old. This is based on the average age of the measured site trees in 2015 within each watershed (Figure 2). The table below shows the average age of the trees measured by watershed within the GRF.

Table 2: Average forest age by watershed.

| Cal Water Planning Watershed | Acres | Average Age | Trees Measured |
|------------------------------|-------|-------------|----------------|
| East of Eureka Hill          | 2,223 | 50          | 20             |
| Inman Creek                  | 4,480 | 60          | 29             |
| Lamour Creek                 | 638   | 51          | 5              |
| Little Penny                 | 1,085 | 52          | 7              |
| North Fork Garcia River      | 7,269 | 51          | 13             |
| North of Gualala Mtn         | 2,327 | 53          | 14             |
| Robinson Creek               | 200   | 59          | 3              |
| Rolling Brook                | 378   | 39          | 3              |
| Signal Creek                 | 3,374 | 54          | 27             |
| Upper Brush Creek            | 144   | 48          | 1              |
| Victoria Fork                | 1,662 | 53          | 21             |

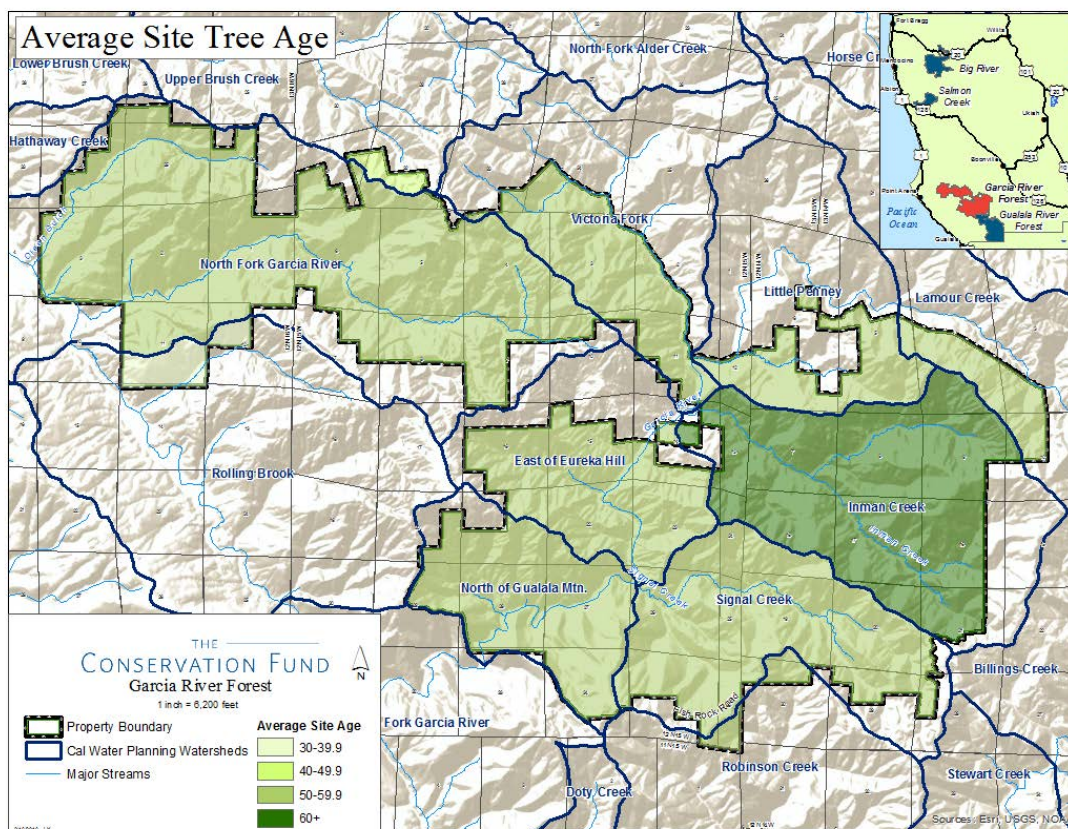


Figure 2: Average Site Tree Age by Watershed

#### VI.D.4 Structural Elements

Structural elements will be retained and recruited as would naturally occur in the forest. When timber harvesting occurs, the silviculture retains standing dead wood in

the form of snags for wildlife trees. Tops are left in the woods during harvesting to increase down wood recruitment; lying dead wood is not be removed from the forest. In the 2015 inventory, the project has an average of more than 1% of standing live carbon stocks in standing dead wood (3.25 MtCO<sub>2</sub>e/acre in standing dead wood).

#### **VI.E Management Activities that Lead to Higher Carbon Stocks than Baseline**

The forest management activities used on the GRF will consist primarily of light-touch selection harvesting. This harvesting approach will generally leave more standing volume post harvest than is modeled in the baseline harvesting regimes.

Compared to the baseline, there are several changes in the management of Garcia River Forest that will lead to higher carbon stocks. The GRF is managed to increase timber stocking (both quality and quantity) with a variety of uneven-aged silvicultural approaches (primarily single-tree selection, but with some group selection and variable retention harvests). The GRF has also set aside larger than required riparian buffers and maintains a designated Ecological Reserve Network (Reserve) which encompasses approximately a third of the total forest area. The Reserve is managed for late seral forest conditions. The combination of the reduced harvest levels, forest retention, and reserve areas results in an increase of standing carbon stocks.

#### **VI.G Previously Listed**

The GRF is an Improved Forest Management (IFM) project that has regularly occurring active management. This project was registered on CAR as a Conservation Based Forestry Project, under protocol version 2.1, from 2/2/2004-12/31/14. This OPDR document will initiate the transition from CAR version 2.1 project to an ARB Improved Forest Management Project as outlined in the Compliance Offset Protocol, November 14<sup>th</sup> 2014.

#### **VII.A Carbon Stock Inventory**

The following information is provided in accordance with Compliance Offset Protocol US Forest Projects November 14, 2014 (Protocol). This section serves as the forest carbon inventory (Protocol, section A3), and is supplemented by Initial OPDR Appendix A (Forest Inventory Cruise Specifications) and Appendix B (Modeling Plan).

*IFM 1: Primary Effect - Standing Live Carbon Pool*

*IFM 3: Primary Effect - Standing Dead Carbon Pool*

## 1. Methodology

The GRF inventory was designed and implemented in 2015. The GRF was sampled using a stratified random sampling design of forested areas. The first step was to identify forested areas. To determine the forested areas, a waterfall of "area subtractions" of zero carbon areas were removed from the project boundary. The first step in this waterfall is to determine the size of zero carbon road areas and remove them. Paved roads, existing permanent, and existing seasonal roads are buffered 18' from the center line in ArcGIS for a total of 36'. These zero carbon road acres are then subtracted from the Project Area to arrive at the Net Acres. Next, the polygons of natural grasslands greater than 1 acre and the Garcia River alluvium polygon (both digitized from 2012 high-resolution aerial imagery) are removed from the Net Acres to get the Forested Acres.

After the forested areas have been determined, the project is split into three strata based on management constraints. These strata are: Reserve, Watercourse and Lake Protection Zone, and Working Forest. The Reserve is the area identified in the conservation easement in which active management is restricted to silviculture aimed to promote the development of a forest with late seral characteristics. The second management stratum is the class I and II watercourse and lake protection zones (WLPZ) in which harvesting is restricted by statute to protect water quality. The third stratum is the unconstrained Working Forest (WF). These strata were chosen because overtime the Reserve and WLPZ will diverge from the working forest in tree size and density. The plots were placed on a 5 chain by 20 chain grid across the property from which plots were randomly selected for sampling in a simple random/systematic stratified sampling design (SRSS).<sup>4</sup>

The Garcia River alluvium polygon, natural grasslands (at least 1 acre in size), and buffered road acres are collectively considered the Zero Carbon Acres, also called the Nontimber Stratum. The GRF project boundary is the full 23,780 and includes roads, grasslands, gravel bars, and a river polygon. The Nontimber Stratum was not sampled and is assumed to have 0 carbon stocks/acre. As the project changes over time, the acreage in these non-forest types (as well the forested strata) may change. However, for the life of the project, roads, grasslands, and the Garcia River alluvium areas will always be assumed to have 0 MgCO<sub>2</sub>e/acre. Over time, the strata designations and associated acreages will be updated as appropriate. (Note, to aid visualization maps are generally represented with only the natural openings as 'nontimber'. The buffered roads network is extensive and generally not included).

---

<sup>4</sup> Shiver, B.D. and Borders, B.E. Sampling Techniques for Forest Resource Inventory. John Wiley and Sons, Inc. New York, NY. 1996.

**Table 3: Strata Descriptions**

| <b>Strata Name</b>                | <b>Strata</b> | <b>Gross Acres</b> | <b>Forest Acres<br/>(roads removed)</b> | <b>Description</b>                                                                                                                                                                                                 | <b>Contains<br/>Forest<br/>Carbon?</b> |
|-----------------------------------|---------------|--------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <b>Reserve</b>                    | RSRV          | 5,784.72           | 5,568.74                                | Forest Reserve – area designated in the Conservation Easement                                                                                                                                                      | yes                                    |
| <b>Working Forest</b>             | WF            | 14,333.01          | 13,800.37                               | Forest Area not along streams or in the Reserve                                                                                                                                                                    | yes                                    |
| <b>Water Lake Protection Zone</b> | WLPZ          | 3,219.67           | 3,086.25                                | 300' - from Main Stem Garcia River Polygon<br>200' - from center line of Class 1 Streams<br>100' - from center line of Class 2 Large Streams<br>75' - from the center line of Class 2 streams                      | yes                                    |
| <b>Nontimber / Zero Carbon</b>    | NT            | 442.68             | -                                       | Nontimber management acres<br><i>(natural openings, but not buffered roads, in "Gross Acres" column.</i><br><i>There a total of 1,325 acres of 'zero carbon' nontimber natural openings &amp; buffered roads )</i> | no                                     |
|                                   | <b>Total</b>  | <b>23,780.08</b>   | <b>22,455.36</b>                        | Garcia River Forest Project Area                                                                                                                                                                                   |                                        |



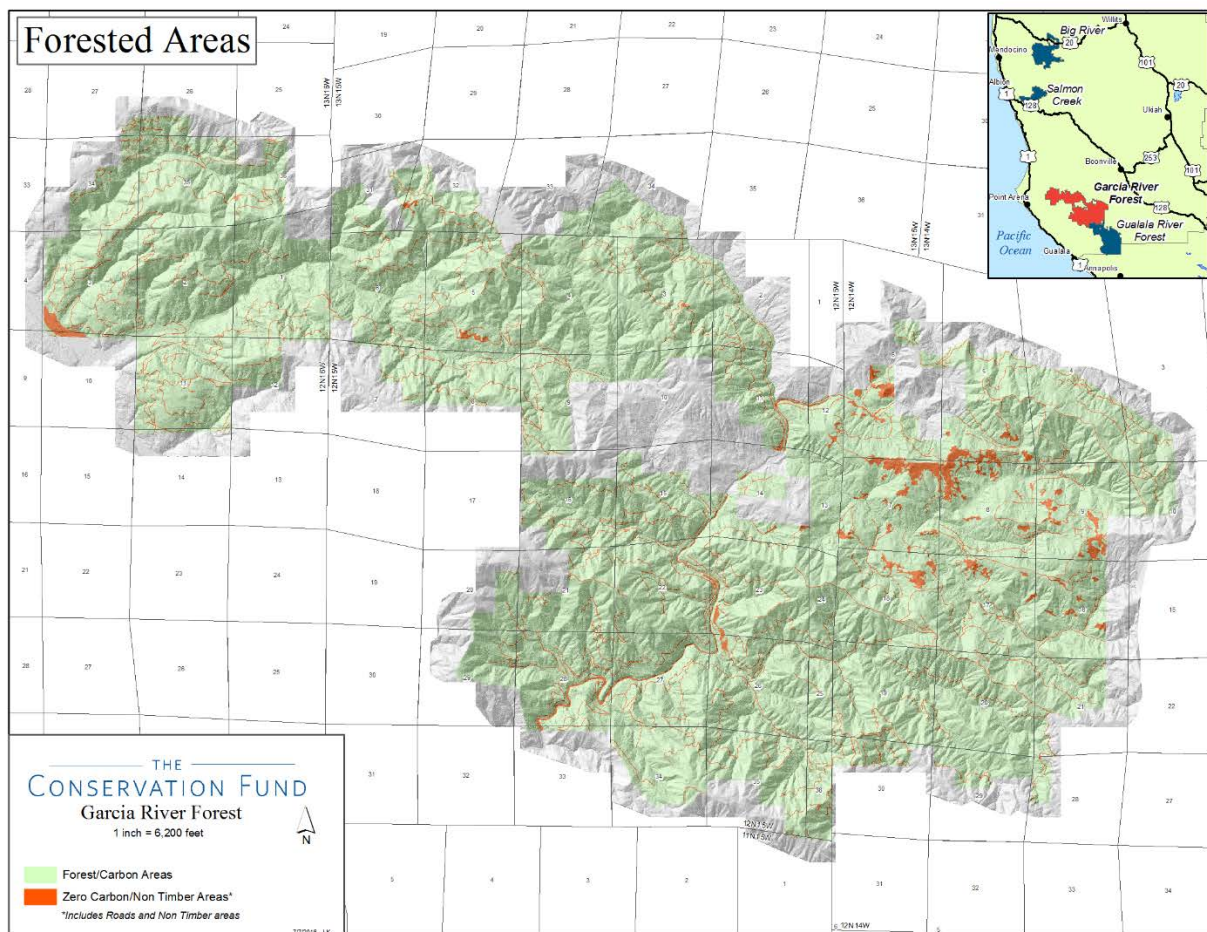


Figure 4: Forested Areas in GRF

## 2. Offset Project Boundary

The GRF measures carbon in standing live trees and in standing dead trees in all forested strata. Within the offset project boundary there are the three forest strata and also a Nontimber Stratum which is not sampled and is assumed 0 MgCO<sub>2</sub>e/acre. The project area is 23,780 acres, which coincides with the entire property boundary of the Garcia Forest owned by The Conservation Fund including natural openings and roads.

## 3. Field Measurement Procedures

Carbon stocks were inventoried in forested areas in 2015. Appendix A details the on-the-ground inventory data collection procedures used in the 2015 inventory. Below is a brief description of the field measurement procedures.

Sampling of standing live and dead trees uses a 1/10 acre fixed area plot for conifer species and a nested 1/20 acre plot for hardwoods species. All hardwood trees greater than or equal to 5 inches are sampled on the 1/20 acre plot; all conifer species greater than or equal to 5 inches are sampled on the 1/10 acre plot. All live

trees less than 5 inches, but at least 2.5 inches in DBH, are measured in a 1/100<sup>th</sup> acre fixed area regeneration plot. The inventory design sub-samples tree height by measuring tree height on approximately a third of the plots. Trees not measured for height are estimated using the equation forms outlined in Eng (2012)<sup>5</sup> or using FORSEE's estimation methods (Modeling Plan, Section III and Section X).

The forest inventory will be periodically updated through new a forest inventory that re-measures the fixed area plots. It is likely that the forest inventory will be collected on a rolling basis where a portion of plots will be re-measured annually instead of conducting a forest-wide inventory periodically. The portion of the inventory which does not have new field data will be updated to the common year using FORSEE (for more information on forest modeling procedures, see the Modeling Plan). Forest inventory data will be maintained and collected so that at any point in time all forest inventory data will be 12 years old or less.

The forest inventory will also be updated each year there is a measurable disturbance resulting from timber harvesting or natural disaster such as fire or wind storm. All plots impacted by the disturbance will be re-measured to document the change in carbon stocks. The cruising methodology described in Appendix A will be used for all re-measurements of plots. As plots are re-cruised, the previous values will be removed, archived and retained (Modeling Plan, Section III).

After inventory data is collected in the field, it is transferred to an electronic format (or between electronic formats if a data logger was used) by the timber cruiser or by TCF staff. The inventory data is then brought into the forest inventory growth and yield database system.

Within the database system the biomass and carbon calculations are performed (Section VII B) which are the basis for the calculation of statistical accuracy and confidence deduction (methods in Modeling Plan, Section IV & Section XI and results below in OPDR Section VII D).

#### 4. Quality Assurance and Quality Control Procedures

All forest inventory data is check-cruised for accuracy and completeness of field measurements; the check done is completed on a cruiser-by-cruiser basis. The check cruise passes if total merchantable BF/acre and metric tons of C/acre are within 10% of the check cruiser's estimate and if these estimates are not statistically different using a paired t-test at the 90% confidence level. After field data collection, values are transferred into Microsoft Access for another level of QA/QC review. This process is also discussed in the Management Plan (Section III).

---

<sup>5</sup> Eng, H. 2012. Tree Height Estimation in Redwood/Douglas-fir Stands in Mendocino County. Pages 649-654. General Technical Report - Proceedings of coast redwood forests in a changing California: A symposium for scientists and managers, Pacific southwest Research Station, Forest Service, U.S. Department of Agriculture, Albany, CA.

## 5. Data Management Systems and Procedures

The GRF project uses a forest growth and yield model as well as in-house computer code to manage the forest inventory and make projections of future forest conditions. Currently, TCF uses the FORest and Stand Evaluation Environment (FORSEE) Software developed by the California Growth and Yield Modeling (CAGYM) cooperative (<http://www.cagym.com/>). FORSEE is an approved growth model found in the Protocol. Use of the model and data management systems are further discussed in the Modeling Plan.

## 6. Description of Known or Potential Diseases

There are relatively few diseases that impact trees throughout the Project and most impact individual or small groups of trees. At this point, landscape scale disease outbreaks resulting in widespread mortality have not been observed. The following diseases are known to occur on the ownership which may result in declining tree vigor and mortality of select individual trees:

Red Ring Rot (*Phellinus pini*) causes heartwood and sapwood decay in a wide range of conifer species and is the most common form of wood decay seen in coastal California forests. Infections in Douglas-fir are common on the property and it is also seen in sugar pine. Visual indicators of infestation include brownish, bracket-like conks on the bole of the tree and swollen branch nodes. Damage is most prevalent in older stands (generally over 50 years) and in areas that have been subject to multiple partial harvest entries; broken limbs and bole scars serve as entry points for the disease.

Black stain root disease (*Leptographium wagneri* var *psedutsugae*) is a vascular root disease common in Douglas-fir throughout the Pacific Northwest. The disease causes a black staining in the sapwood of the roots and lower bole. Outward signs of infection include chlorotic foliage and reduced leader growth. Patches of trees infested with this disease are most commonly seen in areas with disturbed soil, such as adjacent to truck roads, landings, and skid trails.

Velvet top fungus (*Phaeolus schweinitzii*) causes a root and butt rot in Douglas-fir and sugar pine. This disease is most common in older trees and often leads to loss of structural support and windthrow. There are few outward signs of infection other than clumps of brownish, irregularly lobed caps that emerge from roots around the base of infected trees. In advanced cases bole swelling can be significant.

Brown cubical rot (*Poria sequoia*) and white ring rot (*Poria albipellucida*) cause heart rot in redwood, but almost never lead to tree mortality.

Sudden Oak Death is caused by the exotic oomycete *Phytophthora ramorum*. The disease has a very wide host range and mortality has been seen in tanoak, Shreve's oak, interior live oak, California black oak, and canyon live oak. Tanoak is the most highly susceptible species to this disease and tanoak mortality caused by sudden oak death has been observed on the ownership. Mortality in true oaks on the ownership due to sudden oak death has not been observed. Outward signs of

infection include reddish, oozing stem cankers and foliage dieback. Tanoak mortality associated with this disease is almost always in close proximity to California bay trees. California bay trees are not killed by the disease, but are suitable hosts and important sources of inoculum.

## **VII B Calculation Methodologies**

### *IFM 1: Primary Effect - Standing Live Carbon Pool*

Individual trees have the approved Protocol biomass and carbon equations applied to them to calculate their biomass and carbon equivalents<sup>6</sup>. The biomass estimates are then summed and converted to metric tons of biomass per hectare at the plot level. These per hectare biomass estimates are the input variable in a regression developed by Cairns et al.<sup>7</sup> to estimate below ground biomass (BGB) from above ground biomass (AGB). All estimates of belowground biomass are applied at the plot level to metric tons of biomass/hectare of standing live trees. Standing live biomass is the sum of AGB and BGB.

---

<sup>6</sup> The approved DBH to biomass equations were all taken from the USFS Pacific Northwest Research Station documentation that can be found here:

[http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects\\_2014.htm](http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects_2014.htm)

<sup>7</sup> Cairns, M. A., S. Brown, et al. (1997). "Root biomass allocation in the world's upland forests." *Oecologia* 111(1): 1.

Table 4: Volume, Biomass, and Density Equations and Coefficients by Species

| Species            | Scientific Name                     | Code     | Bole Volume | Bark Biomass | Live Branch Biomass | Specific Gravity | Wood Density |
|--------------------|-------------------------------------|----------|-------------|--------------|---------------------|------------------|--------------|
| Ash species        | <i>Fraxinus sp.</i>                 | AS       | 38          |              |                     | 0.51             | 31.82        |
| Big Leaf Maple     | <i>Acer macrophyllum</i>            | BM       | 37          |              |                     | 0.44             | 27.46        |
| Black Oak          | <i>Quercus kelloggii</i>            | BO       | 38          |              |                     | 0.51             | 31.82        |
| Bishop Pine        | <i>Pinus muricata</i>               | BP       | 16          | 14           | 11                  | 0.45             | 28.08        |
| California Bay     | <i>Umbellularia californica</i>     | CB       | 33          |              |                     | 0.51             | 31.82        |
| Canyon Live Oak    | <i>Quercus chrysolepis</i>          | CO       | 42          |              |                     | 0.7              | 43.68        |
| California Buckeye | <i>Aesculus californica</i>         | CU       | 43          |              |                     | 0.33             | 20.59        |
| Douglas-fir        | <i>Pseudotsuga menziesii</i>        | DF       | 3           | 8            | 6                   | 0.45             | 28.08        |
| Edible Fig         | <i>Ficus carica</i>                 | EF       | 41          |              |                     | 0.52             | 32.45        |
| Giant Chinquapin   | <i>Chrysolepis chrysophylla</i>     | GC       | 32          |              |                     | 0.42             | 26.21        |
| Grand Fir          | <i>Abies grandis</i>                | GF       | 23          | 2            | 1                   | 0.35             | 21.84        |
| Interior Live Oak  | <i>Quercus wislizenii</i>           | LO       | 44          |              |                     | 0.59             | 36.82        |
| Mountain Dogwood   | <i>Cornus nuttallii</i>             | MD       | 29          |              |                     | 0.58             | 36.19        |
| Monterey Pine      | <i>Pinus radiata</i>                | MP       | 16          | 14           | 11                  | 0.4              | 24.96        |
| California Nutmeg  | <i>Torreya californica</i>          | NM       | 8           | 13           | 10                  | 0.41             | 25.58        |
| Madrone            | <i>Arbutus menziesii</i>            | PM       | 40          |              |                     | 0.58             | 36.19        |
| Ponderosa Pine     | <i>Pinus ponderosa</i>              | PP       | 5           | 9            | 7                   | 0.38             | 23.71        |
| Pacific Yew        | <i>Taxus brevifolia</i>             | PY       | 8           | 13           | 10                  | 0.6              | 37.44        |
| Red Alder          | <i>Alnus rubra</i>                  | RA       | 26          | 20           | 16                  | 0.37             | 23.09        |
| Redwood            | <i>Sequoia sempervirens</i>         | RW       | 24          | 17/13*       | 10                  | 0.36             | 22.46        |
| Shreve's Oak       | <i>Quercus parvula var. shrevei</i> | SO       | 44          |              |                     | 0.59             | 36.82        |
| Sugar Pine         | <i>Pinus lambertiana</i>            | SP       | 20          | 10           | 8                   | 0.34             | 21.22        |
| Tanoak             | <i>Notholithocarpus densiflorus</i> | TO       | 34          |              |                     | 0.58             | 36.19        |
| Toyon              | <i>Heteromeles arbutifolia</i>      | TY       | 41          |              |                     | 0.52             | 32.45        |
| Unknown            | N/A                                 | UK or XX | 41          |              |                     | 0.52             | 32.45        |
| White Alder        | <i>Alnus rhombifolia</i>            | WA       | 26          | 20           | 16                  | 0.37             | 23.09        |
| Western hemlock    | <i>Tsuga heterophylla</i>           | WH       | 6           | 15           | 12                  | 0.42             | 26.21        |
| Willow species     | <i>Salix sp.</i>                    | WI       | 40          |              |                     | 0.36             | 22.46        |
| Wax Myrtle         | <i>Myrica californica</i>           | WM       | 41          |              |                     | 0.52             | 32.45        |
| Oregon White Oak   | <i>Quercus garryana</i>             | WO       | 41          |              |                     | 0.64             | 39.94        |

\*Where DBH > 39.37 use Equation 17 for RW, otherwise use equation 13. All equations are taken from the USFS documentation on the ARB website<sup>8</sup>

The recommended belowground biomass equation is used to calculate the belowground biomass using the aboveground biomass. This equation is applied at the plot level and is applied to the sum of all standing live wood. That equation is:

**Equation 1: Belowground biomass –**  $BBD = \exp(-0.7747 + 0.8836 \times \ln(ABD))$

BBD – belowground biomass density

ABD – aboveground biomass density in kg/ha – this is a plot level

Total standing live biomass is calculated in Microsoft Access using in-house computer code; the biomass and carbon code follow the equations required by the Protocol and provided on the ARB website (Table 4). After biomass has been calculated, summary queries in the database are used to compile aboveground and

<sup>8</sup> “Volume Estimation for Species in Projects Located in CA, OR, WA (Updated: 9/19/2014) ([https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/2014/volume\\_equations.pdf](https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/2014/volume_equations.pdf)) and “Biomass Equations for Species in Projects Located in CA, OR, WA (Updated: 9/19/2014) ([https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/2014/biomass\\_equations.pdf](https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/2014/biomass_equations.pdf)) Documents available on the ARB website: [http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects\\_2014.htm](http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects_2014.htm)

belowground values. Per acre carbon values are converted to CO<sub>2</sub>e values by multiplying by 3.664 as specified by the Protocol. All per acre values are then scaled to the forest level by multiplying by the stratum area.

The aboveground biomass of standing live trees with broken tops (defect code 91X) is calculated using the broken top height as a true height; this is a conservative but straightforward method. If a broken top tree had a field measured height, then this value is used as the tree height. For unmeasured broken top trees, the percent missing height as recorded by the field crew is subtracted from the calculated height from the height regression. Then, the biomass of the tree is calculated using the revised regressed height as the tree height.

The aboveground biomass of trees which have 10% or more missing volume – cavities from disease, wildfire, or physical damage – are calculated in a two-step process. First, the biomass of the tree is calculated. Then, the percent missing volume is subtracted from originally calculated biomass value.

The standing live biomass for the project activity is calculated each year based on any new inventory data collected and/or grown forward tree lists. The standing live biomass for the baseline is also calculated as described above for the baseline timeframe.

### *IFM 3: Primary Effect – Standing Dead Carbon Pool*

Standing dead wood biomass is calculated based on the DBH and height measured in the field (all dead trees are measured for height). For dead trees with only limited decay (recently dead trees – snags with decay class 1), the full volume and biomass is calculated in exactly the same fashion as for live trees. For snags with more advanced decay (decay classes 2 to 5), volume and biomass are calculated only for the portion of the tree remaining (Table 5). The recommended belowground biomass equation from Cairns et al 2007 is used to calculate the belowground biomass using the plot level values of standing dead aboveground biomass (Equation 1).

**Table 5: Volume basis for biomass calculation of snags**

| <b>Decay Code</b> | <b>Conifers</b>               | <b>Hardwoods</b>              |
|-------------------|-------------------------------|-------------------------------|
| <b>1</b>          | All Aboveground tree portions | All Aboveground tree portions |
| <b>2</b>          | Bole and Bark only            | Bole and Bark only            |
| <b>3</b>          | Bole only                     | Bole only                     |
| <b>4</b>          | Bole only                     | Bole only                     |
| <b>5</b>          | Bole only                     | Bole only                     |

Then, the decay adjusted biomass is calculated by applying the species specific relative density factors from Harmon et al (2011) (Table 6).<sup>9</sup> The decay classes used to categorize dead trees are those defined by the US Forest Service for their Forest Inventory and Analysis (FIA) plots and their description can be found in Appendix A. Dead tree biomass is converted to carbon assuming carbon is 50% of biomass. Carbon is converted to CO<sub>2</sub>e for standing live and standing dead pools by multiplying by 3.664 as required in the Protocol.

Table 6: Relative density factors (Mt/m<sup>3</sup>) from Harmon et al (2011)

| Species            | Scientific Name                            | Code     | Live Trees (FIA values) | Decay Class 1 | Decay Class 2 | Decay Class 3 | Decay Class 4 | Decay Class 5 |
|--------------------|--------------------------------------------|----------|-------------------------|---------------|---------------|---------------|---------------|---------------|
| Ash species        | <i>Fraxinus sp.</i>                        | AS       | 0.51                    | 0.899         | 0.622         | 0.575         | 0.525         | 0.525         |
| Big Leaf Maple     | <i>Acer macrophyllum</i>                   | BM       | 0.44                    | 0.979         | 0.766         | 0.565         | 0.45          | 0.45          |
| Black Oak          | <i>Quercus kelloggii</i>                   | BO       | 0.51                    | 1.02          | 0.841         | 0.705         | 0.591         | 0.591         |
| Bishop Pine        | <i>Pinus muricata</i>                      | BP       | 0.45                    | 0.953         | 0.95          | 0.927         | 0.598         | 0.598         |
| California Bay     | <i>Umbellularia californica</i>            | CB       | 0.51                    | 0.982         | 0.793         | 0.618         | 0.525         | 0.525         |
| Canyon Live Oak    | <i>Quercus chrysolepis</i>                 | CO       | 0.7                     | 1.02          | 0.841         | 0.705         | 0.591         | 0.591         |
| California Buckeye | <i>Aesculus californica</i>                | CU       | 0.33                    | 0.982         | 0.793         | 0.618         | 0.525         | 0.525         |
| Douglas-fir        | <i>Pseudotsuga menziesii</i>               | DF       | 0.45                    | 0.892         | 0.831         | 0.591         | 0.433         | 0.433         |
| Edible Fig         | <i>Ficus carica</i>                        | EF       | 0.52                    | 0.99          | 0.8           | 0.54          | 0.43          | 0.43          |
| Giant Chinquapin   | <i>Chrysolepis chrysophylla</i>            | GC       | 0.42                    | 0.99          | 0.8           | 0.54          | 0.43          | 0.43          |
| Grand Fir          | <i>Abies grandis</i>                       | GF       | 0.35                    | 1.013         | 0.966         | 0.855         | 0.574         | 0.574         |
| Interior Live Oak  | <i>Quercus wislizenii</i>                  | LO       | 0.59                    | 1.02          | 0.841         | 0.705         | 0.591         | 0.591         |
| Mountain Dogwood   | <i>Cornus nuttallii</i>                    | MD       | 0.58                    | 0.982         | 0.793         | 0.618         | 0.525         | 0.525         |
| Monterey Pine      | <i>Pinus radiata</i>                       | MP       | 0.4                     | 0.953         | 0.95          | 0.927         | 0.598         | 0.598         |
| California Nutmeg  | <i>Torreya californica</i>                 | NM       | 0.41                    | 0.994         | 0.951         | 0.902         | 0.605         | 0.605         |
| Madrone            | <i>Arbutus menziesii</i>                   | PM       | 0.58                    | 0.982         | 0.793         | 0.618         | 0.525         | 0.525         |
| Ponderosa Pine     | <i>Pinus ponderosa</i>                     | PP       | 0.38                    | 0.925         | 1.007         | 1.154         | 0.481         | 0.481         |
| Pacific Yew        | <i>Taxus brevifolia</i>                    | PY       | 0.6                     | 0.994         | 0.951         | 0.902         | 0.605         | 0.605         |
| Red Alder          | <i>Alnus rubra</i>                         | RA       | 0.37                    | 1.03          | 0.903         | 0.535         | 0.393         | 0.393         |
| Redwood            | <i>Sequoia sempervirens</i>                | RW       | 0.36                    | 0.994         | 0.951         | 0.902         | 0.605         | 0.605         |
| Shreve's Oak       | <i>Quercus parvula</i> var. <i>shrevei</i> | SO       | 0.59                    | 1.02          | 0.841         | 0.705         | 0.591         | 0.591         |
| Sugar Pine         | <i>Pinus lambertiana</i>                   | SP       | 0.34                    | 1.04          | 0.906         | 0.735         | 0.517         | 0.517         |
| Tanoak             | <i>Notholithocarpus densiflorus</i>        | TO       | 0.58                    | 0.982         | 0.793         | 0.618         | 0.525         | 0.525         |
| Toyon              | <i>Heteromeles arbutifolia</i>             | TY       | 0.52                    | 0.99          | 0.8           | 0.54          | 0.43          | 0.43          |
| Unknown            | N/A                                        | UK or XX | 0.52                    | 0.99          | 0.8           | 0.54          | 0.43          | 0.43          |
| White Alder        | <i>Alnus rhombifolia</i>                   | WA       | 0.37                    | 1.03          | 0.903         | 0.535         | 0.393         | 0.393         |
| Western hemlock    | <i>Tsuga heterophylla</i>                  | WH       | 0.42                    | 0.9           | 0.83          | 0.661         | 0.38          | 0.38          |
| Willow species     | <i>Salix sp.</i>                           | WI       | 0.36                    | 0.982         | 0.793         | 0.618         | 0.525         | 0.525         |
| Wax Myrtle         | <i>Myrica californica</i>                  | WM       | 0.52                    | 0.99          | 0.8           | 0.54          | 0.43          | 0.43          |
| Oregon White Oak   | <i>Quercus garryana</i>                    | WO       | 0.64                    | 1.02          | 0.841         | 0.705         | 0.591         | 0.591         |

\* Chinquapin, Wax Myrtle, Edible Fig, Toyon, and unknown species use the unknown values in Table 6 of Harmon et al. (2011) publication.

#### IFM 6: Primary Effect - Soil Carbon Pool

The soil carbon pool is excluded since no site preparation activities are used.

<sup>9</sup> Harmon, M. E., C. W. Woodall, B. Fasth, J. Sexton., and M. Yatkov. 2011. Differences Between Standing and Downed Dead Tree Wood Density Reduction Factors: A Comparison Across Decay Classes and Tree Species. Pages 40. Research Paper NRS-15, United States Department of Agriculture, Forest Service, Northern Research Station.

### *IFM 7: Primary Effect – In-Use Forest Product Carbon Pool*

The in-use forest product carbon pool is calculated each year when a harvest occurs. The baseline forest product carbon pool is also calculated for all harvest events. In-use forest product carbon is calculated following the methodology described in Appendix C of the Protocol. The mill efficiency used is based on conifer only milling for the Pacific Coast Southwest region. Appendix B, the modeling plan, shows the coefficients used to convert the milled material (after the efficiency deduction is applied) into product classes. These coefficients are taken from the Assessment Area file provided on the ARB's website. The total in-use forest product carbon pool calculation follows table C.2 in the Protocol. The final CO<sub>2</sub>e estimate is converted from carbon by multiplying by 3.664. Table 11 shows the final results by product type for the baseline.

### *IFM 8: Primary Effect – Forest Product Carbon in Landfills Pool*

The forest product in landfill carbon pool is calculated each year when a harvest occurs. The baseline forest product carbon pool is also calculated for all harvest events. Landfill forest product carbon is calculated following the methods described in Appendix C of the Protocol. The mill efficiency used is based on conifer only milling for the Pacific Coast Southwest region. Appendix B, the modeling plan, shows the coefficients used to convert the milled material (after the efficiency deduction is applied) into product classes. These coefficients are taken from Assessment Area data of the Protocol. The total landfill forest product carbon pool calculation follows table C.3 in the Protocol. The final CO<sub>2</sub>e estimate is converted from carbon by multiplying by 3.664. Table 9 shows the final results by product type.

### *IFM 9: Secondary Effect – Site Preparation Emissions*

Site Preparation Emissions are excluded since no site preparation activities are used.

### *IFM 14: Secondary Effect – Changes in Harvesting Outside of Project Area*

The market leakage effects are estimated using a default 20% “leakage” factor applied to the difference in the actual yearly harvest volume relative to modeled baseline harvest levels.

### *IFM 17: Secondary Effect – Forest Product Decomposition Emissions*

Forest product decomposition emissions are quantified as a component of the in-use forest products and landfill forest products calculations.

### VII.C Summary of Carbon Stocks

The start date of the project was the date of the property acquisition: February 2<sup>nd</sup>, 2004. The first successful verification and registration occurred in 2007 and included carbon offset vintages for years 2005, 2006, and 2007. Since the first verification and registration with CCAR, TCF has successfully completed verifications for the 2008-2014 vintage years. For the transition to ARB a new inventory design was used and is described in Appendix A, the new inventory was completed in 2015, and represents the carbon stocks as of 9/2/2015. The trees were then grown forward to 2/14/2016, which represents the carbon stocks at the end of reporting period 1. Methods for adjusting the inventory are further discussed in the Modeling Plan, Appendix B.

The forest was also “backcast” to February 2, 2004; this backwards adjustment of starting stocks was used to calculate carbon stocks for 2004-2014. The adjusted stocks were also the basis for the baseline modeling following the Transition guidance. Carbon stocks for the end of reporting period 1 (1/1/2015-2/14/2016) in are shown in Table 6 below. Also see Appendix C “Calculation of GHG Reductions and GHG Removals Enhancements” for credit calculations.

In Appendix A, the Protocol requires that the carbon stocks be presented by stratum. Table 9A and 9B below show total metric tons CO<sub>2</sub>e by stratum for standing live trees.

**Table 7: Standing live and dead carbon stocks (metric tons) for initial reporting period: 2/14/16**

| <b>Carbon Pool</b>               | <b>Source</b>                           | <b>MtCO<sub>2</sub>e/Acre</b> |
|----------------------------------|-----------------------------------------|-------------------------------|
| Standing Live Carbon Stocks      | Sampling results of trees               | 234.28                        |
| Standing Dead Carbon Stocks      | Sampling results of standing dead trees | 3.25                          |
| Shrubs and Herbaceous Understory | N/A                                     | -                             |
| Soil                             | N/A                                     | -                             |
| <b>Total</b>                     |                                         | <b>237.53</b>                 |

#### *IFM 1 Standing Live:*

The standing live carbon pool for the initial reporting period is 234.28 MtCO<sub>2</sub>e/acre; 5,260,894 MtCO<sub>2</sub>e for the project.

#### *IFM 3 Standing Dead:*

The standing dead carbon pool for the initial reporting period is 3.25 MtCO<sub>2</sub>e/acre; 72,901 MtCO<sub>2</sub>e for the project.

#### *IFM 6 Soil: N/A*

*IFM 7 Carbon in in-use forest products:*

The in-use forest products carbon pools is 1,161 MtCO<sub>2</sub>e for the initial reporting period for the project.

*IFM 8 Forest product carbon in landfills:*

The forest carbon products in landfills is 750 MtCO<sub>2</sub>e for the project.

*IFM 9 Biological emissions from site preparation:* N/A

*IFM 14 Biological emissions/removals from change in harvesting on forestland outside Project Area:*

The biological emissions/removals carbon pool is -11,414 MtCO<sub>2</sub>e for the project.

*IFM-17 Biological emissions from decomposition of forest products:*

This is quantified as a component of IFM-7 and IFM-8 as described above.

#### **VII.D Summary of Inventory Confidence Statistics**

Stratified random sampling formulae are used to calculate the sampling error for the Project, for details see the Modeling Plan (Section IV; Section XI). The Project has a sampling error of less than 5% at the 90% confidence interval (Table 8).

**Table 8: Calculation of sampling error**

|                                               |              |                 |
|-----------------------------------------------|--------------|-----------------|
| <b>Mean standing live &amp; standing dead</b> | <b>63.94</b> | <b>MtC/Acre</b> |
| <b>SE of mean</b>                             | 1.16         | MtC/Acre        |
| <b>SE*1.645 (90% CI)</b>                      | 1.91         | (1.16)*(1.645)  |
| <b>Sampling Error of 90% CI</b>               | 3.0%         | (1.91)÷(63.94)  |
| <b>Inventory Confidence Deduction</b>         | 0%           |                 |

Appendix A of the Protocol requires the identification the metric tons CO<sub>2</sub>e by stratum and the percentage of carbon each stratum represents in relation to the total project area (Table 9A & Table 9B).

**Table 9A Standing Live Carbon: Summary of 2015 Inventory**

| <b>Strata</b>         | <b>No of Plots</b> | <b>Carbon (MtC/acre)</b> |                  |                | <b>Total Acres</b> | <b>C Total</b>   | <b>MtCO<sub>2</sub>e Total</b> | <b>Percent of Standing Live Pool</b> |
|-----------------------|--------------------|--------------------------|------------------|----------------|--------------------|------------------|--------------------------------|--------------------------------------|
|                       |                    | <b>Avg</b>               | <b>Std. Dev.</b> | <b>Std. Er</b> |                    |                  |                                |                                      |
| <b>Reserve</b>        | 172                | 60.49                    | 30.03            | 2.29           | 5,569              | 336,830          | 1,234,146                      | 24%                                  |
| <b>Working Forest</b> | 432                | 62.55                    | 29.71            | 1.43           | 13,800             | 863,177          | 3,162,681                      | 61%                                  |
| <b>WLPZ</b>           | 95                 | 69.93                    | 35.07            | 3.59           | 3,086              | 215,822          | 790,773                        | 15%                                  |
| <b>Total</b>          | <b>699</b>         | <b>63.05</b>             |                  | <b>1.16</b>    | <b>22,455</b>      | <b>1,415,830</b> | <b>5,187,601</b>               |                                      |

Table 9B Standing Dead Carbon: Summary of 2015 Inventory

| Strata                | No of Plots | Carbon (MtC/acre) |           |             | Total Acres   | C Total       | MtCO2e Total  | Percent of Standing Dead Pool |
|-----------------------|-------------|-------------------|-----------|-------------|---------------|---------------|---------------|-------------------------------|
|                       |             | Avg               | Std. Dev. | Std. Er     |               |               |               |                               |
| <b>Reserve</b>        | 172         | 0.93              | 3.70      | 0.28        | 5,569         | 5,162         | 18,912        | 26%                           |
| <b>Working Forest</b> | 432         | 0.89              | 2.92      | 0.14        | 13,800        | 12,333        | 45,187        | 62%                           |
| <b>WLPZ</b>           | 95          | 0.78              | 3.57      | 0.37        | 3,086         | 2,402         | 8,801         | 12%                           |
| <b>Total</b>          | <b>699</b>  | <b>0.89</b>       |           | <b>0.12</b> | <b>22,455</b> | <b>19,896</b> | <b>72,901</b> |                               |

### VII.E Risk of Reversal Calculation

The calculation of reversal risk rating follows the rules laid out in Appendix D of the Protocol. Because the full project is not covered by a qualified conservation easement (QCE), the project uses the non-QCE option and the risk of reversal ratings and the buffer pool contribution is 19.236%. The project's annual Forest Buffer account contribution for the first reporting period is 19,709 credits.

Table 10: Reversal Risk Rating and Buffer Pool Contribution Calculation

| Risk Category                         | Risk Rating    |
|---------------------------------------|----------------|
| <b>Financial Failure</b>              | 5%             |
| <b>Illegal Harvesting</b>             | 0%             |
| <b>Conversion</b>                     | 2%             |
| <b>Over Harvesting</b>                | 2%             |
| <b>Social</b>                         | 2%             |
| <b>Wildfire</b>                       | 4%             |
| <b>Disease/Insect</b>                 | 3%             |
| <b>Other Catastrophic Events</b>      | 3%             |
| <b>Total Buffer Pool Contribution</b> | <b>19.236%</b> |

Calculation of Buffer Pool Contribution from Risk Ratings:

$$100\% - (((1-0.05)*(1-0.02)*(1-0.02)*(1-0.02)*(1-0.04)*(1-0.03)*(1-0.03)*100)) = 19.236\%$$

### VIII.A.2 Baseline Carbon Stocks

Attachment G, below, shows the baseline for aboveground standing live carbon stocks. Attachment H also shows the final baseline average as well as the common practice stocks.<sup>10</sup> The common practice value for GRF project is 176.75 MtCO2e/acre. Based on 20,118 acres of "high site" CRDFMC; and 3,128 acres of NCCMOW. Because the aboveground standing live starting stocks of the project (127.68 MtCO2e/acre)

<sup>10</sup> See figures 5 and 6 for a breakdown of the components of the baseline model.

are below the common practice baseline, a high stocking reference assessment was completed.

The high stocking reference, 80% of the highest value for aboveground carbon stocks within the project area for ten years prior to project commencement, is 102.15 MtCO<sub>2</sub>e/acre (Attachment J). The weighted average aboveground standing live carbon stocks (WCS) is equivalent to the Project starting stocks (Section VIII B 4).

After calculating the Initial Carbon Stocks (ICS) (127.68 MtCO<sub>2</sub>e/acre), the HSR (102.15 MtCO<sub>2</sub>e/acre), the common practice value (176.75 MtCO<sub>2</sub>e/acre), and the WCS (127.68 MtCO<sub>2</sub>e/acre), the minimum baseline level (MBL) was assessed following the method in the Protocol (Equation 6.6). First, the HSR and ICS were compared and the larger value (ICS) was selected. Next, the common practice value and the WCS were compared and the smaller value selected (WCS). Finally, the results of the previous two assessments were compared and the highest value selected; this is the MBL. The MBL is 127.68 MtCO<sub>2</sub>e/acre.

Following the regulation, the project baseline was modelled from the date of the offset project transition plus 100 years. The baseline runs from project commencement in 2004 to 2115.

For modeling purposes, the property has been broken into four separate management types: WLPZ buffering Class I streams, WLPZ buffering Class II streams, Working Forest (unconstrained harvest area), and No Harvest areas, primarily to account for Northern Spotted Owl habitat retention requirements. To calculate the total baseline, all four areas were modeled and combined, and then the standing dead pool was added. In the figure 2, Attachment G below, the solid, thick purple line shows the final baseline model and the dashed horizontal orange line is the 100-year average of this model. The baseline model steadily increases carbon stocks over time in the no harvest acres and the WLPZ acres. The reserve and working forest shows an initial rapid decline in stocks followed by more steady growth after the initial harvest and hardwood management silviculture. Further description of the baseline management regimes can be found in the Modeling Plan (Appendix B).

The graph below reflects the modeled harvest. In the first 20 years, the unconstrained portion of the property is harvested aggressively. Stands are then re-entered periodically when they meet the minimum criteria for re-entry as defined in the modeling plan or ten years whichever is later. Stands harvested using the transition method must have a minimum of 75 ft<sup>2</sup> of conifer basal area/acre before re-entry and only two transition harvests are allowed per stand (plot). Stands harvested using the selection method must have a minimum of 100 ft<sup>2</sup> of conifer BA/acre for entry and can be harvested down to 75 ft<sup>2</sup> of conifer BA using. Stands are re-entered at a minimum of 10 years after they are harvested. There is a period of stock growth after the initial entry followed by a leveling out of harvest rates as the forest reaches a sustainable yield stream as can be seen in the slow but steady increase towards the end of the baseline modeling period.

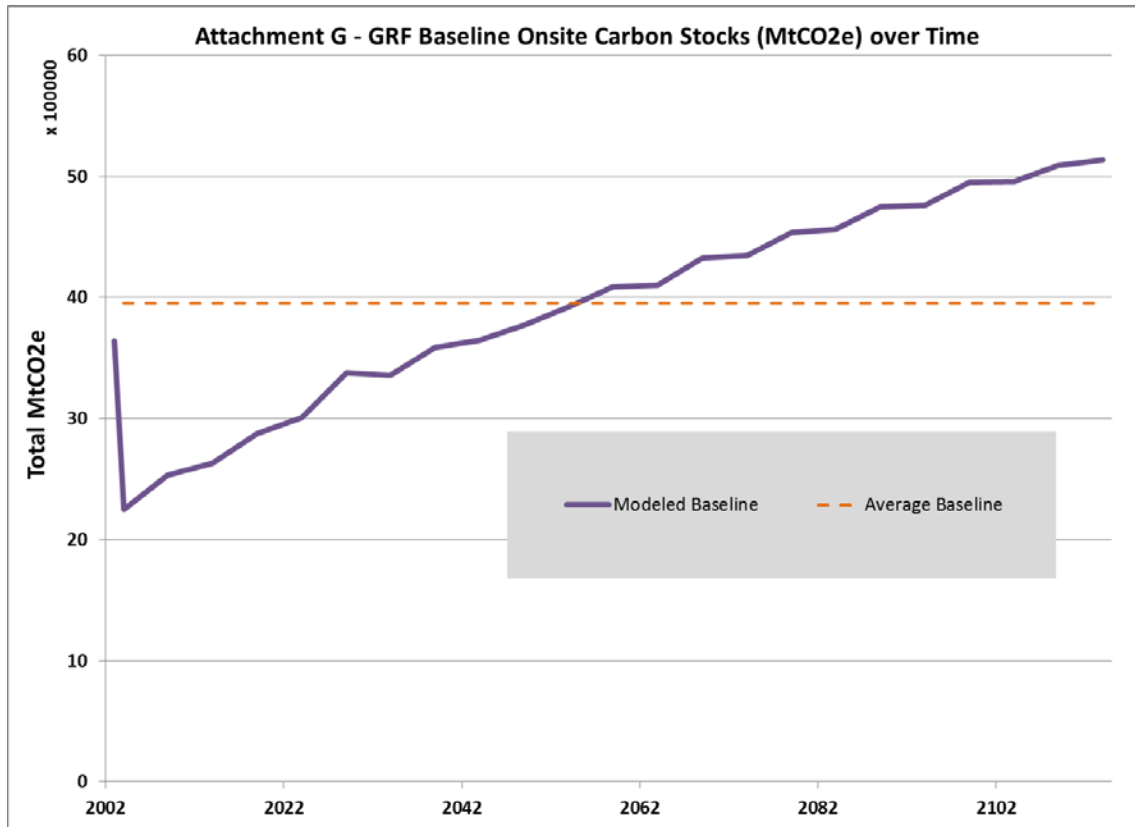


Figure 5: Attachment G - Baseline Model

Compared to the baseline, there are several changes in the management of Garcia River Forest that will lead to higher carbon stocks.

Under the project management, there are two harvest management regimes one for the Ecological Reserve Network and one for the non-reserve portions of the property. The Ecological Reserve Network account for approximately 34% of the total forest acreage (8,046 acres). This area may be harvested but only for the explicit goal of encouraging the forest's return to late seral characteristics.

The remaining, non-reserve, portion of the GRF will be managed using an uneven age selection regime designed in increase forest stocks over time. The selection harvest in some non-reserve areas will include a hardwood competition reduction treatment that is designed to reduce the prevalence of tanoak trees.

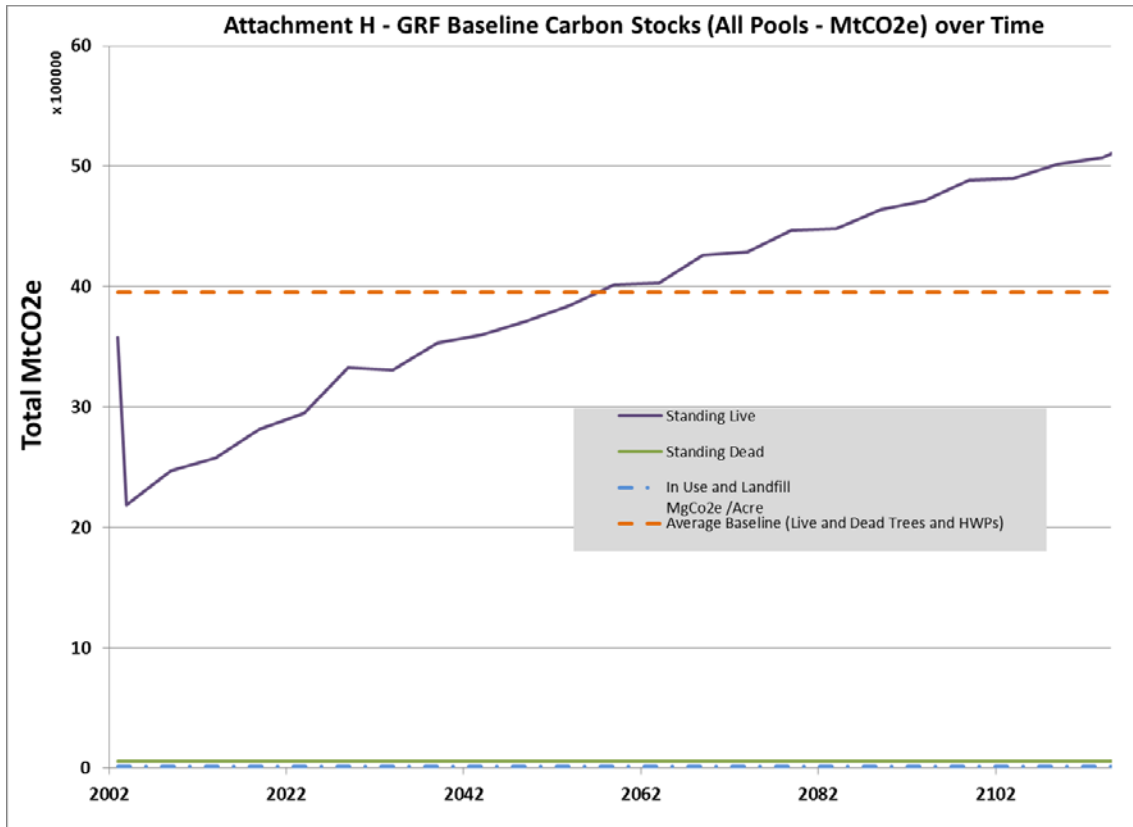


Figure 6: Attachment H, Baseline graph

### VIII.A.5 Carbon Stored Long Term

The table below summarizes the 100-year harvested wood product (HWP) carbon storage by product class. There is no regional market for hardwoods (tanoak or true oaks), so only conifer products are included. This table also shows the final annual addition of HWP storage after applying the 80% HWP production factor to adjust for market responses to HWP production.

Table 11: Harvested Wood Product Summary – Annual Addition by Product Class

|                             | <b>Product Values<br/>(based on 100 year average)<br/>MtCo2e</b> | <b>IFM 7:<br/>100 Year Product<br/>MtCO2e</b> | <b>IFM 8:<br/>100 Year Landfill<br/>MtCO2e</b> | <b>100 Year Product and<br/>Landfill Total<br/>MtCO2e</b> | <b>80% of HWP<br/>Totals</b> |
|-----------------------------|------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------|-----------------------------------------------------------|------------------------------|
| <b>SW Lumber</b>            | 18,864                                                           | 8,734                                         | 5,621                                          | 14,356                                                    | 11,484                       |
| <b>HW lumber</b>            | -                                                                | -                                             | -                                              | -                                                         | -                            |
| <b>SW Plywood</b>           | 364                                                              | 176                                           | 105                                            | 281                                                       | 225                          |
| <b>Oriented Strandboard</b> | -                                                                | -                                             | -                                              | -                                                         | -                            |
| <b>NonStruc Panels</b>      | 47                                                               | 18                                            | 16                                             | 34                                                        | 28                           |
| <b>Misc Prods</b>           | 18                                                               | 3                                             | 8                                              | 12                                                        | 9                            |
| <b>Paper</b>                | 139                                                              | 8                                             | 25                                             | 33                                                        | 26                           |
| <b>Total:</b>               | <b>19,434</b>                                                    | <b>8,940</b>                                  | <b>5,776</b>                                   | <b>14,716</b>                                             | <b>11,772</b>                |

#### VIII.B.4 LMU & WCS

The Conservation Fund owns land within Mendocino County but outside of the existing Logical Management Unit (LMU) for GRF. Section 6.2.1.1 of the protocol states “A ‘logical management unit’ or ‘LMU’ is defined as all land that the Forest Owner and its affiliate(s)... either own in fee or hold timber rights on, and which it or they manage as an explicitly defined planning subunit.”

The Conservation Funds owns 53,000 acres in Mendocino County in 4 distinct tracts in 3 separate LMU’s. The Big River Forest and Salmon Creek Forests are managed as a single unit. All four tracts occur in different watersheds, excepting very small overlap between the Garcia River Forest and the Gualala River Forest and they are all serviced by their own unique road network. Each LMU was purchased individually and has different financial requirements as well as conservation easement restrictions, they are by necessity managed as individual tracts. Each LMU is a unique project with its own inventory and yield stream, and can successfully demonstrate financial feasibility. Therefore, the weighted average aboveground standing live carbon stocks (WCS) for landholdings within the same LMU as the Garcia River Forest is equivalent to the GRF carbon stocks.

Table 12: The Conservation Fund's LMUs

| Tract                       | Acres  | Watershed     | LMU     | CAR ID#                   | Type                                        |
|-----------------------------|--------|---------------|---------|---------------------------|---------------------------------------------|
| <b>Garcia River Forest</b>  | 23,780 | Garcia River  | Garcia  | 102 (Early Action) / 1098 | Conservation Based Forest Management v. 2.1 |
| <b>Gualala River Forest</b> | 13,537 | Gualala River | Gualala | 660 (Early Action) / 1099 | Improved Forest Management v. 3.2           |
| <b>Big River</b>            | 11,707 | Big River     | BR/SC   | 408 (Early Action)/ 1100  | Conservation Based Forest Management v. 2.1 |
| <b>Salmon Creek</b>         | 4202   | Salmon Creek  | BR/SC   | 408 (Early Action)/ 1100  | Conservation Based Forest Management v. 2.1 |

### VIII.B.7 Financial Feasibility Analysis

A test of the financial feasibility of the baseline model was run in accordance with section 6.2.1.3 of the Protocol. This analysis showed there is a positive net present value (NPV) associated with the harvesting of timber under the baseline scenario. The baseline scenario already reflects all legal and regulatory constraints and the costs of logging and values of logs were conservatively estimated so these conclusions will likely hold even with significantly worse market conditions and/or increased harvesting costs. The result of this analysis showed a positive NPV throughout the entire modeled period (2004-2115).

### Changes since Project Listing

Since the project listing document was filed, there have been several changes to the listing document. See the Annual Reporting Period Document for a list of these changes.

Note, changes in calculation methodology are documented in the change log in the Modeling Plan, Appendix B.

## **Attachment A: Ownership Interest in Garcia River Forest**

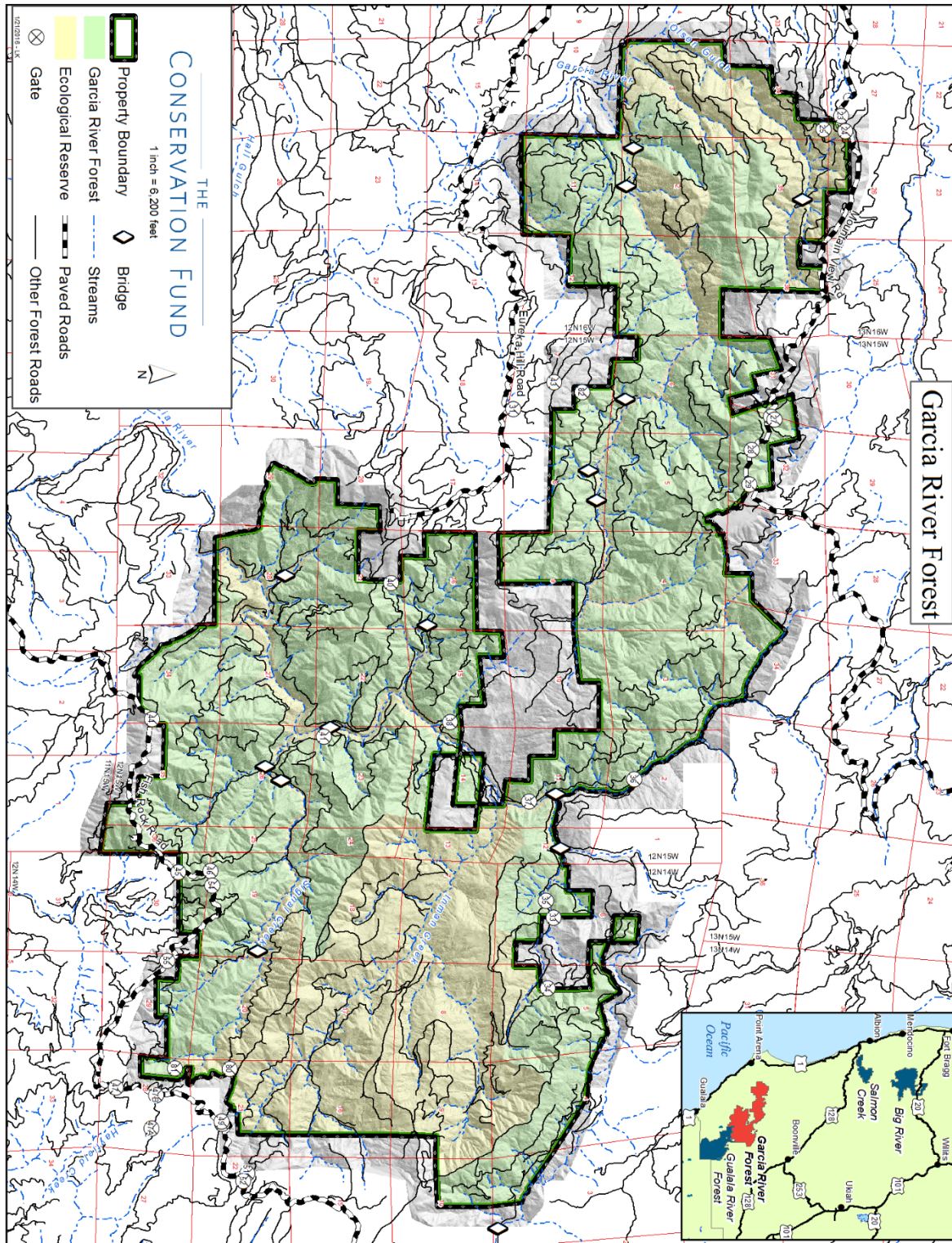
Please see attached pdf -

Attachment\_A\_Coastal Ridges\_Title insurance policy\_GRF\_OPDR.pdf

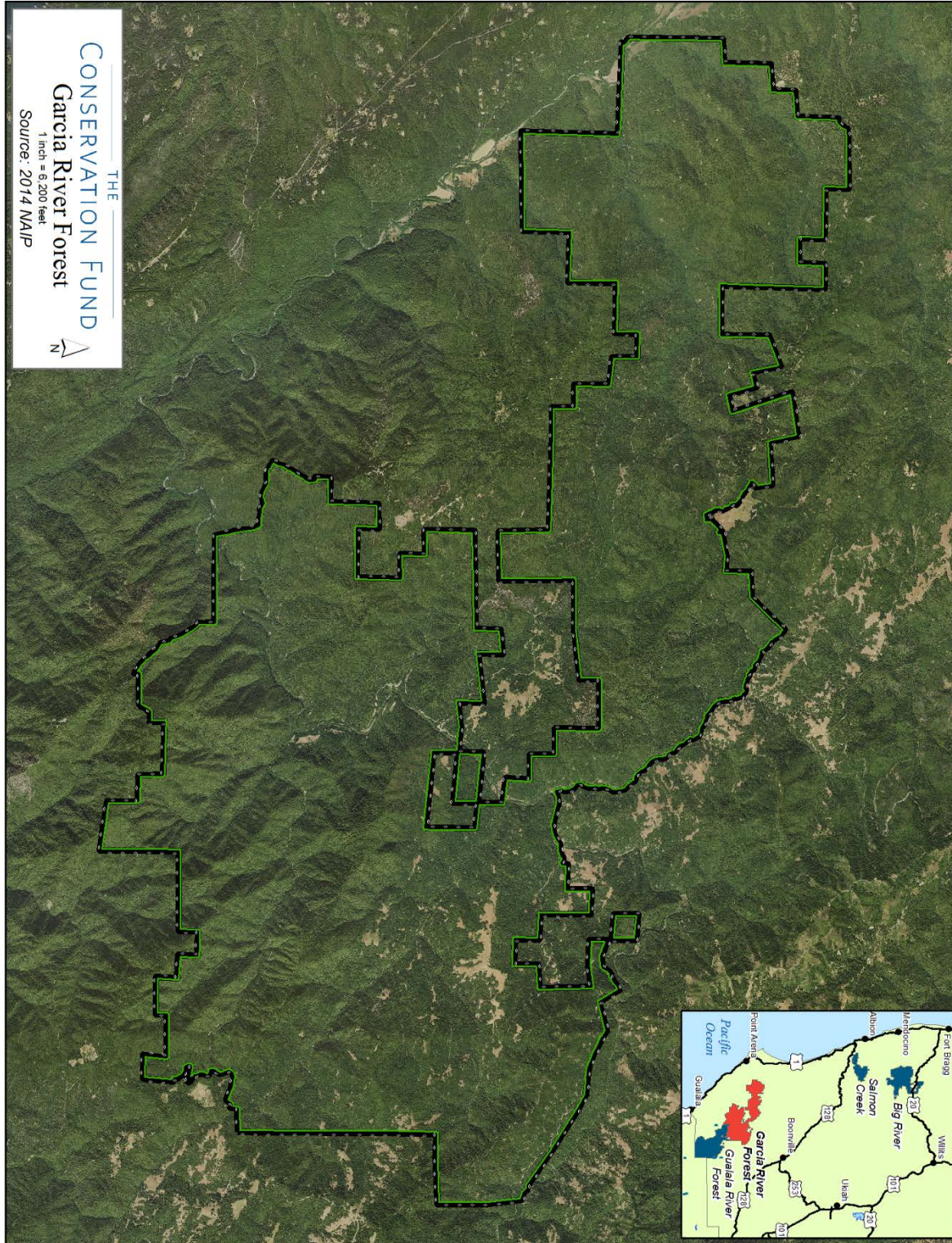
Please also see the conservation easement document:

GarciaRiverForest\_ConservationEasement\_TNC&TCF.pdf

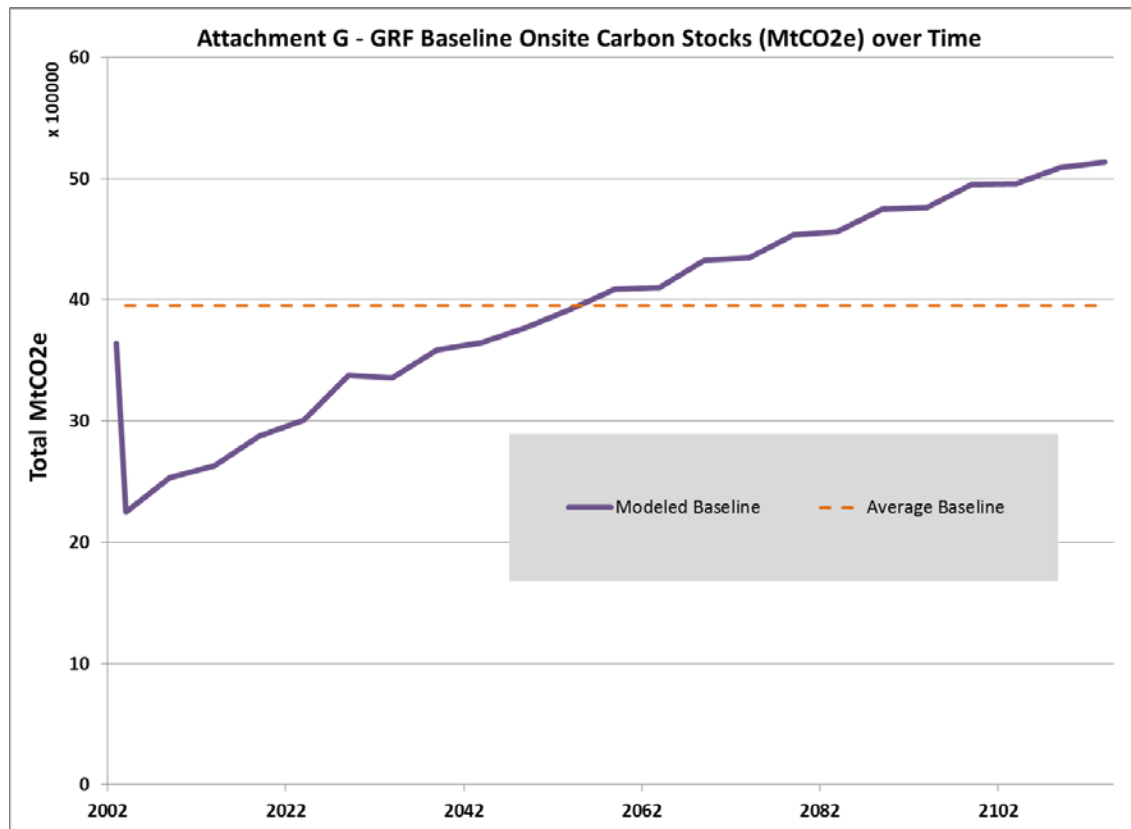
## Attachment E: Map of the Project Area



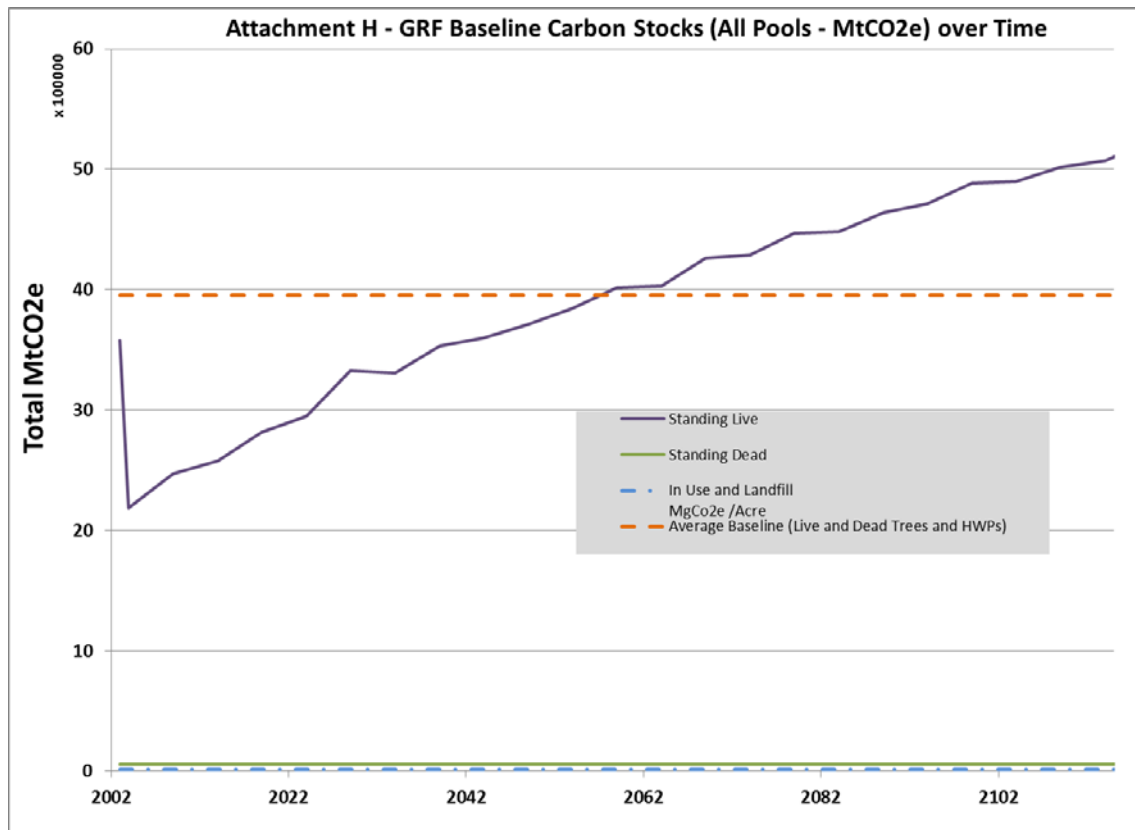
## Attachment F: Canopy Cover of Garcia River Forest



## Attachment G: Graph of baseline onsite carbon stocks



## Attachment H: Diagram of the baseline including all required carbon stocks



## Attachment I: Projections of baseline and actual harvesting volumes from the Project Area over the Planning Horizon

The modeled baseline scenario harvests significantly more board feet timber per year than TCF plans to harvest based on Long Term Sustained Yield modeling (LTSY); see comparison in Table 16. Note, the Actual Harvested Values for operations which have taken place between project commencement in 2004 and project transition in 2015 are presented in Table 17. Actual harvests levels have been substantially lower per year than the LTSY projections. The tables below shows the final baseline model which account for all legal constraints on a per acre basis (Table 13) and for the entire Garcia River Forest Project (Table 14).

Table 13: Baseline carbon stocks (MtCO<sub>2</sub>e/acre)

| Elapsed Time <sup>11</sup> | 5-Year Period Start | MtCO <sub>2</sub> e/acre |               |                     |       |          |
|----------------------------|---------------------|--------------------------|---------------|---------------------|-------|----------|
|                            |                     | Standing Live            | Standing Dead | In Use and Landfill | Total | Baseline |
| start                      | 2003                | 159.3                    | 3.25          | 0.66                | 163.3 | 176.4    |
| 0                          | 2004                | 97.5                     | 3.25          | 0.66                | 101.4 | 176.4    |
| 5                          | 2009                | 110.6                    | 3.25          | 0.66                | 114.5 | 176.4    |
| 10                         | 2014                | 113.4                    | 3.25          | 0.66                | 117.3 | 176.4    |
| 15                         | 2019                | 124.5                    | 3.25          | 0.66                | 128.4 | 176.4    |
| 20                         | 2024                | 130.5                    | 3.25          | 0.66                | 134.4 | 176.4    |
| 25                         | 2029                | 147.4                    | 3.25          | 0.66                | 151.3 | 176.4    |
| 30                         | 2034                | 146.7                    | 3.25          | 0.66                | 150.6 | 176.4    |
| 35                         | 2039                | 156.8                    | 3.25          | 0.66                | 160.7 | 176.4    |
| 40                         | 2044                | 159.2                    | 3.25          | 0.66                | 163.1 | 176.4    |
| 45                         | 2049                | 164.2                    | 3.25          | 0.66                | 168.1 | 176.4    |
| 50                         | 2054                | 170.6                    | 3.25          | 0.66                | 174.5 | 176.4    |
| 55                         | 2059                | 178.3                    | 3.25          | 0.66                | 182.2 | 176.4    |
| 60                         | 2064                | 178.6                    | 3.25          | 0.66                | 182.5 | 176.4    |
| 65                         | 2069                | 189.8                    | 3.25          | 0.66                | 193.7 | 176.4    |
| 70                         | 2074                | 189.0                    | 3.25          | 0.66                | 192.9 | 176.4    |
| 75                         | 2079                | 197.8                    | 3.25          | 0.66                | 201.7 | 176.4    |
| 80                         | 2084                | 198.5                    | 3.25          | 0.66                | 202.4 | 176.4    |
| 85                         | 2089                | 205.6                    | 3.25          | 0.66                | 209.5 | 176.4    |
| 90                         | 2094                | 208.6                    | 3.25          | 0.66                | 212.5 | 176.4    |
| 95                         | 2099                | 217.0                    | 3.25          | 0.66                | 220.9 | 176.4    |
| 100                        | 2104                | 217.5                    | 3.25          | 0.66                | 221.4 | 176.4    |
| 105                        | 2109                | 222.8                    | 3.25          | 0.66                | 226.7 | 176.4    |
| 110                        | 2114                | 224.9                    | 3.25          | 0.66                | 228.8 | 176.4    |

<sup>11</sup> Elapsed Time represents the amount of time during the 5-year modeling period begins. For example, the modeled period beginning in 2114 runs 5 years. It has an elapsed time of 110 years at the period start and 115 at the period end.

Table 14: Baseline carbon stocks for the Garcia River Project (MtCO<sub>2</sub>e)

| Elapsed Time | 5-Year Period Start | MtCO <sub>2</sub> e for GRF |               |                     |           |           |
|--------------|---------------------|-----------------------------|---------------|---------------------|-----------|-----------|
|              |                     | Standing Live               | Standing Dead | In Use and Landfill | Total     | Baseline  |
| <b>start</b> | <b>2003</b>         | 3,578,225                   | 72,901        | 14,716              | 3,665,841 | 3,960,553 |
| <b>0</b>     | <b>2004</b>         | 2,190,084                   | 72,901        | 14,716              | 2,277,700 | 3,960,553 |
| <b>5</b>     | <b>2009</b>         | 2,483,115                   | 72,901        | 14,716              | 2,570,731 | 3,960,553 |
| <b>10</b>    | <b>2014</b>         | 2,546,202                   | 72,901        | 14,716              | 2,633,818 | 3,960,553 |
| <b>15</b>    | <b>2019</b>         | 2,795,727                   | 72,901        | 14,716              | 2,883,343 | 3,960,553 |
| <b>20</b>    | <b>2024</b>         | 2,930,894                   | 72,901        | 14,716              | 3,018,510 | 3,960,553 |
| <b>25</b>    | <b>2029</b>         | 3,309,328                   | 72,901        | 14,716              | 3,396,944 | 3,960,553 |
| <b>30</b>    | <b>2034</b>         | 3,295,164                   | 72,901        | 14,716              | 3,382,780 | 3,960,553 |
| <b>35</b>    | <b>2039</b>         | 3,520,312                   | 72,901        | 14,716              | 3,607,928 | 3,960,553 |
| <b>40</b>    | <b>2044</b>         | 3,574,321                   | 72,901        | 14,716              | 3,661,937 | 3,960,553 |
| <b>45</b>    | <b>2049</b>         | 3,687,684                   | 72,901        | 14,716              | 3,775,300 | 3,960,553 |
| <b>50</b>    | <b>2054</b>         | 3,831,399                   | 72,901        | 14,716              | 3,919,015 | 3,960,553 |
| <b>55</b>    | <b>2059</b>         | 4,002,782                   | 72,901        | 14,716              | 4,090,398 | 3,960,553 |
| <b>60</b>    | <b>2064</b>         | 4,010,947                   | 72,901        | 14,716              | 4,098,563 | 3,960,553 |
| <b>65</b>    | <b>2069</b>         | 4,262,187                   | 72,901        | 14,716              | 4,349,803 | 3,960,553 |
| <b>70</b>    | <b>2074</b>         | 4,245,128                   | 72,901        | 14,716              | 4,332,744 | 3,960,553 |
| <b>75</b>    | <b>2079</b>         | 4,441,060                   | 72,901        | 14,716              | 4,528,676 | 3,960,553 |
| <b>80</b>    | <b>2084</b>         | 4,457,875                   | 72,901        | 14,716              | 4,545,491 | 3,960,553 |
| <b>85</b>    | <b>2089</b>         | 4,616,297                   | 72,901        | 14,716              | 4,703,913 | 3,960,553 |
| <b>90</b>    | <b>2094</b>         | 4,683,488                   | 72,901        | 14,716              | 4,771,104 | 3,960,553 |
| <b>95</b>    | <b>2099</b>         | 4,873,152                   | 72,901        | 14,716              | 4,960,768 | 3,960,553 |
| <b>100</b>   | <b>2104</b>         | 4,882,959                   | 72,901        | 14,716              | 4,970,575 | 3,960,553 |
| <b>105</b>   | <b>2109</b>         | 5,002,782                   | 72,901        | 14,716              | 5,090,398 | 3,960,553 |
| <b>110</b>   | <b>2114</b>         | 5,049,197                   | 72,901        | 14,716              | 5,136,813 | 3,960,553 |

Note: “2003” represents starting stocks (2/2/2004)

Table 15: Baseline modeled harvests

| 5-Year<br>Period<br>Start | BF/acre |                                     |                                       | MBF Harv/Year |
|---------------------------|---------|-------------------------------------|---------------------------------------|---------------|
|                           | BF/acre | Annual Growth<br>(BF/forested acre) | Annual Harvest<br>(BF/harvested acre) |               |
| 2004                      | 8,472   | start                               | 1,342                                 | 15,799        |
| 2009                      | 6,864   | 1,020                               | 642                                   | 1,162         |
| 2014                      | 8,823   | 1,034                               | 736                                   | 6,450         |
| 2019                      | 9,776   | 927                                 | 947                                   | 3,308         |
| 2024                      | 11,529  | 1,297                               | 829                                   | 6,710         |
| 2029                      | 12,701  | 1,063                               | 879                                   | 2,208         |
| 2034                      | 15,063  | 1,352                               | 1,112                                 | 10,273        |
| 2039                      | 15,615  | 1,222                               | 1,388                                 | 5,878         |
| 2044                      | 17,164  | 1,698                               | 1,117                                 | 8,721         |
| 2049                      | 18,055  | 1,295                               | 1,245                                 | 6,865         |
| 2054                      | 19,358  | 1,506                               | 1,162                                 | 8,367         |
| 2059                      | 20,357  | 1,362                               | 1,214                                 | 5,610         |
| 2064                      | 22,008  | 1,544                               | 1,323                                 | 11,291        |
| 2069                      | 22,405  | 1,402                               | 1,279                                 | 5,182         |
| 2074                      | 24,180  | 1,633                               | 1,296                                 | 11,144        |
| 2079                      | 24,619  | 1,384                               | 1,344                                 | 6,315         |
| 2084                      | 26,138  | 1,648                               | 1,235                                 | 10,904        |
| 2089                      | 26,612  | 1,330                               | 1,293                                 | 6,094         |
| 2094                      | 28,154  | 1,601                               | 1,194                                 | 9,660         |
| 2099                      | 28,906  | 1,344                               | 1,281                                 | 6,205         |
| 2104                      | 30,438  | 1,587                               | 1,224                                 | 10,557        |
| 2109                      | 30,993  | 1,335                               | 1,376                                 | 8,116         |
| 2114                      | 32,074  | 1,592                               | 1,201                                 | 9,759         |

**Table 16: Projected Annual Harvesting under Sustained Yield (Actual) Management and Baseline Management Scenario**

| <b>5-Year Period Start</b> | <b>Sustained Yield Plan Projected MBF Harvested/ Year</b> | <b>Baseline Business-As-Usual Modeled MBF Harvested/Year</b> |
|----------------------------|-----------------------------------------------------------|--------------------------------------------------------------|
| <b>2004</b>                | NA                                                        | 15,799                                                       |
| <b>2009</b>                | NA                                                        | 1,162                                                        |
| <b>2014</b>                | 2,261                                                     | 6,450                                                        |
| <b>2019</b>                | 2,642                                                     | 3,308                                                        |
| <b>2024</b>                | 3,045                                                     | 6,710                                                        |
| <b>2029</b>                | 3,828                                                     | 2,208                                                        |
| <b>2034</b>                | 3,926                                                     | 10,273                                                       |
| <b>2039</b>                | 4,598                                                     | 5,878                                                        |
| <b>2044</b>                | 5,302                                                     | 8,721                                                        |
| <b>2049</b>                | 5,758                                                     | 6,865                                                        |
| <b>2054</b>                | 6,517                                                     | 8,367                                                        |
| <b>2059</b>                | 6,845                                                     | 5,610                                                        |
| <b>2064</b>                | 7,359                                                     | 11,291                                                       |
| <b>2069</b>                | 6,102                                                     | 5,182                                                        |
| <b>2074</b>                | 7,398                                                     | 11,144                                                       |
| <b>2079</b>                | 7,079                                                     | 6,315                                                        |
| <b>2084</b>                | 6,369                                                     | 10,904                                                       |
| <b>2089</b>                | 5,210                                                     | 6,094                                                        |
| <b>2094</b>                | 2,182                                                     | 9,660                                                        |
| <b>2099</b>                | 1,596                                                     | 6,205                                                        |
| <b>2104</b>                | 2,387                                                     | 10,557                                                       |
| <b>2109</b>                | 2,362                                                     | 8,116                                                        |
| <b>2114</b>                | 2,362                                                     | 9,759                                                        |

Note: The actual harvest volumes for years 2004-2015 are shown below in Table 17.

Table 17: Actual Harvested Volumes on the Project since Commencement in February 2004

| Year | MBF Harvested by Species |                  |                 | Harvest Total<br>(MBF) |
|------|--------------------------|------------------|-----------------|------------------------|
|      | Redwood                  | Other<br>Conifer | Douglas-<br>Fir |                        |
| 2004 | -                        | -                | -               | -                      |
| 2005 | -                        | -                | -               | -                      |
| 2006 | -                        | -                | -               | -                      |
| 2007 | 960.39                   | 43.52            | 509.96          | 1513.87                |
| 2008 | -                        | -                | -               | -                      |
| 2009 | -                        | -                | -               | -                      |
| 2010 | 71.09                    | 0.22             | 48.91           | 120.22                 |
| 2011 | 125.64                   | 44.73            | 151.71          | 322.08                 |
| 2012 | 881.68                   | 107.19           | 192.81          | 1181.68                |
| 2013 | 365.72                   | 190.56           | 705.46          | 1261.74                |
| 2014 | 8.56                     | -                | 658.33          | 666.89                 |
| 2015 | 352.02                   | -                | 810.43          | 1162.45                |

## Attachment J: High Stocking Reference Analysis

The Garcia River Forest Project initial starting stocks (127.68 MtCO<sub>2</sub>e/acre) are below the common practice baseline (176.75 MtCO<sub>2</sub>e/acre), so a review of the High Stocking Reference is required. The High Stocking Reference for the project area is “defined as 80 percent of the highest value of aboveground standing live carbon stocks per acre within the Project Area during the preceding 10-year period” (Protocol, pg 48). For the GRF, the decade prior to project commencement is 1994-2004. Timber inventory records were not available for the project area during this time, so historical aerial imagery and historical Timber Harvest Plans (THPs) were reviewed.

Both analysis showed that the year of project commencement, 2004, had the highest value for aboveground standing live carbon stocks. Therefore, the HSR is 80% of the initial starting stocks (127.68 MtCO<sub>2</sub>e/acre \* 80% = 102.15 MtCO<sub>2</sub>e/acre), a value of 102.15 MtCO<sub>2</sub>e/acre.

### *Analysis: i-Tree Canopy Cover*

Following the Transition Guidance<sup>12</sup>, an i-Tree Canopy Cover assessment was conducted on the project area. One hundred and fifty points were randomly generated using the i-Tree canopy tool. These points were then imported to Google Earth where historical imagery was available for 1998, 2003, and 2004. A close review of the 150 random points found that the highest tree canopy cover percentage was found in 2004, the year of project commencement.

The HSR calculation is conducted on the year with the highest historical stocking estimate (Transition Guidance, pg 8). The historical stocking estimate uses the percent canopy to develop a historic CO<sub>2</sub>e metric. The year with the highest canopy cover is also the year with the largest historic stocking estimate. In the Project, the year with the highest percent tree canopy is also the year with the highest historic stocking estimate, and is the year of project commencement. Therefore, the HSR calculation is completed using the estimated aboveground live standing live carbon from the year of project commencement, 2004.

Table 19: Historical Canopy Cover of GRF

| Year | Tree Cover | Non-Tree Cover |
|------|------------|----------------|
| 1998 | 84.0%      | 16.0%          |
| 2003 | 84.7%      | 15.3%          |
| 2004 | 90.0%      | 10.0%          |

<sup>12</sup> Guidance for Transitioning Early Action Projects to the California Air Resources Board's Compliance Offset Protocol U.S. Forest Projects. California Air Resources Board, March 2015. Available: [http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects\\_2014.htm](http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects_2014.htm)

### *Analysis: Timber Harvest Plan Records*

Additionally, CalFire records from 1994-2004 were reviewed. In the ten year period prior to project commencement, nine THPs were submitted. The THPs documentation included the number of acres per silvicultural type that were planned and operated. This information was reviewed and summarized. Over the ten year period of 1994-2004, 1,741 acres were harvested (out of the 22,455 forested acres.)

**Table 20: THP Silviculture from 1994-2004**

| <b>Year</b>        | <b>Total Annual Acres</b> | <b>Alternate Prescription</b> | <b>Clearcut</b> | <b>Seed Tree Remove</b> | <b>Selection</b> | <b>Group Selection</b> | <b>Commercial Thinning</b> | <b>Transition</b> | <b>Sanitation Salvage</b> | <b>Special Treatment Area</b> |
|--------------------|---------------------------|-------------------------------|-----------------|-------------------------|------------------|------------------------|----------------------------|-------------------|---------------------------|-------------------------------|
| <b>1994</b>        | -                         | -                             | -               | -                       | -                | -                      | -                          | -                 | -                         | -                             |
| <b>1995</b>        | <b>500</b>                | 210                           | -               | 174                     | 59               | 5                      | 43                         | -                 | -                         | 9                             |
| <b>1996</b>        | <b>752</b>                | 296                           | -               | 218                     | 50               | -                      | 157                        | 31                | -                         | -                             |
| <b>1997</b>        | <b>489</b>                | 282                           | 4               | 51                      | -                | -                      | 116                        | -                 | 11                        | 25                            |
| <b>Grand Total</b> | <b>1741</b>               | <b>788</b>                    | <b>4</b>        | <b>443</b>              | <b>109</b>       | <b>5</b>               | <b>316</b>                 | <b>31</b>         | <b>11</b>                 | <b>34</b>                     |

Using an estimated harvest volume of 3000 BF/acre and an annual growth rate of 3%, a 2004 timber inventory was back-calculated to review the trajectory of forest volume. The exercise demonstrated that forest volume was increasing steadily from 1994 to 2004 leaving to the highest volume at project commencement.

**Table 21: GRF Historic Growth**

|             | <b>Garcia River Forest</b> |                         |                         |               |                       |
|-------------|----------------------------|-------------------------|-------------------------|---------------|-----------------------|
| <b>Year</b> | <b>Total MBF</b>           | <b>Est. MBF Harvest</b> | <b>Potential Growth</b> | <b># THPs</b> | <b>Acres Operated</b> |
| <b>1994</b> | 85,077                     | 0                       | 2,631                   | 0             | 0                     |
| <b>1995</b> | 87,708                     | 1,500                   | 2,666                   | 3             | 500                   |
| <b>1996</b> | 88,874                     | 2,256                   | 2,679                   | 3             | 752                   |
| <b>1997</b> | 89,297                     | 1,467                   | 2,716                   | 2             | 489                   |
| <b>1998</b> | 90,547                     | 0                       | 2,800                   | 0             | 0                     |
| <b>1999</b> | 93,347                     | 0                       | 2,887                   | 0             | 0                     |
| <b>2000</b> | 96,234                     | 0                       | 2,976                   | 0             | 0                     |
| <b>2001</b> | 99,210                     | 0                       | 3,068                   | 0             | 0                     |
| <b>2002</b> | 102,279                    | 0                       | 3,163                   | 0             | 0                     |
| <b>2003</b> | 105,442                    | 0                       | 3,261                   | 0             | 0                     |
| <b>2004</b> | 108,703                    | NA                      | NA                      | NA            | NA                    |

## Attachment K: Legal Constraints

See Appendix B: Modeling Plan for specific silvicultural and legal constraints.

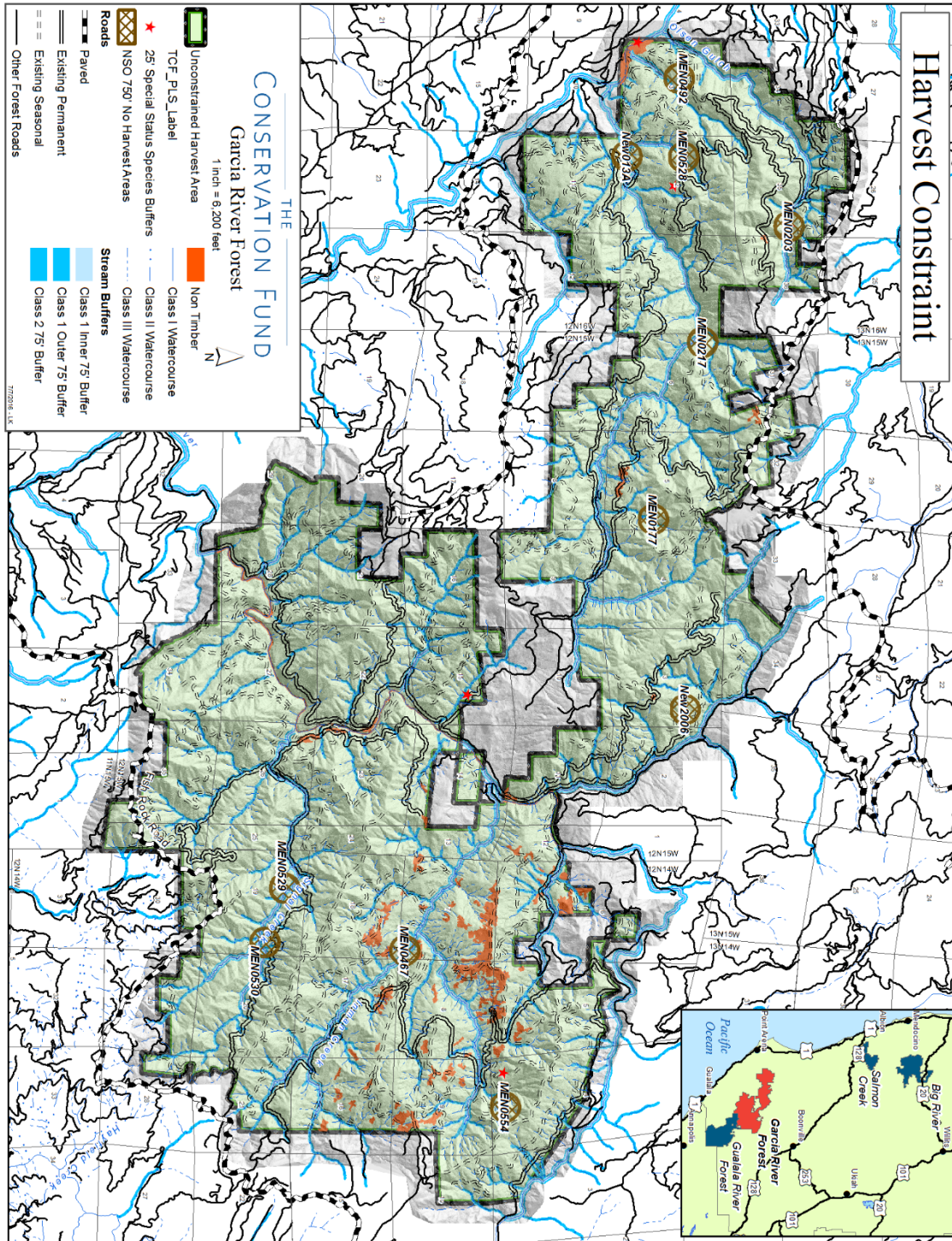
- Z'Berg-Nejedly Forest Practice Act of 1973 (California Public Resources Code – Division 4, Chapter 8): Designed to protect, enhance & restore California's timberland.
- California Forest Practice Rules (Title 14, California Code of Regulations, Chapter 4): Regulations used to implement the Forest Practice Act that govern timber operations.
- California Timberland Productivity Act of 1982 (Gov.C. 51100 et seq.): The intent of this Act is to “*encourage investment in timberlands based on reasonable expectation of harvest*”, and to “*discourage premature or unnecessary conversion of timberland to urban and other uses*”.
- California Environmental Quality Act (CEQA) (Pub.Res.C. 21000 et seq.): statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.
- Porter-Cologne Water Quality Control Act (California Water Code, Division 7. Water Quality): This is the primary vehicle for implementation of California's responsibilities under the federal 1972 Clean Water Act.
- Clean Water Act of 1972 (33 U.S.C. §1251 et seq.): The Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.
- California Endangered Species Act (Fish & G.C. 2050 et seq.): Protects and Preserves all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, that are threatened with extinction.
- Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884): The Act provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend.

## **Attachment L: Financial Feasibility Estimate**

See attached excel workbook -

Attachment\_L\_FinancialFeasibilityEstimate\_GRF\_OPDR.xlsx

## Attachment N: Management Buffers



Nontimber/zero carbon areas depicted here are only the natural openings; the red areas do not include the zero carbon roads.