OFFSET PROJECT DATA REPORT

Green Diamond Resource Company
Klamath West IFM

Reporting Period 1

Air Resources Board
Compliance Offset Protocol – U.S. Forest Projects
Adopted: November 14, 2014

ARB Project ID: CAFR5234

Project ID: ACR 274

Version 4.3

November 22, 2017

GREEN DIAMOND RESOURCE COMPANY
SETTING THE STANDARD IN WORKING FORESTS™

Green Diamond Resource Company
Klamath West IFM

<u>Offset Project Operator</u>:

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(Forest Offset Protocol §2.2)

Reporting Period:

The reporting period for this Offset Project Data Report is 22 months (September 29, 2014 – July 31, 2016).

Protocol Version:

California Air Resources Board Compliance Offset Protocol – U.S. Forest Projects, November 14, 2014 (COP)
Subchapter 10 Climate Change, Article 5, Sections 95800 to 96023, Title 17, California Code of Regulations (Regulation)

Attestation:

I certify under penalty of perjury under the laws of the State of California the GHG reductions and/or GHG removal enhancements for Green Diamond Resource Company — Klamath West Improved Forest Management Project from September29, 2014 to July 31, 2016 are measured in accordance with the Compliance Offset Protocol U.S. Forest Projects, November 14, 2014, and all information required to be submitted to ARB is true, accurate, and complete.

Signature

Date: November 22, 2017

Mike Pruett
Printed Name

VP of Land Management and Business Development
Title

Note to Reader on Attachments to the OPDR
All required attachments are either contained in this OPDR or provided as separate attachments.

Note to Reader on Rounding
Values in this OPDR may differ slightly due to rounding.

Note to Reader Regarding Differences Between OPDR and listing Documents
There are differences between the listing documents and this OPDR. The differences are enumerated in the following table.

Ln #	Item	Where Changed	Listing Documents	OPDR
1	Reporting Period	OPDR pg. ii	Listing Form pg. 1 (Part II)	Reporting period was reduced by two months to coincide with the completion of the forest inventory
2	Project Area	OPDR pg. 1	Listing Form pg. 2 (Part V)	Project Area changed from 185,140 to 170,883 acres; maps changed to reflect revised Project Area
3	Assessment Areas	OPDR pg. 15	Listing Form pg. 2 (Part V. A.)	Acreages allocated to each Assessment Area changed as a result of revisions to the Project Area
4	Summary of onsite carbon stocks	OPDR pg. 55	Listing Form pg. 9 (Part VIII. B1.)	Onsite carbon stock estimates changed as a result of revised Project Area and completion of inventory data collection, as well as changes to carbon calculations.
5	Baseline carbon stocks	OPDR pg. 53	Listing Form pg. 9 (Part VIII. A2.)	Baseline carbon stock estimates changed as a result of FVS modeling and revised carbon calculations
6	Common practice value	OPDR pg. 40	Listing Form pg. 9 (Part VIII. B3)	Changed due to Project Area revisions
7	Reversal Risk Rating	OPDR pg. 64	Listing Form pg. 7 (Part VII. E.)	Revised to account for medium level of fuel treatment being implemented in Project Area
8	Financial Constraints	OPDR pg. 39	Listing Form Attachment J	Revised to meet the requirements of FOP Section 6.2.1.3 (1) – a financial analysis of the costs and returns of the baseline scenario to demonstrate financial feasibility in place of using a comparable timber sale as per FOP Section 6.2.1.3 (2)

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1. Introduction

The Green Diamond Resource Company Klamath West IFM Project (Klamath West) is an Improved Forest Management (IFM) project developed pursuant to the California Air Resources Board Compliance Offset Protocol – U.S. Forest Projects adopted November 14, 2014. The Offset Project Operator is Green Diamond Resource Company.

This document is the Offset Project Data Report (OPDR) for the Klamath West IFM Project, assigned by the American Carbon Registry, which is an approved Offset Project Registry (OPR), as Project ID: ACR 274. The OPDR and all other project documentation and reports that reference carbon stocks have been prepared and submitted by Green Diamond Resource Company, with the assistance of consultants, L&C Carbon, Terra Carbon, Latta Forestry, and Mason Bruce & Girard. As per Section 9.1 of the FOP, Andy Elsbree and Ryan Crans – both Registered Professional Foresters – provided oversight of all required project development activities, documentation, and reports that reference carbon stocks.

The approximately 170,883-acre project is located on commercial forestland held in fee ownership by Green Diamond Resource Company in the vicinity west of Klamath Falls, Oregon.

The Klamath West IFM Project activities will lead to increased carbon stocks as compared to the baseline. Uneven-aged natural forest management will be practiced across most of the Project Area, including forest thinning and plantings to reestablish and maintain optimal stocking levels across the Project Area, as well as extending the length of harvest rotations. Even-aged management will be used in portions of the Project Area while maintaining compliance with all FOP requirements.

The Offset Project Commencement Date coincides with the date these lands were purchased by Green Diamond Resource Company – September 29, 2014. The purchase of the forestland within the Project Area represents a long-term commitment to sustainable forestry by Green Diamond Resource Company – a forest landowner who has carefully stewarded forestlands across the Pacific Northwest for 125 years.

In recent decades, this Project Area has been sold several times and heavily harvested by the various owners. As a result, today these forests contain significantly less overall stored carbon than was present on these lands prior to the 1970s.

Green Diamond Resource Company plans to make long-term investments in these lands to improve forest health, increase productivity, and enhance resiliency to reduce pest outbreaks and wildfire occurrence while storing greater amounts of carbon over the next 100 years. This carbon project offers additional financial resources through the sale of carbon offsets to restore these lands to a healthier and more productive condition.

2. Ownership Interest

(Forest Offset Protocol §2.2, §9.1.1.1(3), Regulation §95974)

Green Diamond Resource Company is the sole owner in fee of the real property and is identified as the Offset Project Operator with the legal authority to implement the offset project.

As the Offset Project Operator, Green Diamond Resource Company is responsible for performing and meeting the requirements of project listing, monitoring, reporting, record retention, verification, and credit issuance.

3. Project Eligibility

3-A. Project Type

(Forest Offset Protocol §2.1, §2.1.2, §9.1.1.1(4&5))

The Klamath West IFM Project is an Improved Forest Management project as defined by Air Resources Board Compliance Offset Protocol – U.S. Forest Projects, adopted: November 14, 2014. The project will produce CO2 emission reductions by managing the Project Area to increase carbon sequestration and stocking over the project period when compared to the project baseline. This will be accomplished by harvesting less timber in the project activity as compared to the baseline.

3-B. Project Location

I. <u>Located in the United States</u>
(Forest Offset Protocol §3.6)

The project takes place on land located in the United States.

The Klamath West IFM Project is generally located west of the town of Klamath Falls, Oregon. The Project Area includes approximately 170,883 acres in Jackson and Klamath counties in Oregon and Siskiyou County in California.

A Vicinity Map (Figure 1) shows the Project Area in relation to major roads, major rivers, towns and jurisdictional boundaries. A Location Map (Figure 2) shows the configuration of the carbon project along with towns, township, and ranges. A Public and Private Roads Map (Figure 3) identifies the public and private roads which transect the Project Area. All public roads are excluded from the Project Area. The vast majority of private roads owned by Green Diamond Resources Company are excluded from the Project Area. Any private roads that exist in the Project Area are within the sampling frame and are available for sample.

Klamath West IFM
Vicinity Map

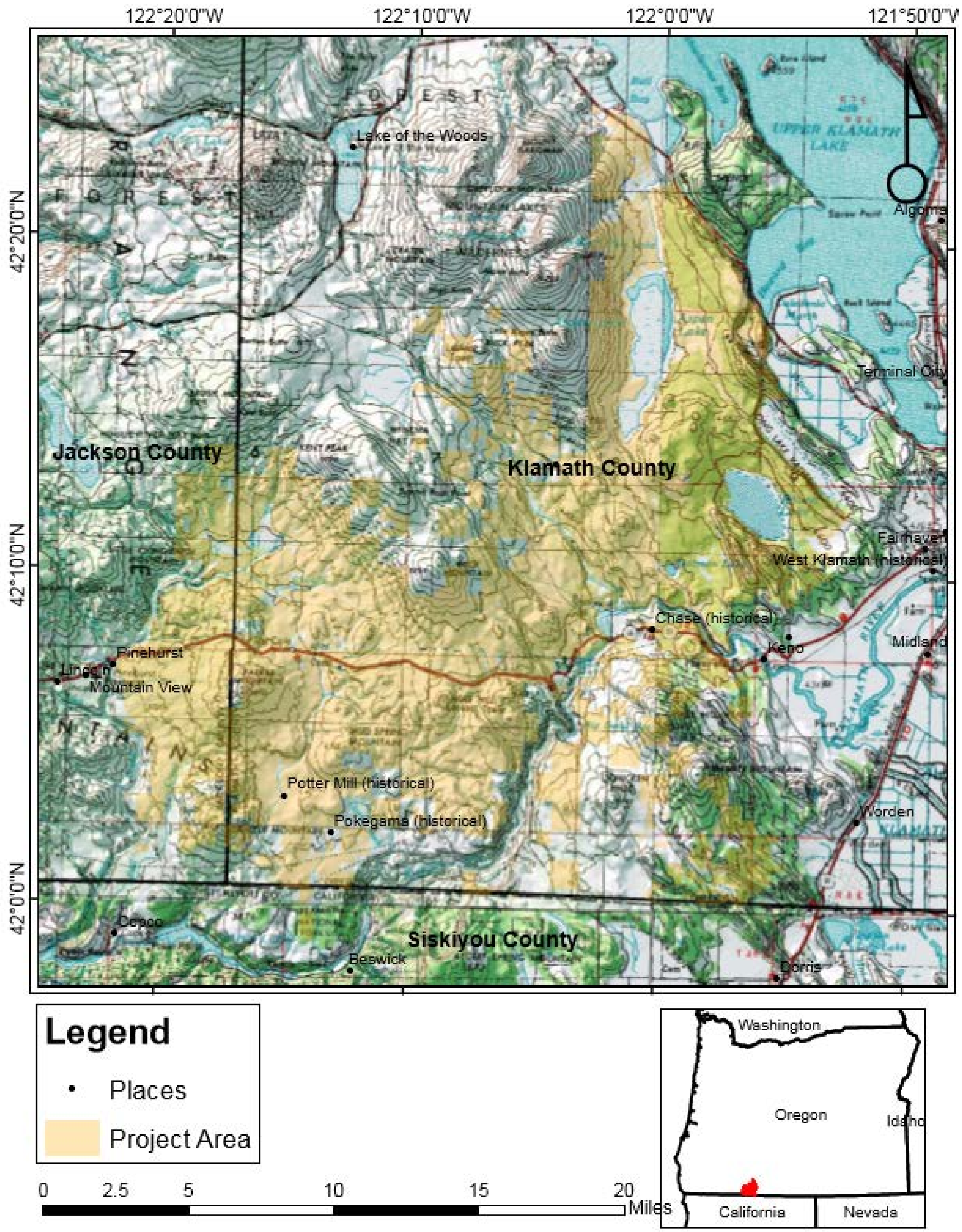

Figure 1 – Vicinity Map

Klamath West IFM
Location Map

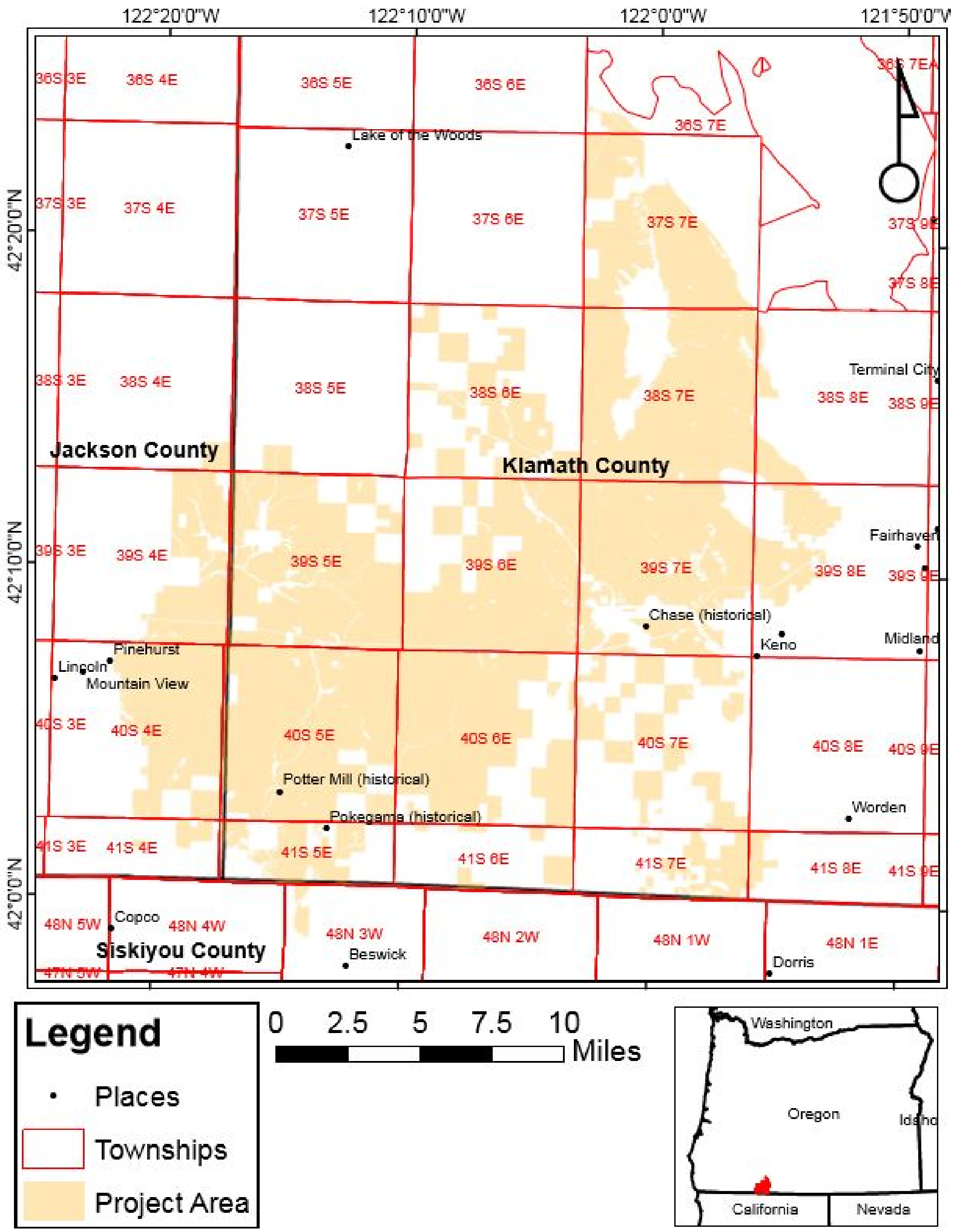

Figure 2 – Location Map

Klamath West IFM
Public and Private Roads Map

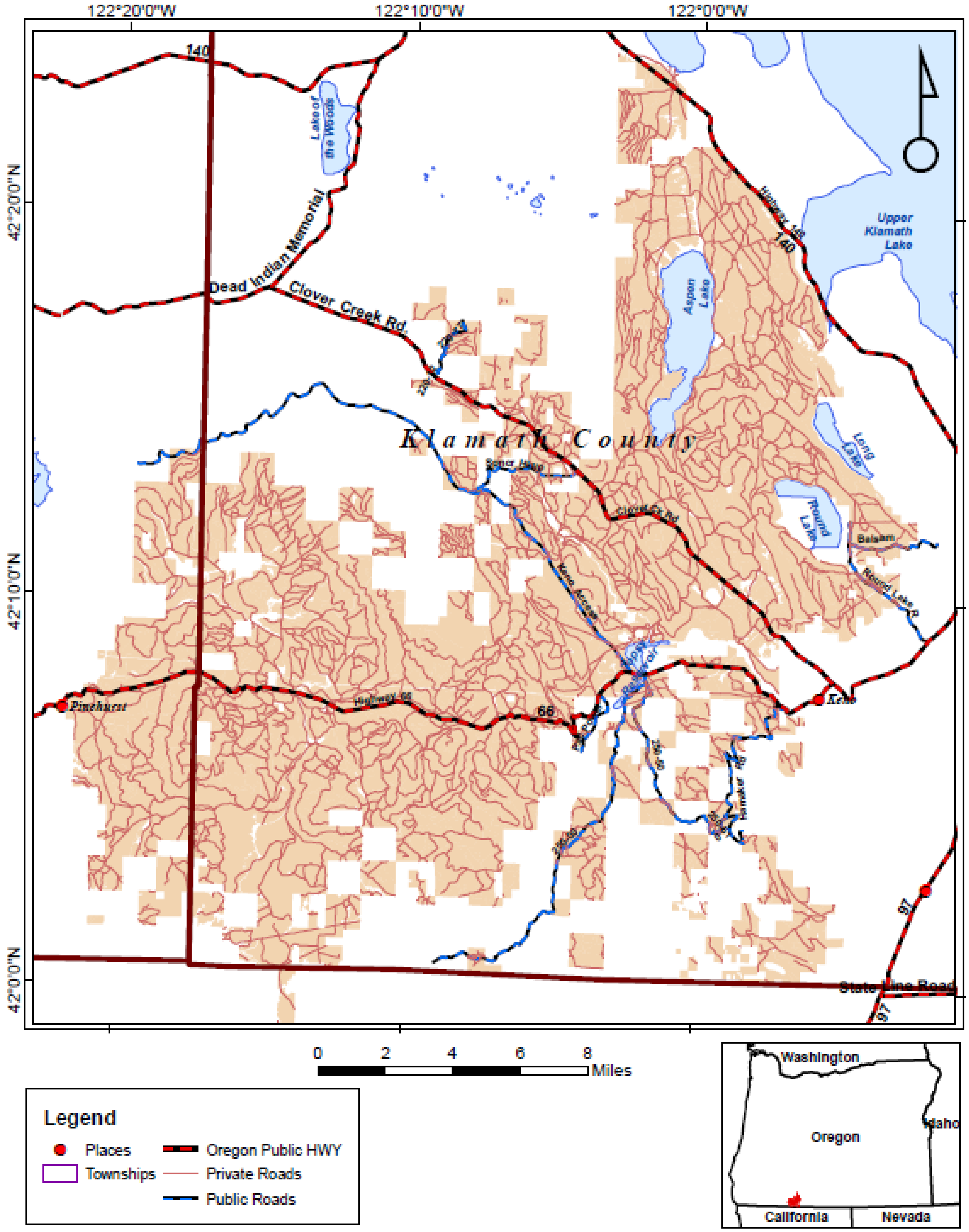

Figure 3 – Public and Private Roads Map

II. Located on Forested Land

(Forest Offset Protocol §2.1.2, §9.1.1.3(1))

The Klamath West IFM Project takes place on land that has greater than 10 percent tree canopy cover based on air photo assessment done specifically for the project in 2015. The Project Area has been in forest cover for the past 100 years or longer. Compliance with the 10 percent tree canopy cover requirement is demonstrated by overlaying a shapefile of the Project Area on current Google satellite imagery. The GIS shapefile will be made available to the Verification Body and Offset Project Registry.

III. Land Ownership Category

(Forest Offset Protocol §3.6, §9.1.1.1(6), Regulation §95975(l))

Green Diamond Resource Company is the sole owner in fee of the offset Project Area. The offset Project Area is not located 1) on land that is owned by, or subject to an ownership or possessory interest of a Tribe, 2) on Indian Land as defined in 25 U.S.C. §81(a)(1), or 3) on land that is owned by any person, entity, or Tribe within the external borders of such Indian Lands.

IV. Any Previous Status as an Offset Project

(Forest Offset Protocol §2.1.2, §9.1.1.1(8))

The land within the Project Area has never been listed or registered with an offset project registry or program, nor have greenhouse gas emission reductions or removal enhancements associated with the Project Area been credited or claimed for the purpose of greenhouse gas mitigation or reduction goals, nor sold to a third party prior to listing, either in a voluntary or regulatory context.

3-C. Project Area

I. Geographic Boundaries

(Forest Offset Protocol §4, §9.1.1.1(15))

Topography & Climate

The topography of the Project Area is gently sloped with about 80 percent of the area less than 10 percent slope. There is a small percentage of the Project Area that is mountainous terrain with steeper slopes near the western and northern boundaries. There is good access to and within the Project Area due to a well-established road network developed through land management activities over the past 100 years.

The climate of the Project Area is classified under the Koppen Climate Classification as Warm Summer Mediterranean, consisting of hot, dry summers and cold winters, with the

greatest precipitation occurring in winter season, much of it falling as snow. Although it is not arid or semi-arid, total precipitation is still low, at 13.41 inches (340.6 mm) per year, due to the Project Area being in the rain shadow of the Cascade Mountains to the west. The Project Area covers a wide range of elevations and aspects, which influence the microclimate and vegetation types in this ecosystem.

The Project Area lies between the 6a and 7b climate zones as mapped by the USDA (Figure 4). The Project Area is within both Climate Division 5 (High Plateau) and Climate Diviation 7 (South Central Oregon) established by the National Climatic Data Center.

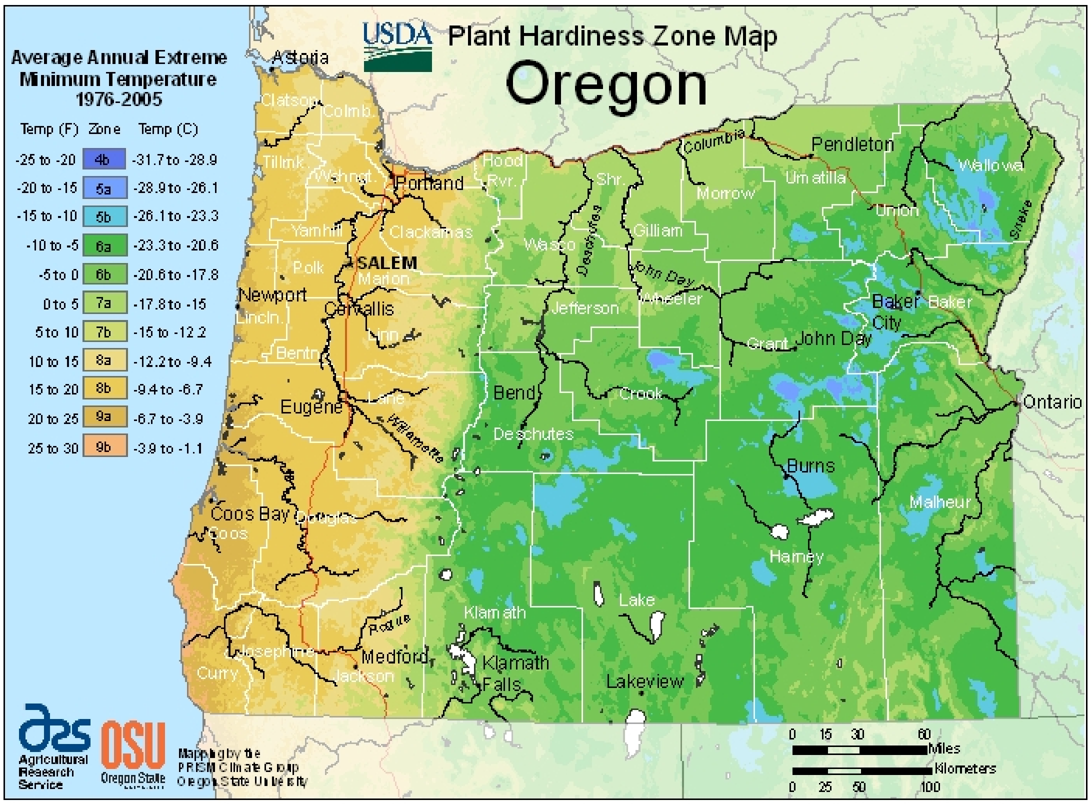

Figure 4 – USDA Plant Hardiness Zone Map

General Location, Towns and Roads

The Project Area is located in south central Oregon, west of Klamath Falls, Oregon and east of the Cascade mountain range.

The approximate centroid of the Project Area is positioned at: 42^{o} 06’ 17.6” N, -122^{o} 08’ 29.0” W. A major towns and roads GIS layer will be made available to the Verification Team and Offset Project Registry, included in the Klamath West IFM Project GIS library.

Watercourses and Watersheds

The Project Area consists of 35 watersheds (Table 1) based on Hydrologic Unit Maps for the State of Oregon. A detailed description of this table may be found in Section 3-M. III.

Table 1 – Project Area Acres within Watersheds

Watershed	Project Acres	Project Acres w/o Burn	Plant/Interplant Year <= 20	% Watershed of Project
Aspen Lake A	5,201	5,201	1,567	30.1%
Aspen Lake B	7,234	7,234	1,067	14.8%
Aspen Lake C	5,945	5,945	1,972	33.2%
Aspen Lake D	3,947	3,947	943	23.9%
Big Bend-Klamath River A	3,458	3,458	761	22.0%
Big Bend-Klamath River B	6,857	6,857	2,393	34.9%
Buck Lake	214	214	1	0.5%
Clover Creek	4,214	4,214	1,573	37.3%
Deer Creek-Klamath River	3,169	0	0	0.0%
Eagle Ridge-Frontal Upper Klamath Lake	402	402	8	2.0%
Fall Creek-Klamath River	4,503	357	106	29.7%
Hayden Creek A	9,914	9,183	4,636	50.5%
Hayden Creek B	3,652	3,652	1,355	37.1%
John C Boyle Reservoir A	9,920	9,920	3,184	32.1%
John C Boyle Reservoir B	5,092	5,092	2,126	41.7%
John C Boyle Reservoir C	6,608	6,608	2,799	42.4%
Johnson Creek A	3,572	3,572	1,908	53.4%
Johnson Creek B	8,275	8,275	4,392	53.1%
Keno Reservoir-Klamath River	1,958	1,958	716	36.6%
Lake Miller	3,865	3,865	1,209	31.3%
Long Lake Valley A	8,353	8,353	2,712	32.5%
Long Lake Valley B	2,890	2,890	599	20.7%
Long Prairie Creek N A	9,410	9,410	4,304	45.7%
Long Prairie Creek N B	4,692	4,692	1,306	27.8%
Long Prairie Creek S	7,539	1,611	855	53.1%
Lower Jenny Creek	4,321	2,782	1,273	45.8%
Lower Spencer Creek	9,326	9,326	4,689	50.3%
Middle Jenny Creek	7,226	7,226	4,260	59.0%
Modac Gulch-Butte Valley	730	730	33	4.5%
Moss Creek-Frontal Upper Klamath Lake	911	911	358	39.3%
Pleasant Valley	439	439	28	6.4%
Rock Creek-Klamath River	4,894	4,815	980	20.4%
Sheepy Creek	9,021	9,021	3,256	36.1%
Upper Jenny Creek	403	403	118	29.3%
Upper Spencer Creek	2,725	2,725	697	25.6%
	170,883	155,290	58,186.27	37.5%

Existing Land Cover and Land Use

The Project Area is zoned as commercial forestland. The land is not suitable for commercial agriculture. Areas within the Project Area are used for grazing to reduce flash fuels for the purpose of reducing fire risk and to generate income. Sport hunting occurs within the Project Area and surrounding lands.

Klamath West IFM
Watershed Map

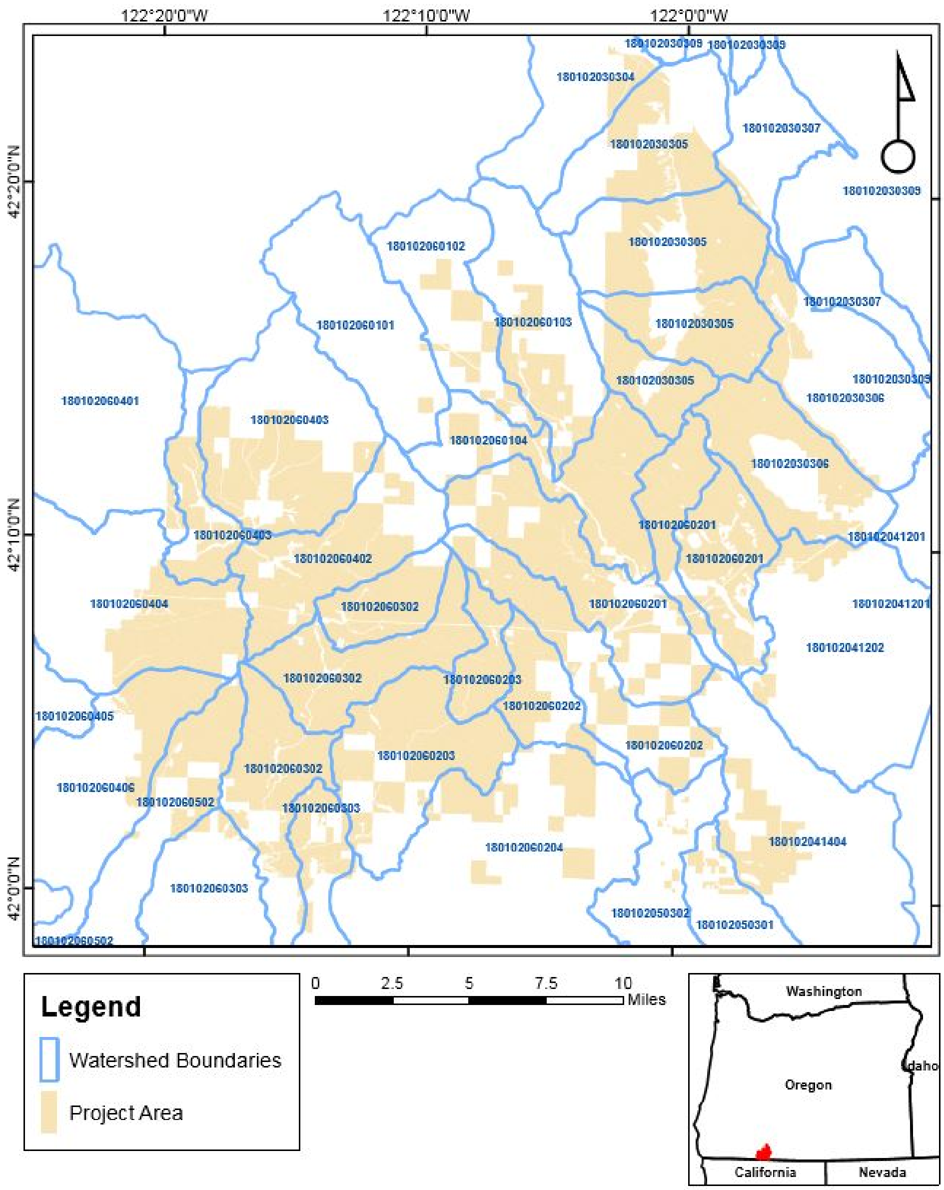

Figure 5 – Watershed Map

There are no significant development pressures applicable to the Project Area because of its rural and remote location and the very small population within the surrounding area. Jackson and Klamath counties include just over 8,725 square miles with a population of 275,742 people or less than seven percent of the State of Oregon's population.

The projected land use within the Project Area and surrounding areas is likely to be timber production throughout the project period, with the potential to increase biomass utilization for energy production.

The primary historical land use within the Project Area and surrounding areas has been timber production and limited grazing compatible with timber production.

Forest Cover

The forest cover within the Project Area consists of three broad categories – natural stands, plantations ranging up to 40 years old, and approximately 16,000 acres that were impacted by a wildfire in 2014 prior to purchase by Green Diamond Resource Company.

Significant forest harvesting over the past 50 years has impacted the quantity and quality of forest cover across the Project Areas. Beginning in the 1970s, clear-cut harvesting took place and plantations of primarily Ponderosa Pine (native to the Project Area) were established. These plantations represent about 58 percent of the Project Area. Natural stands consisting of a mix of native tree species (primarily ponderosa and lodgepole pine, white fir, Douglas-fir, sugar pine, and incense cedar) of varying ages represent about 33 percent of the Project Area. The remaining 9% of the Project Area was burnt in a 2014 wildfire that was salvaged over the past two years.

Site Classes

The Project Area is classified as all high site classes in all Assessment Areas, based on site index classes defined by Oregon State University Extension Service's publication, *Ecology and Management of Eastern Oregon Forest, A Comprehensive Manual For Forest Managers (Manual 12-May 2005)*. Although the majority of site classes are caterogorized as medium according to the OSU Extenation Service publication, high site classes for all Assessment Areas were selected to be conservative, as no medium site class option was available in ARB's Assessment Area Data File.

The site indices stated in Table 10 are sourced from data provided by the previous owners of the Project Area. During the 1960s and early 1970s, Weyerhaeuser researchers based in Klamath Falls established site indices across the entire Klamath Tree Farm – an area that includes the Project Area. These site indices were recorded on a series of paper maps and are the basis for the site indices used by all subsequent owners, including Green Diamond Resource Company. During the 1980s, Weyerhaeuser updated some site indices based on tree measurements in ponderosa pine plantations. However, most of the site indices are

based on the original Weyerhaeuser work.

The site indices have been passed along to each new owner at the time the property transferred ownership. Thus, when Green Diamond Resource Company (Green Diamond) purchased the property from Jeld Wen and JWTR in September 2014, all inventory data and site index information was provided in an Access database, along with the paper maps indicating site index values for the Klamath Tree Farm created by Weyerhaeuser during the 1960s and 1970s.

Based on the site index values contained in the Access database (average in the 60s), it was apparent that the site indies are from a 50 base year curve. After researching Weyerhaeuser records provided to Green Diamond upon land title transfer, documentation was found that indicates stand site index values for ponderosa pine were based on the Powers and Oliver (1978) equation which used a 50 base year and total tree age, because it best describes site trees across sites and ages.

FVS utilizes Barrett (1978) site indices, which use a 100 base year and breast height age. Thus, an average conversion factor by stratum was generated to convert the Powers and Oliver site indices to equivalent Barrett site indices. Two conversion factors were averaged to establish an average conversion factor – 1) a conversion factor that matches Barrett to Power and Oliver at 50 years - total age; and 2) a conversion factor that matches Barrett to Power and Oliver at 100 years - breast height age. Weyerhaeuser documentation states that it takes on average six years for ponderosa pine to reach breast height age in and around the Project Area; thus, we subtracted six years from total age to establish breast height age.

Green Diamond relied on the site indices provided by the previous owners because there are not enough suitable site index trees still standing across each stratum to re-evaluate site index by stand or each stratum within the Project Area. As indicated by the inventory data and onsite carbon stocks at the Offset Project Commencement Date, the Project Area has been high-graded and heavily cut over the past three decades. Further evidence is that the project is substantially below the ARB common practice statistic. As Green Diamond restores the Project Area over the project period, site index trees will be established and measured to confirm or adjust stand site indices.

Site indices for each stratum contained in Table 10 are based on a weighted average of acres by site class. All site index calculations will be provided to the Verification Body and the Offset Project Registry. The weighted averages were calculated as follows:

- Step 1 - Green Diamond's Access database was queried to extract acres by stand and site index.
- Step 2 - The acreage for each stand was multiplied by the site index to derive a total stand site index value.
- Step 3 – The total stand site index values were summed by stratum.

Step 4 – The total stand site index values by stratum were divided by the Stratum acreage to derive the weighted Site Index by Stratum.

Step 5 – The weighted Site Index by Stratum was multiplied by the Barrett/Powers and Oliver average conversion ratio to derive the weighted 100-year breast height site index by stratum.

Green Diamond staff reviewed the site index information available through Natural Resource Conservation Service (NRCS) and decided not to use this information because it is not representative of the forest soil types; rather, it is based almost exclusively on agriculture soil types. Thus, Green Diamond chose to use the site indices that were established by Weyerhaeuser because they are site specific to the Project Area.

Shape Files

Project shape files relevant for the project were generated in Arc GIS and will be made available to the Verification Body and the Offset Project Registry. The Klamath West IFM Project GIS library includes:

- Project Area Boundary
- Supersection Boundaries in relation to the Project Area
- Major Roads and Towns
- Major Watersheds (< 10,000 acres)
- Major Watercourses (4^{th} order or greater) and water bodies
- Topography
- Township, ranges, and sections
- Inventory Plot Locations

Delineation of Project Area

The following process was used to establish the Project Area.

1. Utilizing Green Diamond Resource Company's GIS system, all fee ownership within the Northwest Cascades and Southern Cascades Supersections was identified.

Green Diamond Resource Company matched up its ownership to the PLSS Townships and PLSS Sections downloaded from the BLM Oregon – Washington website. The 2012 version of PLSS was used and a copy of the 2012 PLSS landline and GCD points will be made available to the Verification Body and the Registry upon request.

- Geodatabases used were "landlines.gdb", which included the PLSS Section polygons and the PLSS Township polygons, and the "landlines_gcd.gdb" geodatabase was used in conjunction with the PLSS Section and Township polygons to improve accuracy.
- Sections, Townships and GCD points were exported into their own shapefiles and then clipped in ArcGIS to reduce the size of the shapefiles since only data from

Klamath and Jackson Counties were needed for GDRCo ownership within the Klamath West IFM project.
- Then the shapefiles were re-projected to NAD 1927 Oregon State Plane South in order to match the projection of GDRCo's GIS data.
- GDRCo's Stands layer was then edited and snapped to these features in order to accurately reflect company ownership.
- GDRCo staff used 2014 NAIP imagery and leaps & bounds descriptions from the property deeds as a reference for boundary delineations.
- GDRCo staff used 2016 NAIP imagery to digitize the locations of roads not owned by the Forest Owner that cross the Project Area to ensure alignment with a verifiable source of information.
- GDRCo evaluated using the County tax lot data but found that its own shapefiles better reflected company ownership than the county's parcel layer. The counties are on a 10 year planning goal to fix the parcel layers so they accurately reflect actual ownership boundaries.
- The final step was to use the Stands layer to extract the Strata to create the Klamath West IFM project area boundary.

2. All stand polygons were typed into three categories:
    - Natural
    - Plantations
    - Non-forest

3. Roads were identified as either:
    - Native surface with a 6-foot radius (12-foot buffer), except Balsam Drive where a 15-foot radius (30-foot buffer) was used to account for a 14-foot radius county easement.
    - Improved surface (rock or cinder) with an 8-foot radius, except for the Topsy Grade road where a 30-foot radius (60-foot buffer) and the Slip Easy road where 15-foot radius (30-foot buffer) was used to account for existing easements.
    - Paved surfaced where 30 to 55-foot radii (60 to 110-foot buffers) were used to account for state and county easements.

    For all roads not owned by the Forest Owner, the OPO used 2016 NAIP imagery to digitize the road locations that cross the Project Area to ensure alignment with a verifiable source of information. Then, the OPO created road polygons by buffering each road using the applicable radii and the resulting acreage was removed from the gross acres of each stand polygon.

4. Waterbody were identified:
   - Lakes, reservoirs and pond (not stock ponds) acreage were considered non-forest stands and this area was also removed from gross acres of each stand
   - Associated Riparian Management Areas (RMA) of 100 feet for most waterbodies greater than 8 acres also reduced the gross acres of each stand

5. Wetlands were identified:
   - Acreage of wetlands and forested wetlands greater than 8 acres in size and their associated 100 Foot RMA were removed

6. Streams were classified as:
   - S = Small –a 5-foot radius
   - M = Medium – a 10-foot radius
   - L = Large – a 15-foot radius

RMA size ranges from 0 to 100 feet based on stream size and whether fish are present. Stream and RMA radius can range from 5 feet for a small, non-fish streams, to 115-foot radius for a large, fish bearing streams. Acreage from buffering the streams using the stream's radius were removed from the stands gross acres.

Net acres were derived from identifying those portions of individual stands made up of roads, streams, wetlands, lakes and all the associated RMA's for each and subtracting those acreages from the stands' gross polygon acres.

- All acres to be removed were combined to create a Feature called Ribbons_Buff_Layer.
- By taking the Stand Layer and the Ribbons_Buff_Layer and using the Identity tool in ArcGIS to match them up, a Netstands feature was created.
- By selecting all stand polygons that have either public roads, most private roads owned by Green Diamond Resource Company, waterbody, wetlands, and/or RMA Buffers and then eliminating them from the Netstands feature, we retained only net areas of each Stand.
- Creating the eight strata for the carbon project was completed by selecting the stands by the individual stratum definitions and merging them into the separate stratum polygons, providing the net area of each strata. The net result is a Project Area of 170,883 acres.

II. <u>Assessment Areas</u>

(Forest Offset Protocol §4, §9.1.1.1(16), Appendix F)

The Project is located predominately within the Southern Cascades Supersection, in the Mixed Conifer Assessment Area. Also, about 4% of it is located in the Northwest Cascades Supersection 6). The table below was prepared to present the acres of each Assessment Area in the Project.

Table 2 – Acres by Supersection & Assessment Area

Supersection	Assessment Area	Site Class	Acres
Southern Cascades	Southern Cascade Mixed Conifer	High	126,735
Southern Cascades	Southern Cascade High Elevation Conifer	High	37,744
Southern Cascades	Southern Cascade Mixed Oak Woodland	High	265
Northwest Cascades	Northwest Cascade Mixed Conifer	High	2,237
Northwest Cascades	Northwest Cascade High Elevation Conifer	High	3,902
Total			170,883

Klamath West IFM
Supersection Map

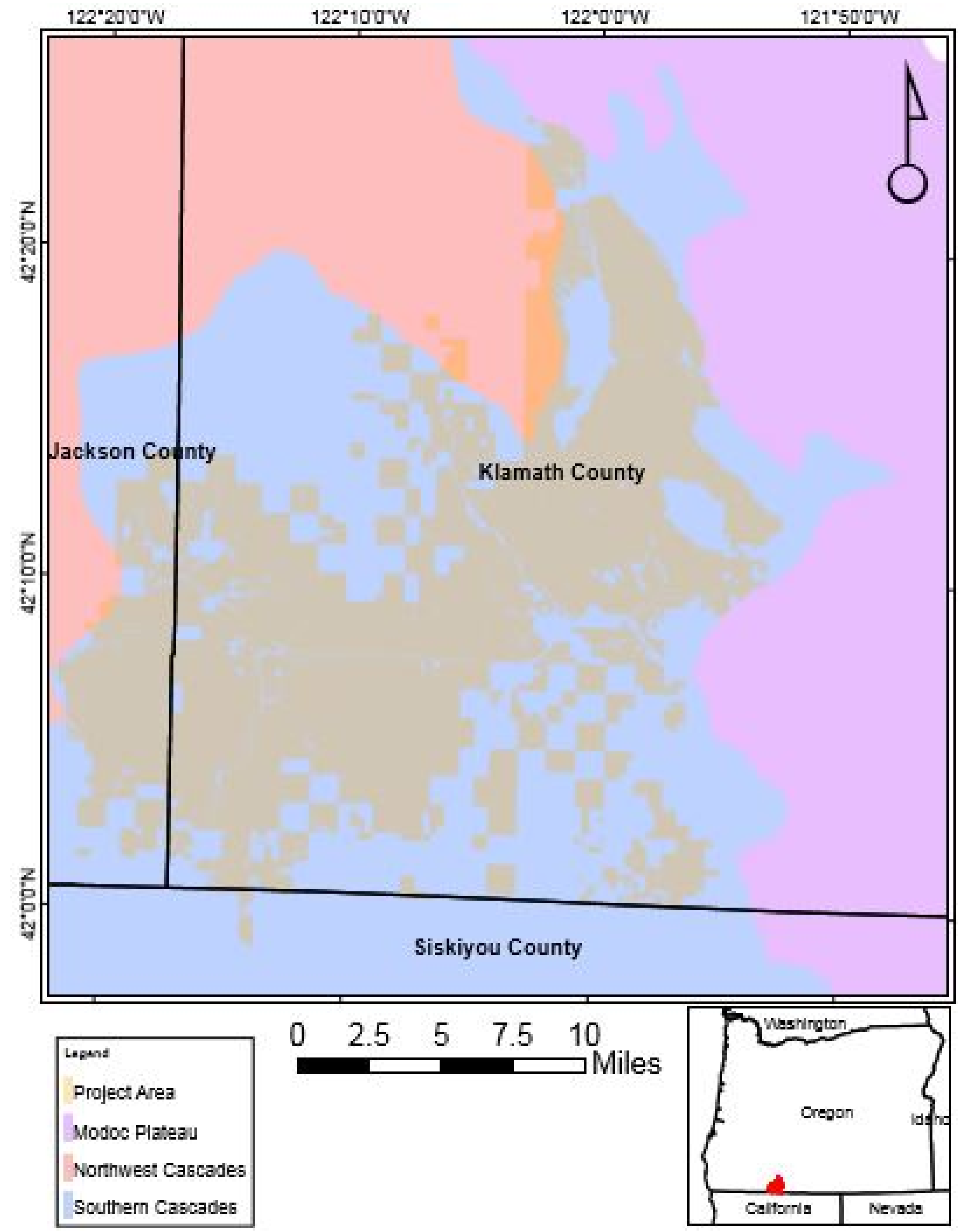

Figure 6 – Project Area in Relation to Supersections

III. <u>General Description of Forest Conditions</u>
(Forest Offset Protocol §9.1.1.1(17))

<u>Tree Species composition; age class distribution; management history</u>

The species composition in the Project Area, by weighted average basal area, is 43.5% ponderosa pine, 20.9% white fir, 15.1% Douglas-fir, 9.5% incense cedar, 3.4% lodgepole pine, 2.9% sugar pine, 2.8% western juniper, and minor amounts of Shasta red fir, Oregon white oak, black oak, and quaking aspen. All species present within the Project Area are native to the region. The species composition list by stratum is detailed in the Klamath West Forest Carbon Inventory report (see:*Klamath West inventory results rev_3.1_21Nov2017*). A copy of this report will be provided to the Verification Body and the Offset Project Registry.

The age class distribution is a result of forest management activities performed by previous landowners over the past 50 years. Due to high harvest levels and significant use of clearcutting to convert older diverse stands to native pine plantations, overall carbon stocking levels have been reduced to levels significantly below Common Practice statistics for the Project Area.

As of the project commencement date, plantations of native pines represent about 58 percent of the Project Area. Approximately 42 percent of the native pine plantations were planted prior to 1995 with an age range between 21 to 40 years of age. All the other native pine plantations were planted after 1995 with the majority in an age range of 10 to 20 years old. Natural stands consisting of a mix of native tree species (primarily ponderosa and lodgepole pine, white fir, Douglas-fir, sugar pine, and incense cedar) of varying ages represent about 33 percent of the Project Area. The remaining 9% of the Project Area was burnt in a 2014 wildfire and was salvaged over the past two years.

3-D. Additionality – Legal Requirement Test

(Forest Offset Protocol §3.1, §3.1.1.2, §9.1.1.1(9), Regulation §95973(a))

The legal constraints affecting forest management activities on the Klamath West IFM Project are primarily contained in the Oregon Department of Forestry Forest Practices Administrative Rules that implements the Oregon Forest Practices Act. The project modeling plan meets the requirements of these rules by utilizing silvicultural methods that conform to leave-tree and reforestation requirements following an entry. Riparian rules, including vegetation retention along designated streams, are met by not allowing the model to simulate any entry into those areas.

The legal constraints affecting forest management activities on the 430-acre portion of the Project Area located in California are contained in the California Forest Practices Rules that implement the Z'berg-Nejedly Forest Practice Act. The key constraints affecting forest management activities include minimum stocking standards, adjacency constraints, and

required protection zones - mostly along streams and waterbodies. All lands within the Project Area located in California were impacted by a wildfire burn in 2014.

These legal constraints are examined more closely in the Baseline Modeling Section 5-A of this document.

3-E. Regulatory Compliance

(Forest Offset Protocol §3.7, Regulation §95973(b))

The Klamath West IFM Project complies with applicable provision of the following federal and state laws:

- Federal Endangered Species Act
- Federal Clean Water Act
- Archaeological Resources Protection Act
- Oregon Forest Practices Act
- Oregon Endangered Species Act
- Z'berg Nejedly Forest Practices Act
- Porter Cologne Water Quality
- California Fish and Game Code
- California Endangered Species Act
- California Environmental Quality Act (CEQA)

The project is not being implemented as the result of any law, statute, regulation, court order or other legally binding mandate. The Forest Owner attests that the Forest Project and associated project lands have met and been in material compliance with all local, state, or federal regulatory requirements during the reporting period.

3-F. Use of Qualified Conservation Easements

(Forest Offset Protocol §3.5, §9.1.1.1(18))

The project will not employ a Qualified Conservation Easement.

3-G. Additionality – Performance Standard Test

(Forest Offset Protocol §3.1, §3.1.2.2)

In Improved Forest Management projects, project activities are considered additional to the extent they produce GHG reductions and/or GHG removal enhancements in excess of those that would have occurred under a conservative Business-As-Usual Scenario, as defined by the baseline estimation requirements. This Improved Forest Management project automatically satisfies the performance test according to Section 3.1.2.2 of the FOP. Activities considered additional are described in section 3-A above.

3-H. Broadcast Fertilization

(Forest Offset Protocol §2.1.2(3), §9.1.1.1(10))

The Klamath West IFM Project has not employed broadcast fertilization in the Project Area since the project commencement date and has no plans to employ broadcast fertilization at any future time in the Project Area.

3-I. Offset Project Commencement Date

(Forest Offset Protocol §3.2, §9.1.1.1(7))

The project commencement date is September 29, 2014, which is the date the title of the property within the Project Area was transferred to Green Diamond Resource Company. The property transfer denotes a discrete and verifiable action as stated in Section 3.2 of the FOP. The first reporting period for this project is the period from September 29, 2014 to July 31, 2016 – the date the initial forest inventory was completed.

3-J. Crediting Period

(Forest Offset Protocol §3.3)

The crediting period for the project starts September 29, 2014 and ends no later than September 28, 2039, a period equal to 25 years.

3-K. Project Life and Minimum Time Commitment

(Forest Offset Protocol §3.4)

The project will monitor and verify forest carbon stocks for a period of 100 years following the last year of the issuance of any ARB Offset Credits (ARBOCs) or Registry Offset Credits (ROCs).

3-L. Demonstration of Sustainable Harvesting Practices

(Forest Offset Protocol §3.8.1, §9.1.1.1(13))

All Green Diamond Resource Company forestland holdings in Oregon, including the Project Area, are certified under the Sustainable Forestry Initiative. Also, all Green Diamond Resource Company forestland holdings in California associated with the Oregon operations, included in the Project Area, are certified under the Sustainable Forestry Initiative. This certification demonstrates sustainable long-term harvesting practices as required by Section 3.8.1 of the FOP.

All forestlands outside the Project Area held by Green Diamond Resource Company are either certified under the Sustainable Forestry Initiative (Washington State) or the Forest Stewardship Council (Northwest California Redwood forests). Evidence of certification will be provided upon request to the Verification Body and Offset Project Registry.

Based on Green Diamond's Forest Management Plan and consistent with its SFI Certification, annual harvest targets are set by company management across the entire Oregon property, which includes the Klamath West IFM Project area. The West Management District encompasses the entire Klamath West IFM Project Area. Once the annual harvest volume target is set for the West Management District, the District Forester identifies the specific stands where forest management activities will be implemented to achieve the annual harvest target.

The District Forester selects the stands to be treated based on management priorities. These priorities include thinning overstocked ponderosa pine plantations and entering natural stands to reduce density, remove ladder fuels, and improve overall health. Stands that are adjacent or near federal or other ownerships are prioritized when possible to reduce wildfire risk.

Once stands are selected, the District Forester develops silvicultural prescriptions to achieve the forest management objectives. Based on the existing stand inventory data and the silvicultural treatments to be applied, a decision is made on the number of acres to be treated within each stand. Next, cutting unit boundaries are identified using GIS and then these boundaries are marked on the ground using paint and ribbon. Then, harvest volumes by species and diameter classes are estimated for each cutting unit and this information is used to negotiate the sale of wood products to various mills, and, in some cases, for contract logger and hauler services.

Post-harvest, the GIS Forester adjusts stand boundaries to match the actual harvested acres and, as appropriate, creates new stands to reflect the timber type present after harvesting. The newest available areal imagery of the stands post-harvest is used to adjust or create new stand boundaries. In addition, when available, GPS points of harvest boundary locations collected by the field technicians are used to adjust stand boundaries post-harvest.

3-M. Natural Forest Management

I. Native Species
(Forest Offset Protocol §3.8.2, Table 3.2, §9.1.1.1(14.a))

Project activities will seek to restore or maintain natural ecosystem processes, enhance native tree species, and adhere to the Natural Forest Management practices required by the FOP. As stated in Table 3.2 of the FOP, the project must consist of at least 95% native species. One hundred percent of the project is comprised of native species based on the 2016 inventory. The table below provides the quantification required to show that at least 95% of the carbon in the standing live carbon pool is composed of native species.

Table 3 - Species by Basal Area & Native Species Proportion

Common Name	Scientific Name	FVS Code	Composition by Basal Area (%)	Native species	Percent by Native
quaking aspen	Populus tremuloides	AS	0.1	Yes	0.1
Douglas-fir	Pseudotsuga menziesii	DF	15.1	Yes	15.1
incense cedar	Calocedrus decurrens	IC	9.5	Yes	9.5
lodgepole pine	Pinus contorta	LP	3.4	Yes	3.4
black oak	Quercus kelloggii	OH	0.9	Yes	0.9
ponderosa pine	Pinus ponderosa	PP	43.6	Yes	43.6
Shasta red fir	Abies magnifica	SH	0.6	Yes	0.6
sugar pine	Pinus lambertiana	SP	2.9	Yes	2.9
white fir	Abies concolor	WF	20.9	Yes	20.9
western juniper	Juniperus occidentalis	WJ	2.8	Yes	2.8
Oregon white oak	Quercus garryana	WO	0.2	Yes	0.2
Total			***100.0%***		***100.0%***

II. Composition of Native Species

(Forest Offset Protocol §3.8.2, Table 3.2, §9.1.1.1(14.a))

The Forest Offset Protocol requires that no single species comprise more than 65% of the given basal area for standing live carbon under the "Species Diversity Index" in the Assessment Area Data File. For the IFM Project ponderosa pine represents the highest proportion of the total stocks at 43.6% of the weighted average basal area, with white fir being the second most common species at 20.9%. As can be seen in the table above, no single species represents higher than 43.6% of the average project basal area per acre. Eleven species, all native, are represented in the basal area numbers. As a result, the Project Area clearly meets the requirement that no single species prevalence exceed the 65% species diversity index (by basal area) for the project area.

III. Distribution of Age Classes

(Forest Offset Protocol §3.8.2, Table 3.2, §9.1.1.1(14.b))

Stratification based on inventory data was used to analyze the distribution of age classes in the Project Area. Hydrological Cataloging Unit (12 digit HUC) data was used to identify 24 watersheds within the Project Area. The 12 digit HUC information is the smallest cataloging unit publicly available for south central Oregon within and around the Project Area. This analysis indicates that seven of the 24 watersheds were greater than 10,000 acres.

To meet the FOP requirements stated in Table 3.2, a Green Diamond Resource Company professional forester with local knowledge of the project area divided the seven watersheds that were greater than 10,000 acres into 18 watershed components based logical topographic features available in a GIS platform. This resulted in 35 watersheds

identified and mapped, each less than 10,000 acres, within the Project Area (see Table 1 on page 8).

Our analysis indicates that at the end of the initial reporting period approximately 37.4 percent of the Project Area, on average, were in age classes 20 years old or younger due to past management practices of the previous landowners. However, at the end of the initial reporting period, 10 out of 35 watersheds did not meet the requirement in Table 3.2 of the FOP that no more than 40% of the forested acres on a watershed scale are in age classes of less than 20 years.

Our analysis used a conservative approach as the age class determination was based on individual stand birth years. Birth year in this instance does not directly correlate with the actual age of a stand, rather it refers to the date of planting or inter-planting within a stand. This is because there are many stands within the Project Area that are two tier with two different age classes. We have taken a conservative approach and assigned an age class based on the planting or inter-planting date, which in many cases is actually younger than the actual stand age. Over the next decade, Green Diamond will evaluate and assign actual stand ages to the stands within each watershed.

Please note that a 2014 wildfire burn on 15,593 acres within several watersheds was excluded from our analysis as it is considered a Significant Disturbance that occurred prior to the Offset Project Commencement Date. The project acres excluding the burn acres were used to calculate the percent of the watershed that is 20 years or younger.

The Forest Offset Protocol requires projects that do not meet the 40 percent requirement to show continuous progress toward meeting the criteria and the criteria must be met within 25 years. Green Diamond Resource Company plans to meet this criterion by moving current even-aged pine plantations to multi-layered and multi-aged stand regimes and to limit the number of acres that will be managed on an even-age planation basis. It is important to note that the previous owner did not establish even-aged pine plantations in the 10 years prior to the Offset Project Commencement Date.

We completed an analysis to determine the number of acres planted and inter-planted over the past 20 years based on stand data received by the previous landowner. Our analysis indicates that 91.6 percent of the acres currently out of compliance are actually more than 10 years old. An additional 7.1 percent of these acres are between 6 and 10 years old, and less than 1.3 percent are between 1 and 5 years old. Our watershed analysis will be provided to the Verification Body and the Offset Registry.

Thus, we project that by 2020, the Project Area should meet the FOP requirement that no more than 40% of the forested acres on a watershed scale are in age classes of less than 20 years.

Management type (even-aged versus uneven-aged) and specific silvicultural methods to be used in stands within each watershed across the entire project area have not been determined by Green Diamond as of the end of the initial reporting period. These decisions will be made over the next few decades as stands are reviewed and silvicultural prescriptions are applied on a case-by-case basis. Green Diamond is aware of its obligation to meet the age class distribution by watershed over the project period and will monitor age classes by watershed during the project period to ensure compliance.

IV. <u>Structural Elements (Standing and Lying Dead Wood)</u>
(Forest Offset Protocol §3.8.2, Table 3.2, §9.1.1.1(14.c))

No salvage harvesting has occurred on 91 percent of the Project Area since the property was purchased by Green Diamond Resource Company. Approximately 9 percent of the Project Area was impacted by a wildfire during the summer of 2014, just prior to the property title transfer on September 29, 2014. Salvage operations took place during the initial reporting period within the BURN stratum; however, significant standing and lying dead wood volumes were retained onsite to create wildlife cover, bird habitat, and create shade pockets.

Since no active removal of down dead material has been conducted since the property transferred ownership, the Project Area outside the BURN stratum must maintain or demonstrate progress toward an average of at least:

a. one (1) metric ton of carbon (C) in standing dead wood per acre; or
b. 1% of standing live carbon stocks, in standing dead wood, whichever is higher.

The current standing dead wood stocks excluding the BURN stratum are 0.16 metric tons of carbon per acre, which is 1.6 percent of the standing live carbon stocks. However, since the current carbon stocks in standing dead wood do not meet the minimum requirement of at least one metric ton of carbon in standing dead wood per acre, the project must demonstrate ongoing progress towards the dead wood target. This will be ensured by allowing natural recruitment of standing dead trees and by not actively removing standing dead trees unless they pose a threat to health and safety, such as along forest roads.

Although the BURN stratum has undergone salvage operations to capture some timber value from the wildfire that burned in 2014, the 2016 inventory estimates that this stratum contains 7.52 metric tons of carbon per acre post salvage. This volume of carbon in standing dead wood greatly exceeds the minimum requirement of two (2) metric tons of carbon per acre. There are no further planned entries into the BURN stratum.

3-N. Ongoing Management Activities
(Forest Offset Protocol §3.8.3)

The Forest Offset Protocol requires that standing live carbon stocking be maintained

and/or increased during the life of the project unless the reduction meets one of the possible causes listed in section 3.8.3 of the FOP. The project activity modeling (described in Section 6 of this document) predicts that total standing live carbon stocks will gradually increase over the life of the project. Overall stocks will never drop below the level of standing live carbon stocks at the initiation of the project. Stocks will be maintained at a level that assures all credited standing live carbon stocks are permanently maintained. Stocks will be monitored over the life of the project by re-measuring the permanent plots and tracking disturbances, with appropriate changes made to the harvest schedule to ensure compliance with this requirement.

4. Inventory Methodology

4-A. Defining the Project's GHG Assessment Boundary

(Forest Offset Protocol §5.2)

The table below was adapted from Table 5.2 of the FOP and describes the project's GHG assessment boundary.

Table 4 - Sources, Sinks, and Reservoirs

SSR	Description	Type	Gas	Quantification Method	Justification/Explanation
Primary Effect Sources, Sinks, and Reservoirs					
IFM-1	Standing live carbon (carbon in all portions of living trees)	Reservoir / Pool	CO2	**Baseline:** Modeled based on initial field inventory measurements **Project:** Measured by field measurements and updating forest carbon inventory	Increases in standing live carbon stocks are likely to be the largest primary effect of Improved Forest Management Projects.
IFM-3	Standing dead carbon (carbon in all portions of dead, standing trees)	Reservoir / Pool	CO2	**Baseline:** Modeled based on initial field inventory measurements **Project:** Measured by updating forest carbon inventory	Improved Forest Management Projects may significantly increase standing dead carbon stocks over time.
IFM-7	Carbon in in-use forest products	Reservoir / Pool	CO2	**Baseline:** Estimated from modeled harvest volumes **Project:** Estimated from measured harvest volumes	Included because many Improved Forest Management Projects may significantly change carbon storage in in-use forest products relative to baseline levels. Treated as a "source/sink" because forest product carbon is quantified according to the change in harvesting volumes, relative to baseline levels, in each year. Of this change (increase or decrease), only the average amount of carbon expected to remain stored for 100 years is included in the final quantification of annual net GHG removals/emissions. This approach accounts for CO2 emissions from decomposition or disposal of wood products (see SSR #IFM-17).

IFM-8	Forest product carbon in landfills	Reservoir / Pool	CO_2	**Baseline:** Estimated from modeled harvest volumes **Project:** Estimated from measured harvest volumes	Because of significant uncertainties associated with forecasting the quantity of forest product carbon that will remain stored in landfills, landfill carbon is excluded from quantification in years when project harvesting volumes exceed baseline volumes. Landfill carbon is included, however, in years when project harvesting volumes are below baseline levels. This case-dependent exclusion or inclusion is necessary to ensure that total GHG reductions and removals caused by the Forest Project are not overestimated.
Secondary Effect Sources, Sinks, and Reservoirs					
IFM-9	Biological emissions from site preparation activities	Source	CO_2	**Baseline:** N/A **Project:** Quantified based on measured carbon stock changes in included reservoirs (SSR #IFM-6, where applicable)	Biological emissions from site preparation are not quantified separately, but rather are captured by measuring changes in included carbon reservoirs (soil carbon, where applicable). For other carbon reservoirs, changes are unlikely to have a significant effect on total quantified GHG reductions/removals.
IFM-14	Biological emissions/ removals from changes in harvesting on forestland outside the Project Area	Source / Sink	CO_2	**Baseline:** N/A **Project:** Estimated using a default 20% "leakage" factor applied to the difference in harvest volume relative to baseline	Improved Forest Management Projects may either increase or decrease harvesting relative to baseline levels. If harvesting is reduced in the Project Area, harvesting on other lands may increase to compensate for the lost production. This "leakage" effect is included in the GHG Assessment Boundary. If harvesting is increased in the Project Area, harvesting on other lands may decrease in response to the increased production. The reduction in harvesting may lead to increased carbon stocks on other lands. Carbon stock increases on other lands are excluded from the GHG Assessment Boundary, however, because it is not possible to ensure their permanence.
IFM-17	Biological emissions from decomposition of forest products	Source	CO_2	**Baseline:** Quantified as a component of calculating carbon stored for 100 years in wood products (SSR #IFM-7) and landfills (SSR #IFM-8) **Project:** Quantified as a component of calculating carbon stored for 100 years in wood products (SSR #IFM-7) and landfills (SSR #IFM-8)	CO_2 emissions from the decomposition of forest products are built into calculations of how much forest product carbon will remain in in-use wood products and in landfills, averaged over 100 years.

IFM-6 Soil Carbon is excluded from the Offset Project Boundary because site preparation activities (deep ripping) will impact less than 25 percent of the Project Area over the Project Life.

Soiling ripping prior to tree planting is a standard practice across eastern Oregon as it is vital for seedling survival due to limited annual moisture across the project area. Ripping occurs

on a limited basis as follows:

- Rows are ripped on a 12-foot spacing, with each row limited to 12 inches of disturbance to a depth of about 18 inches.
- Ripping only occurs on slopes that are 25 percent or less; thus, about 75 percent of the project area is eligible for ripping.
- Areas to be planted will be managed on a 65 to 80-year rotation.

Thus, for each acre planted that is 25 or less percent slope, only 8.3 percent of the acre is actually disturbed by ripping. So, the worst case scenario would be that every eligible acre (75% of the project area) would be ripped 1.5 times over the next 100 years (using a conservative rotation age of 65 years), that would equate to only 9.3 percent of the project area – well below the 25 percent threshold as required under FOP Table 5.2.

During the reporting period, 7,130 acres within the burn stratum were ripped to facilitate planting a large area that was impacted by catastrophic wildfire prior to the Offset Project Commencement Date. The total area actually disturbed equates to 592 acres (7,130 acres X 0.083). No other acres were ripped during the initial reporting period. GIS shape files of the areas ripped by year during the initial Reporting Period will be provided upon request to the Verification Body and Offset Project Registry.

Green Diamond will monitor the total area ripped on an annual basis and will report this information at each project verification.

4-B. Inventory and Sampling Design

(Forest Offset Protocol §9.1.1.1(19), Appendix A.3)

The inventory and sampling design employed in the Klamath West IFM Project is detailed in the Klamath West Forest Carbon Inventory report.

The sampling design and intensity targeted a 4% confidence deduction as assessed by the ARB protocol, corresponding to a 90% confidence interval of +/-9% of mean total (live and dead) forest carbon stock. The population of interest comprised of live trees and snags $\geq$ 5” DBH and $\geq$ 15’ total height, across all forestland within the Project Area, excluding non-forest areas (e.g. roads, rock outcrops, water bodies, wetlands) and stream and lake riparian management areas (RMAs).

The inventory used a stratified random sample design. The stratification and sampling intensity were selected to characterize variability in stocking using volume as a proxy for biomass contained within the Project Area, based on existing inventory data provided to Green Diamond Resource Company by the previous landowner.

Eight strata were identified to represent discrete areas of broadly homogeneous current stocking and management trajectory, outlined below. The table below provides a summary

of stratum by acre and Figure 7 displays the locations of the strata.

1. Natural - uneven-aged mixed conifers
    a. Low stocking per PGBVN (< 4,000 net BF/ac)
    b. Medium stocking per PGBVN (4,000 – 7,000 net BF/ac)
    c. High stocking per PGBVN (> 7,000 net BF/ac)

2. Plantations
    a. Stands planted ≤ 1995
        i. Not chip-thinned
        ii. Chip-thinned ("ChT")

    b. Stands planted after 1995, mostly inter-planted with some natural component, including "A-cut" stands
        i. Low stocking per PGBVN (< 1,500 net BF/ac)
        ii. High stocking per PGBVN (> 1,500 net BF/ac)

3. Temporarily un-stocked post-burn sites – Oregon Gulch Fire and Bryant Mountain Fire 2014

Table 5 - Stratum by Project Area Acres

Stratum	Abbreviation	Acres
	Natural stands	
Low stocking per PGBVN (< 4,000 net BF/ac)	NAT1	42,291
Medium stocking per PGBVN (4,000 – 7,000 net BF/ac)	NAT2	9,384
High stocking per PGBVN (> 7,000 net BF/ac)	NAT3	4,002
	Plantations	
Stands planted ≤ 1995, not chip-thinned	PLA1	24,685
Stands planted ≤ 1995, Chip-thinned ("ChT")	PLA2	13,427
Stands planted after 1995, Low stocking per PGBVN (≤ 1,500 net BF/ac)	PLA3	52,440
Stands planted after 1995, High stocking per PGBVN (> 1,500 net BF/ac)	PLA4	9,061
	Other	
Temporarily un-stocked post-burn sites	BURN	15,593
	Total	170,883

The sample unit was defined as a cluster of four 30'-40' fixed radius plots (plot radii varying by stratum to respond to anticipated stem densities) arranged as a center plot with three surrounding "satellite" plots located 120 feet from the center point of the cluster at azimuths of 0°, 120° and 240°.

The sample intensity was determined as 181 clusters, with a total of 724 plots across strata. Sample clusters were allocated among strata with a Neyman allocation, and then cluster center points were randomly located within strata using ArcGIS (see Figure 8). Project area and strata boundaries were buffered by 40 feet (i.e. plot locations constrained to not fall within the buffer) to avoid boundary overlap and associated field measurement issues; satellite plot centers falling within the buffer were deflected back into the strata using a standardized algorithm developed by Green Diamond Resource Company staff.

Following the conclusion of field work, it was noted that one cluster was located entirely outside of the valid project area, cluster 47 in stratum NAT1. This cluster was dropped from the inventory, resulting in a final sample size of 181 clusters.

An ArcGIS layer identifying inventory cluster locations (projected in NAD 27) will be made available to the Verification Body, along with a file containing a GPS point for every plot center that can be uploaded to a handheld GPS unit.

Klamath West IFM
Strata Map

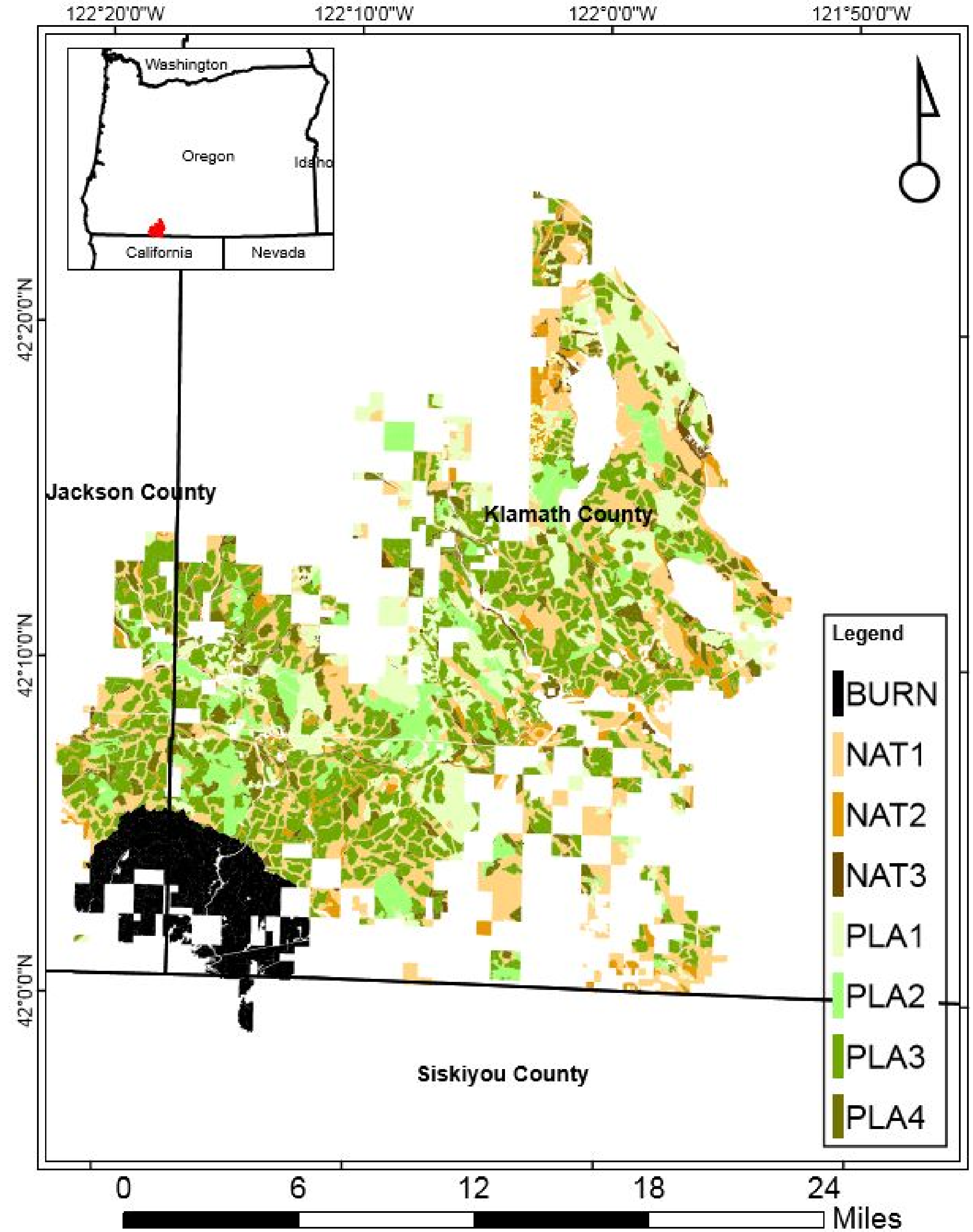

Figure 7 – Strata Map

Klamath West IFM
Inventory Cluster Map

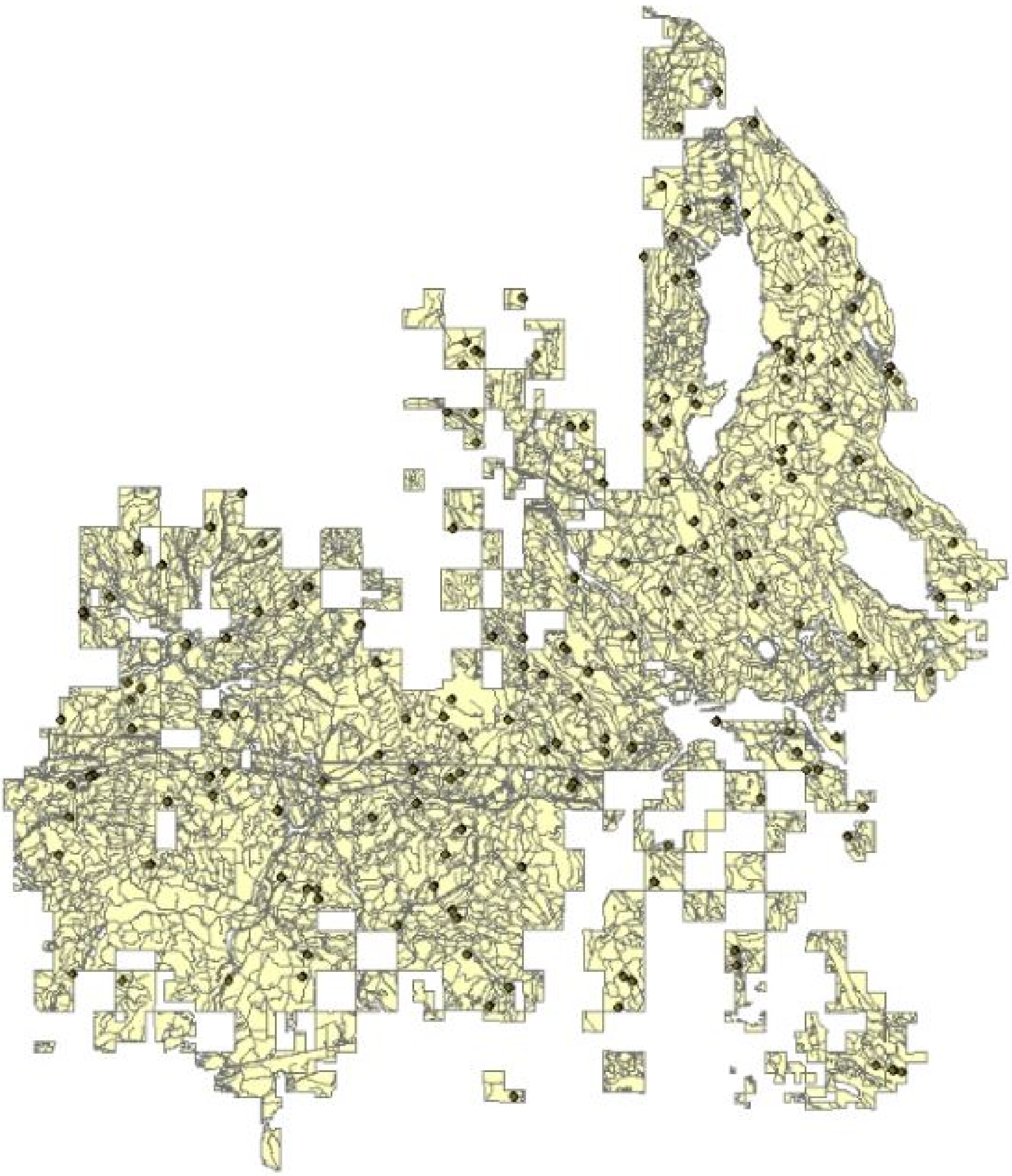

Figure 8 – Inventory Cluster Locations

4-C. Field Measurement and Plot Monumenting

(Forest Offset Protocol §9.1.1.1(19), Appendix A.3)

Detailed instructions on how plot centers were located and monumented, required field data was measured and recorded, and required quality assurance standards are contained in Green Diamond Resource Company's Standard Operating Procedures (SOPs) for the Klamath West IFM inventory. A copy of the SOPs will be provided to the Verification Body and the Offset Project Registry.

Green Diamond Resource Company contracted with a local forest inventory firm, Jefferson Resources, to complete the field inventory work. Field data collection occurred between April and July 2016. Following is a brief overview of the field procedures used by the inventory contractor.

Using a Global Positioning System (GPS), with UTM coordinates provided by Green Diamond Resource Company, the cluster center plot was located and permanently marked by hammering a metal rebar into the ground. Plot center were capped, painted, and tagged.

Plot stand information was recorded in the data recorder, including unique strata and plot ID, date, cruiser's initials, GPS accuracy, and percent slope.

Tree data for all trees ≥ 5" dbh and taller than 15 feet was collected, regardless of merchantability. Trees were recorded in "clockwise" order, starting with the tree closest to due north from the plot center, and numbered accordingly.

All live and dead tree data were measured and recorded in a data recorder, including tree species, DBH to the nearest 1/10 inch, total tree height to the nearest foot, defect, and damage class (snags only).

In addition, on designated clusters, lying dead wood was sampled using the line intersect method employing two direct lines of travel originating from the center of the center plot of the cluster, running to the centers of plots 2 and 3 of the cluster.

Plots will be re-measured at least once every 12 years as described in the modeling plan in section 4-F. In the years between measurements, plots will be updated by using an ARB approved model to grow the inventory forward, following the project's modeling plan. All data will be stored on personal computers and back-up drives at Green Diamond Resource Company offices.

Check cruising was conducted by qualified Green Diamond Resource Company foresters. The inventory contractor uploaded batches of cruise data on a regular basis using an online data storage program (SNAP) made available by Green Diamond Resource Company. In total, nine batches of data were submitted by the contractor.

Once a batch of cruise data was uploaded to SNAP by the contractor, the Green Diamond check cruisers would review the data and then initiate check cruising of those plots. Check cruising was done concurrently with the contract cruising to provide regular feedback on check cruising results. This process ensured any issues affecting the quality and accuracy of contractor data was addressed in a timely fashion throughout the inventory process.

Check cruising was conducted on 79 plots out of 724 total plots, or 11 percent of all plots measured in the inventory. The overall goal was to check cruise at least 10 percent of plots completed by each lead contract cruiser. Additional plots check cruised beyond 10 percent were due to rechecked plots that initially failed and were required to be corrected by the contractor to meet the SOP requirements.

The Green Diamond check cruisers evaluated plots for each lead contract cruiser by batch to confirm all data parameters collected and submitted met the SOP data tolerances. The contractor used teams of two, with a lead cruiser and an assistant. If a plot did not meet the SOP tolerances, then it was failed. Then, all plots cruised by the lead contract cruiser up to that date within the batch were considered failed. The contractor was required to revisit those plots to verify all data parameters were within SOP tolerances. The check cruisers would provide to the contractor the check cruise plot data for those plots that failed to aid in correcting the errors that caused the plot to fail.

Once the contract cruisers revisited the failed plots and corrected the errors, the Green Diamond check cruisers would then re-check those plots to ensure that the corrections were appropriately made in the field and in SNAP. For example, if a tree was missed on a plot by the contractor, the check cruisers would re-visit the plot to ensure that tree was actually added into the plot by verifying the tree was numbered with paint and the SNAP data reflected the required and accurate data (i.e. species, height, dbh, defect).

Further, the Green Diamond check cruisers also checked other plots by the contract lead cruiser that had been completed prior to the date of the failed plot(s), as the contractor was required to revisit all those to confirm or correct data measurements. For example, if thetwo plots of a cluster were check cruised and one or both failed, the check cruisers might visit one or both of the other plots in that cluster, in addition to rechecking the relevant measurements in the plot that failed. The check cruisers would also randomly select one or more plots in other clusters that were required to be rechecked by the contractor to ensure SOP tolerances were met. If any of those plots failed, the contractor was required to revisit and correct that plot, as well as all other completed plots in that batch prior to the fail date.

The check cruisers also used the change log feature in SNAP to review if changes in plot data were made by the contractor and the date of those changes. This provided the check cruisers with an additional tool to verify if any changes in plots not check cruised but which required a revisit by the contractor. If no changes in SNAP were made by the contractor in

any required revisit plots, the check cruisers would select and check several of those plots to verify all SOP tolerances were met. This provided the contractor an incentive to revisit and check/correct all required plots.

The Green Diamond check cruisers validated all parameters that would affect biomass volume required by the SOPs for each plot check cruised. For example, all tree heights, diameters, missing biomass, and location of plot centers were checked for each plot. Parameters such as azimuth to each tree and down wood transects would be randomly checked. For recheck of failed plots, the check cruisers generally verified those measurements that resulted in the fail.

Green Diamond evaluated inventory data submitted by the contractor in two ways. First, the raw tree data was exported to an Excel workbook and a series of checks was completed. For example, tree species, dbh, and height parameters were sorted to identity missing or out of tolerance entries. Also, dbh and heights were correlated to ensure any entry errors were identified. A second evaluation was completed that compared basal area by plot using the contractor's data versus the Green Diamond check cruiser's data as a proxy for meeting the sequential sampling test.

Check cruising continued until all lead contract cruisers consistently passed their plots. The corrected plot data was used in all modeling and analysis. The most common reasons for plots to fail were contract cruisers missing trees that should have been included in the plots, incorrect dbh measurements, and incorrect tree height measurements.

The average difference in plot level basal area between contract inventory cruise and check cruise measurements was 1.1% (n = 67). Additionally, extensive data entry proofing was carried out by Green Diamond Resource Company and L&C Carbon prior to analysis.

Corrective actions: Re-training non-compliant cruisers or removing specific contract cruisers from the job, correcting erroneous samples, and gathering missing data were the minimum corrective actions implemented. Based on check cruising results, if a cruiser repeatedly did not meet the quality standards for allowable error, all points for that cruiser were re-done by a new cruiser that met the quality thresholds.

4-D. Data Management System

(Forest Offset Protocol §9.1.1.1(19), Appendix A.3)

Inventory data collected by the inventory contractor was recorded digitally and uploaded to a third-party cloud-based data management system (SNAP). The data was downloaded by Green Diamond Resource Company staff into Microsoft Office programs (Excel and Access) to perform error checking and ensure consistency in coding and formatting. Further data quality checking was completed by consultant L&C Carbon during formatting data for processing by FVS.

All data, growth and yield simulation results, and carbon calculations remain stored on personal computers and back-up drives at Green Diamond Resource Company's offices and on Dropbox folders shared with consultant L&C Carbon.

Quality Assurance/Quality Control (QA/QC) Plan:

Quality was assured at every step of the data collection, processing and reporting process during initial project development, and will continue throughout the project life. Going forward, QA/QC procedures will be used as inventory plots are re-measured to update the inventory and monitor and report on carbon stocks over time.

Project Area Boundary:

- The project area boundary was created using Green Diamond Resource Company's existing stand polygons that were snapped to BLM 2012 PLSS geodatabase reference points and lines, and then combined into the eight stratums defined in the carbon inventory design. 2014 NAIP imagery and metes & bounds descriptions from the property deeds was used as a reference for boundary delineations.
- The OPO reviewed the entire Project Area to identify and confirm the ownership of all state and country roads that cross its property. For all roads not owned by the Forest Owner, the OPO used 2016 NAIP imagery to digitize the road locations that cross the Project Area to ensure alignment with a verifiable source of information. Next, the OPO reviewed the relevant deeds to confirm the right-of-way distances for each road (road segment in the case of State HWY 66). Then, the OPO created road polygons by buffering each road using the applicable right-of way radii. The road buffers were embedded into the GIS Ribbons_Buff_Layer. The Ribbons_Buff_Layer was intersected with the stand polygons to generate the final net acres contained within the Project Area.
- The majority of the work was completed by a Green Diamond Resource Company forestry technician. This work was supervised, reviewed, and approved by Brett Johnson, Green Diamond Resource Company Inventory/GIS Forester, before being used to establish the project area boundary.

Data collection:

- Inventory plot installation and re-measurements will be conducted by trained inventory crews to the specifications and tolerances described in the inventory SOPs. Check cruising will be conducted on at least 5 percent of the plots according to the parameters in the SOPs to ensure quality measurements and feedback to field crews during data collection. If applicable, timely on-site feedback of the issues found on each of the checked plots will be provided to the cruisers, and the corrected plot data will be used in all modeling and analysis.

Data processing:

- Inventory data will undergo extensive internal review by a Registered Professional Forester (RPF) while it is being entered and processed. All plot data will be combined in

Microsoft Excel and/or Access programs to perform error checking and ensure consistency in coding and formatting. Further data quality checking will be conducted while formatting the data for FVS, and while processing the silvicultural prescriptions within FVS (e.g. by checking FVS output summary tables). A subset of Access carbon queries will be independently validated to ensure that carbon calculations are correct and meet ARB specifications. Data will also be spot-checked for accuracy at each transfer between Excel, FVS, Access, and harvest scheduling. A QA/QC checklist will be implemented to minimize the risk of missed steps or inadvertent errors throughout data processing and transfer.

Data reporting:

- All data files used for reporting calculations within the OPDR will follow standardized naming/dating conventions to allow for data tracing and version control. All digital files will be stored in Green Diamond Resource Company's digital filing system, and backed up on multiple remote servers for data archiving and security.

4-E. Quantification Methodology

(Forest Offset Protocol §9.1.1.1(20), Appendix A.3)

The above ground standing live and standing dead tree biomass volumes of total stem inside bark from ground to tip (CVTS) were calculated using equations specified in the ARB document "Volume Estimation for Species in Projects Located in CA, OR, WA (Updated: 09/19/2014)" and specific gravities and bark and live branch equations were referenced from the ARB document "Biomass equations for species in projects located in CA, OR, WA (updated: 09/19/2014)" to produce estimates of total aboveground biomass for all stems $\geq$ 5" DBH and $\geq$ 15' total height. In all cases, equations assigned to eastern Oregon were used. For all tree species, equations used measured diameter at breast height (dbh) and measured total height as the independent variables.

For all trees, total aboveground biomass was adjusted to deduct any portion observed missing (referencing defect assessments for the top, middle and bottom thirds of the total aboveground biomass of inventory trees). Deductions for defect were incorporated by multiplying total aboveground biomass by weighted average overall percent sound (1 – recorded percent defect) referencing the proportions of aboveground tree biomass represented in each of three assessed thirds (table below referenced from Climate Action Reserve 2012).

Table 6 - Allocations of Total Aboveground Biomass in Top, Bottom and Middle Thirds

Tree Portion	Percent of Tree Biomass
Top 1/3	10%
Middle 1/3	25%
Bottom 1/3	65%

Deductions for defect of snags applied the same procedures outlined above. Wood density of standing dead wood was adjusted by multiplying by a density reduction factor, corresponding to a given species group and decay class, referenced from Harmon et al 2011 (table below).

Table 7 - Reduction Factors for Standing Dead Wood

Decay class as assessed in the field	Reduction factor for softwoods	Reduction factor for hardwoods
1	0.97	0.99
2	1	0.8
3	0.92	0.54
4	0.55	0.43
5	0	0

For decay class 5, the reduction factors were conservatively assumed to be zero (not specified by Harmon et al 2011). Further, for decay classes 2-5, stem wood only was included in biomass estimates, as branch and bark components can be assumed to be zero (broadly consistent with decay class descriptions – see SOPs - *Carbon Inventory 2016 Cruise Methods and Procedures*).

Below ground standing live and dead tree biomass was estimated at the cluster level applying the equation from Cairns et al. 1997:

$$R = e^{-1.085+0.9256*LN(AGBD)}$$

Root (R) and aboveground biomass density (AGBD) employed units of Mg biomass/hectare, and the equation was applied to total (live and dead) aboveground biomass and then apportioned among live and dead components based on relative contribution of each to total aboveground biomass.

Biomass was converted to carbon applying a carbon fraction of 0.5, and carbon converted to carbon dioxide equivalent (CO2e) applying a conversion factor of 3.664. All estimates of carbon dioxide equivalent per unit area were converted to metric tons (1000 kg) per acre.

Estimates were produced at the cluster level, and per unit area conversions referenced the sum total of slope-corrected subplot areas of each cluster; slopes were recorded in the field and component plot areas were corrected for slope, then summed to produce cluster area.

All databases for the baseline simulation will be provided to the Verification Body as part of the verification process.

<u>Harvested wood products pools</u> required an estimate of the average amount of carbon that remains stored in wood products over a 100-year period. This was done according to the steps outlined in Appendix C of the protocol, which utilize the actual proportions of wood products generated during the initial reporting period to account for the long-term storage of wood products. The procedure began with an estimate of the total harvested carbon that was delivered to a mill to be turned into wood products. Next, the series of worksheets from Appendix C in the FOP were used to determine the amount transferred to wood products, the amount stored in in-use wood products, and the amount stored in landfills. The carbon stored in wood products and landfills were summed to determine the total average annual carbon storage in wood products over 100 years.

For the calculation of secondary effects, the above and belowground carbon of all harvested live trees was determined using the same equations and methods for determining standing live tree carbon over time. This was done by running the same Access queries used for live trees on the FVS cutlists (treelist output tables for all harvested live trees) for each strata/prescription/timing choice combination.

4-F. Inventory Update Process

(Forest Offset Protocol §9.1.1.1(19), Appendix A.3)

Annual monitoring of the project is required to ensure up-to-date estimates of project carbon stocks and provide assurance that GHG reductions achieved by the project have not been reversed. A re-inventory will comply with the requirement that no field inventory data will be more than 12 years old; as such the project area and inventoried plots will be re-measured no later than 2028. Because the plots are permanently located, it is anticipated that the 12-year re-measurement will use existing plot locations as the basis for establishing project stocks in 2028. If plot density is reduced at subsequent re-inventory, plots will be dropped systematically and/or randomly such that the inventory continues to meet sampling error requirements. The confidence deduction calculated for the initial reporting period will be used until a re-inventory is completed and a new confidence deduction is calculated.

For reporting stocks on an annual basis until the next inventory, when no harvesting is expected, the inventory update procedure will rely on growth projections from FVS. If any timber harvesting occurs in the Project Area, the timber harvest volumes will be used to update the inventory and then re-project growth from FVS. Timber harvests in the project area shall be designed to treat plots the same as the surrounding stand. Effort will be made to limit knowledge of exact plots locations from the foresters designing and implementing timber harvests, so that the risk of bias is minimized during harvest planning.

At the occasion of a disturbance event other than planned timber harvest, such as fire or windthrow, that appears to alter more than 5% of carbon stocks, 5% of project acreage, or result in a reversal under the protocol (e.g. reduction is greater than annual growth if

project is verified annually) then the plots in the affected area will be re-measured. If the disturbance appears to meet the specified threshold, but does not affect any of the permanent plots in the inventory, new plots will be established in the affected area in sufficient quantity and distribution to account for the disturbance. The newly measured plots will be installed consistent with the SOPs used to establish the original inventory; any improvements or changes to inventory methods or calculations will be documented and justified in the change log (see page iv of this document). Once the plot data has been gathered, a new calculation of the section 6 - Actual On-Site Carbon Stocks will be completed in order to revise the section 7 - GHG Reductions and Removals as well as a new calculation of the confidence deduction. The effects of disturbances on the carbon stocks of the project area will be estimated by monitoring the acreage affected utilizing the average per acre carbon stocks for the applicable strata. If the disturbance affects a significant portion of the strata acreage, then a new stratum will be delineated and the project stocks and confidence deduction calculated using the new strata.

Disturbance events will be monitored as part of normal management activities, as well as through an annual review of aerial imagery and on-the-ground monitoring by Green Diamond Resource Company staff. Any disturbance that affects less than 8,500 acres (e.g. salvage of burned trees) is assumed to have a diminutive effect on project carbon stocks given that 8,651 acres represents approximately 0.5% of the project acres. However, any disturbance of more than 5,000 acres will be reviewed to determine if greater than 5% of Project Area carbon stocks are impacted.

If, in the process of re-measuring plots after a significant disturbance, the plots cannot be relocated, new plots will be established in the same locations as the old plots. The replacement plot data will replace the old plot data for the purposes of calculating project carbon stocks.

5. Baseline Carbon Stocks – Improved Forest Management Projects

5-A. Legal Constraints

(Forest Offset Protocol §6.2.1.2, §9.1.1.3(4))

The following are the legal constraints that meet Oregon and California forest practices laws used to model the project baseline scenario.

The dominant regulating legal requirements are contained in the Oregon Department of Forestry Forest Practices Administrative Rules as implemented through the Oregon Forest Practices Act. There is also a 430-acre portion of the Burn strata located in California that is governed by the California Forest Practices Rules that implement the Z'berg-Nejedly Forest Practice Act. The key provisions in each of the relevant Forest Practices Acts relate to minimum stocking standards, riparian management zones, adjacency constraints, harvesting operations, or herbicide/pesticide applications.

For the Baseline modeling exercise, the primary constraint is that of minimum stocking which is met by following the same legal harvesting practices employed by prior owners over recent decades of removing the maximum amount of volume while meeting the minimum stocking requirement not requiring a legally binding reforestation effort that led to the current depleted forest stock on Project Area. The baseline silvicultural prescription thus leaves at least 40 square feet per acre of basal area and simulates the natural regeneration following such an entry. To avoid any issues related to riparian management zone activity, all riparian zone acreage has been removed from the Project Area. Both adjacency and harvesting operational constraints are outside the scope of inclusion within such a strata-based modeling effort and so were evaluated, yet not explicitly included. Finally, the silvicultural prescriptions did not include the simulated use of either an herbicide or pesticide application.

A Registered Professional Forest reviewed baseline silviculture options and stratification to ensure baseline modeling for standing live carbon stocks considered and incorporated all potential legal constraints that could affect baseline growth and harvesting scenarios.

5-B. Financial Constraints

(Forest Offset Protocol §6.2.1.3, §9.1.1.3(5))

Section 6.2.1.3 of the FOP requires evidence that the growth and harvesting regime assumed for the baseline is financially feasible. To fulfill this requirement, FOP Section 6.2.1.3, option one, was selected for demonstrating that the proposed baseline is financially feasible.

Green Diamond Resource Company completed a financial analysis of the anticipated growth and harvesting regime as depicted in the project baseline that captures all relevant costs and returns, taking into consideration all legal, physical, and biological constraints. Cost and revenue variables included in the financial analysis are based on documented actual and projected costs and returns for the Project Area and on other properties owned and operated by Green Diamond Resource Company in the Klamath Falls area. This financial analysis illustrates that the baseline harvest scenario is financially feasible.

A summary of financial analysis will be provided to the Verification Body under a separate cover due to the confidential information contained in the analysis (Klamath West IFM _Financial Analysis_01May2017).

5-C. Estimate Baseline Onsite Carbon Stocks

(Forest Offset Protocol §6.2.1, §9.1.1.1(21, 22, 25), §9.1.1.3(2, 3), Appendix B)

<u>Step 1: Determining the Common Practice (CP) Carbon Stocks for the Project's Assessment Area</u>.

The Project is located predominately in the Southern Cascades Supersection with a very small portion in the Northwest Cascades Supersection. Based on the acreage in each Assessment Area, the table below illustrates how the Project's Common Practice value was determined. Please note that site classes were not determined for each Assessment Area; thus, as per the FOP Appendix F (4) high site-class Common Practice statistics were used for Assessment Areas where both low and high site classes were available.

The Common Practice value was calculated by weighting the CP values by acres in each Assessment Area and site class combination. The acres for each Assessment Area used in the CP calculation were determined from stand inventory data contained is an Access database provided to Green Diamond by the previous landowner. For each stand by Supersection, the species with the most basal area was identified by using species codes contained in the stand attribute table. The specie with the most basal area within each stand was compared to the Assessment Area species list to assign the appropriate Assessment Area for each stand. Then, the stand acres by Assessment Area within each Supersection were summed and these acres were used to calculate the weighted average CP value for the Project Area.

The weighted average Common Practice value is 114 metric tons/acre of above-ground standing live carbon stocks in CO2e.

CP = ((126,735 ac. X 128 t/ac.) + (37,744 ac. X 72 t/ac) + (265 ac. X 80 t/ac) + (2,237 ac. X 118 t/ac) + (3,902ac. X 72 t/ac) / (170,883 total ac.) = 114 metric tons CO2e/acre.

Table 8 - Common Practice Calculation

Supersection	Assessment Area	Site Class	Acres	Common Practice MT CO_2e
Southern Cascade	Southern Cascade Mixed Conifer	High	126,735	128
Southern Cascade	Southern Cascade High Elevation Conifer	All	37,744	72
Southern Cascade	Southern Cascade Mixed Oak Conifer	High	265	80
Northwest Cascades	Northwest Cascade Mixed Conifer	High	2,237	118
Northwest Cascades	Northwest Cascade High Elevation Conifer	All	3,902	72
			Total Acres 170,883	Weighted Average 114

Step 2: Determining if the Project Area's Initial Carbon Stocks (ICS) are above or below the Common Practice (CP)

Based on the initial forest carbon inventory for the Project Area, the carbon stocks of the aboveground live tree component are calculated to be 25.8 metric tons of CO_2e per acre.

To determine the ICS, the following procedures were implemented.

Because of the twenty-two-month time gap between the project start date (September 29, 2014) and the end date of the initial reporting period (July 31, 2016 – also the inventory completion date), the ICS was reconstructed by first degrowing the inventory trees from the inventory completion date to project initiation. Then, the ICS contribution in above and below ground carbon of the trees harvested during that time period was estimated and added back into the degrown 2014 inventory to establish ICS.

Degrowing Inventory Procedure
Inventory data were degrown to a September 29, 2014 start date via the procedures below. Diameter and height of dead trees were assumed to be constant from the date of measurement (late April to late July 2016) to September 29, 2014.

1. Inventory data were entered into FVS-SO and grown for 10 years with no management (with "NoTriple" keyworded to track individual trees and permit cross-referencing to raw inventory dataset).
2. For each live tree (ascribed a unique identifier), annual diameter and height growth were derived assuming linear growth during the 10-year projection interval (i.e. for dbh, annual growth calculated as dbh at end of 10-year interval *minus* dbh at beginning of 10-year interval, reported in the FVS Treelist output, *divided by* 10).
3. For each live tree, diameter and height data, as measured, were degrown referencing the annual rates derived in step 2 above, multiplied by 1.5 (number of growing seasons between September 29, 2014 and July 31, 2016 (approximate mid-point of 2016 inventory). Estimated growth in the intervening period between measurement and project start date was subtracted from the measured values of dbh and height.
4. Initial carbon stocks were recalculated using the degrown data.

Reconstructing Stocks Due to Harvest
The process to estimate the carbon in standing dead and live harvested between the project start date and the 2016 inventory (i.e. present at project initiation but not present in the 2016 inventory) involved converting the merchantable live and dead tree removals from units reported to the Oregon Department of Revenue (mbf) to total tree above and below ground carbon. Two distinct steps were employed to arrive at the total tree above and below ground carbon content of the September 29, 2014 to July 31, 2016 removals.

First, the harvest volumes delivered to mills were converted from their original units to

cubic foot volume and subsequently converted via ARB specified wood density to carbon. Second, conversion factors of merchantable cubic foot volume to above and below ground tree carbon based on averaged tree removals over the 100-year baseline modeling exercise were used to expand the carbon in trees delivered to mills to total above and below ground carbon and added onto the degrown September 29, 2014 inventory to derive ICS.

September 29, 2014 to July 31, 2016 removals were based on saw log and chip harvest data as reported in thousand board feet (mbf) by Green Diamond Resource Company to the Oregon Department of Revenue for taxation purposes. Chipwood harvests values were reported to Green Diamond Resource Company by the scaling bureaus in green tons and these weights were converted to board feet using a conversion factor required by the Oregon Department of Revenue for the purpose of harvest tax calculations (green ton divided by 11).

The total reported harvest was grouped into a 17,235 mbf saw log harvest of live trees, a 5,801 mbf chipwood harvest of live trees, and a 15,497 mbf sawlog harvest of dead trees. Converting this reported mbf harvest to a protocol-appropriate total tree carbon presented a number of hurdles.

Although the carbon calculations are based on inventory data using only 5.0" dbh or larger trees, no diameter-specific data was included in the harvest reports. Thus, it is possible that a de minimis component of the chipwood live tree harvest could include trees smaller than 5.0 inches dbh.

To determine biomass and then arrive at carbon, the mbf volume was first converted to cubic feet. The board feet to cubic foot conversion factor utilized was based on Green Diamond Resource Company project baseline simulation FVS CutList outputs (modeled removals from 2016 to 2113) by first calculating sound merchantable stem volume (inside bark) for each tree cut using species-specific equations for CV4 cubic feet volume (volume from a 1 foot stump to a 4 inch top); sourced from the ARB document "Volume Estimation for Species in Projects Located in CA, OR, WA (Updated: 09/19/2014)" and comparing that to the FVS-calculated board foot volume for those same FVS modeled trees. Averaging those conversions for all removed trees over the full 100-year baseline gave the final project-specific conversion factor of 219 cubic feet per mbf. Applying that conversion factor to the 2014-2016 harvest and combining the sawlog and chipwood harvest gave a merchantable cubic foot total of 5,051,924 ft^3 harvest of live trees and 3,398,750 ft^3 harvest of dead trees.

The cubic foot removals were then converted to biomass applying wood density values sourced from Pacific Northwest East values found in Smith et al (2006). Saw log harvest was grouped into Smith et al (2006) Table 4 forest types based on the strata of harvest with "fir-spruce-m hemlock" forest type applied to all NAT and BURN strata harvests and ponderosa pine" forest type applied to all PLA strata harvests. Chipwood harvest was grouped into Smith et al (2006) Table 4 forest types based on the species mix of the chips with

“ponderosa pine” specified for all pine chip (“PINC”) volumes and “fir-spruce-m hemlock” for all fir chip (“FIRC”) and mixed chip (“CHMI”) volumes. The resulting 2014-2016 harvest by Smith et al (2006) forest types gave a merchantable cubic foot total of 3,333,345 ft^3 “fir-spruce-m hemlock” harvest of live trees, 1,718,579 ft^3 “ponderosa pine” harvest of live trees, and 3,398,750 ft^3 “fir-spruce-m hemlock” harvest of dead trees. Using Smith et al (2006) wood densities of 23.10 lbs/ ft^3 for “fir-spruce-m hemlock” and 24.04 lbs/ ft3 for “ponderosa pine”, applying a carbon fraction of 0.5, and converting to metric tons at 2204.6 lbs/t resulted in a 2014-2016 harvest delivered to mills total of 26,831 t C of live trees and 17,806 t C of dead trees.

The final step in accounting for Green Diamond Resource Company 2014-2016 harvests involved determining total standing above and below ground tree carbon that the carbon in merchantable stems delivered to mills represented. The Green Diamond Resource Company project baseline simulation FVS CutList outputs (modeled removals from 2016 to 2113) was utilized to arrive at conversion factors for tons above ground and below ground total tree carbon per ton of harvested merchantable carbon delivered to a mill. All volume and biomass calculations were based on either the ARB document “Volume Estimation for Species in Projects Located in CA, OR, WA (Updated: 09/19/2014) or the alternative ARB document “Regional Biomass Equations Used by FIA to Estimate Bole, Bark, and Branches (Updated: 09/19/2014)”. In the Cutlist, the harvested merchantable is CV4 (volume from a 1- foot stump to a 4-inch top) converted to biomass using a species specific wood density and assumed that 50% of that biomass was carbon. The above and below ground total tree carbon were both based off of the CVTS (Volume of the total stem, ground to tip) likewise converted to biomass using a species specific wood density then added to the bark and branch biomass. The live tree aboveground biomass was then summed up to the stratum level to get total per/acre biomass which was then used to calculate below ground tree biomass using Cairns et al (1997) equations and appropriately converting per acre values to per hectare for use in the equations and then converting the resulting biomass back to per acre afterwards. Both above and below ground total tree biomass was then converted to carbon by multiplying the total biomass by 0.5. The analysis resulted in a conversion factor of 1.520 ton total above ground carbon per ton of harvested merchantable carbon and 0.387 ton below ground carbon per ton of harvested merchantable carbon.

Finally, taking the 2014-2016 harvest carbon delivered to mills and applying these conversion factors gave us the final values that were added to the degrown 2014 inventory to arrive at ICS. For above ground live trees, the 26,831 t C delivered to mills results in 40,775 t C or when multiplied by 3.664 it gives 149,401 t CO_2 or 0.87 t CO_2/ac which was added into the live tree above ground ICS pool. For below ground live trees, the 26,831 t C delivered to mills results in 10,380 t C or when multiplied by 3.664 it gave 38,033 t CO_2 or 0.22 t CO_2/ac which was added into the live tree below ground ICS pool. Finally, for dead trees, because they were salvaged following a fire that occurred prior to the project initiation, only the merchantable portion contributes to the dead tree above ground ICS pools in the amount of 17,806 t/C, or when multiplied by 3.664 it gave 65,239 t CO_2 or 0.38

tCO_2/ac.

Since ICS is less than the CP; therefore, the minimum baseline level (MBL) is determined by using the FOP formula in Equation 6.6.

MBL for the project is 25.8 t CO_2e/acre. The calculations used to derive MBL are displayed below.

Equation 6.6. Determining the Minimum Baseline Level Where Initial Stocks Are Equal to or Below Common Practice

MBL = MAX (MAX (HSR, ICS), MIN (CP, WCS))

Where,

MAX = The highest value in the set of values being evaluated.

MIN = The lowest value in the set of values being evaluated.

MBL = Minimum baseline level (above-ground standing live carbon stocks)

HSR = The "High Stocking Reference" for the Project Area. The High Stocking Reference is defined as 80 percent of the highest value for above-ground standing live carbon stocks per acre within the Project Area during the preceding 10-year period. To determine the High Stocking Reference, the Offset Project Operator must document changes in the Project Area's above-ground standing live carbon stocks over the preceding 10 years.

CP = Common Practice (as determined in Step 1).

ICS = Initial above-ground standing live carbon stocks per acre within the Project Area (as determined in Step 2).

WCS = The weighted average above-ground standing live carbon stocks per acre for all Forest Owner (and affiliate) landholdings within the same logical management unit as the Project Area. See Section 6.2.1.1 for requirements and methods for calculating WCS.

Therefore:

HSR = 20.6 t CO_2e/acre

We utilized the iTree Canopy methodology to determine how biomass carbon stocks changed over the preceding 10 years from the project start date. This method was used because incomplete forest inventory and harvest records were available to Green Diamond Resource Company since the property was bought in September 2014 – concurrent with the

project start date. Mason Bruce & Girard completed the analysis. A copy of the analysis will be provided to the Verification Body for review.

Applying the iTrees Canopy methodology indicates that the percent tree cover between 2005 and 2014 increased by 15.4 percent. Thus, the highest biomass carbon stocking over the 10-year period is at the project start date – 09/28/2014.

The HSR value is 80% of the above-ground standing live biomass carbon stocks as of 9/29/2014, since biomass increased over the preceding 10-year period from the project state date. The above-ground standing live carbon stocks per acre at the project start date (09/29/2014) is 25.8 T CO2e/acre. Thus, the HSR is calculated as follows:

25.8 t CO_2e/acre * 0.80 = 20.6 t CO_2e/acre

CP = 114.1 t CO_2e/acre

ICS = 25.8 t CO_2e/acre

WCS = 25.8 t OC_2e/acre
WCS calculated by using existing inventory data provided by the previous owner.
Thus, we used Equation 6.7 to calculate WCS.

Equation 6.7. Formula for WCS Using Inventory Data
If (1-ECS/ICS) $\leq$ 0.2, then WCS = ICS
If (1-ECS/ICS) > 0.2, then WCS = ICS*PA + ECS*EA/PA+EA
Where,

- WCS = The weighted average above-ground standing live carbon stocks per acre within the LMU containing the Project Area
- ICS = Initial above-ground standing live carbon stocks per acre within the Project Area
- PA = Size of the Project Area in acres
- ECS = Above-ground standing live carbon stocks per acre within the LMU but excluding the Project Area (EA), as determined from existing inventory data
- EA = Size of the LMU in acres, excluding the Project Area

Therefore:

ECS = 24.0 t CO_2e/acre
This is based on inventory data provided by the previous owner and used to estimate the above-ground standing live carbon stocks per acre with the LMU, excluding the Klamath West IFM project area.

Note: the LMU contains approximately 635,042 acres. The Klamath West IFM encompasses 170,883 acres. The remainder of the acres in the LMU are contained in the Klamath East

IFM that was listed as an ARB IFM project concurrently with the Klamath West IFM project on September 26, 2015. Green Diamond estimated 24 tCO_2e of above ground standing live carbon stocks per acre for the Klamath East IFM project and this value was based on inventory data received by the previous landowner.

Green Diamond reported the estimated 24 tCO_2e of above ground standing live carbon stocks per acre in the ARB *Application For Listing An Improved Forest Management U.S. Forest Offset Project* for the Klamath East IFM project. Green Diamond, by signing the Klamath East IFM Listing Form, certified under penalty of perjury of the laws of California that the information contained in the form is true, accurate, and complete. Thus, we estimate ECS is 24 tCO_2e/acre as reported to ARB in the Klamath East IFM Listing Form.

A copy of the Klamath East IFM Listing Form will be made available to the Verification Body.

ICS = 25.8 t CO_2e/acre
((1-(24.0/25.8)) = 0.0698; thus WCS = ICS, which is 25.8 T CO_2e/acre

MBL = MAX (MAX (HSR, ICS), MIN (CP, WCS))

MBL = MAX (20.6, 25.8), MIN (114.1, 25.8)

Thus, **MBL = 25.8 t CO_2e/acre.**

Step 3: Determine Baseline Above-Ground Standing Live Carbon Stocks.

The baseline above-ground standing live carbon stocks were determined by modeling above-ground standing live carbon stocks through a series of growth and harvesting scenarios over 100 years and averaging the model results over the 100-year timeframe, so that the baseline is expressed as a single (average) value for above-ground standing live carbon stocks per acre in every year. The baseline simulation incorporates all legal and financial constraints as discussed in section 5-A and 5-B. Consideration was given to financial, legal, and regulatory constraints by removing Forest Practices Act regulated riparian acres from the Project Area and by constraining harvesting intensity via silvicultural prescriptions (Table 9) to remain above levels at which a legally obligated reforestation would be required.

Table 9 - Silvicultural Prescriptions Modeled for Baseline Activity

Strata	Rx ID	Rx Description	Stocking Trigger	Residual Stocking	Regeneration	Sprouting (on/off)
ALL STRATA	Baseline	Thin from above to a minimum residual basal area	3 MBF/ac for selection	40 square feet of basal area	Natural Regeneration: 60 Ponderosa Pine and 40 Lodgepole Pine per acre with a 33% survival rate post-harvest	On
ALL STRATA	NoEntry	Let Grow				

Forest inventory field data was transferred to a database and then reformatted for input to the Forest Vegetation Simulator (Dixon 2002)[1]. Clusters were entered as plots in the FVS database, and plot size entered as the average cluster area for that stratum. The Forest Vegetation Simulator (FVS) is a family of forest growth simulation models supported and maintained by a special unit of the USDA Forest Service[2]. Since its initial development in 1973, it has become a system of highly integrated analytical tools. These tools are based upon a body of scientific knowledge developed from decades of natural resources research. The FVS growth model is an approved ARB growth model (*FOP, Appendix B, Section B.1*).

The FVS is an individual-tree, distance-independent growth and yield model. It has been calibrated for specific geographic areas (variants) of the United States and can simulate a wide range of silvicultural treatments for most major forest tree species, forest types, and stand conditions. The South Central Oregon and Northeast California (SO) Variant (Keyser 2008) has been used for this project to model forest growth, mortality and harvest over time (Keyser 2008)[3].

The SO variant uses a three-digit project location code where the first digit represents

[1] Dixon, Gary E. comp. 2002. Essential FVS: A user's guide to the Forest Vegetation Simulator. Internal Rep. Fort Collins, CO: U. S. Department of Agriculture, Forest Service, Forest Management Service Center. 226p. (Revised: November 2, 2015)
[2] http://www.fs.fed.us/fmsc/fvs/index.shtml
[3] Keyser, Chad E., comp. 2008 (revised February 3, 2016). South Central Oregon and Northeast California (SO) Variant Overview – Forest Vegetation Simulator. Internal Rep. Fort Collins, CO: U. S. Department of Agriculture, Forest Service, Forest Management Service Center. 99p.

Forest Service Region Number and the second digit indicates the closest National Forest. All project stratum used a 620 code indicating the Winema National Forest to further localize the growth equations. This information was input to the model along with the inventory design parameters for proper calibration. Table 10 includes the stratum-level Ponderosa Pine 100 year site index[4] values that were used to further refine and FVS estimated growth behavior to strata specific conditions. The stratum-level site indexes represent the area weighted average calculated from the stand-level project database. FVS growth simulations were conducted in 3-year increments with harvests simulated at the start of the period and pre-harvest stocking reported at the start of the period.

FVS outputs a standing tree lists (TreeList), as well as harvested tree lists (CutList), with tree level attributes to an output database which then calculate ARB approved cubic volume from equations found in the ARB document “Volume Estimation for Species in Projects Located in CA, OR, WA (Updated: 09/19/2014)” (using CVTS for the TreeList and CV4 for the CutList) and calculate biomass in bark and branches as well as convert that cubic volume to biomass using equation in the ARB document “Regional Biomass Equations Used by FIA to Estimate Bole, Bark, and Branches (Updated: 09/19/2014)” as described in Section 4-E. The calculated results, in both wood volume and forest carbon, were summarized at the stratum level to create yield tables based on just growth or harvest treatment type. The live tree aboveground biomass was then summed up to the stratum level to get total per/acre biomass which was then used to calculate below ground tree biomass using Cairns et al (1997)[5] equations and appropriately converting per acre values to per hectare for use in the equations and then converting the resulting biomass back to per acre afterwards. Both above and below ground total tree biomass was then converted to carbon by multiplying the total biomass by 0.5.

A set of Access queries was then used to generate stratum and silvicultural prescription specific yield streams for baseline tree data and harvest data, including above-ground live CO_2/acre and harvest volumes. The baseline harvest schedule stratum and silvicultural prescription specific yield streams were then imported into the project master spreadsheet where the prescription acres were adjusted with the objective of optimizing the baseline such that the 100-year average aboveground live tree pool was equal to or greater than the minimum baseline level (MBL).

The results of the acreages allocated to each silvicultural prescription within each project stratum for the project baseline scenario are provided in Table 10. Of the 170,883 project acres, 170,652 acres were allocated to the Baseline harvesting scenario with periodic thinning from above when strata stocking level exceeds 3 mbf per acre to a residual

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[4] Barrett, James W. 1978. Height growth and site index curves for managed, even-aged stands of ponderosa pine in the Pacific Northwest. Res. Pap. PNW-232. Portland, OR: Forest Service, Pacific Northwest Forest and Range Experiment Station. 14 p.

[5] Cairns, M. A., S. Brown, E. H. Helmer, and G. A. Baumgardner. 1997. Root biomass allocation in the world’s upland forests. Oecologia 111:1-11.

density of 40 square feet per acre of trees greater than or equal to a 5-inch diameter at breast height followed by natural regeneration of 100 trees per acre (60 Ponderosa Pine and 40 Lodgepole Pine) with a 33% survival rate. The remaining 231 acres were enrolled in the NoEntry prescription and just grow with no harvest entries over the 100-year modeling time horizon.

Table 10 - Baseline Acreage Allocation by Prescription and Strata

Strata	**Weighted Powers & Oliver PP Site Index by Stratum**	**Average Conversion Powers & Oliver to Barrett**	**Converted PP Site Index by Stratum Used in FVS**	**Prescription Rx**		**Total**
				NoEntry	**Baseline**	
	(ft @ 50 yrs th)		*(ft @ 100 yrs bh)*	------------------------------------- *Acres* -- ------------------------------------		
BURN	63.7	1.609	**102.4**	21	15,572	**15,593**
NAT1	64.0	1.608	**102.8**	57	42,234	**42,291**
NAT2	63.9	1.608	**102.8**	13	9,371	**9,384**
NAT3	64.7	1.610	**104.1**	5	3,996	**4,002**
PLA1	65.6	1.609	**105.5**	33	24,651	**24,685**
PLA2	68.4	1.611	**110.1**	18	13,409	**13,427**
PLA3	64.1	1.609	**103.2**	71	52,369	**52,440**
PLA4	64.9	1.610	**104.5**	12	9,049	**9,061**
Total				**231**	**170,652**	**170,883**

Table 11 presents the baseline stocks and removals in 10-year increments for the 100-year baseline modeling time horizon. The baseline harvest schedule meets all legal and economic feasibility tests and is a likely scenario under a no-carbon-project scenario. The persistent removals associated with the Baseline silvicultural prescription lead to a level of aboveground live tree carbon that never get much higher than the initial project stocks.

Table 11 - Carbon (1000's t CO_2e) Reported from the Baseline Harvest Schedule

Year	Beginning Stock			Annual Harvest	
	AG Live Tree	BG Live Tree	Standing Dead	AGBG	Removals
	---------------------------------- Thousand tons CO_2 -----------------------------------				
2014	4,416	1,122	587	244	127
2024	4,281	1,104	522	284	139
2034	5,039	1,285	522	241	40
2044	5,279	1,342	522	257	133
2054	4,947	1,263	522	286	151
2064	4,208	1,086	522	323	174
2074	4,046	1,047	522	314	163
2084	3,829	994	522	229	119
2094	4,300	1,107	522	292	156
2104	4,231	1,089	522	252	138
2114	3,540	923	522	210	116

The following figures show the final baseline modeling and resulting average onsite and harvested pools. Figure 9 provides a graphical depiction of the baseline harvest schedule values in Table 11. The majority of the onsite live tree carbon pools, 80% on average, are in aboveground live tree carbon with the remaining 20% of live tree carbon found below ground. The dead tree carbon stocks which are assumed to be stable at 2016 inventoried levels are 10% of the live tree above and below ground total.

The moderate variances in tonnes of CO_2 over the 100-year baseline period depicted in Figure 9 are due to periodic thinning harvests from above when strata stocking level exceeds 3 mbf per acre to a residual density of 40 square feet per acre of trees greater than or equal to a 5-inch diameter at breast height, followed by natural regeneration of 100 trees per acre. Slight increases in harvest activity within the three-year periods modeled are due to pine stands moving into age classes where greater harvest volumes are warranted and because more natural stands are being entered to reduce volume and density.

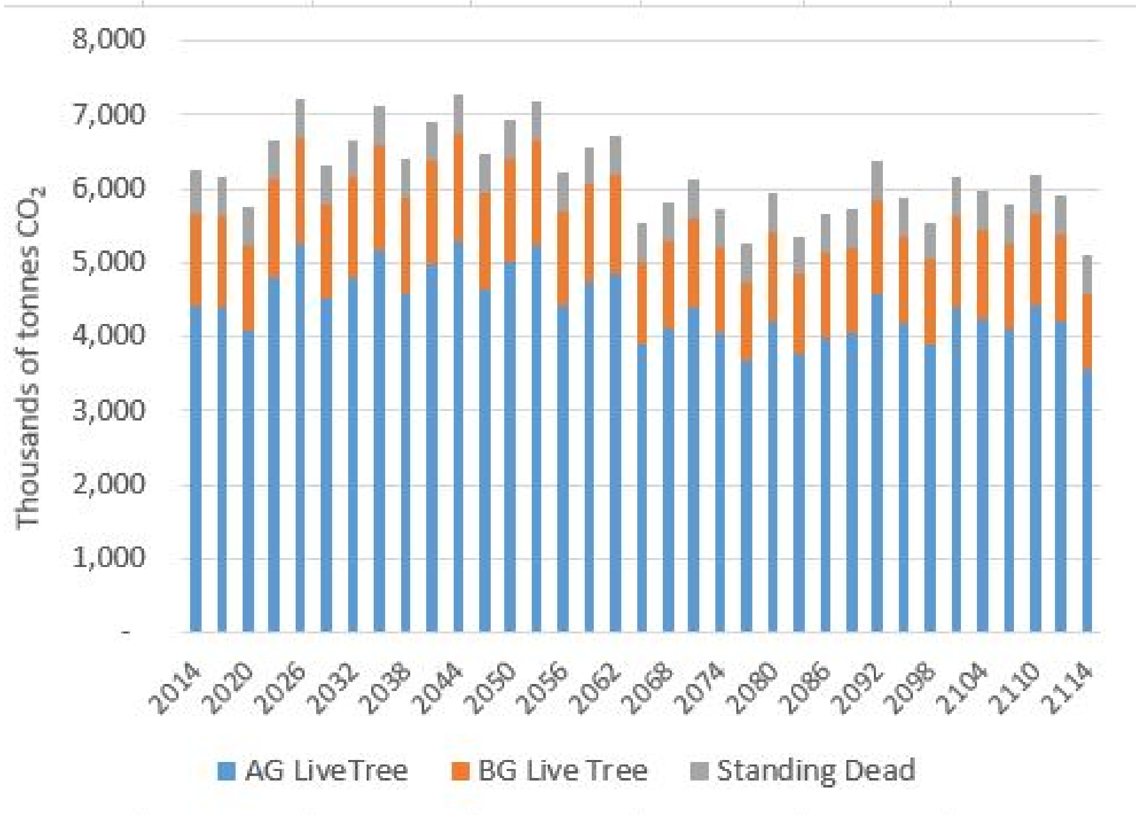

Figure 9 – Onsite Baseline Stocking as Modeled

Figure 10 depicts the final Baseline results where the static horizontal lines represent 100 year averages for those pools. These annual averages across the planning period are used in the carbon credit calculations. The Avg AG Live, MBL, and Avg OnSite lines represent CO_2 stocks and their values are indicated on the x-axis to the left of the graph while the Harvested Live, Harvested Merch, HWP InUse, and HWP in Landfills represent changes in CO_2 stocks over the course of a year and their values are indicated on the x-axis to the right of the graph. Modeling the baseline stocking with legal and financial constraints yields an average onsite above ground standing live tree stocking of 4,416,233 total tons of CO_2e for the 100-year baseline modeling scenario, or 25.8 tons of CO_2e per acre, which is equivalent to the 25.8 tons CO_2e per acre ICS value discussed in Section 5-C, Step 2 and thus does not fall below the 25.8 tons CO_2e per acre MBL as required by the Protocol.

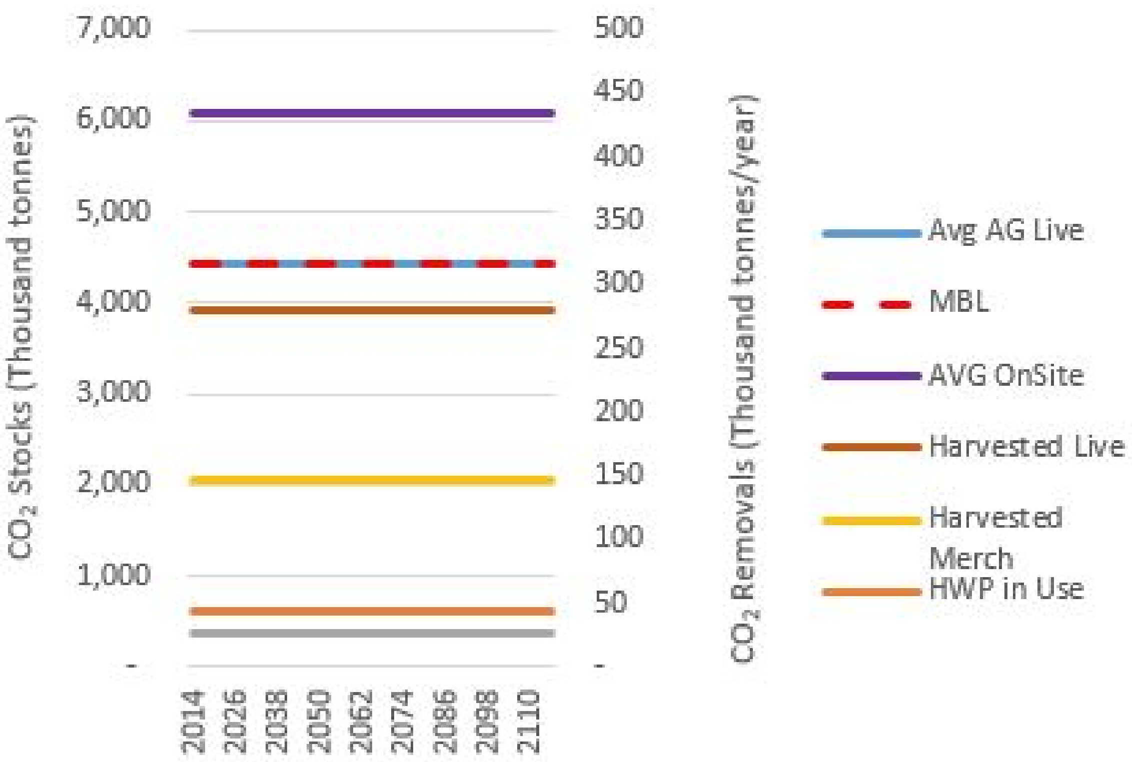

Figure 10 – Onsite Baseline Stocking Modeled Results

<u>Step 4: Determine the Baseline for All Carbon Pools:</u>

There are no optional carbon pools in this Project. Standing live (IFM-1), standing dead (IFM-3), and in-use forest products carbon (IFM-7) are required pools. Forest products carbon stored in landfills (IFM-8) is also required when baseline harvesting exceeds project harvesting. In order to determine the amount of carbon stored in harvested wood products (HWP), the cut trees were further divided into Harvested Live and Harvested Merch. Harvested Live were defined as the carbon in all portions of live trees removed from the project during a harvest (including belowground carbon). Harvested Merch was defined as the carbon in the merchantable portions (bole without bark) of the commercially harvested trees that are sent to mills to be processed into wood products. The baseline Harvested Live value is compared to the actual Harvested Live value and if the baseline value is greater than the project level then both the HWP in-use (IFM-7) and HWP in landfills (IFM-8) were used to account for wood products market effects and leakage while in the event that if the baseline value was less than the project level then only the HWP in-use is used. The average annual values of the relevant baseline carbon pools for this project are:

- Standing Live (IFM-1) – 5,551,351 tons CO_2e
- Standing Dead (IFM-3) – 523,742 tons CO_2e
- Harvested Live – 278,977 tons CO_2e
- Harvested Merch – 146,493 tons CO_2e
- HWP in-use (IFM-7) – 42,799 tons CO_2e
- HWP in landfills (IFM-8) – 27,538 tons CO_2e

5-D. Estimating Baseline Carbon in Harvested Wood Products

(Forest Offset Protocol §6.2.3, §9.1.1.1(26), Appendix C)

Estimation of the baseline carbon in harvested wood products follows the approach specified in FOP section 6.2.3 and Appendix C.

Step C1

Carbon in harvested wood products was calculated from FVS model CutList outputs (modeled removals from 2016 to 2113) by first calculating sound merchantable stem volume (inside bark) for each tree cut using species-specific equations for CV4 cubic feet volume (volume from a 1 foot stump to a 4 inch top); sourced from the ARB document "Volume Estimation for Species in Projects Located in CA, OR, WA (Updated: 09/19/2014)". Cubic foot volume was converted to mass applying wood density values sourced from Smith et al 2006 Table 4, Pacific Northwest East; all NAT and BURN strata referenced values for the "fir-spruce-m hemlock" forest type, and all PLA strata referenced values for the "ponderosa pine" forest type.

Harvested carbon was disaggregated into pulplog and sawlog components by referencing fractions specified in the FVS CutList output, referencing FVS-SO volume merchantability standards (Keyser 2008); sawlogs had a minimum 9" dbh and 4.5" top, the balance was treated as pulp wood. Stems less than 5" dbh were not included in the analysis (matching the same dimensional threshold for standing live stocks) from which accounted harvested volumes are derived.

Removals in the baseline scenario not only include projected removals from 2016 to 2113, but also actual removals from September 29, 2014 to July 31, 2016. Actual removals were added to the FVS projections to produce a full accounting of removals over the 100-year period. Actual removals were based on saw log and chip harvest data from Green Diamond Resource Company, reported to the State of Oregon; a small, and indeterminate, amount of this volume is from stems < 5" dbh. Sawlog harvest, reported in board feet, was converted to cubic feet (CV4 equivalent, inside bark from a 1-foot stump to a 4-inch top) applying a conversion of 0.219313 cubic feet per board foot (board feet calculated per FVS-SO

[6] Smith, J.E., Heath, L.S., Skog, K.E. and Birdsey, R.A., 2006. Methods for calculating forest ecosystem and harvested carbon with standard estimates for forest types of the United States.

merchantability standards, as reported in the FVS cut list), derived as the average value across all modeled removals. Cubic foot volume was converted to mass applying the same wood density values detailed above and referencing the forest type corresponding to the stratum with the dominant acreage for a given harvest unit plan polygon number; note that all actual removals from September 29, 2014 to July 31, 2016 were softwood. For chip harvest, reported in green tons, green tons were converted to board feet applying a conversion of 11 MBF per green ton (specified by the Oregon Department of Revenue). Board feet were converted to cubic feet using the same conversion factor applied to saw log volumes. Cubic foot volume was converted to mass applying the same wood density values as for saw logs; forest type origin for chip harvest was specified as “ponderosa pine” for all pine chip (“PINC”) volumes and “fir-spruce-m hemlock” for all fir chip (“FIRC”) and mixed chip (“CHMI”) volumes.

Biomass was converted to carbon applying a carbon fraction of 0.5. Baseline average annual harvest (before delivery to mill) over the 100-year projection was calculated for each stratum and softwood/hardwood and pulp/sawlog category, and then apportioned among the Northwest Cascades and Southern Cascades supersections based on the area of each supersection relative to the total project area subject to harvest in the baseline.

Step C2

Biomass carbon transformed to wood products was estimated applying mill efficiency values referenced from the ARB **“**Regional Mill Efficiency Data” Microsoft Excel database, for the PNW East region, Oregon, specified in the table below. Mass carbon was scaled to the current 22-month reporting period by multiplying average annual values by 22/12.

Table 12- Regional Mill Efficiencies

Species group	**Sawlog**	**Pulp wood**
Hardwoods	0.568	0.568
Softwoods	0.637	0.637

Steps C3 and C4

Distribution of end wood product classes applied actual values for the harvest period 2014-2016 as required by the Appendix C of the COP (table below), rather than the default values.

Table 13 - Distribution of End Wood Products by Class Identified in the Initial Reporting Period

Wood Products Generated							
Supersection	Softwood Lumber	Hardwood Lumber	Plywood	Oriented Strand Board	Non-structural Panels	Miscellaneous	Paper
Southern Cascades	11%	0%	72%	0%	15%	0%	2%
Northwest Cascades	11%	0%	72%	0%	15%	0%	2%

Wood product amounts retained in storage for 100 years, in in-use wood products and in landfills, were then calculated referencing 100-year average storage factors provided in the ARB protocol Tables C.2 and C.3. Results were multiplied by 3.664 to obtain t CO_2e stored over 100 years from wood harvested in baseline in the current reporting period.

6. Project Carbon Stocks – Improved Forest Management Projects

6-A. Actual Onsite Carbon Stocks

(Forest Offset Protocol §6.2.4, §9.1.1.1(23, 24), Appendix A, Appendix B)

A new inventory was completed at the end of July 2016. Since the initial reporting period began on September 29, 2014, the initial inventory was degrown to reflect the carbon stocks at the project start date.

A summary of the required carbon pools at the end of the reporting period is as follows:

- Standing Live (IFM-1) – 5,830,854 metric tons CO_2e
- Standing Dead (IFM-3) – 521,875 metric tons CO_2e
- HWP in-use (IFM-7) – 47,704 metric tons CO_2e
- HWP in landfills (IFM-8) – 30,748 metric tons CO_2e

Inventory results are presented below for each forest biomass pool measured (live tree biomass and standing dead wood) and then summed across all pools to produce an estimate of total forest carbon for the Project Area. All statistics were produced treating the cluster as the sample unit (not the subplot). All supporting calculations will be provided to the verification team for review.

<u>Live trees</u>

Biomass carbon in live trees is estimated as 34.1 T CO_2e/acre with a 90% confidence interval of 31.6 to 36.7 T CO2e/acre (table below).

Table 14 - Statistics for Estimates of Carbon in Live Trees

	BURN	NAT1	NAT2	NAT3	PLA1	PLA2	PLA3	PLA4
mean tCO2/ac	3.040	35.513	58.561	106.294	43.972	42.724	25.125	36.425
variance	9.5	386.6	1564.7	6901.5	814.5	167.3	162.8	616.3
stan dev	3.1	19.7	39.6	83.1	28.5	12.9	12.8	24.8
CV(%)	1.0	0.6	0.7	0.8	0.6	0.3	0.5	0.7
stan error	1.4	2.8	9.9	19.1	4.7	2.8	2.6	7.9
90% CI	2.9	4.7	17.3	33.0	7.9	4.9	4.5	14.4
N	5	49	16	19	37	21	24	10
Ac	15,592.8	42,291.4	9,384.1	4,001.6	24,684.8	13,426.9	52,440.0	9,061.0
stan error	1.521180							
Mean	34.122							

<u>Standing dead wood</u>
Biomass carbon in standing dead wood is estimated as 3.1 T CO2e/acre with a 90% confidence interval of 2.4 to 3.9 T CO2e/acre (table below).

Table 15 - Statistics for Estimates of Carbon in Standing Dead Wood

	BURN	NAT1	NAT2	NAT3	PLA1	PLA2	PLA3	PLA4
mean tCO2/ac	27.551	0.895	1.387	3.807	0.197	0.824	0.155	0.234
variance	115.6	1.7	3.9	42.7	0.5	8.9	0.1	0.1
stan dev	10.7	1.3	2.0	6.5	0.7	3.0	0.3	0.3
CV(%)	39%	146%	143%	172%	355%	361%	193%	140%
stan error	4.8	0.2	0.5	1.5	0.1	0.6	0.1	0.1
90% CI	10.2	0.3	0.9	2.6	0.2	1.1	0.1	0.2
N	5	49	16	19	37	21	24	10
Ac	15,592.8	42,291.4	9,384.1	4,001.6	24,684.8	13,426.9	52,440.0	9,061.0
stan error	0.446984							
mean	3.054							

Total forest biomass carbon
Total forest biomass carbon was estimated as the sum of the sampled pools of live trees and standing dead wood. Average total forest biomass carbon is 37.2 T CO_2e/acre (table below).

Table 16 - Statistics for Estimates of Total (Live and Dead) Forest Biomass Carbon

	BURN	NAT1	NAT2	NAT3	PLA1	PLA2	PLA3	PLA4
mean tCO_2/ac	30.592	36.408	59.947	110.102	44.169	43.548	25.28	36.659
variance	67.1	392.4	1576.7	7177.2	825.6	168.3	164.0	617.3
stan dev	8.2	19.8	39.7	84.7	28.7	13.0	12.8	24.8
CV(%)	0.3	0.5	0.7	0.8	0.7	0.3	0.5	0.7
stan error	3.7	2.8	9.9	19.4	4.7	2.8	2.6	7.9
90% CI	7.8	4.7	17.4	33.7	8.0	4.9	4.5	14.4
N	5	49	16	19	37	21	24	10
Ac	15,592.8	42,291.4	9,384.1	4,001.6	24,684.8	13,426.9	52,440.0	9,061.0
stan error	1.561600							
mean	37.176							
90% CI	2.6	*t=1.645*						
90% CI as % of mean	6.91%		1.91%	*CONFIDENCE DEDUCTION*				

The 90% confidence interval of the onsite forest biomass carbon estimate across all pools is +/- 2.6 t CO_2e/acre or 6.91% of the mean. Thus, we are 90% confident that the average total forest biomass carbon (for the pools sampled) across the project area is between 34.6 and 39.8 t CO_2e/acre. The resulting confidence deduction is thus 6.9% - 5.0% = 1.9%.

6-B. Actual Carbon in Harvested Wood Products

(Forest Offset Protocol §6.2.5, §9.1.1.1(26), Appendix A, Appendix B, Appendix C)

Determination of the actual carbon in harvested wood products follows the approach specified in FOP section 6.2.5 and Appendix C.

Step C1
Actual removals from September 29, 2014 to July 31, 2016 were based on saw log and chip harvest data from Green Diamond Resource Company records and reported to the state of

Oregon; a small, and indeterminate, amount of this volume is from stems < 5” dbh. Sawlog harvest, reported in board feet, was converted to cubic feet (CV4 equivalent, inside bark from a 1- foot stump to a 4-inch top) applying a conversion of 0.219313 cubic feet per board foot (derived as the average value across all removals modeled in the baseline, originating from the same forest and applying similar merchantability standards). Cubic foot volume was converted to mass applying wood density values sourced from Smith et al 2006[7] Table 4, Pacific Northwest East, referencing the forest type corresponding to the stratum (NAT and BURN strata = “fir-spruce-m hemlock” and PLA strata = “ponderosa pine”) with the dominant acreage in a given harvest unit plan polygon number. All actual removals from September 29, 2014 to July 31, 2016 were softwood. For chip harvest, reported in green tons, green tons were converted to board feet applying a conversion of 11 MBF per green ton (specified by the Oregon Department of Revenue). Board feet were converted to cubic feet using the same conversion factor applied to saw log volumes. Cubic foot volume was converted to mass applying the same wood density values as for saw logs; forest type origin for chip harvest was specified as “ponderosa pine” for all pine chip (“PINC”) volumes and “fir-spruce-m hemlock” for all fir chip (“FIRC”) and mixed chip (“CHMI”) volumes.

Biomass was converted to carbon applying a carbon fraction of 0.5.

<u>Step C2</u>
Biomass carbon transformed to wood products was estimated applying mill efficiency values referenced from the ARB **“**Regional Mill Efficiency Data” Microsoft Excel database, for the PNW East region, Oregon, specified in the table below. No hardwoods were harvested during the current reporting period.

Table 17 – Regional Mill Efficiencies

Species group	**Sawlog**	**Chips**
Softwoods	0.637	0.637

<u>Steps C3 and C4</u>
Distribution of end wood product classes was based on end product data contained in Green Diamond Resource Company records, and cross-referenced to ARB classes as follows:

[7] Smith, J.E., Heath, L.S., Skog, K.E. and Birdsey, R.A., 2006. Methods for calculating forest ecosystem and harvested carbon with standard estimates for forest types of the United States.

Table 18 - Distribution of End Wood Products Classes

End product as reported by Green Diamond	ARB end product class
Lumber (all softwood)	Softwood lumber
Particleboard (all chip harvest)	Non-structural panels
Plywood	Plywood
Pulp	Paper

Wood product amounts retained in storage for 100 years, in in-use wood products and in landfills, were then calculated referencing 100-year average storage factors provided in the ARB protocol Tables C.2 and C.3. Results were multiplied by 3.664 to obtain t CO_2e stored over 100 years from wood harvested in the current reporting period.

Harvest Data Management Process

Single or multiple cutting units (timber sales) are identified as a "setting". One or more settings are assigned a plan number for the purpose of filing Notices of Operations with the State of Oregon-Department of Forestry and to track volume harvested from each setting. These harvest data are used for multiple purposes; including, to pay logging and hauling contractors, to track payments from mills for wood volumes delivered, to update stand management information, and to report and pay harvest tax to the Oregon Department of Revenue.

Green Diamond tracks a range of data for each setting harvested. Before each log truck or chip van leaves a setting, an electronic load receipt is generated at the landing. Information recorded for each load receipt includes the date, time, setting number, load number, trucker name, and mill destination. If it is a load of logs, logs are required to be branded, and this information is included on the load receipt. Once the truck driver arrives at the mill, the load receipt is handed off to the third-party bureau scaler who measures the load and electronically reports the species and volumes/weight to the mill and Green Diamond on a daily basis.

When Green Diamond receives the third-party bureau data by load number and mill location, it is uploaded to its CT3 software program, usually on a daily basis. This third-party software program tracks harvest volume or weight and mill delivery data by load for each setting. Green Diamond uses this information to account for each load that leaves every setting. It is also the basis upon which Green Diamond pays contractors and gets paid for wood volume delivered to each mill.

Data stored in the CT3 system is backed up every day and a copy of the backup is stored off-site. Green Diamond conducts regular internal audits of data in the CT3 system to ensure every load of wood products that departs each setting is accounted for and that all volume/ weight data by load received by the third-party scaling bureau is complete and accurate.

A variety of reports can be generated by CT3 for operational and management purposes. Reports generated from CT3 for the initial project reporting period were used to generate Harvested Wood Products values used in calculating GHG reductions and removals (see Table 19).

Data from various CT3 reports were exported to Excel for sorting and aggregation purposes. These data included setting number and board foot volumes by species/species mix for logs and green tons of chips by species/species mix delivered to each plant/mill location. Green tons of chips were converted to board feet using a conversion factor (Green ton divided by 11) required by the Oregon Department of Revenue for the purpose of harvest tax calculations.

Setting numbers were associated with harvest plan numbers used by Green Diamond for management purposes and Notification of Operations submitted to the Oregon Department of Forestry. The harvest plan numbers were then associated with the strata delineated in the carbon inventory. We then assigned a forest type, referred to as the "predominate species" category, for each setting based on the forest type corresponding to the strata (NAT and BURN strata = "fir-spruce-m hemlock" and PLA strata = "ponderosa pine").

A list of mills was generated where wood products (sawlogs/chips) were delivered during the initial reporting period. Wood product categories were determined for each mill location based on products manufactured by the plant/mill, for example the Columbia Forest Products' Klamath Falls plant produces plywood, Collins Products' Klamath Falls plant produces particleboard, and Collins Pine's Lakeview sawmill produces lumber.

The final step was to aggregate harvested volumes/weights for all settings by predominate species for each plant/mill producing the same product type (lumber, particleboard, plywood, and pulp). We separated the volumes harvested from the Oregon Gulch Fire using the unique setting/harvest plan numbers associated with harvest in the burn. This final step resulted in board foot volumes of tree harvest by predominate species for sawlog and chip categories. These values were then used in estimating baseline carbon in harvested wood products (see Section 5-D) and actual carbon in harvested wood products (see Section 6-B).

Evidence will be provided to the Verification Body demonstrating that log truck load tickets are tracked from a setting landing to a mill; loads are measured by a third-party scaling bureau and reported to Green Diamond; and load data is entered and stored in the CT3 system. Further, evidence will be provided to demonstrate the Harvested Wood Products calculations were based on board foot volumes of tree harvest by predominate species for sawlog and chip categories generated from Green Diamond's CT3 system for the initial reporting period.

6-C. Quantifying Secondary Effects

(Forest Offset Protocol §6.2.6, §9.1.1.1(23))

Secondary effects from IFM projects can occur if an IFM project leads to a reduction in harvesting within the Project Area of a level high enough to elicit an increase in harvesting activities on other nearby forest properties. Accounting for Secondary Effects thus compensates for activity shifting leakage that results from changes in forest management activity resulting from the project activity. This compensation only occurs in the event that the actual amount of onsite carbon harvested in a given reporting period is less than the estimated average baseline amount of onsite carbon harvested over an equal time frame. The estimated project secondary effects are calculated as 20% of any negative difference between actual and baseline carbon in harvested live trees and zero if actual project harvest exceeds the baseline level over the verification reporting period.

For the project reporting period of September, 29, 2014 to July 31, 2016, the 311,817 t CO_2 actual carbon in trees harvested for wood products (Table 19, Row 9) is less than the 510,261 t CO_2 baseline carbon in trees harvested for wood products (Table 19, Row 10) by 198,444 t CO_2 (Table 19, Row 17), thus resulting in a Secondary Effects value of 39,689 t CO_2 (Table 19, Row18).

6-D. Projected Actual Harvest

(Forest Offset Protocol §9.2.1(20))

As stated elsewhere in this document, Project Area carbon stocks were heavily depleted by previous landowners over many decades through conversion of older stands to new stands, as well as by high-grading tens of thousands of acres of natural stands. The annual harvest over the next 100 years will be constrained to a small percentage of annual growth to allow the forest to recover and build carbon stocks. Harvesting will focus on thinning, improving stand resiliency to fire and other natural threats, and creating an older average stand age as compared to common practice of the adjacent private forest landowners.

Annual harvest within the Project Area was projected over the next 100-year period based on projected growth of carbon stocks. We project that, on average, the carbon stocks will grow about 0.5 tonnes of carbon per acre per year. Lower growth will occur in the initial decades of the project period and will increase as stands become fully-stocked and as average age classes increase across the Project Area.

Over the initial three decades, annual harvest is projected to be 12,000 t C., or about 24 percent of annual growth. During decades four, five, and six, annual harvest is projected to increase to 24,000 t C, or about 28 percent of annual growth. Over the remaining four decades, annual harvest is projected to increase to 60,000 t C, or about 38 percent of annual growth.

7. Calculation of GHG Reductions and Removals

Equation 6.1 was used for estimating the first reporting verification period GHG reductions and removals. Implementation of the Equation 6.1 Total Net GHG Reductions and Removals were calculated automatically using the Klamath West ARB IFM Project Monitoring and Calculation Worksheet. This worksheet Quantified GHG Reduction (QR) calculation process included changes in onsite stocks, confidence interval deductions, long-term average wood product storage, and secondary effects. The results, which reference the QR calculation rows, are shown in Table 19.

Table 19 - Total Net GHG Reductions and Removals

		Start Date	Reporting Period Beginning Date	29-Sep-14
Calc Row	**Onsite Carbon Stocks**	**29-Sep-14**	**Reporting Period End Date**	**31-Jul-16**
1	Sampled Onsite Carbon Stocks (tonnes CO2e)	6,125,736		6,352,730
2	Confidence Deduction (percent)	1.9%		1.9%
3	Adjusted Sampled Onsite Carbon Stocks (adjusted for confidence deduction) (tonnes CO2e)	6,009,347		6,232,028
4	Soil Carbon Emissions	-		-
5	Increment in Actual Onsite Carbon Stocks (tonnes CO2e)	6,009,347		222,681
6	Baseline Onsite Carbon Stocks (tonnes CO2e)	6,075,092		6,075,092
7	Increment in Baseline Onsite Carbon Stocks (tonnes CO2e)	6,075,092		-
8	Quantified GHG Reductions / Removals for Onsite Carbon Stocks (tonnes CO2e)	(65,746)		222,681
	Accounting for Wood Products Including Market Effects and Leakage			
9	Actual Carbon in Trees Harvested for Wood Products in (tonnes CO2e)	-		311,817
10	Baseline Carbon in Trees Harvested for Wood Products (tonnes CO2e)	-		510,261
11	Actual Carbon Stored Long-term in Wood Products (tonnes CO2e) - Excl Landfill	-		47,704
12	Actual Carbon Stored Long-term in Wood Products (tonnes CO2e) - Incl Landfill	-		78,452
13	Baseline Carbon Stored Long-term in Wood Products (tonnes CO2e) - Excl Landfill	-		78,465

14	Baseline Carbon Stored Long-term in Wood Products (tonnes CO2e) - Incl Landfill	-	128,951
15	Difference in Actual and Baseline Carbon Stored in Wood Products (tonnes CO2e) - Landfill Adj	-	(50,499)
16	GHG Reductions / Removals for Carbon Stored in Wood Products (tonnes CO2e) w/ mkt response	-	(40,400)
	Accounting for Secondary Effects		
17	Difference Between Actual and Baseline Carbon in Trees Harvested for Wood Products (tonnes CO2e)	-	(198,444)
18	Other Secondary Effects Emissions (shifting activities/materials) IFM Projects (tonnes CO2e)	-	(39,689)
	Quantified GHG Reductions and Removals		
19	Annual GHG Reductions/Removals Net of Discounts and Secondary Effects (tonnes CO2e)	(65,746)	142,593
20	Cumulative GHG Reductions/Removals; not incl.neg. carryover or reversals (tonnes CO2e)	-	-
21	Cumulative Negative Carryover from Prior Year (tonnes CO2e)	-	(65,746)
22	Credits Issued - Net of Negative Carryover, bef. Buffer or adjust for Reversals (tonnes CO2e)	-	76,847
	Calculation of Buffer Pool Contribution		
23	Project Specific Reversal Risk Rating	18.1%	18.1%
24	Buffer Pool Contributions (QRs)	-	13,942
	Accounting for Reversals		
25	Annual Reversals (tonnes CO2e)	(65,746)	-
26	Total "Avoidable Reversals" to be compensated by the Forest Owner (tonnes CO2e)	(65,746)	-
27	Unavoidable Reversals compensated by the Reserve from the Buffer Pool (tonnes CO2e)	-	-
	Compensating for Avoidable Reversals		
28	Avoidable Reversals compensated by retirement of QRs in the Forest Owners Reserve Account (tonnes CO2e)	-	-
29	Avoidable Reversals compensated by retirement of QRs issued to other Forest Projects Registered with the Reserve (tonnes CO2e)	-	-
30	Carryover "Avoidable Reversals" which need to be compensated by Forest Owner (tonnes CO2e)	(65,746)	-
	QRs Issued to Account Holder		
31	Annual QRs Issued to Account Holder	-	62,905
32	Cumulative QRs Issued to Account Holder	-	62,905

8. Reversal Risk Rating

8-A. Reversal Risk Rating by Category

(Forest Offset Protocol §7.2.2, §9.1.1.1(27), Appendix D.1, D.2, D.3, D.4)

<u>Financial Risk</u> - Contributions to the buffer pool associated with financial risk come from the potential financial failure of an organization resulting in bankruptcy, which can lead to dissolution of agreements and forest management activities to recover losses that result in reversals. Forest Projects that employ a Qualified Conservation Easement, or that occur on public lands, have lower risk. The default financial risk for the US is 5%.

- Financial Risk Default Buffer Pool Contribution 5%

<u>Management Risk</u> - Management failure is the risk of management activities that directly or indirectly could lead to a reversal. Forest projects that occur on public lands, or employ a Qualified Conservation Easement are exempt from this risk category. There are three categories of management risk: illegal logging, conversion to an alternative use, and over harvesting. The Klamath West IFM Project is within the United States, thus the default illegal harvesting risk of 0% is used.

The risk of conversion is assigned a default buffer pool rating of 2% since the project area is not covered by a Qualified Conservation Easement.

The risk that the project might overharvest as a result of high timber prices or due to fuel treatments is estimated to be the same as the default US rate and is assigned a Buffer Pool contribution of 2%.

- Default Illegal Harvesting (U.S) Buffer Pool Contribution 0%
- Default Conversion to Alternative Land Use Buffer Pool Cont. 2%
- Default Over Harvesting Buffer Pool Contribution 2%

<u>Social Risk</u> - Social risks exist due to changing governmental policies, regulations, and general economic conditions. The risks of social or political actions leading to reversals are low, but could be significant.

The social risk for the project is identified as 2% since the project is within the United States.

- United States Default Social Risk Buffer Pool Contribution 2%

Natural Disturbance Risk - Natural disturbances can pose a significant risk to the permanence of the GHG reductions and GHG removal enhancements. Natural disturbance risks are only partially controllable by management activities. Management activities that improve resiliency to wildfire, insects, and disease can reduce these risks.

Natural Disturbance Risk I – Wildfire - A wildfire has the potential to cause significant reversals, especially in certain carbon pools. These risks can be reduced by certain techniques including reducing surface fuel loads, removing ladder fuels, adding fuel breaks, and reducing stand density. However, these techniques cannot reduce emission risk to zero because all landowners will not undertake fuel treatments, nor can they prevent wildfire from occurring.

Although Green Diamond does not have a separate fuels management plan since they recently bought the property, managing wildfire risk is a high priority for Green Diamond and is considered in every management action planned and implemented across the Project Area. Management activities prioritize thinning overstocked plantation and harvesting in natural stands to reduce fuel loading, eliminate ladder fuels, and improve overall health and resiliency of stands, with a focus on acres adjacent to federal forestlands. Slash generated from whole tree harvesting is consolidated at landings throughout the harvest areas and is disposed of through burning on an annual basis. Also, managing grazing leases to reduce flash fuels is ongoing across nearly all the acres within the Project Area.

Green Diamond treated the following acres, not including the acers salvage harvested in Burn stratum, during the initial reporting period:

Action	**Acres**
Plantation Thinning & Natural Stand Harvesting	7,455
Slash Pile Burning	19,243
Grazing Allotments	162,229

The thinning/harvesting acres cited above do not include the acers salvage harvested in Burn stratum; however, acres of slash piling burning do include portions of the Burn stratum where slash pile burning occurred.

GIS shape files will be provided to the Verification Body showing the location of the acres treated during the initial reporting period for each of the three fire risk reduction actions.

Green Diamond estimates it will treat the following acres on an annual basis over the next decade. Currently, there is a backlog of acres within the natural stand strata that require slash pile burning because the previous owner did not burn slash in these strata for nearly a decade. Over the next decade, Green Diamond plans to eliminate this backlog. These actions will be tracked and documented for third-party verification.

Action	Acres
Plantation Thinning & Natural Stand Harvesting	9000
Slash Pile Burning	10,000
Grazing Allotments	162,229

The Project Area contains an extensive maintained road system allowing easy access for initial firefighting attack. The Oregon Department of Forestry (ODF), through the support of forest landowner financial support, operates a highly trained and well-equipped firefighting organization. ODF is mandated by the State of Oregon with primary wildland fire protection on private and public lands. In addition, Green Diamond trains and makes available initial attack personnel during fire season, possess and maintains firefighting equipment, regularly patrols its forestland during fire season, and coordinates initial attack and wildland firefighting activities with the Oregon Department of Forestry.

The resulting wildfire risk buffer pool contribution due to the medium level of fuel treatment, access, and highly trained and well-equipped firefighting organization is calculated as (4%) x (66.3%) = 2.7%

- Wildfire Risk Buffer Pool Contribution (as described above) 2.7%

<u>Natural Disturbance Risk II – Disease or Insect Outbreak</u> - A disease or insect outbreak has the potential to cause a reversal, especially in certain carbon pools. The default assigned risk rating for disease or insect outbreak is 3%.

There are several diseases that could affect the health of the project's inventory stocks. These include a foliage and several root diseases. None of these diseases are prevalent within the Project Area such that they are negatively impacting the health of the project's inventory, specifically above-ground standing live and dead trees.

Following is a list of diseases that could affect the health of the project's inventory stocks. Elytroderma needle blight – this affects ponderosa pine and only becomes damaging at elevation above 5,000 feet in Oregon.

Annosus root and but rot – this mostly affects pines and true firs in the Pacific Northwest.

Armillaria root rot – it can affect all tree species across the Pacific Northwest.

Black stain root rot – it mostly affects Douglas-fir trees on Westside Pacific Northwest forests; however, it can occasionally be found in ponderosa pine on moist sites in eastern Oregon.

Laminated root rot – mostly associated with Westside Douglas-fir type, it can be found in higher elevation Eastside site in mixed conifer stands.

Fact sheets on each of the diseases produced by the USFS' Region 6 will be made available to the Verification Body for their information.

The Oregon Department of Forestry, in cooperation with Region 6 of the USFS, conduct annual statewide insect and disease aerial surveys as a way to monitor and share information with all landowners about the changes in the populations and spread rates of various insects and diseases across the state. Information about these surveys can be found online at http://www.oregon.gov/ODF/ForestBenefits/Pages/ForestHealth.aspx.

Also, Green Diamond employees regularly monitor forest conditions across the Project Area through observations during their field work. Changes in forest health conditions, such as insect and/or disease out breaks, are reported to the district foresters so further evaluation by trained professional foresters can be completed and appropriate management actions can be taken to address such out breaks.

- Default Insect and Disease Outbreak Buffer Pool Contribution 3%

Natural Disturbance Risk III – Other Episodic Catastrophic Events - A major wind-throw event (hurricane, tornado, high wind event) has the potential to cause a reversal, especially in certain carbon pools. The default risk contribution from other catastrophic events is 3%.

- Default Other Catastrophic Events Buffer Pool Contribution 3%

8-B. Summarizing the Risk Analysis and Calculating the Project Reversal Risk Rating

(Forest Offset Protocol §7.2.2, §9.1.1.1(27), Appendix D.5)

The table below summarizes the project's contribution to the buffer account based on the risk analysis and risk rating calculation.

Table 20 - Project Contribution to the Buffer Account Based on Risk

Risk Category	Contribution from Risk Descriptions Above	
	Source	**Forest Project without a Qualified Conservation Easement and/or Public Ownership**
Financial Failure	Default Risk	5%
Illegal Forest Biomass Removal	Default Risk	0%
Conversion	Default Risk	2%
Over-harvesting	Default Risk	2%
Social	Default Risk	2%
Wildfire	Default Risk	2.7%
Disease or Insect Outbreak	Default Risk	3%
Other Catastrophic Events	Default Risk	3%
Overall Contribution Based on Appendix D.5 Calculation		18.1%

Overall Contribution to Buffer Pool is **18.1 %** as calculated per the equation in the Forest Offset Protocol, Appendix D.5 and as shown below:

100% - ((1-5%) x (1-0%) x (1-2%) x (1-2%) x (1-2%) x (1-2.7%) x (1-3%) x (1-3%)) = **18.1**%.