Forest Project Design Document

.

Sierra Pacific Industries

SPI Wildfire Reforestation Project #5

CAR 1044

Reporting Period 1

Protocol Version 3.2

Contents

1. Introduction

The Fred, Power, Poe, and Little wildfires that occurred prior to 2005 killed or severely damaged most of the standing timber and portions of those fires in this project were first planted in 2005. These efforts form the core of this Reforestation Project.

2. Project Eligibility

a. Project Type (Section 2.1)

The project consists of areas that have been significantly burned in wildfires. Tree mortaility in these areas was extremely high, prompting SPI to invest in reforestation efforts to return these sites to their productive capacity (including carbon sequestration) as soon as possible. The project start date is the earliest reforestation event date for the wildfire areas defined by the project area, in this case 11-1-2004. This project does not and will not employ broadcast fertilization and is not on land that was previously part of a registered Forest Project. No commercial harvest is expected until the planted forest is at least 30 plus years old unless the harvesting is necessary to prevent or reduce an imminent threat of disease.

b. Project Location (Section 3.8) and Project Area (Section 4)

The project is location in Amador, Butte, El Dorado, and Tuolumne County. See detailed location maps "Map CAR1044.pdf" and "Map CAR1044 Detail.pdf"

The project area existing land cover is described as recently planted young early seral stage forests.

The project area has a forest vegetation type of post-fire pine dominated mixed conifer.

The land use is commercial timberland. The surrounding ownership is Sierra Pacific Industries timberland or likely US Forest Service property.

The forest species composition includes Ponderosa Pine, Sugar Pine, White Fir, Douglas Fir, and Incense Cedar.

The age class distribution of the project is based on the date of the wildfire and subsequent reforestation efforts.

Because of the wildfires, there are currently no site trees in the project area and it will be multiple years until the planted trees are large enough to be assessed as site trees. Site class is determined as an average of Site Class 2 by pre-wildfire TPZ site tree information.

There are no land pressures- the project areas will persist as forested timberland.

The project areas are in a dry summer climate (Mediterranean Climate)

c. Additionality – Legal Requirement Test (Section 3.1.1)

i. Reforestation

There are no legal mandates that require SPI to reforest ownership burned in wildfires, nor is there any funding available that would encourage reforestation efforts.

d. Additionality – Performance Standard Test (Section 3.1.2)

i. Reforestation

The Fred, Power, Poe, and Little wildfires that occurred prior to 2005 killed or severely damaged most of the standing timber and portions of those fires in this project were first planted in 2005. This project area meets scenario 13 because while a mix of higher and lower site classes they all have high site preparation costs, low harvest value and all rotation ages on project lands are restricted by State Law to be greater than or equal to 60 years. Thus, they all qualify as eligible. Each area will have this analysis confirmed by the verifier.

e. Broadcast Fertilization

The project has not and will not utilize broadcast fertilization.

f. Project Start Date (Section 3.2)

The project consists of areas that have been significantly burned in wildfires. The project start date for this project is derived from the earliest date of actions that began the effort to reforest the project areas occurred. In this case, planting began 11/1/2004.

g. Sustainable Harvesting Practices (Section 3.10.1)

While no commercial harvest is expected until the planted forests are at least 30 plus years old, this project is part of a larger ownership that is Certified Sustainably Managed under Sustainable Forestry Initiative (SFI) 3rd party certification system.

h. Natural Forest Management (Table 3.2)

i. Native Species

Overall, the planting mix in the project area consists primarily of ponderosa pine and Douglas-fir. White fir, sugar pine, and incense cedar are also planted to a lesser degree. Hardwood re-sprouting and natural regeneration of conifer species add to the diversity of these burned areas. The project meets the FPP criteria for composition of native species.

ii. Composition of Native Species

This will be determined at the first inventory which will occur sometime (when there is enough carbon to warrant measurement) after the pre-commercial thinning which maintains forest health, but also alters species composition. Our initial planting records indicate that at the time of planting no species exceeded the composition of native species percentages shown in the Assessment Area Data file. Species composition can be found in the “PDD Monitoring Report Project 5.PDF”.

iii. Distribution of Age Classes

The age class distribution of the project is based on the date of the wildfires and the subsequent reforestation efforts. The age of the planted trees varies depending on the establishment date of the burned area. The entire project area was impacted by significant disturbance and therefore is excluded from the 40% forested acreage ageclass test.

iv. Structural Elements

The quantity of standing and lying dead wood that remains after SPI’s post-wildfire reforestation

efforts is always more than what existed prior to the wildfire. Also, preference is given to leaving large diameter snags and down wood because of its benefits for wildlife. These structural elements will be maintained through forest practices that retain and recruit snags and lying dead wood.

i. Ongoing Management Activities (Section 3.10.3)

REQUIRED: Describe the ongoing management activities on the Project Area that will lead to increased carbon stocks in the Project Area compared to the baseline.

The management action that has led to the increased carbon stocks was the reforestation and maintenance and forest health protection will maintain and continue this increase as SPI monitors these plantations.

Any project located on public lands must provide documentation demonstrating explicit approval of the project's management activities.

3. Inventory Methodology

a. GHG Assessment Boundary (Section 5)

Primary Effect Sources, Sinks, and Reservoirs: RF-1, RF-2, RF-3, RF-7

Secondary Effect Sources, Sinks, and Reservoirs: RF-9, RF-10, RF-13, RF-17

Note that RF-6: Soil carbon (optional pool) will not be included because the following did not and will not occur: "site preparation activities involve deep ripping, furrowing or plowing where soil disturbance exceeds 25 percent of the Project Area, or Mechanical site preparation activities are not conducted on contours".

b. Inventory Design and Sampling Process

This will be determined at the first inventory which will occur after the pre-commercial thinning.

c. Field Measurement and Plot Monumenting

This will be determined at the first inventory which will occur after the pre-commercial thinning.

d. Data Management System

REQUIRED: Describe the organization of data for the project, including the software and tools used to manage and store data, as well as any quality control methods in place.

This will be detailed once the first inventory is conducted.

e. Quantification Methodology

REQUIRED: Describe the methodology for translating the sampling and inventory process into a figure for metric tons CO_2e per acre, including conversion factors and units.

This will be detailed once the first inventory is conducted. units.

f. Inventory Update Process

REQUIRED: Describe the process for which the Project will update its carbon stocks from year to year. Also specify the schedule for conducting new inventories, how any new inventory plots will be incorporated into the inventory estimate, and how any harvests or disturbances will be addressed. Specify the model used as well as explicitly state that the project will comply with the requirement that any field inventory data used cannot be more than 12 years old.

This will be detailed once the first inventory is conducted.

4. Baseline Carbon Stocks (Section 6)

a. Reforestation Projects (Section 6.1)

i. Baseline Characterization

SPI Reforestation Qualitative Assessment of the Projects Baseline

Without the actual and planned project activities in California's Mediterranean climate, the site would naturally return to shrub and brush species and would be at high risk of re-burn and likely a long cycle of return fires will occur. Possibly over centuries a sparse forest may re-occupy the site, but the 100-year baseline would not expect that to be significant. As can be seen in both (Abatzoglou et al. 2016, and Westerling et al. 2006) fire conditions in the western US are changing as a result of climate changes, long term buildup of fuels from past successful fire suppression. Fire season is getting longer and forests are burning at a greater pace and with greater intensity. Since we are describing a SPI reforestation project, we are in an area that has experienced a catastrophic stand destroying fire or fires. This qualitative assessment is based upon some assumptions:

1. Without the project and no investment in fire/fuels reduction and no planting the site will convert to a chaparral vegetation type. From USDA, USDI – LandFire:

   "Chaparral is composed of woody, sclerophyllous shrubs that generally vary from 3 to 15 feet in height. Shrub cover is usually dense and continuous, covering vast areas of land. … At elevations above 4000 feet, resprouting manzanitas, shrub interior live oak, birchleaf mountain mahogany and canyon live oak are common associates."

   "Chaparral burns in high-intensity, stand-replacing crown fires that burn thousands of acres in a single event. However, there is a considerable range in the flammability of shrub species (e.g., chamise is "flashier" than manzanita). Large, stand replacement events can interact with seed availability and, hence, influence post-fire successional pathways differently than for smaller, less severe fires. Mean fire return intervals are highly variable across the state depending on species composition and other factors."

2. The LandFire modeling effort suggests a minimum fire return interval of 30 years with a historic average of 50 years. Also, when this vegetation type does burn it is stand replacing 100% of the time.

3. It is our professional opinion that these fire return intervals will shorten in the future based upon published research from both Westerling et al. and Abatzoglou et al.

It is our best (conservative to the atmosphere) professional opinion that the site will grow to approximately 20-ton CO_2e per acre and return to zero 5 times over the 100-year modeling time period, resulting in an estimated average carbon stocking of 8.8 tons over the 100-year period. It is estimated that the potential natural revegetation to maximum 20-year-old conifers (from serotinous cones or episodic seed fall) before the next wildfire, would have very little commercial value before burning again. Since this is a qualitative estimate of the baseline which will be reevaluated with future adjacent unplanted area data, it is appropriate to provide a sensitivity analysis to the primary driving assumption in this estimate. If the counter factual future fire return interval was longer than our estimate, given all the factors remain the same, we estimated using 30 or 50 fire return intervals (as the current LandFire historically derived estimate suggests), the average carbon stocking would range between the 11.3 and 15 tons CO_2e per acre (respectively). Reestablishment of conifer forests in any of these fire -return intervals would not only be unlikely but increasingly so. There are some climate change modelers who predict with such fire return intervals one might see a lifeform change

from forest to shrub and potentially grassland. This qualitative assessment will be replaced to the extent possible when the first inventory is taken and adjacent non-project lands can be measured.

References

Abatzoglou, John T., and A. Park Williams. 2016. Impact of anthropogenic climate change on wildfire across western US forests. Proceedings of the National Academy of Sciences of the United States of America. October.

The Rapid Assessment Reference Condition Model for chaparral from the LANDFIRE project. Reference condition models for the Rapid Assessment were created through a series of expert workshops and a peer-review process in 2004 and 2005. For more information, please visit www.landfire.gov. LANDFIRE (LF), Landscape Fire and Resource Management Planning Tools, is a shared program between the wildland fire management programs of the U.S. Department of Agriculture Forest Service and U.S. Department of the Interior.

Westerling, A. L., H. G. Hidalgo, D. R. Craven, and T. W. Swetnam. 2006. Warming and earlier spring increase Western U.S. forest wildfire activity. Science 313:940–943.

ii. Inventory of Carbon Stocks Affected by Site Preparation

This will be determined at the first inventory.

iii. Baseline Modeling

This will be determined at the first inventory.

iv. Estimating Baseline Carbon in Harvested Wood Products

This will be determined at the first inventory.

5. Project Carbon Stocks

a. Reforestation (Section 6.1)

i. Actual Onsite Carbon Stocks

This will be determined at the first inventory.

ii. Actual Carbon in Harvested Wood Products

This will be determined at the first inventory.

iii. Quantifying Secondary Effects

SPI cannot calculate the complete estimate of Secondary effects (if any) until we establish an inventory for the Project area and the final boundary of the project area. When we actually do the first inventory and establish these values, we will provide complete calculation following Section 6 guidance.
The only Secondary effects applicable value will be using the low 0.090 Metric Tons of CO2e per acre due to the lack of any brush cover after the wildfire for the project area. This value will be multiplied by the final project acreage to establish the estimated Secondary effects. There will be no leakage secondary effects because the project area was not conducted on active cropland and the project area is on lands where harvest of timber has been the historic dominant economic activity. These values will now be provided in the updated “PDD Monitoring Report Project 5.PDF”.

6. Calculation of GHG Reductions and Removals

a. All Project Types

This will be determined at the first inventory.

7. Reversal Risk Rating

a. Reversal Risk Rating by Category

Risk Category	Source	PIA Only	PIA and Qualified Conservation Easement and/or Qualified Deed Restriction and/or Public Ownership
Financial Failure	Default Risk – Remedies for reversals addressed in PIA	5% (Default Value)	1% (Default Value)
Illegal Forest Biomass Removal	Default Risk	0% (Default Value)	0% (Default Value)
Conversion	Default Risk – Remedies for reversals addressed in PIA	2% (Default Value)	0% (Default Value)
Over-harvesting	Default Risk – Remedies for reversals addressed in PIA	Default Risk –	0% (Default Value)
Social	Default Risk	2% (Default Value)	2% (Default Value)
Wildfire	Calculated Risk from worksheet	% (Must be supported per Appendix D Table D.7) or 4% (Default Value)	% (Must be supported per Appendix D Table D.7) or 4% (Default Value)
Disease or Insect Outbreak	Calculated Risk from worksheet	3% (Default Value)	3% (Default Value)
Other Catastrophic Events	Calculated Risk from worksheet	3% (Default Value)	3% (Default Value)

	Subordination Clause Type 2	Subordination Clause Type 1
PIA Subordination Type	10%	2%

b. Project Reversal Risk Rating

This will be determined at the first inventory. This should be calculated according to the following equation:

100% - (1-*Financial Failure%*) x (1-*IllegalForestBiomassRemoval%*) x (1-*Conversion%*) x (1-*OverHarvesting%*) x (1-*SocialRisk%*) x (1-*Wildfire%*) x (1-*Disease/InsectOutbreak%*) x (1-*OtherCatastrophicEvents%*) x (1-*PIASubordination%*)

Initial estimate is:

= 1-(0.95*1*0.98*0.98*0.98*0.96*0.97*0.97*0.98)

= 20.85%