Review of Findings

Selected Terrestrial Sequestration Projects
WESTCARB - Phase II

CLIMATE ACTION RESERVE

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Topics for Discussion

CLIMATE ACTION RESERVE

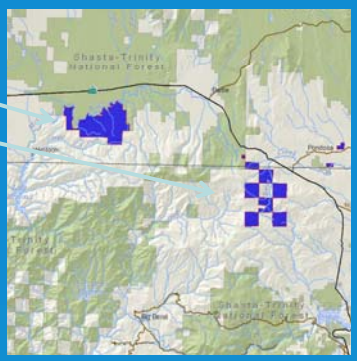
- Issues raised by forestry demonstration projects for improving protocol practicality and effectiveness.
- Summary of issues addressed in latest Climate Action Reserve Forest Project Protocol, Version 3.2.
- Summary of issues needing further work.
- Key insights provided by demonstration projects.
- Suggested projects to assist with future protocol work.

Demonstration Projects

- Bascom Pacific Forest (River Tract and Bear Tract) - Pacific Forest Trust (Final 10/2010)
- LaTour Demonstration State Forest (Sunset and McMullen Projects) -Report Prepared by CAL FIRE (Final Revised 9/2010)
- Winrock/WESTCARB Fire Panel - Report Prepared by Winrock Intl (Final Revised 7/2010)
- Afforestation Projects in Shasta County, CA - Report Prepared by Winrock Intl (Final 9/2010)

Bascom Pacific Forest

- Improved Forest Management Project (Restricted Harvest)
- River Tract – 4,859 Acres
- Bear Tract – 4,344 Acres
- Siskiyou and Shasta Counties, Northern California
- Primarily Mixed Conifer Forests
- 90% Acreage Managed for Timber Production
- Perpetual Conservation Easement/Pacific Forest Trust



Bascom Pacific Forest - Findings

CATEGORY	ISSUE	REVISIONS IN FPP 3.2
Carbon Stocks Inventory - Expense with Variance From Standard Timber Inventory Practices	Statistical Confidence Requirements Higher	Allows for up to 5% Sampling Error with No Deduction
	Inclusion of Standing and Down Dead Biomass Too Expensive	Eliminated Requirement for Measuring Down Dead Biomass.
	Permanent Marking of Plot Centers Too Expensive	Eliminated Requirement for Permanent Marking of Plot Centers
Carbon Stocks Inventory - Accuracy	Jenkins Equations for MBF Conversion to Carbon Too Generalized	Diameter-Only Jenkins Equations No Longer Allowed, Replaced by Species-Specific FIA Equations
Entity Level Reporting	Potential Costs (Not An Issue with Bascom Project Where Entity and Project are Same)	Eliminated Requirement for Entity Reporting
Overall Project Costs Related to Project Scale	Need for Collaboration Among Smaller Landowners	Publication of the Reserve Guidelines for Aggregating Forest Projects

Bascom Pacific Forest - Findings

CATEGORY	ISSUE	REVISIONS IN FPP 3.2
Baseline Characterization – Timeframe Distortions	Fluctuations Caused by High Intensity Removal Followed by Period of Growth	Use of Averaged Baseline to Remove Fluctuations and Provide Consistent On-Site Inventory Levels
	Accounting for Early Termination with Use of Averaged Baseline	Use of Compensation Rate (>1:1) Required in cases of Early Termination (< 50 years after Effective Date)
Baseline Characterization - Reference Point	On-The-Ground Experience Indicates Higher Average Stocking than Predicted by Prevailing Regulation	Use of "Common Practice" Benchmark with Credit for Sustained Increases in Stocks While Below that Level
	National FIA dataset varies in Consistency and Intensity of Sampling	FIA not Used for "Common Practice" Unless Standard Error Estimates for FIA Data are Acceptable
	Application Outside of California	Methodology Now Applicable To Forest Types and Locations Anywhere in the United States

Bascom Pacific Forest - Findings

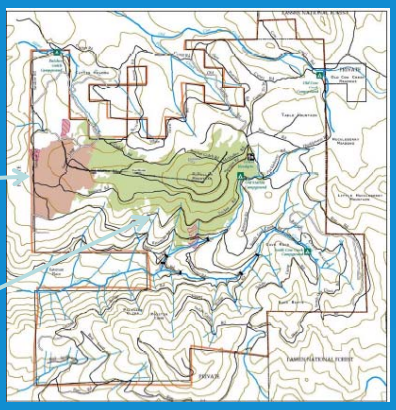
CATEGORY	ISSUE	REVISIONS IN FPP 3.2
Project Activity Modeling – Accuracy	Need for Recalibration Over Time	Modeling of Project Activity No Longer Required, Now Require Annual Update of Inventory Estimates
Harvested Wood Products – Accuracy	Lack of Rigor, Uncertainties	Use of Published Default Factors for Mill Efficiency by Region and 100-Year Average Storage Factors by Product Class Accounting for landfill only when conservative to do so (no crediting)
Harvested Wood Products – Fluctuations	Timing of Harvest has More Impact Than Volume of Harvest	Use of Averaged Baseline Includes Average of Harvested Wood
Permanence – Reliable Loss Estimates	With Short Project History, Difficult to Reliably Estimate Project Risk	Use of Minimum Risk Buffers to Address Unavoidable Reversals (9% with Qualified CE and/or Deed Restriction or Public Ownership; 17% with PIA only); Contractual Remedies to Address Avoidable Reversals

Bascom Pacific Forest - Findings

CATEGORY	ISSUE	REVISIONS IN FPP 3.2
Permanence – Ownership and Management Changes	Need for Multiple Legal Instruments to Mitigate Risks	Contractual Obligations and Remedies Carry Over to Successors and Assigns
	Duration of PIA (100 years) versus Ongoing Landowner Obligations (>100 years)	The PIA is Updated When Credits are Issued so Each Credit is Assured a 100 year Monitoring and Reversal Obligation
Verification – Expense	Need for Clear Policies and Guidance	Added Guidance on 6-Year Intervals for On-Site Verification and Interim Desk Verification

LaTour Demonstration State Forest

- Improved Forest Management (IFM) and Reforestation Projects
- Public and Private Land Scenarios
- Sunset 428 Acres
  - Reforestation = 10 Acres
  - Predom. Ponderosa Pine
- McMullen Mtn 1,211 Acres
  - Reforestation = 19 Acres
  - Predom. White Fir
- Shasta County, Northern California

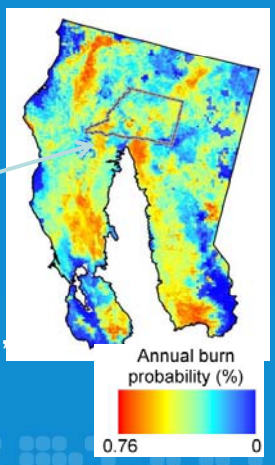


LaTour Projects - Findings

CATEGORY	ISSUE	REVISIONS IN FPP 3.2
Project Type - Mix	Stratification of Project into Different Project Types (Reforestation and Improved Forest Management)	Acreage under Different Project Types Required To Be Submitted As Different Projects Due to Complexities in Pro-Rating Baselines and Other Requirements
Economic Feasibility	Reforestation Projects Not Economically Viable on Either Private or Public Lands	Allows for Deferral of Inventory Work
	IFM Projects Not Economically Viable on Public Lands	Projects Must Continue to Show Additionality following Guidelines for Determining Baselines on Public Lands
Fuels Treatment	Analysis of Benefits to Carbon Management	Includes Adjustment to Reversal Risk Rating with Fuel Treatments

Winrock International and WESTCARB Fire Panel

- Potential for new project type involving fuel reduction treatments
- Literature review, consultation with fire experts, and analyses of fuel treatment projects
  - Shasta County, CA
  - Lake County, OR
- Evaluated: fire emissions, fuel treatment emissions, forest growth, retreatment, and fire risks with/without treatments including intensity and spread

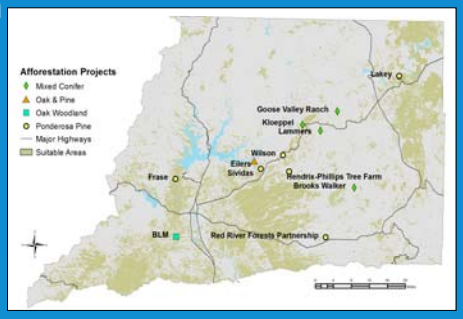


Winrock International and WESTCARB Fire Panel - Findings

CATEGORY	ISSUE	REVISIONS IN FPP 3.2
Potential New Project Type To Address Fire Emissions from Forestlands	Reduction of GHG Emissions from Wildfire through Hazardous Fuels Reduction Combined with Fuel Removal to Biomass Energy Facility	Not an Eligible Project Type; Emissions from Fuel Treatments Combined with Low Probability of Fire on a Given Acre of Land Prevent a Workable Carbon Offset Methodology.
Protection of Co-Benefits	Enhancing Forest Health, Protecting Wildlife Habitat and Watershed Benefits	Only Incentive Currently Provided in FPP: Calculation of Reversal Risk Rating Incorporates a Discount (i.e., 2%) if Fuel Treatments Have Been Implemented

Afforestation Projects in Shasta County, CA

- 12 Reforestation Projects
- 476 acres ranging in size from 7-98 acres
- Range of elevations (500'-5,400') and site classes (very low site to IV Dunning)
- Pre-project cover: recent burn to dense Manzanita
- Winrock Partners: Western Shasta Resource Conservation District and WM Beaty and Associates



Afforestation Projects- Findings

CATEGORY	ISSUE	REVISIONS IN FPP 3.2
Reforestation Projects - Economic Feasibility	Feasibility Dependent on Project Size	Publication of the Reserve Guidelines for Aggregating Forest Projects
	Lag Time Between Initiation of Planting and Positive Carbon Balance	Allows for Deferral of Inventory Work
Reforestation Projects – Landowner Participation	Conservation Easement Requirement	Eliminated as a Requirement for Reforestation and Improved Forest Management Projects
Reforestation Projects – Baseline Carbon Stocks	Determining Shrub Biomass – Feasibility and Levels of Uncertainty	Shrub Biomass Still Required -Can be a Significant Source of Carbon Emissions during Site Preparation Operations
Reforestation Projects – Biomass Fuels Produced by Site Prep Work	Relatively Few Contractors with Equipment and Expertise to Produce Clean Biomass for Energy Facility	Needs to Be Addressed, Outside Scope of Current Protocol Work

Issues Addressed in FPP 3.2 - Costs

- Reduced Costs of Required Inventory Work:
  - 5% Sampling Error Allowed Without Deduction
  - Eliminated Required Sampling of Dead, Down Biomass
  - Eliminated Permanent Marking of Plot Centers
  - Eliminated Required Entity Reporting
  - Deferral of Inventory for Reforestation Projects
  - Clarified Verification Guidelines
- Published Reserve Guidelines for Aggregation
- Eliminated Conservation Easement Requirement for Reforestation and IFM Projects
- Eliminated Required Project Activity Modeling

Issues Addressed in FPP 3.2 – Baselines and Permanence

- Improved Baseline Characterization:
  - Use of Average (with adjustments for early termination)
  - Use of "Common Practice" (where FIA Data Acceptable)
  - Applicable Throughout United States
  - Published Default Factors for Harvested Wood Products
- Permanence Adjustments:
  - Use of Minimum Risk Buffers
  - Discount for Risk Rating with Fuel Treatments
  - Update of PIA whenever Credits are Issued

Issues Unresolved Through Scope of Protocol Revisions

- Stratification of project into different project types.
- Economic viability of Reforestation Projects.
- Economic viability of IFM Projects on public lands.
- Accounting methodology/viability of projects that reduce risks of emissions from wildfire.
- Accurate and efficient measurement of shrubs and herbaceous understory.
- Production of clean forest biomass for energy facilities.

How Projects Provided Insight

- Findings validated the potential of the forest projects under the CAR protocol to provide emissions reductions assuring additionality.
- WESTCARB participants involved in the CAR stakeholder group and directly influenced development of revised protocols (3.0, 3.1, and 3.2).
- Findings pointed out areas than need further work (i.e., shrub and herbaceous understory measurement).
- Research provided key discovery on fuel treatment carbon trade-offs.

Suggested Future Projects

- Further work on post-harvest wood products carbon flows (tracking chain of custody, accounting for secondary emissions, rates of decay in landfills).
- Improve guidance for measurement techniques for shrubs and herbaceous understory carbon to estimate as accurately and efficiently as possible.
- Improve ability to estimate management effects on soil carbon – both for crediting purposes and for accurate accounting of emissions.

Suggested Future Projects

- Explore methodologies to define additionality with Reforestation Projects on abandoned agricultural fields with evidence of natural regeneration.
- Need pilot projects to refine estimates of risk with Avoided Conversion Projects.
- More projects which analyze and quantify carbon trade-offs with management activities to reduce wildfire risk (different kinds of fuel treatments, use of biomass from fuel removal in energy facilities, etc.).