WESTCARB Annual Business Meeting

Emissions Reductions Through Conservation-Based Forest Management

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Scottsdale, AZ
September 15-17, 2009

Road map

- Project overview
- Results
- Lessons learned
- Project conclusions
- Implications of protocol revisions

Project Overview: Purposes

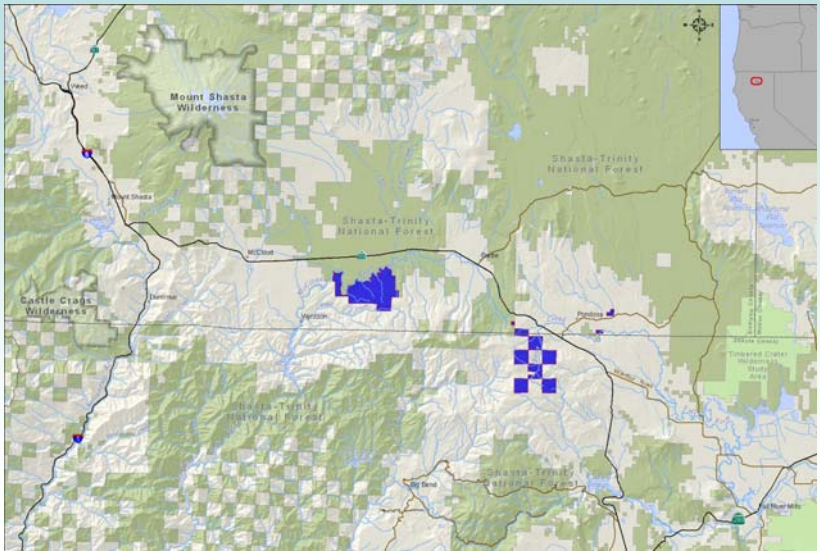
Quantitative Assessment:

- Existing C stocks
- Potential emissions reductions
- Methodology based on Forest Project Protocols (FPP) v2.1 of the California Climate Action Registry

Qualitative Assessment:

- Practicality and effectiveness of FPP in determining C stocks and emissions reductions
- Ability of FPP to address standard GHG accounting principles (e.g. baseline, permanence)

Project Overview: Location



Project Overview: Setting

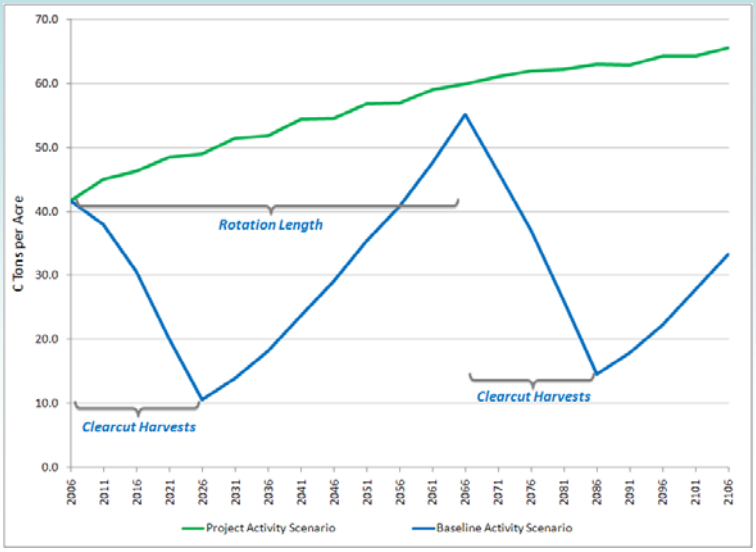
- Mixed conifer forest – ponderosa pine, sugar pine, incense cedar, white fir and black oak
- ~10 MBF/acre
- Managed for commercial timber production
- History similar to other nearby commercial properties
  - Managed at or near regulatory standards
  - Even-aged silviculture

Project Overview: Quantitative Analysis

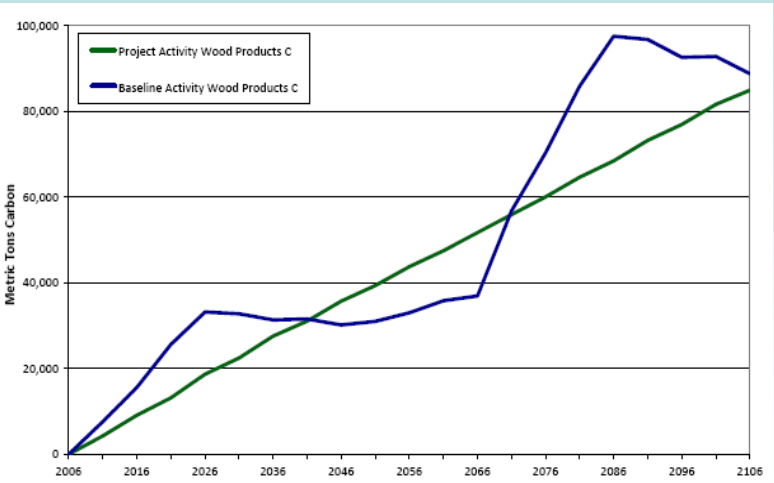
- Measurement of initial existing C stocks
- Calculation of anticipated emissions reductions by comparing baseline activity projection to project activity projection (100 years)
- Baseline = Regulatory standards (CA Forest Practice Rules, Endangered Species Act, etc.)
  - Minimum rotation length for even-aged management (e.g. 60 year rotation for Site II lands)
  - State-mandated stream buffer widths
- Project = Conservation easement restrictions
  - Harvest 80% of growth until 25 MBF/acre stocking achieved
  - Stream buffers extended
  - Retention standards
- Comparison of projected and measured C stocks

Results C Stocks

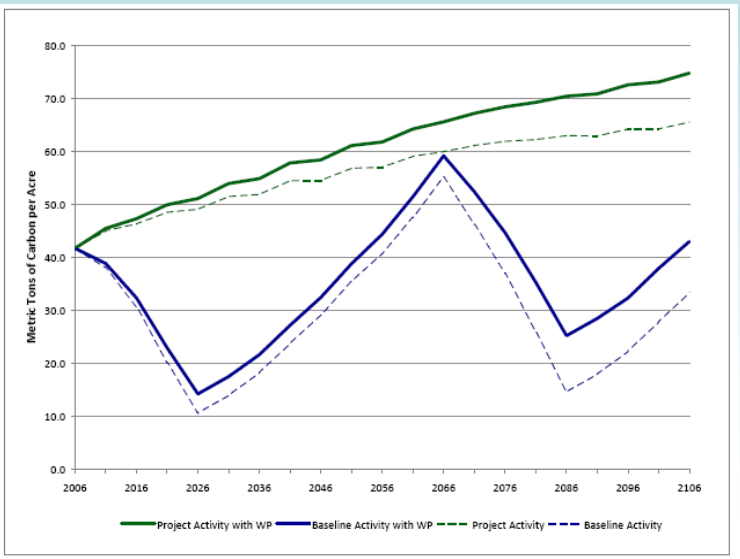
~1 Million tons CO_2e



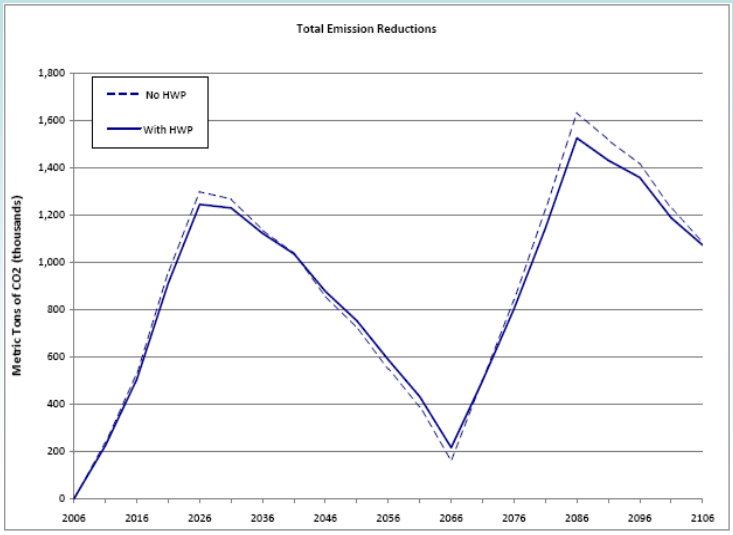
Results Harvested Wood Products C Stocks



Results Effects of harvested wood products on C stocks



Results Effects of harvested wood products on ERs



Results 2008 Project Stocks Monitoring

	Total mt C	Per acre mt C
2006 Starting Stocks	384,172	41.7
2008 Projected Stocks	396,280	43.3
2008 Measured Stocks	428,684	47.2

Carbon Pool	Total C (mt)			% Change from 2006 to 2008	
	2006	2008			
		Projected	Actual	Projected	Actual
Live Tree	368,544	380,653	402,457	3.3%	9.2%
Standing Dead Tree	3,142	3,142	8,275	0.0%	163.4%
Lying Dead Wood	12,486	12,486	17,952	0.0%	43.8%
Total	**384,172**	**396,280**	**428,684**	**3.2%**	**11.6%**
Wood Products	0	1,727	184	n/a	n/a
Total	**384,172**	**398,007**	**428,868**	**3.6%**	**11.6%**

Lessons Learned

- FPP's basic methodology and guidance is effective
- Measurement requirements exceed conventional timber inventory standards
  - Live trees ≥3" DBH (here, <3% of total live tree pool)
  - Standing dead and lying dead pools
  - Increases inventory cost
- Monument plot centers for revisitation
  - Not overly burdensome, but not preferred
  - Difficult to relocate in some forest types
  - Also increases inventory cost

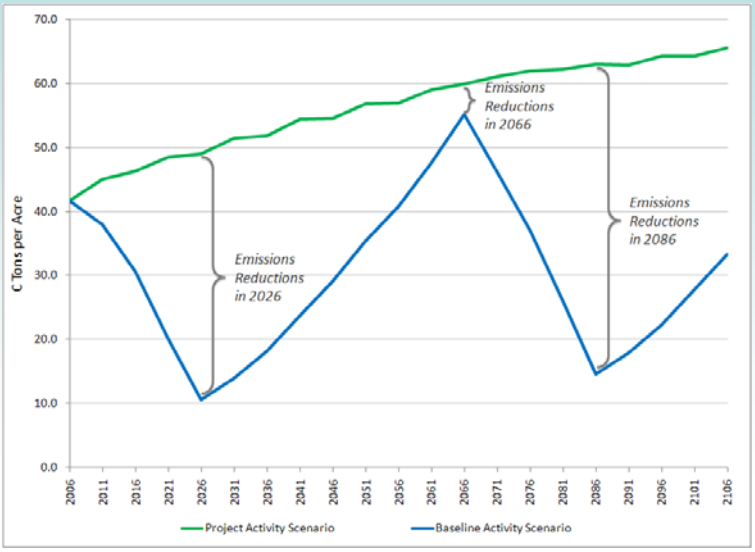
Lessons Learned (*cont'd*)

- Allometric biomass equations should be updated
  - Currently based on national-level broad species groups that consider only DBH
  - Local species-specific equations available that consider both DBH and height
- Projections for baseline are good in principle
  - Specific standards for establishing baselines
  - But, accounting issues due to changes in baseline stocks
  - "Average" baseline value to determine emissions reductions

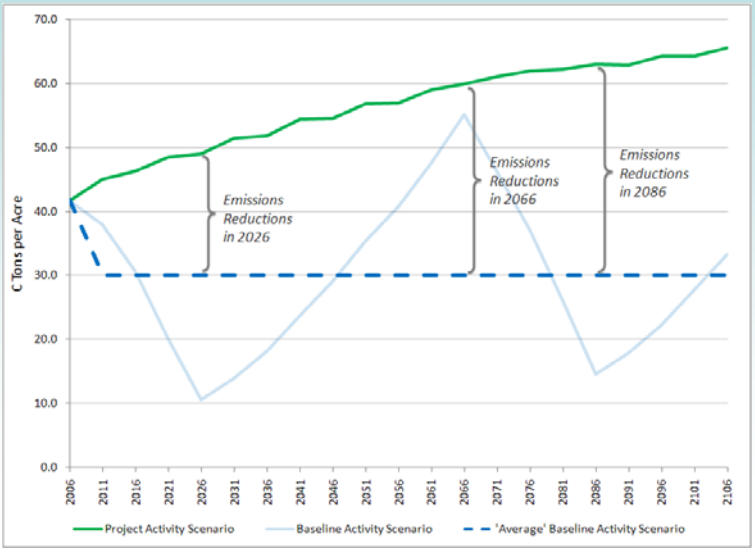
Lessons Learned (*cont'd*)

- HWP can have relatively small effect on ERs
  - Total ERs dropped by 1.3% with inclusion of HWP
  - Project and Baseline harvest are similar in this case
    - Baseline harvest is +6.8%
  - Larger discrepancy in harvest volumes could cause a material reduction in ERs
- Projected C stocks underestimated measured stocks
  - Some variance expected
  - Supports approach of requiring reporting of actual stocks

Lessons Learned (*cont'd*)



Lessons Learned (*cont'd*)



Conclusions

- FPP's basic methodology and guidance is practical and effective
  - Consensus on recommended improvements to measurement guidance and biomass equations, baseline accounting
- Increased inventory costs
  - May require retrofitting existing inventory
- ~1 million tons of additional CO_2e
- HWP can have minimal effect on ERs
- Periodic inventory sampling provides better depiction of C stocks than model projections
- Project requires detailed work, but can more than pay for itself

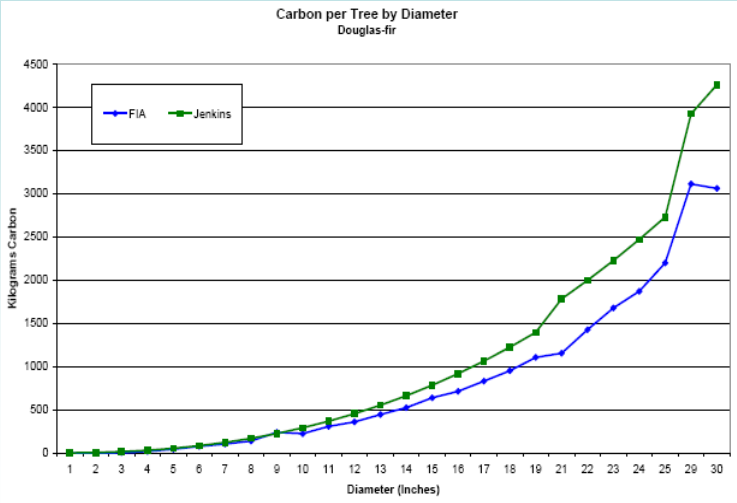
CAR Forest Project Protocol Revisions FPP v 3.0

- Adopted by CAR 9/1/09
  - National protocol
- Revised definition of BAU baseline
  - FIA mean represents common practice
- New biomass equations
- Revised sampling requirements
  - 5" minimum diameter
  - Temporary monumenting of sample points
- New method for calculating HWP
  - Required pool

CAR Forest Project Protocol Revisions FPP v 3.0

- Reduced frequency of verification site visits
  - Desk reviews for interim verification
- Revised requirements for permanence
  - CE not required
  - Project Implementation Agreement
- Expanded definition of natural forest management

Effects of Project Protocol Revisions FPP v 3.0



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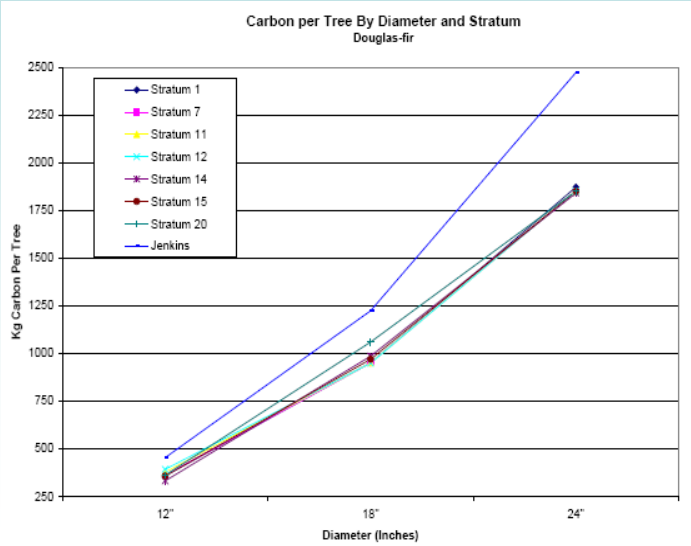

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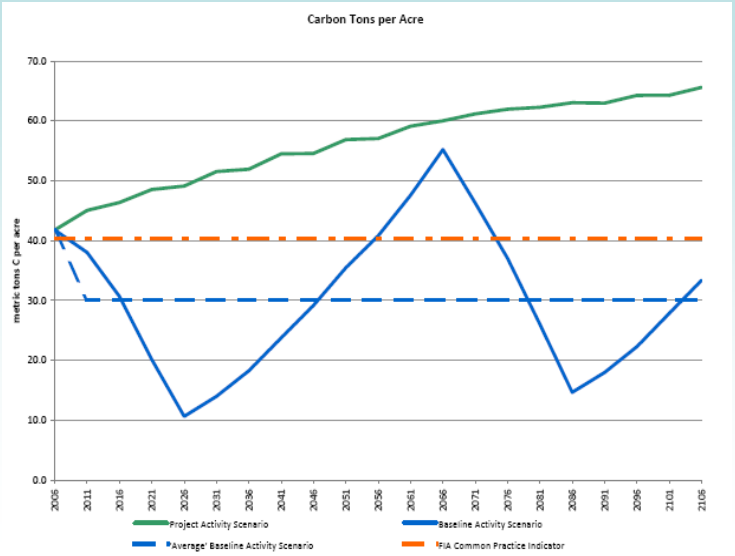

Effects of Project Protocol Revisions FPP v 3.0

- Revised Baseline
  - FIA mean > CA FPRs
    - Fewer reductions
  - Averaged values
    - Better accounting
- Improved estimation of biomass
  - Species and region specific equations
- Less cumbersome calculation of HWP
- Potential cost savings compared to previous version
  - Reduced frequency of verifier site visit
  - Sampling method more aligned with conventional timber sampling
- Better guidance overall for project developers

Thank you

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