

# Carbon Sequestration Potential of the Elliott State Forest Under Different Management Scenarios



Presented to Western Forest Economists

May 11, 2011

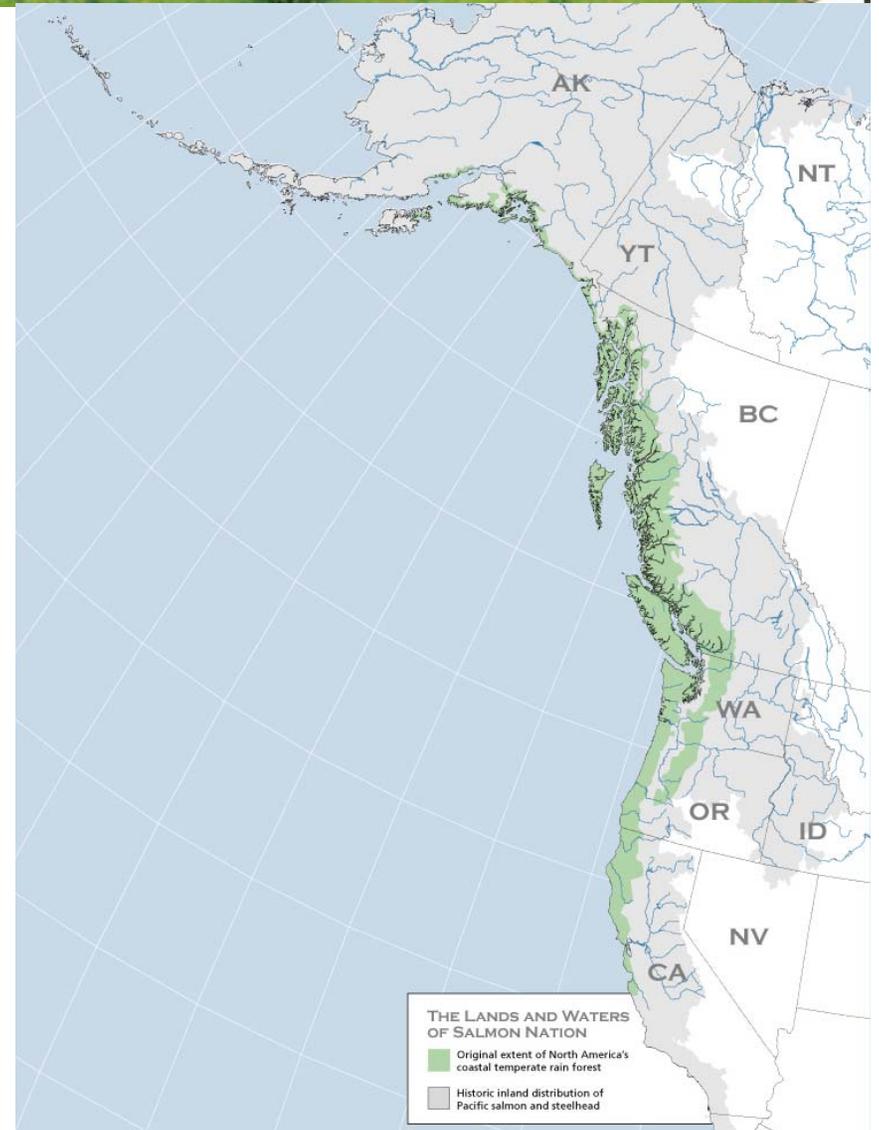
By Brent Davies





- Ecotrust

- Ecotrust's mission is to inspire fresh thinking that creates economic opportunity, social equity and environmental well-being.



# Ecotrust

- Non-profit organization working to build a conservation economy balancing economy, ecology, and equity (3E)
- Sector programs – fisheries, forestry, food & farms, community ecosystem services
- Focus on practical solutions to address resource management issues



# Project Goals

**PROJECT SUMMARY:** Evaluate the carbon sequestration of the Elliott State Forest under ODF's proposed Habitat Conservation Plan and three different harvest levels (30, 35, 40 MMBF/year)

**PURPOSE:** Provide information about the volumes of carbon that could be stored on the Elliott State Forest under different management regimes

**RATIONALE:** Current management planning does not evaluate carbon sequestration as one of the ecosystem services the state forests provide

# Oregon Strategy for Greenhouse Gas Reductions

- By 2010, arrest the growth of Oregon's greenhouse gas emissions and begin to reduce them, making measurable progress toward meeting the existing benchmark for CO<sub>2</sub> of not exceeding 1990 levels.
- By 2020, achieve a 10 percent reduction below 1990 greenhouse gas levels
- By 2050, achieve a "climate stabilization" emissions level at least 75 percent below 1990 levels.



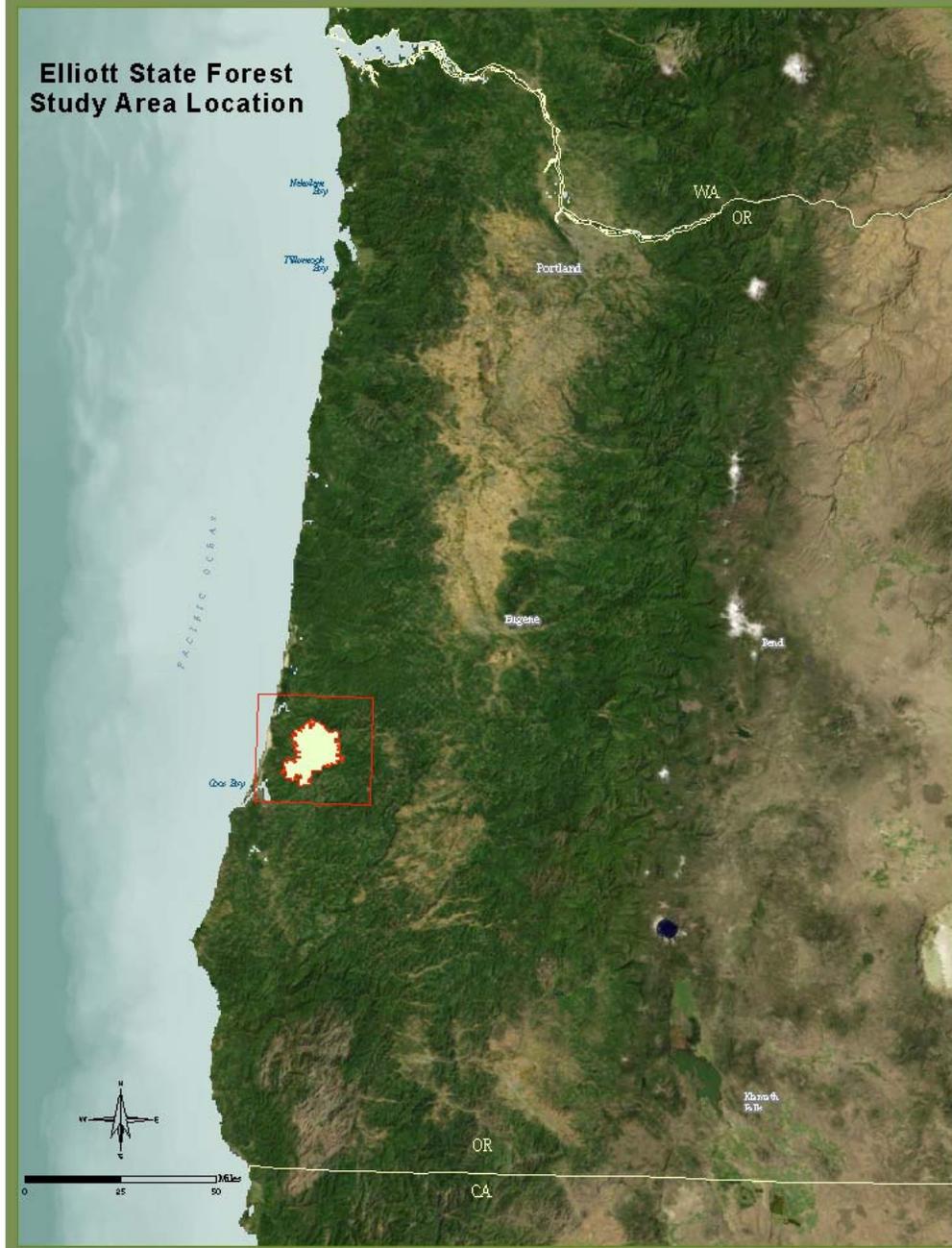
# Governor's Advisory Group (2004)

- Considered forestry sector “low hanging fruit”
- Did not consider changes to management planning on public or private forests
- Estimated 4.3 MMtCO<sub>2</sub>e annual reduction from biological sequestration actions
  - wildfire risk reduction
  - reduced deforestation and soil degradation, and
  - afforestation of unproductive lands capable of growing forests.

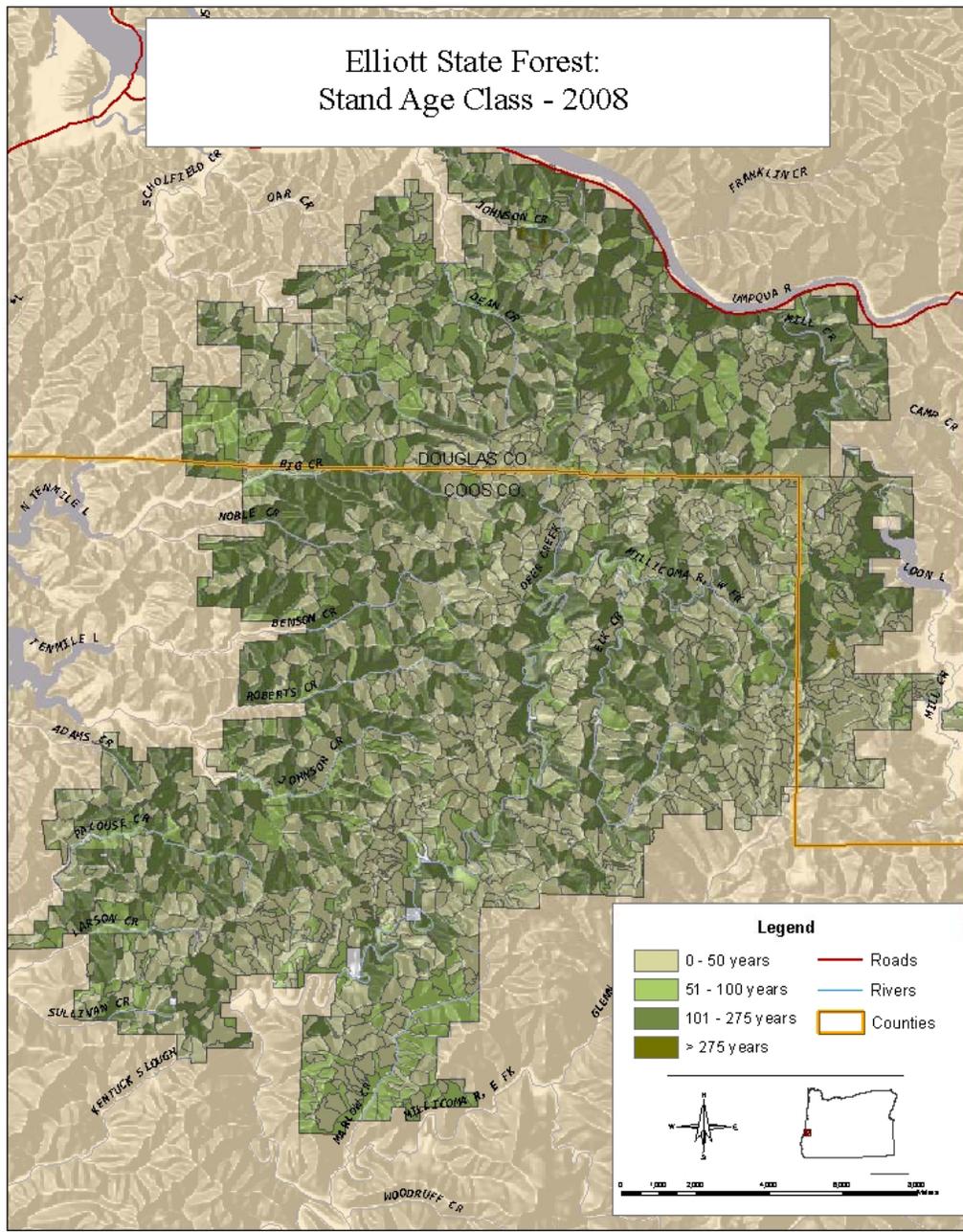
# Forestry Working Group (2010)

- Did not establish numerical sequestration targets
- Two categories of recommendations
  - *Carbon Inventory*
    - Establish a carbon inventory for all Oregon forests.
  - *Public Forests – Existing State Forestlands Management*
    - All timber management planning and public forest transactions (e.g., timber sales, offset sales) should include net impact on Oregon's carbon account.
    - Oregon State forestlands should be managed to increase carbon stores over time, consistent with ecosystem values and yield of durable forest product.

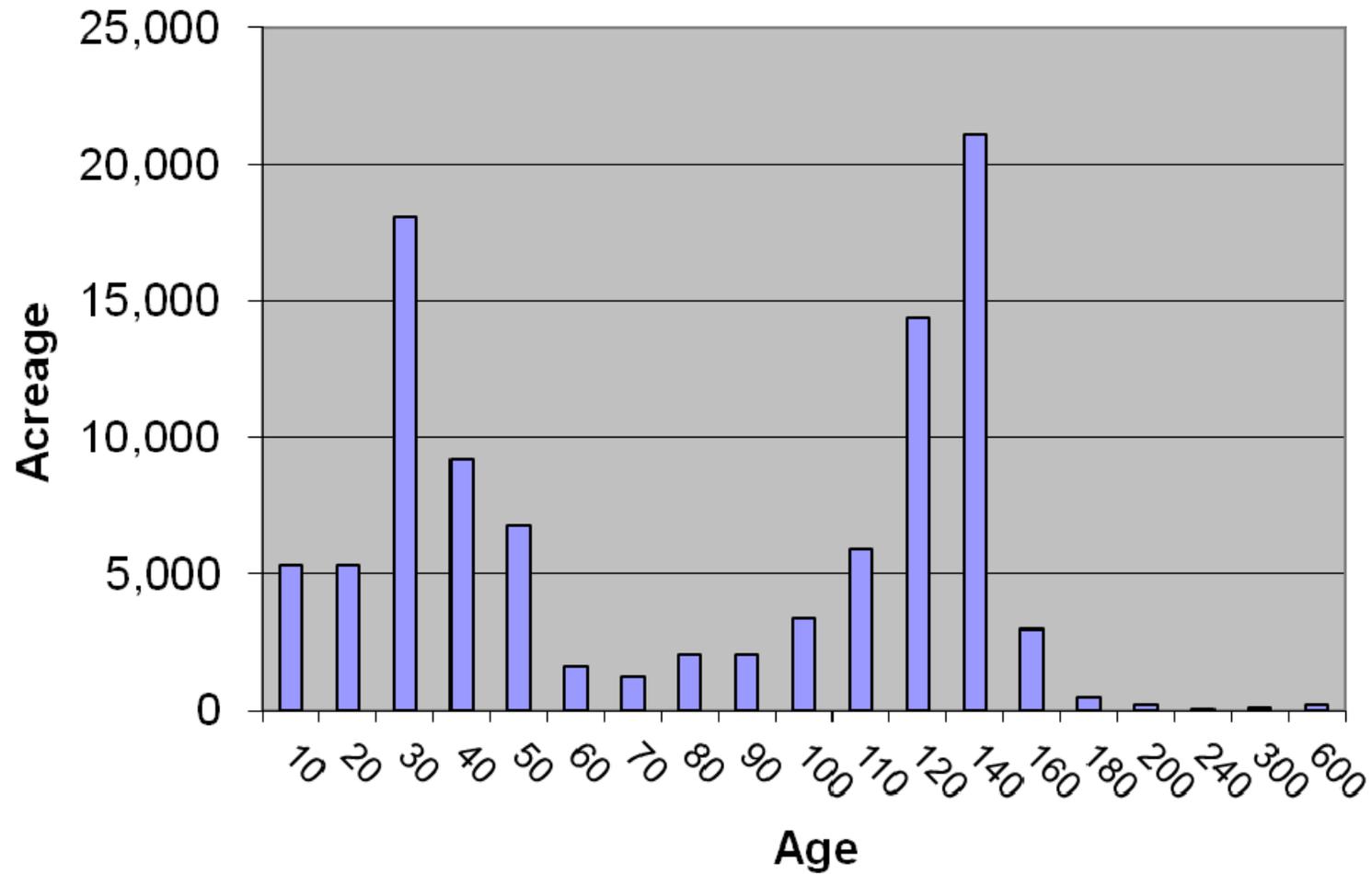
## Elliott State Forest Study Area Location



# Elliott State Forest: Stand Age Class - 2008



## Elliott Age Class Distribution



# Analytical Process

- Select a recognized and applicable third-party forest carbon offset protocol
- Adapt the protocol to management circumstances on the Elliott State Forest
- Define carbon pools to be included in the analysis
- Model carbon storage over time, following management prescriptions and optimizing harvest schedules
- Calculate carbon storage on the forest, while accounting for storage in wood products
- Provide context for evaluating the results

# Climate Action Reserve (CAR)

- Applied the Improved Forest Management Methodology v3.1
- Calculated carbon pools required by the protocol
- Provided regional averages for analysis
- Did not evaluate the private or public lands baselines as defined by CAR
- Did not include leakage assessments

# Carbon Pools Modeled

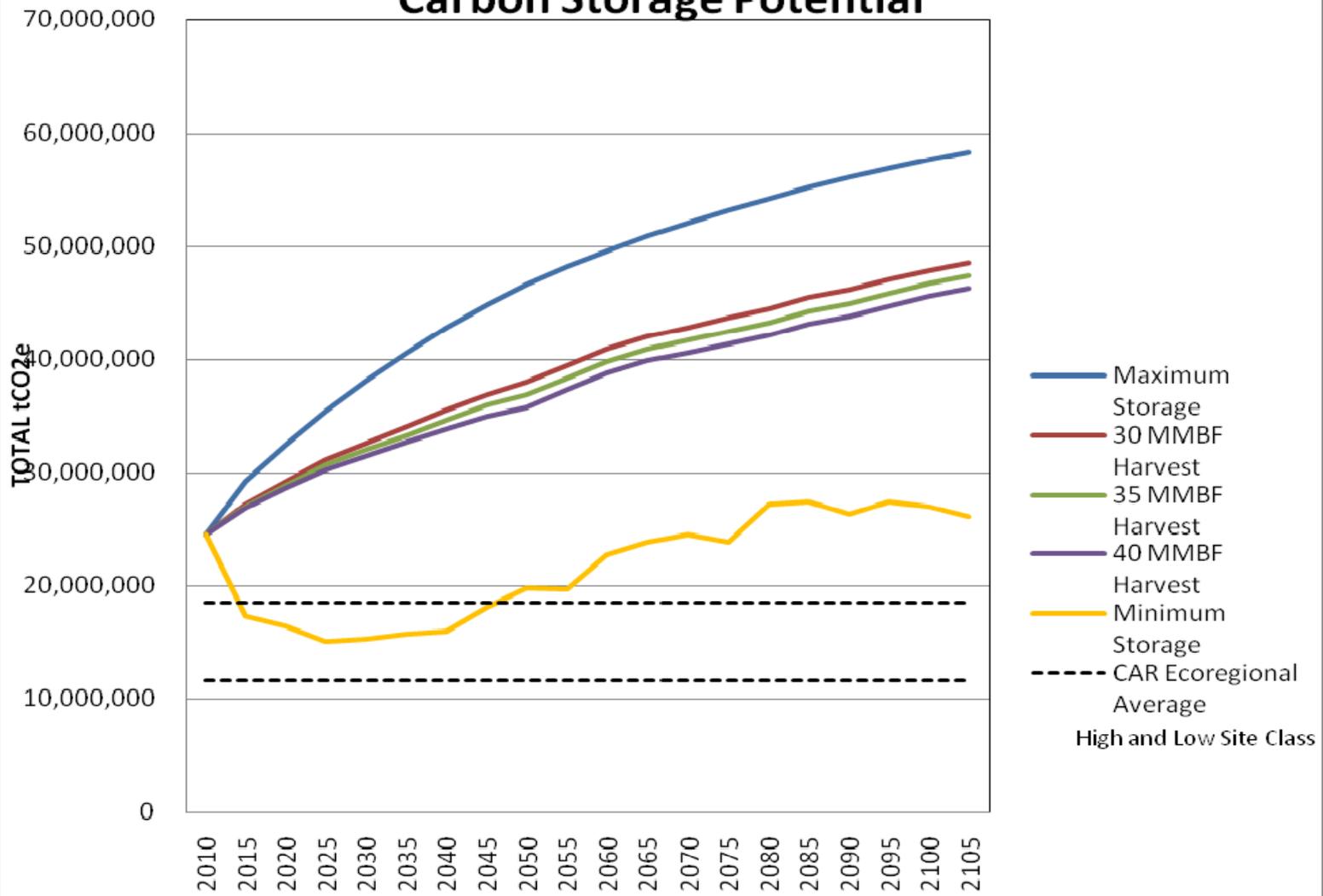
- Standing live trees
  - Above ground biomass
  - Below ground biomass
- Standing dead trees (no downed woody debris)
  - Above ground biomass
  - Below ground biomass
- Harvested timber stored in:
  - Wood products
  - Landfills

# Modeled Scenarios and Reference Points

- No harvest
- Habitat Conservation Plan prescriptions and
  - 30 MMBF annual harvest
  - 35 MMBF annual harvest
  - 40 MMBF annual harvest
- Private land allowable harvest
- Climate Action Reserve regional averages (high and low site class)

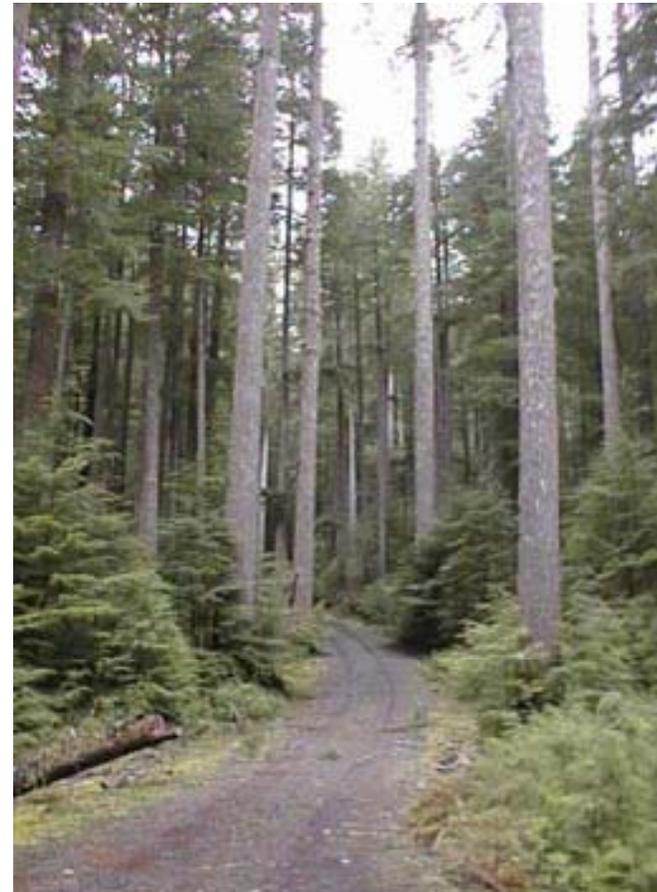


## Carbon Storage Potential

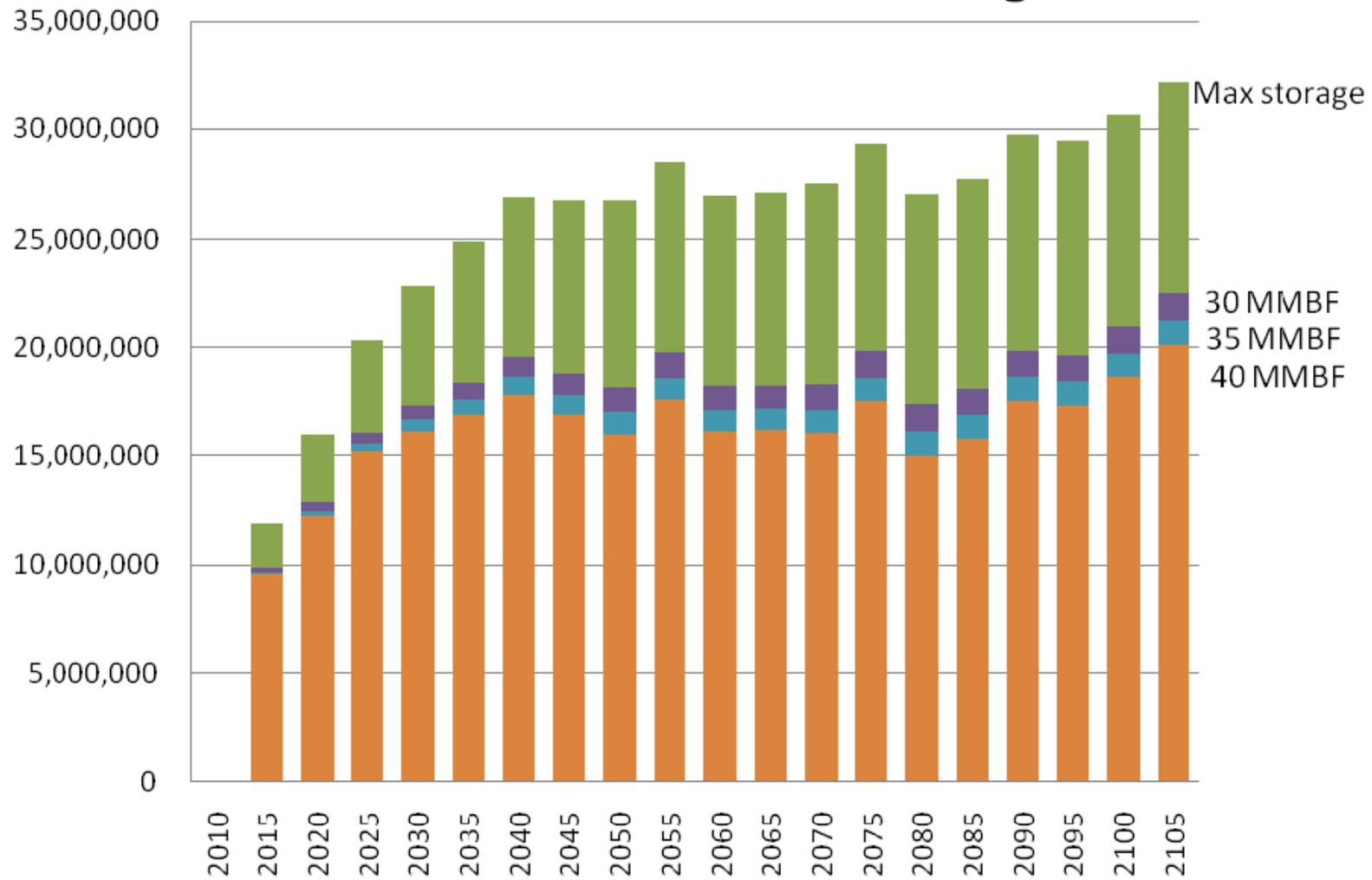


# Cumulative Totals

If no harvests were to occur on the Elliott State Forest, the total amount of carbon stored would be approximately 47 million metric tonnes of carbon dioxide equivalent (MMtCO<sub>2</sub>e) by 2050, approximately 67% of the annual emissions of greenhouse gases for the entire state in 2005 (70 MMtCO<sub>2</sub>e).



## Additional Carbon Above Min Storage Scenario



# Cumulative Totals

Comparing a no harvest scenario with a private lands allowable harvest scenario

- An additional 27 MMtCO<sub>2</sub>e by 2050 (approximately 39% of the total greenhouse gas emissions for the state of Oregon in 2005)

Comparing the HCP management scenarios with a private lands allowable harvest scenario

- An additional 16-18 MMtCO<sub>2</sub>e by 2050 (approximately 23-26% of total greenhouse gas emissions for the state of Oregon in 2005)

## Annual Rate Reductions (compared against a baseline harvest 40MMBF)



# Annual Totals

Taking the HCP prescriptions and three harvest levels:

- switching management from the 40 MMBF harvest scenario to the 30 MMBF will save the equivalent amount of greenhouse gases as removing approximately 10,000 cars from United States' highways for a year.
- switching management from the 35 MMBF harvest scenario to the 30 MMBF will save the equivalent amount of greenhouse gases as removing approximately 4,800 cars from United States' highways for a year.

# Conclusions

- PNW forests have the capacity to sequester a significant amount of carbon dioxide under active and passive management scenarios
- If the State of Oregon could afford to delay harvest for 10-30 years, it could achieve its 40 MMBF per year harvest target and continue to increase the level of carbon sequestration into the future

# Questions?

What are the opportunities to compensate public forest owners for making changes in management practices (increasing conservation measure) to help mitigate against the effects of climate change?

# Thank you!

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# Small Landowner Aggregation

## Aggregated FSC Certified Forest (1238 acres)

