Conservation Banking as a Market-Based Incentive for Recovery of T&E Species

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The Katoomba Group

"Markets for Carbon and Ecosystem Services: The Business Case"

Adam Davis, Director, Environment Division

www.eprisolutions.com/environment

Introduction

- Ecosystem Services theory, in practice
  - Supply and demand = financial value
  - However: ‘demand’ by private parties for ‘public goods’ is mediated primarily by law (to a lesser extent by strategy and ethics)
  - Therefore: Financial value depends on policy and enforcement
- Opportunities
  - Wetlands and stream mitigation
  - Carbon sequestration
  - Conservation Banking for T&E species

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For today…

- A bit on Conservation Banking
- A bit on the STREAM economic model
- An example of a real deal
- Some observations

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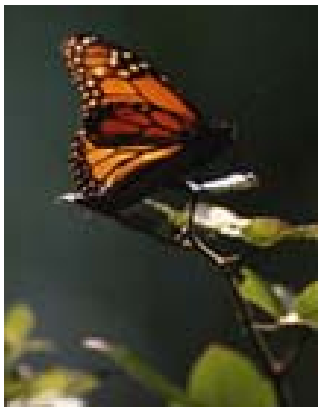
What are Eco-Assets?

"Eco-assets" are environmental features that provide financial value to private landowners when they are maintained in, or restored to, their natural state.



- Wetlands
- Forests
- Endangered species
- Rivers & watersheds
- Riparian and upland habitat

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Conservation Banking

- Endangered Species Act issues
  - 1982 amendments to ESA provided for an "incidental take" of listed species, if "a landowner provides a long-term commitment to species conservation through the development of a Habitat Conservation Plan (HCP)."
  - Incidental take permits are applied for under Section 10(a)(1)(B) of the ESA . (Section 7 applies to Federal lands.)
  - As of April 10, 2003, 541 HCP's have been approved, covering approximately 38 million acres and protecting more than 525 endangered or threatened species.

What is Conservation Banking? (1)

- "Land containing natural resources, which is conserved and managed in perpetuity for specified listed species and used to offset impacts occurring elsewhere to the same natural resource values on non-bank lands."
- A private party requesting an incidental take permit from FWS can purchase "species credits" from pre-established conservation banks, to provide mitigation for the take.

What is Conservation Banking? (2)

- FWS issued conservation banking guidance on May 2, 2003, to help FWS personnel:
  - Evaluate the use of conservation banks to meet the conservation needs of listed species;
  - Fulfill the purposes of the ESA; and
  - Provide consistency and predictability in the establishment, use and operation of conservation banks.
- There were 10-15 banks in U.S. prior to guidance.
- CA issued banking guidance in 1995. There are approximately 50 conservation banks in CA.

Conservation Bank Components

- Credit unit: Individuals, breeding pairs (RCW), acres (vernal pools), nest site, family unit.
- Service area: Area over which the credits can be bought or sold. May be entire species range, a portion of the range or a watershed.
- Long-term assurances:
  - Establish a conservation easement or transfer fee title so that land is put into conservation in perpetuity, even after credits are sold or species is delisted.
  - Must have a long term management and monitoring plan, and funding assurances to ensure habitat is maintained for species use.

FWS Requirements for Conservation Banks

- Credit issuance: “Must be expressed and measured in the same manner as the impacts of the development projects that will utilize the bank”
  - Acres for acres
  - Breeding pairs for breeding pairs
  - Intact populations for intact populations
- Service territory: Area in which bank credits may be used to offset project impacts
  - Based on conservation needs of species being conserved
  - Existing FWS ‘recovery areas’ from recovery plans
  - Credits may be sold to projects outside of recovery areas if they impact the same species

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STREAM Model Purpose (1 of 2)

- To analyze and compare on a *financial basis* different land management options, including eco-assets development.

- STREAM 2.0 can analyze three types of eco-asset investment projects, and compare each to a "base case."
  - Forest carbon sequestration
  - Wetland & stream mitigation
  - Endangered species conservation "banking"

STREAM Model Purpose (2 of 2)

- STREAM 2.0 is:
  - A computer simulation model that can be used to conduct *cash-flow* and *financial risk analysis* of proposed eco-asset investment projects.
  - A sophisticated *land management planning tool* that can help electricity utilities and others to optimize land management activities.

- STREAM 2.0 is not:
  - An eco-asset production model that can be used to estimate physical eco-asset production, such as the amount of carbon sequestered in a forest over time.

STREAM 2.0 Features

Assumptions & Input Data

- Assumptions
  - Corporate Financial
    - Discount rate(s)
    - Effective corporate tax rates
  - Analytic Assumptions
    - Sensitivity analysis parameters
    - Scenario definitions
    - Optionality parameters
    - Market opening values & parameters
- Project-level Input Data
  - Financial
    - Eco-asset “credit” prices and risk
    - Commodity prices
    - Annual capital & O&M costs
    - “Optional” eco-asset management
  - Eco-asset & related commodity production
    - Expected timing
    - Expected production quantities

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STREAM 2.0 Features

Risk & Uncertainty

- Automated *sensitivity analysis* of critical variables
  - Real discount rate
  - Initial eco-asset prices
  - Price uncertainty
  - Annual real appreciation rate
  - Expected eco-asset production levels
- Automated *scenario analysis* compares a "default" scenario with three user-defined alternatives
- *Monte-Carlo simulation* for uncertain variables
  - Key variables can be defined as probability distributions rather than single "best guess" estimates
  - Results are shown as ranges of forecast values
  - Simulations include 1,000's of individual trials

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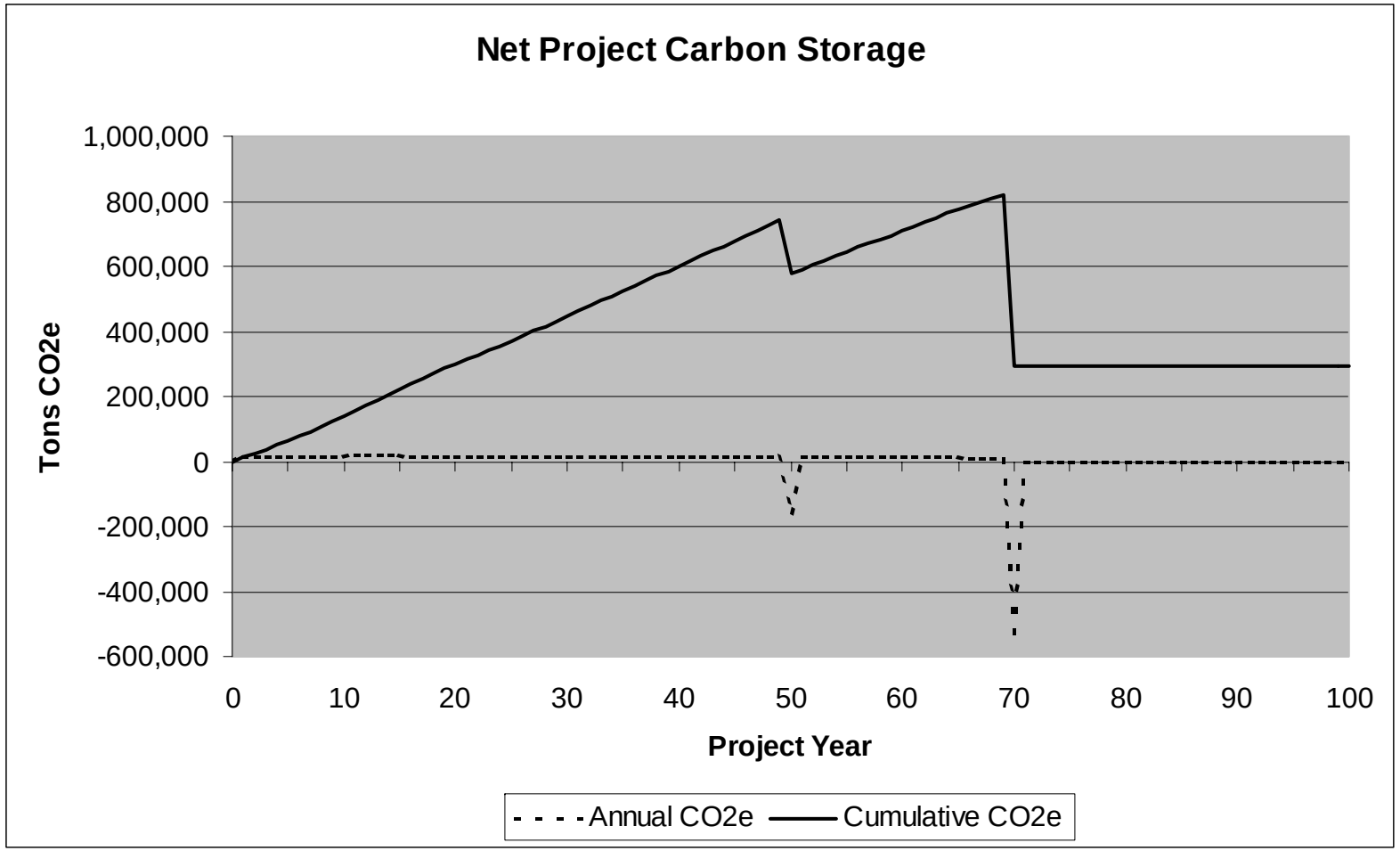
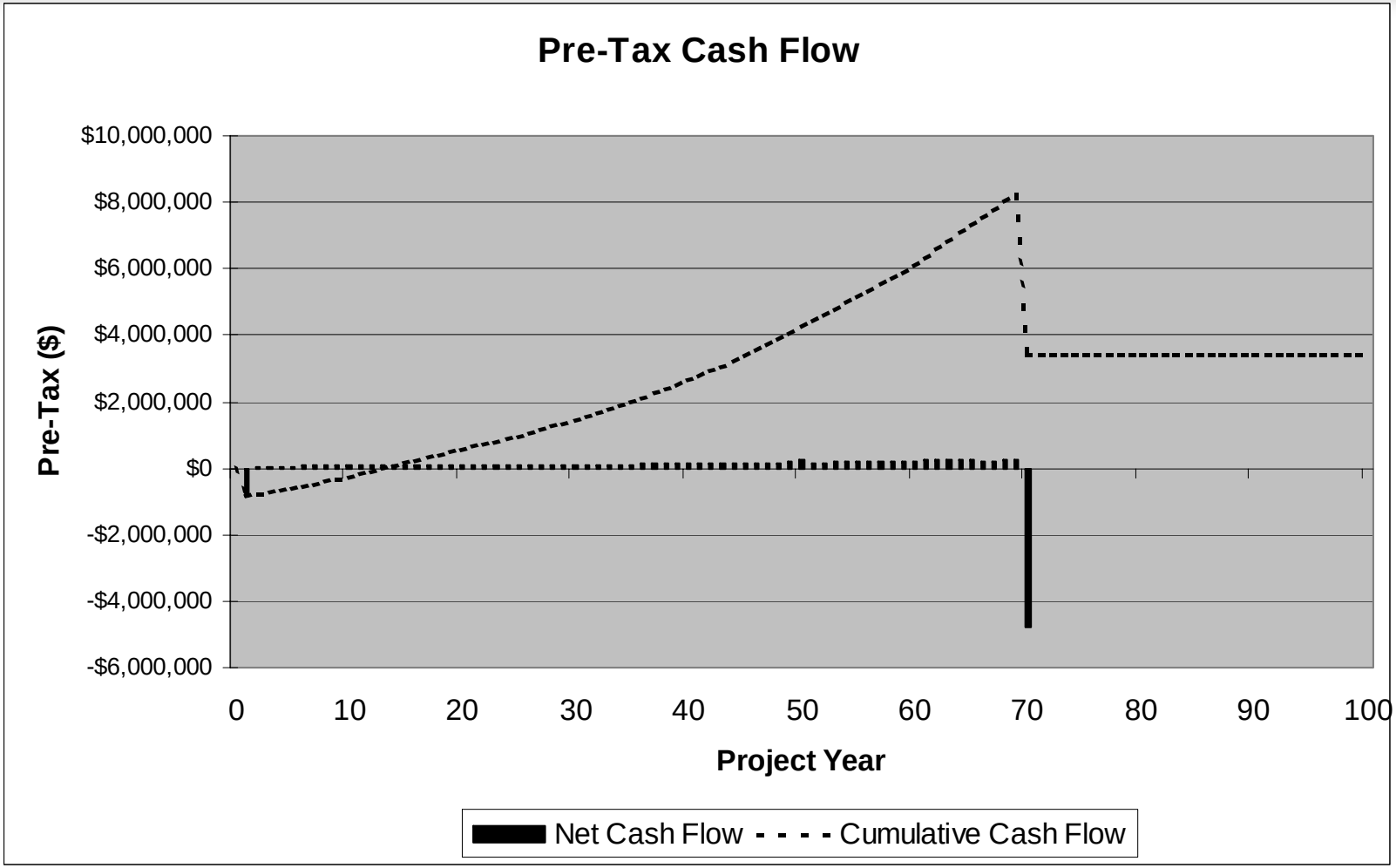
Model Demonstration

Carbon Stocks and Flows



Model Demonstration

Projected Cash Flow



Model Demonstration

Summary Results - Carbon (1 of 2)

	Pre-Tax Analysis		
	Present Value ($)	Present Value ($ / acre)	Levelized ($/ Net Ton CO2e)
Economic Benefits			
Timber	$103,855	$34.62	$0.57
Carbon Storage	$989,050	$329.68	$5.40
Total Benefits	**$1,092,905**	**$364.30**	**$5.97**
Economic Costs			
Forestry			
Land Acquisition	$0	$0.00	$0.00
Forest Establishment	$864,603	$288.20	$4.72
Forest Management	$39,421	$13.14	$0.22
Subtotal	*$904,024*	*$301.34*	*$4.94*
Carbon Management			
Optionable	$0	$0.00	$0.00
Non-Optionable	$31,316	$10.44	$0.17
Subtotal	*$31,316*	*$10.44*	*$0.17*
Total Costs	**$935,340**	**$311.78**	**$5.11**
Total Net Benefits	**$157,565**	**$52.52**	**$0.86**

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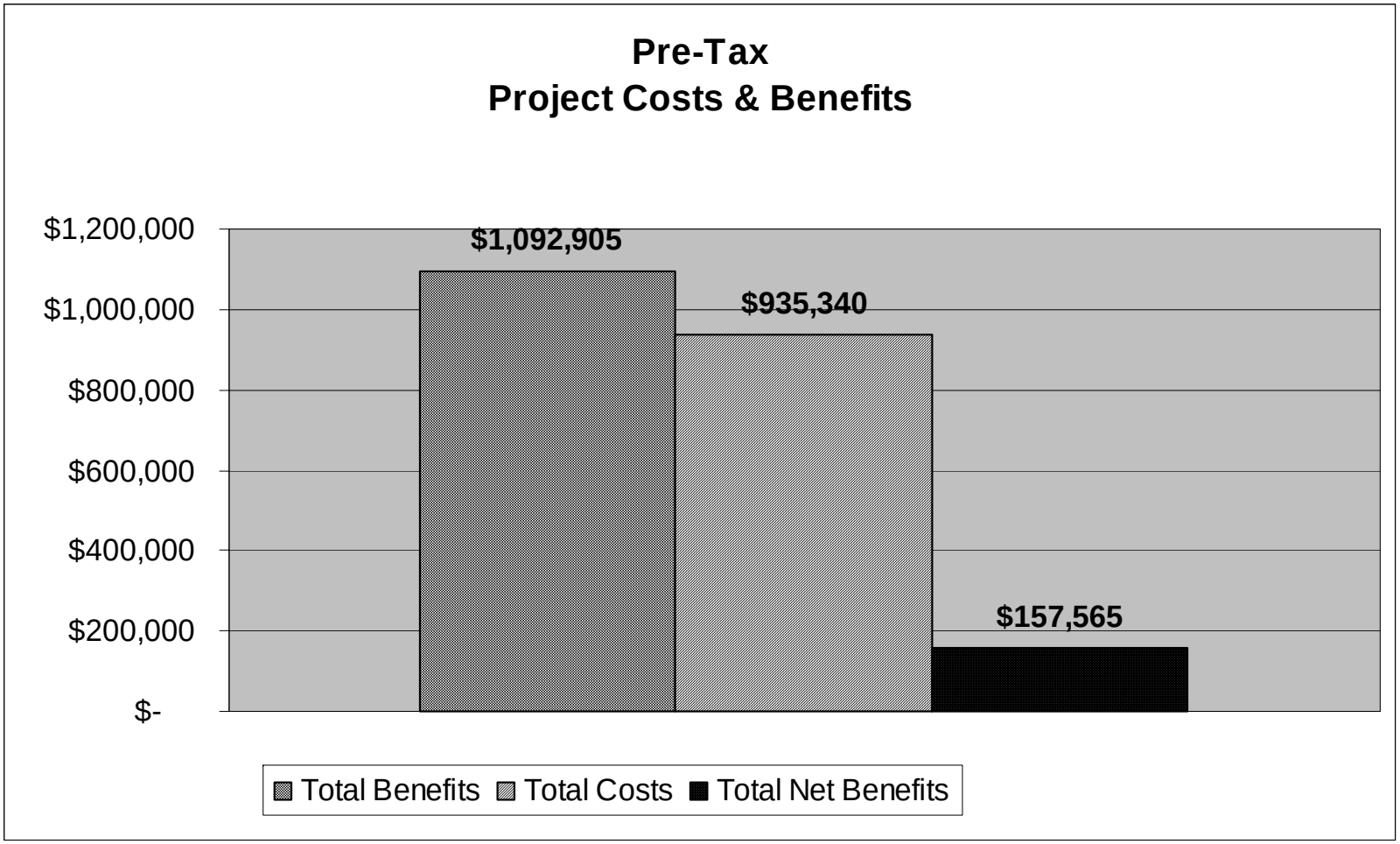
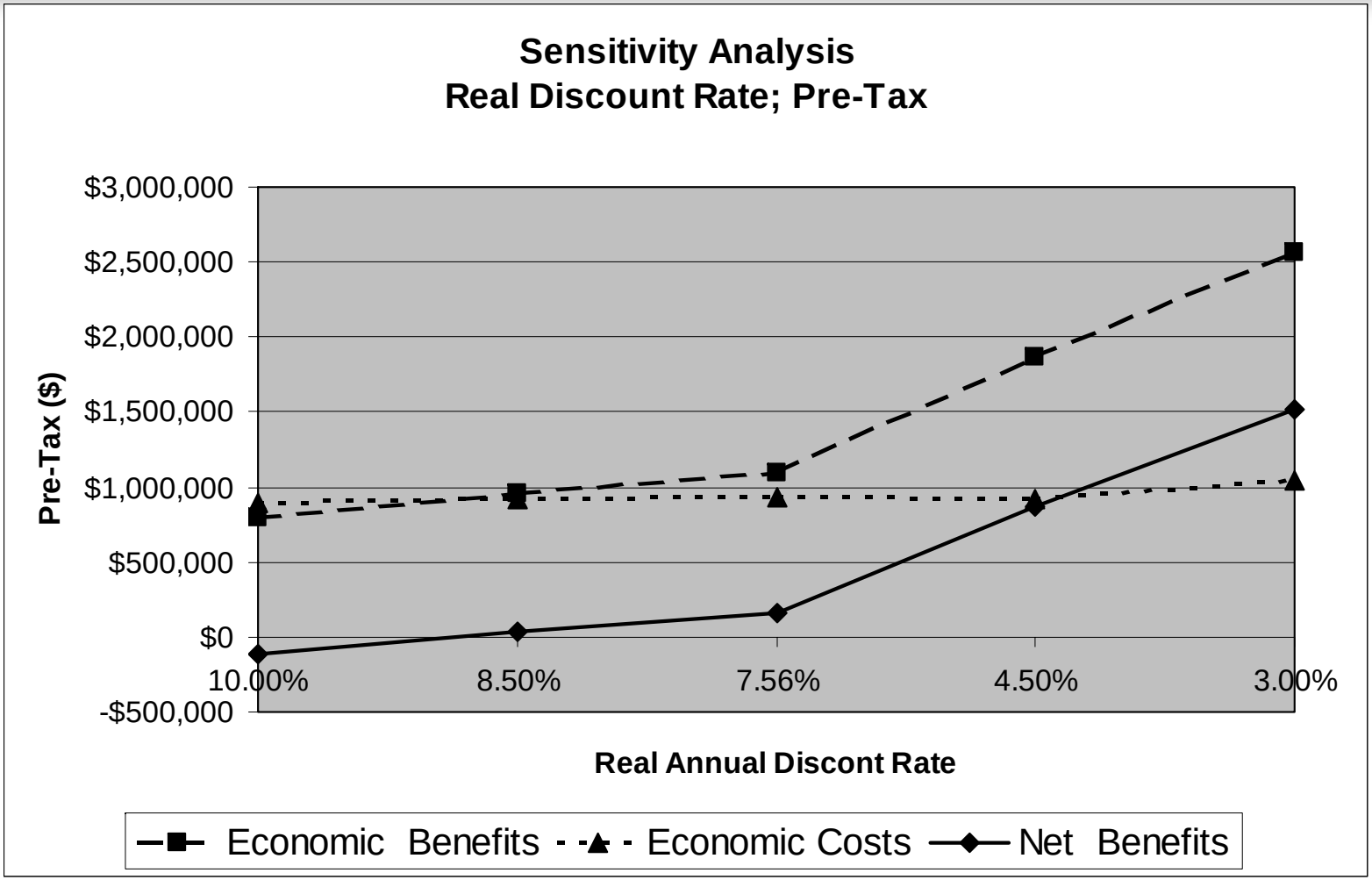
Model Demonstration

Summary Results - Carbon (2 of 2)



Sensitivity Analysis



Scenario Analysis

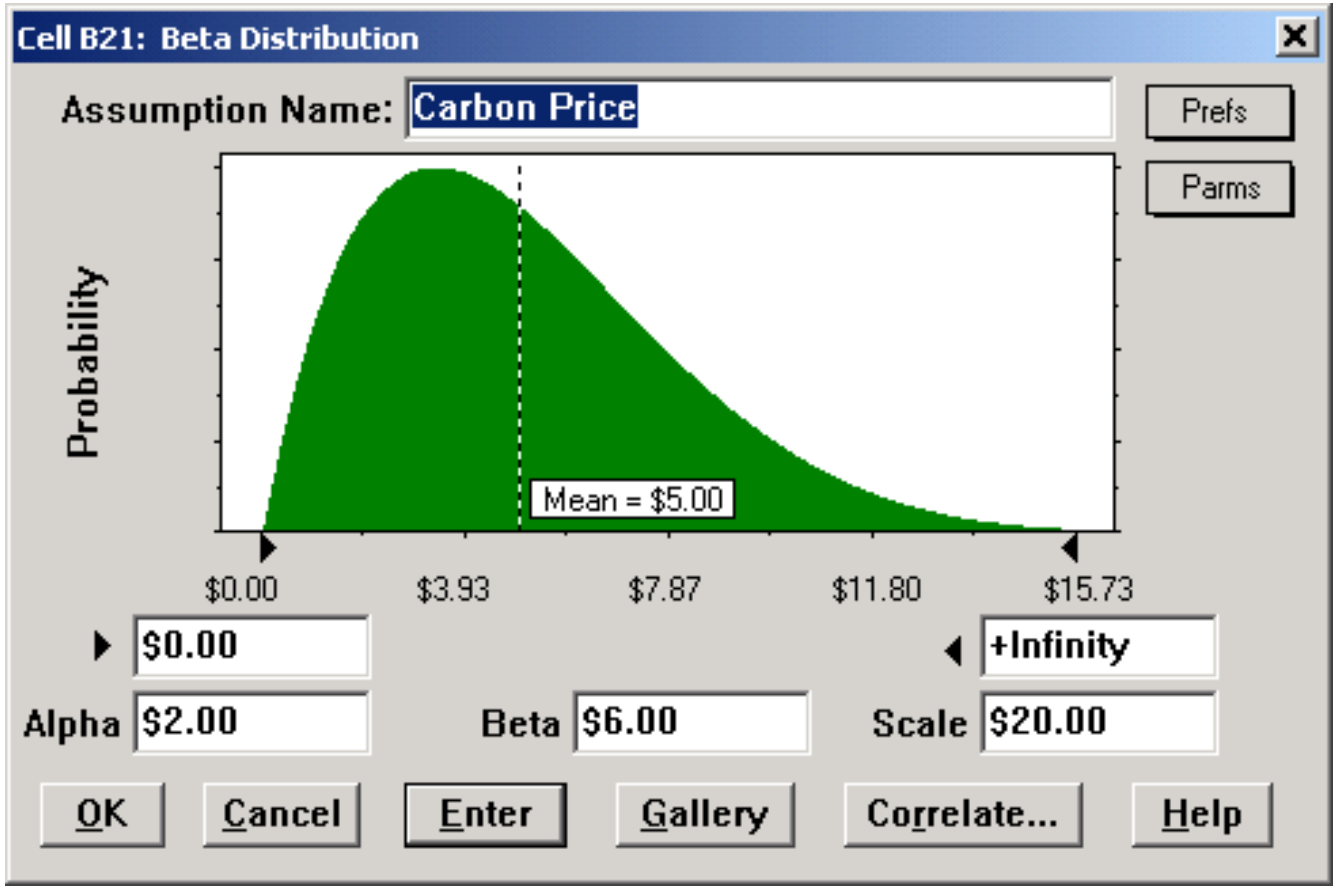
- Define model scenarios

Analysis Variables	Scenarios			
	Default	**Alt 1**	**Alt 2**	**Alt 3**
Discount Rate	7.6%	7.6%	5.0%	3.0%
Carbon Price	$5.00	$10.00	$15.00	$20.00
Price Risk	5.00%	5.00%	5.00%	5.00%
Appreciation Rate	2.00%	2.00%	2.00%	2.00%
Buyback Fraction	1.00	1.00	0.75	0.50
Carbon Production	100%	100%	100%	100%

Note: Values shown in red represent changes from the “default” values.

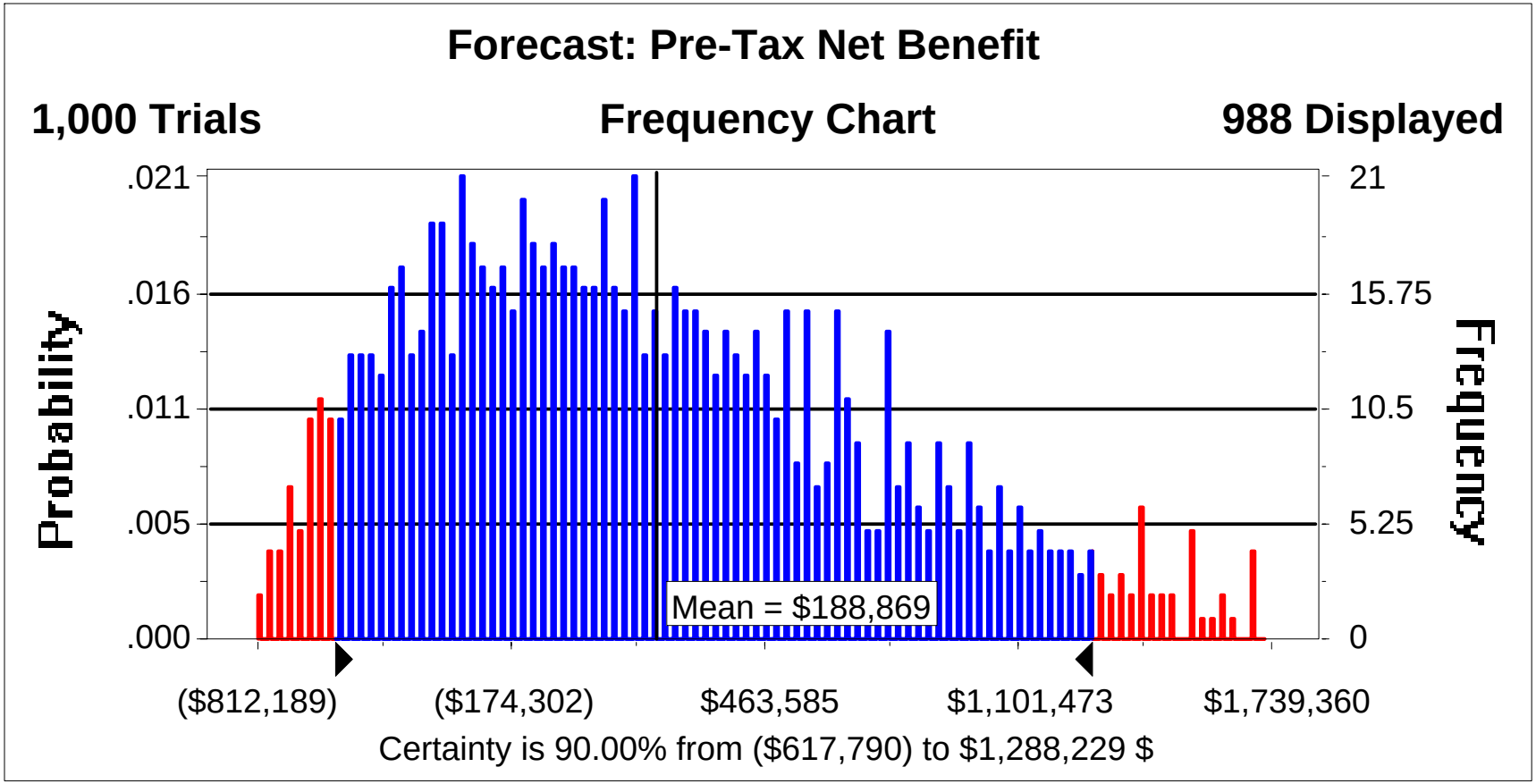
Monte Carlo Simulation (1 of 2)

- Key variables can be defined in probabilistic terms



Monte Carlo Simulation (2 of 2)

- Model results are shown as a range of outcomes



Endangered Species Project Description

- Potential habitat for Indiana Bat: Approximately 12,000 acres
- Provides summer habitat
- Requires development of Habitat Conservation Plan
- Requires revisions to existing forest management regime

Project Assumptions

- Project Duration = 70 Years
- Number of Credits = 1,200
- Credit Price = $50,000/credit
- Credit sales phased over life of project, based on tree development

Indiana Bat Credit Estimation Methodology

- Credit is defined as one primary roost tree, supporting 30-400 female members
- Density of roost trees assumed to be 1 per 10 acres
- Total suitable habitat = 12,000 acres
- Roost trees assumed to be 70+ years old, credits awarded as forest matures

Project Results

- PV Costs = $948,666 ($77/acre)
- PV Revenues = $1,895,563 ($158/acre)
- PV Net Income = $976,896 ($81/acre)

Per-Acre Comparison of Eco-Asset Projects

	Pasture	Carbon Sequestration	Creek	Species
Cost/acre	$7	$294	$2,181	$77
Revenue/acre	$83	$244	$3,028	$158
Net Income/ acre	$76	$-53	$846	$81

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Value to Private Landowners

- Time to permit/Cost to permit
- Maximize value of under-utilized commercial real estate assets
- Strategic approach to land disposition issues
- Improve interactions between land managers and corporate financial/strategic planning staff
- Evaluates the financial impacts of investing in eco-asset projects

Value to Society

- Bank is established in advance of impacts to the species.
- Provides incentive for conservation actions on private lands.
- Aligns profit making motivation with species conservation; turns species “liabilities” into “assets”.
- Facilitates exchange or conversion of many small pieces of habitat for large, contiguous tracts of land.

Conservation Banking Pitfalls

- Need to ensure good science is applied to bank establishment – “Recovery plan should guide development for conservation bank.”
- Timing of credit vesting - Need to ensure that habitat is preserved and species occupy habitat.
- Without ESA enforcement, there is no market driver.

Conclusions

- Conservation Banking is an imperfect example of ‘Applied Ecosystem Services Theory’
- Still, “The best is the enemy of the good”.
- Federal conservation banking guidance will facilitate development of conservation banking, similar to wetland banking guidance.
- A disciplined approach to investment is necessary: caveat emptor.
- New flexible mechanisms like conservation banking are more than ‘compliance programs’; they set a precedent and establish a principle: “Conservation is valuable”.