

American Forest Foundation

Market-Based Conservation Incentives Workshop: Strategies for Family Forest Owner Participation in Biodiversity and Water Markets

Legal and Financial Aspects of Markets and Managing Risk

September 10-11, 2008 Turf Valley Resort, Ellicott City, MD

#### **Public Goods**

#### **Private Capital**

# Introduction

The purpose of this session is to stimulate discussion about Family Forest Owner participation in ecosystem credit markets

- 1. Assumptions from the landowner / manager perspective
- 2. Markets a little clarity
- 3. Profile the emerging markets Carbon / Water / Biodiversity
- 4. Look at an example project investment decision process
- 5. A few considerations for the forest support community
- 6. A few considerations for landowners moving forward

### **Ecosystem Service Enterprises**

#### Assumptions

- 1. Markets for natures services can function to incorporate total production cost into price.
- 2. The landowner/producer can be compensated for the production or protection of natures services.
- 3. Including production of natures services can help forests compete effectively with other land uses.

#### Markets

#### **Traditional Markets**

Sustainable Timber and Agriculture Production Limited Development consistent with Conservation Outcomes Recreational Leases

# Emerging Ecosystem Credit Markets Stream and Wetlands Mitigation Water Quantity Trading Carbon Sequestration Water Quality Trading Biodiversity – Threatened and Endangered Species Banking



## **Markets – Traditional**

Established Products and Delivery – Route to Market weights and measures - bushel of corn / barrel of oil Information - volume of transactions - transparency exchanges that secure purchase and delivery - contracts **Established Commodity Market Characteristics** exchanges – brokers are key actors products are contracted– delivery risk is on suppliers purchases are at arms length – exchange is intermediary futures contracts/arbitrage exist in clear contract environment **Producers** have a measure of demand and an outlet for supply



#### **Emerging Ecosystem Credit Markets**

**Voluntary Markets** 

variable demand – feelings based, not compulsory weights and measures are voluntary – unregulated delivery risk can remain with buyer – not the supplier

#### **Compliance Markets**

demand is dictated – penalties for non-compliance weights and measures are required to assure compliance contracts may transfer liability for compliance – delivery risk standards and registries can assure buyers exchanges can be established based on delivery contracts with exchanges and demand – volume and transparency

### **Emerging Ecosystem Credit Markets**

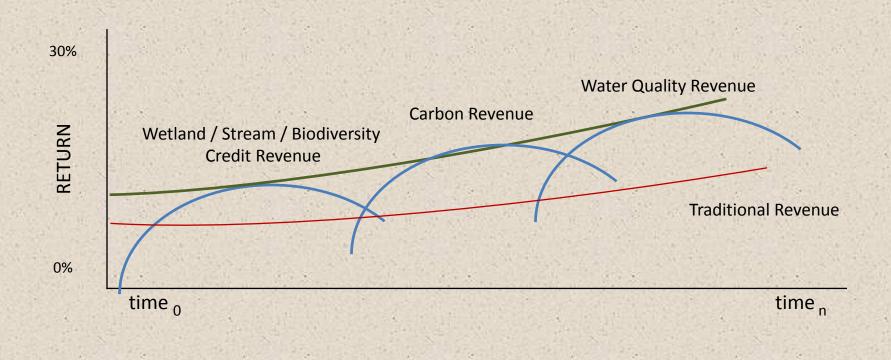
Multiple unique markets

Stream and Wetlands Mitigation Biodiversity - threatened and endangered species banking Carbon Sequestration - land use - Agriculture and Forestry Water Quality Trading - point to nonpoint source trading ... in various stages of development Stream and Wetlands Mitigation - Compliance - CWA

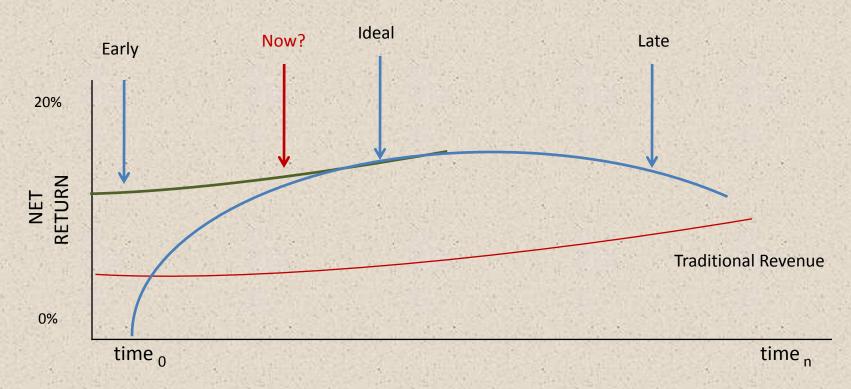
Biodiversity - Compliance - Endangered Species Act

Carbon Sequestration - In between Voluntary and Compliance



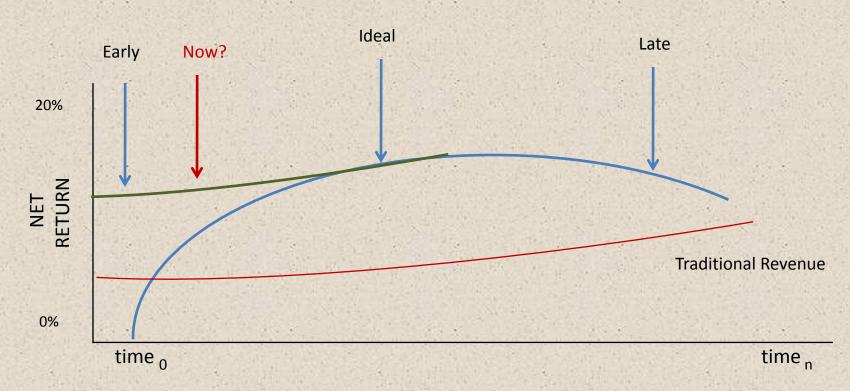


#### Wetland / Stream / Biodiversity Credit Revenue



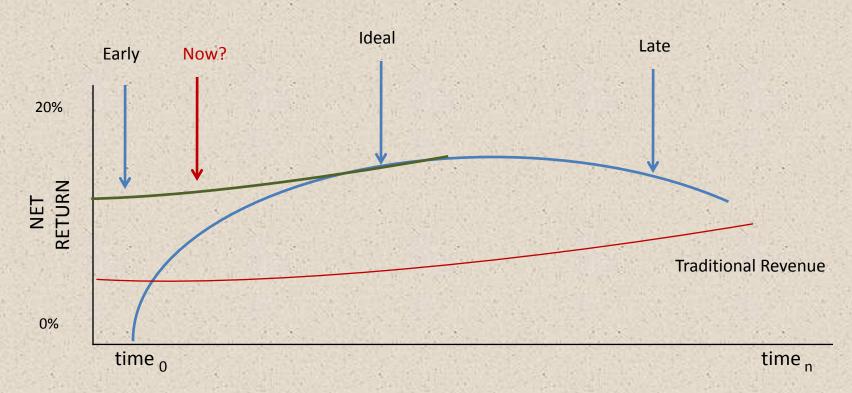
- (+) Mitigation Banking Regulated on both supply and demand side of transactions
- (+) Transfer of liability occurs with the purchase / sale of credits delivery risk is on supplier
- (-) Market is still opaque (not transparent in terms of volume and pricing)
- (-) Transactions are bilateral between specific buyer and seller no secondary market

#### Carbon Revenue



- (-,+) Carbon offsets Voluntary with an anticipated compliance market in the near future
- (-) Transfer of liability does not occurs with sale of credits delivery risk is on buyer
- (-) Market is still opaque (not transparent in terms of volume and pricing)
- (+) Standards are developing and aggregators are emerging, secondary market emerging

Water Quality Trading



- (-,+) Nitrogen Phosphorus Pilot markets with anticipated compliance market in the future
- (-) Transfer of liability does not occurs with sale of credits delivery risk is on buyer
- (+) Pilot markets are transparent, restricted in size and scope
- (+) Standards are developing and aggregators are emerging, secondary market emerging

# **New Markets – Transition Strategy**

Which credit markets suit your land and objectives Stream and Wetlands Mitigation Water Quantity Trading **Carbon Sequestration** Water Quality Trading **Biodiversity – Threatened and Endangered Species Banking Determine balanced management objectives** Identify and evaluate trade-offs Credit revenue generation can sub-optimize other revenues Credit generation can be mutually excusive of other uses Create a comprehensive picture of the stewardship plan



# **Value Creation Strategy**

WORKING LANDS

Portfolio Management

OPERATION

Credit Sales

Operations Management

Planning & Entitlement

TRANSITION

**Evaluate Options** 

FEASABILITY

Current Land Use

Balanced Allocation Diversification Risk Management

Growth and Development Strategy Credit Sales and Accounting **Demand Analysis** 

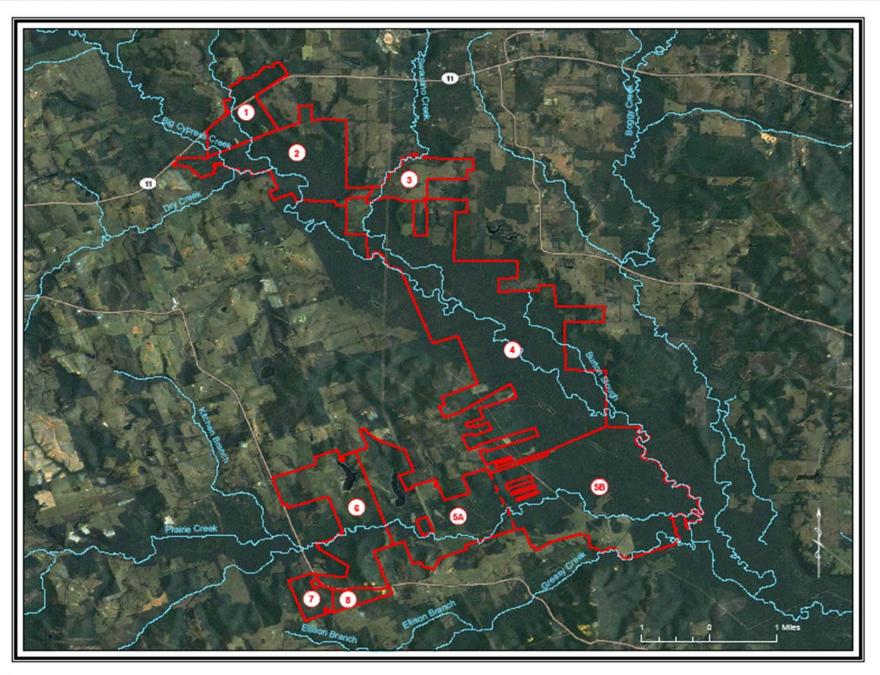
Agency and Owner Relationships Maintenance and Operations Bank Monitoring and Reporting

Timber / Ltd Development / Eco Credits Ecological Banking Instruments Permits / Standards / Registries

Identify actual buyers / aggregators Financial Modeling & Risk Analysis Field Work – Identifying Trade offs

**Define Baseline Land Use Stewardship** 

VALUE

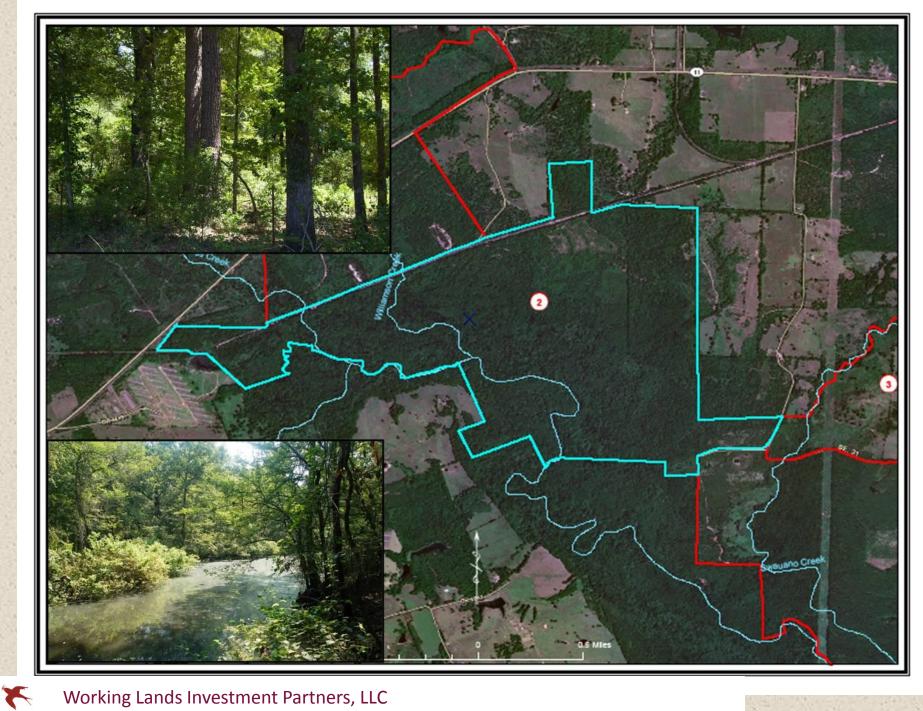


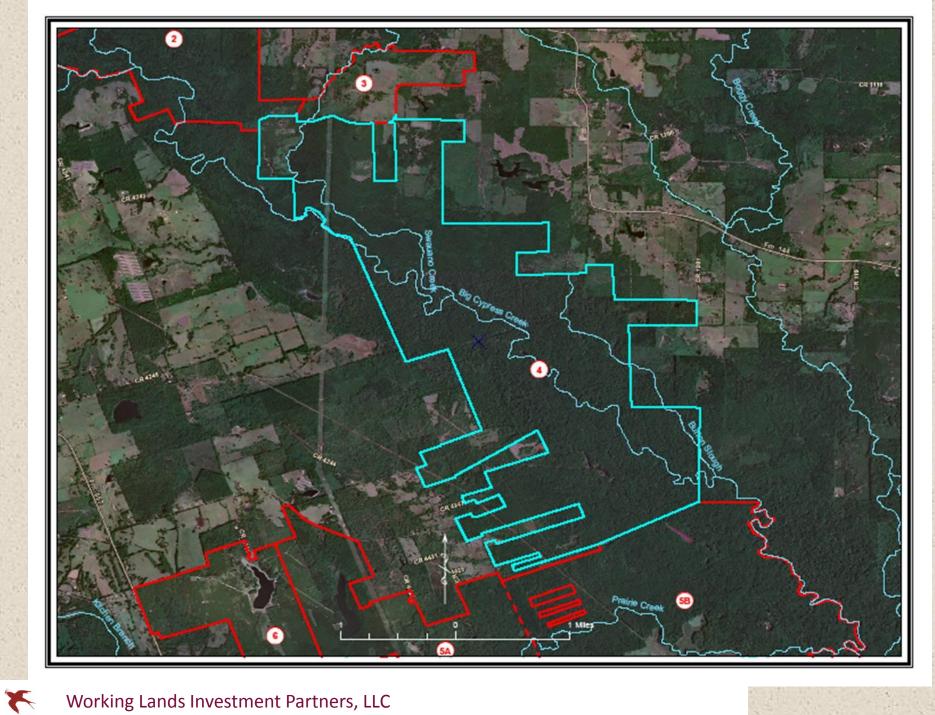
# **Pro Forma Assumptions**

Easement Sales	Mitigation	Recreation	Timber	Limited Development	Carbon
<ul> <li>4,000 acres</li> <li>Appraised value/acre: \$500</li> <li>Tax Basis Reduction: 20%</li> <li>Transaction costs: \$35,000 per sale</li> </ul>	<ul> <li>Project IRR: 43%</li> <li>Deal Size: 2,000 acres</li> <li><u>Investment</u>: \$1,510,000</li> <li><u>Ongoing Costs</u>:</li> <li>Bank Maintenance: 10%</li> <li>Monitoring/ac: \$1.50</li> <li>Endowment: 3%</li> <li><u>Revenue Sources</u>:</li> <li>Stream Credits: 50,000 @ \$80/credit</li> <li>Wetland Credits: 1,875 @ \$12,000/credit</li> <li>Brokerage Fees: 6%</li> <li>Uniform credit release</li> </ul>	<ul> <li>Hunting Lease rate/acre: \$10.00</li> <li>Insurance costs/acre: \$1.50</li> <li>\$550-600K NPV</li> </ul>	<ul> <li>Current Value: \$6,776,025</li> <li>42% HS</li> <li>32% PS</li> <li>14% HW</li> <li>7% CN</li> <li>6% PW</li> <li>12% harvested per year (value)</li> <li>8% biological growth</li> <li>3% price inflation</li> <li>NPV standing timber at Year 10: \$2.7 million</li> <li>NPV Harvested Timber \$8-8.5 million</li> </ul>	<ul> <li>Residential Sale (Year 2): 50 acres @ \$15,000/acre</li> <li>Ranchette Sale (Year 2): 500 acres @ \$4,250/acre</li> <li>Recreational Sale (Year 8): 1,500 acres @ \$2,500/acre</li> <li>Costs/sale: \$30,000</li> <li>Brokerage Fees: 3%</li> </ul>	•TBD pending further due diligence

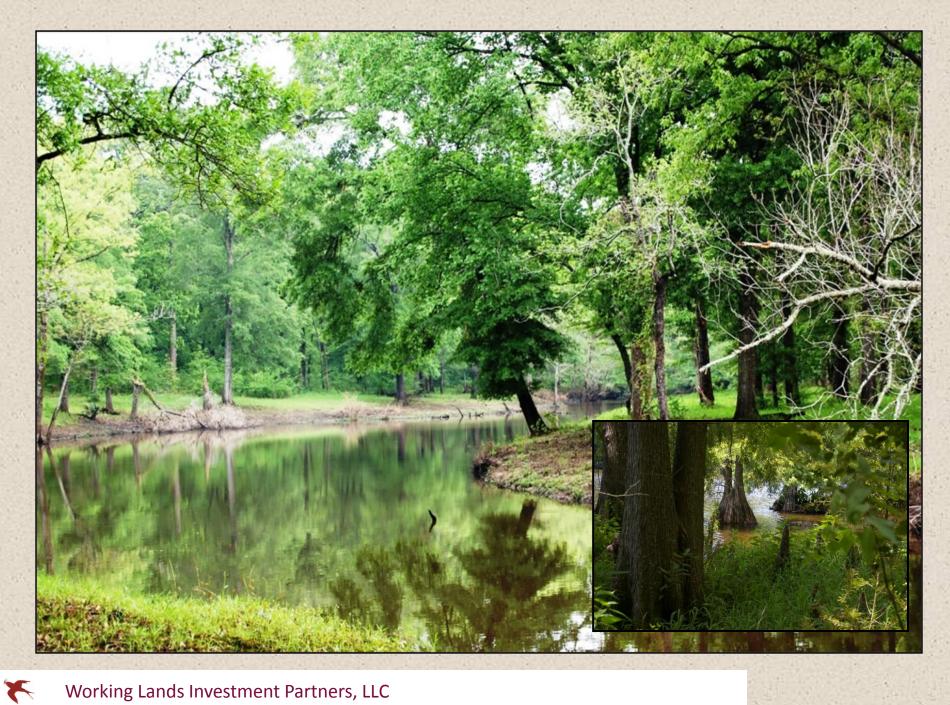
Working Lands Investment Partners, LLC

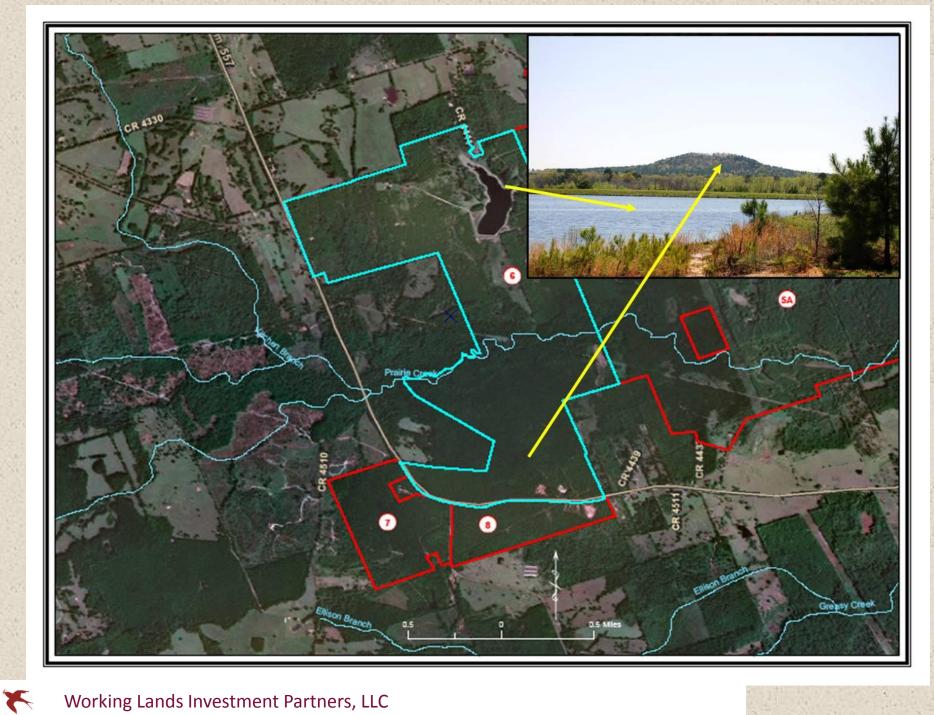
X



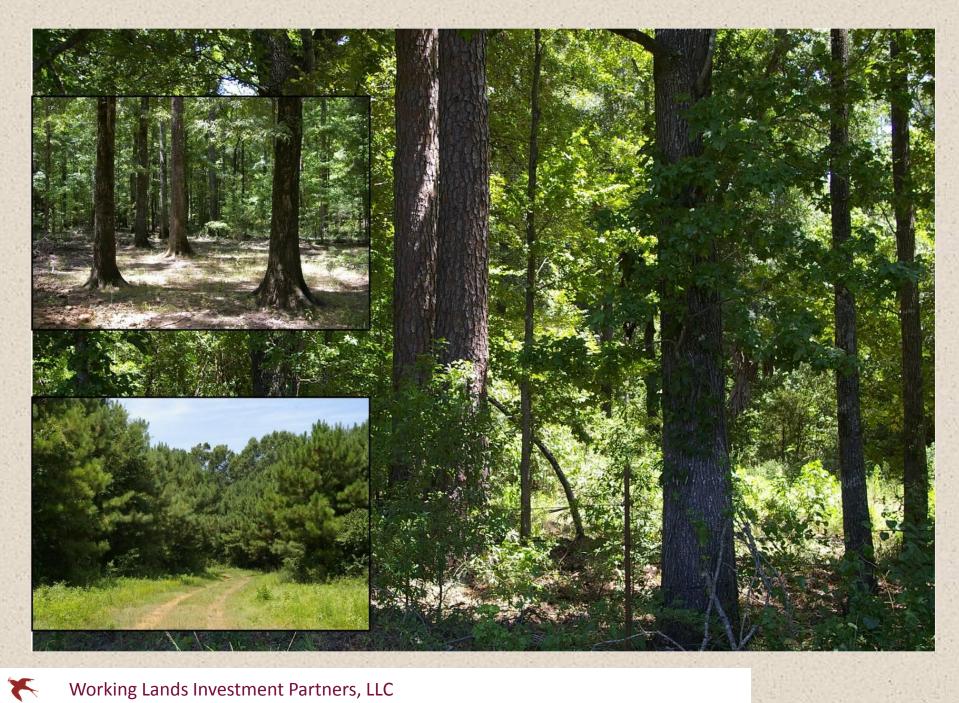












### **Example - Return Profile**

#### Carbon

•Expected returns pending baseline establishment, determination of additionality, and route to market

#### Limited Development

• Must be consistent with conservation strategy

#### **Easement Sales**

On mitigation and recreational sites
Back end loaded
Project IRR still >15% assuming donation

#### Total Projected IRR: 17%

#### Recreation

Mitigation

•Site could be

expanded beyond

2,000 acres

•IRR stress tested on

timing of credit sales

•Assumes no lease rate uplift from restored habitat

#### Timber

• Provides stable income while promoting growth of more valuable timber

#### X

# **Disciplined Land Stewardship**

- Biophysical modeling
  - Growth and Yield for fiber / carbon production FVS, FORMOP, other variants
  - Hydrogeomorphic modeling

USCOE HGM models for wetlands functional assessment

- Land use modeling landscape level TMDL modeling EPRI – WARMF, WRI – Nutrient Net, EPA SWAT
- Financial Modeling
  - Cash flow tables for timber production
  - Pro forma development to optimize stewardship plan



# **Approach to Valuation - General**

- Inputs
- Management Activities
- Outputs

\$\$ Input Costs + Required Return Management Activities against Stewardship Plan T<sub>0</sub> to T<sub>n</sub>

\$\$\$ Revenue @ Required Return

W 💦

## **Approach to Valuation - Forestry**

Input \$\$: site prep, herbaceous control, seedlings, and planting costs

- Management: two thinning from below, harvest at 50
- Output \$\$\$: Volume \* Stumpage price = Return



**Management** Activities

Thin @ 15 (35%) Thin @ 25 (35%) Harvest @ 50 (25%)

 $T_0$  to  $T_n$ 

\$\$\$ Revenue NPV \$75.24 / acre @ 8% Return



### **Approach to Valuation - Forestry**

COSTS YEAR	0	5	10	15	20	25	30	35	40	50
Site Preparation	ALL MAR		神经		200	C. E. C.		Assump	tions:	1
Mowing	34.50	1.	- 12	Frendese	1	1. 1.		8.00%	ARR	a star
Subsoil Plowing	34.50		2	The state	-	R. A.		3.87%	inflation	a
Herbicide Application	110.00	1				W. SYL		0.43%	labor	
Establishment		1. B					1.	0.40%	real price	HW Saw
Seedlings - Bare Root	127.00	301.12	22.5.27	1	13572		801 12	1.20%	real price	HW Pulp
Planting	50.00	1	法刑 一是	s Sheres				435	435 1/0 bare root	
Survival Survey		29.43	1000					1.00	seedlings / acre	
Timber Stand Improvement	1 1 1 · · ·	1.	15 - 2	1. 1.	2 <del>1</del> 5	1 201 - 14	129	165/4		
Management Fee	4.63	3.81	3.14	2.58	2.12	1.75	1.44	1.18	0.97	1.20
Property Taxes	13.90	11.43	9.41	7.74	6.37	5.24	4.31	3.55	2.92	3.61
	374.53	44.67	12.55	10.32	8.49	6.99	5.75	4.73	3.89	4.81
REVENUES		1.7				19 43.1	4			
Timber: Hardwood Sawtimber	-		S. 4.	1. A. M.	13. S. L.	229.28	2010	38. L		266.78
Hardwood Pulp	6.23 24	1.350478	h Mi - L	S. Constants	Derette di	55.92	1.35.20	alle Mire	20.04	Section.
		1997	1	a la series		285.20	1.5		-	266.78
NPV 75.24	(374.53)	(44.67)	(12.55)	(10.32)	(8.49)	278.21	(5.75)	(4.73)	(3.89)	261.98

Table 21. Cash Flow Analysis – Bare Ground – Expected Final Harvest Value \$1,535 / acre.

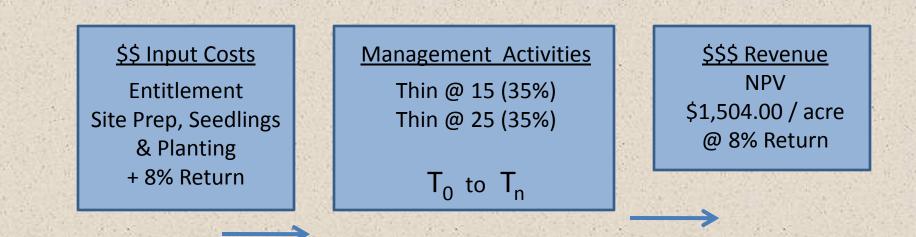
This cash table represents the NPV of BHW management starting with 'bare ground'.



# **Approach to Valuation - Wetlands**

- Input \$\$: site prep, herbaceous control, seedlings, and planting costs
- Management: two thinning from below
- Output \$\$\$:

Volume \* Function Price = Return



# **Approach to Valuation - Wetlands**

#### Table 7. Restoration Cost Breakeven Analysis at 8% Return.

COSTS YEAR	0	5	10	15	20	25	30	35	40	50
Restoration Land	450.00							Assumpti	ons:	
Legal - Conservation Easement	20.00	1. 1. 1.	- 19 Mail	11. 12.	1. 241		1. 2. 2.	8.00%	ARR	1. 1. 1. 1. 1.
Mitigation Banking Instrument	65.00		1200	100 200		12 20		3.87%	inflation	
Jurisdictional Determination	15.00	23 Men 11	8-1-1-2	200	5	1 1 2	103-637	0.43%	labor	
Survey	12.00					18 A. 1	1	0.40%	real price	Saw
Site Preparation	SALE AND		15. 01 80			D' SNEL	1.	1.20%	real price	Pulp
Mowing	34.50	3 m - m		1. 1. 1.		26 4 2	4.	1,000	acres	1. 17
Subsoil Plowing	34.50	14 - C	12.	0.540	語して		S.S.C. AL	435	1/0 bare ro	oot
Herbicide Application	110.00	1072.4	· · · ·	8 S - 1		Sec. 6	SAM	~	seedlings	/ acre
Establishment			11 . 2.21		gran pi		(	0.50	HGM Crea	dit / Acre
Seedlings - Bare Root	127.00	-	-1	1000	1.11	E H			HI SPACE	100
Planting	50.00		SIL EN	1	100	2. 重排一次		in the second	MH APA	1
Survival Survey	67	21.02	· · · · · · · · · · · · · · · · · · ·	-	1	ALC:			162 -	
Timber Stand Improvement	20	Red-	10 TO	29.71	1-1 -2	10 10			an it	1.1-1-
Management Fee	23.16	19.06	15.68	12.90	10.62	8.74	7.19	5.92	4.87	3.30
Property Taxes	13.90	11.43	9.41	7.74	6.37	5.24	4.31	3.55	5.32	1.98
	955.06	51.51	25.09	50.36	16.99	13.98	11.50	9.47	10.19	5.27
REVENUES	S Contra		Mar 20	Stars.					S. Ohn	
Mitigation Credit Sales	376.00	309.40	254.60	209.50		111-11	1.	1000	1	
Timber: Hardwood Sawtimber		10, 24		10 - 6	1.24		1		And the state	0.00
Hardwood Pulp	200 - 20	-	1200	2008 - P.C.		12 20		1.	1 200 2	0.00
	376.00	309.40	254.60	209.50	1.4			1.4-		0.00
Breakeven \$ 1,504.00 / acre	(579.1)	257.89	229.51	159.14	(16.99)	(13.98)	(11.50)	(9.47)	(10.19)	(5.27)
NPV \$ 0							1. 1			
HGM Credit \$ 3,008	2 1 2 2 2	1.5.5		2300	155		Same			1. 1. 2. 2
4 0,000	1 NO 1					- OC - XC			C . X	

# **Forestry Service Skills & Expertise**

#### State and Private Forest - stewardship planning

Expand the notion of forestry / land use outputs – good and services Provide landowners with the tools necessary to optimize their land using forestry skills

Participate in the entitlement process to include forestry principles

#### Land management support community

- Inform policy with guidance leading to results on the ground
- Provide tools that are necessary to support market transactions
- Provide outreach and tools necessary for private landowners to evaluate their options with ecosystem services markets
- Learn Do Teach Support active pilots projects that demonstrate effective management regimes and routes to market



#### **New Markets – landowner perspective**

The question may be not whether but when.

- Develop a clear definition of management objectives
- Recognize that these markets are developing and in flux
- Identify opportunities that are consistent with overall plans
- and understand the tradeoffs involved...
  - for instance conservation easements that preclude other land use,
    - loss of timber revenue due to longer rotation or exclusion of timber production, etc.

Pick your optimal point of entry, with realistic expectations.



### For More Information, please contact:

#### **Working Lands Investment Partners, LLC**

Deborah Spalding (203) 654 6145 <u>dspalding@working-lands.com</u> Dan Spethmann (202) 330 3356 <u>dspethmann@working-lands.com</u>