

WFE Fluid Session May 1, 2006

**Investing in the avoidance of future costs
by reducing fire risks: Do economists
not get it?**

**While non-market values, in this case
they are real avoidable costs that can be
estimated, not just experimental choice
WTP estimates.**

What Do Markets Pay for?

Wood, paper, biofuel,
residences, businesses etc.



- Including any expected cost from risk of environmental damage that might violate laws or impact neighbors and could be litigated in courts



... What Not?

- Any value for contributing to clean air & water, habitat & biodiversity, recreation, aesthetics even if required by regulation.
- Any benefits from avoiding costs from fires i.e. fire fighting costs, fatalities, facilities, habitat, post-fire restoration etc.
- Any benefits for the use of wood vs. steel or concrete in construction even though it reduces air and water pollution, and CO₂ emissions.



Management Alternatives Can Address Any or All of These:

Timber markets for

- Construction & industrial markets
- Paper and biofuel



Public ecosystem service values

- Biodiversity & habitat
- Aesthetics & recreation
- Jobs & rural lifestyles
- Carbon storage
- Air & water pollution & solid waste
- ***Reduced risk of fire/smoke/& related costs***



Conclusions or Just Hypothesis?

- **We have technology to simulate management alternatives that measure many different attributes serving many different owner objectives and can be linked to many public values.**
 - **This is progress.**
- **What's needed to get these values working in the market:**
 - **The focus that this is important?**
 - **The scale of users?**
 - **The scale of support?**
 - **Holding economists accountable?**
 - **Holding politicians accountable? HA!**

The Opportunity - a New Paradigm - an Optimistic View

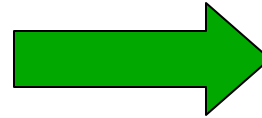
- Incentives/payments for eco-services
- Management decisions reflect avoided future costs
- Purchasing standards reflect environmental burdens
- ***But how do we find a way to get there?***
- ***We say we want it but don't do the accounting or fix the institutional links.***

The (easiest?) Opportunity

- Thin overly dense stands to avoid future costs from fire and insects
- Use markets to gain efficiency and compensate producers



Treating Dry Site Overstocked Forests



or



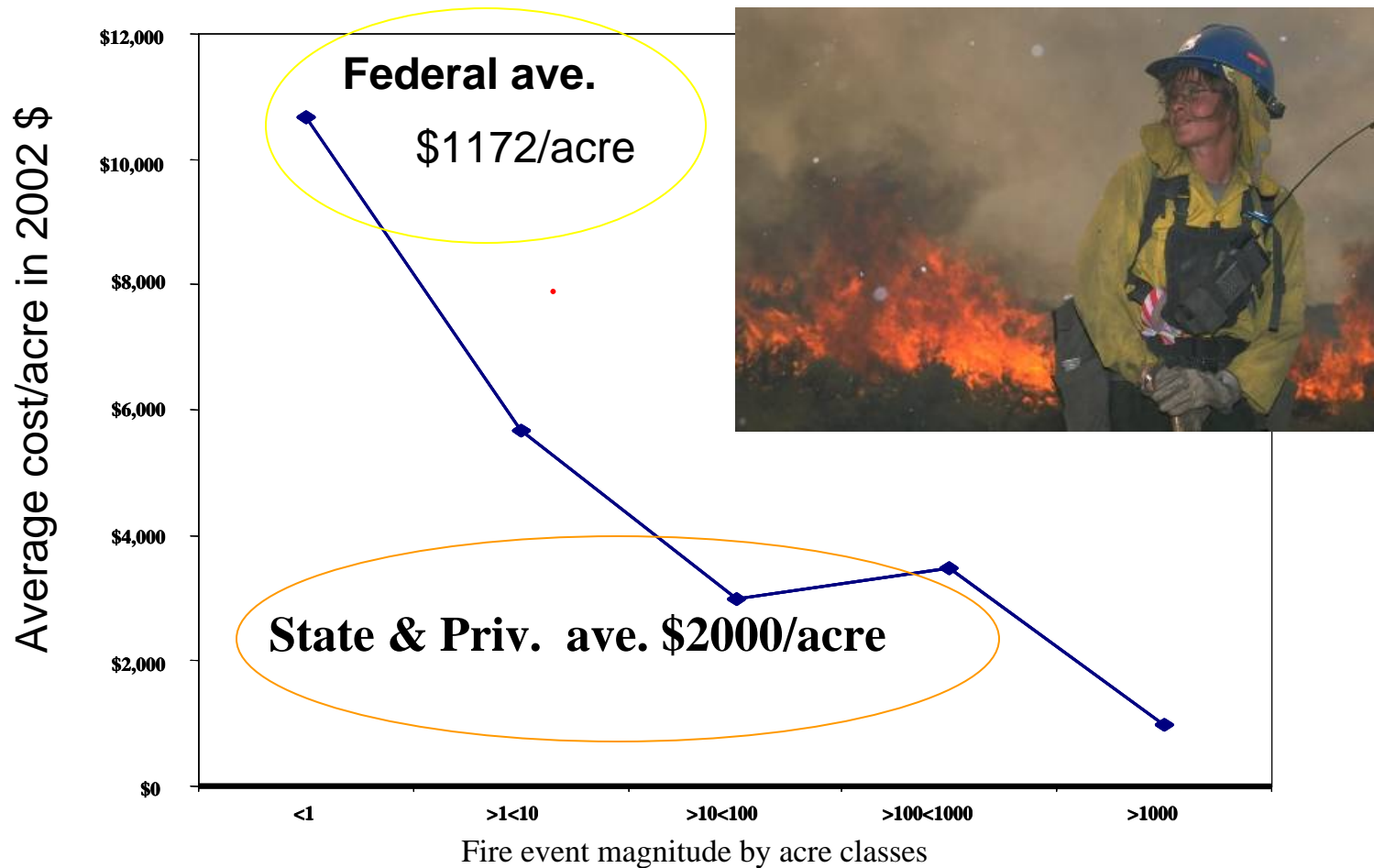
Thinning can avoid costs created by fires e.g. fire fighting, fatalities, etc. producing positive non-market values

However, small diameter fuel removals are costly.



The market value of small logs will likely be less than the harvest & haul costs.

Firefighting cost/acre (1992-2002) by fire event magnitude



Fire Fighting is Expensive and Dangerous

Non-market Valuations: estimating avoidable costs

$$V_0 = \frac{V_n}{(1+i)^n}$$

Where:

V_0 = present value at time 0

V_n = future value after n periods (years)

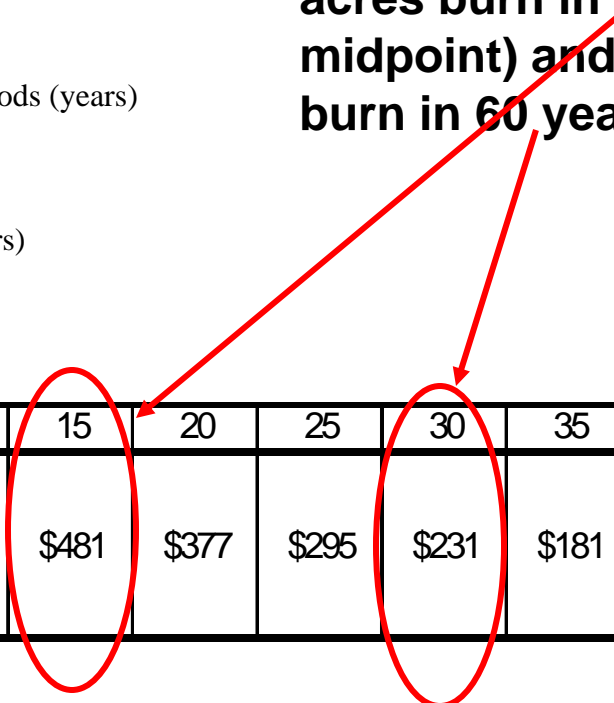
i = interest rate

n = number of periods (years)

Parametric Present Value Estimations of Fire Risk Costs with Assumptions of \$1000/acre to Fight Fire and 5% as the Discount Rate.

For this Exercise Assume all High Risk acres burn in 30 years (15 year midpoint) and all Moderate Risk acres burn in 60 years (30 year midpoint).

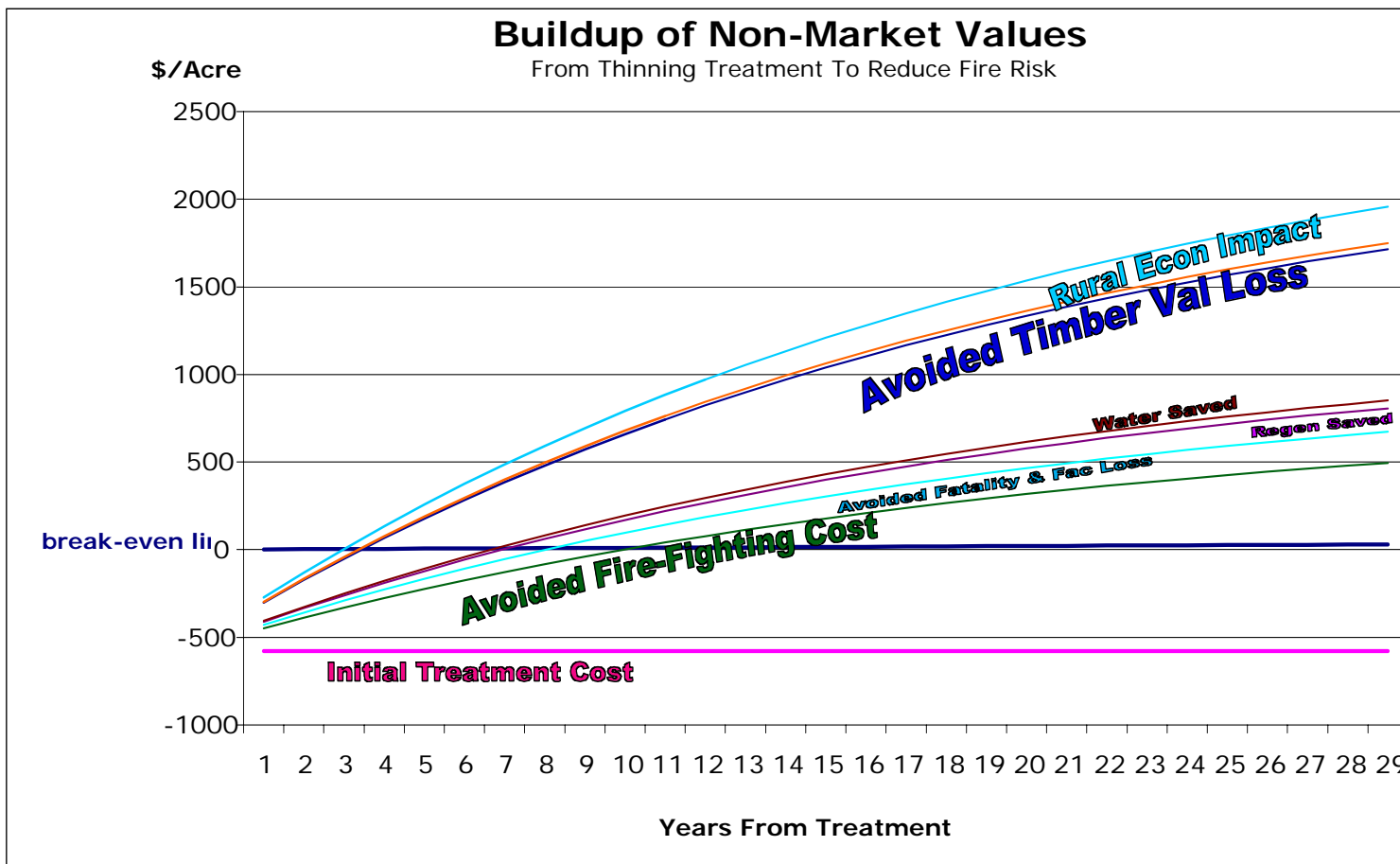
Year	5	10	15	20	25	30	35	40	45	50	55	60
Method 1. Present cost/ac of a forest fire at specified future year	\$784	\$614	\$481	\$377	\$295	\$231	\$181	\$142	\$111	\$87	\$68	\$54



Estimates of Avoided Costs, Non-market and Market Values (incomplete list)

Treatment Benefits	Value per acre	
	High Risk	Moderate Risk
Fire fighting costs avoided	\$481	\$231
Fatalities avoided	\$8	\$4
Facility losses avoided	\$150	\$72
Timber losses avoided	\$772	\$371
Regeneration and rehabilitation costs avoided	\$120	\$58
Community value of fire risk reduction	\$63	\$63
Increased water yield	\$83	\$83
Regional economic benefits	\$386	\$386
<i>Total Benefits</i>	\$2,063	\$1,286
Treatment costs		
Operational costs	(\$374)	(\$374)
Forest Service contract preparation costs	(\$206)	(\$206)
<i>Total Costs</i>	(\$580)	(\$580)
<i>Positive Net Benefits from Fuel Removals</i>	\$1,483	\$706

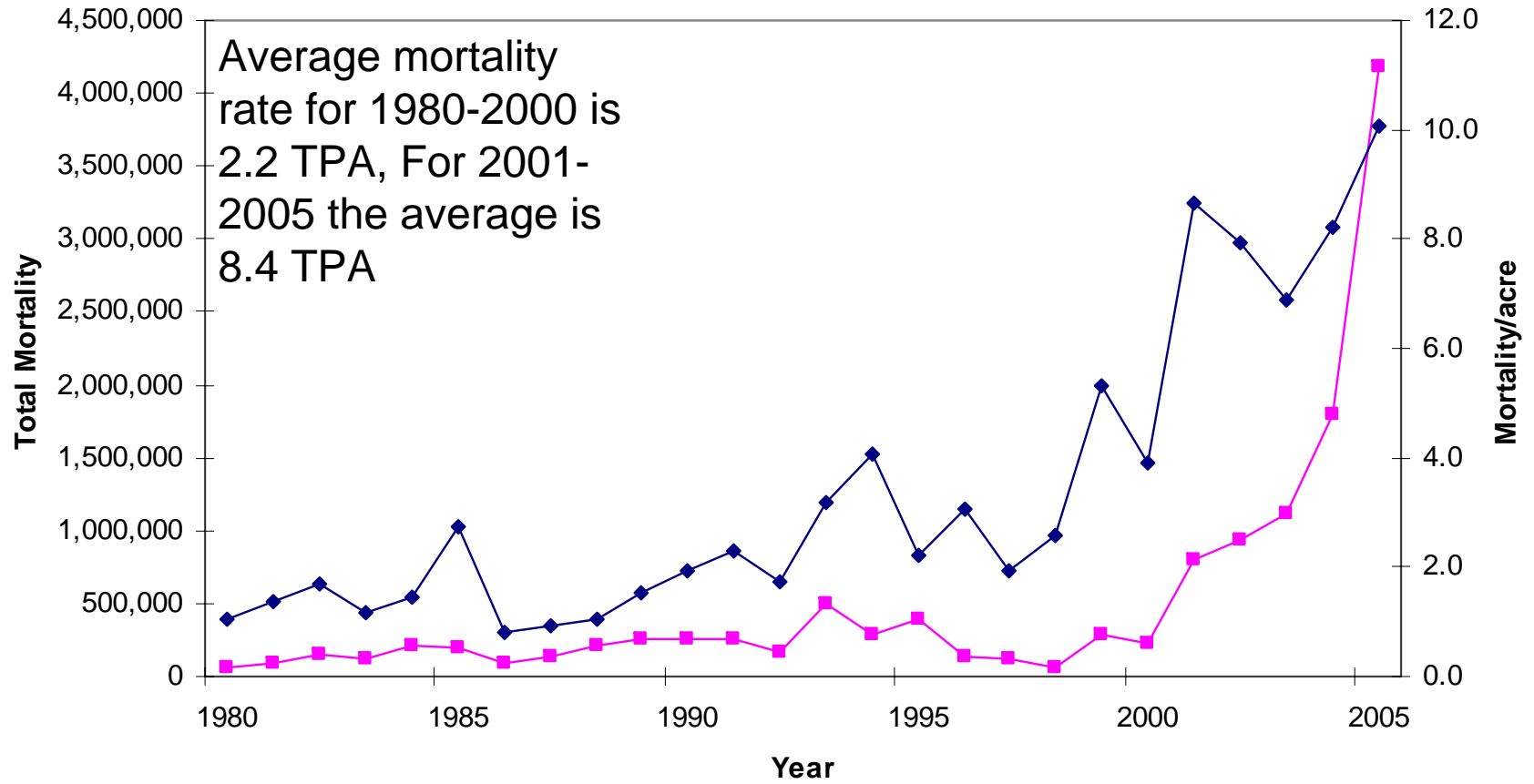
Buildup of Non-market Values



Is fear the only motivator and fire not sufficient:

- Then track the MPB !

Mortality by MPB in PP and LP over 25 year period



■ # Trees killed by MPB ◆ # Trees/acre killed by MPB

Impacts in WA by broad ownership boundary: 2005 example

YEAR	Acres	# Trees killed by MPB	# Trees/acre killed by MPB	Owner Group
2005	185,535	2,321,472	12.5	NF NP NWR
2005	230,410	1,776,504	7.7	Non-Fed only

Impacts by dominant species:

YEAR	Acres	# Trees/acre killed by MPB	Species	Owner Group
2005	175,598	13.0	Lodgepole pine	NF NP NWR
2005	9,937	3.9	Ponderosa pine	NF NP NWR

What We Know about Ecosystem Services

- Essential
- The public values them
- Natural ecosystems are being impaired
- Management can protect and restore ecosystem services
- Effective policies & functional institutional arrangements are difficult

Some Policy Disconnects:

- NEPA no action alternative:
 - Benign (really?)
 - Too hard to estimate (really?)
 - Serious impacts can be avoided (is there doubt?)
 - Supervisors not rewarded for reducing risk?
- Scale and stability depends on policy:
 - No stable volume flow - no investments
 - Imploding infrastructure will not be easily replaced
- Subsidizing biofuel is not the right target missing the opportunity to incentivize eco- services
- Economists not doing their job?

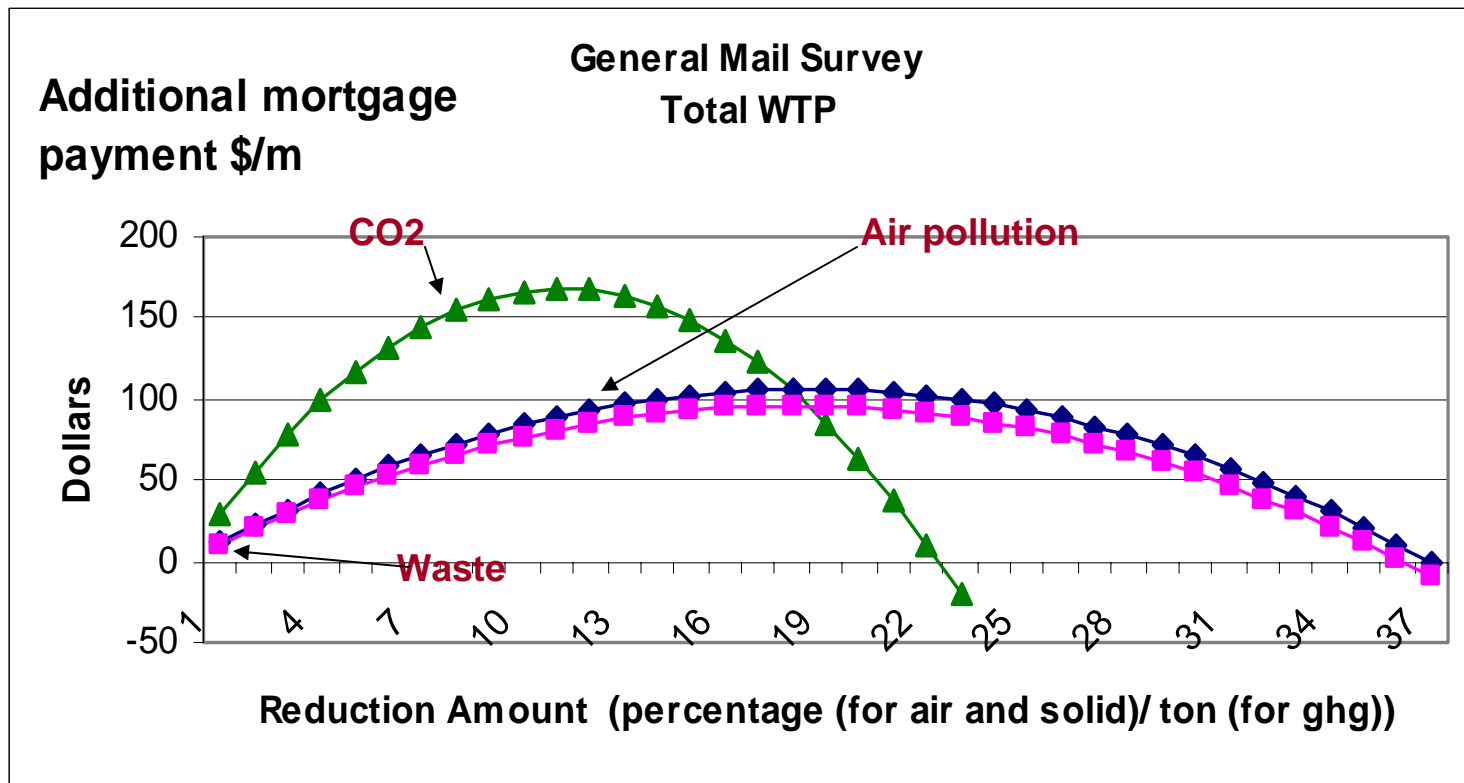
Ecosystem Service Market Considerations

- Who benefits from increases (decreases) in the service?
 - Do the beneficiaries have money?
 - Can property rights be established?
 - Can a unit of trade be established?
 - Is the market local, regional, or global?
 - Is the market large enough to cover organization and monitoring costs? Who will bear these costs?
 - Fix the terminology: incentives not subsidies; restoration to what for what; etc.
- › WE

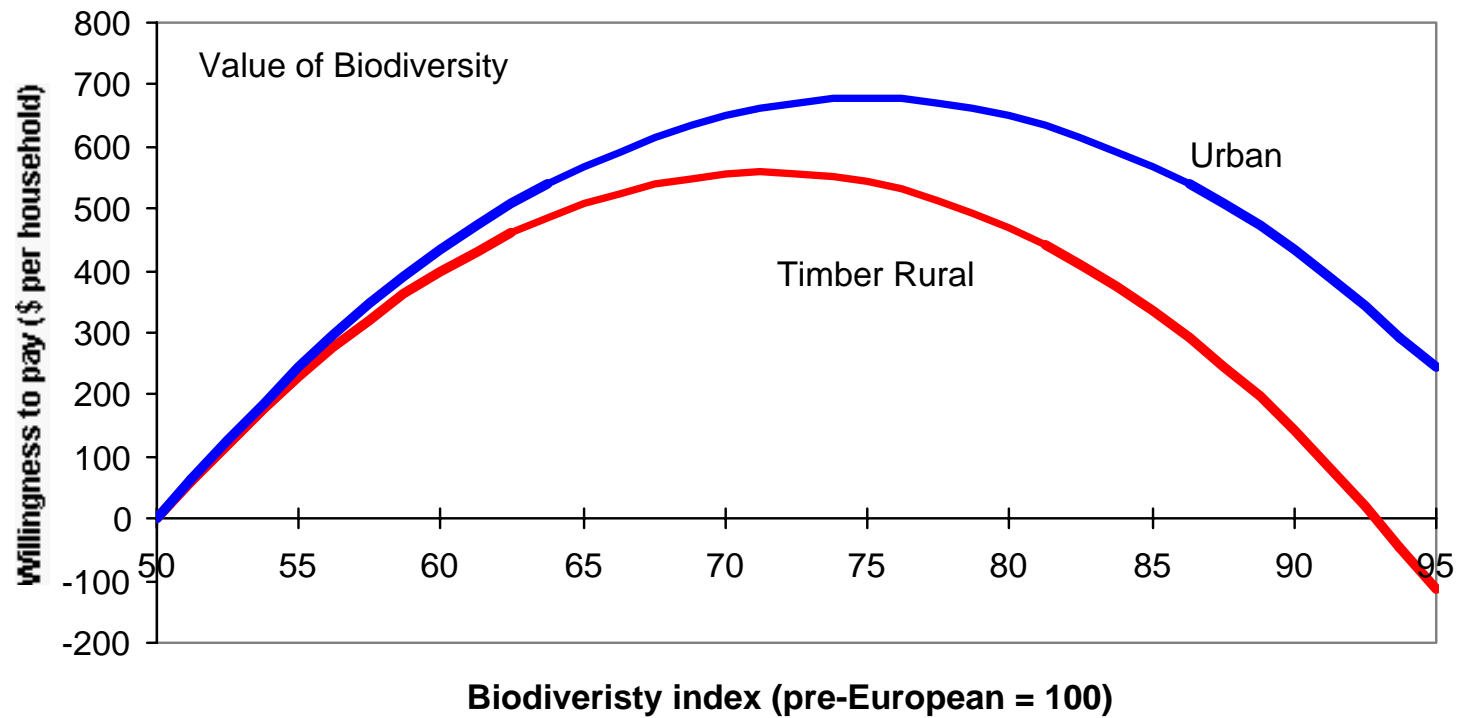
Markets for Environmental Services are Scarce but the Potential is Large:

- Federal stewardship contracting
- Conservation easements
- Incentive contracts
- Alternate plans for environmental values - services
- Product & purchasing standards that reflect environmental burdens

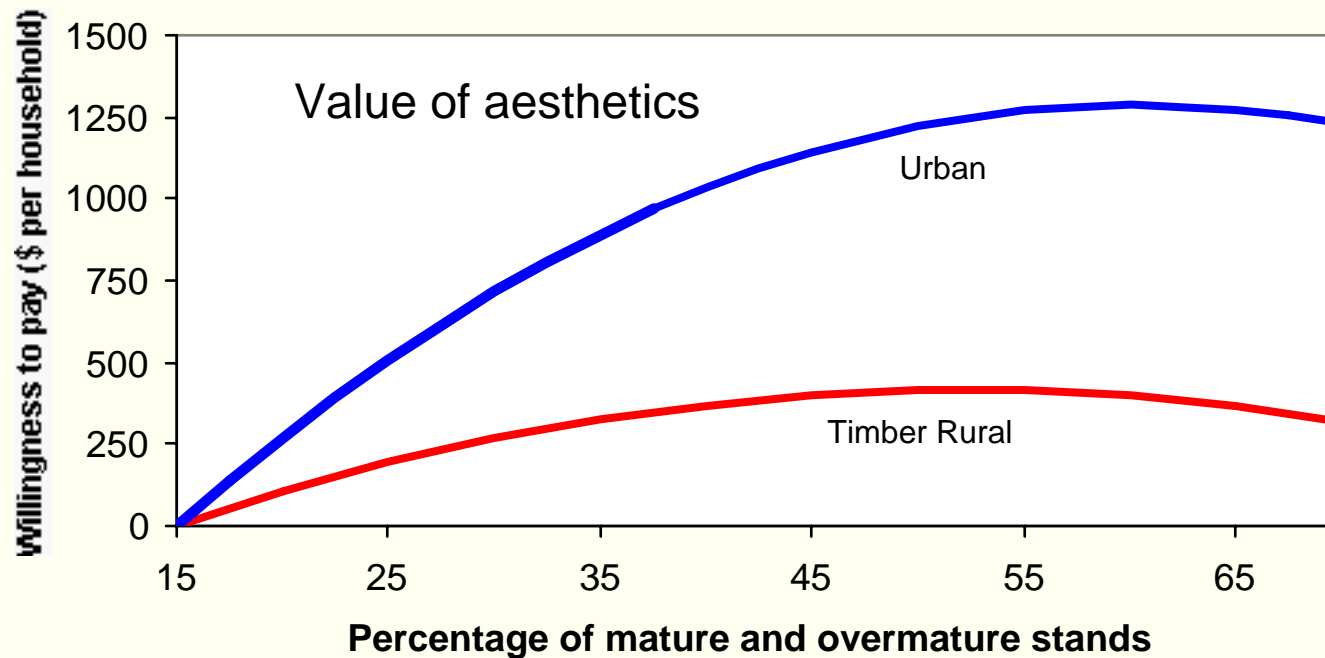
WTP for Reduced Emissions In a Home Purchase: Comparing Wood vs. Steel Frame



Willingness to Pay for Biodiversity



Willingness to Pay for Aesthetics



Willingness to Accept Rural Job Losses

