

# Entiat River HFEP

## *Remuneration Model and Possible Funding Sources*

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&  
PERC**

# Meeting Goals

- Our goals here today are to have a conversation, to show you our work, to get your reactions, comments, criticisms, and to discuss next steps.
- Remember the old Chinese proverb, “finish house, die.”
- Please interrupt early and often.

# Meeting Agenda

- Present Report
- Discuss any changes or additions you seek
- Present Remuneration Model
- Discuss Distribution of Report
- Discuss next steps, moving to funding

# Good News

- This has been a fun project for us
- PERC is engaged
- We are preparing a case study of what you are doing. It is to become a chapter in a book on enviopreneurs, a PERC trademark, literally
- Terry Anderson, Executive Director, sends his regards, and he would be here but for a PERC board meeting at the same time as this.

# Thanks

- Lots of people involved.
  - students in Econ 332 at Montana State University (Fall 2008)
  - participants at several PERC workshops
- Especially grateful to members of the Entiat Watershed Planning Unit and the HFEP Advisory Group for their time, energy, passion, insights, and motivation.
- Several individuals provided special help
  - Julie Morgan
  - Nancy Warner
  - John Thoren
  - Ray Sandige
  - several anonymous farmers whose data assistance was indispensable
  - And all of you who attended meetings, talked, gave of your time. Heartfelt thanks
- Taxpayers of Chelan County and their representatives for financial support

# Our Assignment

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- Two main chores
  - Develop a remuneration model
  - Help define and develop funding sources

# Our Team

- This was a team project, not just two investigators
- All of the aforementioned folks plus
  - Bobby McCormick, Ph. D.
  - Reed Watson, J.D., M.A.
  - Terry Anderson, Ph.D.
  - Kristina Catani
  - Kathryn Sayles, B.S., M.E.M.
  - Harrison Trammel, B.S.

# Report

- Two bottom lines
  - We think that we have a methodology to properly estimate the value of putting riparian habitat in place in lieu of tree fruit farming.
    - The model is data based
    - Our calculations are scientifically based
  - We believe that some sort of fish stamp may be the best conceptual approach to funding

# Overview of Situation

- The Entiat is channelized
- Fishing grounds have been lost
- There is intense residential real estate development pressure
- Tree fruit orchards can be converted to riparian habitat to benefit not only fish but other species, provide green space, and view
- Local community is united behind the idea of riparian habitat restoration
- Community is united and organized behind conservation and maintenance of local ecology and character
- Compensation to those providing these services is not only right, but appropriate, feasible, and perhaps the best if not only way to achieve restoration.

# The Abiding Issue

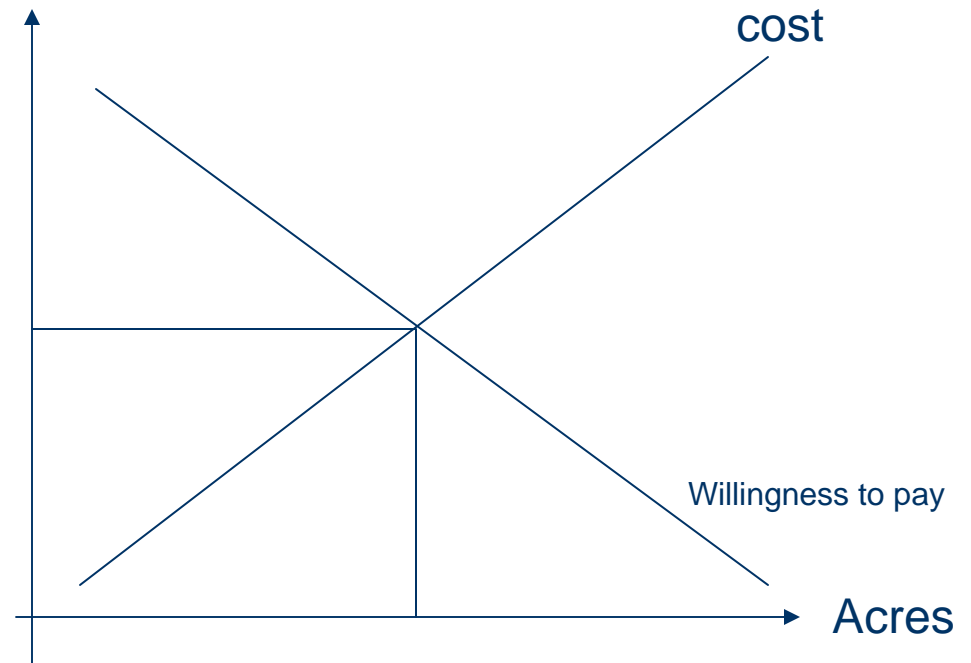
- How do we get tree fruit orchard land converted back to riparian habitat?
- Compensation schemes must be devised
- Payment or revenue streams must be developed
- Some sort of management system must be created

# Sustainable Features

- Ethical considerations
  - Consumers should pay for what they enjoy when they can.
  - Program should create appropriate philanthropic support for those who cannot.
- Practical considerations
  - Link product with the consumer to simplify price negotiation and payment amount.
  - Avoid conflict and government gridlock over payment process.

# Overview of Concept

- Structuring the deal
- Supply and Demand of ecosystem services
- People want ecosystem services
- Farmers and landowners can supply these services (if, see first bullet!)



# Demand for ecosystem services

- Funding Sources

- Background literature suggests beneficiaries will pay for fish:
  - Example: Yellowstone wolf compensation fund
  - Bees for Trees
  - Ducks Unlimited easement and purchase programs
- Broad based support – theoretical and practical – for these projects.
- The question is how do we structure the deal so that it is **sustainable** and **worth doing**.

# Program Design and Funding Source



This \$2 stamp in 1965 would be \$x today.

There is clear precedent for this idea.

# Program Design & Funding Sources

- Salmon Stamp added to Washington and Oregon sport fishing licenses.
  - Advantages
    - Proceeds go towards habitat enhancement where the fish are actually produced.
    - Not limited to sportsman; conservationists and collectors fund large part of duck stamp programs.
    - Long history of success at both state and federal level of directing funds towards habitat enhancement.
      - 98 cents of every dollar goes to U.S.F.W.S. for habitat conservation.
    - Cheap publicity: hold contest for artwork. See success of similar ventures in other arenas
    - Captures **existence value** demand through appropriate marketing strategies.
    - Taps the entire demand curve (willingness to pay)

# Program Design & Funding Sources

- Salmon Stamp added to Washington and Oregon sport fishing licenses.
  - Issues
    - Liaison with Washington Dept. of Fish & Wildlife and/or Dept. of Natural Resources
      - These agencies currently sell the state's duck stamp, so we would not need to reinvent the wheel.
      - But, who will be the champion there?
    - Some production and administration costs.
      - Could partner with American Sportsfishing Association, Trout Unlimited, or some other similar NGO (is TNC a possibility?)
    - Long run sustainability – will revenues be captured and diverted to some other government use?
      - Examples that work: highway trust fund (mandatory), Ducks Unlimited (voluntary), Oregon Water Trust (hybrid)
    - Doesn't capture demand of other wildlife or greenspace demanders

# Other Funding Options

- Hybrid Access Fee Programs
  - Montana's Block Management Program
- Enrollment in NGO habitat conservation programs
  - The American Sportfishing Association (ASA)
    - Fish America Foundation (ASA's grant program)
  - Trout Unlimited
    - The Home Rivers Initiative – large scale watershed habitat restoration projects
    - Embrace-A-Stream Program – *matching* grants to local TU chapters for
    - Pacific Northwest Salmon: WhyWild campaign
  - Defenders of Wildlife
  - Pacific Rivers Council
  - The Nature Conservancy
- See details in report, section 5.1 for more details

# Remuneration Model - Purpose

- Calculate remuneration rates upon which the farmers can base their decision to participate in the HFEP.
- This needs to be **all-encompassing** but **defensible**.

# Remuneration Model - Method

- Estimate the *net* present value of:
  - foregone fruit production from any acres taken out of production to accommodate buffer restoration including:
    - the net projected future value of productivity losses for the full production period of the crop,
    - the replacement cost of any fixed assets (trellis, irrigation system, etc.) removed or damaged because of participation,
    - impacts on scale economies (where applicable).
  - planting and maintenance costs of the riparian vegetative buffer;
  - raw land rental value;

# Remuneration Model – Method

- Estimate the *net* present value of:
  - market and non-market benefits and costs attributable to new cropping system including:
    - increased frost risk due to reduced air circulation,
    - tax liability increases or decreases,
    - specialty crops and contributions to integrated pest management programs, and
    - any reduced costs associated with operation and maintenance of existing crops.

# Remuneration Model – Details

- Data analysis of four rental contracts
  - Provide market based estimate of raw land opportunity cost
- Data analysis of actual riparian installation projects
  - Provides market evidence on cost of installation and maintenance

# Data Analysis, Sacramento River Installations

- The value of introducing riparian buffers into the landscape is a benefit
  - One-time costs:
    - Installation costs vary with hydrogeochemical attributes of the land and type of contractor
    - Range from \$3,000 to \$7,000 with \$3,000 to \$5,000 being the most common range
  - On-going costs:
    - Incredibly variable based on land use and goals for the area
    - Small when compared to one-time installation fees

# Data Analysis, Sacramento River Installations

- Offsetting costs can reduce financial burden and build community awareness and environmental stewardship
  - Non-profit organizations as contractors
  - “Plant-a-tree” school days and office days
  - Fly-fishing vacation packages from \$300 to \$400 per day for Bed & Breakfast and access
  - Pest prevention and awareness

# Data Analysis, Sacramento River Installations

- Limitations and uncertainties may cause us to overestimate or underestimate the true economic benefit of riparian buffers
  - SR dealt with walnut, plum and almond growers who may have different payment schedules for their trees
  - Floodplain land prices may vary between Washington and California
- This analysis appears to be one of the first of its kind; therefore incorporating estimates from analogous projects is reasonable
- Estimates from Riparian Restoration on Selected Stillaguamish Farms, provide similar but smaller estimates of installation costs
- Conclusion: we estimate that the cost of riparian installation is approximately, \$4,000 per acre in mid-2000 year terms.

# Data Analysis, Rental Contacts

- Apples, pears, apricots, cherries
- Spanning 2004-2007
- Leases with net income share arrangements
  - Leases vary from 10-40% share for landowner

# Data Analysis, Rental Contacts

<b>Analysis Across Crops</b>		
<i>Type of Crop</i>	<i>Valuation per Acre at 10%</i>	<i>Valuation per Acre at 8%</i>
<b>Pears</b>	<b>\$ 10,673.00</b>	<b>\$ 13,341.00</b>
Cherries B	\$ 59,123.73	\$ 73,904.66
Cherries C (2006)	\$ 20,844.10	\$ 26,055.13
Cherries C (2007)	\$ 25,033.01	\$ 31,291.26
<b>Cherry Average</b>	<b>\$ 35,000.28</b>	<b>\$ 43,750.35</b>
<b>Apricots</b>	<b>\$ -</b>	<b>\$ -</b>
Apples C (2006)	\$ 2,999.60	\$ 3,749.50
Apples C (2007)	\$ 15,894.11	\$ 19,867.64
Apples D (2007)	\$ 27,756.00	\$ 34,695.00
<b>Apples Average</b>	<b>\$ 15,549.91</b>	<b>\$ 19,437.38</b>
<b>Overall Average</b>	<b>\$ 15,305.80</b>	<b>\$ 19,132.18</b>
<b>Adjustment for inflation to 2009</b>	<b>\$ 15,757.32</b>	<b>\$ 19,696.58</b>

**Overall average includes apricots at zero. If apricots excluded, then overall average is approximately \$26,262.**

# Remuneration Model In Full, cherries

<b>Cherries</b>			
	Per acre one time cost	Per acre annual cost	Present value per acre (8% discount rate)
Opportunity Cost of Land in terms of lost tree fruit production		\$3,500	\$ 43,750.00
Legal costs (5 percent of land value)			\$ 2,187.52
Additional costs of fruit production, loss of economies of scale etc. (depends on farm size, assume 7% of land value)			\$ 3,062.52
Loss of view shed (10 % of value)			\$ 4,375.03
Total one time costs	\$3,000 to \$5,000		\$ 4,000.00
<b>Net Present Valuation per acre</b>			<b>\$ 53,375.42</b>

# Remuneration Model In Full, apples

<b>Apples</b>			
	Per acre one time cost	Per acre	Present value per acre (8% discount rate)
		annual cost	
Opportunity Cost of Land in terms of lost tree fruit production		\$1,555	\$19,438
Legal costs (5 percent of land value)			\$972
Additional costs of fruit production, loss of economies of scale etc. (depends on farm size, assume 7% of land value)			\$1,361
Loss of view shed (10 % of value)			\$1,944
Total one time costs	\$3,000 to \$5,000		\$4,000
<b>Net Present Valuation per acre</b>			<b>\$23,714</b>

# Remuneration Model In Full, pears

Pears			
	Per acre one time cost	Per acre annual cost	Present value per acre (8% discount rate)
Opportunity Cost of Land in terms of lost tree fruit production		\$3,500	\$ 1,067.28
Legal costs (5 percent of land value)			\$ 667.00
Additional costs of fruit production, loss of economies of scale etc. (depends on farm size, assume 7% of land value)			\$ 934.00
Loss of view shed (10 % of value)			\$ 1,334.00
Total one time costs	\$3,000 to \$5,000		\$ 4,000.00

# Pro forma

- Produced electronically so that you may
  - Do sensitivity analysis
  - Perform various “what ifs”
  - Expand and improve model as time marches by
- Open it and discuss, [link here](#)

# Take Aways and Thanks

- Truly appreciate your valuable time, energy, wisdom, and enthusiasm. This project would not be possible without you.
- Take aways:
  - This project is doable
  - There are many issues and potential roadblocks
  - The basic chores are done. The foundation is laid.
  - The details remain.
- Distribution of Report?
  - Who?
  - How?
    - Email, mail, website