

Marketing the Fruits of Multiple Resource Management

Frank Casey, Ph.D.
 Center for Science and Decisions
 US Geological Survey



Rangeland Science Symposium
 Managing Rangelands for Multiple Ecosystem Services
 Davis, California, January 19, 2011

Topics

- "Fruits" of Multiple Resource Management
- Markets vs Payments for Rangeland "Products"
- Requirements for Created Markets or PES Programs
- How to get there
- Final thoughts




Types of Ecosystem Services

- Climate, water, and gas regulation
- Water supply, nutrient storage
- Soil formation, nutrient cycling
- Waste management, biological control
- Wildlife habitat, food and fiber production
- Recreation, cultural and scenic value





Markets vs. Payments for Ecosystem Services

- **Commodity Markets:** Goods are easy to define; Private Transactions; Price Set by Demand and Supply
- **ES Payments:** Goods hard to define; Public-Private Transactions; Price Often Negotiated





Market-based or payment approaches to ecosystem service provision

The Idea:

"The marketing of ecosystem goods and services is basically an effort to turn recipients [who benefit for free] ... into buyers, thereby providing market signals that serve to help protect valuable services."

(Brown *et al.*, 2006:1)



Ecosystem service market failure dilemma

- Many ecosystem services are public goods
- Total value cannot always be captured by landowners/ranchers
- Few created markets for public goods (e.g., wetland and species/critical habitat mitigation banks)




Process for ecosystem services markets/payments

- 1) Identify the ecosystem (land area and land use) Identify services (human uses) provided by system
 - ◆ Biologists
 - ◆ Ranchers
 - ◆ Ecologists
 - ◆ Hydrologists
 - ◆ Recreation planners
 - ◆ Public
- 2) Quantify service flows in physical terms
- 3) Identify unit values (\$) for individual flows

Example: The economic value of a wetland's removal of 100 kg of nitrogen per year from surface waters depends on whether the water is used by humans, the marginal value of the removal for those uses, and on the cost of alternative removal options.



Most ecosystem service payments to date are based on government created markets programs

- Reason: many ecosystem services are public goods – i.e. use rights are insufficiently defined to attract owner investment, and benefits cannot be completely captured by land owners



Designing Ecosystem Service Payment or Market Programs

- Low transaction costs for buyers and sellers
- The definition of service units (i.e. “currency”)
- The setting of exchange rules (trading areas, trading ratios)
- Securitization of service contracts
- Outcome indicators to be measured




So why is designing markets or PES Programs a challenge?

Need to determine (not so evident):

- **Who** pays **whom**?
- **When**? Before or after service is rendered
- **For what**? What exactly is the product or output
- **How many** buyers and sellers are there
- **How is the output measured**, and
- **How much is it worth**?




Who pays whom?

- Individual to individual

Driven by self interest, not regulation:

- Perrier-Vittel pays farmers to use less intensive dairy farming techniques to reduce pollution of its springs (France)
- Costa Rica hydropower plant pays upstream farmers to implement land management practices to reduce soil erosion




Mitigation markets – purely government constructed, regulation driven

- Clean Water Services pays farmers to plant shade trees along Tualatin River to reduce water temperature and comply with U.S. Clean Water Act
- U.S. Wetland Mitigation Banking – developers must offset filled wetlands to comply with Clean Water Act, (but...are functions the same?)



Measurement of Ecosystem Service Flows

- **Assessment methodologies should be:**
 - reasonably accurate
 - reasonably inexpensive
- **Applicable by the land owner, not only trained ES technicians/scientists**



Kadyszewski, 2005

Securitization of Services

- **Insurance/bonds to guarantee fulfillment of service provision contract**
- **Establish guidelines for financial security and clear chain of liability**




Application: Northern Everglades Payment for Ecosystem Services

- **Who pays whom?** Water Management District Pays Ranchers
- **For what?** Water Retention and Phosphorus Control
- **How is the product measured?** Through compliance measures
- **How is payment determined?** Cost of installation plus fixed annual payments to smooth variability
- **Compliance measures:** Models of average retention; daily water levels measured; pump records; documentation
- **Collaboration and assurances?** Multi-partner effort and safe harbor agreement
- See: <https://www.fresp.org/pdfs/lynch.pdf> (contracts signed)

Bundling of ecosystem services

- **Protection strategy for services that suffer from market failure:**
 - Identify marketable services that are co-products of public good services
- **Examples of bundling:**
 - Carbon sequestration
 - Water quality preservation
 - Landscape beauty preservation




Southwestern Willow Flycatcher



How to Get To Environmental Payments

- **Buyer Motivation**
- **Compatible with supply of marketable services: cattle, forage**
- **Market structure and rules established**
 - How payment is determined
 - Product measurement and verification
 - Definition of compliance measures
 - Contract flexibility
 - Bonding/Insurance




The Conservation Registry

www.conservationregistry.org





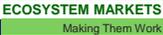
Final Thoughts

- Viable ES markets/payments: standardized units of trade; protocols; low-cost measurement and pricing of service flows
- Who is the buyer?
- PES program assistance: USDA Conservation Innovation Grants; USDA Office of Environmental Markets
- Think about multiple incentives
- CRCC Water Quality Markets Report
- SUSCON and Bay Bank projects on water quality payments
- Florida Ranchland Ecosystem Services Project



Mark Your Calendar for ACES and Ecosystem Markets 2012

A Community on Ecosystem Services Linking Science, Practice and Decision Making


December 10-14, 2012 | Harbor Beach Marriott | Ft. Lauderdale, FL, USA

Visit the website to join the conference mailing list and receive announcements for the following proposal opportunities:

• Pre-Conference Workshops	• Town Hall Meetings
• Organized Sessions	• Post-Conference Tours
• World Café Sessions	• Individual Abstracts

www.conference.ifas.ufl.edu/aces

THANK YOU!

Frank Casey - ccasey@usgs.gov
Science and Decisions Center
Energy, Minerals and Environmental Health