



**BLM-USGS ECOSYSTEM
SERVICES VALUATION PILOT**

**Assessing Ecosystem Services in the San Pedro
Watershed**

WHAT ARE ECOSYSTEM SERVICES?

- “Components of nature, directly enjoyed, consumed, or used to yield human well-being” (Boyd and Banzhaf 2006)
- Millennium Ecosystem Assessment (MEA) identified four categories of ecosystem services
 - Provisioning services (e.g., timber and water)
 - Regulating services (e.g., carbon sequestration)
 - Cultural services (e.g., recreation and spiritual uses)
 - Supporting services (e.g., nutrient cycling)



WHY VALUE ECOSYSTEM SERVICES?

- Nonmarket goods and services are not generally given the same weight as market commodities
- Changing public expectations and environmental attitudes have led to increased demand for environmental valuation
- Ecosystem service valuation improves BLM's ability to provide a comprehensive account of the costs and benefits of our programs and activities
- Better accounting of costs and benefits improves our ability to make informed decisions



PROJECT GOALS

- Determine usefulness of ecosystem service valuation for the Bureau
- Determine the feasibility of valuation tools and methods given BLM's capabilities
- Provide relevant information for plans and projects in the Gila District



PROJECT OVERVIEW

- Why the San Pedro?
 - Strong interest from District, SO, and external agencies in using San Pedro as project site
 - Opportunities to benefit from collaboration with other agencies/researchers pursuing similar projects
 - Strong foundation of ecological research in the San Pedro watershed gives the project team a defensible scientific foundation to build on
- Timeline
 - Project kick-off meeting held in January
 - Anticipate project completion mid-2011
- Outcomes
 - White paper on feasibility and usefulness of ecosystem service valuation for the BLM
 - Technical report on valuation findings



ECOSYSTEM SERVICES TO BE EVALUATED

- Water
 - Ground water for drinking and irrigation
 - Surface water for recreation and aesthetics
- Biodiversity
 - Biodiversity for birding
 - Biodiversity for hunting
- Carbon sequestration and storage
- Cultural services
 - Recreation
 - Aesthetic
 - Spiritual



HOW DO WE VALUE ECOSYSTEM SERVICES?

○ Methods

- Primary valuation: conduct original study on economic value of ecosystem services
- Benefit transfer: apply value estimates from an existing study to the site of interest

○ Tools

- Numerous tools have been developed in response to growing interest in ecosystem service valuation
- Many of these tools integrate valuation using the benefit transfer method
- Two tools the project team is considering: ARIES and InVEST



ES SOFTWARE TOOLS: MORE DEVELOPMENT NEEDED

- InVEST:
 - Well-documented, runs through ArcGIS, globally-applicable model
 - Customization for local conditions is not possible
- ARIES:
 - Models easier to tailor to local conditions; accounting for spatial flows is the most realistic way to handle services
 - Global models not yet available (tradeoff with having locally customizable models; currently only SE AZ, S CA, W WA)
- Neither model integrates cross-boundary data well
- Previously collected ecological & economic data don't always integrate well with model data needs



CONCLUSIONS: GOOD NEWS

- Given the rapidly changing landscape for ES tools, this may change even in the short to medium-term (i.e., 6 months-year)
- Significant opportunities exist to reduce resource requirements to run these models (i.e., data management and sharing)
- Could improve the situation with:
 - Carefully-targeted funding
 - Incentives for collaboration between project teams & government, academic, NGO communities



NEXT STEPS

- Complete Phase 1 technical report with insights from Gila District staff and partners
- Initiate a Phase 2 study in a different ecosystem, considering a subset of the most promising tools identified in Phase 1.



PARTICIPANTS (SO FAR)

- Lead Agencies: BLM (WO, Gila District Office) & USGS
- Lead Researcher: Ken Bagstad, University of Vermont
- Other Federal Agencies:
 - FWS
 - USDA – ARS
 - BOR
 - EPA
 - DOD (Ft. Huachuca)
 - DOI (Office of Policy Analysis)
 - NPS
- Non-Federal Participants:
 - University of Arizona
 - Arizona State University
 - University of New Mexico
 - Cochise College
 - The Nature Conservancy
 - Natural Capital Project
 - Upper San Pedro Partnership



PROJECT CONTACTS

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