The Division of Economics and the Use of Economic Information in the USFWS: Resources, Rationale and Applications

Dr. James Caudill
Chief, Division of Economics
USFWS HQ
Arlington VA
Road Map

- Division of Economics
- Getting Help
- Economic Information
- Uses of Economic Information
- Analytical Examples
- Information Sources
Division of Economics

- Created in 1994
- Five economists
- Purpose: to assist programs with economic analysis needs
- NEPA (EIS and EA’s), Critical Habitat analyses, Hydropower relicensing, NRDA’s, Refuges, Hatcheries, WO policy analysis, Rulemaking.
- In-house, contractors, BPA
Getting Help

- Division of Economics
  - In-house studies
  - BPA with Industrial Economics and Research Triangle
  - Co-op Research Units

- USGS Policy Analysis and Science Branch Ft. Collins CO

- GSA Contracting Schedule
  - [http://www.gsaelibrary.gsa.gov/ElibMain/sinDetails.do?executeQuery=YES&scheduleNumber=899&flag=&filter=&specialItemNumber=899+1](http://www.gsaelibrary.gsa.gov/ElibMain/sinDetails.do?executeQuery=YES&scheduleNumber=899&flag=&filter=&specialItemNumber=899+1)

- Get Economist involved early
- Frequent communication (meetings, conference calls)
- Attendance at public meetings
- Peer Review
Economic Information

- Economic Values
- Economic Impacts
- Economic Costs
Economic Value

- Consumer Surplus
- Net Economic Value

Max. Willingness to Pay minus Actual Payment

Examples:
Recreation
Ecosystem Services
Public Lands Goods and Services

- Recreational Use
- Commercial Use
- Ecosystem Services
- Restoration
- Information
- Federal Spending
- Subsistence
- Cultural, Religious
- Existence Value
Ecological Goods and Services

- Natural products
- Fisheries production and support
- Fish and wildlife habitat
- Natural areas/open space
- Flood storage and conveyance
- Shoreline anchoring/dissipation of erosive forces
- Storm-wave and surge protection
- Groundwater recharge
- Pollution assimilation/sediment trapping
- Biodiversity
- Energy fixation/food chain support
- Nutrient cycling
Economic Valuation of Ecosystems

- Ecological goods and services (Q)

- How are these goods and services affected by the project? (change in Q)

- How are people affected by these changes?

- How does human behavior change in response to these changes?

- What type of value do people place on these changes?
Human Behavior is the Basis for Economic Value

- The stronger (more direct) the link between people and ecosystem services, the greater the probability of obtaining accurate, defensible, quantifiable estimates.

- The weaker (more indirect) the link between people and ecosystem services, the lesser the probability of obtaining accurate, defensible, quantifiable estimates.
Problem: Limited or Non-Existential Information

- Doing site-specific studies:
  - Very expensive
  - Time consuming

- Rely on existing studies
  - Cheap, quick
  - Questionable relevance
Economic Impacts

- Expenditures
- Output
- Employment
- Income
- Taxes
Angling $ \rightarrow \text{Sporting Goods Store} \rightarrow \text{Wholesaler} \rightarrow \text{Manufacturer} \rightarrow \text{Manufacturing Inputs} \rightarrow \text{Multipliers}

* Direct

* Indirect

* Induced

* Induced
Why Economics?

- Mandatory

- Discretionary: Because it helps achieve your program goals and objectives
Use of Economic Information

- As an **AID** to FWS decision-making
- As a check on other agencies analyses
- Public Relations (we do great things)
- Public Relations (It’s not *that* bad)
- Because we have to
Examples of Economic Analyses

- NFH Salmon Production
- Public lands as a vehicle for economic development
- Economic Analysis for Rule-Making
- Cultural Resource Valuation
- Condor Recovery Costs
- Gambian Pouch Rat Damage Assessment
The Economic Effects of Pacific Northwest National Fish Hatchery Salmon Production

Four Mid-Columbia River Hatcheries
Mid-Columbia River
National Fish Hatcheries

- Spring Creek - Fall Chinook
- Willard – Coho
- Little White Salmon – Fall, Spring Chinook
- Carson – Spring Chinook
Economic Effects of Hatchery Salmon Production

- Recreation
- Commercial
- Tribal
- Ecological use
- Information
- Federal Spending
Study Results

- Hatch Releases/Production
- Salmon Returns to Columbia River
- Coded Wire Tag Returns: Four Hatcheries
- Economic Effects
Recreational Catch and Economic Value (based on average CWT return rates)

<table>
<thead>
<tr>
<th>Type</th>
<th>Fish Caught</th>
<th>Economic Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sport River</td>
<td>7,486</td>
<td>$558,571</td>
</tr>
<tr>
<td>Sport Ocean</td>
<td>3,036</td>
<td>$151,782</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10,522</strong></td>
<td><strong>$710,353</strong></td>
</tr>
</tbody>
</table>
Recreational Catch and Economic Impacts
(based on average CWT return rates)

<table>
<thead>
<tr>
<th>Type</th>
<th>Expenditures</th>
<th>Personal Income Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sport River</td>
<td>$1,471,543</td>
<td>$956,502</td>
</tr>
<tr>
<td>Sport Ocean</td>
<td>$227,530</td>
<td>$143,552</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,699,073</strong></td>
<td><strong>$1,100,054</strong></td>
</tr>
</tbody>
</table>
# Annual Economic Effects

Average CWT Return Rate (thousands $)

<table>
<thead>
<tr>
<th>Sport value</th>
<th>Sport Income</th>
<th>Ex Vessel</th>
<th>Comm. Income</th>
<th>State and Federal Taxes</th>
<th>Total Economic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>$619</td>
<td>$1,230</td>
<td>$638</td>
<td>$721</td>
<td>$226</td>
<td>$3,433</td>
</tr>
</tbody>
</table>
Economic Effects per $1 Budget

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average CWT Returns</td>
<td>$1.44</td>
</tr>
<tr>
<td>1 % Return Rate</td>
<td>$4.54</td>
</tr>
</tbody>
</table>
## Economic Effects and Budget Costs per Released Fish

<table>
<thead>
<tr>
<th>Budget Cost</th>
<th>Economic Effects Avg. CWT Returns</th>
<th>Economic Effects 1 % Return Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.09</td>
<td>$0.14</td>
<td>$0.43</td>
</tr>
</tbody>
</table>
Lower Mississippi River Conservation Committee

- Aquatic Resource Management Plan for the Lower Mississippi
- Mississippi River Conservation Initiative

Emphasizes the enhancement and expansion of sustainable natural resource-based economic development
1. What is the current situation?
   - Opportunities: Hunting, Fishing, Wildlife Watching, Biking, Picnicking, Camping, Boating
   - Current and past use: Quantitative estimates

2. What is the potential for increasing tourism?

3. How is the potential realized?
Wildlife-Related Retail Expenditures in Arkansas

- Watching: $607 million
- Hunting: $788 million
- Fishing: $425 million

2006 Total: $1.8 billion
Study estimated:

- Current Visitation
- Potential Visitation
- Retail Expenditures
- Jobs
- Personal Income
- Tax Revenue Generated
- County-level Impacts
Economic Analysis for Rule-making

- Refuge-specific Hunting and Sport Fishing Regulations

- Importation, Exportation, and Transportation of Wildlife
  Inspection Fees, Import/Export Licenses, and Import/Export License Exemptions

- Termination of the Southern Sea Otter Translocation Program
Cultural Resource Valuation: State of the Economics

Bruce Peacock
National Park Service
Social Science Division
Overview

- What are cultural resources?
- How can cultural resources be valued?
- What are the valuation challenges?
What are cultural resources?

- Sites, structures, landscapes, and objects that are of some importance to a culture or community for scientific, traditional, religious, or other reasons
  - Tangible and intangible aspects
  - Current and past time frames
- **Example**: “Congress declares that the national park system ... areas ... are ... cumulative expressions of a single national heritage”
  (Redwood amendment – 16 USC 1a-1)
Historic resources
Archeological resources
Natural resources
What are the valuation challenges?

- The key challenge
  - Economic valuation is all about tradeoffs
  - *Is the core nature of identity subject to tradeoffs?*
  - If not, how can cultural resources be addressed in a market-oriented society that faces resource scarcity?
Condor Replacement Costs

Estimate the budget cost of replacing a 30-year old condor in the wild

LA Zoo Costs plus Hopper Mountain NWR Condor Program Costs

1. Personnel Costs
2. Operations and Supply Costs

Total costs from the beginning of the incubation period to 30 years after birth: $428,000
The Potential Economic Costs of a Gambian Pouch Rat Infestation

- Small population in Florida Keys
- USDA considering eradication efforts @ $400,000

- How do the potential eradication benefits compare to the eradication costs?
Characteristics of $400K of Pouch Rat Damage

- Agricultural damage estimates per year per rat: $4 - $68
- Number of rats necessary to cause $400K in damages: 5,860 – 109,589
- Number of acres necessary to cause $400K in damages: 29 – 2,192
Information Sources

- Economics Primer (conceptual)
- Socioeconomic data
- Natural Resources and Economics
- Economics is Fun!
Economics Primer

Environmental Economics 101
http://www.env-econ.net/environmental_economics_1.html

Tim Haab: Ohio State University
John Whitehead: Appalachian State University

Environmental Economics
http://www.env-econ.net/
Economists on environmental and natural resource economics

Ecosystem Valuation
Dennis King and Marisa Mazzotta: U of Maryland
www.ecosystemvaluation.org

EPA National Center for Environmental Economics
Yosemite.epa.gov/ee/epa/eed.nsf/webpages/homepage
Socioeconomic Data

U.S. Census Bureau

American Fact Finder: Population, housing economic and geographic information
factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

American Community Survey: The ACS is an on-going statistical survey that samples a small percentage of the population every year.
www.census.gov/acs/www/

Bureau of Economic Analysis

Personal income and employment by county
www.bea.gov/regional/index.htm

Department of Labor

Bureau of Labor Statistics
www.bls.gov
Economics and Natural Resources

Sustainable Earth Exchange Link for Educators
Cal-Poly, Pomona
Provides links to a wide variety of natural resource-related sites, including fish and wildlife, endangered species, agriculture, climate change, economics, etc.
Information includes bibliographies, data, maps, education and research institutions, government programs, non-profits and NGO’s, studies and reports.
www.class.csupomona.edu/ec/aebres/earth

Center for the Advancement of the Steady State Economy
steadystate.org
Economics can be Fun!

Movies and TV for Economists

www.moviesforecon.com
tvforecon.blogspot.com

Jokes about Economists and Economics (PG13)

- http://economicscience.net/content/JokEc
“Not everything that can be counted counts, and not everything that counts can be counted.”

Albert Einstein
“In a world where money talks, the environment needs value to give it a voice”

Francis Cairncross