A role for economics in NOAA protected resources management: Challenges and opportunities

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Preliminary results – do not cite or circulate
Objectives of this talk

1. Discuss challenges to effective PR management in the West Coast Region

2. Identify opportunities for applying economic analysis to address management challenges

3. Assess PR economics at NWFSC
   1. Strengths
   2. Weaknesses
   3. Strategies

Gap Analysis Findings

Implications for PR Research at NWFSC
Current use of economic analysis in protected resources (PR) management

Policy evaluations:
• Economic considerations do not play a role in ESA listing decisions
• CHD represent large share of economic analyses
• Regulatory reviews can involve consideration of costs and benefits under EO12866 and EO 13563

Academic literature
• SP studies to measure preferences for species recovery
• The influence of management institutions on bycatch of protected species
A call for collaboration and coordination across disciplines

“The complete lack of discussion of coordination between the natural sciences and economics and other social sciences was noteworthy … more effort should be placed on integrating the relevant social and natural sciences that bear on recovery.”

-West Coast Protected Fish Species Science Program Review (2015)
The West Coast PR gap analysis

- NOAA Economics of Protected Resources Workshop (2014) recommended conducting a high-level analysis to:
  1. Document and assess species threats and the instruments used to reduce threats
  2. Identify information needs for evaluating threats
  3. Identify research needs in PR economic research

- Regional focus due to heterogeneous management challenges across regions
PR management challenges

• Evaluating recovery alternatives
  • Prioritizing alternative recovery actions
  • Deciding whether to undertake a proposed recovery action
  • Understanding distributinal impacts

• Addressing scientific uncertainty
  • Incomplete understanding of underlying processes
  • Data, modeling, and computational limitations
  • Alternative futures under climate change and other anthropogenic pressures

• Management across protected species
  • ESA does not permit consideration of recovery tradeoffs across species, but implicit are made through resource allocation decisions.
  • Cross-species management issues:
    • Overlapping and conflicting protections
    • Evaluating recovery tradeoffs across listed species
Tools for evaluating recovery actions: Cost Effectiveness Analysis (CEA)

Evaluation framework
• “Biggest recovery bang for your buck” or
  “Least cost alternative for achieving an objective”
• Prioritizes alternatives with the lowest average costs of achieving a specified objective
• Requires estimates of costs, but not benefits

PR application
• Well-suited to compare recovery actions designed to meet a common objective (e.g. species delisting)
• Facilitates comparison of many recovery alternatives
• Can assess dynamic and stochastic species recovery scenarios
Tools for evaluating recovery actions: Cost Benefit Analysis (CBA)

**Evaluation framework**

- Prioritizes actions based on their total economic value
- Used to evaluate single projects and to compare alternatives
- Considers project benefits, requires non-market valuation, often with SP and RP methods

**PR application**

- CBA appropriate for evaluating recovery actions with:
  - Large non-market ecosystem service values
  - Multiple objectives
  - Large distributional effects
- CBA is costly and time consuming, which may limit its ability to inform policy
Addressing scientific uncertainty with economic analysis

Management question

• Allocating a limited data collection budget

• Evaluating PR research proposals and implementing adaptive management

Evaluation method

Apply CEA to identify the least-cost data collection strategy that reduces uncertainty within some criteria

Conduct a limited-scope CBA

• Estimate the value of scientific information net of the research costs

• Account for the likelihood of research success and the timing of the costs and benefits.
Management across protected species: Conflicting protections and mandates

• Marine mammal and ESA listed prey species interactions (e.g. sealions and salmon; sea otters and abalone)

• Interactions between ESA listed species (e.g. SRKW prey on salmon)

• NOAA Fisheries objectives of species conservation and harvest promotion

➤ Overlap and conflict of protections suggests need for EBM for protected species rather than piecemeal approach
Management across protected species: Resource allocation

• Allocating recovery resources among protected species:
  • Not permitted currently, but possible as listings accumulate
  • Triage for endangered populations that are “too far gone”? (e.g. Levin & Stunz, 2005)
  • Focus on protecting healthy populations?
  • EBM and multi-objective, multi-species, recovery planning?

• Informing allocation decisions with economic analysis:
  • Measure public preferences for recovery across species with non-market valuation (e.g. SP studies)
  • Analyze cost effectiveness of multispecies recovery planning
  • Investigate heterogeneous stakeholder preferences for recovery scenarios to inform recovery planning
PR Economics at NWFSC

**STRENGTHS**
- Identified need for integration of economics in PR research
- Competencies in relevant methods (e.g. non-market valuation and dynamic scenario analysis)
- Biophysical PR experts at NWFSC

**WEAKNESSES**
- Lack of guidance
  - When to undertake analysis?
  - Which evaluation tool?
  - Best practices?
- No dedicated funding
- Research silos can prevent transdisciplinary thinking
PR Research strategy

Themes:
1. Economic analysis of Pacific salmon recovery and management
2. An Ecosystem approach to PR management
3. Develop cross-discipline collaboration and coordination on PR research
4. Assessing the value of scientific information to inform research effort allocations
PR Research strategy (cont.)

Projects:

• CEA of salmon habitat restoration

• Ecosystem service values of salmon habitat restoration

• Investigating angler preferences for wild and hatchery steelhead

• Overlapping and conflicting protections for endangered species and marine mammals
Questions or comments?

Photo: NOAA Fisheries