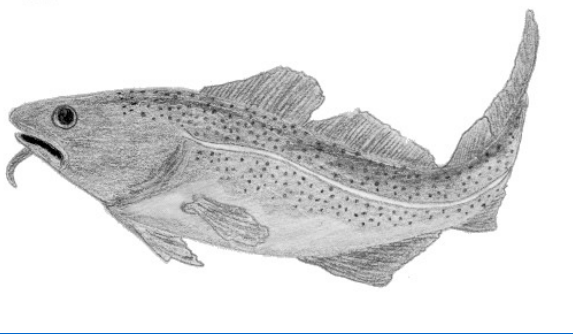


Evidence and Attribution  
2007 Environmental Evaluator's  
Networking Forum

Andy Rowe

# Outline

- Evidence
  - Methods to gather evidence
  - Standards for evaluation evidence
  - Values and power in evidence
  - Does evaluation require different evidence?
  - Types of evidence
- Attribution
  - Why a concern
  - Comparison to an alternative



# Reviewing 25 Years of Resource & Environmental Evaluations

- None of the evaluations would have been suited for an experimental design approach
- Two of the evaluations were response programs to a catastrophic collapse of the resource where if the science managers and politicians had lived up to their ethical and professional responsibilities, they would have used experimental designs for stock assessments and setting quotas with the possibility of different management strategies
- In most of the evaluations experimental designs beyond good comparison groups were not feasible for technical reasons, for some the reasons were more a political/technical and in a few ethical

**“No randomized trials of parachute use have been undertaken”**



Gordon Smith and Jill Pell, British Medical Journal (courtesy Michael Patton)

<http://bmj.bmjournals.com/cgi/content/full/327/7429/1459?ck=nck>

# Smith and Pell concluded:

“Only two options exist. The first is that we accept that, under exceptional circumstances, common sense might be applied when considering the potential risks and benefits of intervention.”

OR

# Standards of Evidence for Evaluation

- Non negotiable
  - Ethical
  - Feasible
  - Valid and reliable
  - Credible
  - *Transparent*

See AEA website

<http://www.eval.org/EvaluationDocuments/progeval.html>

# Knower is Part of the Known

... all of human knowledge consists of actions and products of acts in which men and women participate with other human beings, with animals and plants, as well as objects of all types, in any environment. Men and women have, are, and will present their acts of knowing and known in language. Generic man, and specific men and women are known to be vulnerable to error.

Consequently, all knowledge (knowing and known) whether commonsensical or scientific; past, present, or future; is subject to further inquiry, examination, review, and revision.

John Dewey, Arthur Bentley, (1949). *Knowing and the Known*. Beacon Press, Boston. p121-139)

# Evidence for Improvement & Evaluative Thinking Key for Adaptive Management



Mowers Will Mow



Recreational Anglers Will Trample



# Types of Evidence

- Direct observations, inferences, judgments...
- Also
  - Context is essential
  - Inquiry is also Temporal (backwards and forwards) and Spatial
  - Inquiry must be dynamic and conditional

# Traditional and Modern Science Knowledge Can Work Together Productively

- Natural Resource Management Services exist to plan and execute a balanced direction for the protection, use, and enhancement of all tribal natural resources. Resources shall be managed as sustainable assets available for cultural, subsistence, economic and social purposes or opportunities in perpetuity consistent with the Confederated Tribes sovereign and treaty status.
- Departments:
- Ranger Enforcement
- Policy & Planning
- Realty
- Water & Soil
- Range & Agriculture
- Fish, Wildlife & Parks
- Cultural Resources
- Forestry Programs
- GIS Programs



# Which Salmon Are Attributed to the Decision?



I'm here because they improved water flow and a big guy like me can now get through the shallows

The rest of my family would be here but they got netted off Greenland

I'm not here because of global warming

I'm here because they took out the Marmot dam



# James Heckman 2000 Nobel Prize in Economics

"for his development of theory and methods for analyzing selective samples"



# Summary

- Evidence is not simple
- Focus on evidence standards and requirements, not method