

Adaptive Management for the Forest and Fish Agreement

Adaptively Managing (adaptively)

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Talk Outline

- AM overview
- How AM is working in Forest and Fish Agreement
- What we learned
- Questions

Adaptive Management is: (utopian view)

...where we use the best scientific knowledge and technologies, clearly recognize knowledge gaps, build shared expectations among those who have a stake in ecosystem outcomes, monitor actions, and adjust management actions accordingly (Johnson and O'Neil 2001)...

Other catchy notions.....

“... leaning by doing.”

“... learning to manage by managing to learn.”

“... policies are experiments; *learn from them.*”

“... compare selected policies, by evaluating alternative hypotheses about the system being managed...”

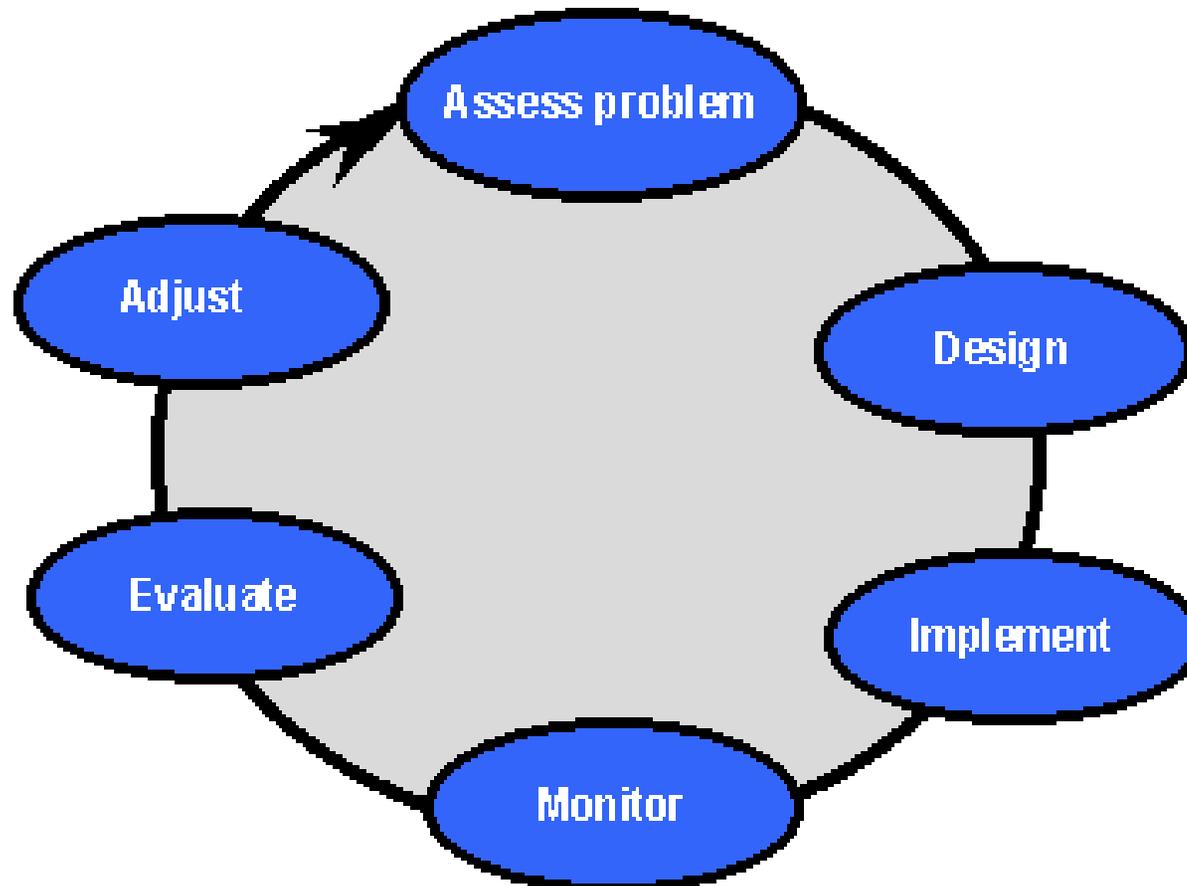
Conditions That Warrant an Adaptive Management Approach

1. Work With Complex Systems
2. World Is Constantly Changing
3. Actions Have Unintended Consequences
"Competitors" Are Changing and Adapting
4. Immediate Action Is Required
5. Information Is Never Complete
6. Can Learn and Improve

Process outline for AM

1. Design an Explicit Model of System
2. Develop Management Plan to Learn
3. Develop a Monitoring Plan to Test Assumptions
4. Implement Management and Monitoring Plans
5. Analyze Data and Communicate Results
6. Use Results to Adapt and Learn

The iterative nature of AM



Everyone and their siblings are apparently doing it

- 1,560,000 google hits for AM 2003
- 4,800,000 google hits for AM 2007

Forest and Fish Agreement 2000

- HCP meets ESA and CWA on ~ 4 million ha
- Covered all fish and 7 amphibians
- New forest practice rules for state and private
- Established AM as cornerstone of agreement
- AM funded at ~ \$2 million/year

Forest and Fish Adaptive Management

- How AM changes the negotiation dynamic (then and now)
- How AM improves management actions

The role of AM in ***FFA Negotiation Process***

- Provided mechanism for dealing w/ uncertainty
- Made real the idea of “knowledge as mitigation”

Dealing with Uncertainty

- FFA would not have happened without AM
 - Too much complexity, scientific uncertainty, opinion
 - Avoid getting *stuck* for 50 year HCP term
 - Parking lot for thorny issues (e.g., DFC, PIP, seeps)
- Many fine details left undone
 - clean-up after the party
 - easy to forget intent of negotiations
- Requires continuous post party negotiations

Legitimacy of “Knowledge as Mitigation”

Seven amphibian species *covered* in FFA

- 1) uncertainty related to status or habitat needs
- 2) obtained modest increases in protection measures
- 3) promise of better knowledge vs. risk of decline

Scientists engaged to define equivalencies

- 1) scientist needed in real-time negotiations

Adaptive Management

Improving Management Actions

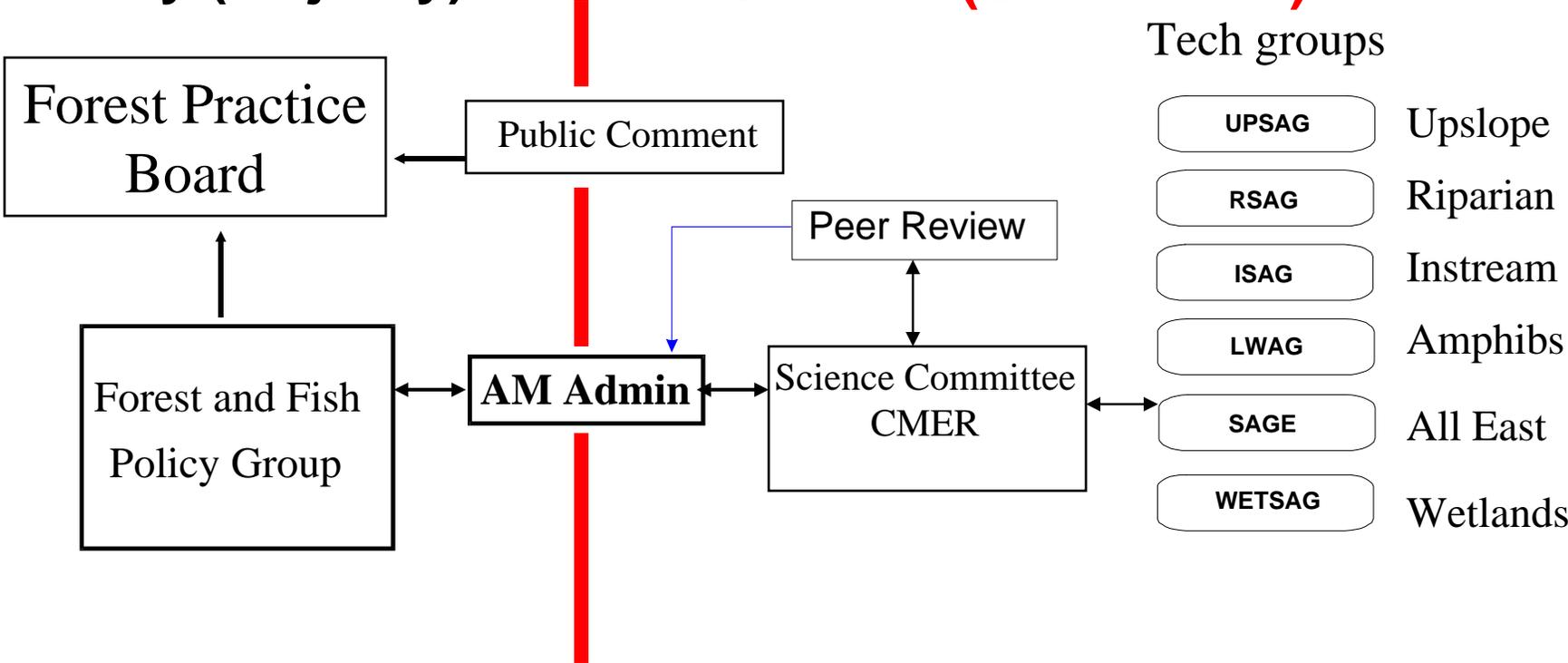
(how has AM worked in past 6 yrs)

- Building the organization
- Initiating and sustaining meaningful inquiry
- Changing management!

Forest and Fish Agreement AM Structure

Policy (Majority)

Science (Consensus)



Organizing Inquiry

Many ways to ask how FFA rules working and many require new techniques (rule tools)

- Implementation
- Compliance
- Effectiveness
 - Site scale
 - Extensive (status/trends)
 - Cumulative effects
- Validation
 - Site scale
 - Extensive (status/trends)
 - Cumulative effects

Organizing Inquiry

Many ways to prioritize spending AM funds

- Risk to public resources
(lots of ways to do this)
- Risk to landowners (\$)
- Feasibility of study
- Study cost
- Study implications

Organizing to do real AM

Science

- Need trained scientist in each stakeholder group
- understand how research is conducted
- appreciate bias
- understand scientists role in negotiations

Caution - Do NOT Cross

Policy

- Need trained policy-makers
- understand scientific uncertainty
- understand pace, cost, and limits of research
- need timelines for decision making

Organizing to do real AM

Need some full-time staff who run the show

Need participation grants to secure support
(participation as mitigation)

Need continuity of players so as to not forget
rules

Building an Organization

Where AM time and money went (2001-2005)

Program admin	\$3.2
Rule tools (stream typing, protocol develop.)	\$2.3
Lit reviews & workshops	\$0.8
Status and Trend	\$0.0
Effectiveness Studies	\$2.3
Validation Studies	<u>\$0.0</u>
Total	\$8.6

Knowledge as Mitigation 2001-2005

- 16 publications, 8 peer reviewed, with ~ 10 more in prep.
- Lots of non-fish bearing stream research
 - Much increased knowledge of (Dunn's and Torrent Salamanders, Pacific Tailed Frog, and Giant Salamanders)
 - Better understanding of headwater fish distribution, and spatial dynamics of surface flow
- A bunch of educated policy and science folks

Two Pending Course Corrections

Composition of W. WA Riparian Buffers

- FFA negotiated BA targets at ~ 260 ft²/ac at age 140 years, and different BA targets by site class
- AM research showed BA in 140 year old riparian plots ~ 330 ft²/ac, and no site class effect
- Net result is increase in number of trees left in RMZ

Two Pending Course Corrections

Length of Riparian Buffer on Non-fish Streams

FFA negotiated non-fish bearing streams to begin at a basin size of 21 ha (i.e., top of the Type N stream)

AM research showed top of Type N to be ~ 2.5 ac

Net result is increase in RMZ length of about 75 m/stream

Conclusions

- AM is as much a policy as scientific pursuit
- AM is process of renegotiation at a chronic level
- Policy makers are resistant to change
- Specificity (#'s) decreases chance of agreement
increase probability of Δ in management
- Serve as scientist or policy maker not both

Some additional thoughts

(hard to do, requires science and policy, but worth the effort)

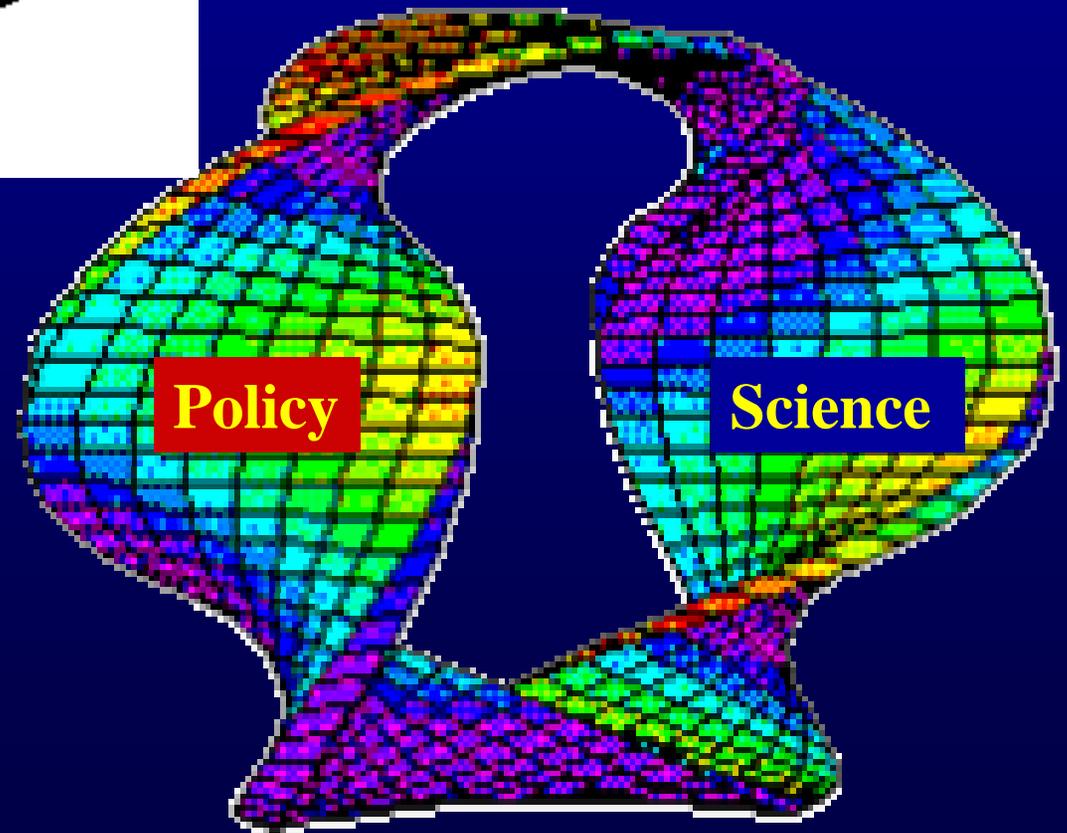
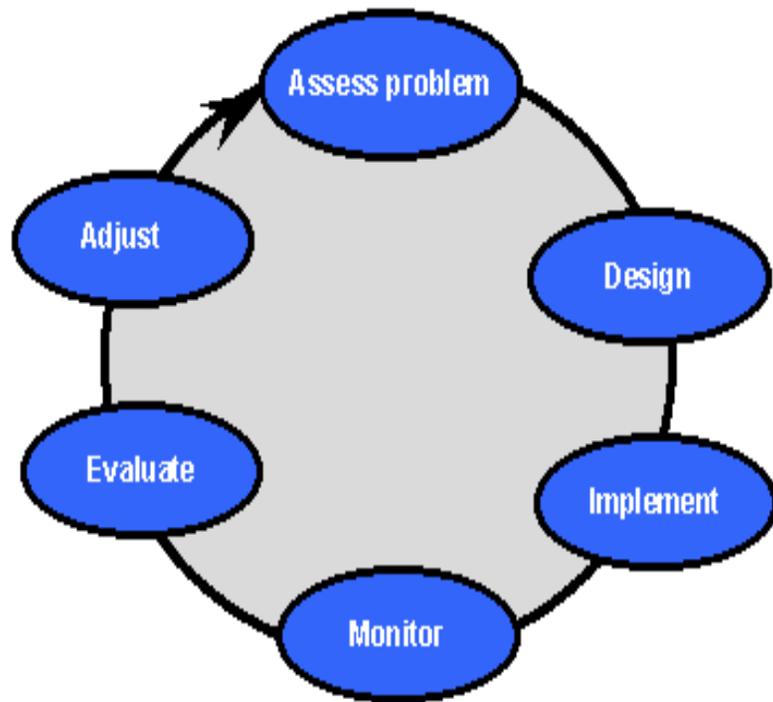
Define **policy response space** prior to monitoring:

i.e., negotiate ranges within which rules can change in short term.

Define **policy negotiation space** prior to monitoring

i.e., recognize levels of knowledge. Poorly informed numbers should change with better knowledge.

Some, not all, changes may require understanding of cause and effect.



REAL ADAPTIVE MANAGEMENT