ECOSYSTEM COMPLEXITY AND RESPONSE TIME: WHAT ARE THE INSTITUTIONAL CHALLENGES?

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Problem scale relative to available resources

- Resources increasingly becoming scarce
- Public and politicians increasingly will expect demonstrable “results”
- To what extent should we conduct ecosystem “triage”?
  - Is the Endangered Species Act the correct filter to make those decisions?
System response time

- Limited public and political attention span
- Length and complexity of decision process
- Pressure for quick, demonstrable results
- Decision bias in favor of short-term gains versus long-term ecosystem recovery?
Uncertainty/limited info.

- Difficulty communicating (to public and politicians) the nature and inevitability of uncertainty in restoration efforts
- Regulated parties want compliance certainty. Shifts risk of failure to species.
- Decision bias in favor of restoration efforts that are more certain versus those that increase knowledge and understanding?
Fundamental modifications

- Role of scientists and managers in deciding whether goals are futile?
  - Are the changes irrevocable or fixable?
- Should program goals shift from trying to accommodate fundamental changes to reversing those changes?
  - And who decides those questions?
Problematic objectives (I)

- Only Congress can change statutes.
- Agencies can change regulations, but time-consuming and often political.
- "Flexible" agency interpretations and implementation judicially reviewable.
- Should we proceed with high risk of failure or delay restoration to try to fix objectives?
Problematic objectives (II)

- Program objectives stated in terms of measurable actions rather than demonstrated ecosystem progress.
  - E.g., acres of habitat replanted or numbers of hatchery fish stocked versus ecosystem recovery indicators.

- What are the right things to count?
  - NAAQS and SIP program analogy
Albert Einstein

“Not everything that counts can be counted and not everything that can be counted counts.”

(Sign on office door at Princeton)
Intractable conflicts

- Perfect is the enemy of the good – we can’t have it all
- Arguably Congress punts to the agencies
- Can managers choose among objectives when statutes require all to be met?
  - (Not universal. Some laws set priorities.)
  - Explicit versus implicit choices!
Geographic constraints

- Jurisdictional limits to authority
  - Challenge of inter-jurisdictional coordination
- Substantive limits to authority
  - Challenge of inter-agency coordination
- Do the best you can within jurisdictional and substantive limits or broader view?
External forces

- Exacerbate problems of program scope.
- Exacerbate limits to legal authority.
- Obligation of program managers when statutory objectives are constrained or futile in face of external forces?
Private sector single step

- Problem Identification
- Identify Options
- Select and Propose Option
- Input from others
- Modify and select final option
- Implement final option
Private sector iterative

- External factor changes
- Evaluate modifications
- Evaluate effect
- Continue or modify
- Decision

(Using same process)

(Process per previous slide)
Private sector iterative

Problem Identification
- Identify Options
- Select and Propose Option
- Input from others
- Modify and select final option
- Implement final option

Decision
- Continue or modify

External factor changes

Evaluate modifications

Monitor
- Problem Identification
- Identify Options
- Select and Propose Option
- Input from others
- Modify and select final option
- Implement final option

Evaluate effect
Public sector single step

- Problem Identification
- Identify Options
- Select and Propose Option
- Input *(notice and comment)*
- Modify and select final option
- Maybe more notice and comment
- Choose/implement final option

Judicial Review
- Upheld
- Remanded
Public single step with extra environmental reviews

- Problem Identification
- Identify Options
- Select and Propose Option
- Input *(notice and comment)*
- Modify and select final option
- Maybe more notice and comment
- Choose/implement final option

Judicial Review
- Upheld
- Remanded

NEPA
ESA
404
Public sector iterative

External factor changes → Evaluate modifications → Evaluate effect → Monitor → Decision → Continue or modify → (Process per previous slide)
Public sector iterative

Evaluate modifications
External factor changes

Evaluate effect

Constant iteration

Remand?
Decision
Public review
Judicial review
Final decision

Continue or modify

Decision
Monitor
Public sector iterative

- Decision
- Evaluate effect
- Continue or modify
- Final decision
- Public review
- Judicial review
- Remand?
- Envtl reviews
- Evaluate modifications
- External factor changes
- Monitor
Added complexities in restoration programs

- Technical and Advisory Committees
  - Maybe with associated FACA process
- Intergovernmental coordination and joint decision making
- Changing legal and political landscape over time span of long ecosystem restoration efforts
Interlocking components

- Flow augmentation
- Exotic species removal
- Habitat Restoration
Interlocking components

- Decision
- Exotic species removal
- Flow augmentation
- Habitat Restoration
- Decision
Benefits of complex process

- Inclusiveness
- Better and better-informed decisions
- Accountability
  - Judicial review
  - State-federal
  - Inter-agency review
- Prevents oversimplification
- Facilitates collaboration/cooperation
Impediments in complex process

- Delay
  - Public participation
  - Judicial review
- Potential lost “windows” of opportunity
- Potentially “worse” decisions to please all?
- Resource drains
- Frustration, impatience
Ideas to strike a balance

- One-stop shopping
- Can some steps be eliminated as duplicative?
- Improvements to tiered NEPA processes?
- Do we need a National Environmental Restoration Act?
  - With exemptions from duplicative statutes?
  - With national funding program?
  - With nationwide decision process for ecosystems to target for restoration?