



# 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

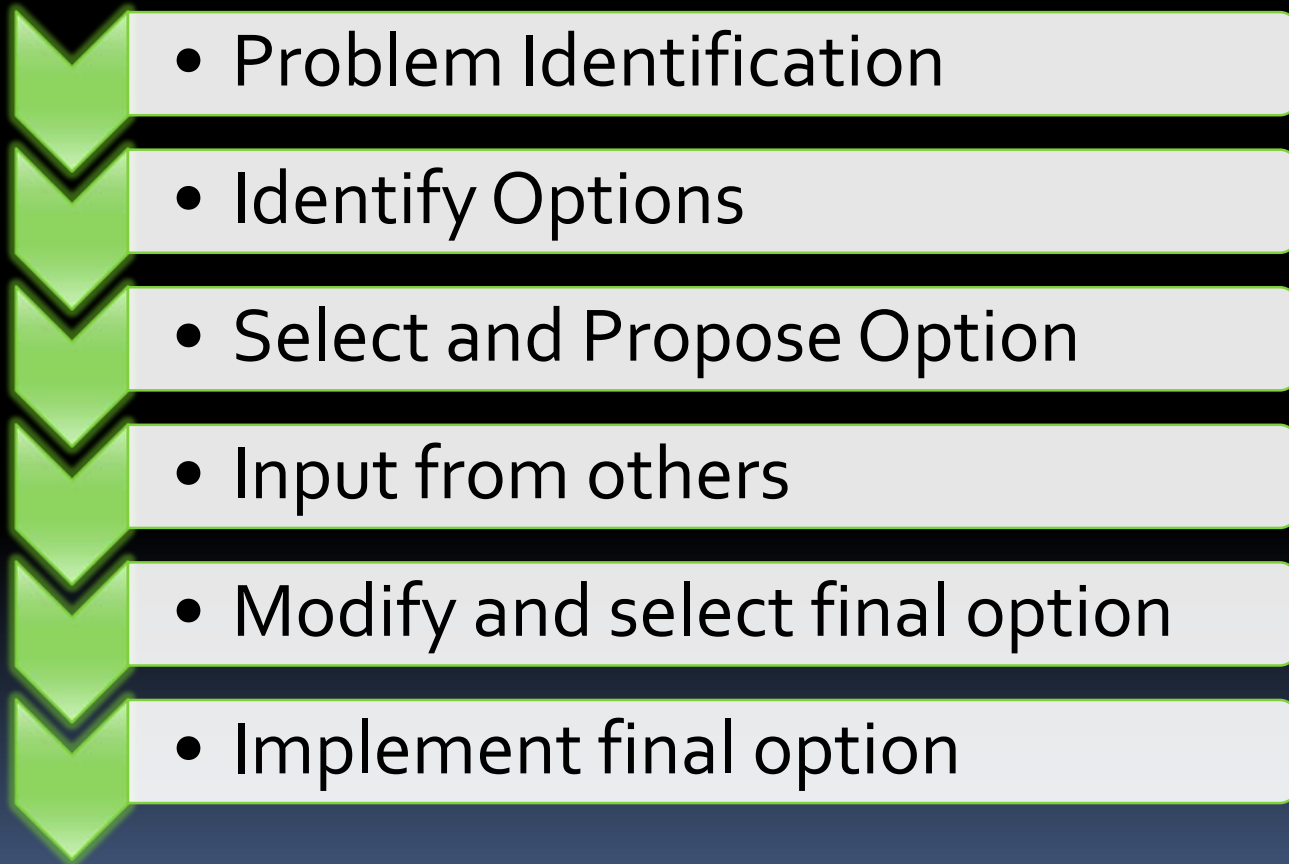
- Jurisdictional limits to authority
    - Challenge of inter-jurisdictional coordination
  - Substantive limits to authority
    - Challenge of inter-agency coordination
  - Do the best you can within jurisdictional and substantive limits or broader view?
- 



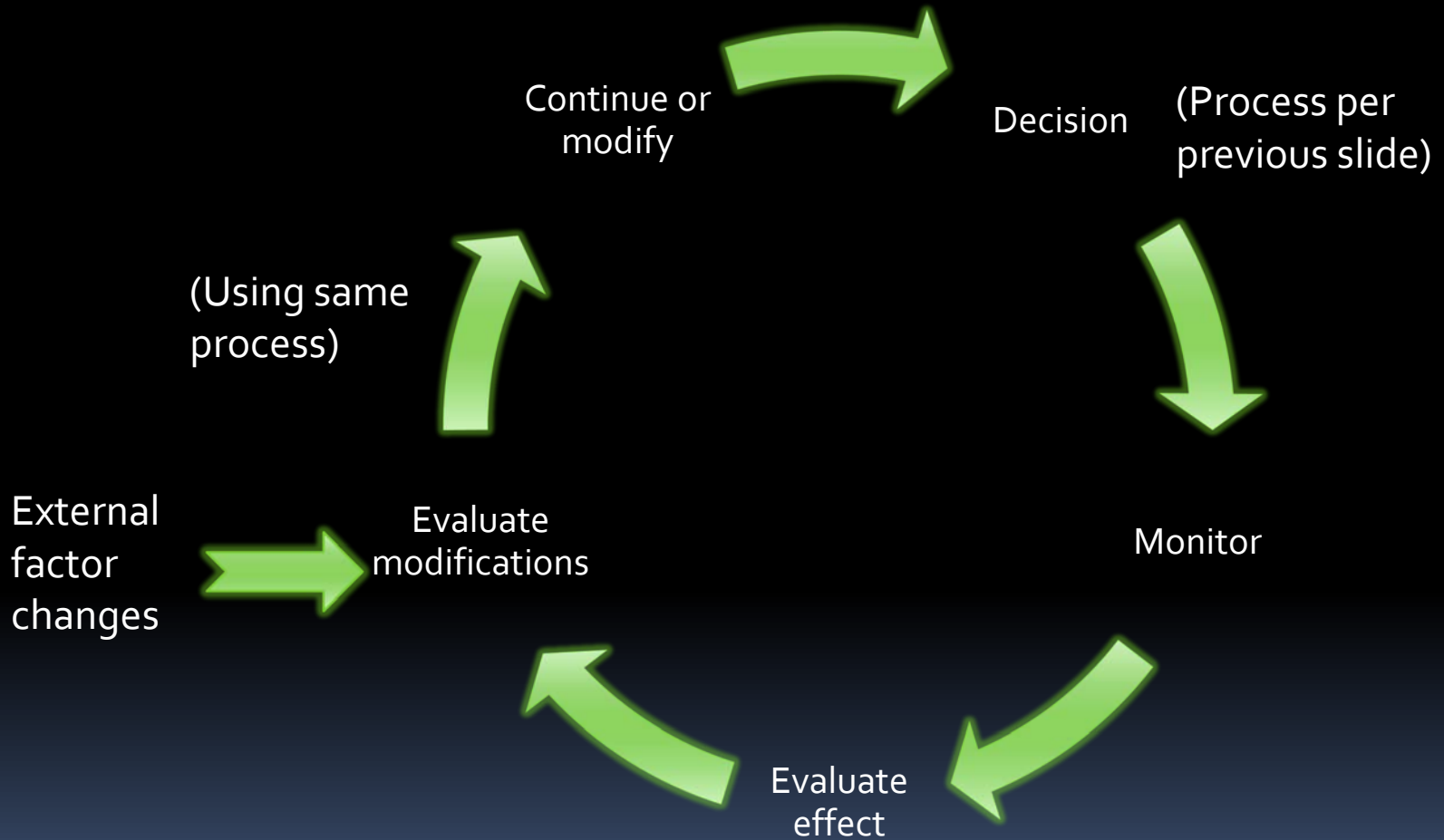
# External forces

- 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?**
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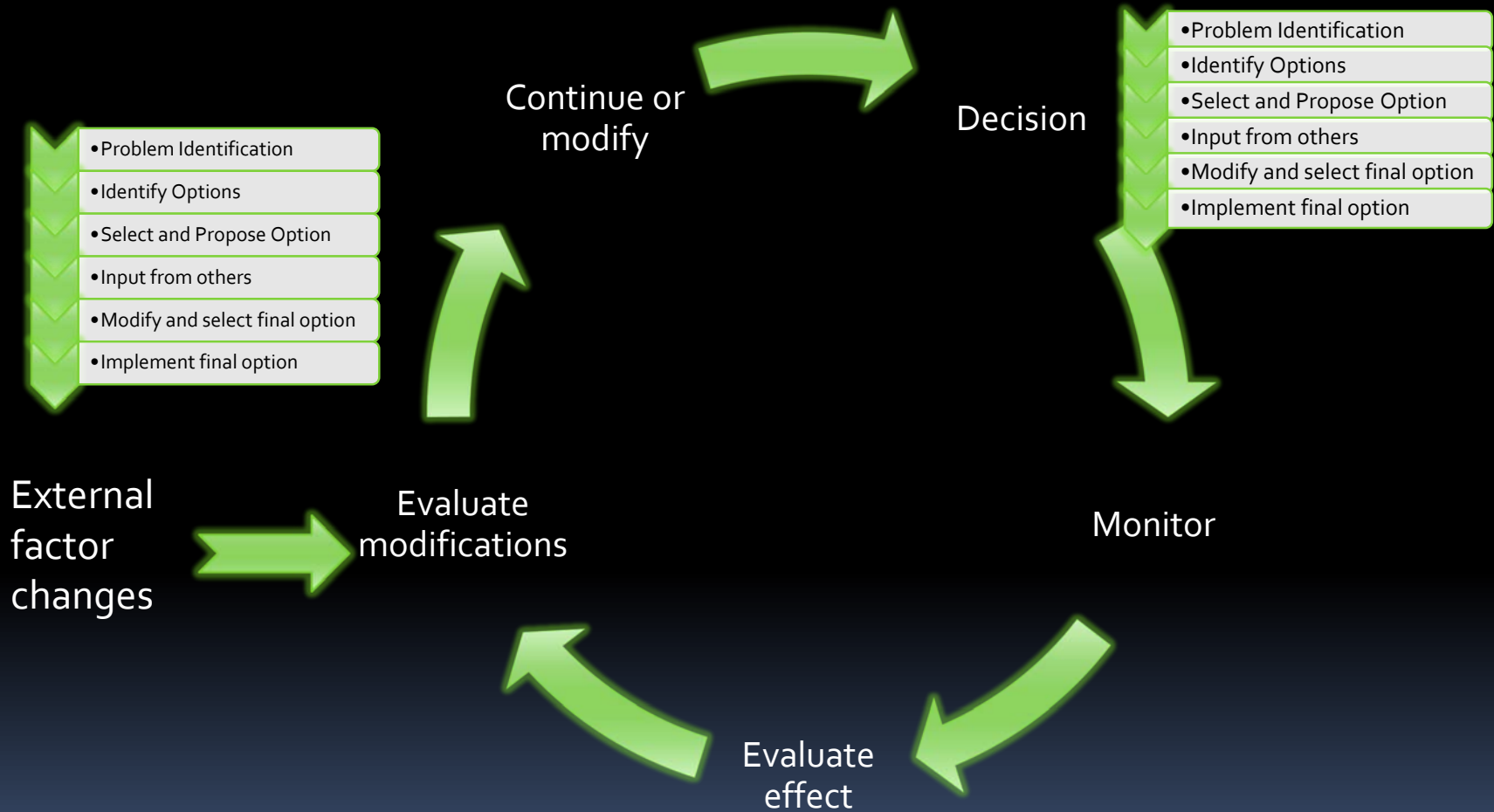
# Private sector single step



# Private sector iterative



# Private sector iterative



# Public sector single step

- Problem Identification

- Identify Options

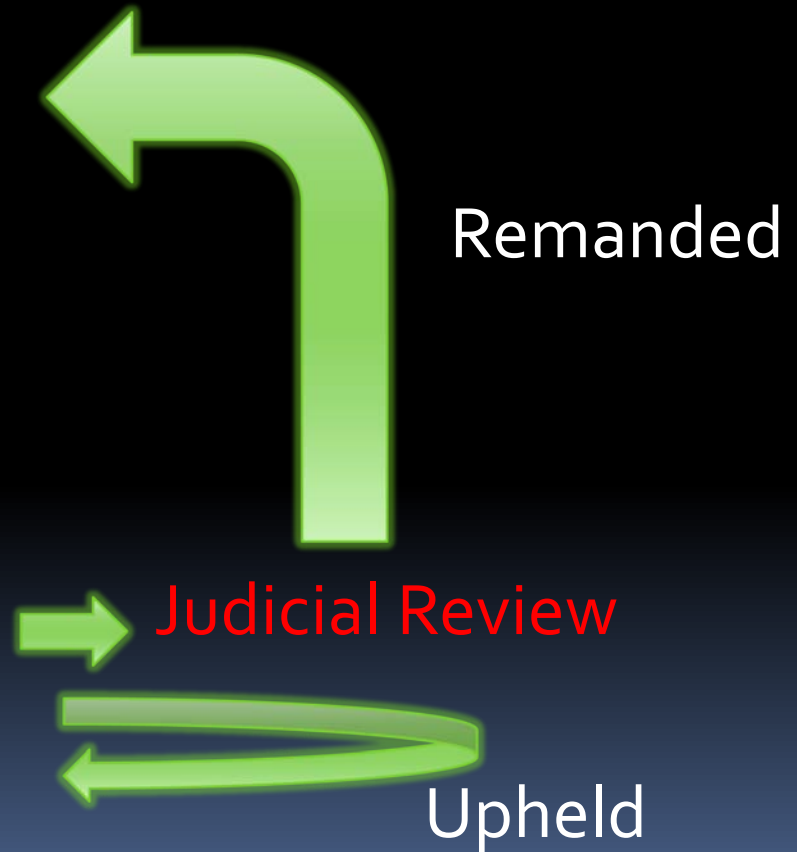
- Select and Propose Option

- Input (**notice and comment**)

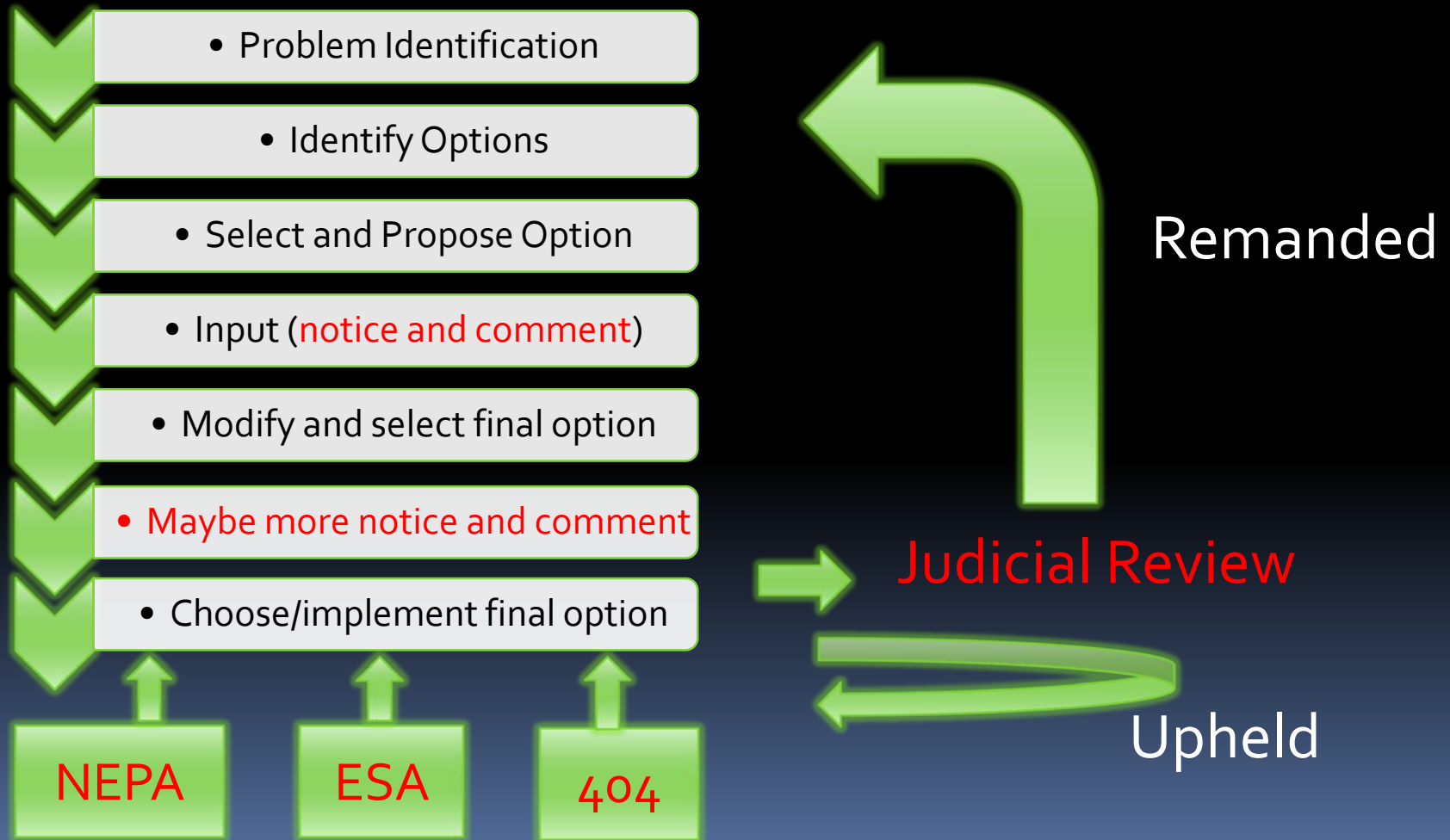
- Modify and select final option

- **Maybe more notice and comment**

- Choose/implement final option

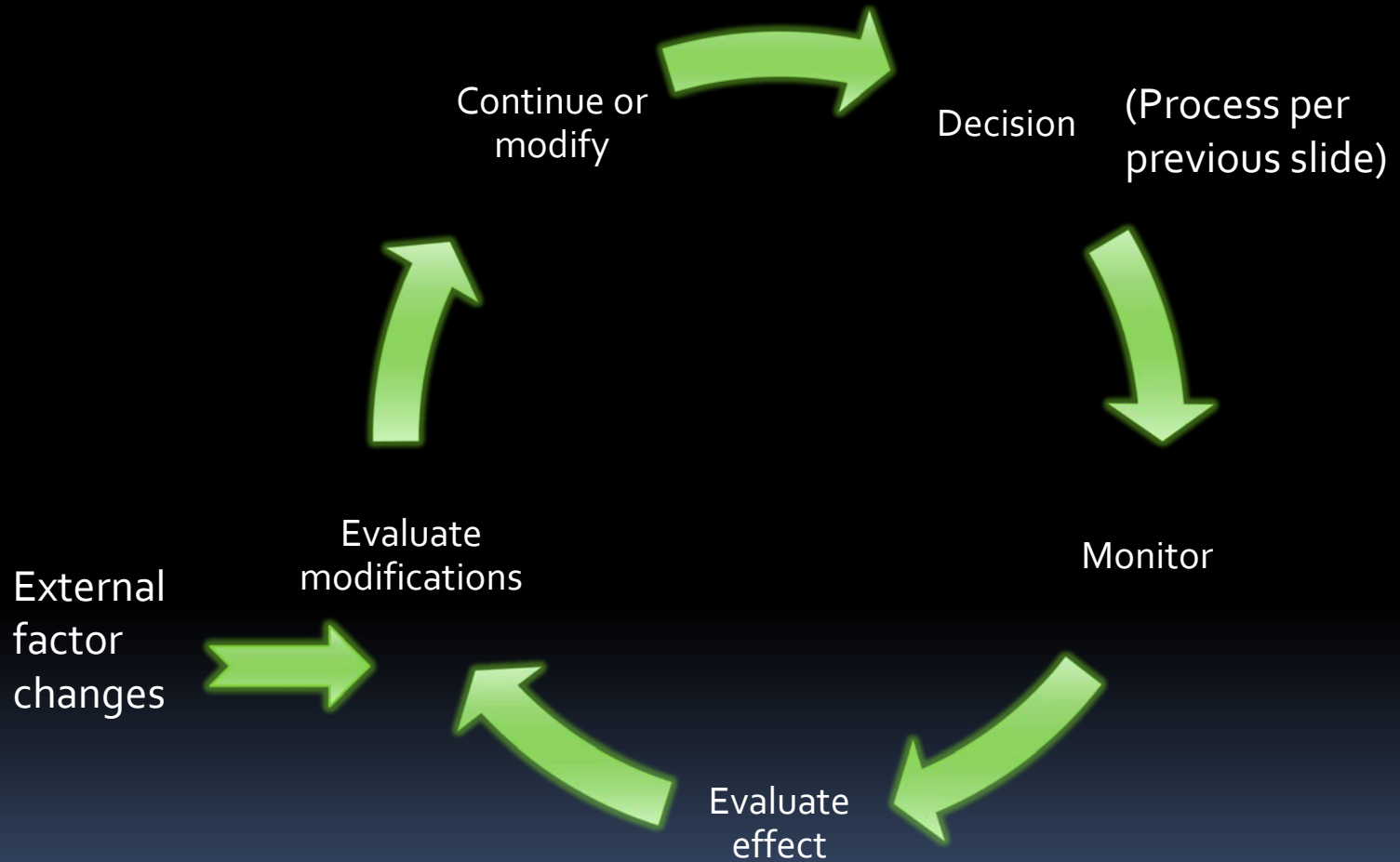


# Public single step with extra environmental reviews

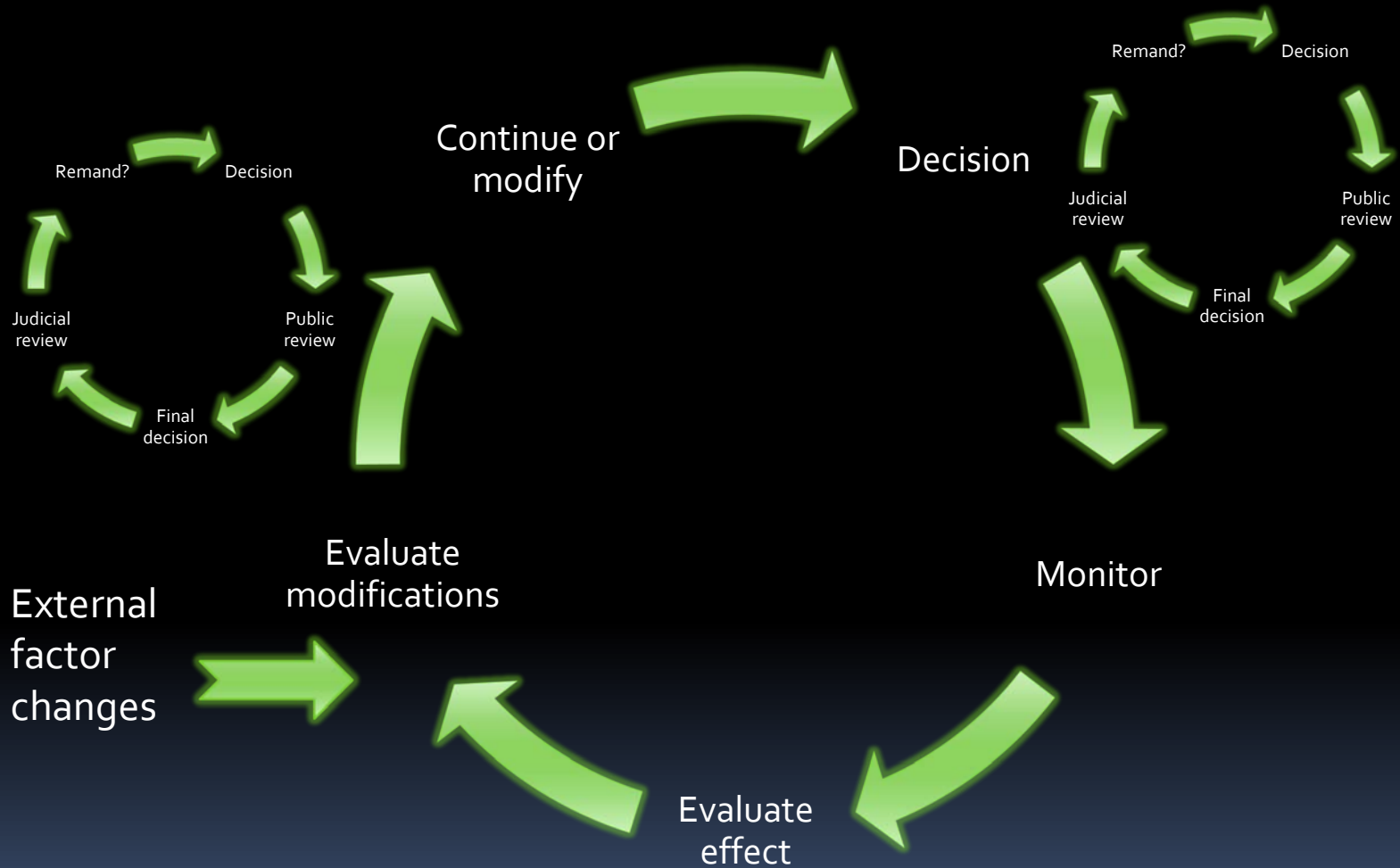




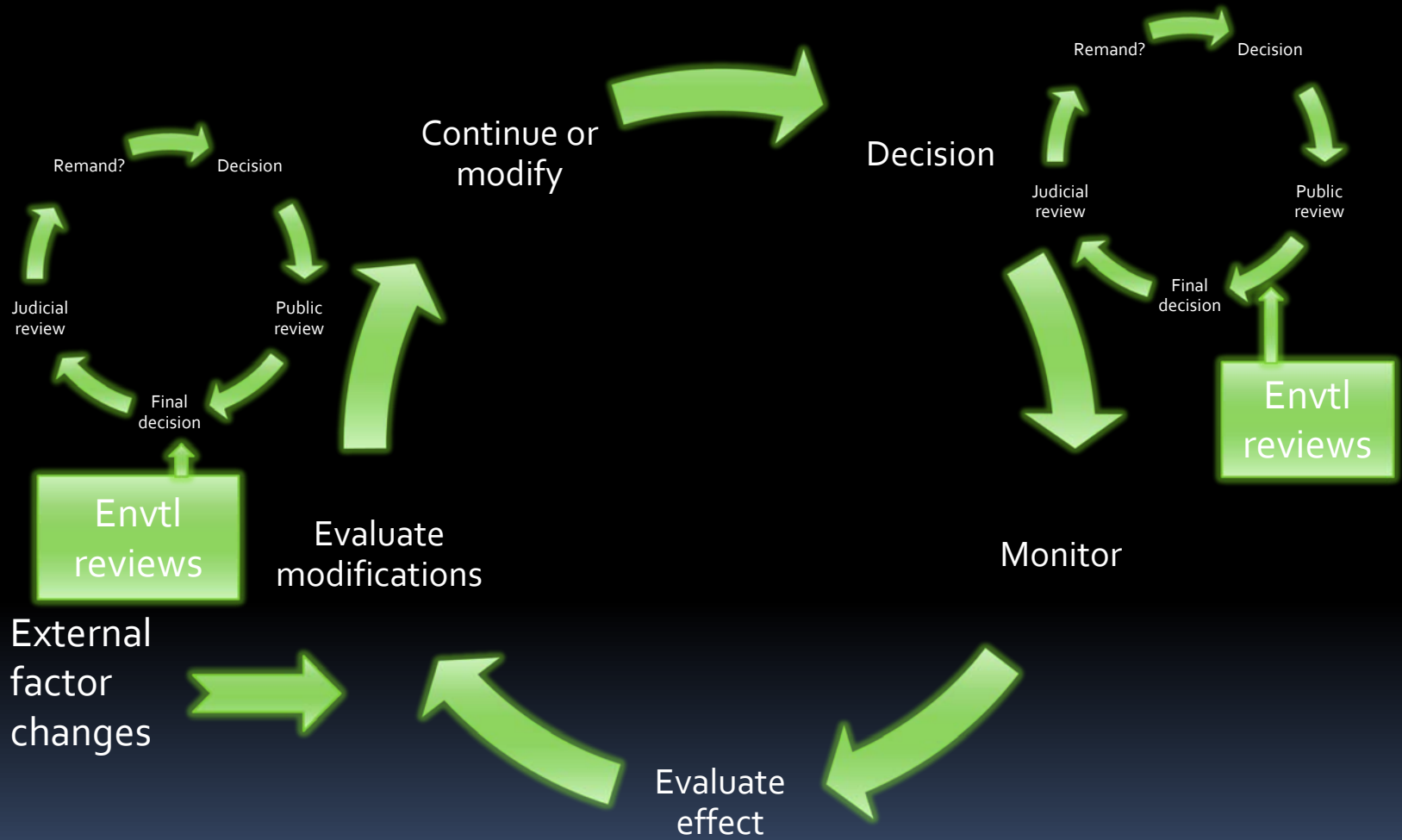
# Public sector iterative




# Public sector iterative




# Public sector iterative

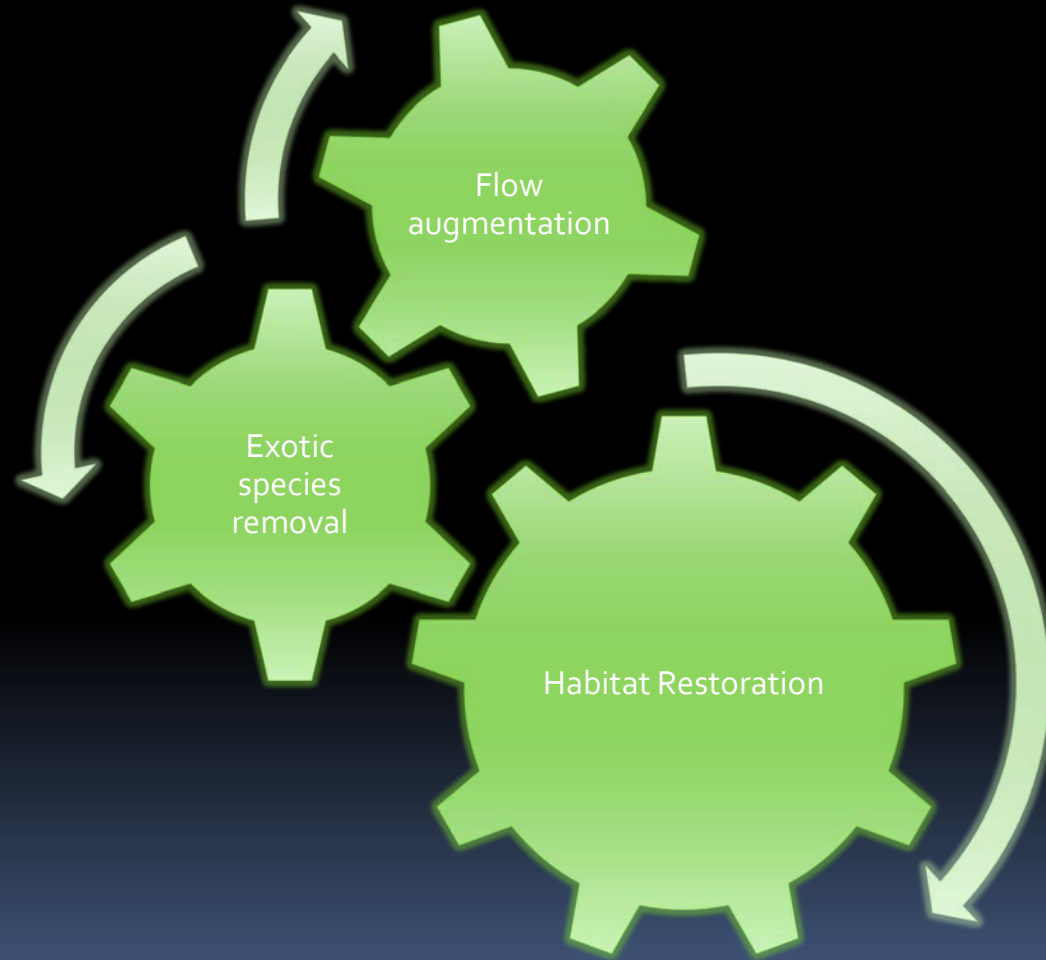




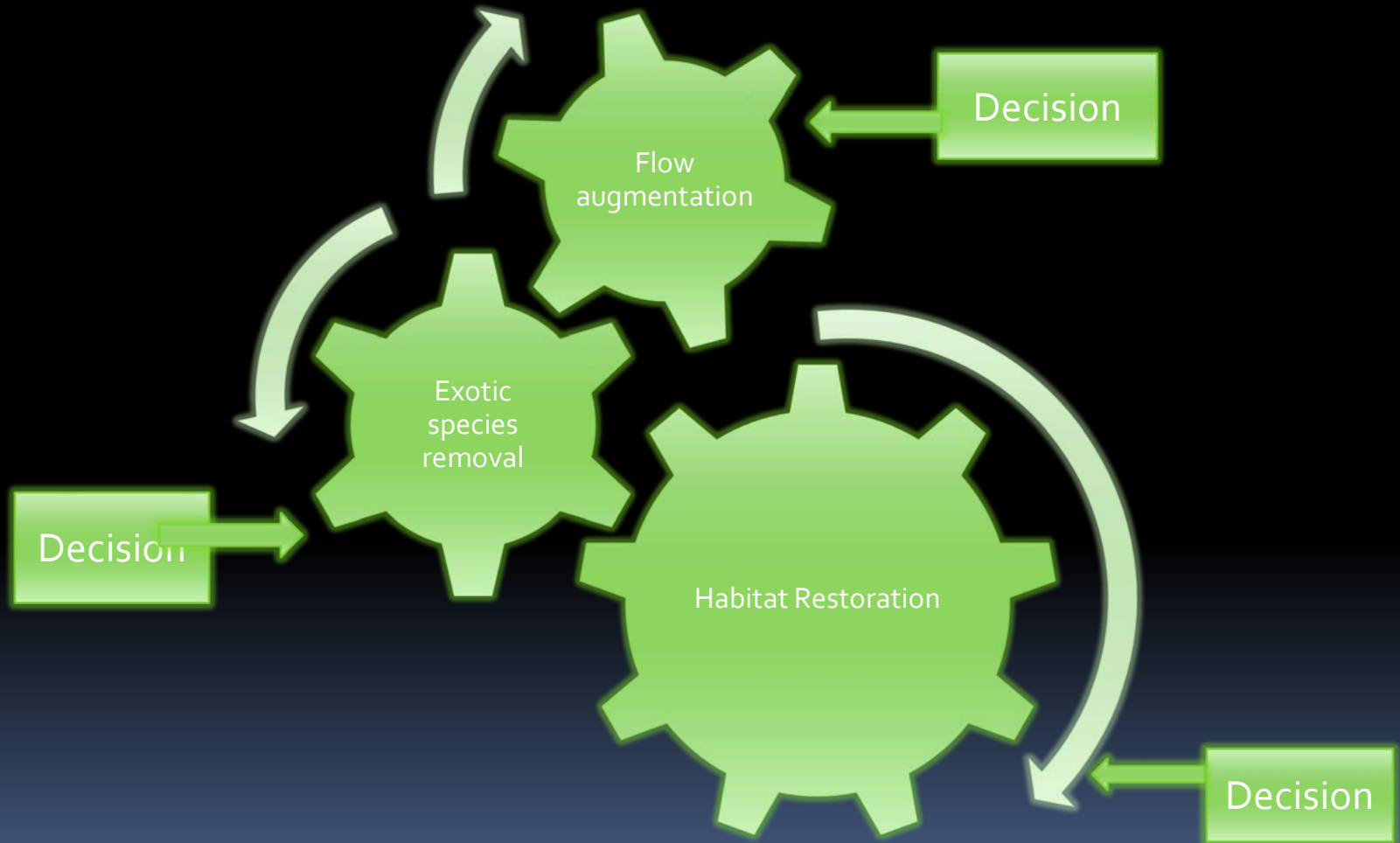
# Added complexities in restoration programs

- 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
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# Interlocking components




# Interlocking components





# Benefits of complex process

- Inclusiveness
  - Better and better-informed decisions
  - Accountability
    - Judicial review
    - State-federal
    - Inter-agency review
  - Prevents oversimplification
  - Facilitates collaboration/cooperation
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# 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?