



# Adaptive Management

Present by:  
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The Louis Berger Group



# History of Adaptive Management

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- Described in the 70s by Holling  
“management decisions and policies to be viewed as hypotheses subject to change”
- Originally adapted from a business model
- Considered by some as a buzzword or a management default
- Has been defined in a number of ways (variations of a similar method)



# Technical Guide Definition

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- DOI defines adaptive management as:  
“[a decision process that] promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood.  
... emphasizes learning by doing.  
... a means to more effective decisions and enhanced benefits....”



# What Adaptive Management Is

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- A learning-based process improving understanding
- Structured approach to decision making
- Process that openly acknowledges uncertainty

“A system of management practices...”



# What it is not

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- Trial and error management
- Not an end in itself but a means
- Monitoring by itself
- Not applicable in all situations



# Common Perceptions

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- Undermines existing conservation laws
- Authorizes risky, experimental mgt.
- Marginalizes the public
- Federal action blank check
- End-run on accountability



# Authority

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- CEQ NEPA regulations
- Draft DOI NEPA regulations
- Case law
- DOI Departmental Manual
- FAA policy guidance and NEPA
  - Ex. Panama City International Airport ROD  
2006



# Challenges

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- Reluctance to change
- Institutional commitment for long term monitoring and evaluation
- Time lag between action and impact
- Collecting enough data
- Legal environment



# Benefits

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- Provides flexibility—ability to respond to the resources
- Encourages collaboration with stakeholders
- Promotes better decision making



# Similarities Between Adaptive Management and NEPA

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- Informed decision making
- Interdisciplinary approaches
- Public and Stakeholder Involvement
- Consideration of models and alternatives
- Understanding resource impacts and responses
- Monitoring



# Effective Integration

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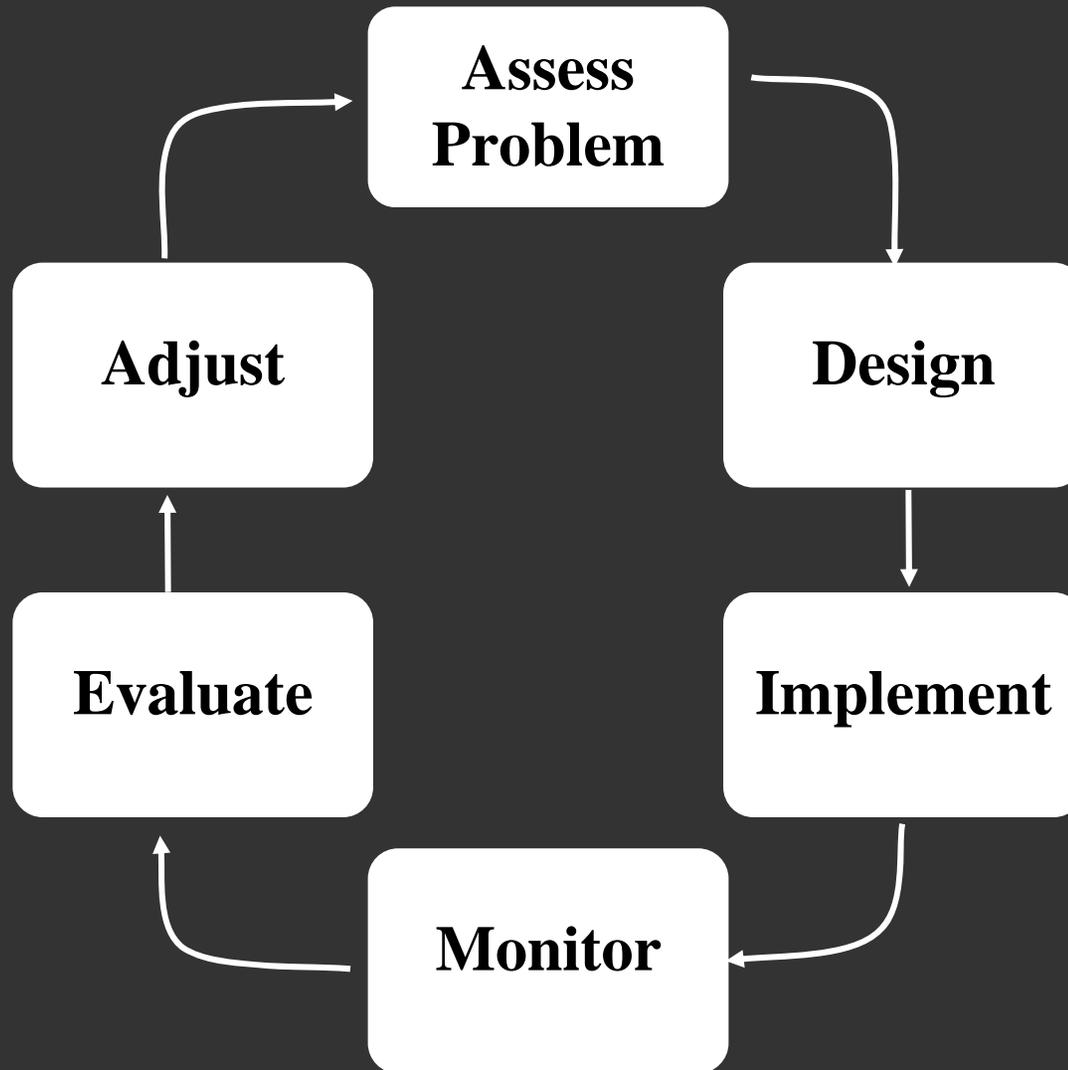
- Development of Interdisciplinary Planning and Compliance teams
- Applying NEPA early in the process
- Committing to an AM approach early in the process

**NO AFTER THOUGHTS**



# The AM Process—Key Elements

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# Adaptive Management: A Two Phased Approach

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- Set-up Phase
- Iterative Phase



# Setup Phase

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- Stakeholder Involvement
- Objectives
- Management Actions
- Models
- Monitoring Plans



# Stakeholder Involvement

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- Individuals and organizations with a **vested interest** in a shared enterprise.
- Interests can include:
  - An expectation of received benefits;
  - A perceived threat;
  - A prior investment of time and/or resources; or
  - Values shared with others associated with the enterprise.



# Stakeholders vs. the Public

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- Stakeholders actively engage and commit time and resources.
- Public may be more driven by self-interest and value-based requirements. Their objectivity may be limited. Involvement may be inconsistent.



# Stakeholder Involvement

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- Identify and engage your stakeholders
  - Be aware of FACA
- Notify and inform the public
- Scope the issues:
  - Purpose
  - Need
  - Preliminary Management Alternatives or Actions
  - Adaptive Management Objectives



# Objectives

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- Specific, measurable, achievable, results-oriented, and time-fixed
- A way of measuring the success of a management action
- The **Link** between the **Purpose of and Need for** action and the **Management Alternative** being considered



# Example of Objectives

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- Deer Management Plan
- Objective Statement: ...to ensure tree regeneration sufficient to have a sustainable eastern hardwood forest...
- That objective is based on a particular metric: stocking rate
- Metric is that successful regeneration occurs when 2/3 or more of open vegetation plots being monitored contains 51 or more seedlings.
- Monitoring period is six years



# Management Actions

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- Objectives answer “Why?” Management actions answer “How?”
- A useful set of actions requires interaction among stakeholders, managers, and scientists
- Actions should be limited in number, span the range of desirable outcomes, and maximize differences in system responses
- As with objectives, the set of actions may not be immediately obvious



# Management Actions

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- Management Actions are the NEPA Alternatives that must be developed
- The range of alternatives is limited by the purpose and need for action
- If the purpose and need statements are written too narrowly then they will constrain the number of alternatives that can be considered.



# Spatially or Temporally Separated Actions within Alternatives

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- Spatially Separated: Varying actions for prescriptions taken in different areas testing the management effectiveness (prescribed fire v. mowing)
- Temporally Separated: Varying actions over time in response to environmental conditions and monitoring data  
(ungulate reduction, timber cuts, prescribed fire, replanting)



# Models

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- Models can vary from conceptual to highly quantitative
- Models for Adaptive Management Purposes
  - Assist in developing objectives, actions, and monitoring needs
  - Can help provide a framework for anticipated results



# Monitoring Plans

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- Provides data to
  - Evaluate progress towards achieving objectives
  - Determine resource status in order to identify appropriate management actions
  - Increase understanding of resource dynamics
  - Help improve or refine models
- Allows for an evaluation of impacts predicted and those actually occurring
- Provides a basis/justification for adjusting management actions



# Adaptive Management Framework

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- Describes how and when subsequent action will be taken
- Describes objectives, thresholds and metrics used
- Refers to monitoring plans
- Articulates a length of time
- Describes what actions will be taken when certain conditions are or are not met and what those conditions are.



# The Iterative Phase

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- Decision Making and Implementation
- Follow-up Monitoring
- Assessment
- Iteration



# Decision Making

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- Finalize and Describe Decision in a Decision Document
- Implement Decision
- New decisions may be made depending on data collected during monitoring and resource response



# Follow-up Monitoring

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- Implement the monitoring plan that was described in your plan/EIS or EA.
- Could include collecting additional baseline data prior to taking actions



# Assessment

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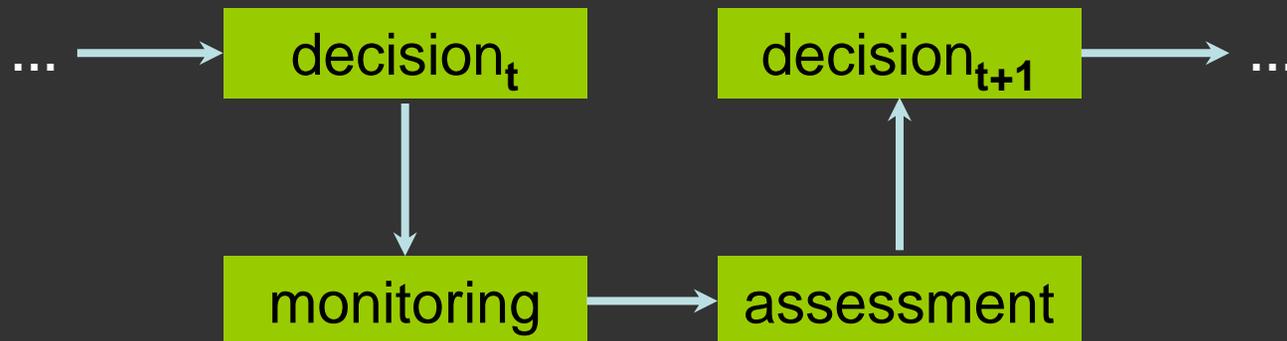
- Evaluate monitoring data to assess whether the management action is achieving the objective. Is it effective?
- Evaluate whether environmental impacts predicted are occurring.



# Iteration

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- Will you continue to implement the initial action?
- Will you adopt a new action?

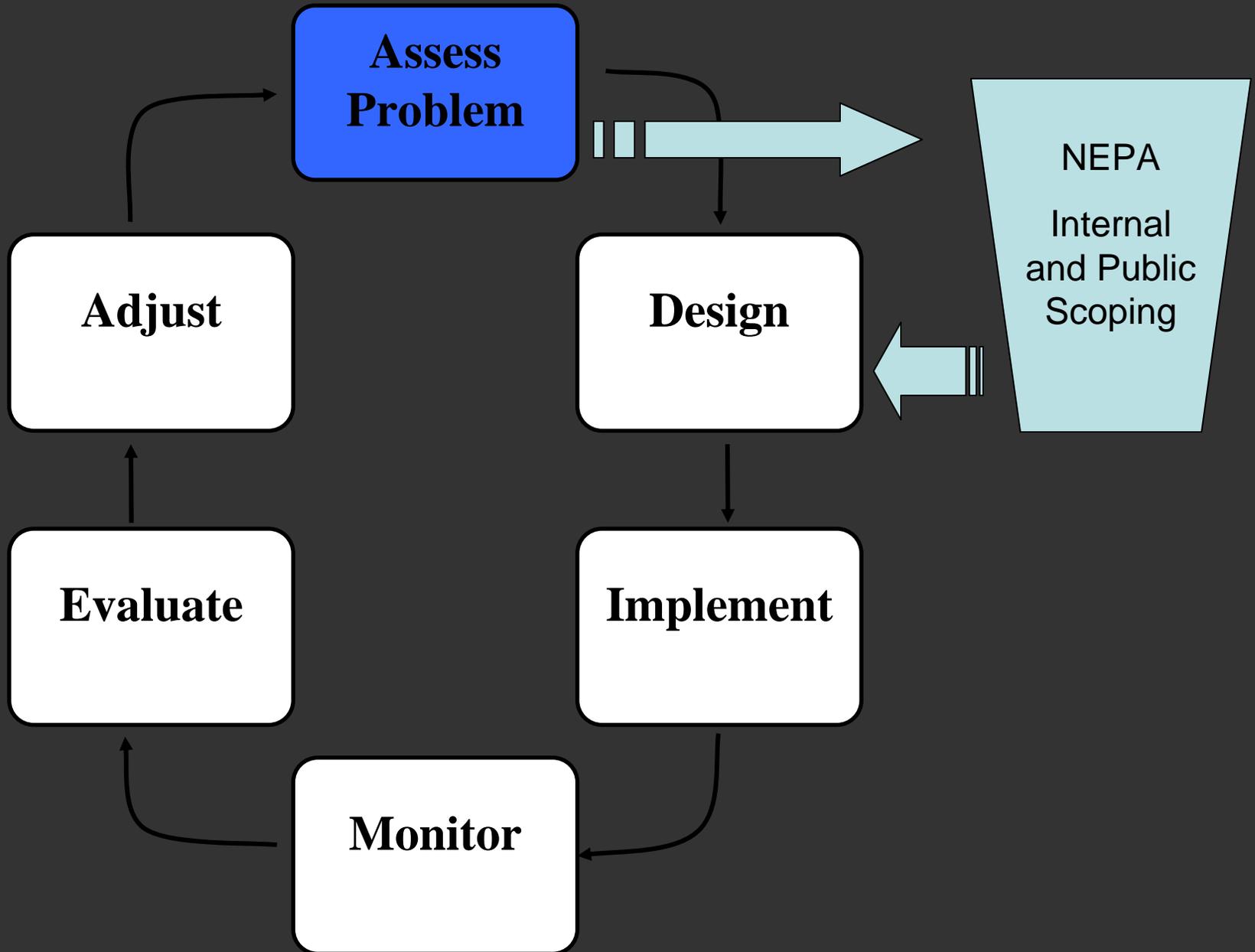


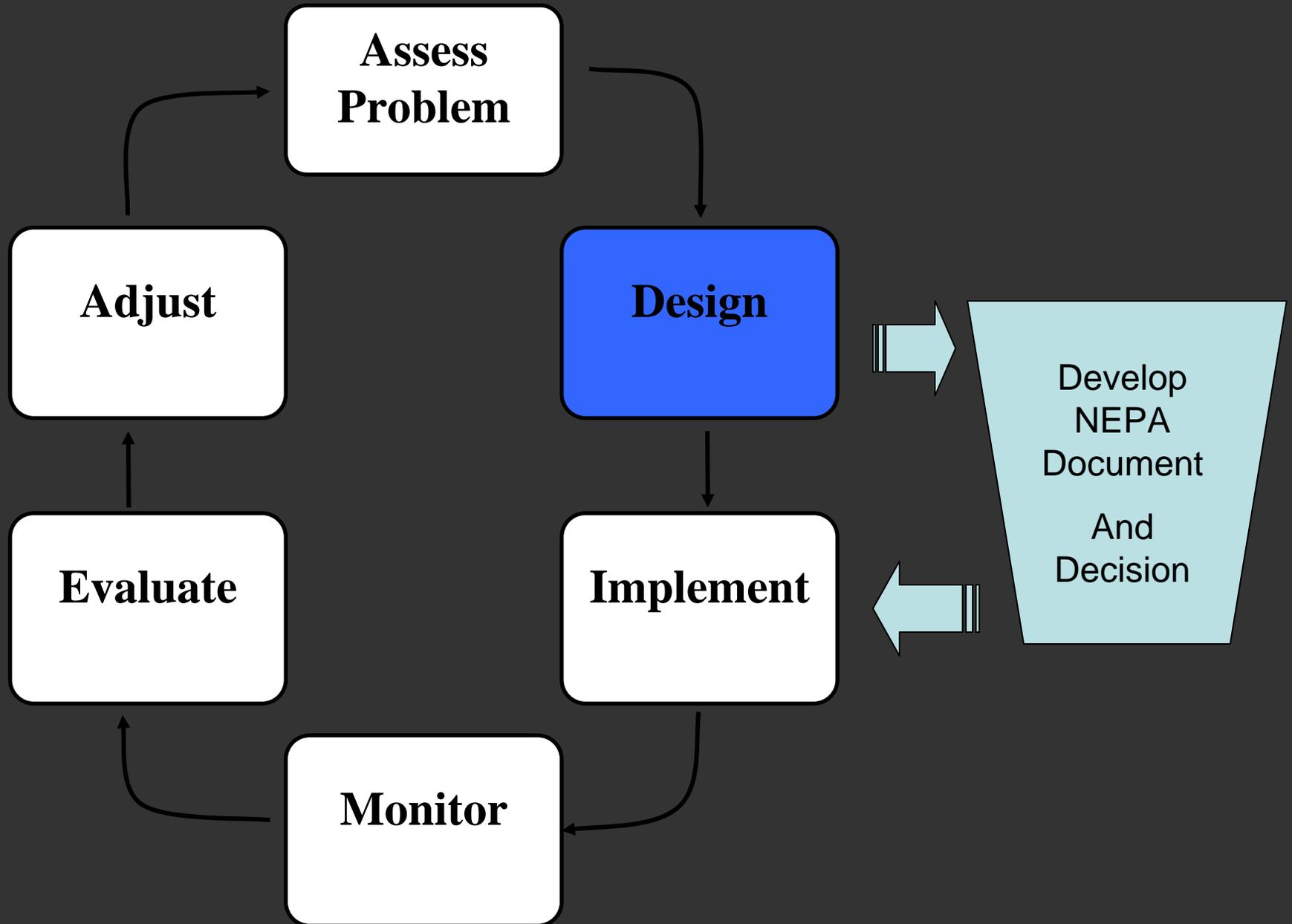
# Examples of Adaptive Management

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- Waterfowl Management
- Deer Management
- Landscape Management
- Avian Protection Plan







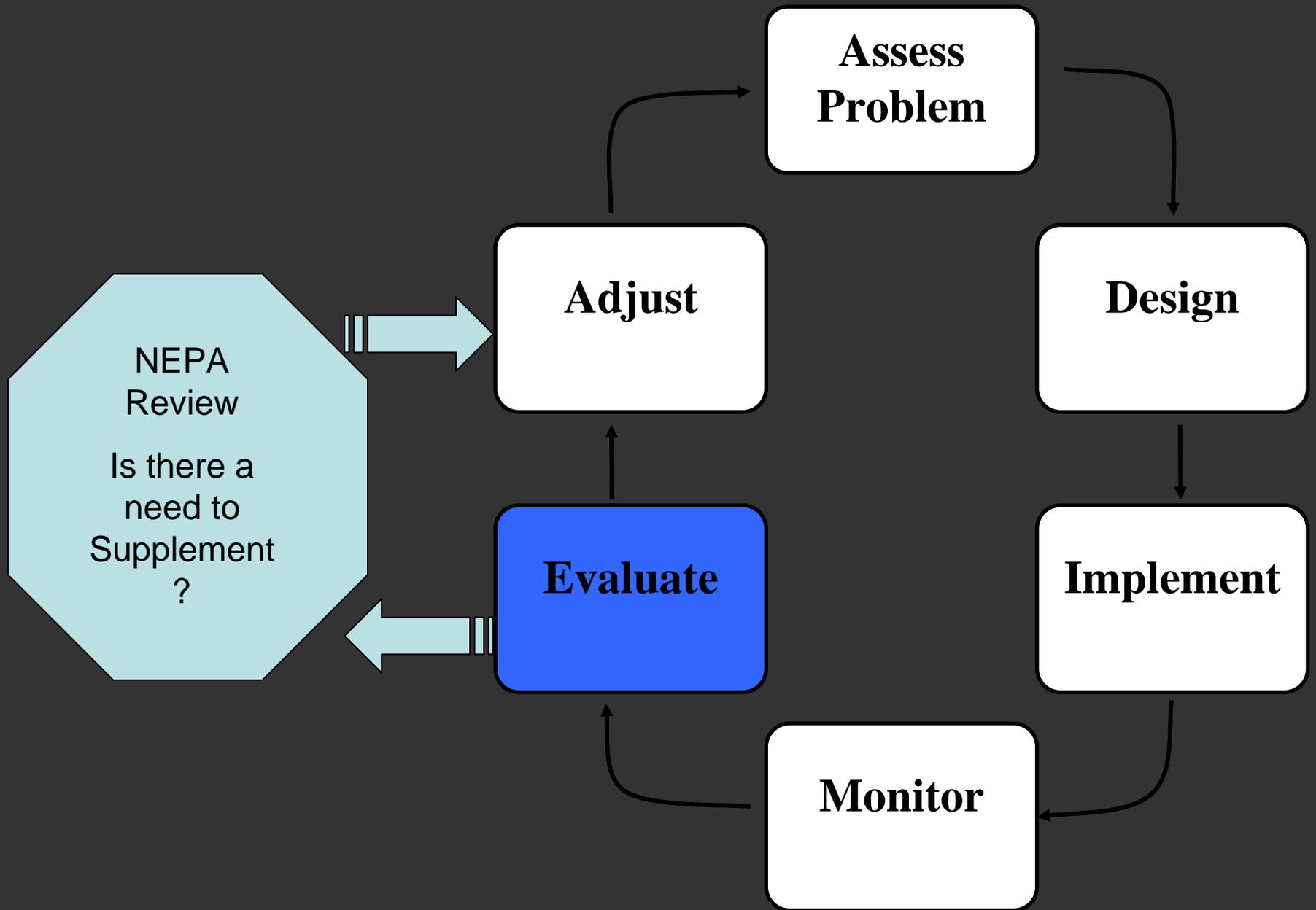
# The Design Stage

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## Develop in the NEPA Document:

- Purpose and Need that lends itself to AM;
- Objectives for achieving the Purpose and Need;
- Metrics for objectives to measure success;
- A range of alternatives including subsequent actions; and
- An Adaptive Management framework describing how it will work, including a monitoring plan.
- An impact analysis that considers subsequent actions





# The Evaluate Stage

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## Based on your NEPA document:

- Evaluate monitoring data to determine if meeting objectives;
- Consider changing actions already described in your implemented alternative to better achieve objectives;
- Re-examine predicted environmental impacts in the NEPA document with what is occurring;
- Adjust actions if there are no “significant new circumstances or information bearing on the proposed action or its impacts.”



# NEPA and a Need to Supplement

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## 1. When there is a change in the proposed action that is relevant to environmental concerns

- This first requirement has a two part test. First there must be change to the proposed action. Second, that change has to be relevant to environmental concerns.

## 2. When there are significant new circumstance or information bearing on the proposed action or its impacts

- This also has several parts to the analysis in determining what is significant and new.



# Subsequent Action NEPA Compliance

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- Memo to file or similar document
- Tiered Environmental Assessment or other environmental analysis
- Supplemental EIS



# Legal Considerations

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- Need to supplement
- Analyzing the impacts
- Engaging the public
- Legal Certainty
- FACA



# National Parks Air Tour Management Act of 2000

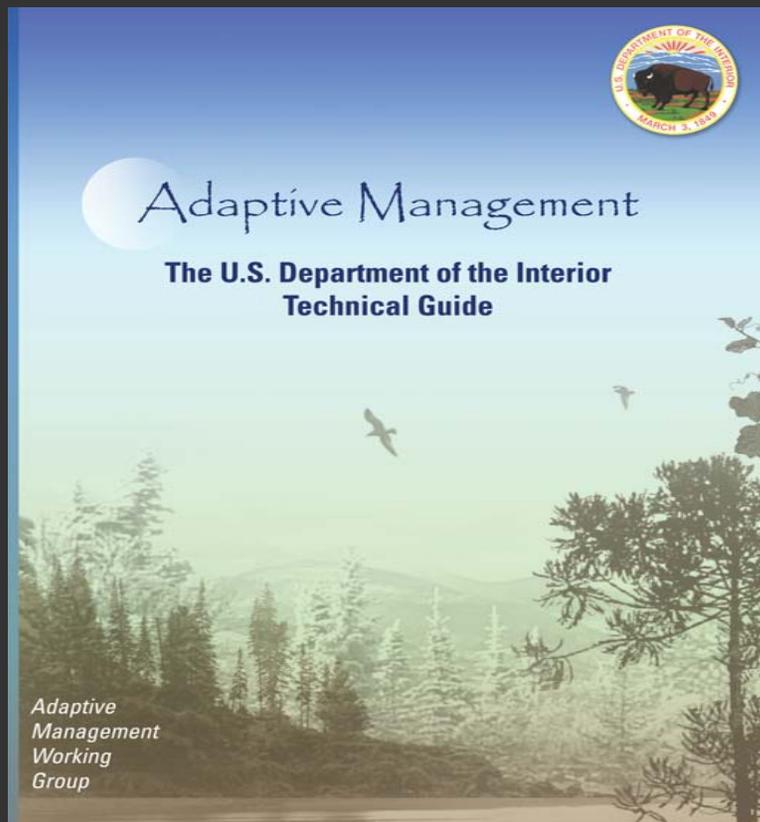
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- Lends itself to adaptive management strategies
- “develop acceptable and effective measures to mitigate or prevent the significant adverse impacts ... upon natural and cultural resources, visitor experience, and tribal lands.”
- “may establish conditions” (e.g., routes, altitudes, time of day, etc.)



# DOI Adaptive Management Technical Guide

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- **DOI Technical Guide**  
<http://www.doi.gov/initiatives/AdaptiveManagement/index.html>

## Rollout Broadcasts

- Overview -  
[http://www.ntc.blm.gov/Adaptive\\_Management/AdaptiveFinal.swf](http://www.ntc.blm.gov/Adaptive_Management/AdaptiveFinal.swf)
- Set-up phase-  
<http://www.ntc.blm.gov/krc/uploads/54/AdaptManage2.swf>
- Iterative phase-  
<http://www.ntc.blm.gov/krc/uploads/78/AdaptManage3.swf>

