

Adaptive Resource Management

Adaptive management is a decision process that promotes flexible decision making that can be adjusted as outcomes from management actions and other events become better understood (Williams et. al 2007). Monitoring of these outcomes advances scientific understanding and supports adjustments in policies and operations.

Adaptive management provides for addressing biological/ecological, social, and economic goals with stakeholder involvement.

Passive adaptive management focuses on implementation of management actions followed by review and evaluation of outcomes (Allan 2007). Important components of effective passive management include:

- Evaluation
- Reflection
- Communication
- Incorporation of learning into planning and management

Active adaptive management entails a stronger emphasis on learning by utilizing methods to test hypotheses (e.g., using a range of treatments and monitoring results) and is not being proposed for this process.

Adaptive management approaches are used in several Minnesota DNR Fisheries Management Section large lake plans.

- *Harvest Plans for Red Lakes Walleye Stock*
- *Fisheries Management Plan for the Minnesota Waters of Lake Superior*
- *Lake Management Plan, Lake Vermilion*

Using a more formal adaptive management framework has the potential to increase collaboration and learning among diverse interests, and increase transparent decision making.



Figure 1.1. Diagram of the adaptive management process.

Box 4.1 Adaptive Management Operational Steps

Set-up phase

- ❖ *Step 1 - Stakeholder involvement*
Ensure stakeholder commitment to adaptively manage the enterprise for its duration
- ❖ *Step 2 - Objectives*
Identify clear, measurable, and agreed-upon management objectives to guide decision making and evaluate management effectiveness over time
- ❖ *Step 3 - Management actions*
Identify a set of potential management actions for decision making
- ❖ *Step 4 - Models*
Identify models that characterize different ideas (hypotheses) about how the system works
- ❖ *Step 5 - Monitoring plans*
Design and implement a monitoring plan to track resource status and other key resource attributes

Iterative phase

- ❖ *Step 6 - Decision making*
Select management actions based on management objectives, resource conditions, and enhanced understanding
- ❖ *Step 7 - Follow-up monitoring*
Use monitoring to track system responses to management actions
- ❖ *Step 8 - Assessment*
Improve understanding of resource dynamics by comparing predicted vs. observed change in resource status
- ❖ *Step 9 - Iteration*
Cycle back to Step 6 and, less frequently, to Step 1

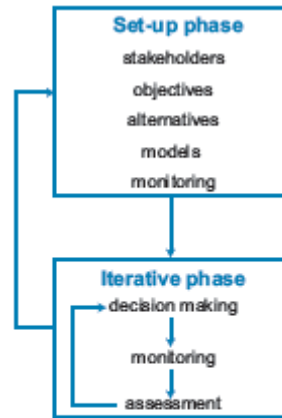


Figure 3.4. Two-phase learning in adaptive management. Technical learning involves an iterative sequence of decision making, monitoring, and assessment. Process and institutional learning involves periodic reconsideration of the adaptive management set-up elements.

References:

- Allan, C. 2007. Adaptive management of natural resources. Proceedings from the 5th Australian Stream Management Conference. Charles Sturt University, New South Wales.
- Williams, B.K., R.C. Szaro, and C.D. Shapiro. 2007. *Adaptive Management: The U.S. Department of Interior Technical Guide*. Adaptive Management Working Group, U.S. Department of Interior, Washington, DC.