

Curso Electivo de Postgrado

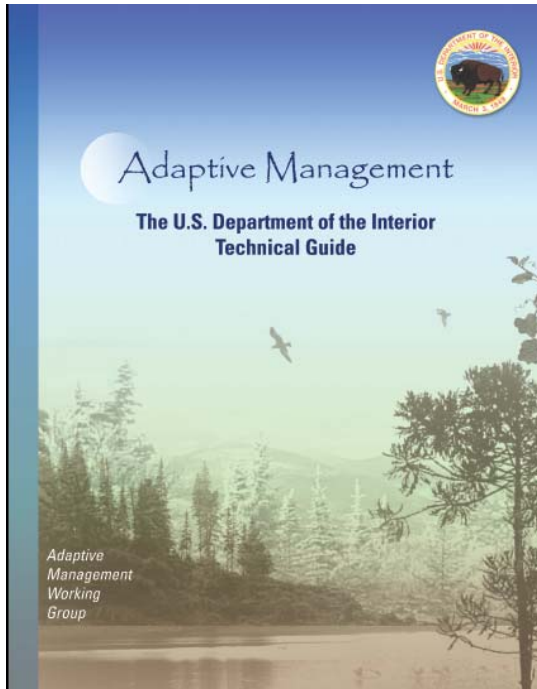
PLANIFICACIÓN DE USO Y CONSERVACIÓN DE ECOSISTEMAS NATURALES

HORACIO BOWN

hbown@uchile.cl

8 U.D.





Adaptive Management

The U.S. Department of the Interior Technical Guide

Adaptive Management Working Group

Chair: Olivia Barton Ferriter

Director, Conservation, Partnerships & Management Policy

Lead Authors

Byron K. Williams, Robert C. Szaro, and Carl D. Shapiro

Other Contributors

*Robert Adamcik, Mary Boatman, Sarah Bransom,
Jeremy Casterson, John Fay, Scott Florence,
Douglas Growitz, Caroline Hermans, Fred A. Johnson, James Kendall,
Dennis Kubly, Michael Mayer, Susan Moyer, Malka Pattison,
Randall Peterson, Laura van Riper, Michael Runge, Robert Snow,
Christine Turner, and Rich Whitley*

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Vitmary Rodriguez

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Adaptive management

- 1) What is **adaptive management**?
- 2) When should it be **used**?
- 3) How should it be **implemented**?
- 4) How can its success be **recognized and measured**?



What is Adaptive management?

Adaptive management is a **decision process** that promotes **flexible decision making** that can be adjusted in the face of **uncertainties**

Careful **monitoring** of these outcomes helps adjust policies as part of an **iterative learning process**.

Williams, Szaro, and Shapiro (2009)



Adaptive Management

- **Trial and error** is not the same as adaptive
- **adaptive management** is systematic pursuit of knowledge as an explicit part of management

Williams, Szaro, and Shapiro (2009)



When Should Adaptive Management be Used?

- A real **management choice** is to be made
- There is an opportunity to apply **learning**
- **Clear** and **measurable** management objectives can be identified

Williams, Szaro, and Shapiro (2009)



When Should Adaptive Management be Used?

- The **value of information** for decision making is **high**
- **Uncertainty** can be expressed as a set of testable **models**
- A **monitoring system** can be established to reduce uncertainty

Williams, Szaro, and Shapiro (2009)



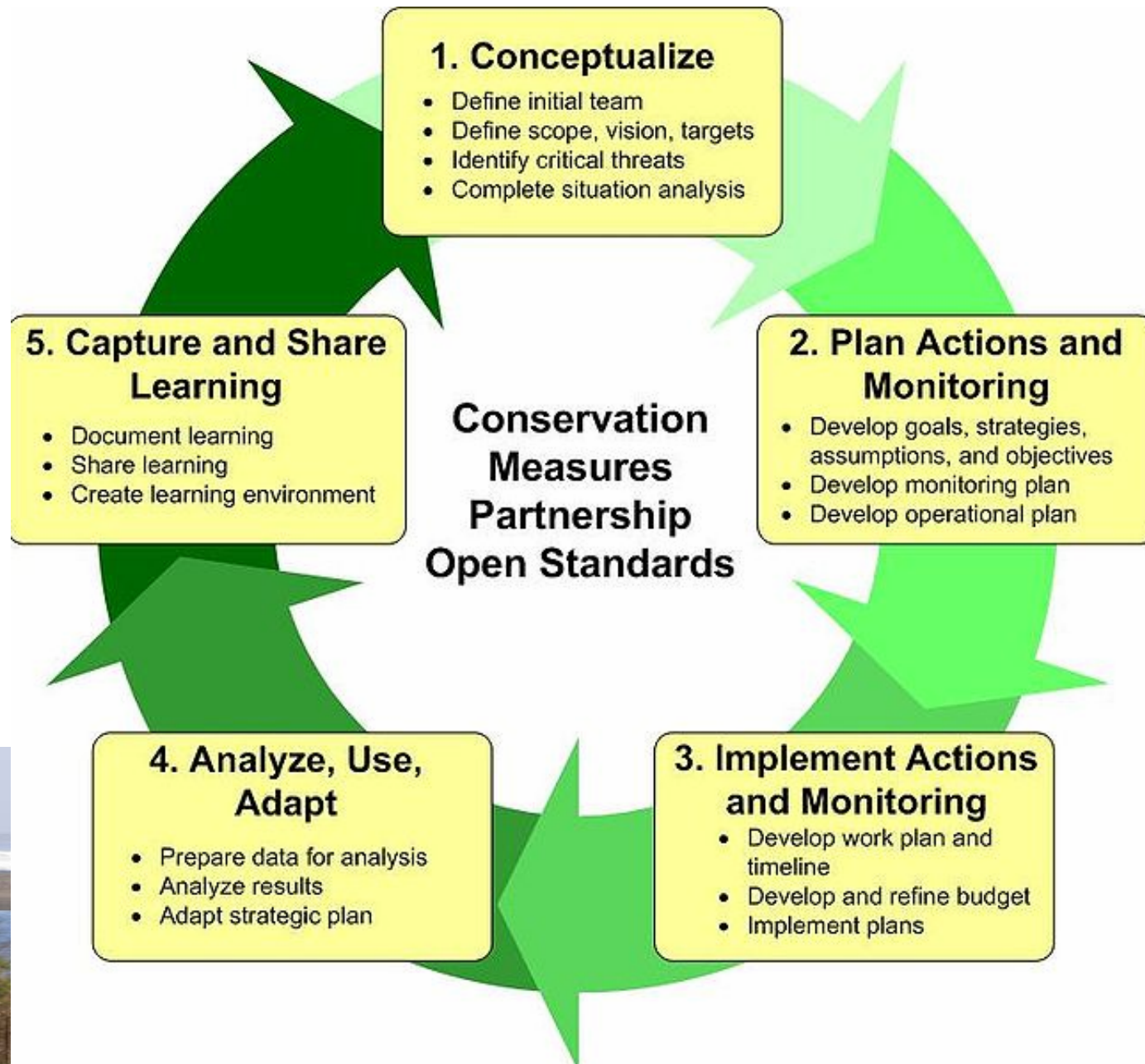
Limitations to use Adaptive Management

- Inappropriate for **single-time** decision making.
- Inappropriate if **monitoring** information is unavailable.
- Inappropriate if there are **irresolvable** conflicts about objectives or decision alternatives.
- Inappropriate if management interventions cannot influence system behavior
- Inappropriate if there is not a **commitment to sustained funding** for monitoring and assessment.

Williams, Szaro, and Shapiro (2009)



How Should Adaptive Management be Implemented?



How Should Adaptive Management be Implemented?

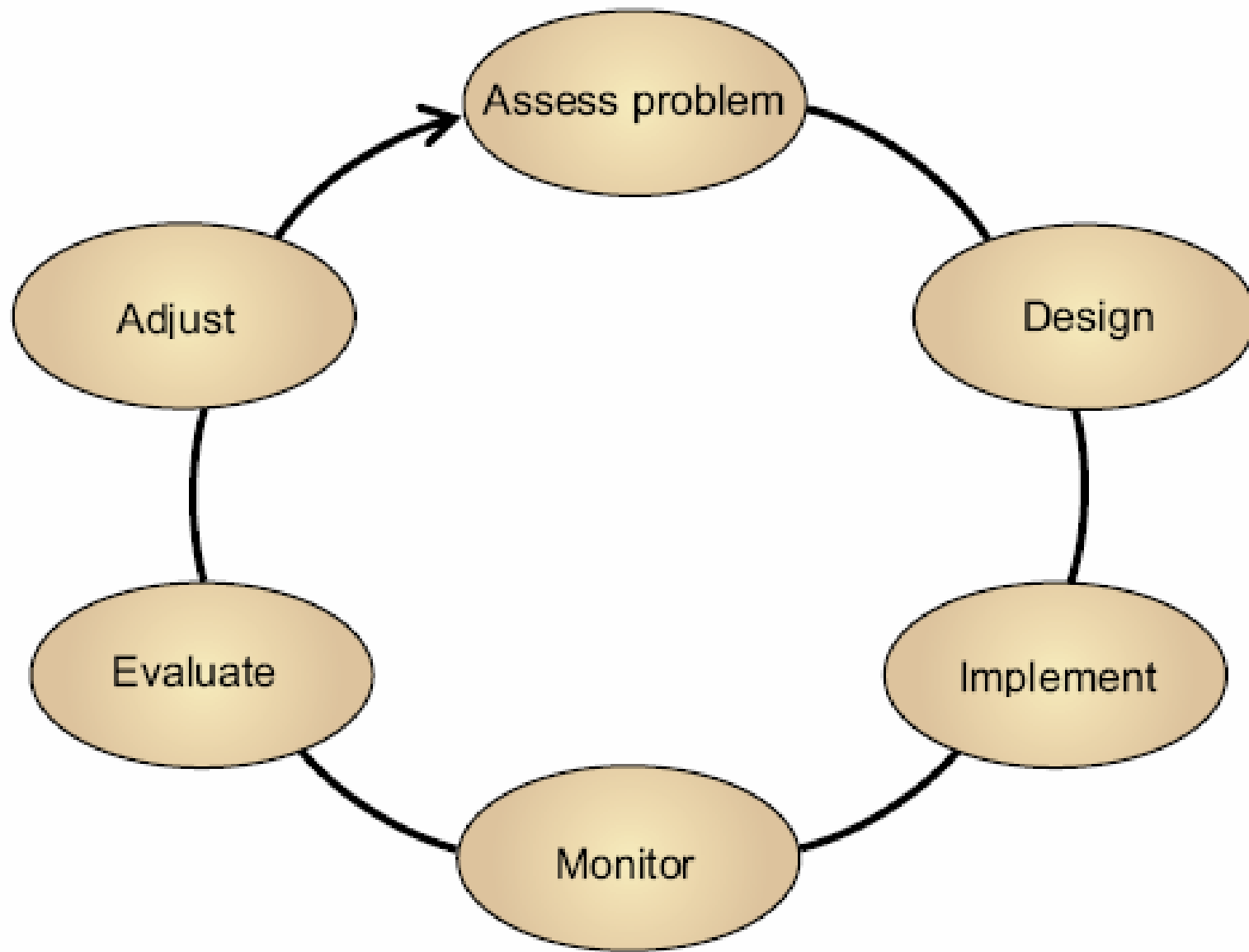


Figure 1.1. Diagram of the adaptive management process.

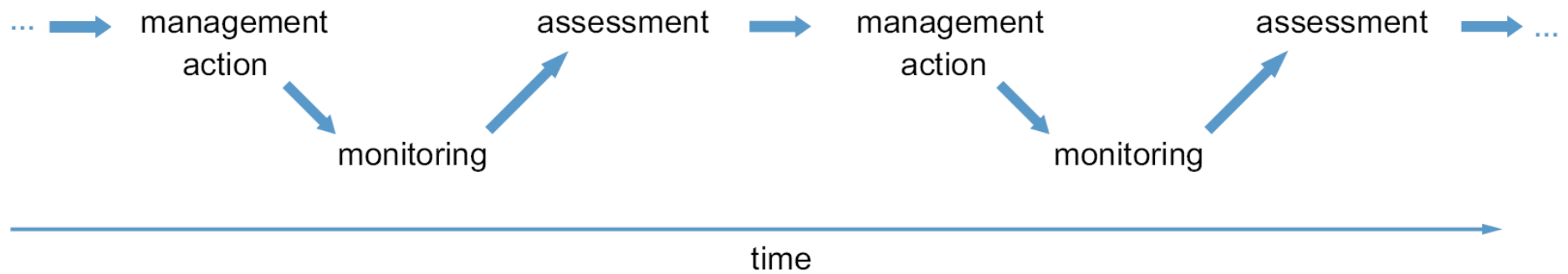


Figure 3.3. Iterative cycle of adaptive management. Management actions are based on objectives, resource status, and learning. Data from followup monitoring are used to assess impacts and update understanding. Results from assessment guide decision making in the next time period.

Williams, Szaro, and Shapiro (2009)

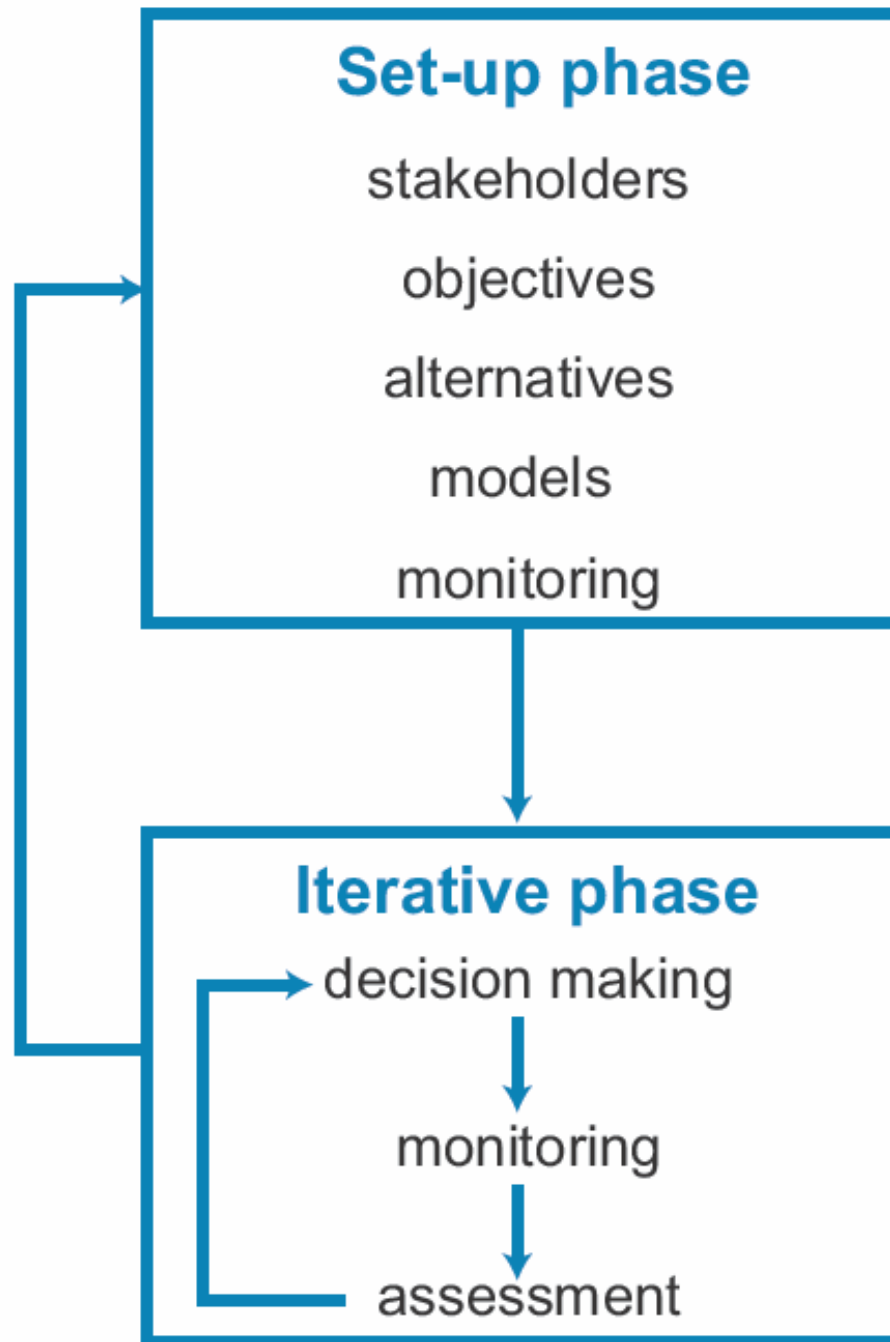


How Should Adaptive Management be Implemented?

- Engaging the relevant **stakeholders** in the decision making process
- Identifying the **problem** to be addressed
- Specifying **objectives and tradeoffs** that capture the values of stakeholders
- Identifying the **range of decision alternatives** from which actions are to be selected
- Specifying **assumptions** about resource structures and functions
- **Projecting the consequences** of alternative actions
- Identifying key **uncertainties**
- Measuring **risk tolerance** for potential consequences of decisions
- Accounting for **future impacts** of present decisions
- Accounting for **legal guidelines** and constraints

Williams, Szaro, and Shapiro (2009)





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

When is Adaptive Management Successful?

- Stakeholders are actively involved and committed to the process.
- Progress is made toward achieving management objectives.
- Results from monitoring and assessment are used to adjust and improve management decisions.
- Implementation is consistent with applicable laws.

Williams, Szaro, and Shapiro (2009)



Adaptive Management Success Model



level of uncertainty / emphasis on learning

high



active adaptive management

Decision making involves the **active pursuit of learning**, either through experimental or quasi-experimental management that focuses simultaneously on learning and achievement of management objectives

passive adaptive management

uncertainty is recognized in the decision making framework, but the focus is on the achievement of management objectives, **with learning as an untargeted byproduct**

management based on resource status

Here the focus of decision making is on achieving management objectives, **with little or no recognition of uncertainty** in the decision making framework

low



Concluding Remarks

- Adaptive management is an **iterative** process
- Based on **learning**
- Decision making under **uncertainty**

Williams, Szaro, and Shapiro (2009)

