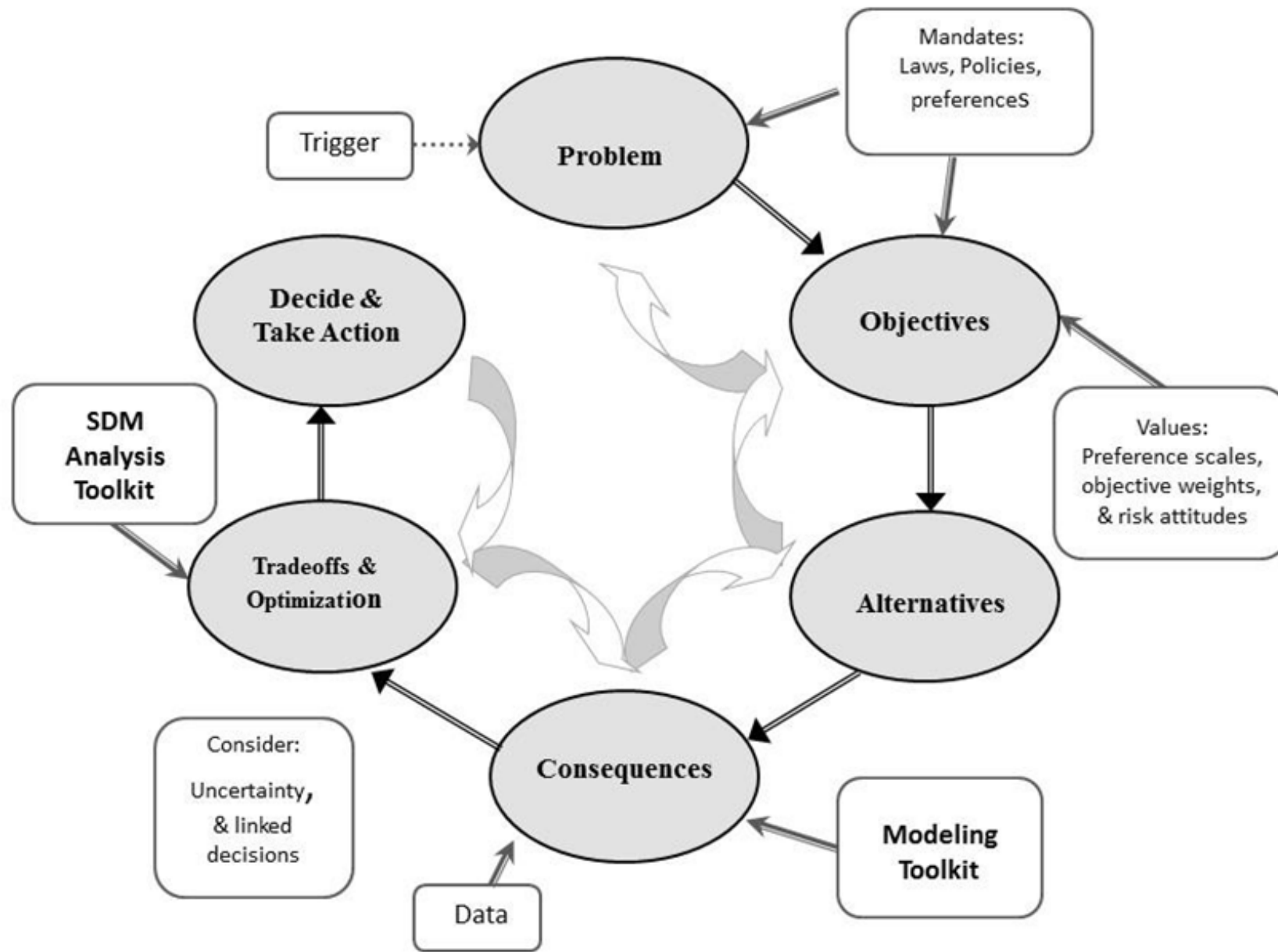# Conclusions: summary and next steps

Module 7:

Brielle K Thompson & Michael E Colvin

Workshop: An overview of Structured Decision Making for natural resources, Midwest Fish and Wildlife Conference 2025, St. Louis, MO

Modified from: Fundamentals of Structured Decision Making TWS Conference Workshop 2023 & an Overview of Structured Decision-Making Washington Department of Fish and Wildlife 2022-2023

Source: Jean Fitts Cochrane
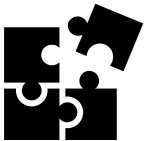
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Summary:

- Two key elements of SDM:

1. Values-focused
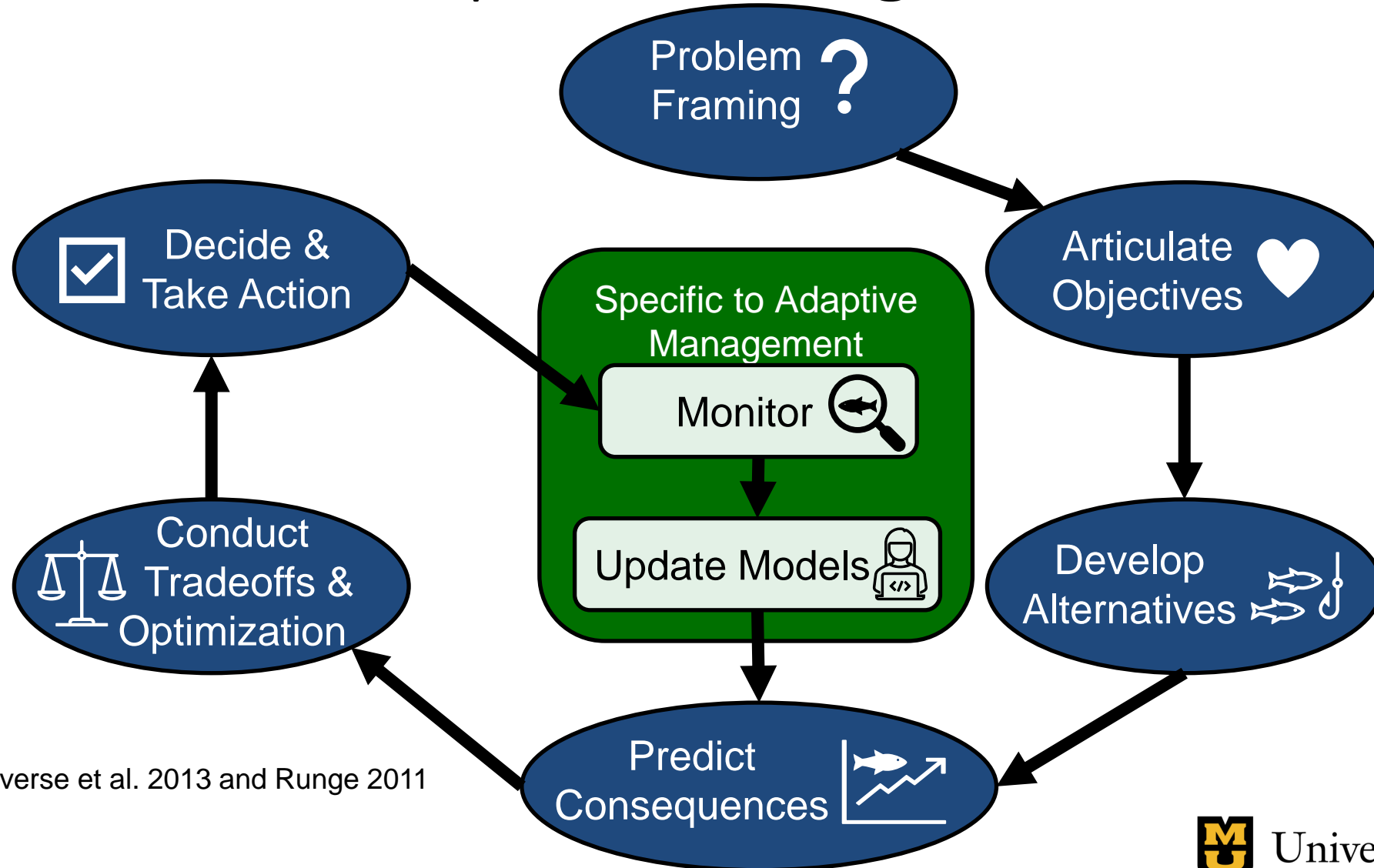   - Objectives are discussed first vs alternative focused methods

2. Problem decomposition
   - Break problem into components, separating science from values
   - PrOACT cycle

What else?

- What we didn't cover:
  - **Dealing with uncertainty**
    - Simulations, sensitivity analysis
    - Risk analysis
    - Value of information analysis (methods to determine the "value" of collecting additional information)
    - Adaptive management
  - **Dealing with people**
    - Stakeholder analysis, forming a team
    - Facilitation
    - Expert elicitation

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An aside on adaptive management

Problem Framing ?

Articulate Objectives ♥

Decide & Take Action ☑

Specific to Adaptive Management
Monitor
Update Models

Develop Alternatives

Conduct Tradeoffs & Optimization

Predict Consequences

Adapted from Converse et al. 2013 and Runge 2011

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An aside on adaptive management

- What it is:
  - **Iterative** decision process of "**learning by doing**" that uses **monitoring data** to **reduce uncertainty** and **adapt** management over time

- What it is not:
  - Trial by error

- We can use it when we have:
  - Repeated decisions
  - Uncertainty that is important to management
  - The ability to monitor to reduce uncertainty

- Analytical tools:
  - Management Strategy Evaluation
  - Stochastic Dynamic Programming
  - Bayesian updating

Waterfowl harvests
(Williams and Johnson 1995)

30 years + counting!

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Leading an SDM process?

1. Questions to ask:

Who is the decision maker?

What is to be decided?

What impedes the decision?

Are objectives disputed? (aka is SDM warranted?)

2. Identify the decision class

Multiple objective problem? Portfolio problem? Strategy problem? Risk problem? Uncertainty? Etc.

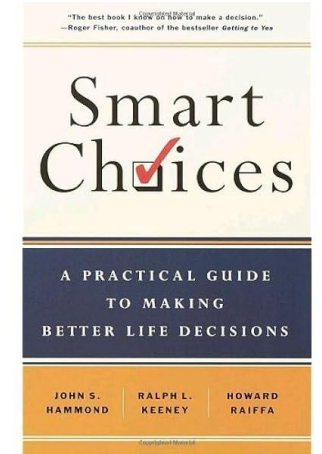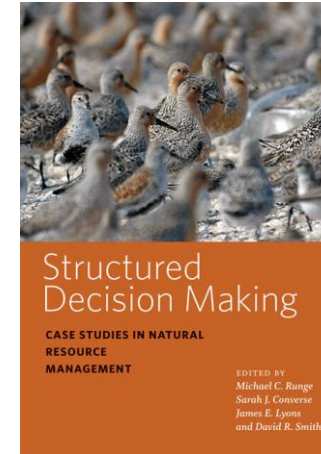## 3. Run a quick PrOACT analysis on your own

4. Build a team

Nicholson et al. 2002 – "Ten Heuristics…"

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Additional Resources

- Peer reviewed journal articles/books/videos
  - Structured Decision Making Book (Runge et al. 2020)
  - Review paper: An introduction to decision science for conservation (Hemming et al. 2022)
  - Smart choices book
  - National Conservation Training Center Videos
  - https://www.structureddecisionmaking.org/resources/

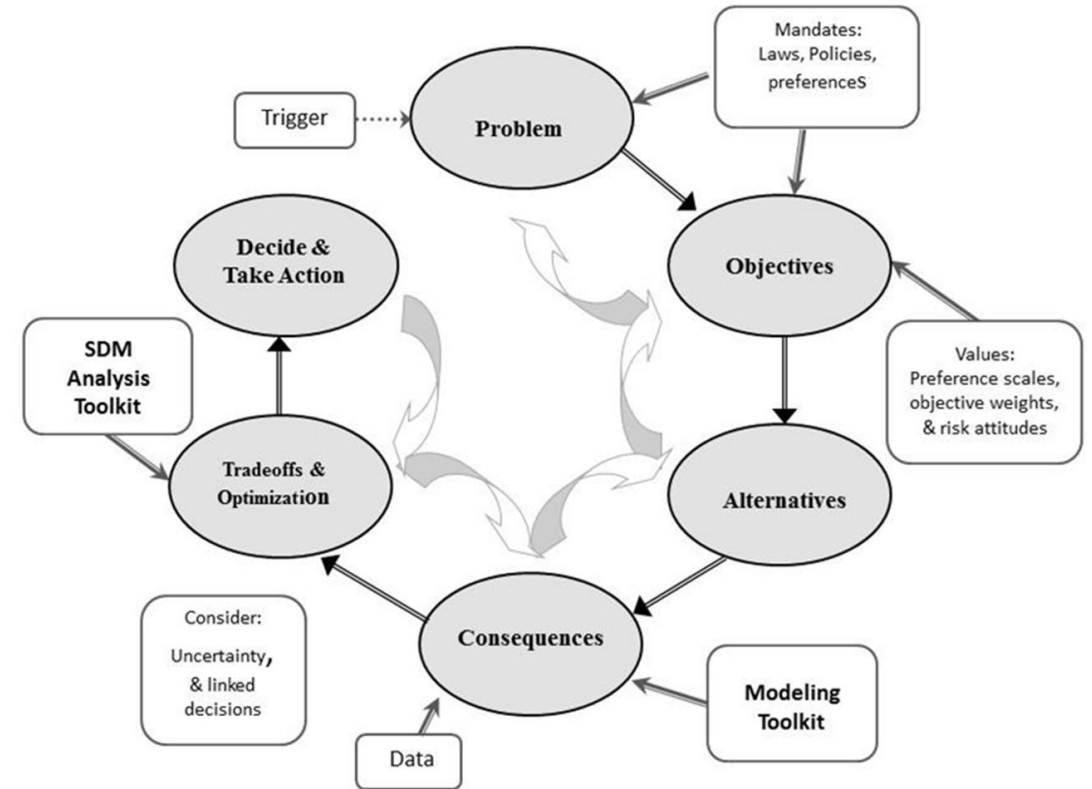
If interested in decision theory:
- *Thinking, Fast and Slow* by Daniel Kahneman
- *Nudge* by Richard Thaler and Cass Sunstein
- *Thinking in Bets* & *Quit* by Annie Duke

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Big takeaways

- Two components of SDM
  - Values focused
  - Problem decomposition (PrOACT)
- Rapid prototype and iterative process!

Source: Jean Fitts Cochrane

"We just want to screw up as quickly as possible. We want to fail fast. And then we want to fix it. Together."

- Lee Unkrich, a Pixar director, describing the company's grueling creative process

"Imagine: How creativity works", by Jonah Lehrer, Houghton Mifflin Harcourt
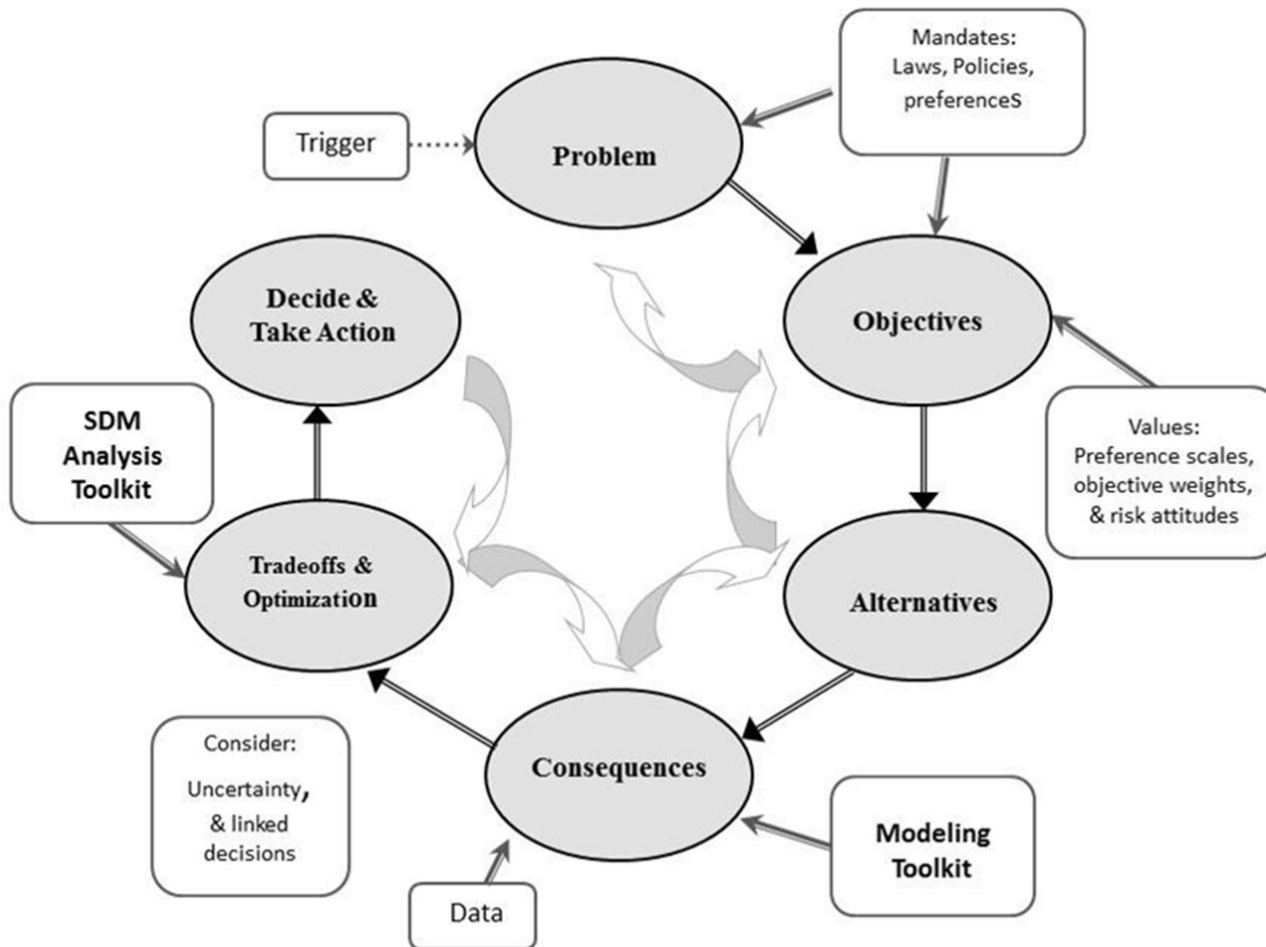
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Discussion

- How would you use SDM in your research?
- Personal life?

- Think about a decision you recently made, which part of PrOACT do you think was the most challenging? Easiest?

- Did you learn anything today that would've helped that decision?

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Questions and Comments?

Source: Jean Fitts Cochrane

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