University of Missouri

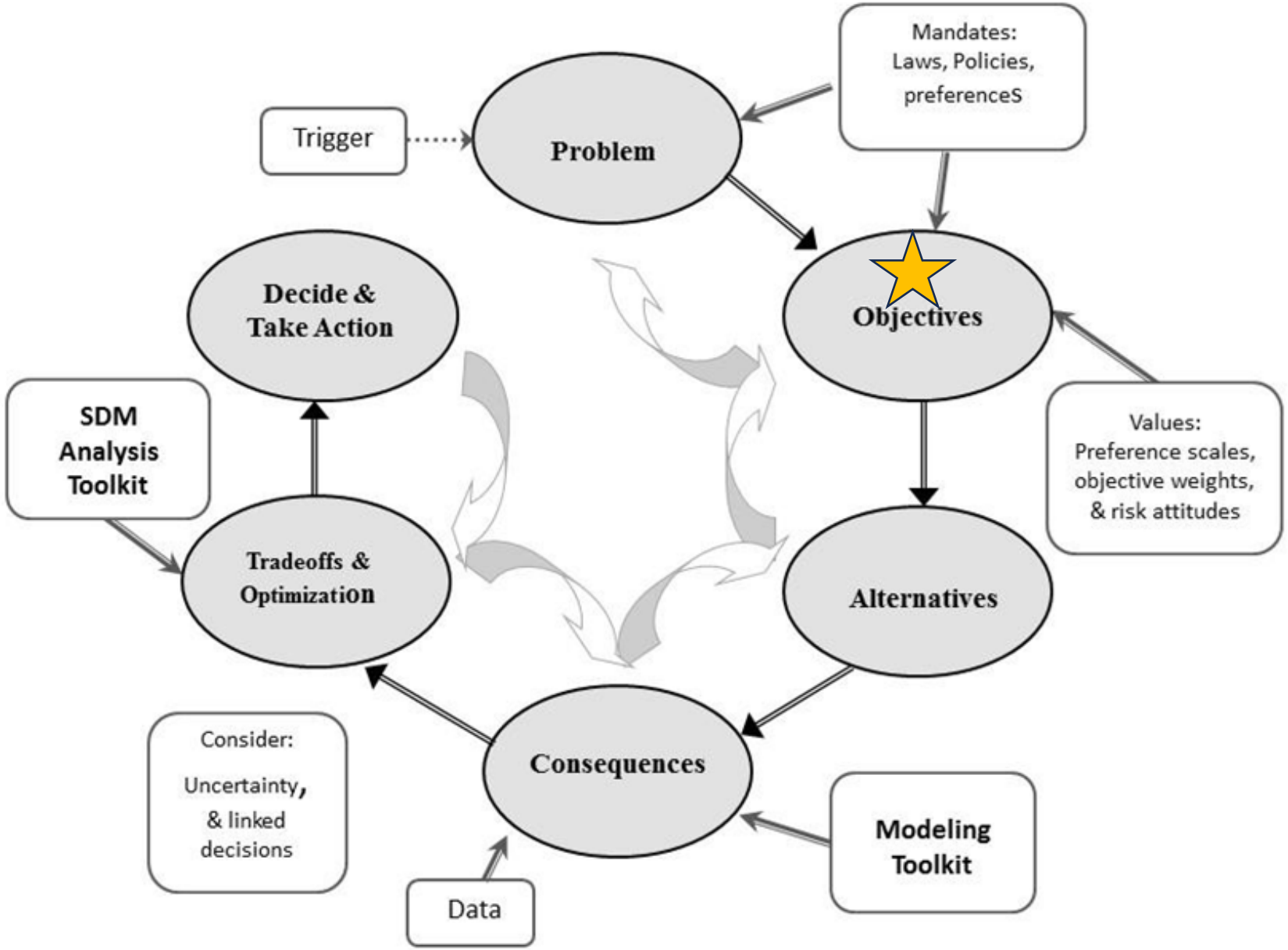
Objectives

Module 3:

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

What are objectives, and why are they important?

- We make decisions to achieve something
- Objectives are what we want to achieve

Medium

Example: I am deciding where to go on vacation.
What objectives are in play for me?

I want to maximize:
- Relaxation
- Fun
- Comfort

I want to minimize:
- Cost
- Travel time

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

University of Missouri

What are objectives, and why are they important?

- Spending time on this step is important because we will:
  - Compare alternatives on the right criteria
  - Develop creative alternatives
  - Know what we want to make predictions about
  - Better explain our decisions to others

Medium

We are surprisingly poor at identifying objectives

1) We often don't know all our objectives:
   - Bond et al. (2008) asked MBA students to imagine choosing an MBA program, list their objectives, then check against a master list
     - Students included $\bar{x}$ = 7.4 items on their original list
     - Students recognized $\bar{x}$ = 7.6 items on the master list that they had not originally listed
     - $\bar{x}$ = 4 of the missed objectives made their lists of top 10 most important objectives

Medium

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

University of Missouri

We are surprisingly poor at identifying objectives

1) We often don't know all our objectives
2) We confuse ends and means:
   - Example – when deciding about management of an endangered species:
     - Is this the objective?
       - Maximize survival probability of the endangered species
     - Or is this the objective?
       - Maximize probability of persistence of the endangered species

Medium

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

Pieces of an objective:

Direction
(maximize, minimize) + **What is desired** + **Attribute**
(the units)

Developed by Brielle K Thompson

Process for identifying objectives

1. Articulate concerns and convert to objectives
2. Structure objectives
    2a. Distinguish types of objectives
    2b. Create an objectives hierarchy
3. Develop measurable attributes

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

1. Articulate concerns and convert to objectives

Ask:

- What do you hope to achieve?
- What concerns will this decision address?
- How can the current situation be improved?
- What are the best and worst possible outcomes from this decision?
- What do you like and dislike about solutions you can think of?
- What does this issue look like from the perspective of other stakeholders?

Make these concerns – and subsequent objectives – distinct and independent

1. Articulate concerns and convert to objectives

With a neighbor, convert concerns to objectives:

Hint: direction + what is desired

Goal or Concern	***Hope to Achieve***	***Potential Objective***
It's hard to catch bluegills any more	Improve fishing	
Many loons die ingesting lead tackle	Reduce loon mortality and increase loon populations	
Ballast water brings invasive species	Avoid release of invasive species and protect native species	
Certain interest groups feel excluded	Organize an inclusive decision process	
I won't have enough money for this	Reduce cost and manage within budget	

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

University of Missouri

1. Articulate concerns and convert to objectives

With a neighbor, convert concerns to objectives:

Hint: direction + what is desired

Goal or Concern	***Hope to Achieve***	***Potential Objective***
It's hard to catch bluegills any more	Improve fishing	Maximize recreational fishing success
Many loons die ingesting lead tackle	Reduce loon mortality and increase loon populations	Maximize persistence of loon populations
Ballast water brings invasive species	Avoid release of invasive species and protect native species	Maximize native invertebrate and fish communities in lakes
Certain interest groups feel excluded	Organize an inclusive decision process	Maximize interest group engagement
I won't have enough money for this	Reduce cost and manage within budget	Minimize cost

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

University of Missouri

2a. Distinguish types of objectives

1. **Fundamental**
   - The basic reason for caring about the decision (essential)
2. **Means**
   - Influence the achievement of fundamental objectives (not necessarily essential)
3. **Process**
   - Concern for how the decision is made rather than what decision is made
     - Example- maximize public trust
4. **Strategic**
   - Higher level – objectives covering all decisions made by the organization or person or an agency mandate

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

2a. Distinguish types of objectives

Fundamental objectives:

- Must be controllable
  - Available alternatives could influence objective
- Must be essential
  - Relevant to evaluation of all alternatives

Keep asking, "Why is that important?"

When the answer is:

"Just because"/ "This is important"/ "Inherent value"

→You have reached a fundamental objective.

Means objectives:

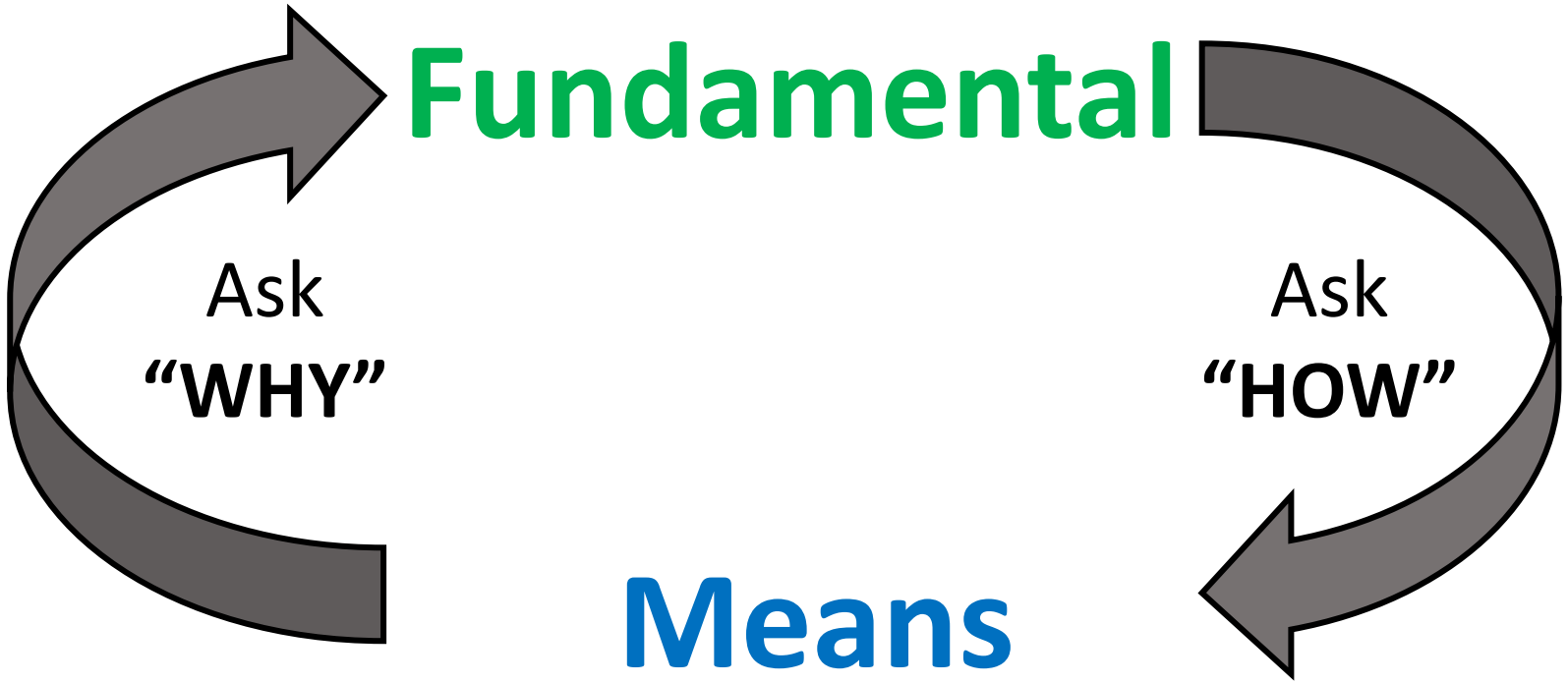
- Point to actions you can take to influence what matters (i.e., the fundamental objective)

Keep asking, "How?"

- How can I address this concern?
- How can I measure success?
- How can I make the stakeholders happy?

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

2a. Distinguish types of objectives



Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

2a. Distinguish types of objectives

Exercise: Identify the fundamental objective 

Concern	**Objectives**
1. Ballast water brings invasive species	Minimize ballast dumping
	Minimize invasive species introductions
	Maximize native species
2. You don't have enough money for this	Minimize cost
	Maximize conservation within budget

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

University of Missouri

2a. Distinguish types of objectives

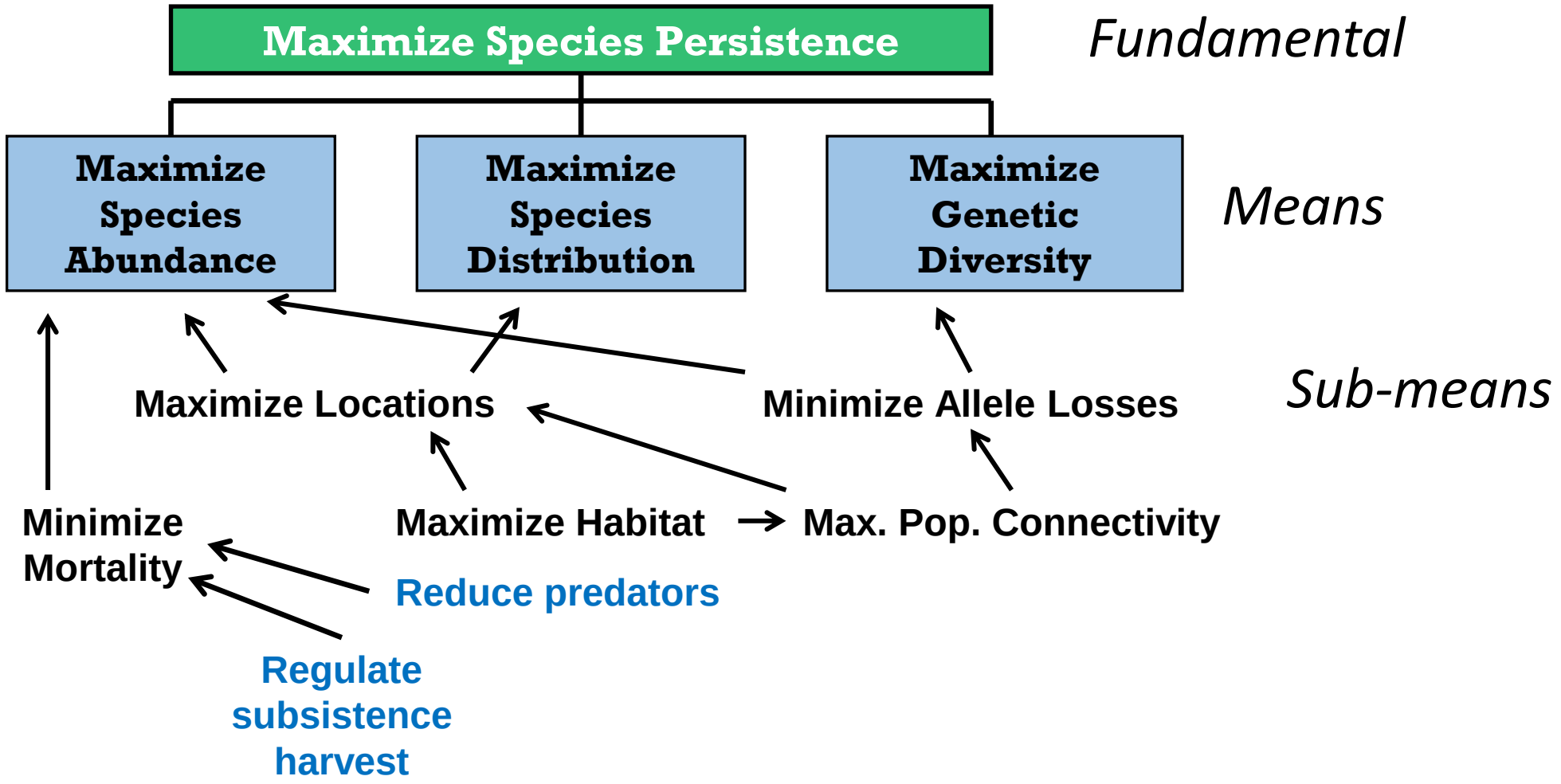
Exercise: Identify the fundamental objective ★

Concern	Objectives
1. Ballast water brings invasive species	Minimize ballast dumping
	Minimize invasive species introductions
	Maximize native species ★
2. You don't have enough money for this	Minimize cost ★
	Maximize conservation within budget

Do not combine objectives!

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

2b. Create an objective hierarchy



Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

3. Develop measurable attributes (the units)

Attributes measure performance and is used to:

- Predict (in advance of the decision) how a given decision will lead to measurable outcomes
- Compare realized objective outcomes to predicted outcomes after decision implementation

Attribute scales:

1. Natural scale

- Objective can be directly measured
- Example: $ for cost

2. Constructed scale

- Sliding or relative scale requiring interpretation
- Example: Likert scale (5 = very satisfied…1 = very unsatisfied) *for* fisher satisfaction

3. Proxy scale

- Natural attribute that is highly correlated with the objective, but does not directly measure
- Example: % of natural range preserved *for* species genetic diversity

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

University of Missouri

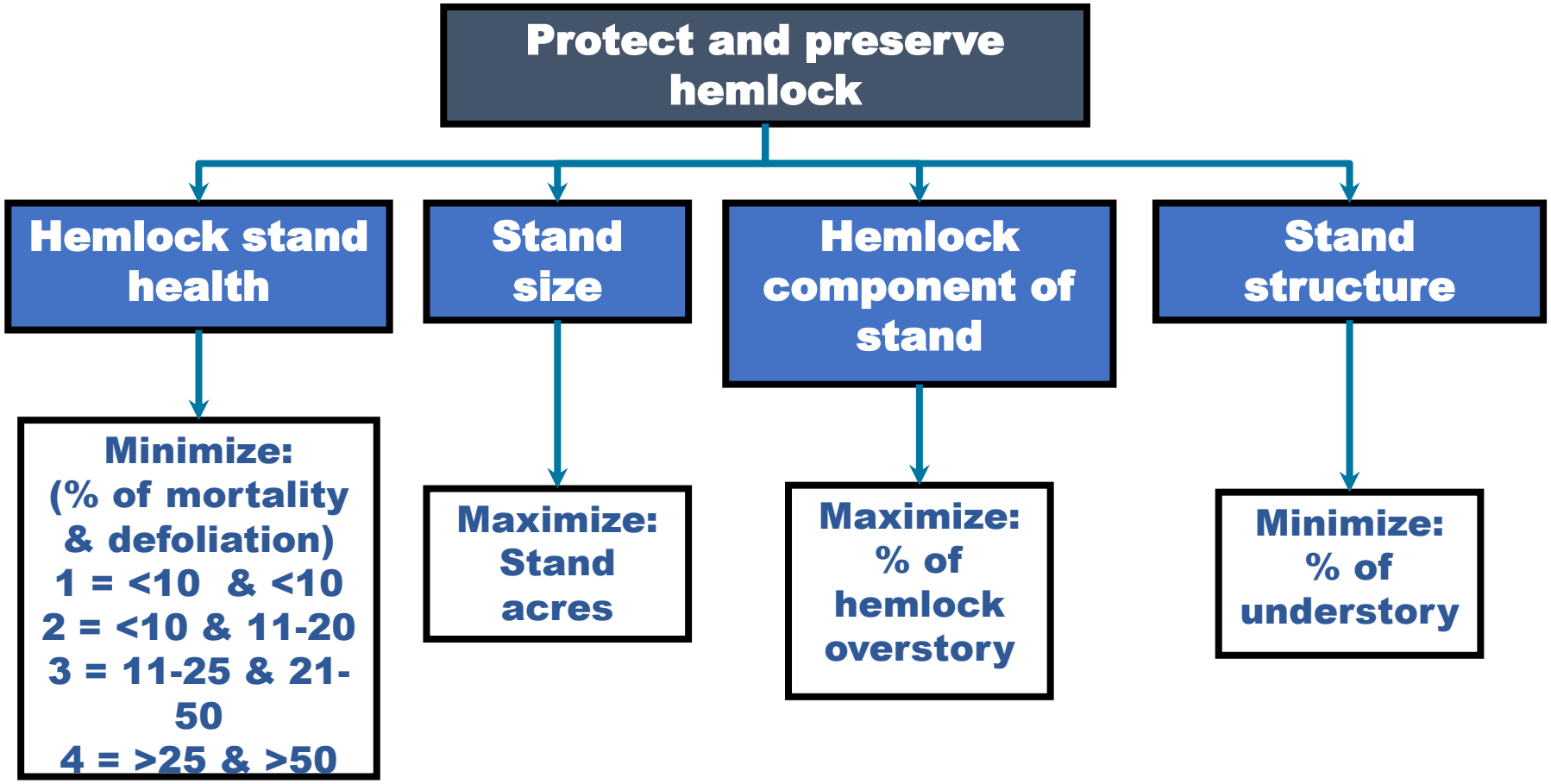
3. Develop measurable attributes (the units)

Objective	Direction	Attribute	
Minimize costs	Minimize (↓)	M$/yr	Natural
Maximize occupancy probability	Maximize (↑)	Probability (0-1)	Natural
Minimize extinction probability	Minimize (↓)	Probability (0-1)	Natural
Maximize hunter satisfaction	Maximize (↑)	Harvest Success Rate (# harvested/# permits)	Proxy

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

University of Missouri

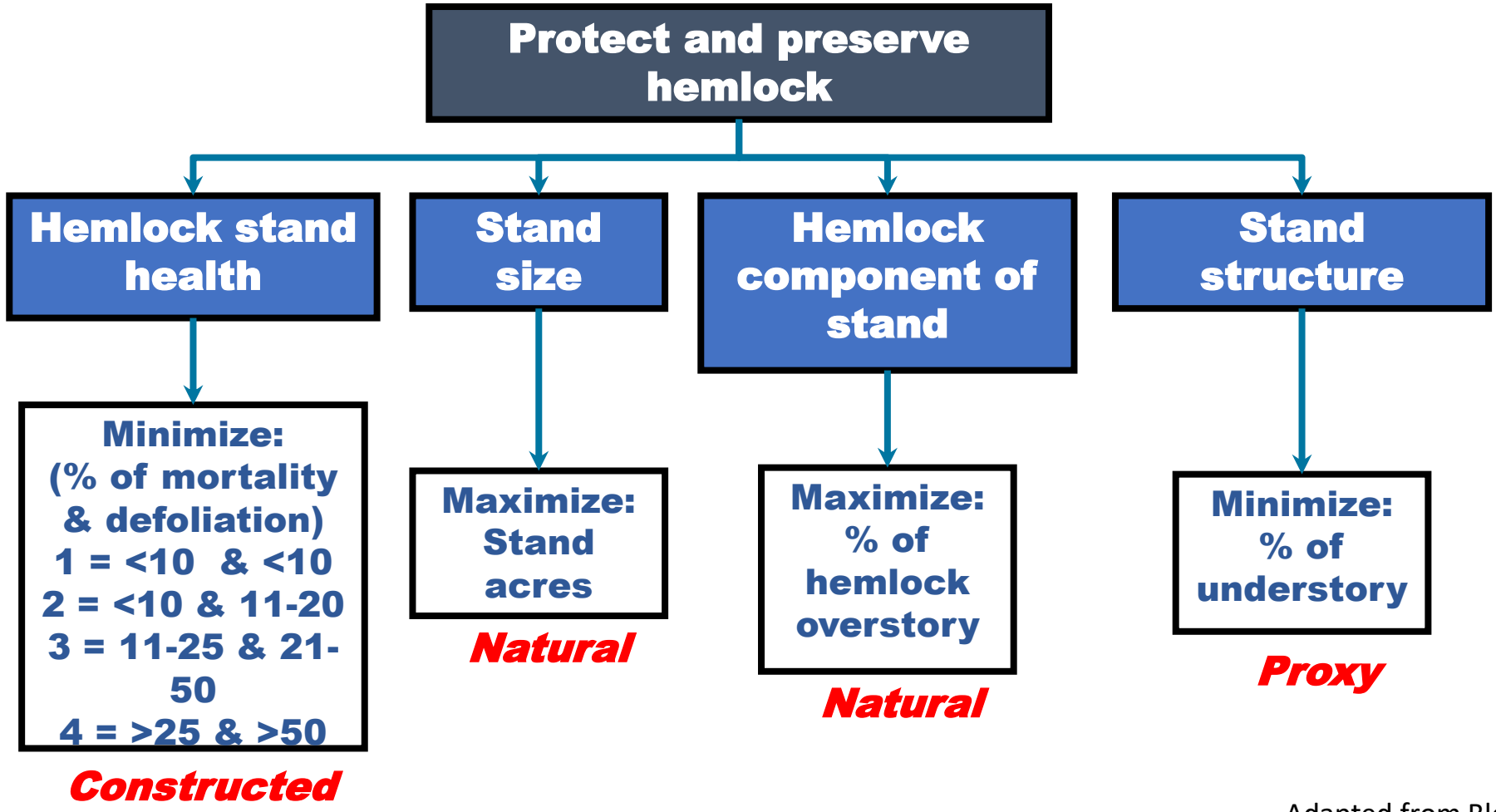
Exercise: What are the attribute types?



Adapted from Blomquist et al. (2010)

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

Exercise: What are the attribute types?



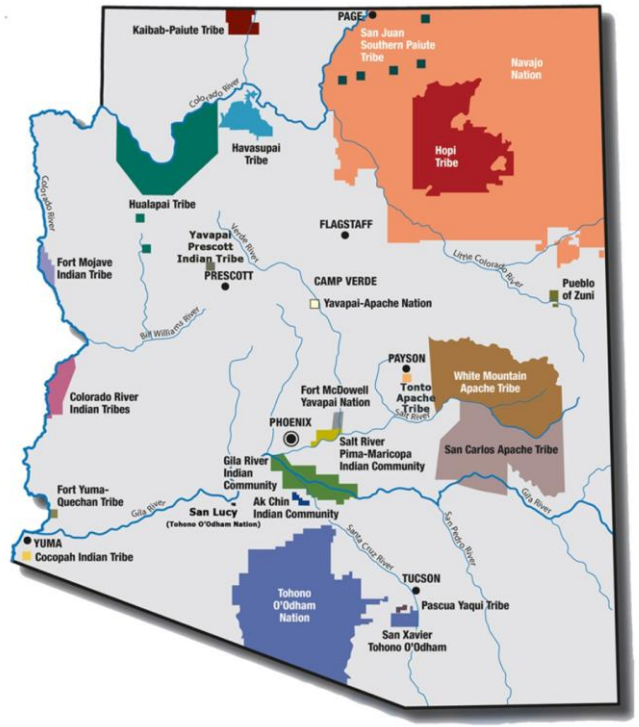
Adapted from Blomquist et al. (2010)

Developed by Alex McInturff, Jean Fitts Cochrane, Angela Matz, Jennifer A. Szymanski, James E. Lyons, Sarah J. Converse, & Michael C. Runge

University of Missouri

Case study: (Runge et al. 2011)

- See attachment of case study description (CaseStudyDescription.pdf)



Arizona Department of Education

Exercise: Articulate objectives

Hint:

1) Transform concerns to objectives

2) Structure objectives (distinguish types) & create an objective hierarchy

3) Develop measurable attributes

10 minute break!