

## Module D — Developing Alternatives

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# PrOACT

By the end of this module, you should be able to:

1. Understand tools used to develop alternatives
2. Given a list of objectives, use at least one technique to find creative alternatives
3. Recognize typical pitfalls in the development of alternatives

### Pitfalls of Decision-Making

We have a natural human tendency to focus first on *alternatives* when making decisions rather than focusing first on *objectives*.

What are the risks of this?

- We tend to limit ourselves to a smaller set of alternatives
- We may anchor on the first suggested alternative

### Alternatives are

- ... created *after* you decide where you'd like to go (with your objectives)
- ... focused directly on achieving objectives

Example

1. Problem/Concern: Many rare lizards are killed during capture for pet trade
2. Objective: Minimize mortality of lizards during capture
  - 2a. Measurable Attribute: mortality rate over 2 years
3. Alternative Set
  - 3a. Ban lizard sales
  - 3b.
  - 3c.
  - etc.

### Good alternatives require...

- *Imagination*
  - Don't limit to 'practical' alternatives
- *Creativity*
  - Think of the widest range of possible alternatives
  - Don't let preconceived ideas or constraints be limiting

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- *Distinctiveness*
  - Outcomes of alternatives should be discrete from each other to limit an often infinite number of possible alternatives and to aid learning about which alternative is best
- *Iteration*
  - Build on your ideas
- *Communication*
  - Seek input from others and other disciplines

### Approaches to Generating Alternatives

1. Focus on fundamental objectives
2. Address conflicting objectives
3. Challenge constraints
4. Visualize – use diagrams
5. Create groups of alternatives – portfolios & strategies
6. Revisit objectives

#### 1. Focus on fundamental objectives

- Brainstorm; think creatively
- Work independently, then as a group
- Integrate your knowledge
  - Political
  - Technological
  - Scientific
  - Economic
- Identify assumptions & challenge constraints
- Give everyone time and a place to think – make sure everyone is heard

#### 2. Address conflicting objectives

- Imagine the best possible consequences for each objective – create one alternative to get you there
- Then, create hybrid alternatives, trying to meet more than one objective.
- Consider a great option: why do you like it?
- Consider a terrible option: what do you want to avoid?

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#### Example

Problem/Concern: Many rare lizards are killed during capture for pet trade

Objectives:

- Minimize capture mortality
  - Maintain pet industry
- } Possibly conflicting  
} objectives

Alternatives:

- Ban sale of lizards
- Certify captive bred suppliers

### 3. Challenge constraints to expand your alternatives

- When there are few apparent alternatives, challenge constraints
- Identify both real & perceived constraints
- Don't anchor on initial set of options
- Develop alternatives before assessing feasibility & efficacy
- Expand options: scope, scale, rearrange, combine

Example Problem: To which of several islands should an endangered bird be translocated?

Perceived Constraint: Introduced predators on Island A make it unsuitable

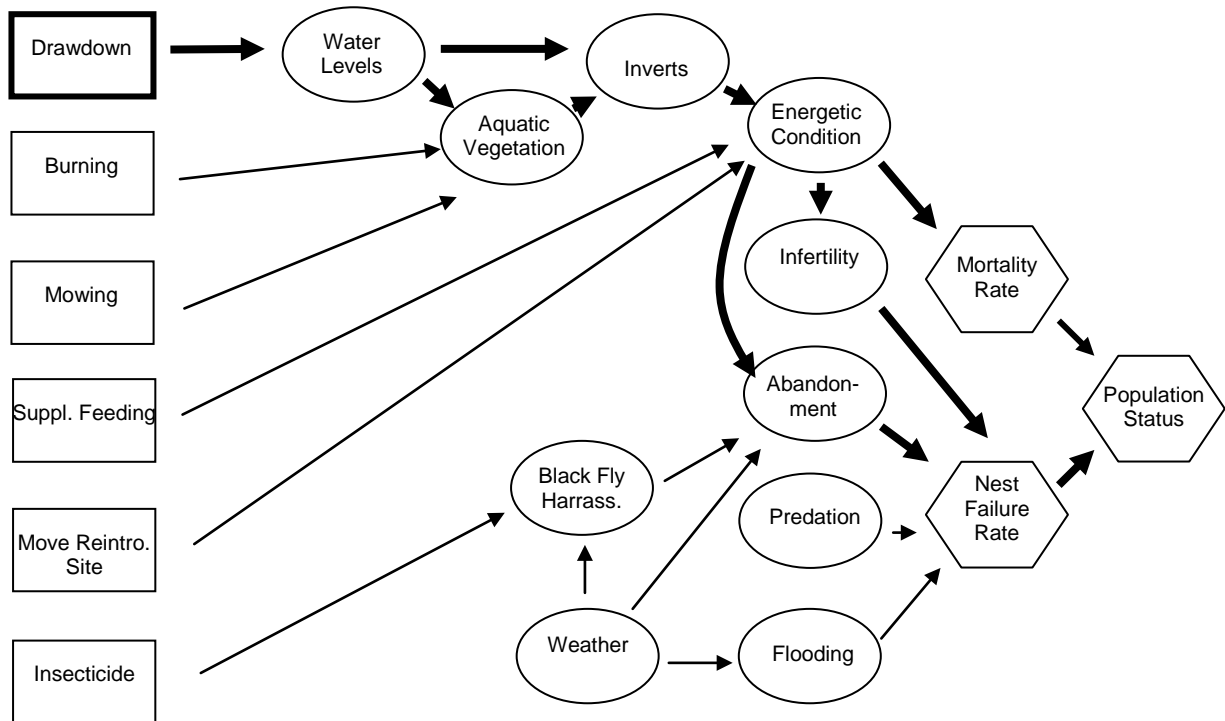
New Alternative: Combination of predator control and translocation to Island A

### 4. Visualize

- Use diagrams to help develop management alternatives.
- This method is used as a creative process to **generate** alternatives, rather than predict the effects of actions on objectives.

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Example: crane nest failure at Necedah National Wildlife Refuge



### 5a. Create Alternative Portfolios

- A portfolio is a combination of like elements arranged in a set
- The elements themselves can be discrete or continuous actions
- The combination now represents a single alternative
- Compare to a stock portfolio
  - A portfolio is a set of individual stock holdings
  - You are interested in the performance of the *portfolio*, not so much the performance of the individual stocks
- The consequences (benefits) from a portfolio may be greater (or lesser) than the sum of its constituent parts
- Constraints are often used to limit the number of available portfolios

Example: What stock to buy for \$20K?

- Alternative 1: 50 shares Stock A (\$400 per)
- Alternative 2: 100 shares Stock B (\$200 per)

Portfolios (4 alternatives):

- Alt 1: 40 shares Stock A, 20 shares Stock B
- Alt 2: 30 shares Stock A, 40 shares Stock B
- Alt 3: 20 shares Stock A, 60 shares Stock B
- Alt 4: 10 shares Stock A, 80 shares Stock B

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Example: Portfolios that target removal of invasive species to restore habitat. The individual actions (A, B, C, D) come from a discrete set, and represent the species to be managed. The portfolios are the complete set of species that will be targeted.

Target sp.	Costs (\$K)	Ac. restored
A	15	14
B	7	18
C	3	7
D	12	32
A+B	(15+7 ≠) 18	(14+18 ≠) 29
A+C	20	35
...	...	...
B+C+D	20	40
A+B+C+D	30	52

Consider reducing the number of possible portfolios by adding constraints: 1) Invasive species B must be eradicated; 2) Budget < \$25k

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**5b. Create Alternatives Strategies**

*Adapted from: Robin Gregory, Compass Resource Management, Vancouver, BC*

1. Alternatives combining multiple unlike elements: Strategy Tables  
 List management options under each element  
 Select a coherent set among those to be one Strategy
  
2. Based on alternative hypotheses about limiting factors.  
 Influence diagrams are often useful to visualize alternative paths linking outcomes with different management ‘means’ or actions to produce strategies that address hypotheses

Example: Recovery of an Endangered Species

Themes:	Habitat Protection	Predator Control	Enhance Population	Monitor
Action elements:	Status Quo	Status Quo Harvest	None	None
	Ban logging in critical habitat	Increase harvest; reduce predators by 10%	Maternity Pens	Basic Monitoring
	Develop linkage corridors	Increase harvest; reduce predators by 50%	Captive Breeding Translocate	Enhanced Monitoring

Themes →	Habitat Protection	Predator Control	Enhance Population	Monitor
↓ Strategies				
Maintain Existing Population	Status Quo	Status Quo Harvest	None	Enhanced Monitoring
“On the Go” (Dispersal)	Develop linkage corridors	Increase harvest; reduce predators by 10%	Translocate	Basic Monitoring
Increase Population to Carrying Capacity	Ban logging in critical habitat	Increase harvest; reduce predators by 50%	Captive Breeding	Enhanced Monitoring

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**6. Revisit Your Objectives**

Once an initial set of alternatives is developed, it can be worthwhile to:

- Be sure you've properly separated fundamental from means objectives
- Clarify the statement of objectives
- Identify if additional objectives exist

**Other tips on creating alternatives...**

- The first list of alternatives is usually unnecessarily narrow.
- Sometimes alternatives are obvious; but often they're not.
- SDM is iterative, don't stop looking for alternatives
- Create first, evaluate later.

**Good alternatives...**

- Address the future, not the past
- Are unique
- Are creative and encompass a broad range of actions
- Are financially, legally, and politically reasonable
- Can actually be implemented by the decision maker
- Address all objectives

**Consider alternatives that ...**

- Are an ongoing process
- Delay the decision
- Gather more information

Treat them as real and subject to the same evaluation as other alternatives