

## Portfolios of Actions

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Structured Decision Making Workshop

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## Portfolio Development

- Consider all possible combinations of actions
  - Sum benefits from all actions in each set
    - Simple sum (additive model) easiest
    - Could include interactions in benefits
  - May constrain by maximum budget, at least one action from each subset, etc...
- Develop sets of actions by themes or strategies
  - May base on different means objectives, alternative hypotheses about limiting factors, ...
  - Determine benefits for the set or portfolio in total, including any interaction effects/synergies

## All Combinations Considered

Actions	Benefits	Benefits Sum
1	14	14
2	18	18
3	7	7
1 + 2	14 + 18	32
1 + 3	14 + 7	21
2 + 3	18 + 7	25
1 + 2 + 3	14 + 18 + 7	39

## All Combinations Considered with constraints

Budget < \$12k and must contain Action 1

Actions	Benefits	Sum	Cost (\$k)
1	14	14	4
<del>2</del>	<del>18</del>	<del>18</del>	<del>3</del>
<del>3</del>	<del>7</del>	<del>7</del>	<del>6</del>
1 + 2	14 + 18	32	7
1 + 3	14 + 7	21	10
<del>2 + 3</del>	<del>18 + 7</del>	<del>25</del>	<del>9</del>
<del>1 + 2 + 3</del>	<del>14 + 18 + 7</del>	<del>39</del>	<del>13</del>

## All Combinations Considered with constraints & interaction

Add 'bonus' benefit when actions 1 & 3 together

Actions	Benefits	Sum	Cost (\$k)
1	14	14	4
<del>2</del>	<del>18</del>	<del>18</del>	<del>3</del>
<del>3</del>	<del>7</del>	<del>7</del>	<del>6</del>
1 + 2	14 + 18	32	7
1 + 3	14 + 7 + 14	35	10
<del>2 + 3</del>	<del>18 + 7</del>	<del>25</del>	<del>9</del>
<del>1 + 2 + 3</del>	<del>14 + 18 + 7 + 14</del>	<del>53</del>	<del>13</del>

## Strategic Portfolio

- Based on a theme
  - Use Strategy Table
    - List management options under each factor (e.g., by increasing level of intensity)
    - Select a set with a coherent theme or strategy

Cultus Lake sockeye example

- Created by assembling 'blocks' of options from:
  - Cultus Lake Exploitation Rate %
  - Upstream Exploitation Rate %
  - Enhancement options
  - Freshwater projects options

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

## Cultis Lake Sockeye Strategy Table

### Alternative 1: "Status Quo 2005"

Cultus Exp %	Upstrm Expl %	Enhancement	FW Projects
5	0	None	None
10-12	10	Captive Brood	Current Milfoil
20	20	Current Ongoing	Moderate Milfoil
30	30	Double Smolt	Full Milfoil
40	Unconstrained	Max Enhancement	<5% Pikeminnow
		Dbl current cap	5-20% Pikeminnow
			>20% Pikeminnow

## Cultis Lake Sockeye Strategy Table

### Alternative 6: "Spread the Pain 2"

Cultus Exp %	Upstrm Expl %	Enhancement	FW Projects
5	0	None	None
10-12	10	Captive Brood	Current Milfoil
20	20	Current Ongoing	Moderate Milfoil
30	30	Double Smolt	Full Milfoil
40	Unconstrained	Max Enhancement	<5% Pikeminnow
		Dbl current cap	5-20% Pikeminnow
			>20% Pikeminnow

## Strategic Portfolio

- Based on a theme
  - Use Strategy Table
  - Cultis Lake sockeye example
- Based on alternative hypotheses about limiting factors
  - Use Influence Diagram
    - Alternative 'paths' through the diagram start from different 'causes' that link with different management 'means'
    - Columbia River white sturgeon example

## Columbia River White Sturgeon Influence Diagram

### LC1: Movement to habitat, Age 0-15

