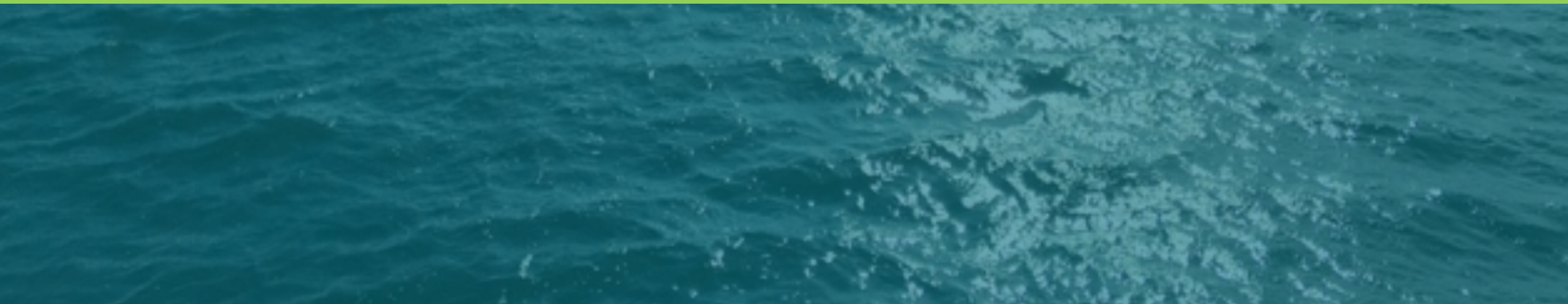
Herring River Restoration Phase 1 Project Update

* Permitting
  * Development of Regional Impact Review
* Herring River Executive Council
* Regulatory Oversight Group
* Design & Engineering
* Monitoring & Adaptive Management

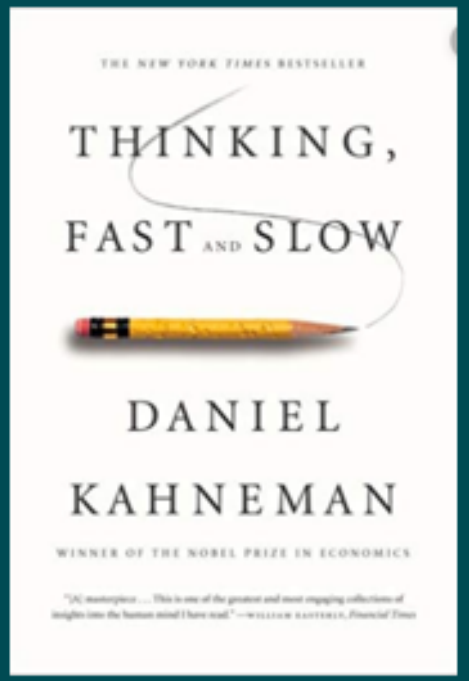
March 2020 Update for Adaptive Management

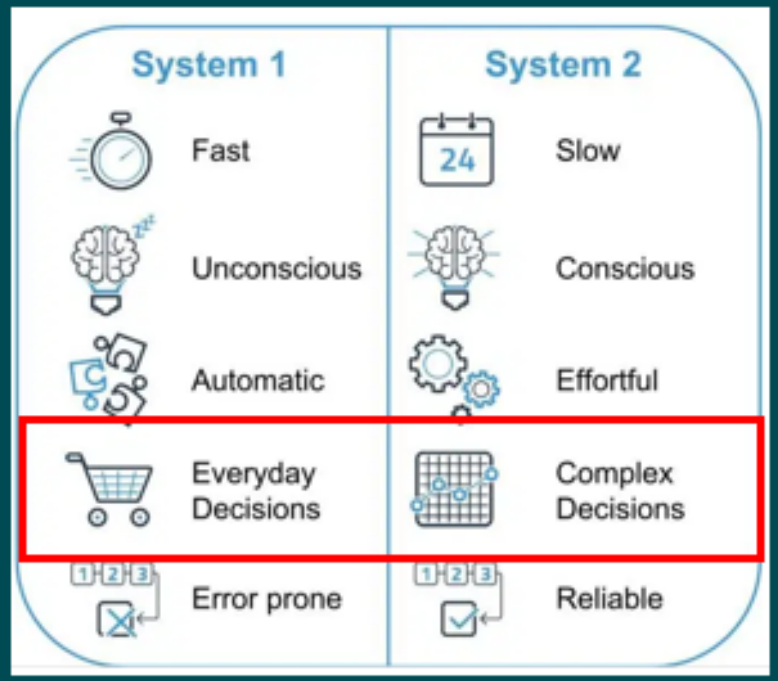
ADAPTIVE MANAGEMENT FOR THE HERRING RIVER

Demystifying the Decision-Making Process



RECAP OF January Webinar: We Discussed Psychological Basis for Formal Decision-Analysis





WHAT MAKES DECISIONS HARD?

RECAP OF January Webinar: We Walked Through an Simple Decision-Analysis Example, Planning a Family Trip

DECISION ANALYSIS DEMO

With **Objectives** and **Alternatives** specified we can begin to analyze the decision…

OBJECTIVES

- Minimize family drama
- Minimize costs
- Maximize family togetherness
- Maximize time spent with extended family and old friends
- Optimize trip duration
- Maximize exercise/training opportunities
- Maximize new experiences
- Minimize carbon footprint

ALTERNATIVES

- Visit brother's family as usual
- Stay home and cook
- Stay home but go to restaurant
- Visit lost twin at Hawaii surf school
- Visit close friends 300 miles away
- Spend Holiday in Europe and drop son at university in Berlin

RECAP OF January Webinar: We Described How Consequence Tables Are Used to Compare Objectives and Alternatives

DECISION ANALYSIS DEMO

PREDICTING OUTCOMES: CONSEQUENCE TABLE

Original scores

CONSEQUENCE MATRIX			Alternatives					
Objectives	**Goal**	**Units**	**Usual Routine**	**Home - Cook**	**Home - Restaurant**	**Hawaii**	**Friends**	**Europe**
1. Family Drama	Min	% of potential	• This is where we enter data • Predictions of expected outcomes • Data come from: ✓ Direct Source; *Cost of Airfare, Carbon Footprint Calc.* ✓ Past Experience; *Drive Time from A to B* ✓ Models (mental, conceptual, numerical); *Maps* ✓ Informed Estimates (Elicitation); *Judgement of Quality of New Experience*					
2. Cost	Min	$$$						
3. Family Time	Max	days						
4. Extended Family/Friends	Max	day/pers						
5. Trip Duration	Max	day						
6. Exercise/Training	Max	miles						
7. New Experiences	Max	0-10						
8. Carbon Footprint	Min	tons C						

RECAP OF January Webinar: We Explored How Weighting Can Help Analyze Sensitivity to Objectives and Alternatives

DECISION ANALYSIS DEMO

QUANTIFYING STAKEHOLDER VALUES – SENSITIVITY ANALYSIS

Dad: Family Time and Cost

CONSEQUENCE MATRIX			Alternatives						
Objectives	Goal	Units	Usual Routine	Home - Cook	Home - Restaurant	Hawaii	Friends	Europe	Weight
1. Family Drama	Min	probability %	0.00	0.28	0.30	0.25	0.28	0.21	0.30
2. Cost	Min	$$$	0.25	0.18	0.25	0.00	0.24	0.09	0.25
3. Family Time	Max	# days	0.03	0.00	0.00	0.15	0.05	0.10	0.15
4. Extended Family/Friends	Max	# people days	0.03	0.00	0.00	0.05	0.05	0.00	0.05
5. Trip Duration	Max	# days	0.02	0.00	0.00	0.05	0.02	0.04	0.05
6. Exercise/Training	Max	mi. run/wk	0.05	0.15	0.15	0.00	0.00	0.00	0.15
7. New Experiences	Max	constructed scale (0-10)	0.00	0.00	0.01	0.05	0.02	0.04	0.05
8. Carbon Footprint	Min	tons C	0.00	0.00	0.00	0.00	0.00	0.00	0.00

RECAP OF January Webinar: Finally, We Compared How Our Family Trip Example Relates to Decisions About the Herring RIver

HOW DOES THIS APPLY TO HERRING RIVER?

DATA FOR ALTERNATIVES CAN BE ENTERED FOR BOTH SETS OF OBJECTIVES:

HERRING RIVER RESTORATION CONSEQUENCE MATRIX			Alternatives					
Objectives	Goal	Units	5-year	15-year	25-year	Slow-Fast 15-year	Fast-Slow 15-year	Sediment
1. Safety at Dike								
2. Safety in HR Floodplain								
3. Views from Public Locations								
4. Views from Private Locations								
5. Public Rights on Private Land								
6. Recreation								

TRIP PLANNING CONSEQUENCE MATRIX			Alternatives					
Objectives	Goal	Units	Usual Routine	Home - Cook	Home - Restaurant	Hawaii	Friends	Europe
1. Family Drama	Min	% of potential	90	15	5	20	10	30
2. Cost	Min	$$$	500	5000	300	18000	1200	15000
3. Family Time	Max	days	3	1	1	10	4	7
4. Extended Family/Friends	Max	day/pers	12	0	0	20	20	0
5. Trip Duration	Max	day	3	0	0	10	4	7
6. Exercise/Training	Max	miles	30	40	40	25	25	25
7. New Experiences	Max	0-10	0	0	2	9	3	7
8. Carbon Footprint	Min	tons C	0.30	0.10	0.10	9.00	0.30	6.70

Moving Forward With Herring River Decision-Analysis…

Just Like the Family Trip Planning Example, We Need Input On Each Adaptive Management Objective In Order to Evaluate Herring River Management Policies

TRIP PLANNING CONSEQUENCE MATRIX			Alternatives						
Objectives	Goal	Units	Usual Routine	Home - Cook	Home - Restaurant	Hawaii	Friends	Europe	Weight
1. Family Drama	Min	% of potential	90	15	5	20	10	30	
2. Cost	Min	$$$	500	5000	300	18000	1200	15000	
3. Family Time	Max	days	3	1	1	10	4	7	
4. Extended Family/Friends	Max	day/pers	12	0	0	20	20	0	
5. Trip Duration	Max	day	3	0	0	10	4	7	
6. Exercise/Tr…	Max	miles	30	40	40	25	25	25	
7. New Experience									
8. Carbon Footprint									

HERRING RIVER RESTORATION CONSEQUENCE MATRIX			Alternatives						
Objectives	Goal	Units	5-year	15-year	25-year	Slow-Fast 15-year	Fast-Slow 15-year	Sediment	Weight
1. Safety at Dike	Min	wgtd avg.							
2. Safety in HR Floodplain	Min	# sub-basins							
3. Views from Public Locations	Min	% of visual field							
4. Views from Private Locations	Min	% of visual field							
5. Public Rights on Private Land	Min	# properties							
6. Recreation	Max	acres							

Moving Forward With Herring River Decision-Analysis…

Like the family trip planning example, we need input on each objective in order to evaluate Herring River management policies.