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

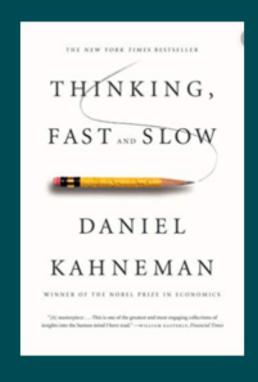
ADAPTIVE MANAGEMENT FOR THE HERRING RIVER

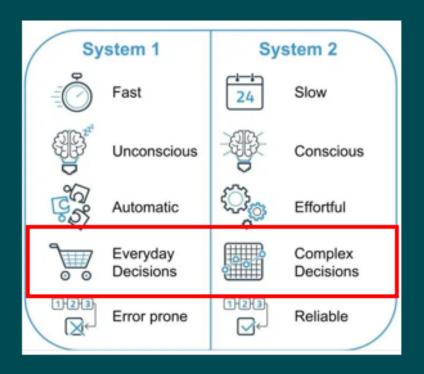
Demystifying the Decision-Making Process

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

ADAPTIVE MANAGEMENT FOR THE HERRING RIVER

HR Stakeholder Group Webinar: January 15, 2020





WHAT MAKES DECISIONS HARD?

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

ADAPTIVE MANAGEMENT FOR THE HERRING RIVER

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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

ADAPTIVE MANAGEMENT FOR THE HERRING RIVER

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DECISION ANALYSIS DEMO

PREDICTING OUTCOMES: CONSEQUENCE TABLE

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

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

ADAPTIVE MANAGEMENT FOR THE HERRING RIVER

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DECISION ANALYSIS DEMO

QUANTIFYING STAKEHOLDER VALUES – SENSITIVITY ANALYSIS

Dad: Family Time and Cost

CONSEQUENCE MATRIX			A Itern atives							
Objectives	Goal	Units	U sual Routine	Home - Cook	Home - Restaurant	Hawaii	Friends	E urope	Weight	
1. Family Drama	Min	probability %	0.00	0.28	0.30	0.25	0.28	0.21	0.30	
2. Cost	Min	SSS	0.25	0.18	0.25	0.00	0.24	0.09	0.25	
3. Family Time	M ax	# 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	M ax	# days	0.02	0.00	0.00	0.05	0.02	0.04	0.05	
6. Exercise/Training	M ax	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

ADAPTIVE MANAGEMENT FOR THE HERRING RIVER HR Stakeholder Group Webinar: January 15, 2020												
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-ye			r 15-year		25-year	Slow- 15-ye		Sadim	ent		
1. Safety at Dike	TRIP P	LANNING										
2. Safety in HR		EQUENCE N	/ATRIX	(Alternatives						
Floodplain 3. Views from Public Locations	Object		Goal	Units	Usual Routine	Home - Cook	Home - Restaurant	Hawaii	Friends	Europe		
4. Views from Private Locations	1. Fam		Min	% of potential	90	15	5	20	10	30		
5. Public Rights on	2. Cos			Min	\$\$\$	500	5000	300	18000	1200	15000	
Private Land	3. Family Time		Max		days	3	1	1	10	4	7	
6. Recreation	4. Exte		Max	day/pers	12	0	0	20	20	0		
	5. Trip		Max	day	3	0	0	10	4	7		
	6. Exe	ing	Max	miles	30	40	40	25	25	25		
	7. Nev	-	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...

6. Recreation

Max

acres

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

									_		_	
TRIP PLANI CONSEQUE	rix											
Objectives Goal			Units	Usual Routin e	Home - Cook	Home - Restauran	Hawaii	Friends	Europe	Weig	<mark>ht</mark>	
1. Family D	rama	Min	% of potential	90	15	5	20	10	30			
2. Cost		Min	\$\$\$	500	5000	300	18000	1200	15000			
3. Family Ti	ime	Max	days	3	1	1	10	4	7			
4. Extended Family/Frie		Max	day/pers	12	0	0	20	20	0			
5. Trip Dura	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			RESTORAT MATRIX	ION			Alt	ternatives				
8. Carbon Footprint	Carbon		God	al Units 5-y		ar 15-year	25-year	-	Slow-Fast 15-year Slo yea		Sediment	Weight
-	1. Safety	at Dike	Mi	n wgtd a	vg.							
	2. Safety Floodpla		Mi	n # sul basir								
	3. Views Location		blic Mi	% o n visua field	al							
	4. Views Private l		s Mi	% o n visua field	al							
	5. Public	_	on Mi	# n prope	rtie							

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.

Input Predictive Data

Gather Community Attitude Data

Monitor Objectives to Track Changes

Ecological Objectives

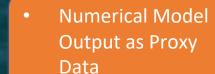
(ex: hydrology, salinity, vegetation change)



(ex: recreation, safety, public access, aesthetics)



- Numerical Model Output;
- Expert Elicitation (Web-Based Survey)





We need to gather data on community attitudes related to many of the objectives.



We need to collect monitoring data to track changes for all objectives.



How should the HRSG be involved?



How should the HRSG be involved?