



VALUING NATURE

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Managing Marine Natural Capital: Assessing the Impact of Fisheries Management on the Utility of Recreational Sea Anglers

Placement Objectives

- Assess the impact of management (catch restrictions) on the benefits of Recreational Sea Angling
- Through the design of a Stated Preference Choice Experiment (SPCE)
- Complimenting my interests:
 - Outdoor and nature based activities that promote psychological well-being
 - Valuation using stated preferences



Source: Jane Hawkey, Integration and Application Network, University of Maryland Center for Environmental Science.

Table 1: Example of a Stated Preference Choice Experiment (SPCE) design. The table shows attributes and levels for three alternative fishing trips (A, B, C) and a 'None' option.

Attribute	Level	None	A	B	C
1. Trip Duration	1/2 day, 1 day, 2 days		1/2 day	1 day	2 days
2. Trip Cost	\$10, \$20, \$30		\$10	\$20	\$30
3. Trip Location	Local, Regional, National		Local	Regional	National
4. Trip Type	Day, Weekend, Multi-day		Day	Weekend	Multi-day
5. Trip Difficulty	Easy, Moderate, Difficult		Easy	Moderate	Difficult
6. Trip Frequency	Once, Twice, Three times		Once	Twice	Three times
7. Trip Season	Spring, Summer, Fall, Winter		Spring	Summer	Fall
8. Trip Weather	Sunny, Cloudy, Rainy, Windy		Sunny	Cloudy	Rainy
9. Trip Food	None, Picnic, Dinner		None	Picnic	Dinner
10. Trip Accommodation	None, Tent, Cabin, Hotel		None	Tent	Cabin
11. Trip Transportation	None, Car, Boat, Plane		None	Car	Boat
12. Trip Safety	Low, Medium, High		Low	Medium	High
13. Trip Accessibility	None, Easy, Difficult		None	Easy	Difficult
14. Trip Wildlife	None, Low, High		None	Low	High
15. Trip Scenery	None, Low, High		None	Low	High
16. Trip Wildlife	None, Low, High		None	Low	High
17. Trip Scenery	None, Low, High		None	Low	High
18. Trip Wildlife	None, Low, High		None	Low	High
19. Trip Scenery	None, Low, High		None	Low	High
20. Trip Wildlife	None, Low, High		None	Low	High

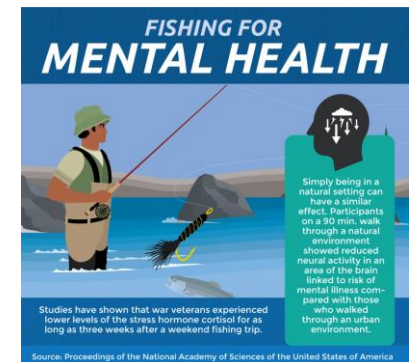




Table 1: Stated Preference Choice Experiments of Recreational Sea Anglers Preferences

Reference	Study Objective	Species Considered	Expected Catch Attributes	Management Attributes	Other Attributes	Cost Vehicle	Ranking Option	Choice pairs / U Design notes
Low & Larson (2012)	Estimate the economic benefit of fishing for different groups of anglers and for different periods characteristic of their fishing trips	(3) = = halibut, Chinook, Salmon and Coho (Each choice pair presented participants with attributes for two species)	Catch per day (halibut = 1/2/4 Co. Salmon = 2/2/4 Co. Salmon = 2/2/4) Average size of fish caught (lb) (halibut = 20/40/80 Co. Salmon = 15/25/40 7/10/12)	Daily bag (size) limit (halibut = 1/2/2 Co. Salmon = 2/2/2 Co. Salmon = 3/4/6)	Charter or Private boat (Charter/Private) Number of fishing days (1/2/3 days for South Central Alaska version; 1/2/4 days for all others)	Fishing trip cost per person including all fishing trip related costs (the number (\$US25 - \$2,000) different for each of 3 respondent types)	Which do you like best/worst	(4) Conditional Logit Number of Attributes in Choice Task = 9 Opt out = Do something other than Alaska salmon fishing
Anderson & Lee (2013)	How value of fishing is affected by changes in regulations and catch and hatchery salmon rates. Do anglers exhibit different preferences for wild and hatchery salmon, catch in excess of the bag limit	(8) = = halibut, Lingcod, Rockfish, Wild Silver Salmon, Hatchery Silver Salmon, Hatchery King Salmon, Hatchery King Salmon, Pink Salmon	Catch per day - weight per fish (variable for each species)	Legal daily limit (variable for each species)	None	¹⁰ Fishing Cost per person per day - not including transport and lodging costs (Private boat cost = 20/40/80s Charter boat cost = 85/125/175)	If your first choice was available what would be your second choice? Or the third choice? A and B would you most often use a charter or private boat? How many fishes - Da	(4) Number of Attributes in Choice Task = 3 Opt out = Do one of the following (other than B would you most often use a charter or private boat? How many fishes - Da

³⁰ Costs for both charter and private boats were presented for each scenario in a choice pair.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T										
1	MNL efficiency measures																													
2	1																													
3	0 error	0.01982																												
4	A error	0.229004																												
5	B estimate	11.28384																												
6	C estimate	1.28474																												
7																														
8	Prior	b1	b2	b3	b4	b5	b6	b7	0																					
9	P fixed priors	1	-1	1	1	1	-1	-1	0																					
10	to estimate	1.15912	1.28474	0.881964	0.870822	1.025999	0.854834	Undefined																						
11	to variance	1.802005	1.750213	2.087039	2.100404	1.950511	2.119901																							
12																														
13	Design																													
14	Choice set	id1,db1	id1,m1s	id1,c1	id1,cro	id1,ent	id1,price	id2,db1	id2,m1s	id2,c1	id2,cro	id2,ent	id2,price	Block																
15	4	0	1	15	10	3	20	9	0	10	10	1	20	1																
16	14	1	1	5	5	1	10	2	5	5	5	2	5	5	1															
17	15	3	0	10	5	2	10	0	3	15	15	1	20	1																
18	22	1	2	5	15	3	5	2	1	10	5	1	5	1																
19	5	5	3	10	20	0	5	0	2	15	10	3	10	2																
20	6	2	2	20	20	1	40	1	1	15	15	1	40	2																
21	19	3	3	20	5	2	20	0	2	5	15	3	5	2																
22	24	2	2	5	15	2	20	3	0	20	15	0	40	2																
23	1	1	1	20	20	2	40	2	2	10	20	2	20	3																
24	11	0	5	10	5	10	5	3	10	15	20	15	20	5																
25	16	2	0	20	20	0	40	3	3	1	10	3	10	3																
26	17	2	1	15	20	1	40	2	1	20	20	2	40	3																
27	3	3	1	15	15	3	5	2	1	5	20	5	20	5																
28	8	3	0	5	5	2	10	1	0	20	20	0	40	4																
29	12	3	3	5	15	3	5	0	0	20	20	0	20	2																
30	13	0	0	15	15	3	10	0	3	15	3	0	10	4																
31	2	0	1	10	20	2	5	3	0	15	10	1	5	9																
32	7	2	1	20	20	0	40	1	2	20	5	3	20	5																
33	9	1	2	10	10	1	20	2	1	20	20	1	40	5																
34	18	0	3	5	15	0	10	0	0	10	10	3	10	5																
35	10	0	3	20	5	2	20	1	1	10	2	40	6																	
36	20	1	0	15	5	1	10	0	3	5	20	2	10	6																
37	21	2	2	5	10	1	40	1	2	5	10	2	10	2																
38	13	3	3	0	10	10	3	5	3	15	5	0	5	6																
39																														
40																														
41																														
42																														
43																														

Placement Activities (continued)



Online Survey Construction



Piloting Online Survey



Collecting Feedback on Survey



Refinement of Online Survey



Fishing?

Example Choice Task:

In the following pages you will be asked to choose between pairs of sea angling trips, on examples of what is shown in the table below. The table will tell you about each trip, on example of what is shown in the table below. The table will tell you about each trip, on example of what is shown in the table below.

Hill Generation JawsLump

What trip do you like the best?

Click to choose Trip A Click to choose Trip B Click to choose Trip C

Choice Task (1 of 4)

It is possible to go on two different sea angling trips described in the table below. Imagine these are the only two trips available to you.

Please look carefully at the two trips and decide which of the two you would prefer to take. If neither trip is better to you, or you would prefer to take an alternative trip, or some of the activities related to the trips, choose Trip C. The two trips offer a range of the number of fish and other species you may catch (in addition to the number of fish and other species you would typically catch). The type of regulations in force in the area of the trip will affect the cost and other aspects of the trip.

Trip Characteristics	Trip A	Trip B	Trip C
1. Weight limit of fish (kg)	0	0	0
2. Minimum Landing Size of fish (mm)	300mm	350mm	350mm
3. Presence of other species	None	None	None
4. Increase in the Average Number of fish Caught	5	2	2
5. Increase in the Average Number of Other Species Caught	2	2	2
6. Cost of recreational sea angling (euros)	€30	€20	€20

Which trip do you like the best?

Click to choose Trip A Click to choose Trip B Click to choose Trip C

Placement Learning Experience



Source: pixabay.com

- Insight into what life is like working at an executive agency of Defra.
- Seeing valuation from a policy practitioner perspective
- The power of non-government angling associations

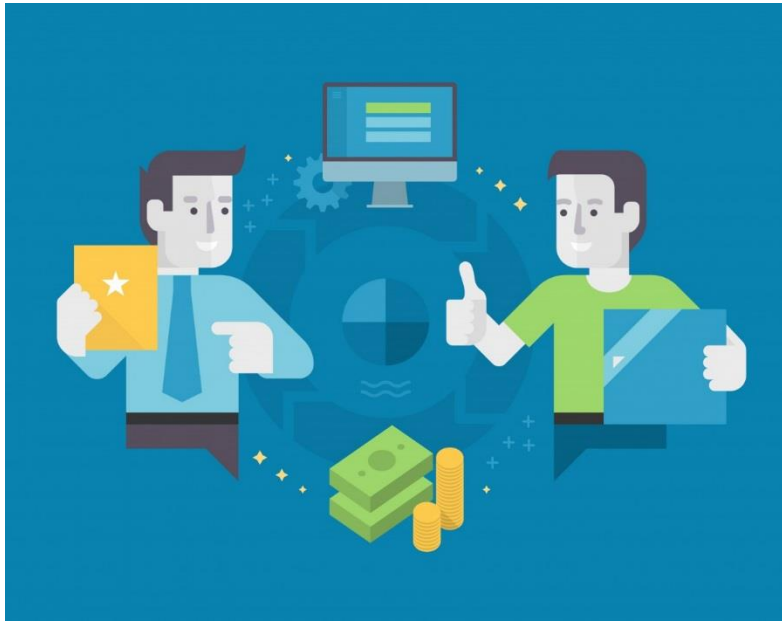
Placement Learning Experiences

- Focus on Provisioning?
- Efficacy of Stated Preference Methods?
- Choice Experiment Design
 - Selecting attributes and attribute levels
 - Finding suitable payment mechanisms
 - Experimental design
 - Making online surveys
 - Fisher Yates Shuffle



Source: pixabay.com

Challenges



- Short comings in previous research
 - Payment Mechanisms
 - Explaining to non-economists why previous research methodologies maybe insufficient
- Accessing participants
- Adaptive management!
- Bureaucratic inertia

Opportunities

- Continuation of work on choice experiments with Cefas
- Invited to present at WGRFS 2018 (working group on recreational fishing surveys)
- Discussions with international group of experts performing choice experiments in this context
- Need for SPCE online survey tools
- To explicitly incorporate the spatial nature of recreational angling opportunities

Progress on Outputs

- Literature review on the application of stated preference choice experiments for assessing management of recreational sea angling in the UK
- Recommendations for the continued use of stated preference choice experiments for recreational sea angling management
- Revised online survey



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Questions?