

APPENDIX 1

SUPPLEMENTARY MATERIALS TO: FISHING STRATEGY DIVERSIFICATION AND FISHERS' ECOLOGICAL DEPENDENCY

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Table A1.1. Data used in the compartmentalization analysis for the number of fishers in primary fishing strategies (FSx), and switching to temporary fishing strategies (sx) in 1996. For example, there are a total of 104 fishers who have FS1 as their primary strategy, and of these, 30 fishers switch to temporary strategy FS2 (s2 in the table). In the social network, links were added if at least 5% of farmers switched, and the link weights equal to the percentage of fishers that combined their primary strategy with another temporary fishing strategy. Self-loops were removed from the network. FS11 was not practiced as the primary strategy in 1996.

1996													
	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13
FS1	104	30	9	15	9	17	7	3	3	0	0	0	0
FS2	19	420	9	6	112	14	30	46	45	8	0	13	0
FS3	5	4	12	1	2	5	1	1	0	0	0	0	0
FS4	8	3	4	20	1	6	1	0	0	0	0	0	0
FS5	4	69	3	2	118	7	5	13	13	4	0	2	0

FS6	5	2	2	4	0	10	0	2	0	0	0	0	0
FS7	1	6	0	1	5	1	17	0	1	0	0	1	0
FS8	0	9	1	0	2	1	1	16	4	0	0	1	0
FS9	0	9	0	0	7	0	8	4	21	0	1	0	0
FS10	0	4	0	0	8	0	0	0	4	38	5	12	8
FS11													
FS12	0	8	0	0	15	0	2	1	1	22	3	113	6
FS13	0	0	0	0	0	0	0	0	0	18	4	6	23

Table A1.2. Data used in the compartmentalization analysis for number of fishers in primary fishing strategies (FSx) and switching to temporary fishing strategies (sx) in 2009. Self-loops were removed. See Table S1a caption for how the data was used in network construction.

2009													
	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13
FS1	37	9	0	6	5	3	0	1	0	0	0	0	0
FS2	6	168	5	5	71	6	47	28	0	9	0	1	0
FS3	3	6	13	6	6	3	3	2	0	0	0	0	0
FS4	8	6	4	16	3	2	1	2	0	0	0	0	0
FS5	3	16	3	2	41	1	1	9	0	2	0	2	0
FS6	4	7	3	3	2	9	1	0	0	0	0	0	0
FS7	0	25	1	1	9	0	38	4	1	1	0	1	0
FS8	0	7	1	0	5	0	1	7	0	0	0	0	0
FS9	1	1	0	0	1	0	1	0	2	0	0	0	0
FS10	0	1	0	0	0	0	1	0	0	11	4	5	5
FS11	0	0	0	0	0	0	0	0	0	8	13	6	1
FS12	0	1	0	0	12	0	1	0	0	1	1	55	0
s13	0	0	0	0	0	0	0	0	0	4	5	0	22

Table A2.1. Data for fishing links as catch (kilograms) per fishing event (trip) per an average fisher in each strategy in 1996. In the social-ecological network construction, a link was added from a fishing strategy to a target fish species if the average catch for a species exceeded 2% of the average total catch for that particular fishing strategy. The following abbreviations are used: FS: fishing strategy, CO: cod, HE: herring, SP: sprat; SA: salmon, FL: flounder, PL: plaice, NP: Northern pike, PP: Pikeperch, PE: perch, TU: turbot, EE: eel, WH: whitefish, TR: seatrout.

1996													
	CO	HE	SP	SA	FL	PL	NP	PP	PE	TU	EE	WH	TR
FS1	1152	11	0	1091	1	0	27	0	7	0	25	3	178
FS2	1652	2	0	0	6	0	3	0	1	4	0	2	1
FS3	4584	105	228	0	162	15	0	0	0	10	1	0	0
FS4	85	244	0	3	92	1	99	6	64	11	917	44	5
FS5	1373	5	0	1	38	1	1	1	3	3	1	2	1
FS6	15	2	0	1	11	1	196	744	209	2	10	387	16
FS7	2	0	0	0	20	0	100	33	410	1	10	35	3
FS8	1374	2241	0	0	10	0	4	6	8	2	6	0	0
FS9	119	17796	1608	0	0	0	0	0	2	0	1	1	0
FS10	19	117245	179261	0	0	0	0	0	0	0	0	0	0
FS11	20	2226	15866	1	0	0	0	0	0	0	1	0	0
FS12	17	1	0	766	0	0	0	0	0	3	0	1	121
FS13	21	0	0	0	5	1	1	1	0	448	0	0	3

Table A2.2. Data for fishing links as catch (kilograms) per fishing event (trip) per an average fisher in each strategy in 2009 See Table S2a caption for how the data was used in network construction. The following abbreviations are used: FS: fishing strategy, CO: cod, HE: herring, SP: sprat; SA: salmon, FL: flounder, PL: plaice, PI: Northern pike, PP: Pikeperch, PE: perch, TU: turbot, WH: whitefish, TR: seatrout.

2009													
	CO	HE	SP	SA	FL	PL	NP	PP	PE	TU	EE	WH	TR

FS1	626	0	0	62	0	0	0	0	0	0	1	0	2
FS2	588	1	0	0	7	7	1	0	0	1	0	2	0
FS3	4670	144	60	0	24	45	0	0	0	4	0	0	0
FS4	139	20	0	4	33	0	13	6	8	3	196	35	20
FS5	317	0	0	0	56	13	0	0	1	2	0	1	1
FS6	21	0	0	1	9	0	136	187	100	0	3	192	2
FS7	0	1	0	0	37	0	16	2	254	0	0	31	1
FS8	695	3024	0	0	43	4	9	0	8	5	0	2	0
FS9	108	14608	1880	3	0	0	1	0	0	0	0	0	0
FS10	169	95804	171413	1	0	0	0	0	0	0	0	0	0
FS11	29	5041	9225	0	0	0	0	0	0	0	0	0	0
FS12	57	0	0	1483	0	0	1	0	0	0	0	0	15
FS13	13	0	0	0	1	1	0	0	0	91	0	0	0

Table A3. Ecological network used in the social-ecological analysis. Predator species are placed in rows and prey species in columns.

	Seatrout	Turbot	Pikeperch	Northern pike	Perch	Whitefish	Eel	Cod	Sprat	Herring	Salmon	Flounder
Seatrout												
Turbot												
Pikeperch	1			1	1	1			1	1	1	1
Northern pike	1	1	1	1		1			1	1	1	1
Perch	1		1	1	1	1			1	1	1	1
Whitefish												
Eel												
Cod		1			1			1	1	1		1
Sprat												
Herring										1		
Salmon									1	1		
Flounder												

Table A4. Compartmentalization sensitivity analysis for link thresholds (TH) 2%, 5% and 10% in compartmentalization analysis. In the sensitivity analysis, links below each threshold were removed from the social networks, and the table presents compartmentalization results for the resulting 2%, 5% and 10% threshold networks. The table presents the number of compartments (N) for each network, and fishing strategy (FS) memberships in each compartment.

Network	N	Compartment 1	Compartment 2	Compartment 3	Compartment 4
1996 TH2	3	FS1, FS3, FS4, FS6	FS2, FS5, FS7, FS8, FS9	FS10, FS11, FS12, FS13	
1996 TH5	3	FS1, FS3, FS4, FS6	FS2, FS5, FS7, FS8, FS9	FS10, FS11, FS12, FS13	
1996 TS10	4	FS1, FS3, FS4, FS6	FS2, FS8, FS9	FS7	FS5, FS10, FS11, FS12, FS13
2009 TS2	2	FS1, FS2, FS3, FS4, FS5, FS6, FS7, FS8, FS9	FS10, FS11, FS12, FS13		
2009 TS5	2	FS1, FS2, FS3, FS4, FS5, FS6, FS7, FS8, FS9	FS10, FS11, FS12, FS13		
2009 TS10	2	FS1, FS2, FS3, FS4, FS5, FS6, FS7, FS8, FS9	FS10, FS11, FS12, FS13		

Table A5. Motif sensitivity analysis

Motif sensitivity analysis for link thresholds (TH) 2%, 5% and 10%. In the sensitivity analysis, links below each threshold were removed from the social-ecological networks, and the table presents motif results for the resulting 2%, 5% and 10% threshold networks.

Motif	Empirical	Random count (mean)	Standard deviation	T-ratio
1996 Threshold 5%				
T1	8	3.770000	1.716556	2.464236 *
T2	1	3.070000	1.615925	1.281000
T3	73	82.980000	6.628649	1.505586
S1	13	15.330000	5.745538	0.405532
S2	29	13.530000	4.361111	3.547261 ** (+)
S3	16	19.640000	5.584104	0.651850 "
1996 Threshold 10%				
T1	6	2.040000	1.549976	2.554879 * (+)
T2	2	3.020000	1.537281	0.663509
T3	48	51.080000	4.730473	0.651098
S1	7	8.290000	3.266899	0.394870
S2	25	13.370000	4.210749	2.761979 * (+)
S3	9	10.780000	3.249180	0.547831
2009 Threshold 5%				
T1	1	1.300000	0.948151	0.316405

T2	1	1.350000	0.967920	0.361600
T3	39	49.200000	4.447221	2.293567 * (-)
S1	2	6.860000	2.916411	1.666432
S2	3	6.790000	2.879026	2.156980 * (+)
S3	16	6.960000	2.673930	0.359022
2009 Threshold 5%				
T1	1	0.960000	0.952615	0.041990
T2	0	1.160000	1.143449	1.014475
T3	31	40.010000	3.988608	2.258934 * (-)
S1	0	4.520000	2.226924	2.029705 * (-)
S2	13	6.130000	2.852095	2.408756 * (+)
S3	4	4.920000	2.588553	0.355411

Table A6. Potential changes in the relative pressure on fish species as change between the years 1996 and 2009 in percentage points. The numbers are calculated for an average fisher per fishing strategy. Green colour is used to mark the increase in fishing pressure from 1996 to 2009, and yellow marks decrease. This table is based on the data same data as Tables S1a and S1b. The table aids to comprehend differences in Figure S1 link weights.

	CO	HE	SP	SA	FL	PL	NP	PP	PE	TU	EE	WH	TR
FS1	44	0	0	-35	0	0	-1	0	0	0	-1	0	-7
FS2	-2	0	0	0	1	1	0	0	0	0	0	0	0
FS3	5	1	-3	0	-3	1	0	0	0	0	0	0	0
FS4	24	-11	0	1	1	0	-4	1	-2	0	-17	5	4
FS5	-15	0	0	0	12	3	0	0	0	0	0	0	0
FS6	2	0	0	0	1	0	9	-18	2	0	0	5	-1
FS7	0	0	0	0	8	0	-12	-5	7	0	-2	3	0
FS8	-19	18	0	0	1	0	0	0	0	0	0	0	0
FS9	0	-3	3	0	0	0	0	0	0	0	0	0	0
FS10	0	-4	4	0	0	0	0	0	0	0	0	0	0
FS11	0	23	-23	0	0	0	0	0	0	0	0	0	0
FS12	2	0	0	11	0	0	0	0	0	0	0	0	-12
FS13	8	0	0	0	0	1	0	0	0	-7	0	0	-1

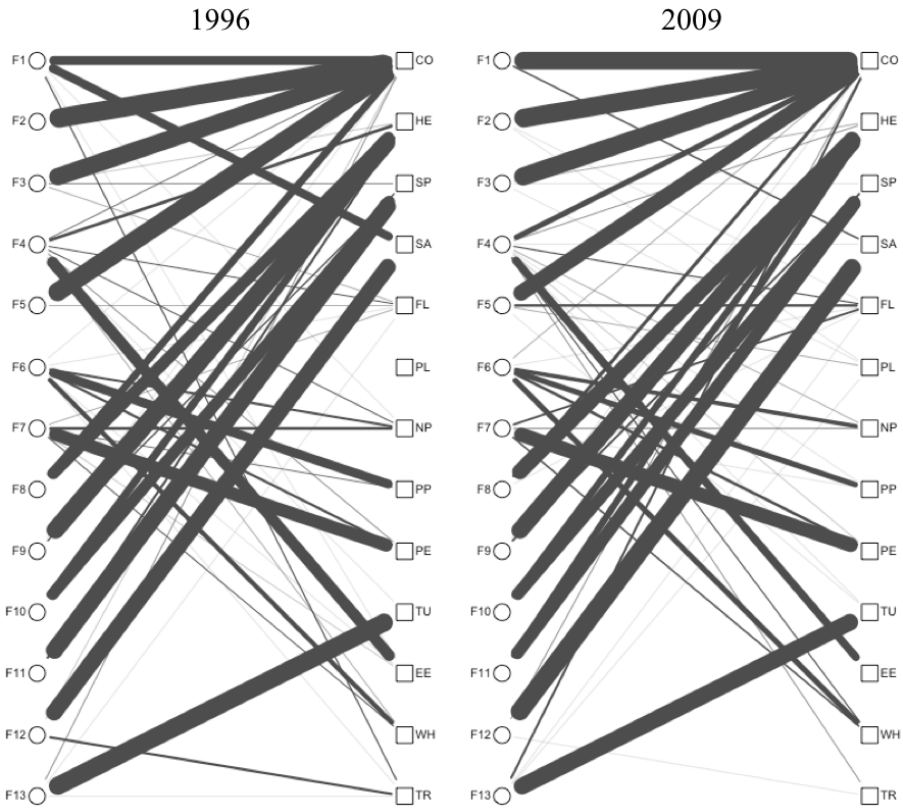


Figure A1. The relative fishing pressure on fish species. The width of the links from each fishing strategy (Fx) indicate the percentage of catch per species for an average fisher in that strategy (raw data presented in Tables S1a and S1b). The following abbreviations are used: FS: fishing strategy, CO: cod, HE: herring, SP: sprat; SA: salmon, FL: flounder, PL: plaice, NP: Northern pike, PP: Pikeperch, PE: perch, TU: turbot, EE: eel, WH: whitefish, TR: seatrout.