The following supplement accompanies the article

Long-term decrease in sex-specific natural mortality of European lobster within a marine protected area

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Catch-per-unit-effort calculations

Catch-per-unit-effort (CPUE) during 1994 to 1999 (fyke nets) was calculated as lobsters per fyke net per day. CPUE for lobster traps (used during 1999 to 2007, see Table S1) is dependent on the number of days the trap has fished (soak time) as catch rate decreases with soak time (Miller 1990). Catch saturation in a lobster trap is dependent on the amount of bait left and a density interaction between lobsters. The CPUE dependence on soak time (st) in the Kåvra marine protected area during 1999 to 2007 (Fig. S1) can be described by the following equation:

$$CPUE_{st} = 1.29 \times (st)^{-0.77},\ r^2 = 0.54 \quad \text{(S1)}$$

Mean soak time per trap haul during 1999 to 2007 (n = 181) was 7.5 d ± 4.2 SD (range 1 to 34 d), and CPUE on each trap haul was standardised to the corresponding CPUE as if each trap had a soak time of 7.5 d. The standardised CPUE was thus estimated from:

$$\text{Standardised CPUE} = \text{Observed CPUE} / (CPUE_{st}/CPUE_{7.5d}) \quad \text{(S2)}$$

Average CPUE in 1999 to 2007 was calculated as the mean of the standardised CPUE for each trap haul in a year. To plot and analyse CPUE for the 2 gear types and periods together, we multiplied mean fyke net CPUE by a factor of 2.1 for the years 1994 to 1998, corresponding to the difference between mean lobster trap and fyke net CPUE in 1999 when both gear types were used.

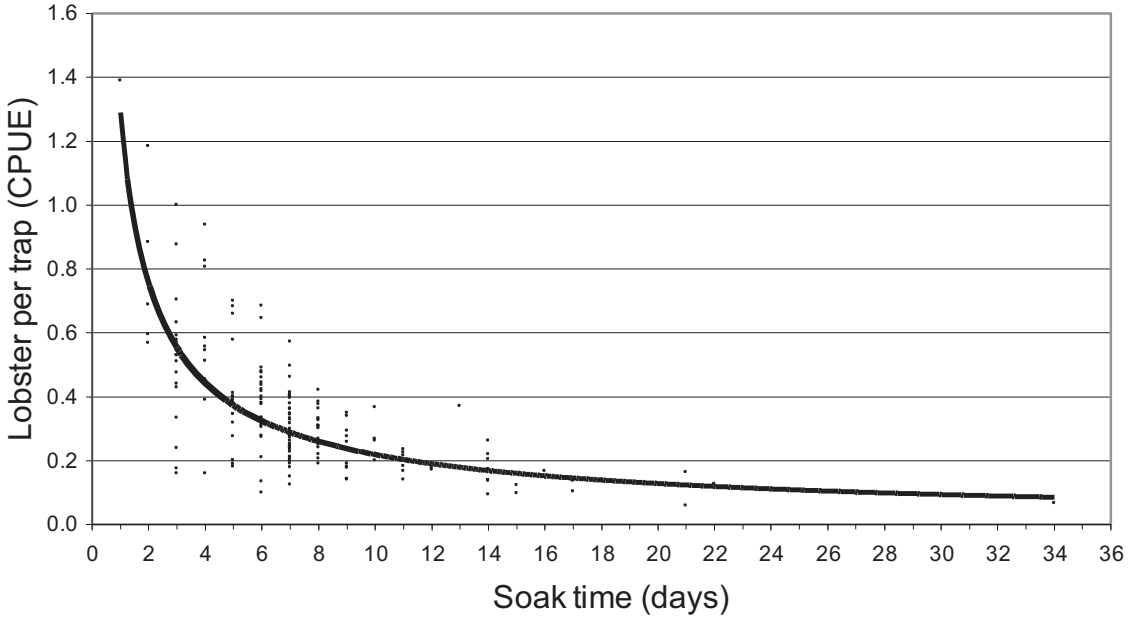

Fig. S1. Catch-per-unit-effort (CPUE) dependence on soak time (elapsed time in days between deployment and hauling) for lobster traps hauled in the Kåvra marine protected area (MPA) during 1999 to 2007 (Eq. S1). The sampling gear used in the Kåvra MPA shifted from shellfish fyke nets to lobster traps during 1999 (see Table S1). The mean number of traps hauled during each trap haul (1999 to 2007) was 16.7 ± 4.8 SD (range 3 to 25, n = 181)

Table S1. Sampling effort: total number of baited shellfish fyke nets and standard lobster traps hauled in the Kåvra marine protected area during 1994 to 2007

Year	No. of fyke nets hauled	No. of traps hauled
1994	450	-
1995	550	-
1996	390	-
1997	580	-
1998	500	-
1999	230	503
2000	-	628
2001	-	333
2002	-	334
2003	-	303
2004	-	233
2005	-	171
2006	-	148
2007	-	265

Summary of captures and releases

Table S2. Reduced m-array for male and female lobsters captured and released in the Kåvra marine protected area throughout the study period. R(i) is the number released in each year (i) including individuals marked in previous years, m(i,j) is the number recaptured in subsequent years (j), and r(i) is the total number recaptured

Male captures and releases															
i	R(i)	m(i,j)													r(i)
	j =	95	96	97	98	99	00	01	02	03	04	05	06	07	
94	177	42	10	4	3	2	1	1	1	0	1	0	0	0	65
95	188		49	20	1	5	0	1	0	0	0	1	0	0	77
96	123			33	6	2	0	3	1	0	0	1	0	0	46
97	193				50	36	6	4	0	1	1	0	0	0	98
98	196					87	18	2	2	1	0	0	0	0	110
99	326						136	16	7	1	0	5	0	0	165
00	250							84	20	7	2	0	0	1	114
01	167								60	15	1	2	0	0	80
02	175									76	14	4	0	1	95
03	220										62	23	11	3	99
04	152											48	18	5	71
05	178												65	10	75
06	200													52	52
Female captures and releases															
i	R(i)	m(i,j)													r(i)
	j =	95	96	97	98	99	00	01	02	03	04	05	06	07	
94	160	49	7	6	2	6	1	0	0	0	0	0	0	0	71
95	215		44	12	6	4	3	2	0	1	0	0	0	0	72
96	151			41	16	9	2	1	2	0	2	0	1	0	74
97	205				49	36	11	1	1	2	1	0	1	0	102
98	211					81	21	9	4	1	1	1	0	0	118
99	414						154	30	17	8	1	4	1	1	216
00	355							105	34	16	9	3	6	1	174
01	221								68	27	7	7	2	2	113
02	228									85	26	13	7	1	132
03	255										57	30	22	8	117
04	176											32	20	6	58
05	173												46	20	66
06	208													38	38

LITERATURE CITED

Miller RJ (1990) Effectiveness of crab and lobster traps. Can J Fish Aquat Sci 47:1228–1251