

Supporting Information. M. Hidalgo, V. Rossi, P. Monroy, E. Ser-Giacomi, E. Hernández-García, B. Guijarro, E. Massutí, F. Alemany, A. Jadaud, J.L. Perez, and P. Reglero. 2019. Accounting for ocean connectivity and hydroclimate variability in fish recruitment fluctuations within large transboundary metapopulations. *Ecological Applications*.

Appendix S3: Statistical analyses of recruitment time-series of the three management areas.

Appendix S3 - Figures

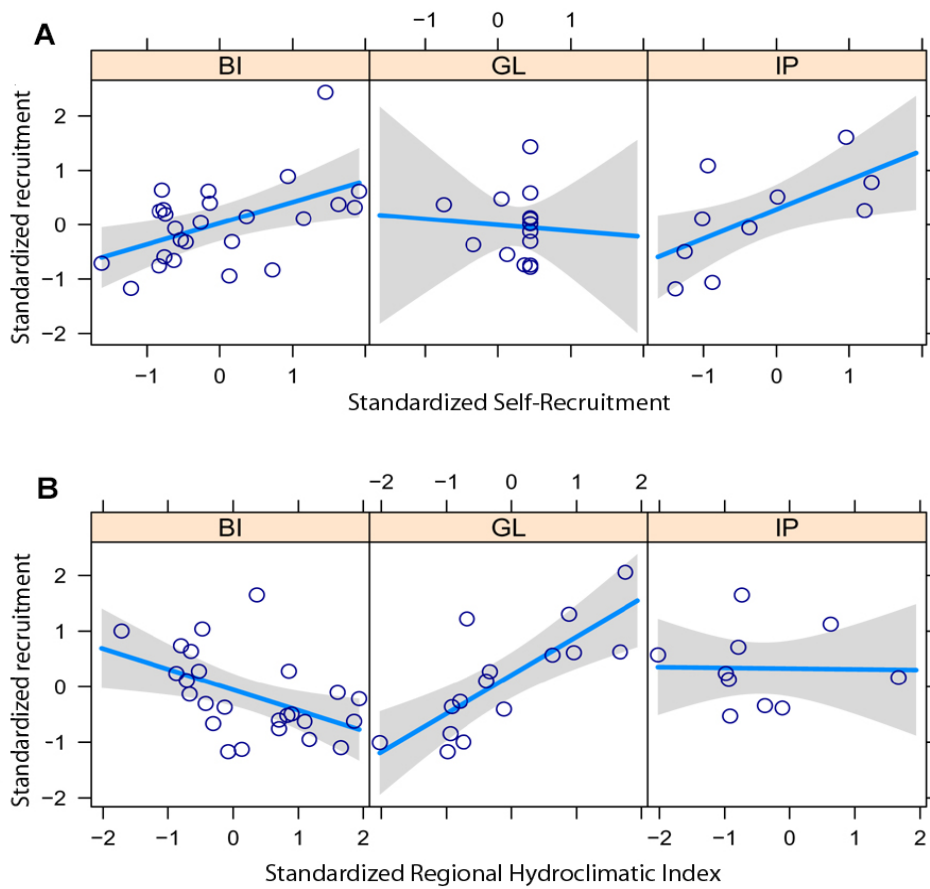


Figure S1. Partial effects of the global linear model of fish recruitment constructed for the whole metapopulation with all variables standardized to statistically compared the strength of Self-Recruitment (SR, A) and the Regional Hydroclimatic Index (RHI, B) on the fisheries recruitment estimates for each management area. Partial effects for Balearic Islands (BI), Gulf of Lion (GL) and the Iberian Peninsula (IP) appear in the left, center and right sides respectively. Blue dots represent the partial residuals and the gray shadows the 95% confidence intervals.

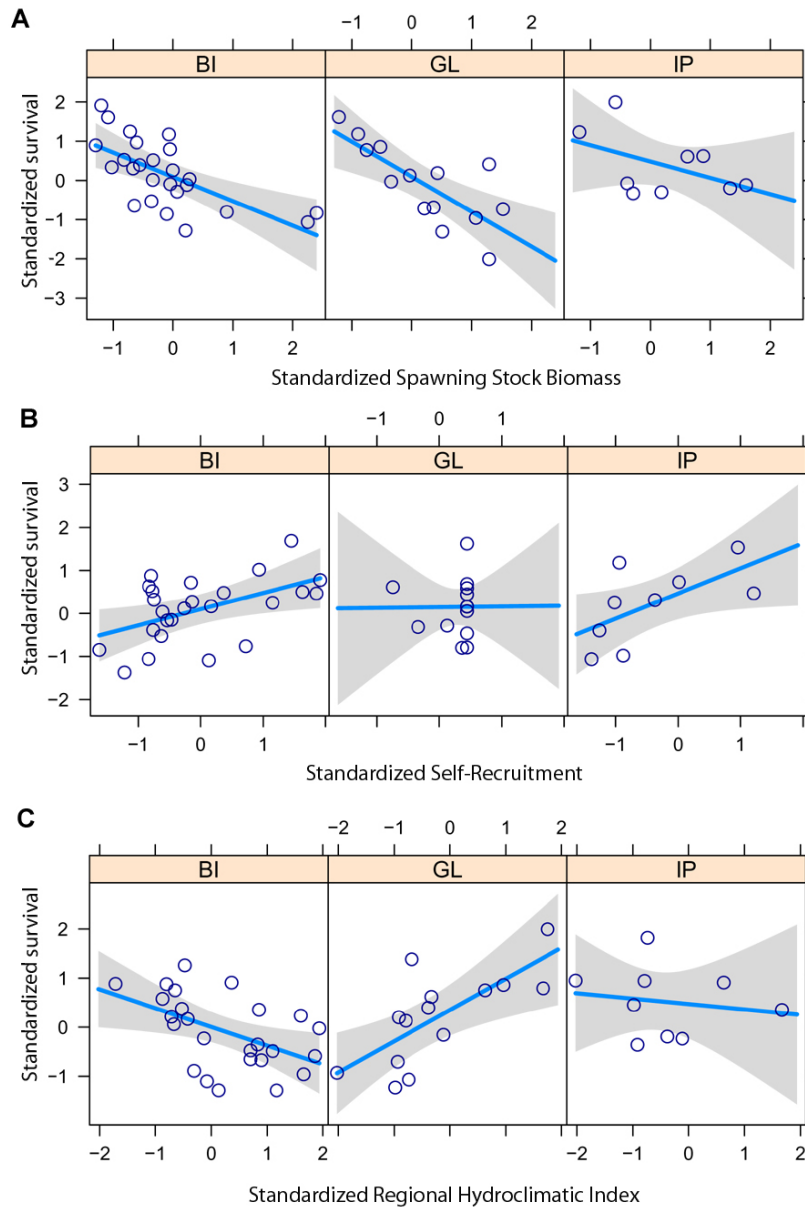


Figure S2. Partial effects of the global linear model on fish survival constructed for the whole metapopulation with all variables standardized to statistically compared the strength of the effects of spawning stock biomass (SSB, A), Self-Recruitment (SR, B) and Regional Hydroclimatic Index (RHI, C) on survival for each management area. Partial effects for Balearic Islands (BI), Gulf of Lion (GL) and the Iberian Peninsula (IP) appear in the left, center and right sides respectively. Blue dots represent the partial residuals and the gray shadows the 95% confidence intervals.

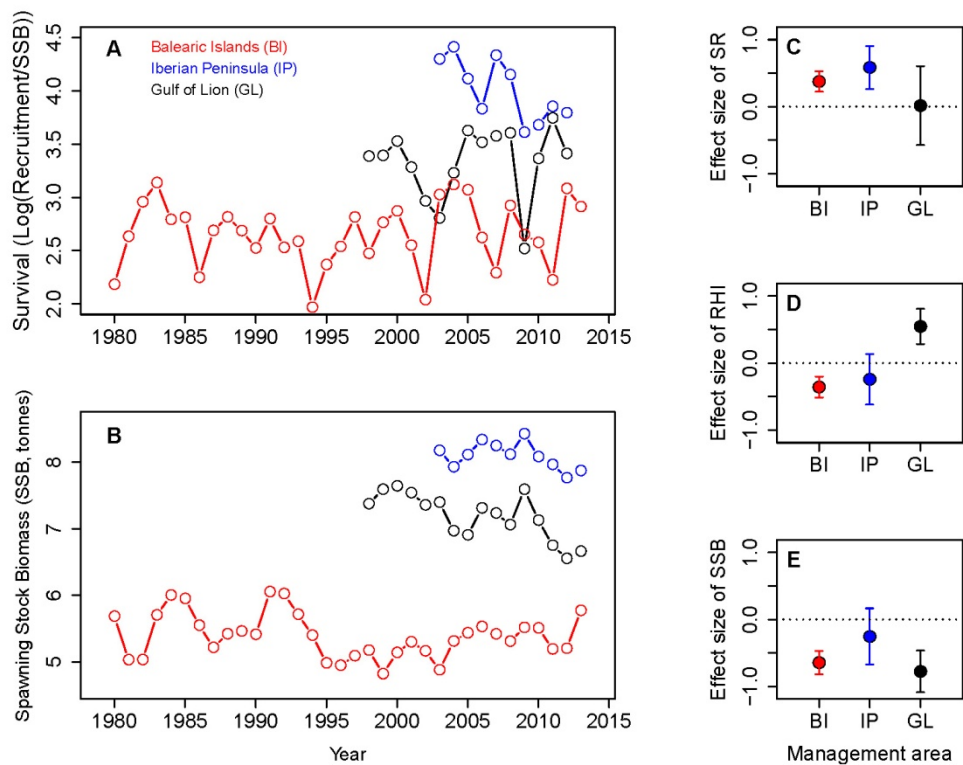


Figure S3. (A) Annual survival and (B) spawning stock biomass (SSB) for the three management areas (Balearic Islands, BA; Iberian Peninsula, IP; Gulf of Lion, GL). With the covariates of the best survival models (Appendix S2: Table S1), a global linear model was constructed for the whole metapopulation with all variables standardized to statistically compare the strength of the effect of Self-Recruitment (SR), the Regional Hydroclimatic Index (RHI) and spawning stock biomass (SSB) on survival for each management area (Appendix C: Fig. C2). The effect size (i.e. linear model estimates) is presented for SR (B), the RHI (C) and SSB (D): no overlapping of vertical bars (standard errors of the model estimates) with zero horizontal lines reveals statistical significance of the effect.

Appendix S3 - Tables

Table S1. Best four linear models for survival obtained for each management area. Covariates included are the Spawning Stock Biomass (SSB), Regional Hydroclimatic Index (RHI), Self-Recruitment (SR), Import (Imp) and Local Retention (LR). In the case of the Gulf of Lion and Iberian Peninsula, less than four models had significant covariates. Note that connectivity metrics were calculated at two geographical levels: management area and subpopulations (see *Materials and Methods*). CC, VG and NBI refer, respectively, to Catalan coast, Valencia gulf and Northern Balearic Islands subpopulations. GL, IP and BI refer, respectively, to Gulf of Lion, Iberian Peninsula and Balearic Islands management units. Akaike Information Criteria (AIC), delta AIC and Deviance Explained (DE, %) are also presented. Models for the Iberian Peninsula are presented attending to two different spawning stock biomass (SSB) estimates, one including only SSB of the IP and other combining SSB of IP and GL.

Management area	Covariates	AIC	Delta AIC	DE (%)
Balearic Islands	SSB	48.98	25.51	19.86
	SSB+RHI + SR_{BI}	23.47	0	49.21
	SSB+RHI + SR _{NBI}	27.26	3.79	40.89
	SSB+RHI + LR _{BI}	27.91	4.44	39.65
	SSB+RHI + LR _{NBI}	28.82	5.35	37.09
Iberian peninsula SSB= SSB-IP	SSB ^{ns}	9.74	6.02	2.3
	Imp_{CC}	3.76	0	41.6
	Imp _{VG}	5.53	1.77	25.4
Iberian peninsula SSB= SSB-IP+SSB-GL	SSB ^{ns}	7.3	3.15	4.25
	SR_{CC}	4.25	0	30.7
	SR _{IP}	5.28	1.03	20.8
	SR _{VG}	5.33	1.08	20.3
Gulf of Lion	SSB ^{ns}	11.28	5.41	13.98
	SSB + RHI	5.87	0	43.1