The following supplements accompany the article

Selective exploitation of spatially structured coastal fish populations by recreational anglers may lead to evolutionary downsizing of adults

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Supplement 1. Prior distributions

Supplement 2. Testing the feasibility of the Bayesian approach

Supplement 1. Prior distributions

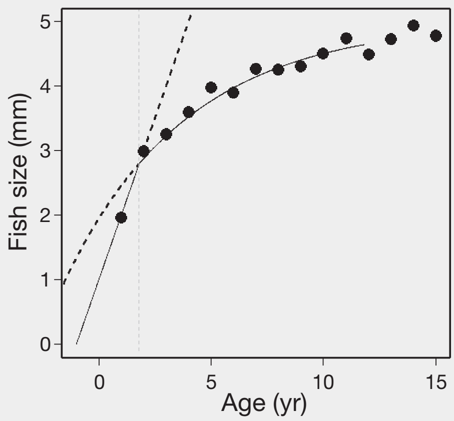
Table S1. Prior distributions for individuals (*i*) and groups (*j*) applied for Bayesian estimation of the individuals' life-history traits using the mechanistic growth model developed by Lester et al. (2004). Normally distributed priors are denoted as *dnorm* (mean and variance), uniformly distributed priors as *dunif* (minimum and maximum value) and gamma distributed priors as *dgamma* (shape and scale). The life-history traits and growth parameters considered in the approach were the annual reproduction investment (g in yr^{-1}), the growth rate (k in yr^{-1}), maximum theoretical length (L_∞ in mm), age of onset of maturation (T in yr), immature growth rate (h in mm yr^{-1}), the theoretical age 0 of the von Bertalanffy growth equation (t_0 in yr) and the theoretical age of transition between different juvenile growth rates (t_1 in yr) (Lester et al. 2004)

Priors for individuals for (*i* in *1 : n fish)*	
T[i]	dnorm(m*T*[group[*j*]],1/sqrt(taut))
k[i]	dnorm(m*k*[group[*j*]],1/sqrt(tau*k*))
L_∞ *[i]*	dnorm(mL_∞[group[*j*]],1/sqrt(tauL_∞))
t_0*[i]*	dnorm(mt_0[group[*j*]],1/sqrt(taut_0))
g[i]	3*(exp(*k*[*i*]) - 1)
h[i]	L_∞[*i*]*(exp(*k*[*i*]) - 1)
t_1*[i]*	*T*[*i*] - (1 - exp(-*k*[*i*]*(*T*[*i*] - t_0[*i*])))/(exp(*k*[*i*]) - 1)
Prior for groups (sampling method or population) for(*j* in *1 : n groups*)	
m*T[j]*	dnorm(2,1/sqrt(0.5))
m*k[j]*	dunif(0,1)
mL_∞ *[j]*	dnorm(5, 1/sqrt(0.001))
mt_0*[j]*	dunif(-2,1)
m*g[j]*	3*(exp(m*k*[*j*]) - 1)
m*h[j]*	mL_∞[*j*]*(exp(m*k*[*j*]) - 1)
mt_1*[j]*	m*T*[*j*] - (1 - exp(-m*k*[*j*]*(m*T*[*j*] - mt_0[*j*])))/(exp(m*k*[*j*]) - 1)
Prior for variances	
tau	dgamma (0.001, 0.001)
tau*T*	dgamma (0.001, 0.001)
tau*k*	dgamma (0.001, 0.001)
tauL_∞	dgamma (0.001, 0.001)
taut_0	dgamma (0.001, 0.001)

Supplement 2.

The feasibility of the Bayesian approach estimating individual values of life-history traits was tested via computer simulation. We generated simulated data (length-at-age data) for one individual with known life-history traits (L_∞, g, T and h). A Gaussian error representing a reasonable otolith reading error was included in the simulated data using a distribution with a mean = 0 and standard deviation = 0.1 (Fig. S1). Then the individual values of life history traits were estimated using the model parameterization described in 'Materials and methods: estimation of individual life-history traits on *Serranus scriba*' of the main article. The distributions of the Bayesian means that were estimated were also compared with the true values as shown in Table S2.

Fig. S1. Individual trajectory of one individual growing following the somatic growth derived by Lester el al. (2004) (solid line). Grey dashed vertical line shows the timing of maturation (in this case T = 1.8). Dashed black lines after maturation (T) is the projection considering immature lineal growth, while the projection backwards of T is the theoretical vo Bertalanffy growth curve when exclusively fitted to the mature fish length-at-age data. Solid circle are the back-calculated length-at-age data at otolith scale (mm).



Results

The simulation exercise demonstrated the feasibility of the Bayesian estimating framework to derive individual life-history traits L_∞, g, h and T from length-at-age data (Table S2). Values estimated through Monte Carlo Markov Chains (MCMC) from the simulated individual growth curve were very close to the true values (Table S2). Credibility intervals were relatively small and unbiased for all the parameters (Table S2).

Table S2. True and estimated life-history values obtained in the simulation exercise to check the performance of the Bayesian estimation framework (Fig. S2). Estimated values are the Bayesian mean and standard deviation as well as Bayesian credibility intervals

True values		Estimated values (using MCMC methods)				
Parameter				Bayesian credibility intervals		
	value	Mean	SD	2.5%	Median	97.5%
L_∞	5	5.01	0.09	4.82	5.01	5.19
T	1.8	1.79	0.20	1.35	1.81	2.14
g	0.6	0.62	0.06	0.53	0.61	0.77
h	1	1.04	0.09	0.92	1.02	1.26