

ASA Results

Parameter estimates

Parameter	Estimate	SE
dummy	0.0000	NA
fsh_sel50	3.7569	NaN
fsh_sel50	3.5953	NaN
fsh_sel95	5.7843	NaN
fsh_sel95	5.3359	NaN
srv_sel50	3.8894	NaN
srv_sel50	2.7283	NaN
srv_sel95	4.9997	NaN
srv_sel95	5.0000	NaN
fsh_logq	-6.1794	NaN
srv1_logq	-5.1387	NaN
srv2_logq	-4.6148	NaN
mr_logq	0.0133	NaN
log_rbar	-1.3033	NaN
log_rec_devs	16.0626	NaN
log_rec_devs	16.0806	NaN
log_rec_devs	16.1002	NaN
log_rec_devs	16.1225	NaN
log_rec_devs	16.1481	NaN
log_rec_devs	16.1774	NaN
log_rec_devs	16.2105	NaN
log_rec_devs	16.2483	NaN
log_rec_devs	16.2911	NaN
log_rec_devs	16.3401	NaN
log_rec_devs	16.3966	NaN
log_rec_devs	16.4616	NaN
log_rec_devs	16.5360	NaN
log_rec_devs	16.6214	NaN
log_rec_devs	16.7171	NaN
log_rec_devs	17.0486	NaN
log_rec_devs	16.7214	NaN
log_rec_devs	16.2588	NaN
log_rec_devs	16.7113	NaN
log_rec_devs	16.5638	NaN
log_rec_devs	16.5609	NaN
log_rec_devs	16.8774	NaN
log_rec_devs	16.4267	NaN
log_rec_devs	16.3708	NaN
log_rec_devs	16.2590	NaN
log_rec_devs	16.4822	NaN
log_rec_devs	16.5120	NaN
log_rec_devs	16.3329	NaN
log_rec_devs	16.4506	NaN
log_rec_devs	16.5820	NaN
log_rec_devs	16.4629	NaN

(continued)

Parameter	Estimate	SE
log_rec_devs	16.6578	NaN
log_rec_devs	16.5839	NaN
log_rec_devs	16.6087	NaN
log_rec_devs	16.5825	NaN
log_rec_devs	16.8330	NaN
log_rec_devs	16.9024	NaN
log_rec_devs	16.9586	NaN
log_rec_devs	17.0228	NaN
log_rec_devs	16.6663	NaN
log_rec_devs	16.7595	NaN
log_rec_devs	16.7223	NaN
log_rec_devs	16.5005	NaN
log_rec_devs	16.3087	NaN
log_rec_devs	16.1577	NaN
log_rec_devs	16.0016	NaN
log_rec_devs	15.9460	NaN
log_rec_devs	15.8280	NaN
log_rec_devs	15.6837	NaN
log_rec_devs	15.6410	NaN
log_rec_devs	15.7563	NaN
log_rec_devs	15.6904	NaN
log_rec_devs	15.7617	NaN
log_rec_devs	15.8909	NaN
log_rec_devs	16.2300	NaN
log_rec_devs	16.2110	NaN
log_rec_devs	16.5656	NaN
log_rec_devs	16.5971	NaN
log_rec_devs	16.5329	NaN
log_rec_devs	16.5965	NaN
log_rec_devs	16.3193	NaN
log_rec_devs	16.0820	NaN
log_rec_devs	15.9535	NaN
log_rec_devs	15.7611	NaN
log_rec_devs	15.8083	NaN
log_rec_devs	15.7451	NaN
log_rec_devs	15.6314	NaN
log_rec_devs	15.8672	NaN
log_rec_devs	15.9538	NaN
log_rec_devs	15.8561	NaN
log_rec_devs	15.5461	NaN
log_rec_devs	15.5539	NaN
log_rec_devs	15.8062	NaN
log_rec_devs	16.7415	NaN
log_rec_devs	17.7518	NaN
log_rec_devs	18.2543	NaN
log_rec_devs	17.4945	NaN
log_sigma_r	1.7293	NaN
log_Fbar	-3.0859	NaN
log_F_devs	-3.2729	NaN
log_F_devs	-4.2997	NaN

(continued)

Parameter	Estimate	SE
log_F_devs	-3.7573	NaN
log_F_devs	-3.8509	NaN
log_F_devs	-3.1672	NaN
log_F_devs	-1.3036	NaN
log_F_devs	-1.0012	NaN
log_F_devs	-1.0402	NaN
log_F_devs	-0.9398	NaN
log_F_devs	-1.0167	NaN
log_F_devs	-1.0999	NaN
log_F_devs	-0.8819	NaN
log_F_devs	-0.7487	NaN
log_F_devs	-0.3896	NaN
log_F_devs	-0.5271	NaN
log_F_devs	-0.5022	NaN
log_F_devs	-0.4322	NaN
log_F_devs	-0.2981	NaN
log_F_devs	-0.2798	NaN
log_F_devs	-0.7035	NaN
log_F_devs	-0.6892	NaN
log_F_devs	-1.0297	NaN
log_F_devs	-1.1193	NaN
log_F_devs	-1.1438	NaN
log_F_devs	-1.0876	NaN
log_F_devs	-1.1933	NaN
log_F_devs	-1.2084	NaN
log_F_devs	-1.4723	NaN
log_F_devs	-1.4412	NaN
log_F_devs	-1.7284	NaN
log_F_devs	-1.7592	NaN
log_F_devs	-1.9124	NaN
log_F_devs	-1.7673	NaN
log_F_devs	-1.7746	NaN
log_F_devs	-1.9670	NaN
log_F_devs	-1.9440	NaN
log_F_devs	-2.0911	NaN
log_F_devs	-1.9822	NaN
spr_Fxx	0.1280	NaN
spr_Fxx	0.1050	NaN
spr_Fxx	0.0710	NaN

Catchability

Estimates on natural scale

Fishery q: 0.0021

Survey (1-hr soak) q: 0.0059

Survey (3+hr soak) q: 0.0099

Mark-recapture q: 1.0133

Likelihood components

Catchability priors: 0.2653, 1.5647, 2.6288, 0.8793

Catch: 5.2118

Abundance indices (fsh, srv1, srv2, mr): 30.7848, 8.3705, 19.5606, 0.9246

Age comp 2690.8811, 3415.762

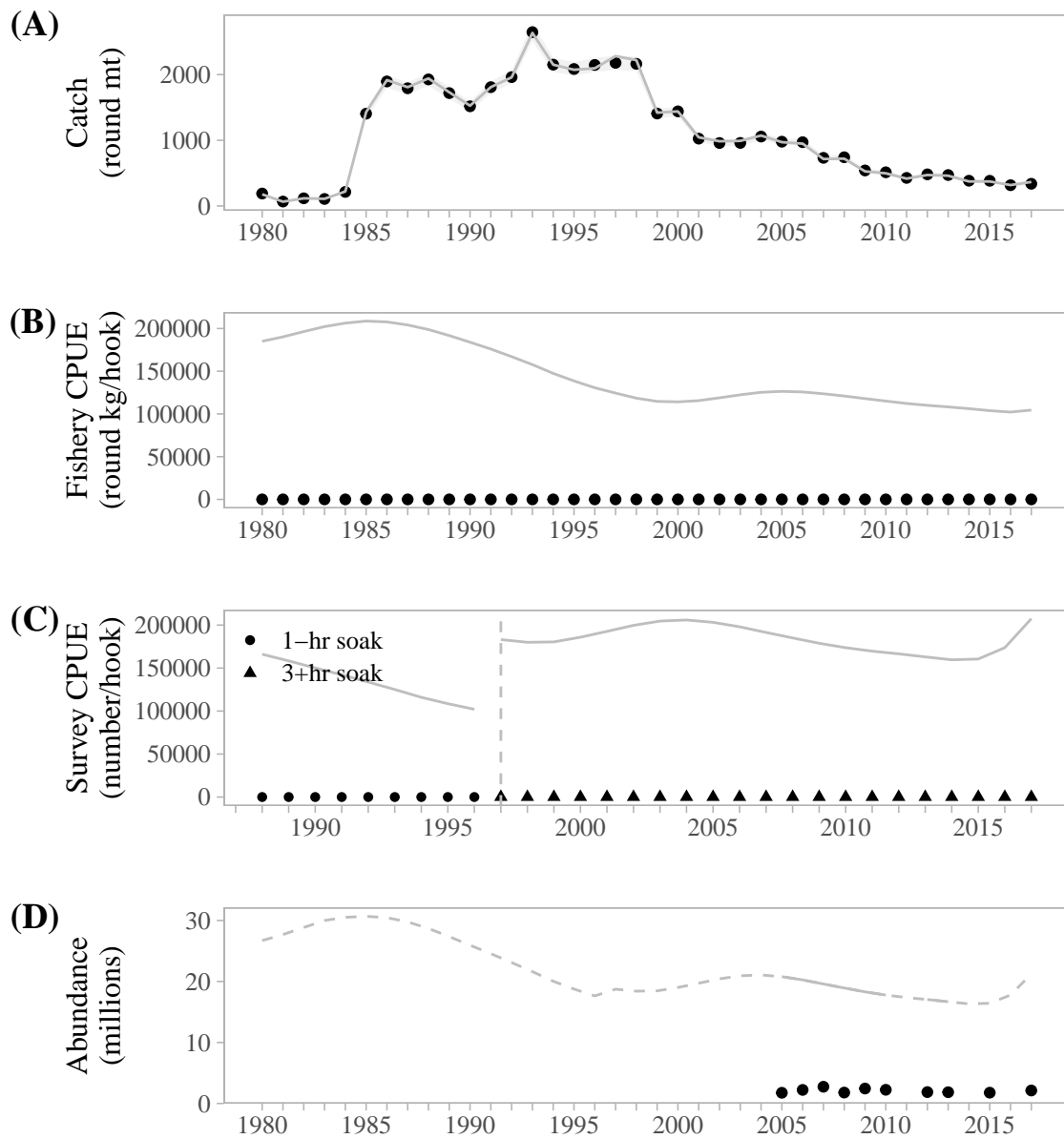
Multinomial offsets 2.8754, 33.992

Penalty on fishing mortality deviations: 12.2327

Penalty on recruitment deviations: -132.6085

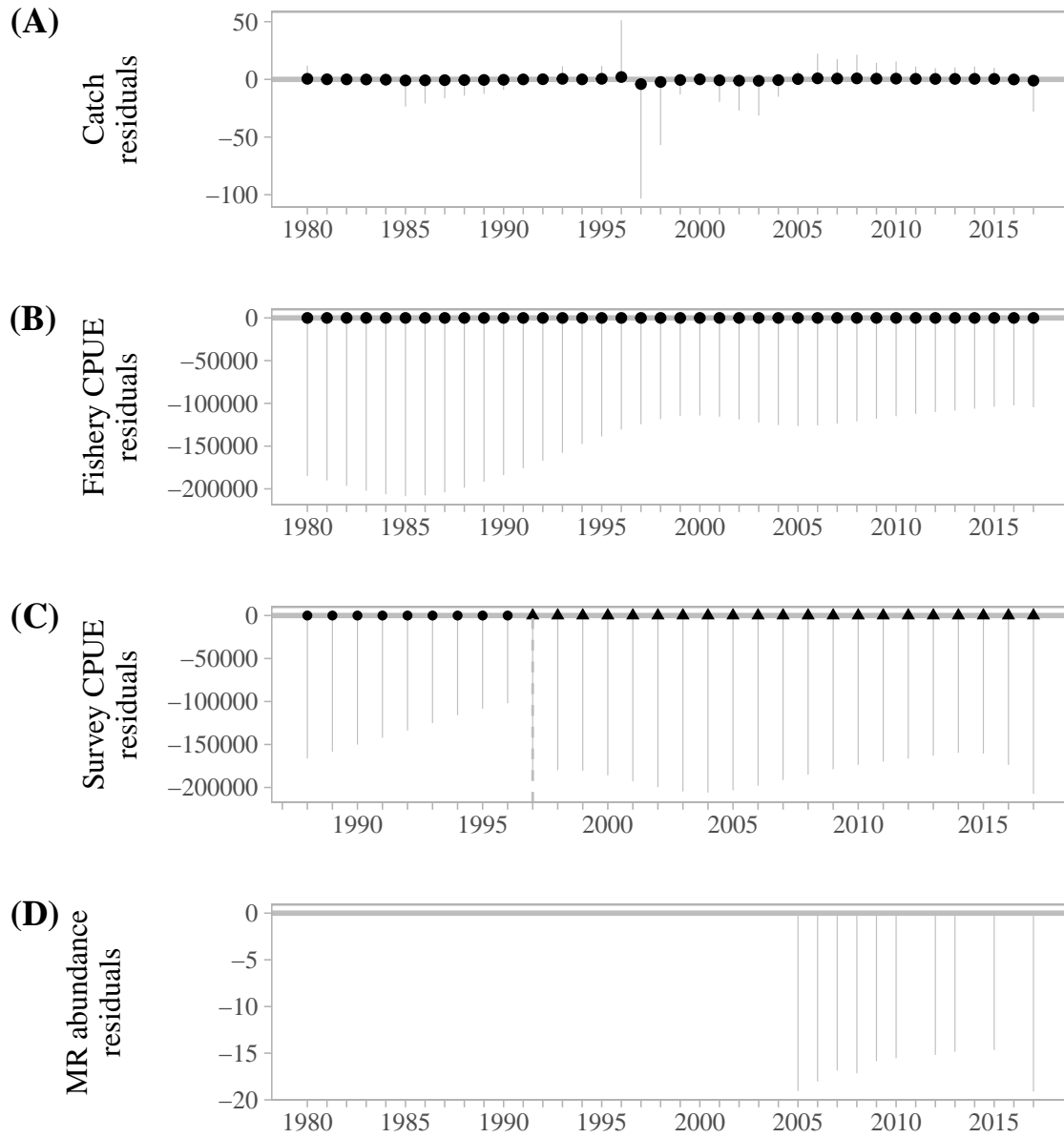
Total likelihood: 6056.4577

Time series of catch and abundance indices



Residuals for time series of catch and abundance indices

Standardized residuals:



Derived time series of recruitment, abundance, and biomass

(A)

(B)

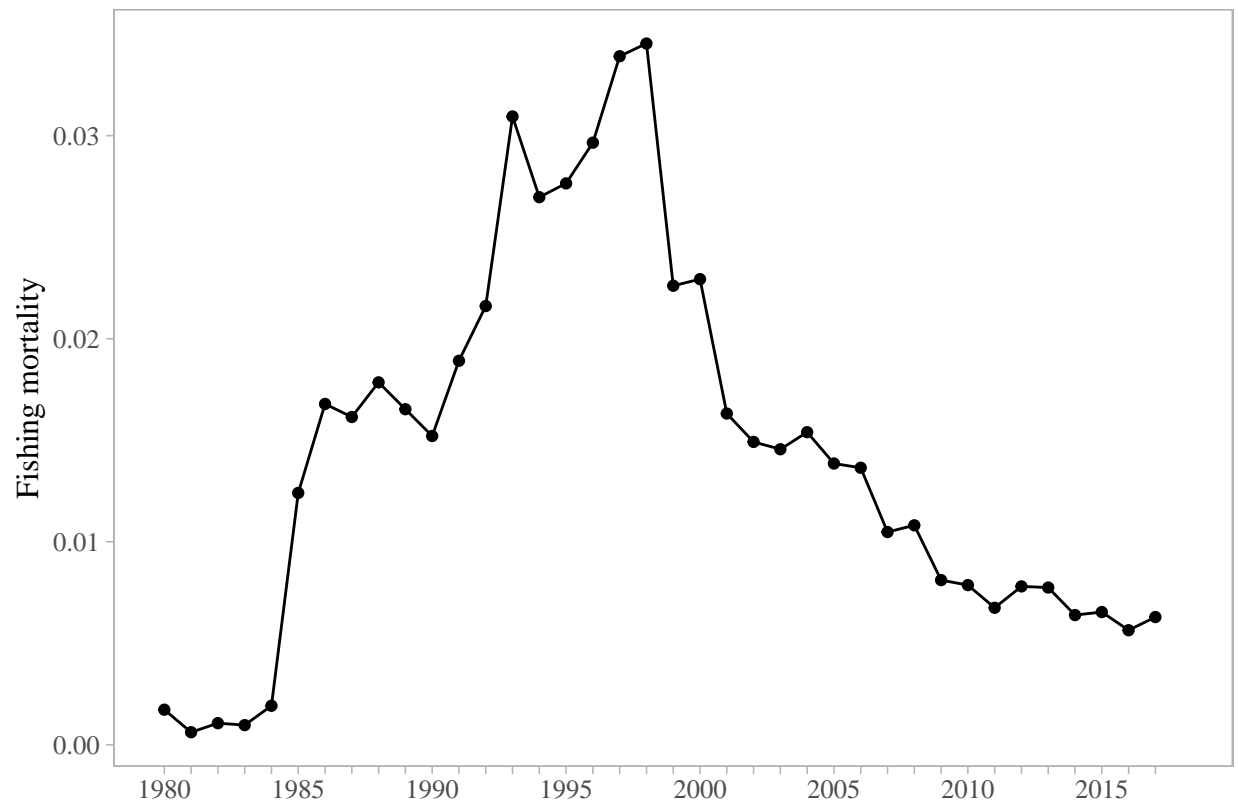
(C)

(D)
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,000,000,030,402,208,822,208,608,448,686,684,620,228,242,200,262,444,424,060,404,068,444,228,480,02
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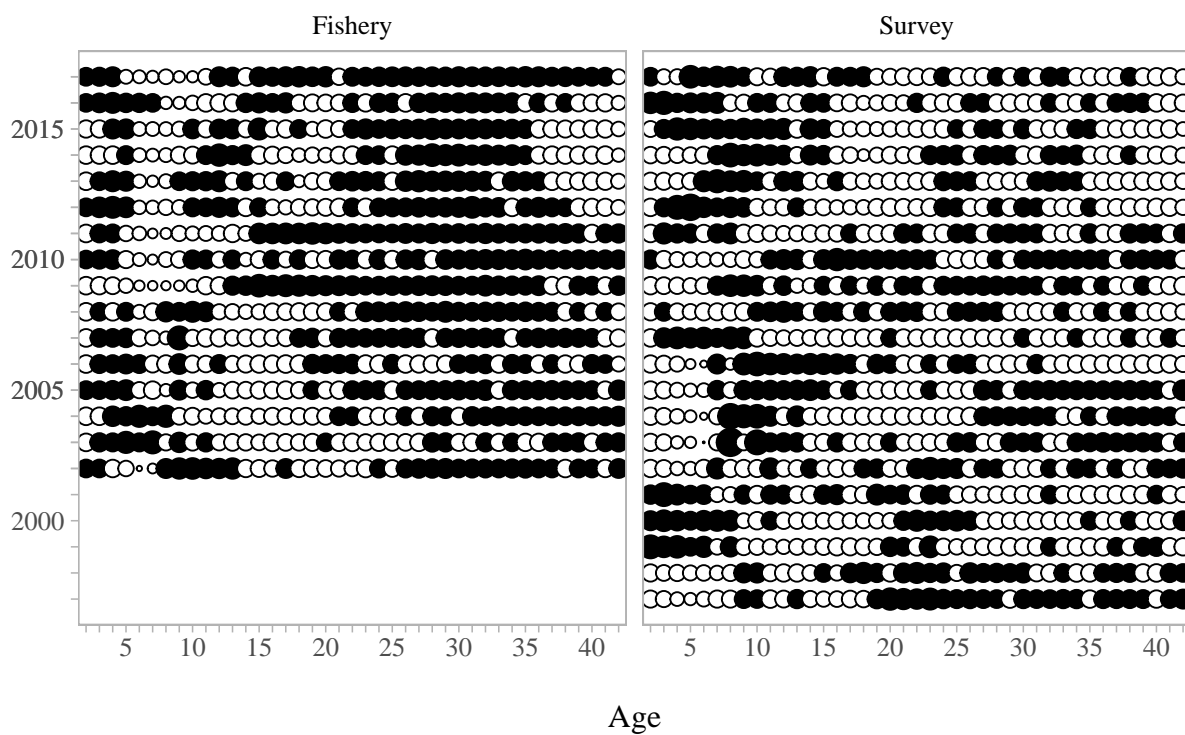
(E)
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Estimate of fishing mortality

On natural scale

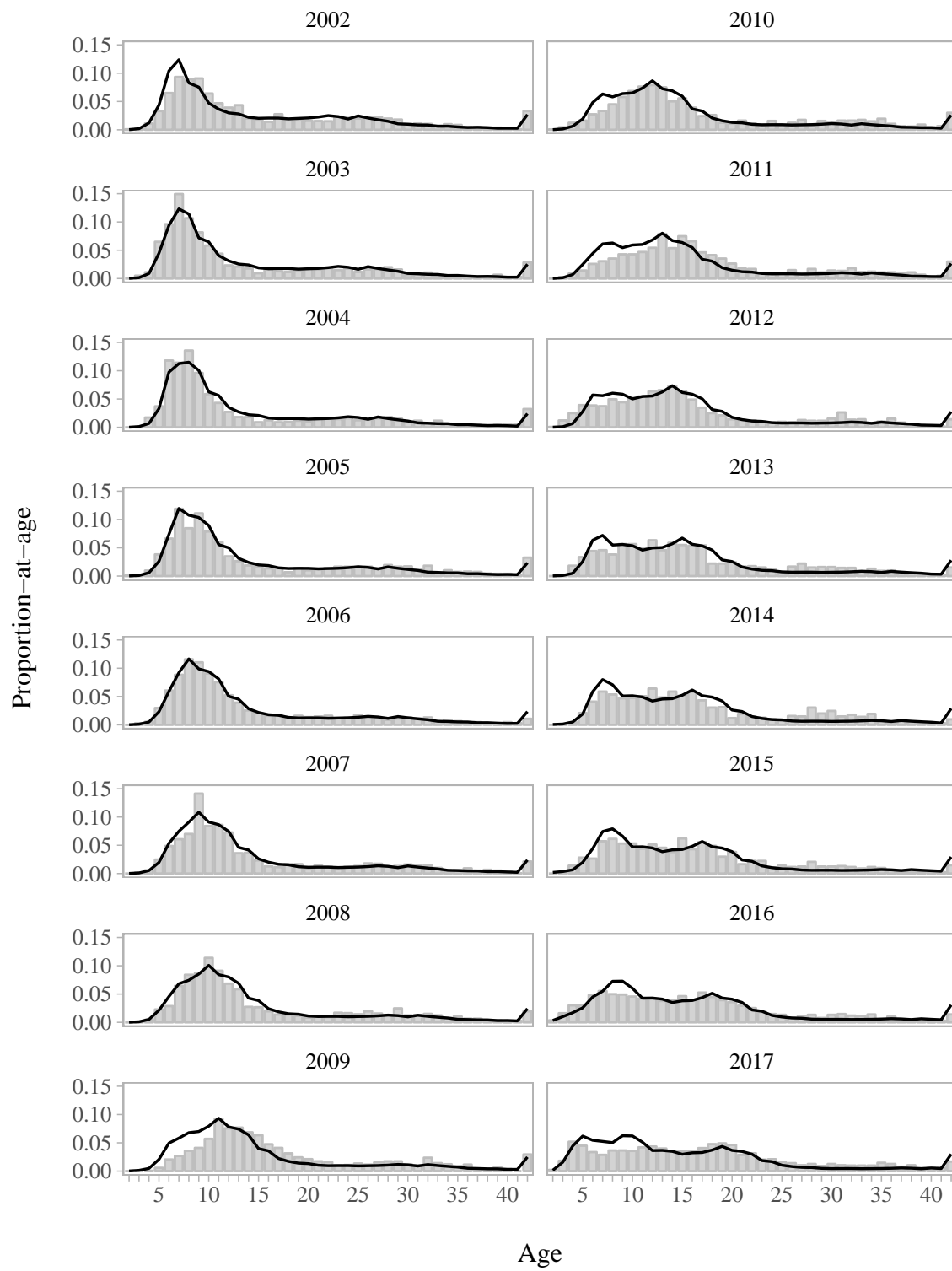


Fits to age comps

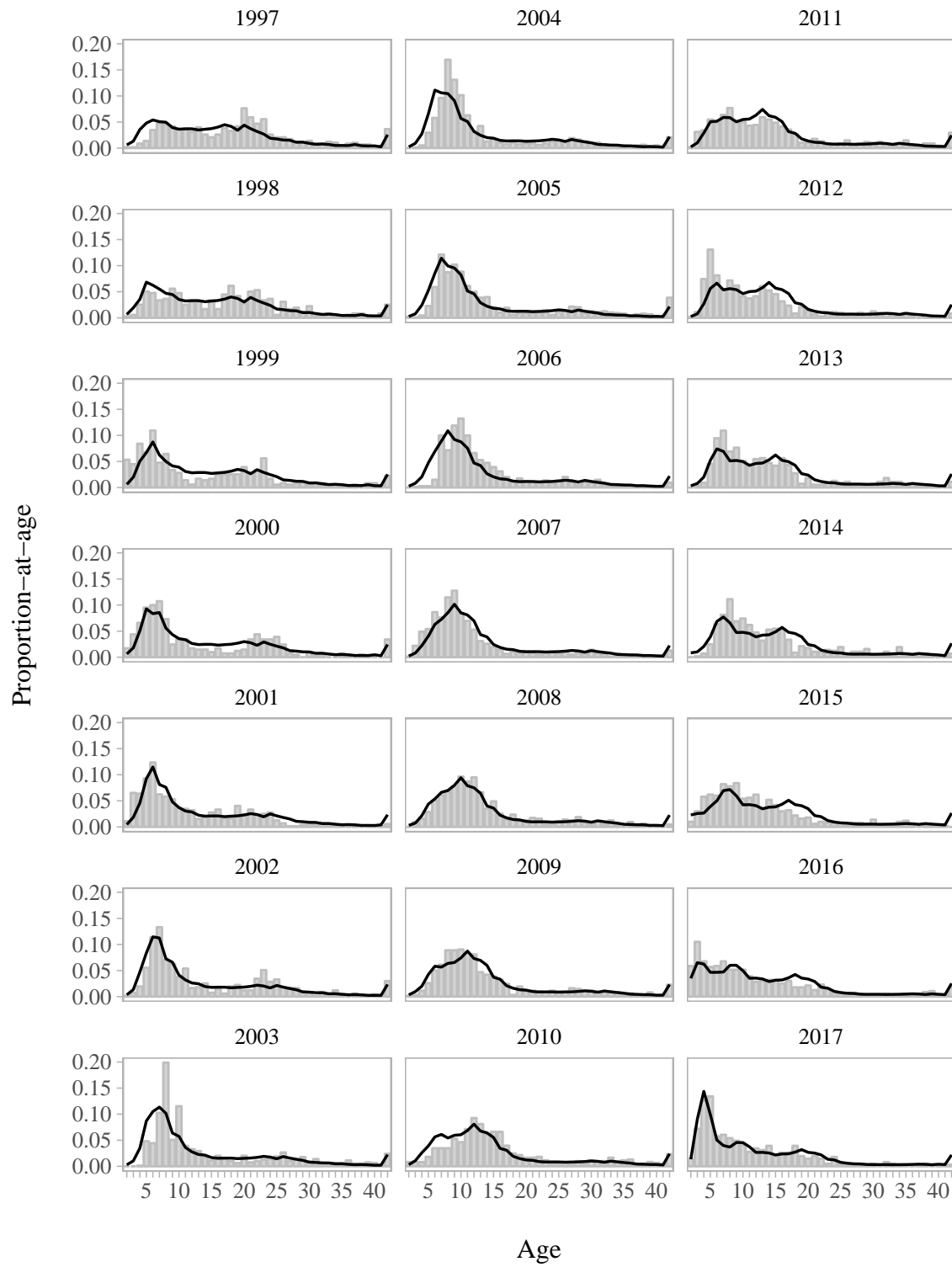


Model performance ● Observed greater than estimated ○ Observed less than estimated

Fits to fishery age comps



Fits to survey age comps



Selectivity

