Appendix C4: Results for Model 3

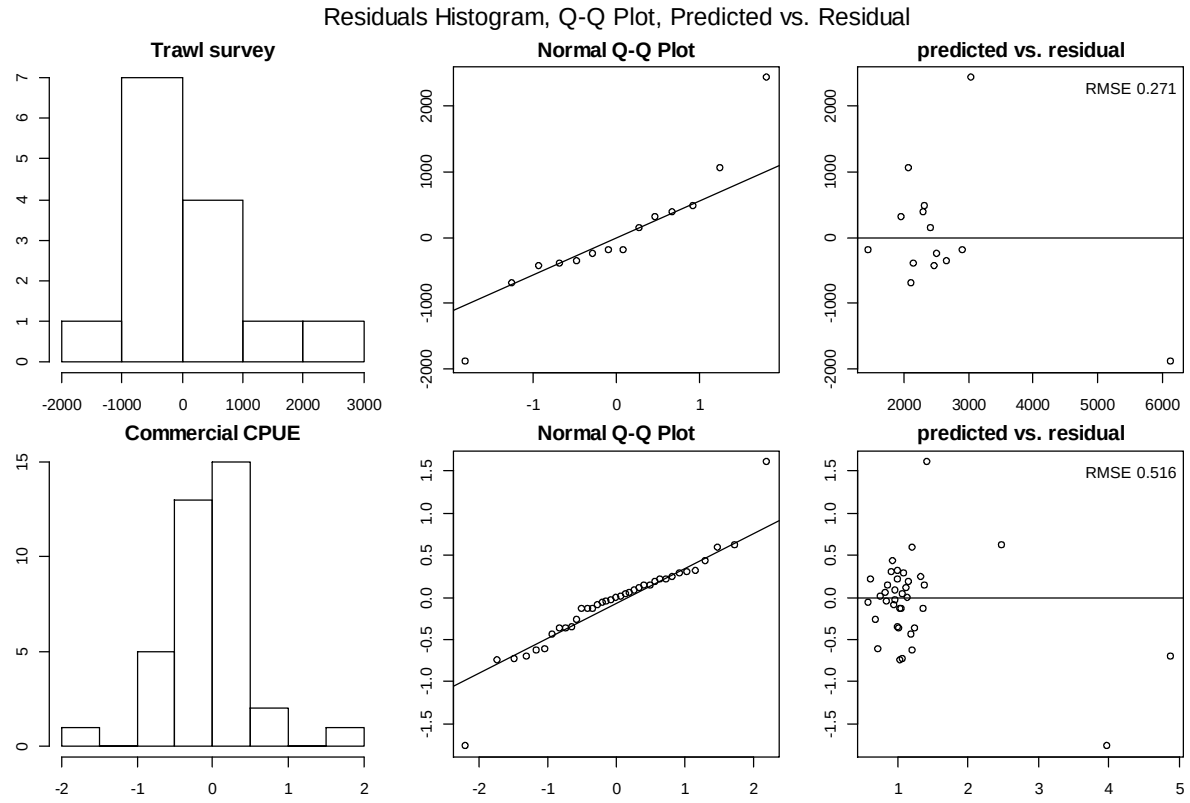

Figure C4-1. QQ plots of trawl survey abundance and commercial CPUE residuals.

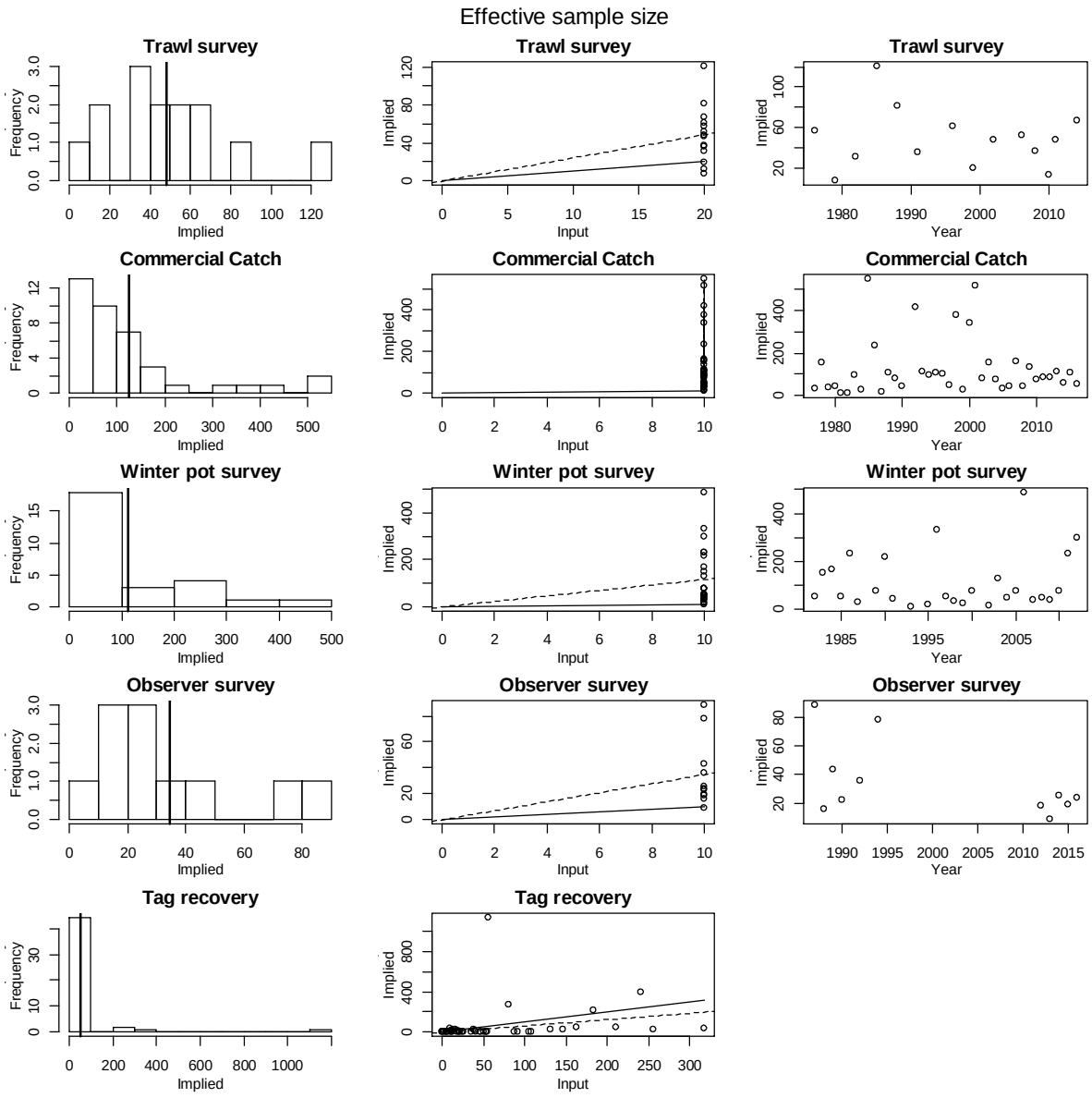

Figure C4-2: Implied effective sample sizes. Figures in the first column show implied effective sample size (x-axis) vs. frequency (y-axis). Vertical solid line is the mean implied effective sample size. The second column shows input sample sizes (x-axis) vs. implied effective sample sizes (y-axis). Dashed line indicates the linear regression slope, and solid line is 1:1 line. The third column shows years (x-axis) vs. implied effective sample sizes (y-axis).

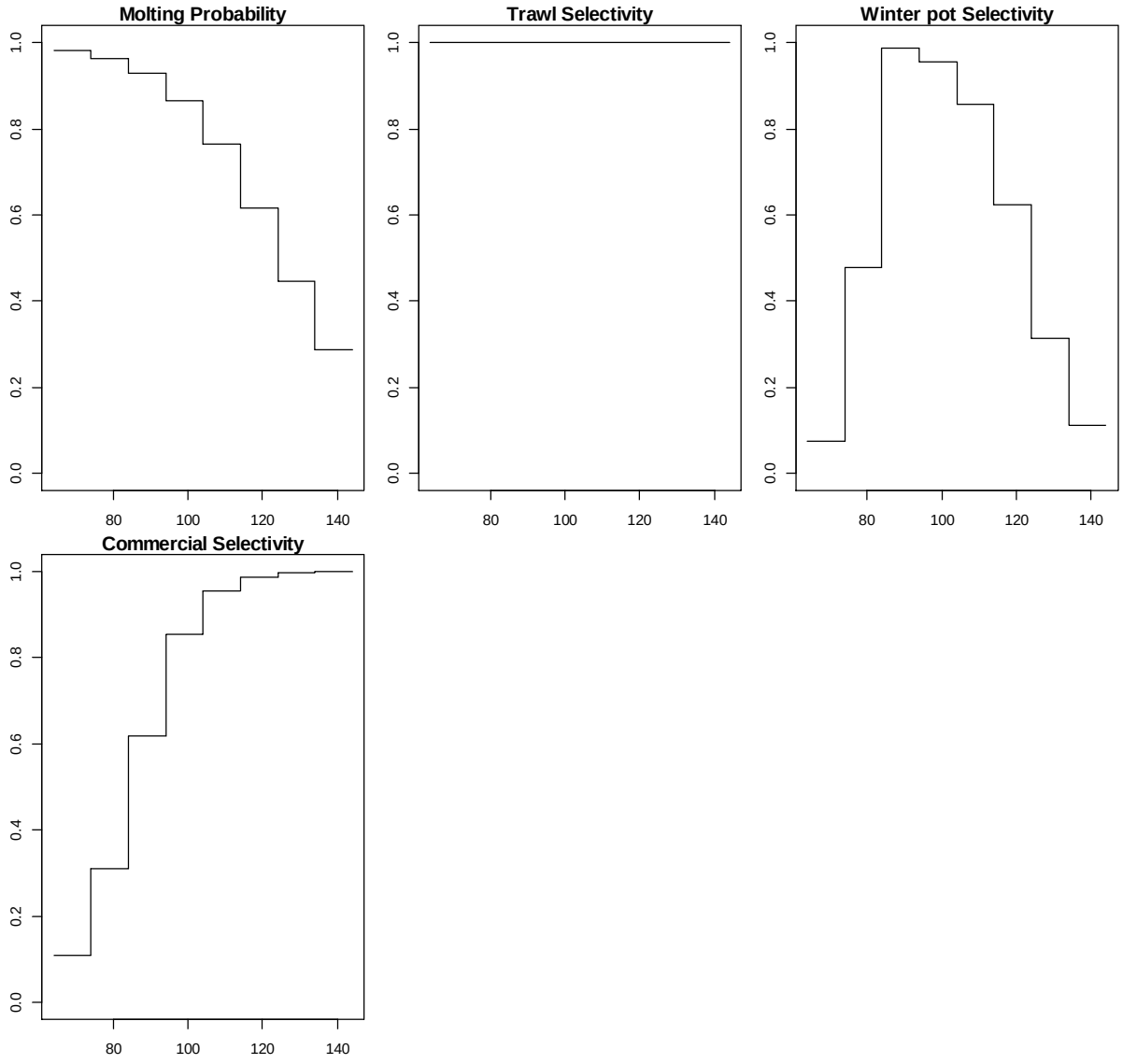

Figure C4-3. Model estimated annual molting probability, trawl survey selectivity, winter pot survey selectivity, and summer commercial fishery selectivity. X-axis is carapace length (mm).

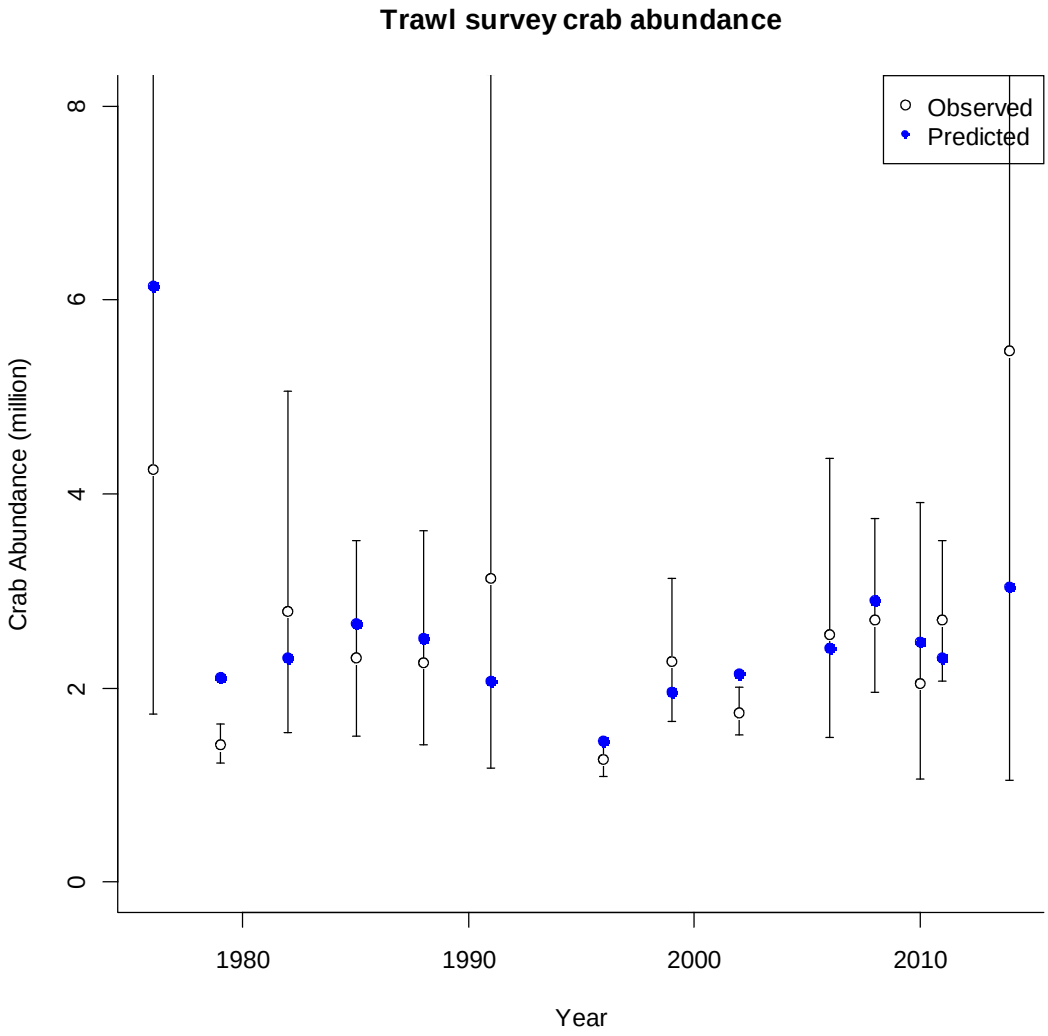

Figure C4-4. Observed and model estimated trawl survey male abundances over time with 95% confidence intervals (crab ≥ 74 mm CL).

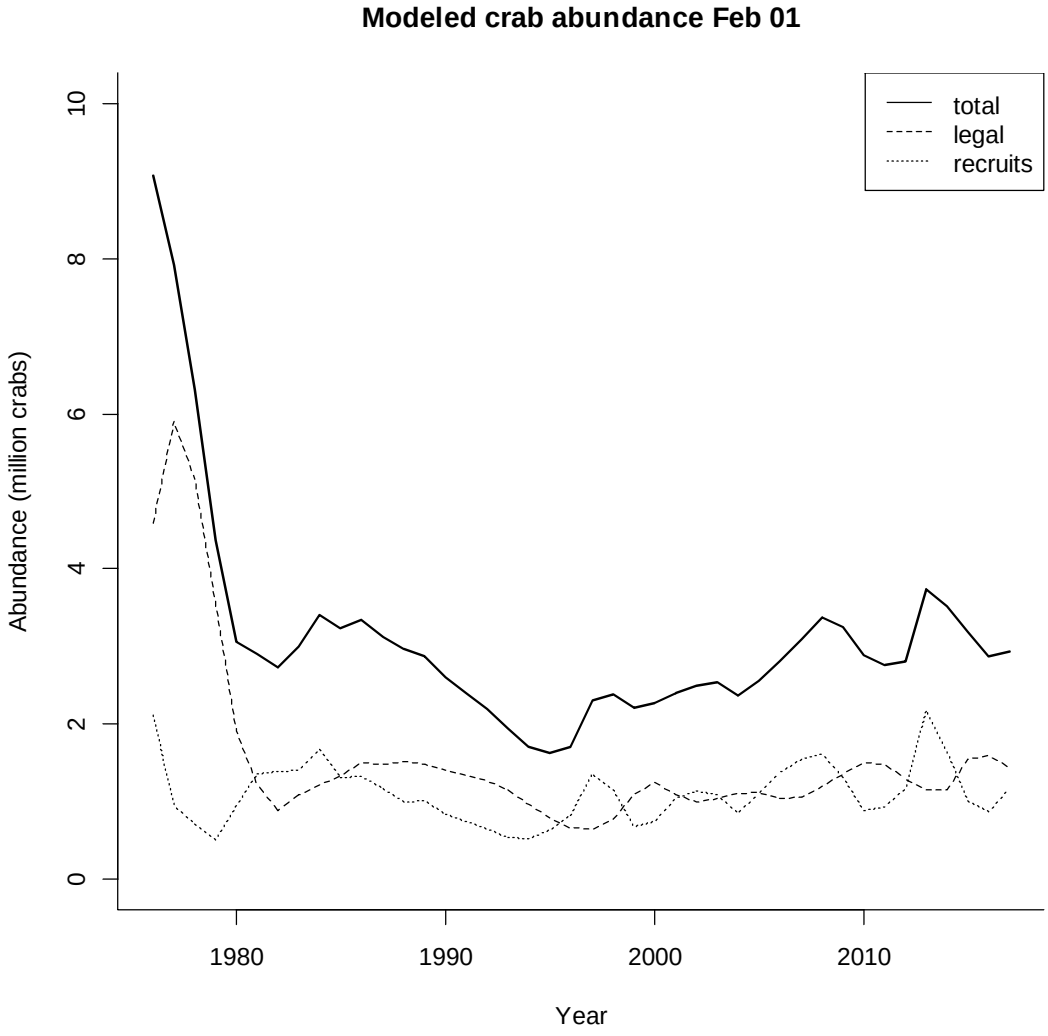

Figure C4-5. Estimated abundance of total, legal, and recruit males from 1976-2016.

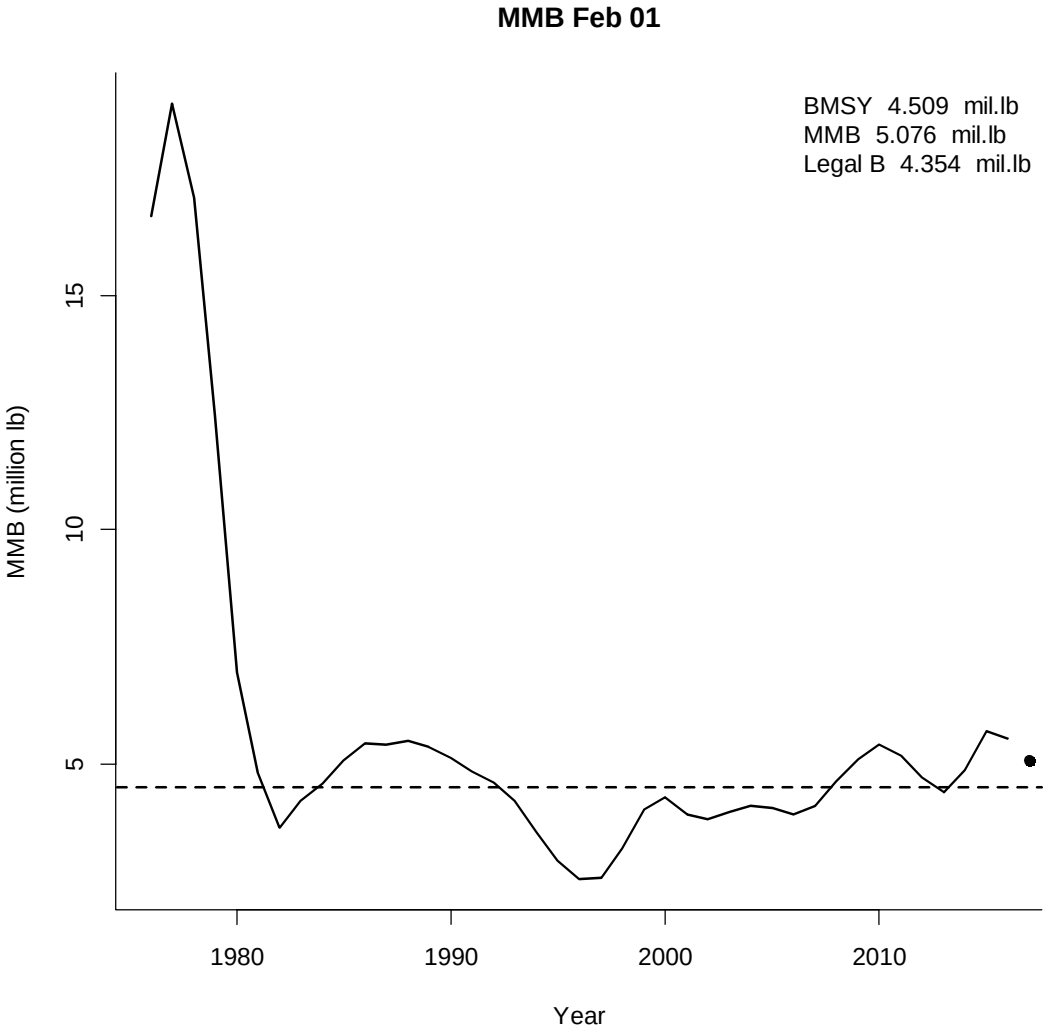

Figure C4-6. Estimated abundance of leg recruits from 1976-2016. Dash line shows B_{msy} (Average MMB of 1980-2016).

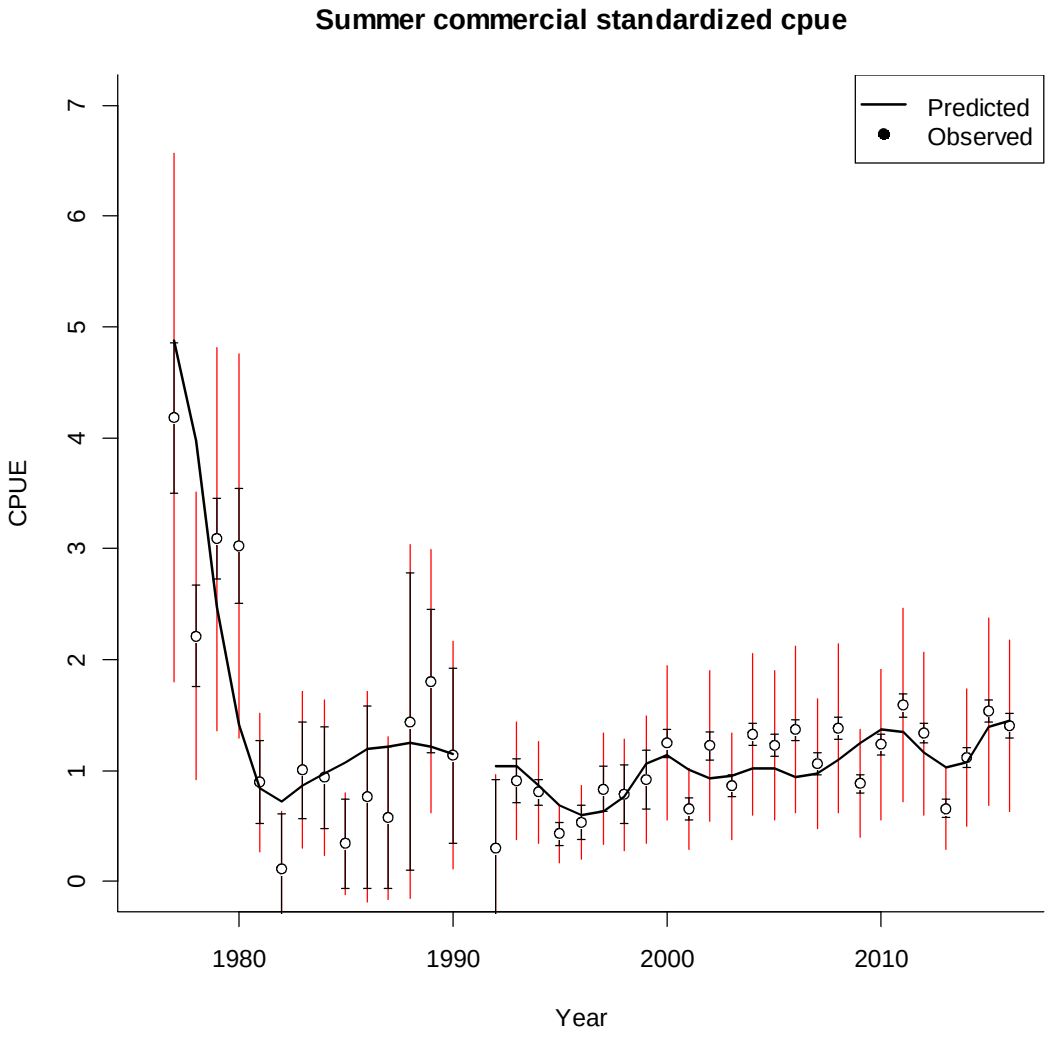

Figure C4-7. Summer commercial fishery standardized cpue during 1977-2016.

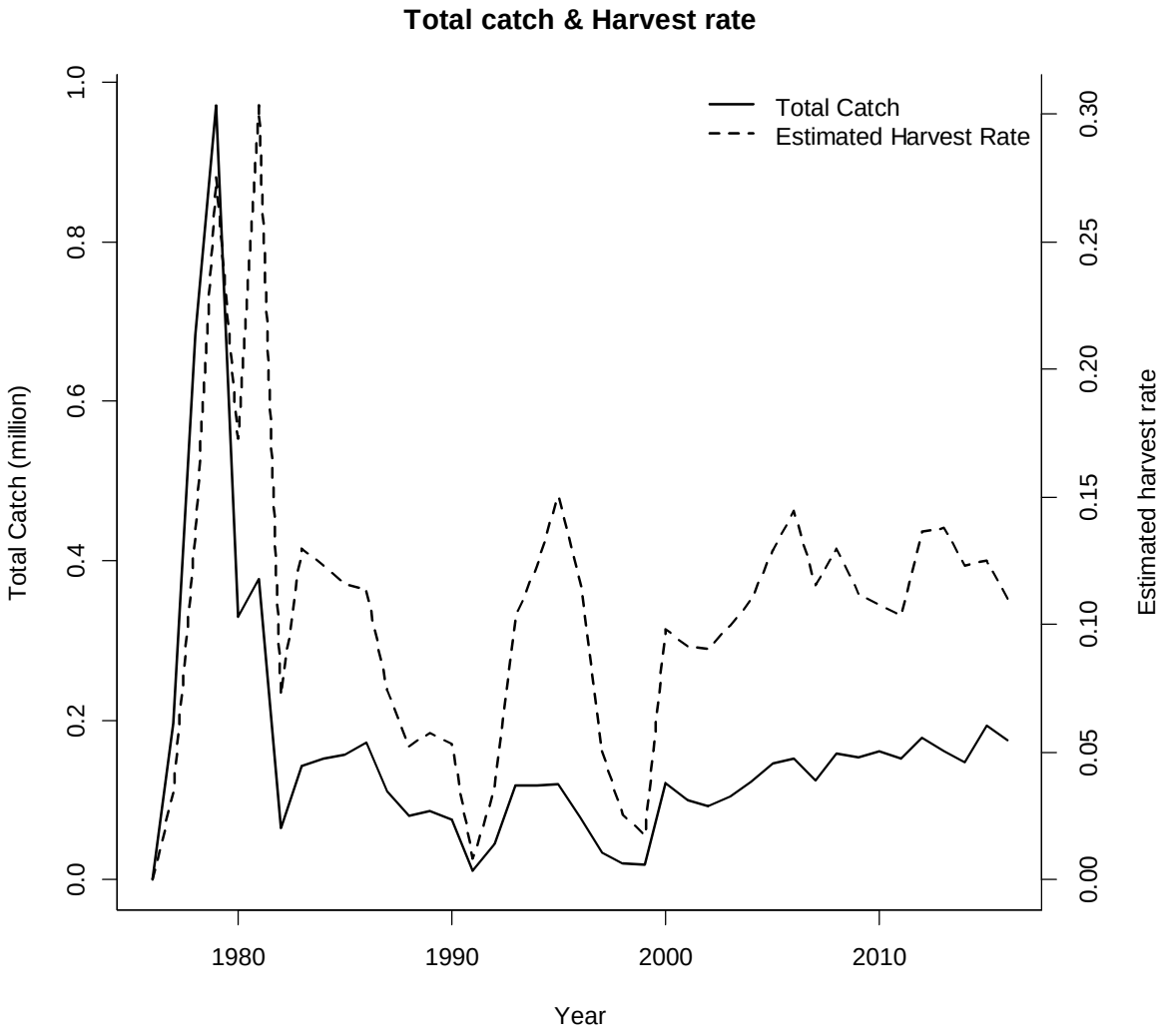

Figure C4-8. Total catch and estimated harvest rates during 1976-2016.

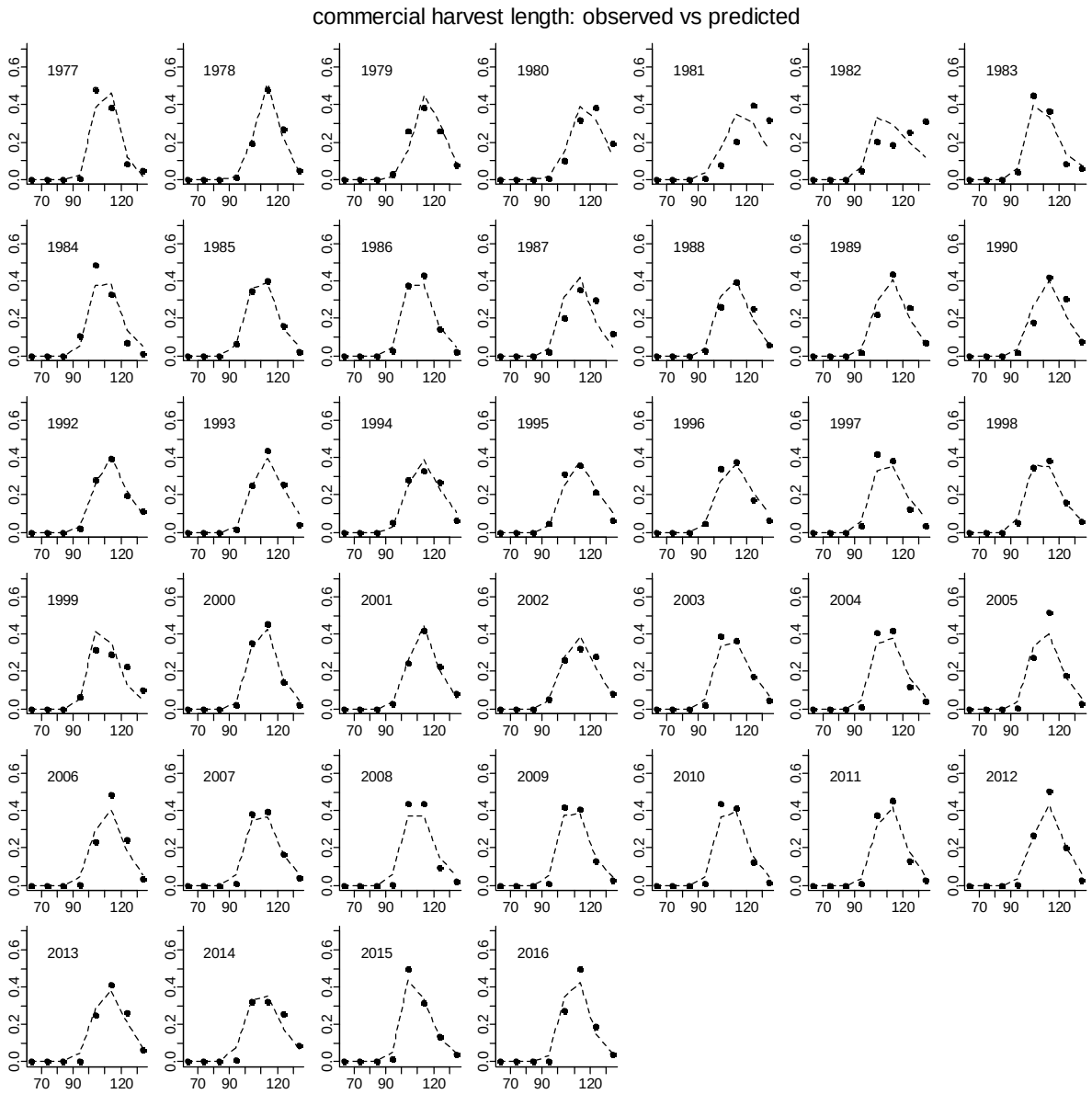

Figure C4-9. Predicted (dashed line) vs. observed (black dots) length class proportions for commercial catch.

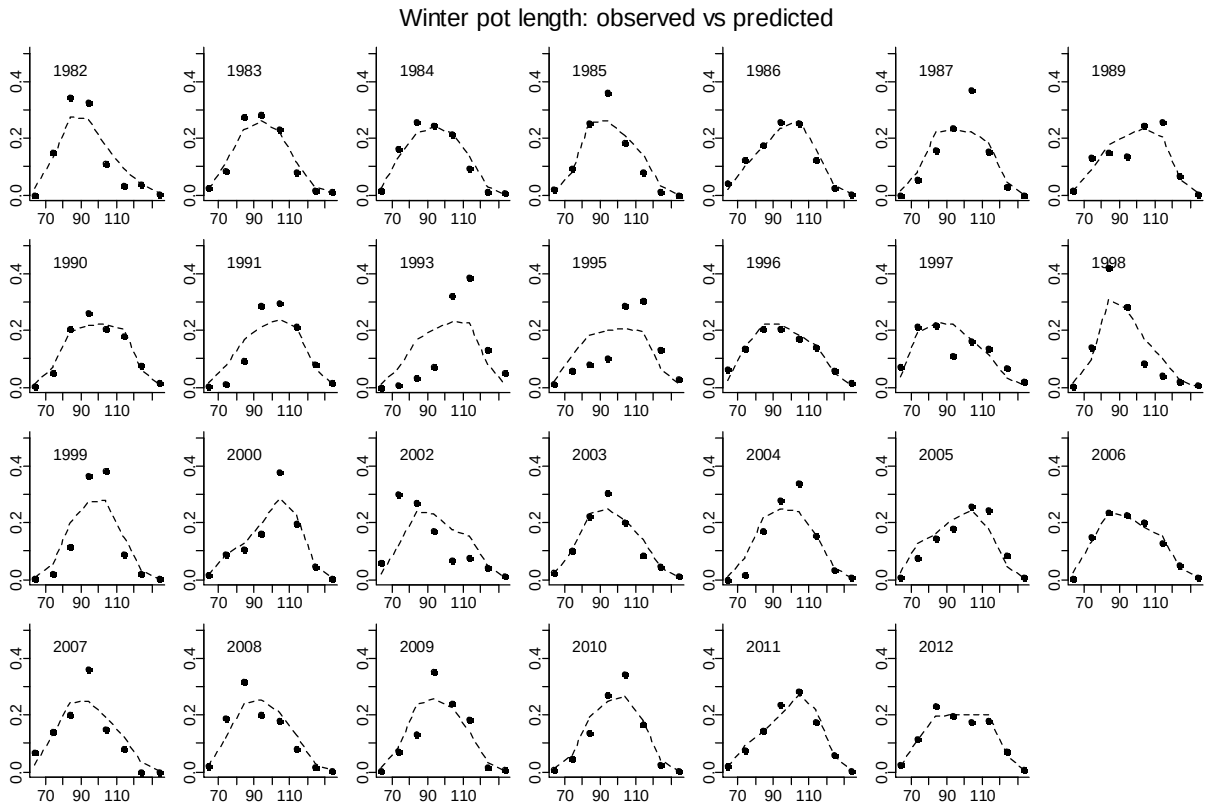

Figure C4-10. Predicted (dashed line) vs. observed (black dots) length class proportions for the winter pot survey.

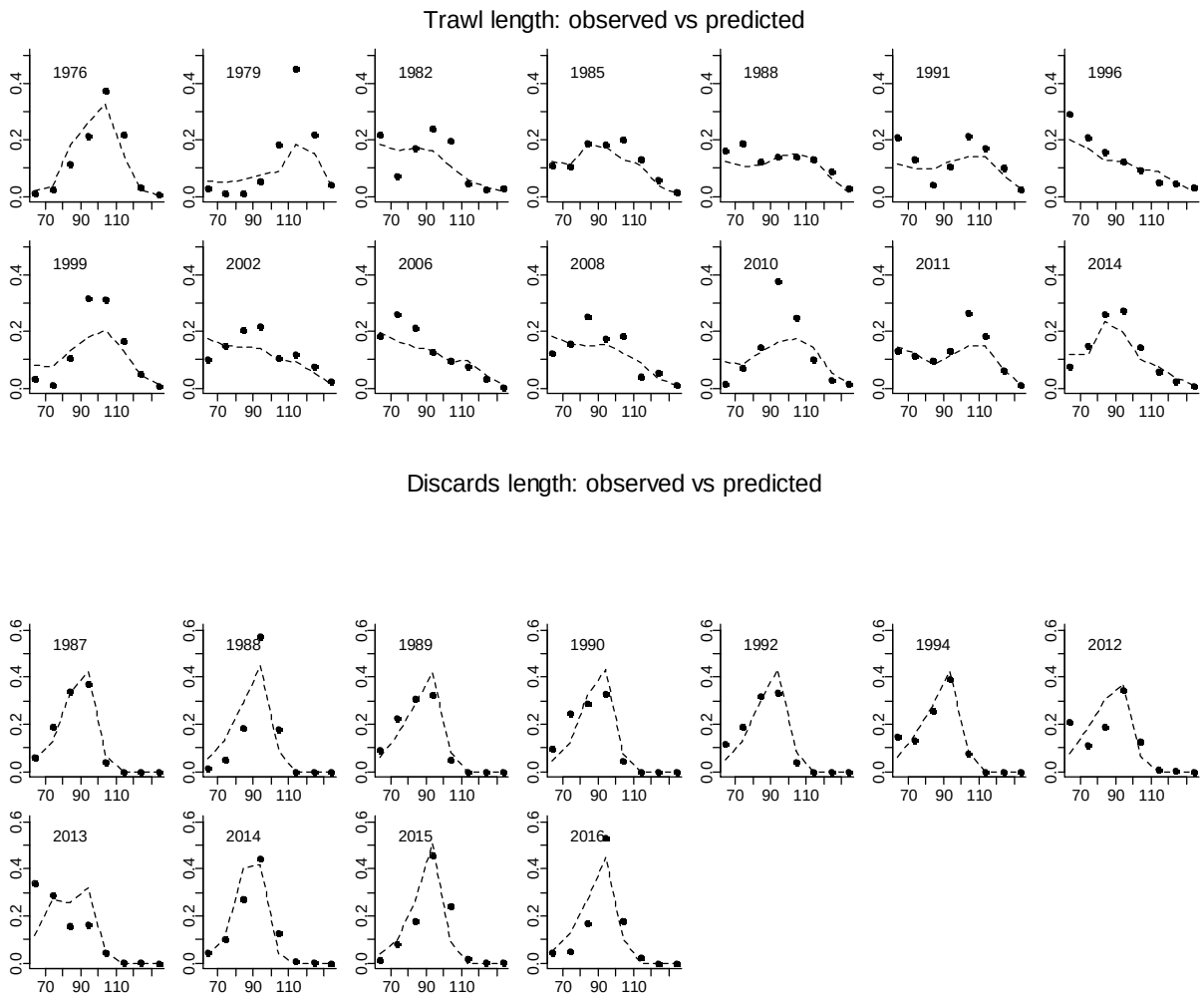

Figure C4-11. Predicted (dashed line) vs. observed (black dots) length class proportions for the trawl survey and observer survey.

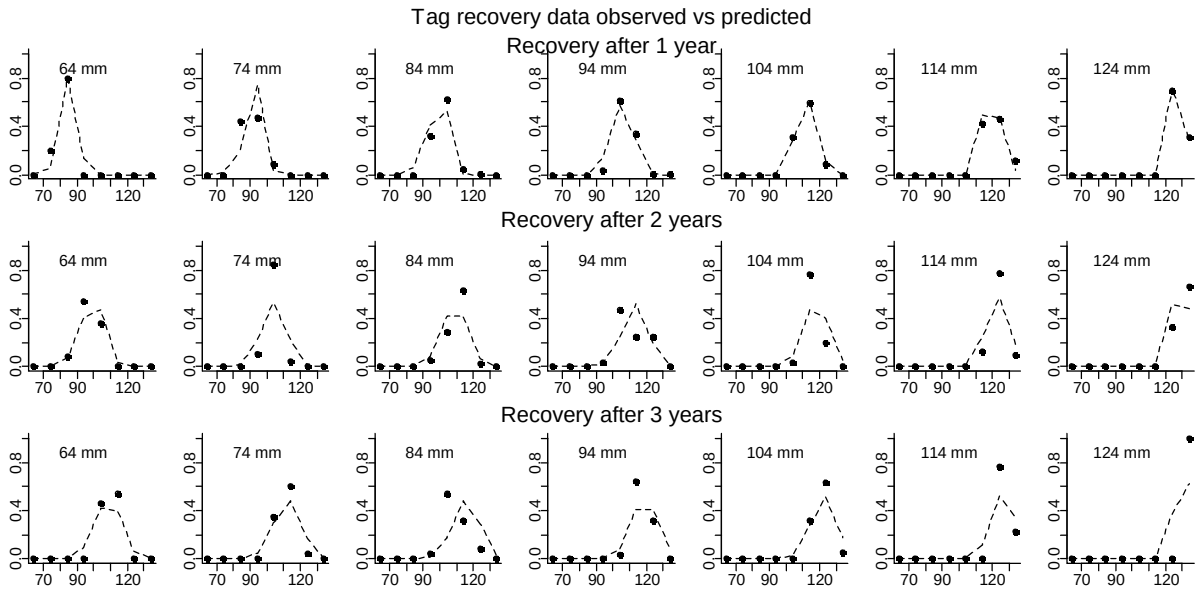

Figure C4-12. Predicted (dashed line) vs. observed (black dots) length class proportions for tag recovery data.

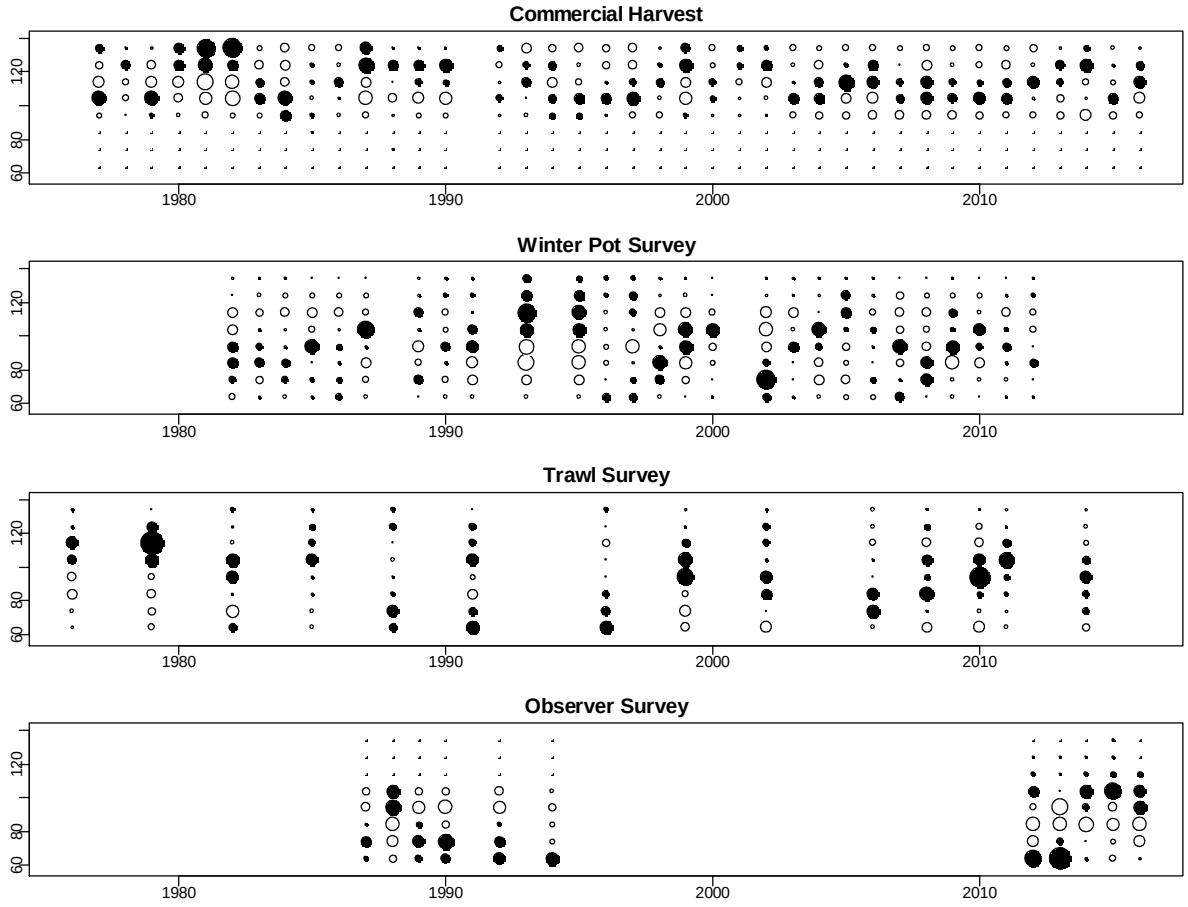

Figure C4-13. Bubble plots of predicted and observed length proportions. Black circle indicates model estimates lower than observed, white circle indicates model estimates higher than observed. Size of circle indicates degree of deviance (larger circle = larger deviance).

Table C4-1 . Summary of parameter estimates for a length-based stock synthesis population model of Norton Sound red king crab.

name	Estimate	std.dev
log_q_1	-6.925	0.185
log_q_2	-6.790	0.100
log_N_{76}	9.112	0.145
R_0	6.448	0.078
log_R_{76}	-0.007	0.419
log_R_{77}	-0.576	0.368
log_R_{78}	-0.767	0.350
log_R_{79}	0.206	0.320
log_R_{80}	0.398	0.279
log_R_{81}	0.298	0.268
log_R_{82}	0.359	0.312
log_R_{83}	0.605	0.265
log_R_{84}	0.035	0.299
log_R_{85}	0.372	0.281
log_R_{86}	0.017	0.288
log_R_{87}	-0.038	0.253
log_R_{88}	0.026	0.262
log_R_{89}	-0.318	0.281
log_R_{90}	-0.313	0.259
log_R_{91}	-0.511	0.285
log_R_{92}	-0.730	0.307
log_R_{93}	-0.613	0.290
log_R_{94}	-0.356	0.261
log_R_{95}	-0.102	0.229
log_R_{96}	0.496	0.221
log_R_{97}	-0.098	0.293
log_R_{98}	-0.700	0.315
log_R_{99}	-0.157	0.304
log_R_{00}	0.148	0.257
log_R_{01}	0.139	0.238
log_R_{02}	0.055	0.298
log_R_{03}	-0.309	0.332
log_R_{04}	0.263	0.243
log_R_{05}	0.377	0.225
log_R_{06}	0.476	0.242

name	Estimate	std.dev
log_R_{07}	0.486	0.233
log_R_{08}	0.132	0.284
log_R_{09}	-0.359	0.296
log_R_{10}	0.041	0.244
log_R_{11}	0.240	0.280
log_R_{12}	1.000	0.225
log_R_{13}	0.094	0.327
log_R_{14}	-0.141	0.408
log_R_{15}	-0.167	0.440
a_1	1.419	4.236
a_2	2.019	3.986
a_3	3.606	3.754
a_4	3.981	3.736
a_5	4.198	3.727
a_6	3.426	3.759
a_7	1.905	4.052
r1	10.000	1.136
r2	9.747	1.153
log_α	-2.671	0.094
log_β	4.832	0.016
log_ϕ_{st1}	-14.382	1891.200
log_ϕ_w	-2.055	0.051
Sw1	0.076	0.036
Sw2	0.478	0.111
log_ϕ_1	-2.052	0.054
w^2_t	0.072	0.022
q	0.765	0.138
ms	3.279	0.293
σ	3.988	0.227
β_1	12.070	0.743
β_2	7.755	0.185