

FLife: Operating Model Conditioning

Thornback Ray

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Life history parameters

Life history parameters from Fish Base for the Von Bertalanffy growth model were L_{∞} (118), k (0.141), and t_0 (-1.06), for the length/weight relationship $W = aL^b$ were a (0.0036) and b (3.22), and age at maturity (a_{50}) was (5.22).

The values for the empirical Gislason natural mortality relationship m_1 and m_2 were (236.6) and (-1.61) respectively.

The fishery was assumed to only catch mature fish and so selection pattern is modelled by a double normal equivalent to the maturity ogive, parameters were a_1 , s_l and s_r were (6.22, 1, 5000) respectively.

The stock recruitment relationship is assumed to be of a Beverton and Holt functional form with a steepness and virgin biomass of 0.8 and 1000 units respectively.

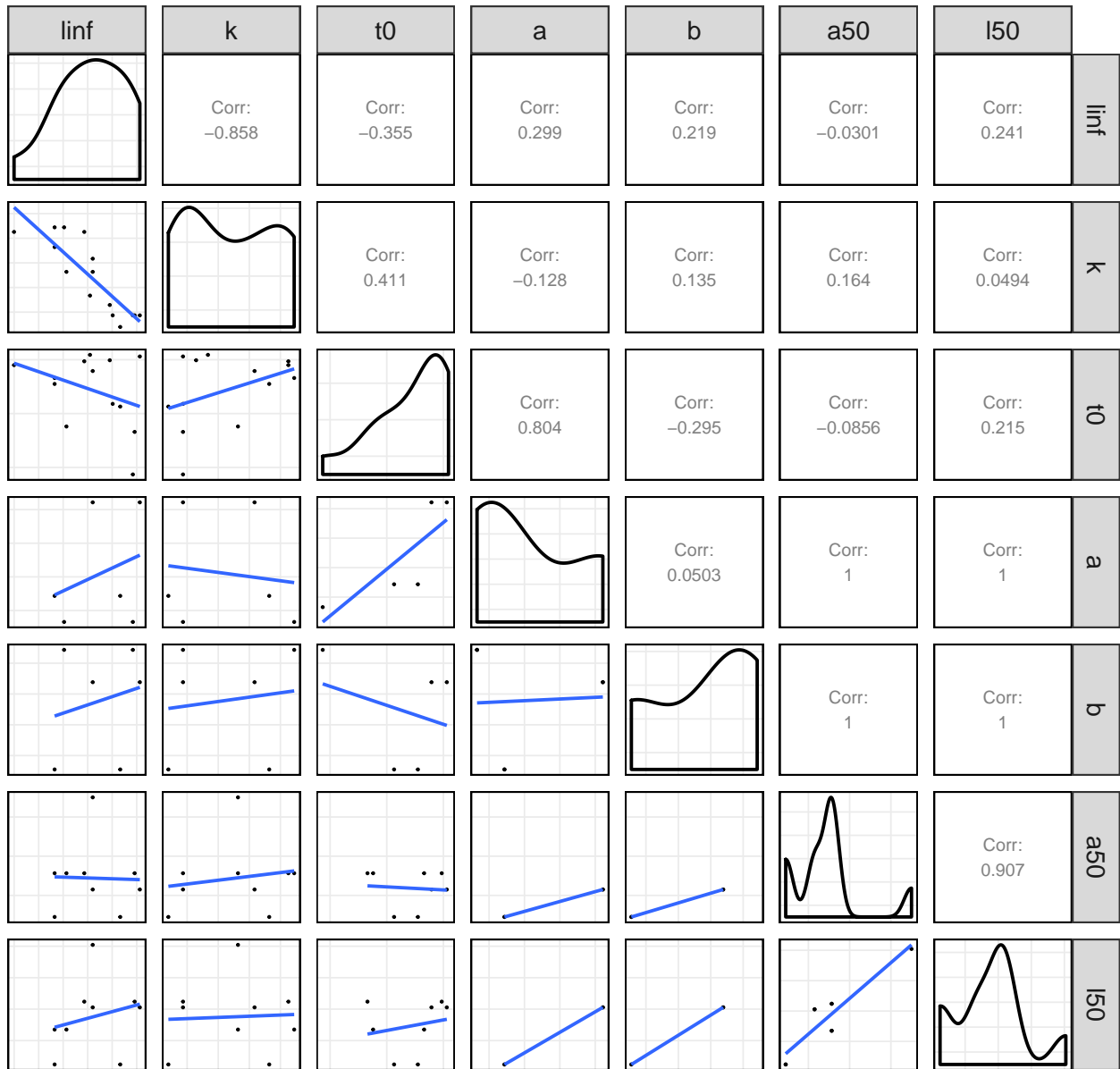


Figure 1 Pairwise scatter plots of life history parameters.

Equilibrium dynamics

The parameters are then used by `1hEq1` to simulate the equilibrium dynamics by combining the spawner/yield per recruit relationships with a stock recruitment relationship.

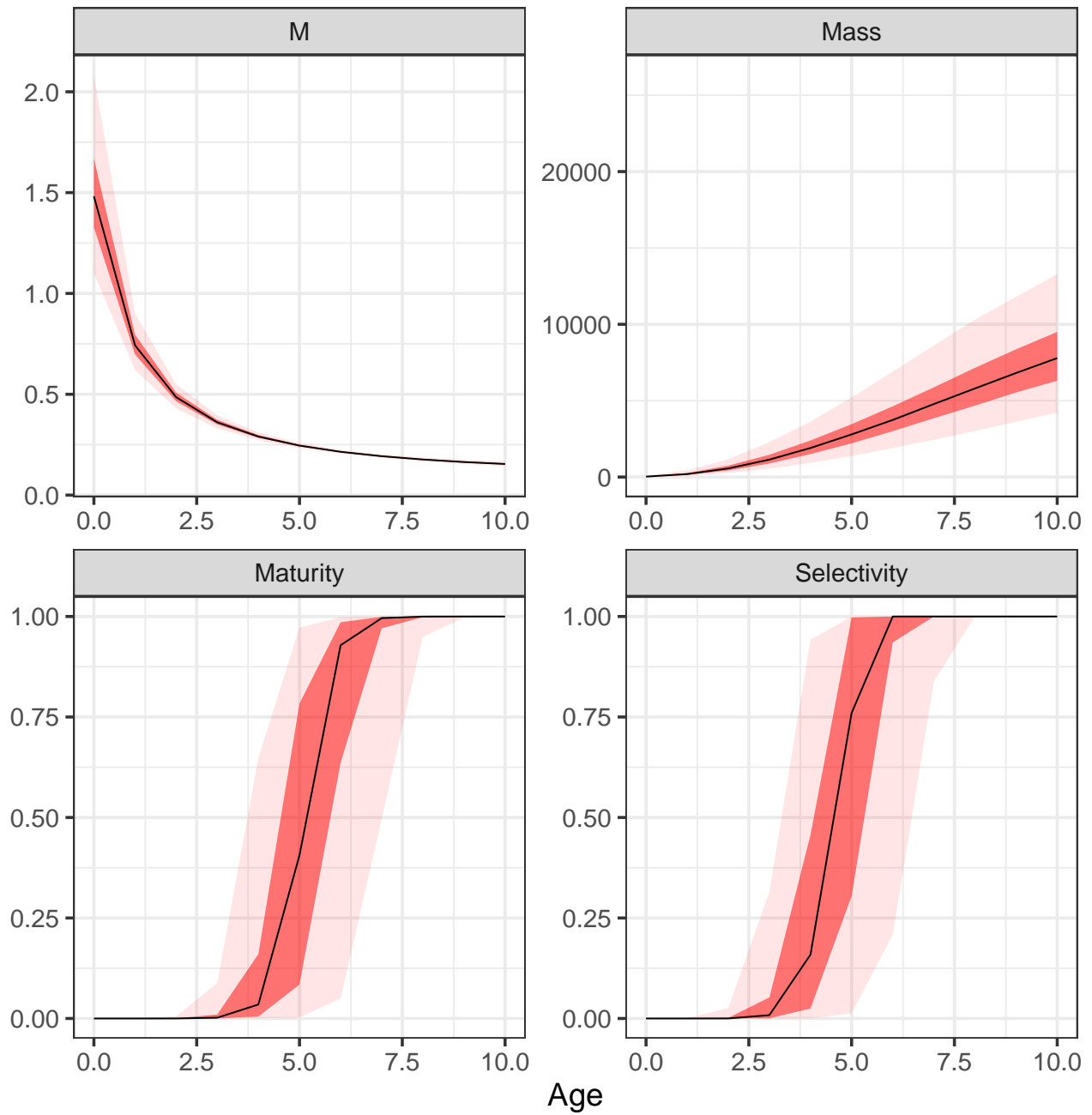


Figure 2 Vectors.

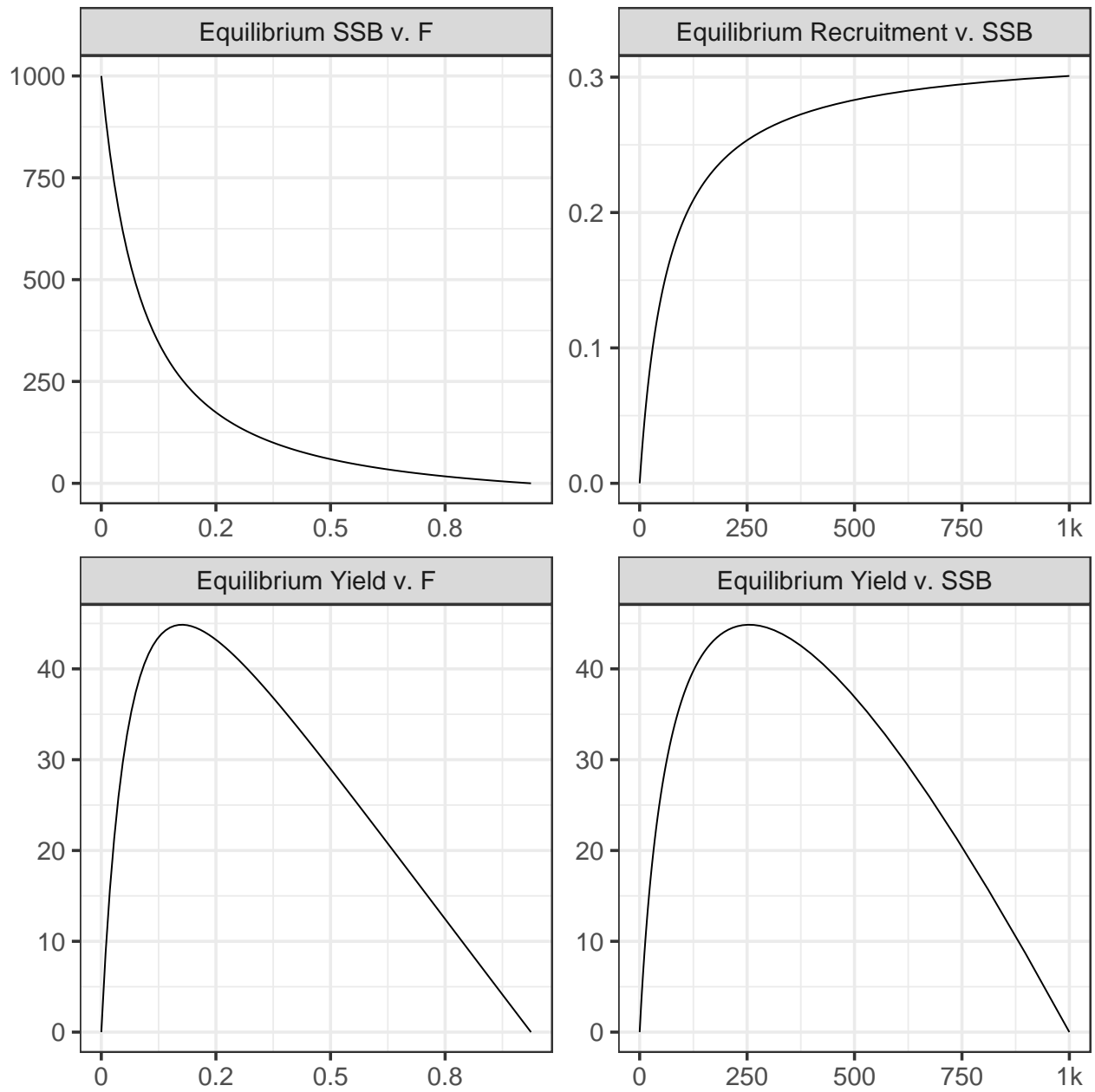


Figure 3 Example equilibrium Curve.

Population dynamics

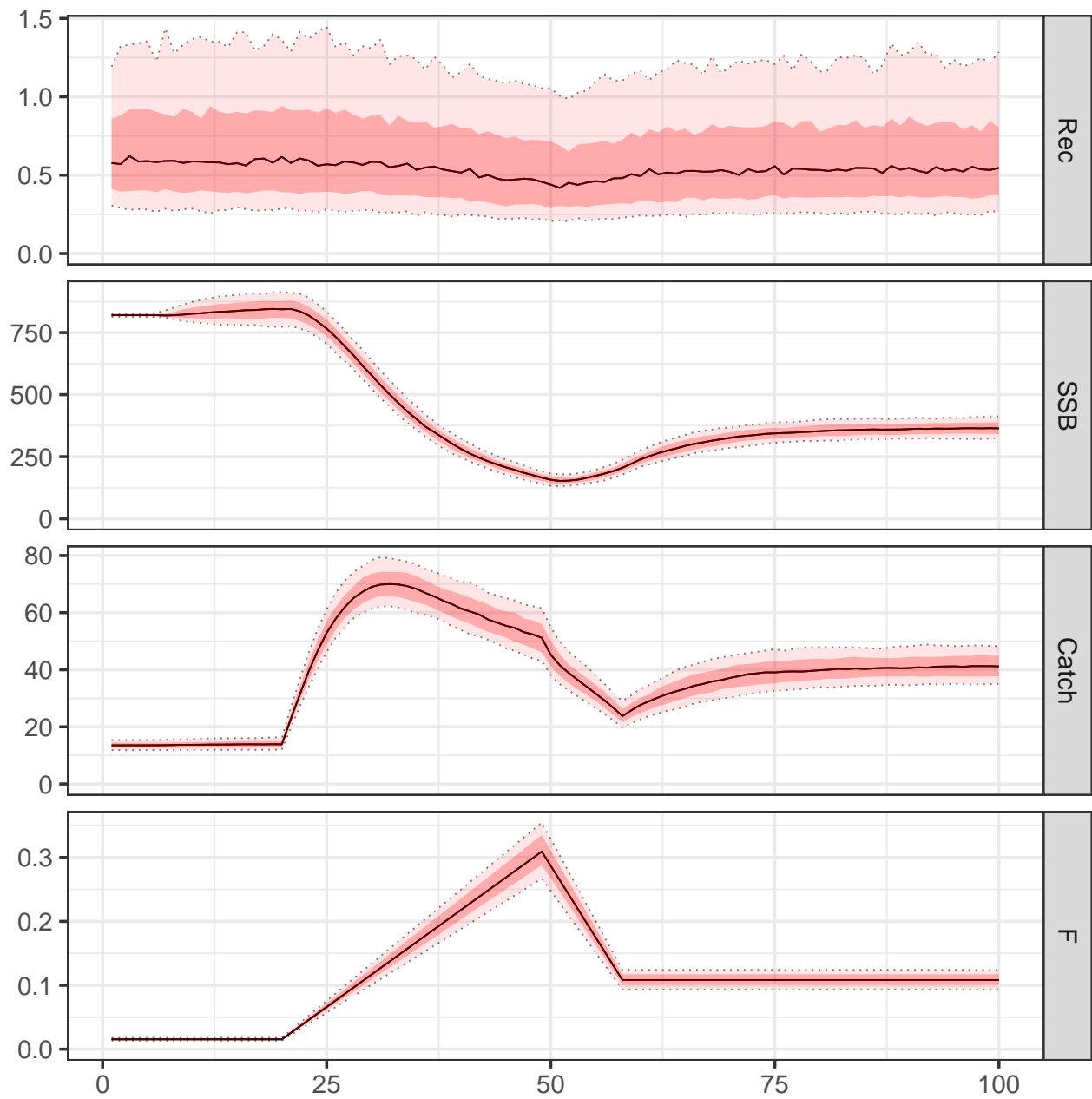


Figure 4 Time series.

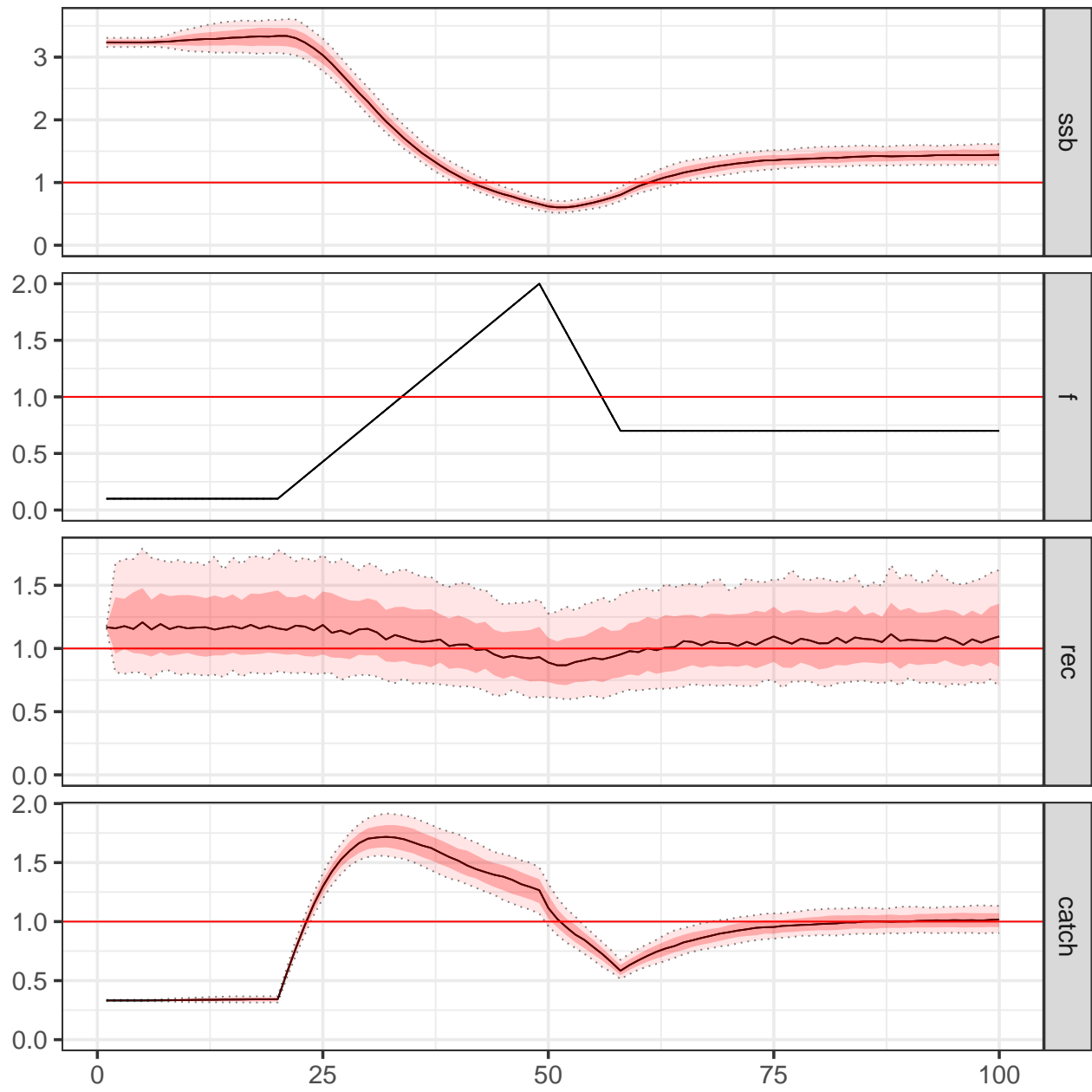


Figure 5 Time series relative to MSY benchmarks.

Software Versions

- R version 3.4.1 (2017-06-30)
- FLCore: 2.6.9.9001
- FLBRP: 2.5.3
- FLasher: 0.5.0
- FLife: 3.2.1.9001
- ggplotFL: 2.6.4
- **Compiled:** Fri Aug 17 21:25:41 2018

Author information

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References

Session Info

R version 3.4.1 (2017-06-30)
Platform: x86_64-pc-linux-gnu (64-bit)
Running under: Ubuntu 16.04.2 LTS

Matrix products: default
BLAS: /usr/lib/libblas/libblas.so.3.6.0
LAPACK: /usr/lib/lapack/liblapack.so.3.6.0

locale:

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[3]	LC_TIME=en_GB.UTF-8	LC_COLLATE=en_US.UTF-8
[5]	LC_MONETARY=en_GB.UTF-8	LC_MESSAGES=en_US.UTF-8
[7]	LC_PAPER=en_GB.UTF-8	LC_NAME=C
[9]	LC_ADDRESS=C	LC_TELEPHONE=C
[11]	LC_MEASUREMENT=en_GB.UTF-8	LC_IDENTIFICATION=C

attached base packages:

[1]	stats	graphics	grDevices	utils	datasets	methods	base
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other attached packages:

[1]	FLife_3.2.1.9001	ggplotFL_2.6.4	FLasher_0.5.0
[4]	FLFishery_0.1.5	FLBRP_2.5.3	FLCore_2.6.9.9001
[7]	lattice_0.20-35	GGally_1.4.0	reshape_0.8.7
[10]	dplyr_0.7.6	plyr_1.8.4	ggplot2_3.0.0
[13]	knitr_1.20		

loaded via a namespace (and not attached):

[1]	Rcpp_0.12.18	RColorBrewer_1.1-2	compiler_3.4.1
[4]	pillar_1.1.0	bindr_0.1.1	tools_3.4.1
[7]	digest_0.6.15	evaluate_0.10.1	tibble_1.4.2
[10]	gtable_0.2.0	pkgconfig_2.0.1	rlang_0.2.1
[13]	Matrix_1.2-10	yaml_2.1.18	bindrcpp_0.2.2
[16]	gridExtra_2.3	withr_2.1.2	stringr_1.3.1
[19]	stats4_3.4.1	rprojroot_1.3-2	grid_3.4.1
[22]	tidyselect_0.2.4	glue_1.2.0	R6_2.2.2
[25]	rmarkdown_1.9	reshape2_1.4.3	purrr_0.2.5
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[34]	assertthat_0.2.0	colorspace_1.3-2	labeling_0.3
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