California Halibut Data Documentation

Julia Coates Julia.Coates@wildlife.ca.gov, Sarah Valencia sarah.r.valencia@gmail.com, Kat Meyer Kathr

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Contents

Metadata

Data used in this MSE was directly compiled from the stock synthesis model files generated during the 2020 California halibut stock assessment. The MSE was conducted prior to stock assessment peer review. Therefore, it may be necessary to revise these data if elements of the stock synthesis (SS) files are changed during peer review. We focus exclusively on the southern stock defined as occurring between Point Arguello and the US-Mexico border. The SS model is parameterized for three commercial fleets (trawl, hook & line, gillnet) and one recreational fleet (commercial passenger fishing vessels (CPFV)). Using the MSEtool function ss2Data to export data object elements combines these fleets into a single fishery.

Table 1: Table 1. Summary of metadata

Name	HalData - - Female, All Fleets
Common Name	CA Halibut
Species	Paralichthys californicus
Region	Southern California
Last Historical Year	2018
Last TAC	NA
Units	mt
Last TAE	1
Number of areas	2

Biology

Pattison and McAllister (1990) found maximum ages of 30 and 23 for females and males, respectively, although the maximum age reported through sampling the fishery is 24 in the past decade (CDFW unpublished data). Use of an approach recommended in the 'Accepted Practices and Guidelines for Groundfish Stock Assessments' (PFMC 2017), produces an estimate of 0.22 for females and 0.27 for males based on the maximum ages of 30 and 23, respectively (Then et al 2015).

Sunada et al. (1990) collected age-length data from gill and trawl net fisheries in southern California collected, as well as sub-legal sized fish samples from research trawls in order to estimate sex-specific growth rates.

Data collected spanned the years 1985-1989. CDFW began aging otoliths taken from portside samples in southern California once again in 2007 and has continued through present. Barnes et al (2015) provided Von Bertallanffy growth parameter estimates from data collected through 2014. Additional data was collected since that study, so age data through 2017 was used to recalculate growth parameters using the standard Von Bertallanffy growth model and those values were used in the assessment.

California halibut maturity was studied in southern California by Love and Brooks (1990) who visually examined gonad samples during peak reproductive season. Information in this paper was used to model the logistic maturity curve in the assessment for southern California. Only female maturity is parameterized.

Figure 1. Density plots of biological parameters

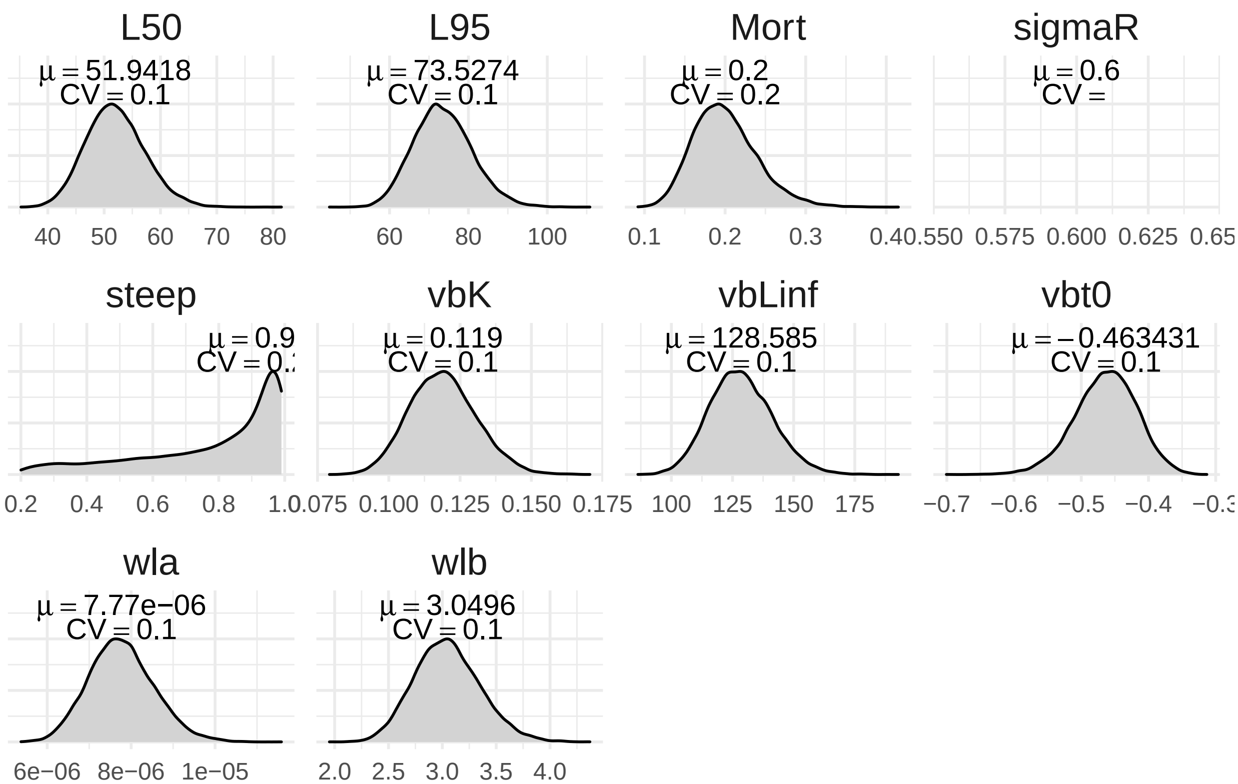
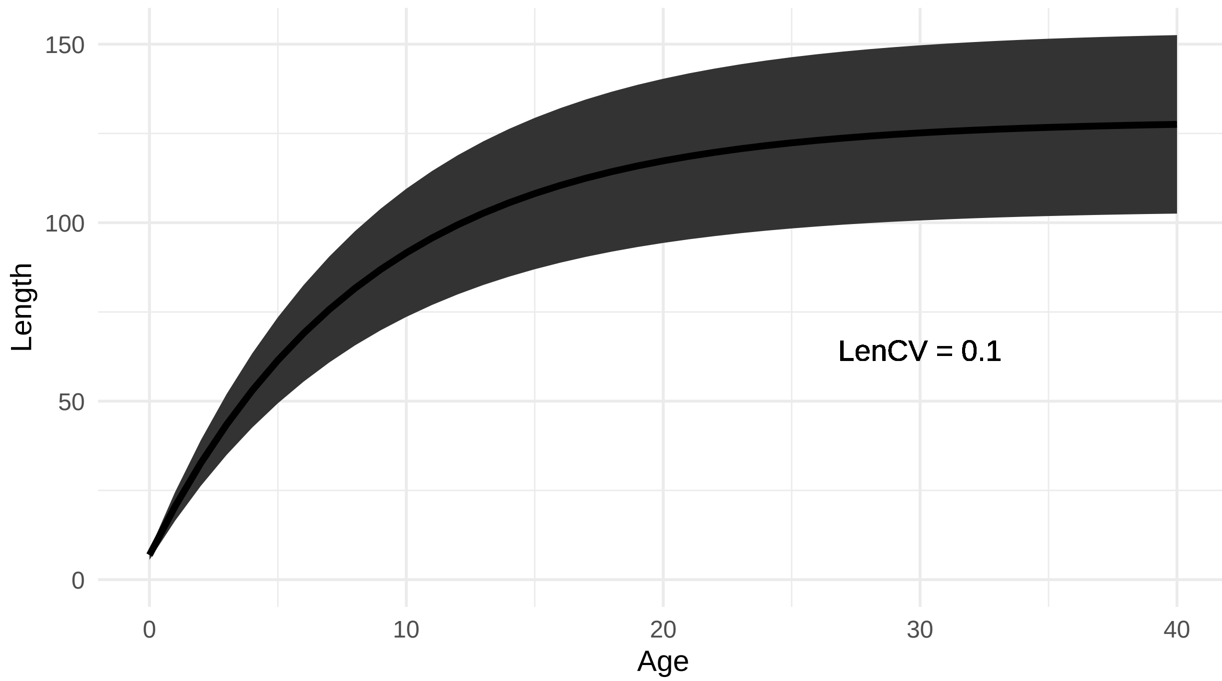


Figure 2. Distribution of length−at−age

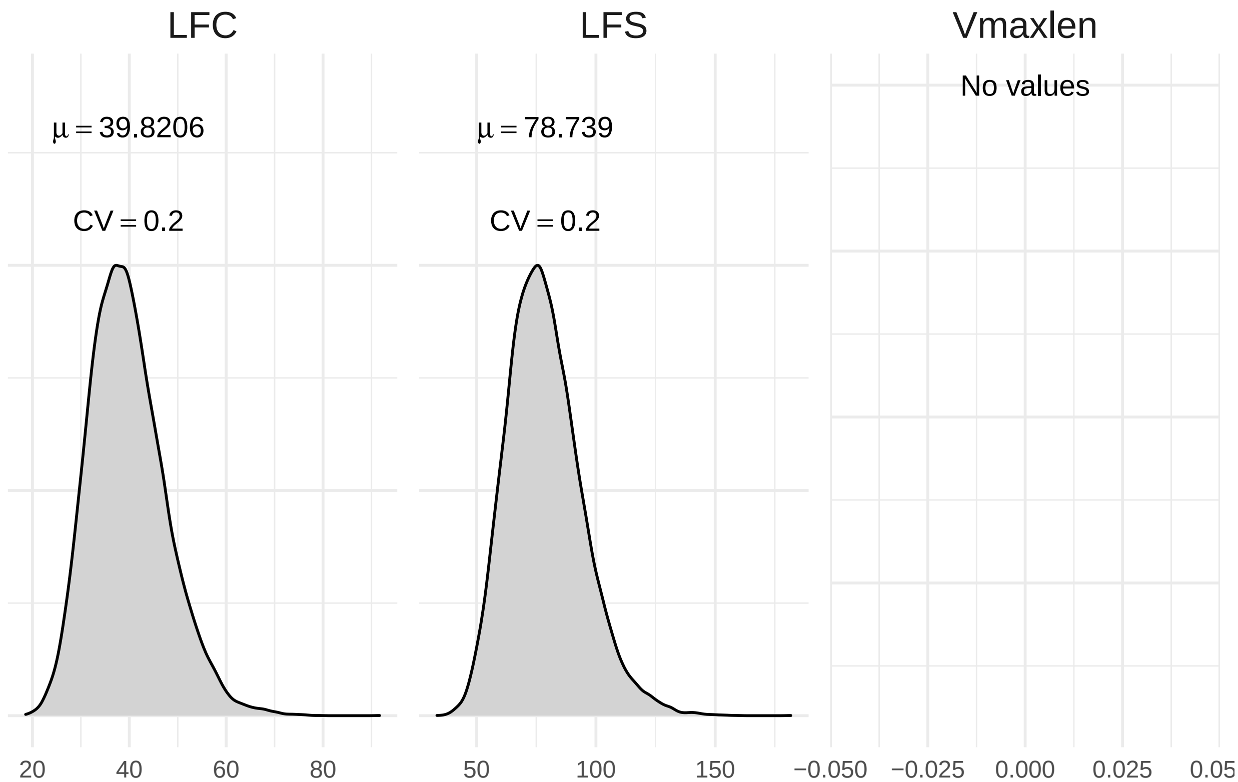
Mean length−at−age (solid line) and 2 standard deviations (shaded region)



Selectivity

Length-based selectivity is estimated by the SS model separately for each fleet. The selecivity parametes used in this data object are the result of MSEtool's function to translate these fleet-specific selectity curves into combined estimates.

Figure 3. Density plots of selectivity parameters

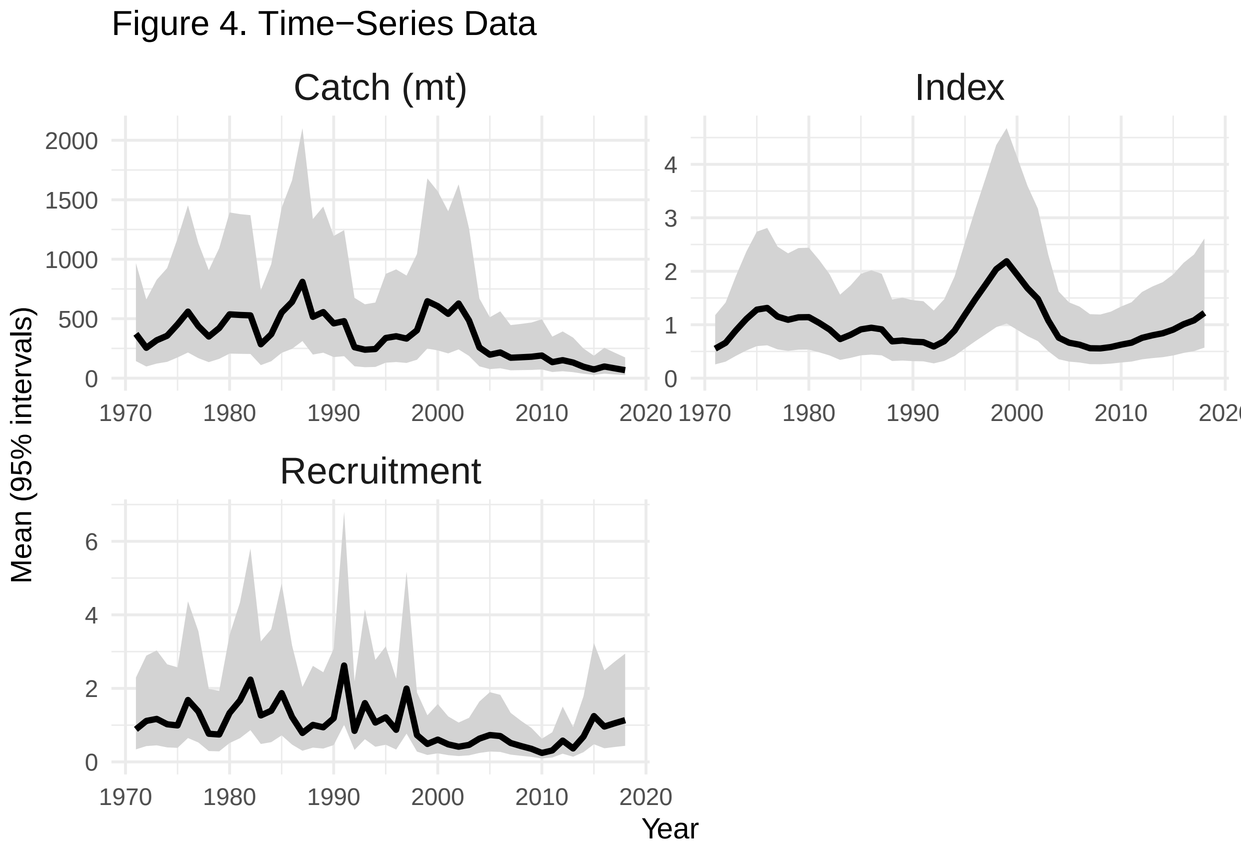


Time-Series

Landings in metric tons are reported from 1971 through 2018. They are a combination of recreational and commercial landings. Recreational catch estimates were available from three sources: 1971-1979 were reconstructed from the CPFV logbook data (Maunder et al 2010), 1980-2003 were obtained from the Marine Recreational Fisheries Statistical Survey (MRFSS) database, and data from 2004-2017 were taken from the California Recreational Fishing Survey (CRFS) database (www.recfin.org). Commercial landings were extracted from the CDFW Marine Landings Data System (MLDS) and reflect all fleets.

The abundance index is a combination of CPUE data for the trawl and recreational fleets that is combined by the MSEtool into a single index. Individual CPUE indices are described below. See the stock assessment report for further detail. The CPFV logbook database must be subset to obtain catch and effort data relevant only to those trips on which anglers could have potentially caught a Halibut. This was accomplished by applying a logistic regression on presence/absence data to determine the probability of a species co-occurring in the catch with Halibut (Stephens and MacCall 2004) and only using trips with species that had a moderate-high probability of co-occurring with a Halibut. Effort was calculated by summing the total angler hours for each trip and raw catch-per-unit effort was calculated by dividing that value by the number of Halibut caught on each individual trip. These data were then statistically standardized for the factors 'block', 'month', and 'year' using a delta-GLM (R GUI, package 'fishmethods'). The combined binomial and lognormal coefficients for year effect were used as the index of abundance. A CPUE abundance index for the trawl fleet was based on logbook data subset for logs from trips declaring halibut as a target and for trips not declaring halibut but occurring in less than 50 meters depth. The same standardization procedure for recreational data was used.

A recruitment index was pulled from the SS model that is a result of model estimated recruitments.



Catch-at-Age

Catch at age data are available from CDFW sampling efforts between 2007 and 2017. These were collected and specified in the SS model for each commercial fleet individually and exported by the MSEtool as a combined dataset.

Catch-at-Length

Catch at length data are available between 1980 and 2018. Lengths are binned by 1mm between 10 and 140mm. Recreational length data is availabe but isn't sex specific and so was not used here. Commercial length data is avaiable from CDFW port sampling and is fleet and sex specific. Only female data was used.

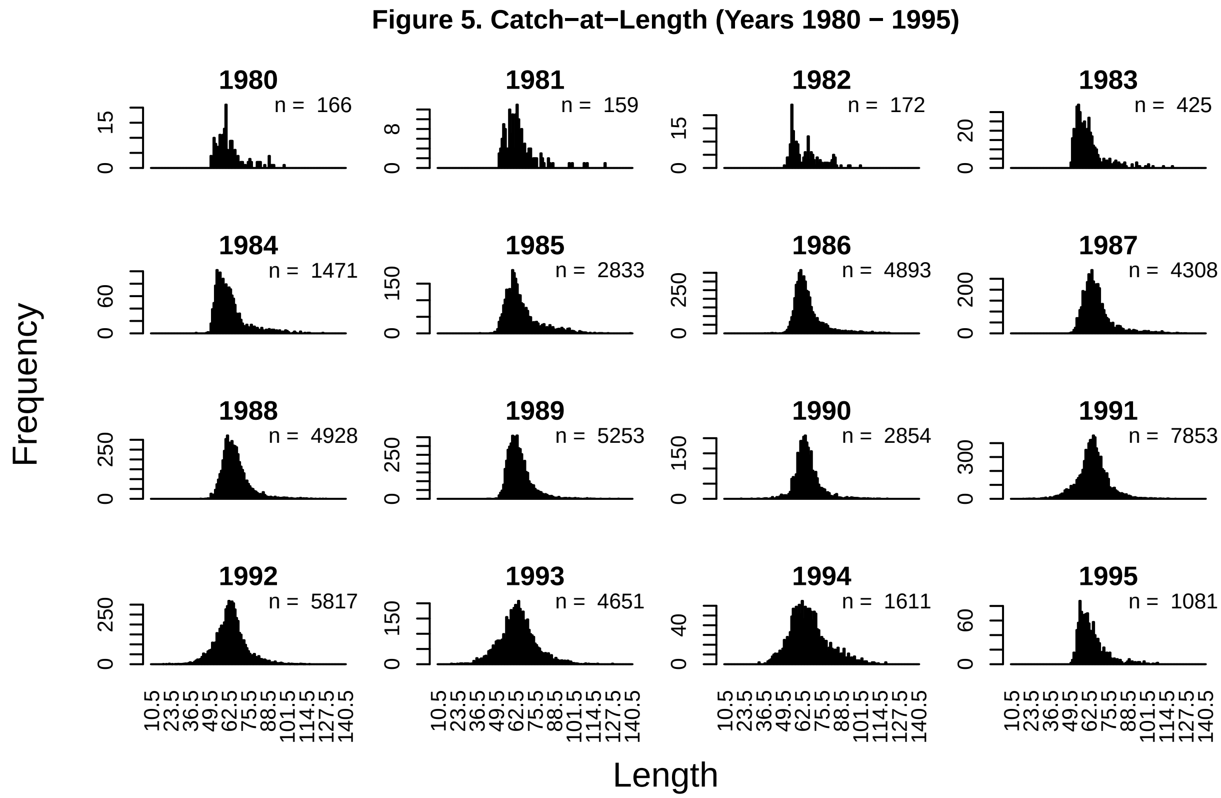


Figure 5. Catch−at−Length (Years 1980 − 1995)
1980
n = 166
1981
n = 159
1982
n = 172
1983
n = 425
1984
n = 1471
1985
n = 2833
1986
n = 4893
1987
n = 4308
1988
n = 4928
1989
n = 5253
1990
n = 2854
1991
n = 7853
1992
n = 5817
1993
n = 4651
1994
n = 1611
1995
n = 1081
Frequency
Length
10.5 23.5 36.5 49.5 62.5 75.5 88.5 101.5 114.5 127.5 140.5

Figure 6. Catch−at−Length (Years 1996 − 2012)

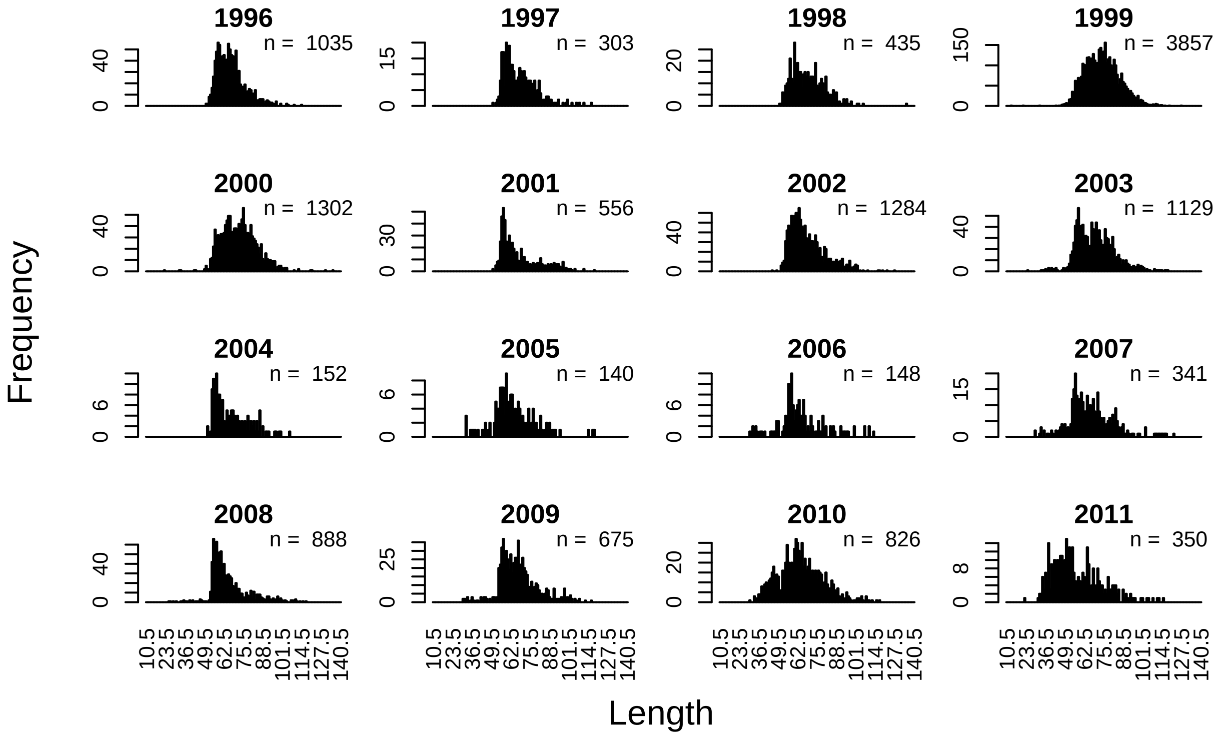
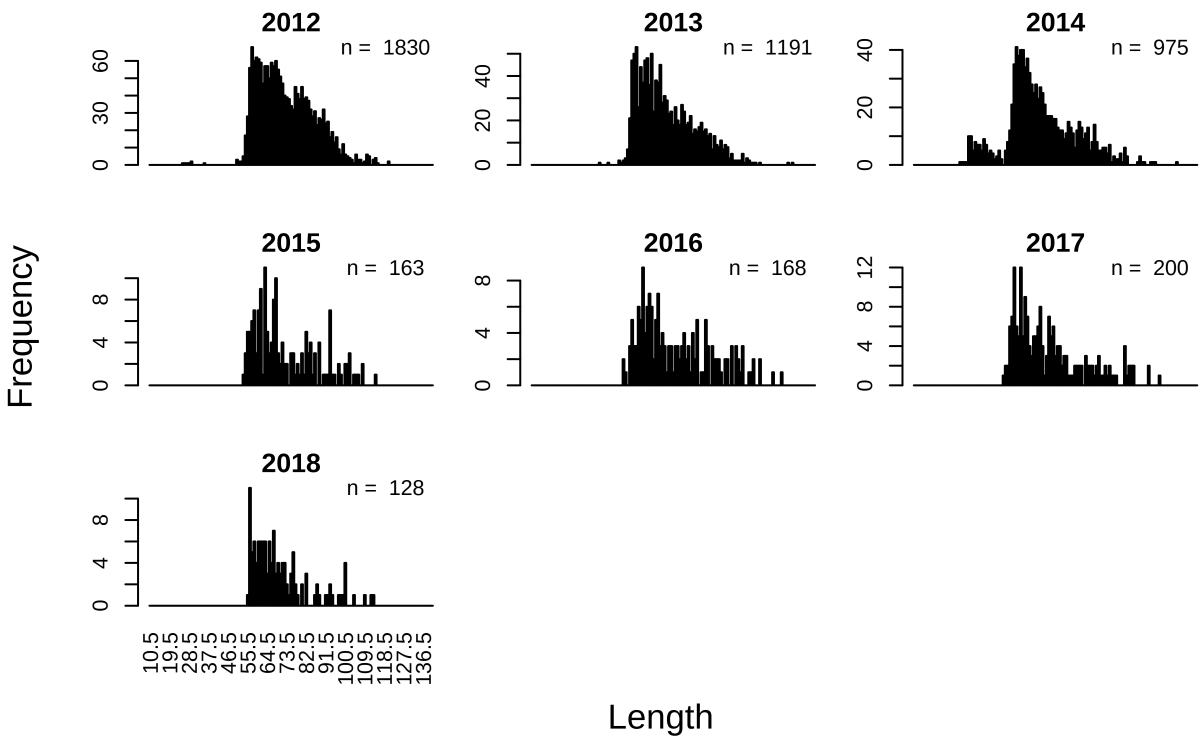


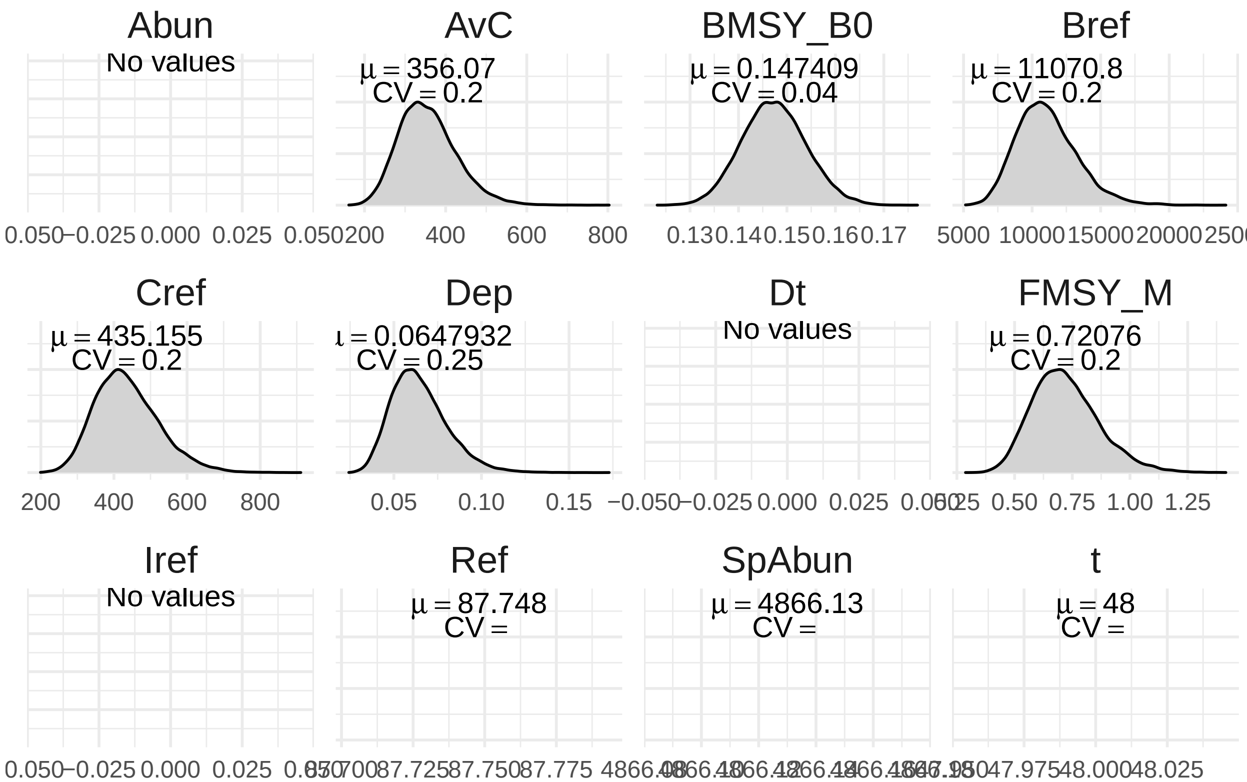
Figure 7. Catch−at−Length (Years 2012 − 2018)



Reference

Reference values are populated by the MSEtool function ss2Data based on MSY calculations made within the SS model.

Figure 8. Density plots of Reference parameters



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