Petrale sole 2019 Assessment

Updated Data and Results

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SSC Review

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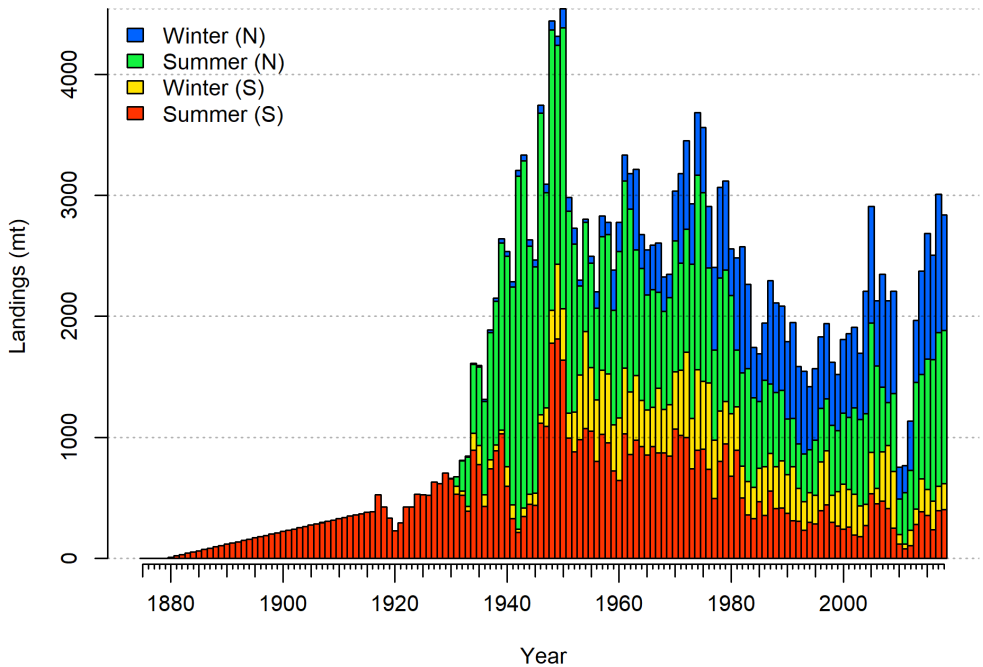
Outline

Petrale sole (*Eopsetta jordani*)

- Distributed from Alaska Aleutian Islands to Northern California
- Typically distributed between 200 - 400 meters during summer months
- Semi-demersal and can be pelagic
- Both sexes move to deeper water with age
- Currently, no evidence for genetic differences in the assessment area
- Females move to deeper waters post-spawning during winter months and return inshore in spring.

Landings



landings stacked.png

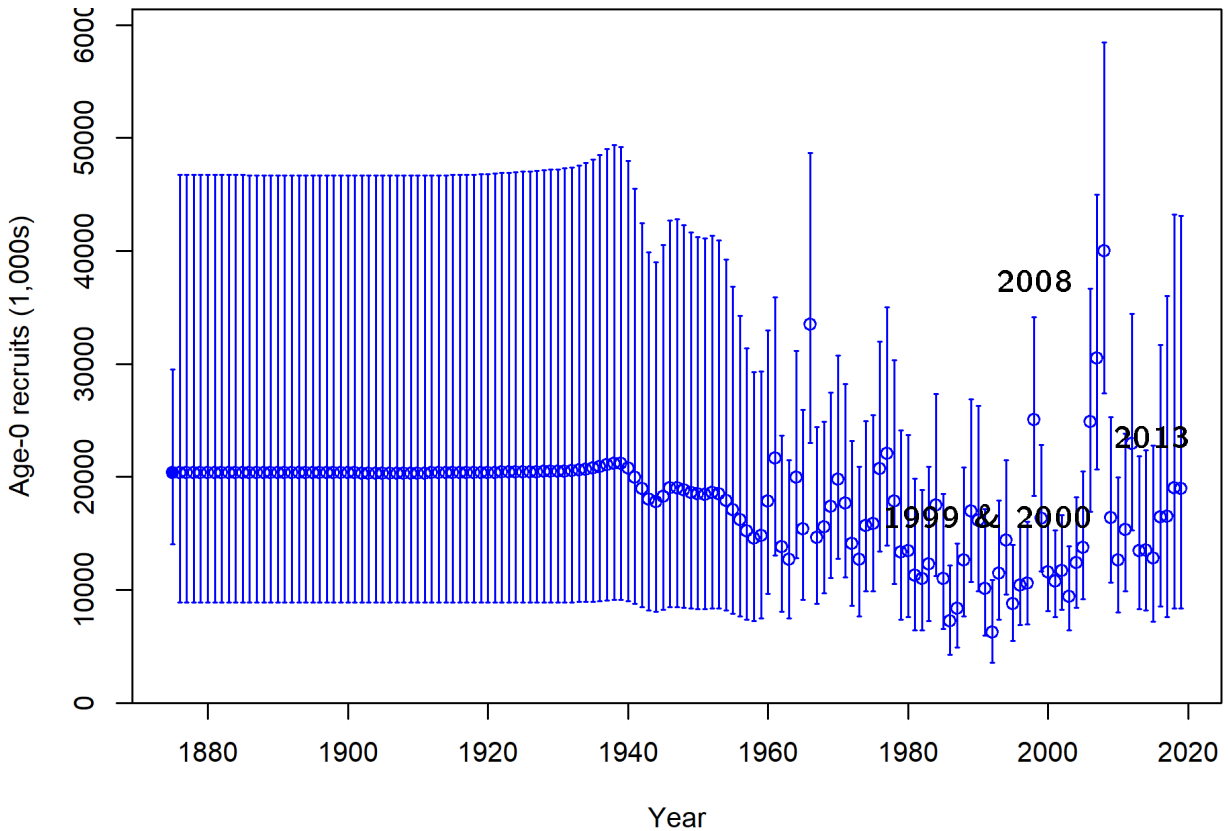
Landings Removals Over the Last 10-Years

Year	Winter-N	Summer-N	Winter-S	Summer-S	Total Landings	Total Removals
2009	874	642	470	250	2209	2344
2010	264	292	78	121	755	869
2011	224	427	40	78	768	785
2012	410	497	124	108	1135	1153
2013	513	1045	130	280	1967	1995
2014	853	861	273	386	2373	2392
2015	1040	1077	215	354	2686	2704
2016	865	1168	237	235	2506	2523
2017	1142	1271	201	393	3008	3026
2018	957	1262	218	402	2840	2857

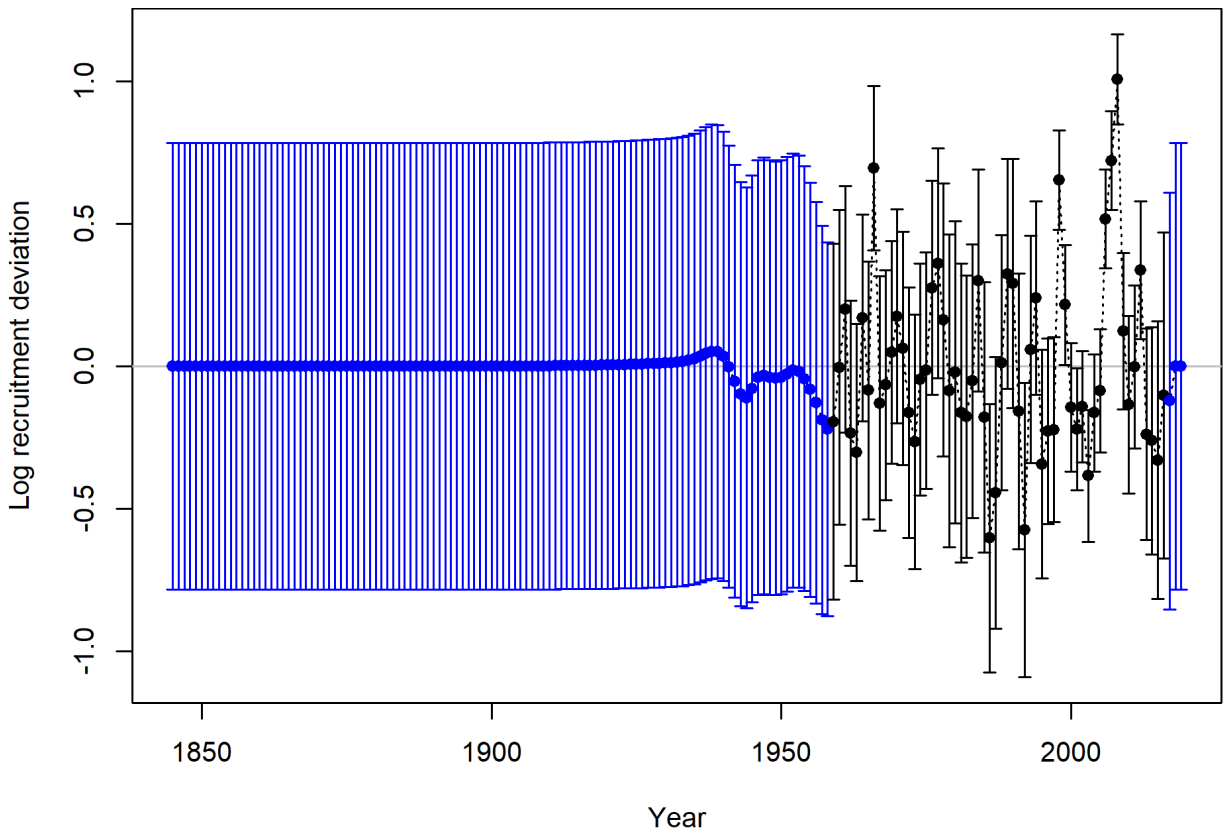
Correction for the Post-STAR Model

- Addition to California historical landings
  - 1948-1968 corrections totaling 10 mt
- Survey catch removal correction
  - Stock Synthesis was not removing catches for survey fleets
- Weight-at-length
  - Small correction to the weight-at-length values for females and males

Estimated Annual Recruitment



Estimated Annual Recruitment Deviations



Comparison between 2011 and 2017

Major Changes Between the Previous and Current Assessment

- Steepness
  - The 2011 assessment fixed $h = 0.40$
  - The current assessment fixed $h = 0.50$
- Natural Mortality
  - The 2011 assessment fixed $M = 0.05$ for females, males estimated $M = 0.051$
  - The current assessment fixed $M = 0.054$ for both sexes
- Landings History
- Maturity and Fecundity
- Fleet and Survey Selectivities

2011 Model Data "Update"

2017 Base Model Sensitivities

Key Sources of Uncertainty

- Steepness
  - Fixed at 0.50 within the base model. Likelihood profile over steepness indicates no information in data concerning steepness. Fixing the value at the steepness prior value of 0.72 results in stock status 97% of unfished.
- Natural Mortality
  - Fixed at 0.054 for males and females, the mean of the prior when maximum age is 100. Likelihood profile relatively flat around the prior.
- Recruitment
  - Estimated large recruitments in 2008 and 2013.
  - Setting these recruitments equal to the stock-recruitment curve results in a decline in stock status to 54%.
- NWFSC shelf-slope age data
  - Treating these data as either conditional age-at-length or as marginals results in differing estimates of R_0 and final stock status.

Outline

Fecundity

*Sensitivity to assumed fecundity shown to not have a large impact on results

Weight-at-Length

Length-at-Age

Data Summary Used in the 2017 Assessment

Outline

Landings Data: 2017 vs. 2011

Cumulative Catch Difference

*Resulted in $<$ 1% change in $R0$

Outline

Survey Stratificaiton and Model Selection

Survey	Depth (m)	Latitude	Model	Error
Pacific ocean perch	155-500	44-48.5	VAST	Lognormal
Triennial shelf	55-366	40.5-49	VAST	Lognormal
AFSC slope	183-549	42-49	VAST	Lognormal
NWFSC slope	183-549	42-49	Bayesian delta glmm	Gamma
NWFSC shelf-slope	55-549	42-49	VAST	Lognormal

Designed Based vs. Model Indices

Pacific Ocean Perch Survey Diagnostics

Triennial Shelf Survey Diagnostics

All: Standardized

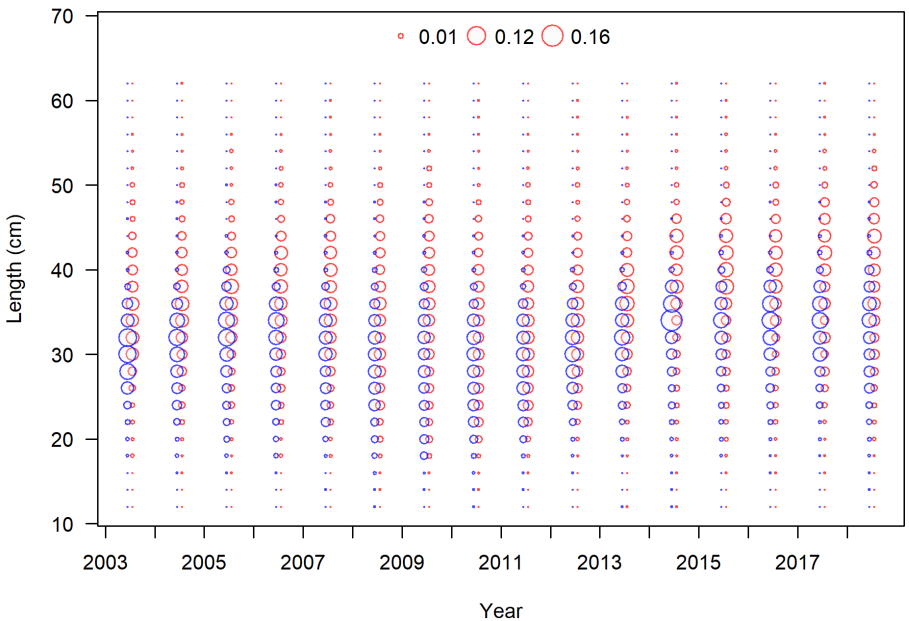
Outline

Fishery Length and Age Data

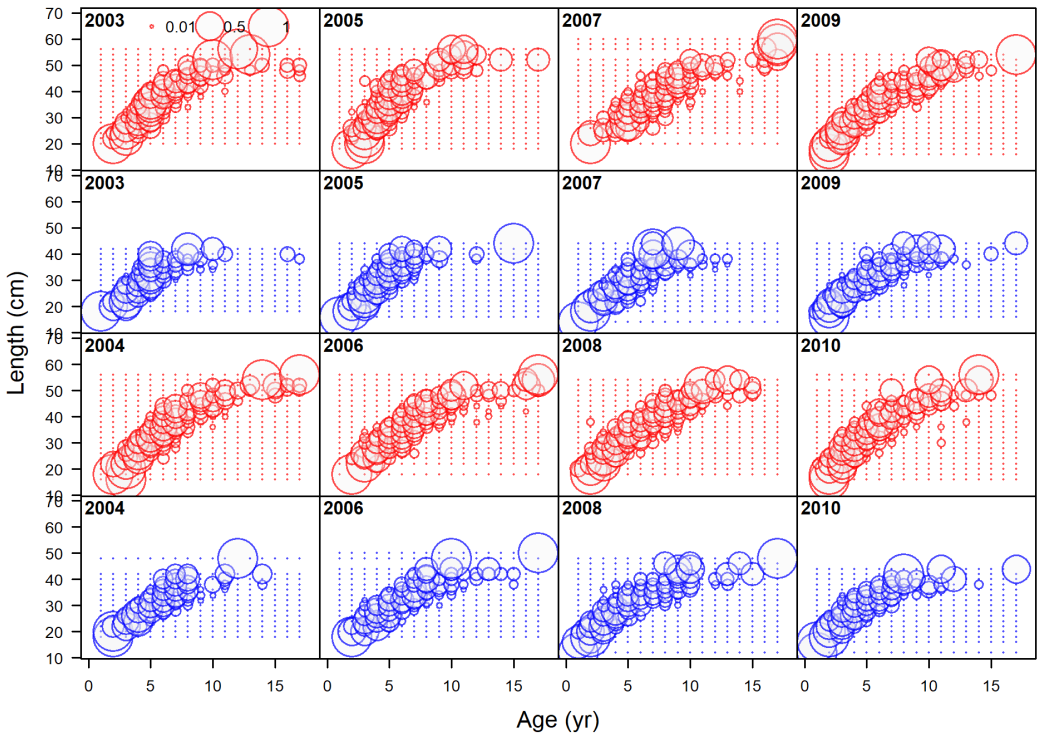
Fishery length data used in the 2017 assessment:

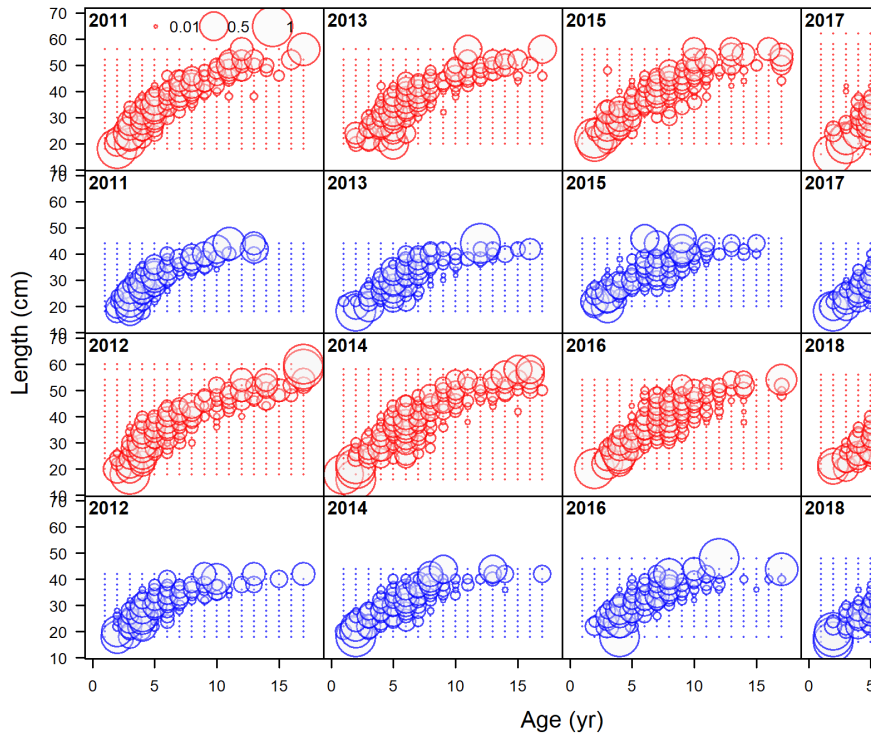
- Fishery: bottom trawl, mid-water trawl, fixed gear
  - Retained Lengths: 1966-2016
  - Discarded Lengths: 1986 (Pikitch), 2004-2015
  - Ages: 1981-1988, 1994, 1999-2016
- At-sea hake fishery
  - All (Retained and Discarded) Lengths: 2003-2016
  - Ages: 2003, 2006, 2007, 2014

NWFSC shelf-slope survey

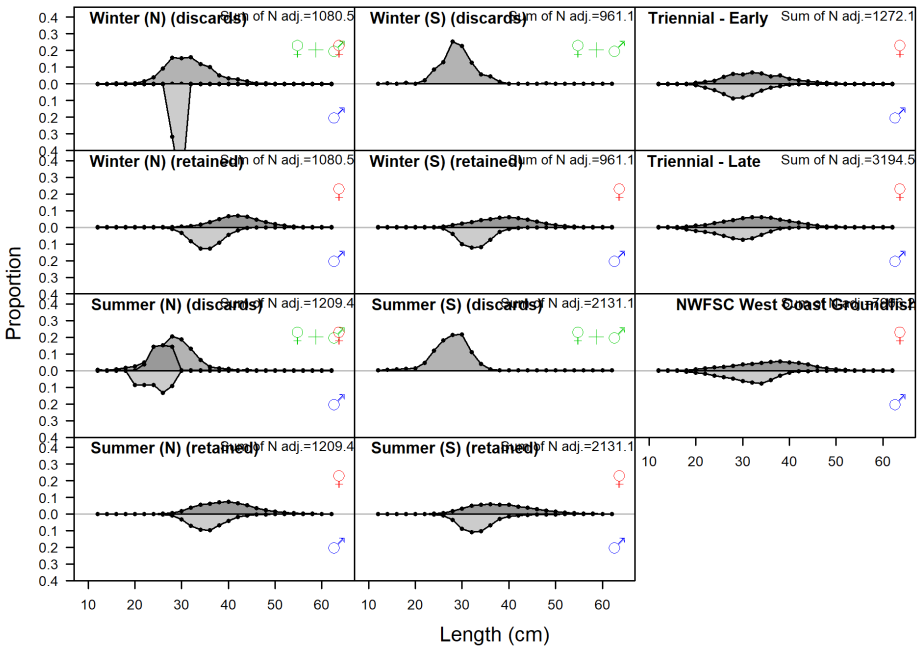


NWFSC shelf-slope conditional age-at-length





Aggregated data by source



Additional data slides