Chapter 10
Assessment of the Alaska plaice stock in the Bering Sea and Aleutian Islands

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Executive Summary

Alaska plaice (*Pleuronectes quadrituberculatus*) are assessed on a biennial stock assessment schedule as part of the National Marine Fisheries Service assessment prioritization plan implemented in 2017. For Bering Sea/Aleutian Islands partial assessments, an executive summary is presented to recommend harvest levels for the next two years. Please refer to last year's full stock assessment report for further information regarding the stock assessment model (Wilderbuer and Nichol, 2017, available online at https://repository/library/noaa.gov/view/noaa/17507). A full stock assessment document with updated assessment and projection model results is scheduled to be presented in next year's (2019) SAFE report.

A statistical age-structured model is used as the primary assessment tool for the Bering Sea/Aleutian Islands Alaska plaice assessment, a Tier 3 stock. This assessment consists of a population model that uses survey and fishery data to generate a historical time series of population estimates, and a projection model, which uses results from the population model to predict future population estimates and recommended harvest levels. The data sets used in this assessment include total catch biomass, fishery age compositions, trawl survey abundance estimates and trawl survey age compositions. In a partial assessment year, the full assessment model is not rerun but instead a Tier 3 projection model with an assumed future catch is run to estimate the stock level in future years. This incorporates the most current catch information without re-estimating model parameters and biological reference points. The Tier 3 projection operates outside the full assessment model by projecting estimates of future female spawning biomass, age 6+ total biomass, ABC and OFL from the full model estimate of 2017 numbers-at-age and weight-at-age.

Summary of Changes in Assessment Inputs

Changes in the input data: New data added to the Tier 3 projection model, used to forecast stock condition ahead to year 2032, included an updated 2017 catch estimate (16,489 t) and new catch estimates for 2018. The 2018 catch was estimated by rounding the catch as of October 15, 2018 upward (since Alaska plaice catch was still accumulating at about 200 t per week) to 24,000 t (from 22,507) as the final 2018 catch. To estimate future catches through 2032, the catches that corresponded to the average F of the most recent 5 years were used, as estimated by the 2017 full assessment.

Changes in the assessment methodology: There were no changes in assessment methodology since this was an off-cycle year.

Summary of Results

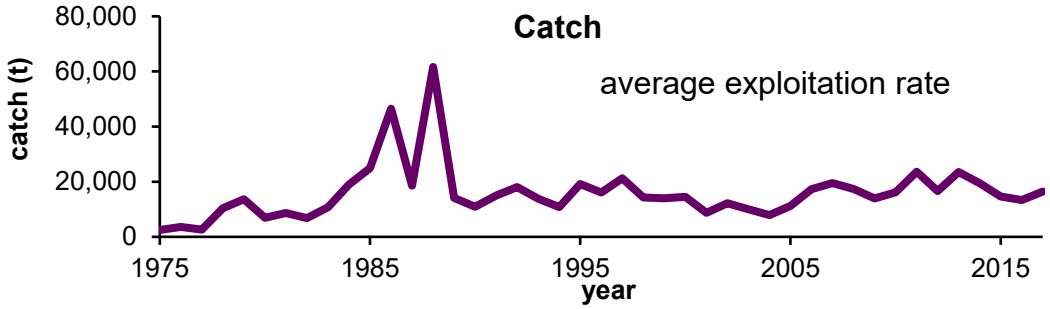
For the 2019 fishery, the recommend harvest is the maximum allowable ABC of 143,100 t from the Tier 3 projection model. This ABC is 14% less than last year's ABC of 155,100 t. Reference values for BSAI

Alaska plaice are summarized in the following table, with the recommended ABC and OFL values for 2019 in bold.

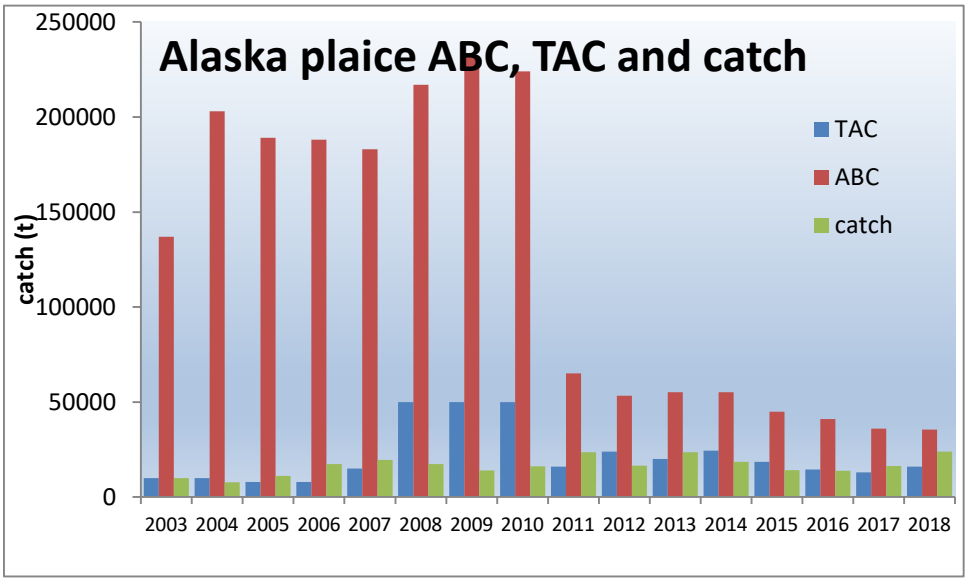
Quantity	As estimated or *specified last* year for: 2018	2019	As estimated or *recommended this* year for: 2019	2020
M (natural mortality rate)	0.13	0.13	**0.13**	0.13
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	417,300	412,000	**400,700**	394,700
Female spawning biomass (t)	191,460	181,730	**186,100**	171,100
$B_{100\%}$	317,360	317,360	**317,360**	317,360
$B_{40\%}$	126,900	126,900	**126,900**	126,900
$B_{35\%}$	111,100	111,100	**111,100**	111,100
F_{OFL}	0.149	0.149	**0.149**	0.149
$maxF_{ABC}$	0.124	0.124	**0.124**	0.124
F_{ABC}	0.124	0.124	**0.124**	0.124
OFL (t)	41,170	38,800	**39,880**	37,860
maxABC (t)	34,590	32,700	**33,600**	31,900
Status	As determined *last* year for: 2016	2017	As determined *this* year for: 2017	2018
Overfishing	no	n/a	No	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished. The tests for evaluating these three statements on status determination require examining the official total catch from the most recent complete year and the current model projections of spawning biomass relative to $B_{MSY\%}$ for 2018 and 2019. The estimated total catch for 2018 is 24,000 t, far below the 2018 OFL of 41,170 t; therefore, the stock is not being subjected to overfishing. The estimates of spawning biomass for 2019 and 2020 from the 2018 stock assessment projections are 186,100 t and 171,100 t, respectively. Both estimates are well above the estimate of $B_{MSY\%}$ at 111,100 t and, therefore, the stock is not currently overfished nor approaching an overfished condition.

Fishery Trends

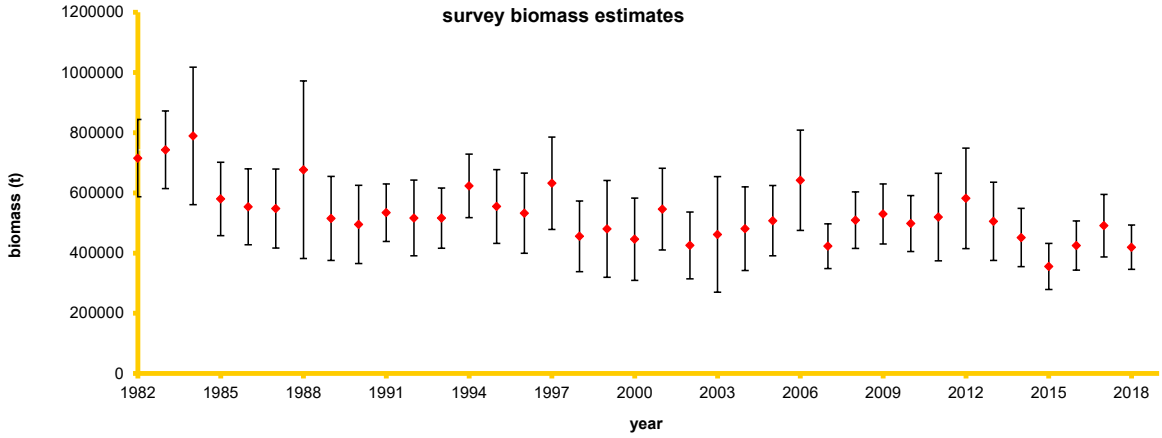


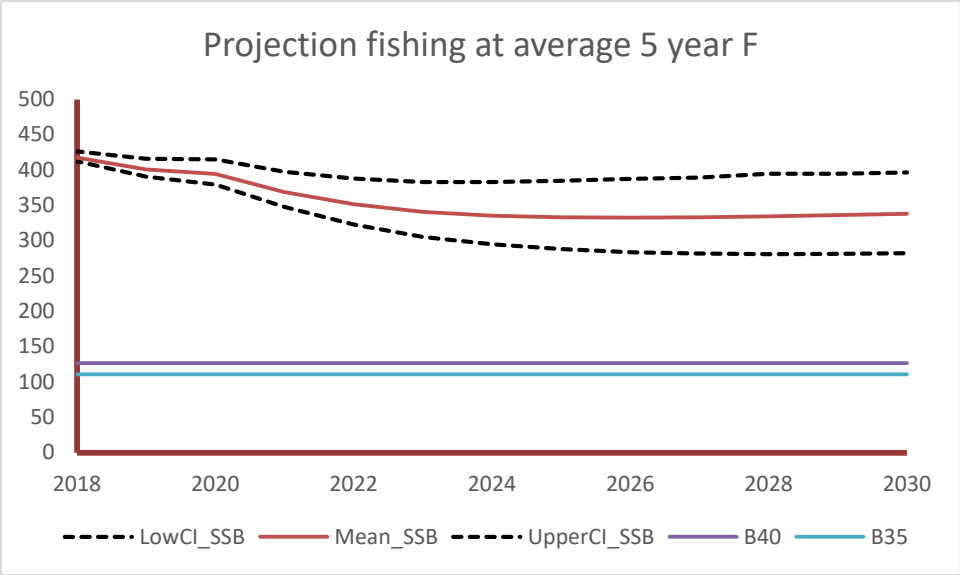
The Alaska plaice catch in 2018 of 22,507 t (as of October 13) is above the 1975-2018 long term average of 15,825 t, but well below the annual ABC in every year. Catches primarily are made throughout the year as bycatch in the yellowfin sole and northern rock sole fisheries. Retention rates are high, estimated at 85% in 2016.



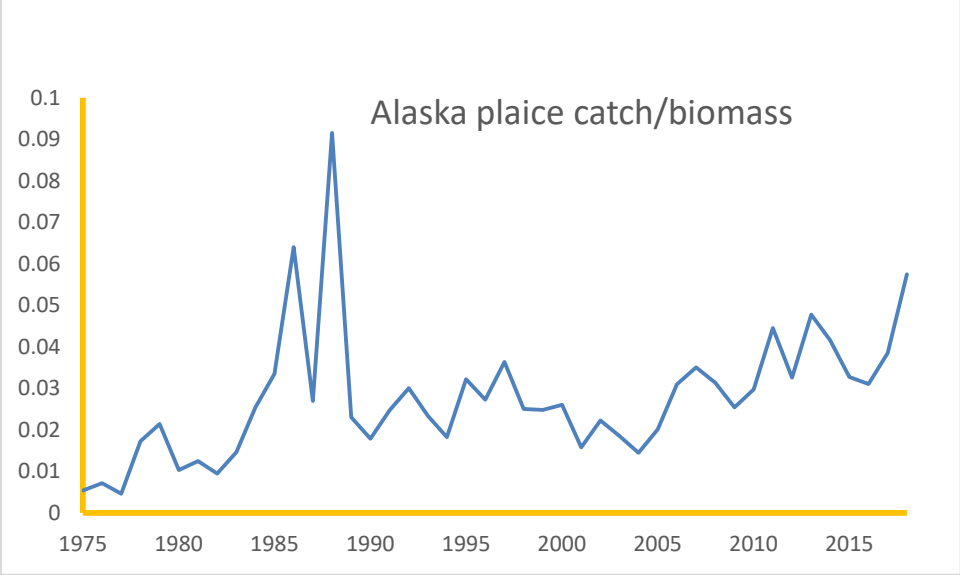
Survey Trends

The 2018 shelf trawl survey abundance estimate decreased 15% from the 2017 estimate and the stock has been at a lower level relative to the time-series for the past 5 years.





The Alaska plaice stock is projected to remain above the $B_{35\%}$ level of female spawning biomass while declining through 2023.



Exploitation fraction has averaged 3% from 1975-2018. Biomass is model estimate of total biomass.