

Chapter 10

Partial 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, 2019; available online at <https://www.npfmc.org/safe-stock-assessment-and-fishery-evaluation-reports/>).

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 2019 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 2019 catch estimate (16,163 t) and new catch estimates for 2020 through October 23, 2020. The full-year 2020 catch was estimated by rounding the catch as of October 23 (19,685) upward to 20,000 t based on predicted further accumulation of 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 2019 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 2021, the recommended harvest is the maximum allowable ABC of 31,657 t from the Tier 3 projection model. Reference values for BSAI Alaska plaice are summarized in the following table, with the recommended ABC and OFL values for 2021 in bold.

Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2020	2021	2021	2022
<i>M</i> (natural mortality rate)	0.13	0.13	0.13	0.13
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	428,800	435,700	427,587	430,164
Female spawning biomass (t)	170,800	161,000	166,528	160,150
<i>B</i> _{100%}	333,300	333,300	335,172	335,172
<i>B</i> _{40%}	133,300	133,300	134,069	134,069
<i>B</i> _{35%}	116,600	116,600	117,310	117,310
<i>F</i> _{OFL}	0.15	0.15	0.160	0.160
<i>maxF</i> _{ABC}	0.125	0.125	0.132	0.132
<i>F</i> _{ABC}	0.125	0.125	0.132	0.132
OFL (t)	37,600	36,500	37,924	36,928
maxABC (t)	31,600	30,700	31,657	30,815
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2018	2019	2019	2020
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 2019 and 2020. The estimated total catch for 2020 is 20,000 t, far below the 2020 OFL of 37,600 t; therefore, the stock is not being subjected to overfishing. The estimates of spawning biomass for 2021 and 2022 from the 2019 stock assessment projections are 166,528 t and 160,150 t, respectively. Both estimates are well above the estimate of $B_{35\%}$ at 117,310 t and therefore the stock is not currently overfished nor approaching an overfished condition.

Fishery Trends

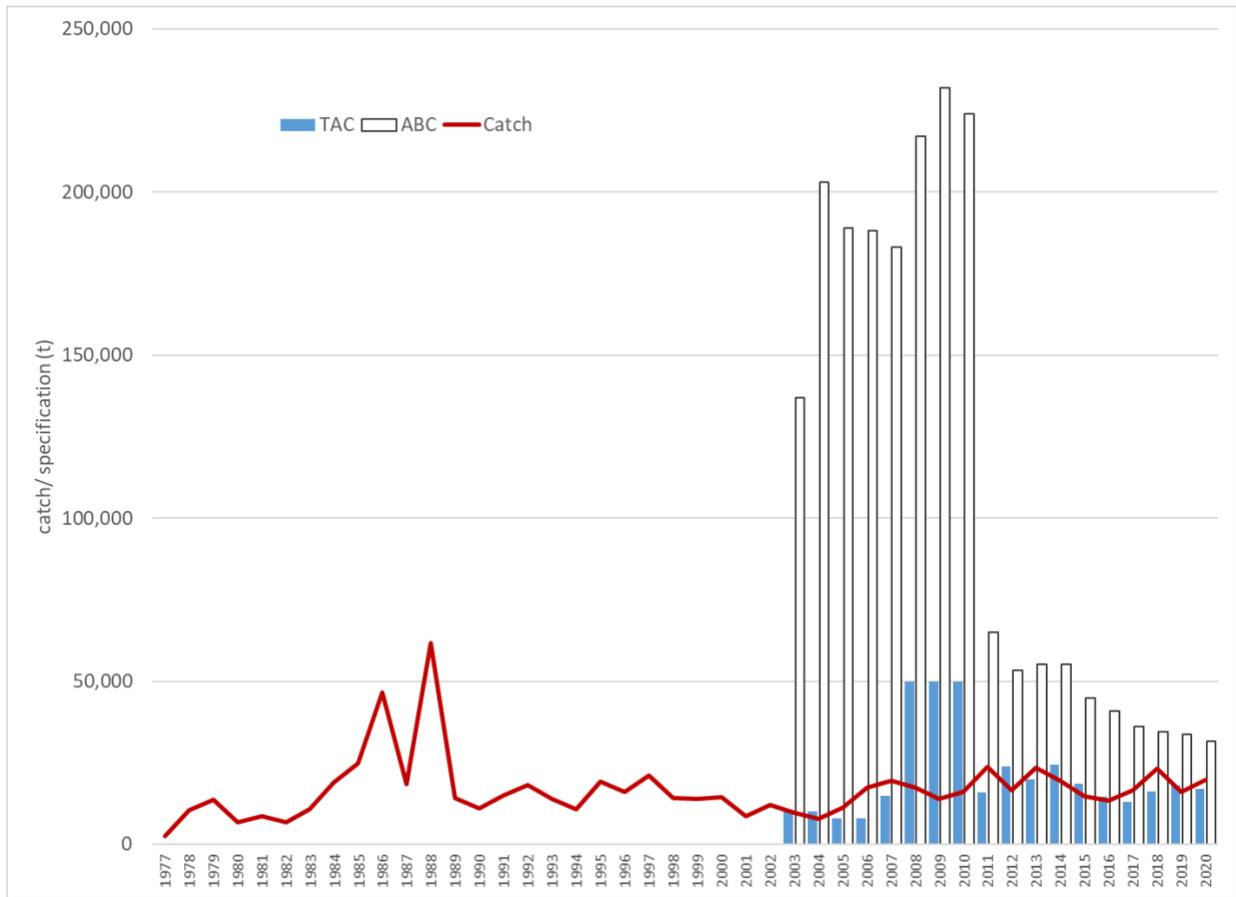


Figure 1. Alaska plaice catch, ABC, and TAC from 1977-2020. Data are from the NMFS Alaska Regional Office. As of October 23, 2020 the Alaska plaice catch for 2020 was 19,685 t, which is above the 1975-2019 long-term average of 15,825 t but well below the annual ABC in every year. Catches are made throughout the year primarily as bycatch in the yellowfin sole and northern rock sole fisheries. Retention rates are high, estimated at 91% in 2018 and 96% in 2019.

Population Trends

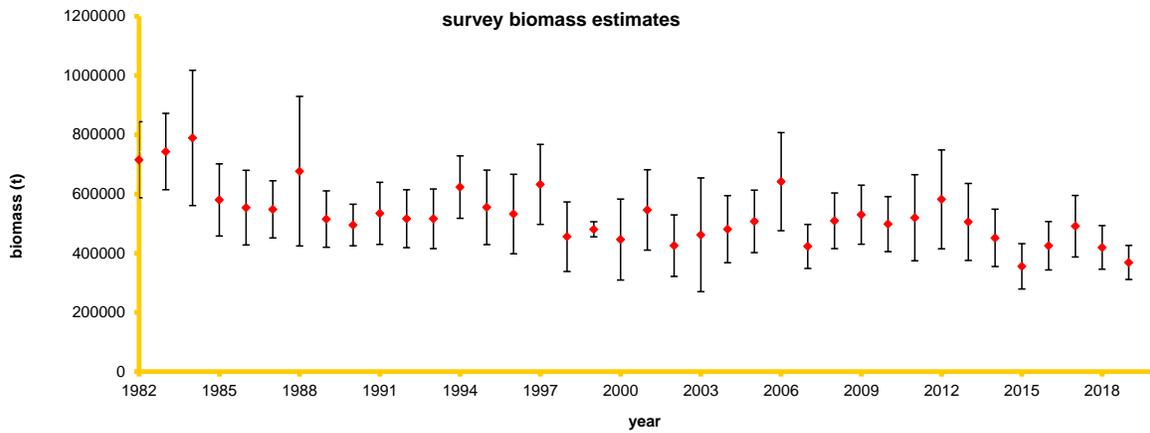


Figure 2. Alaska plaice biomass estimates from the EBS shelf trawl survey, 1982-2019. The 2019 shelf trawl survey abundance estimate decreased 12% from the 2018 estimate and the stock has been at a lower level relative to the time-series for the past 5 years. No survey was conducted in 2020 due to the coronavirus pandemic.

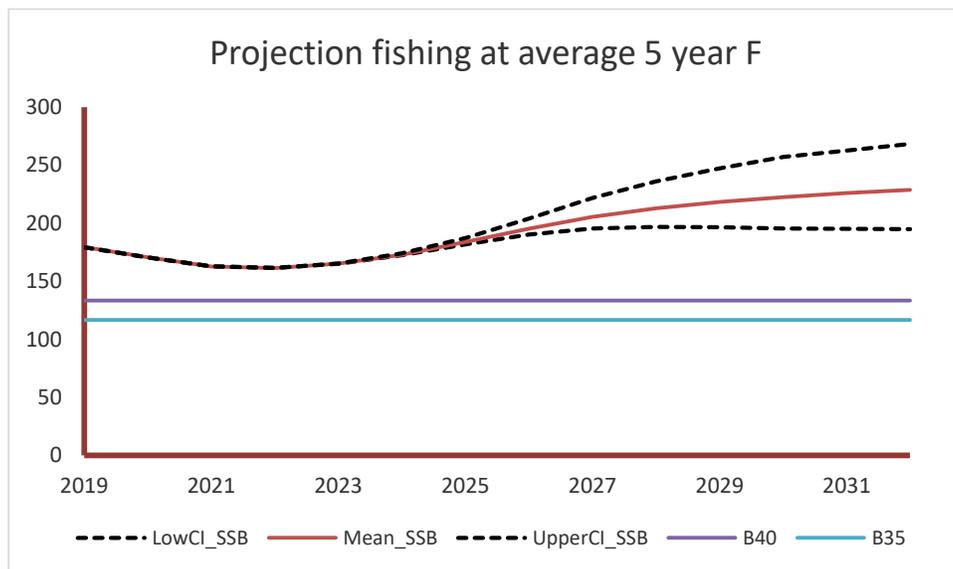


Figure 3. Projected spawning biomass of Alaska plaice in the BSAI. The Alaska plaice stock is projected to remain above the $B_{35\%}$ level of female spawning biomass while declining over the next several years.

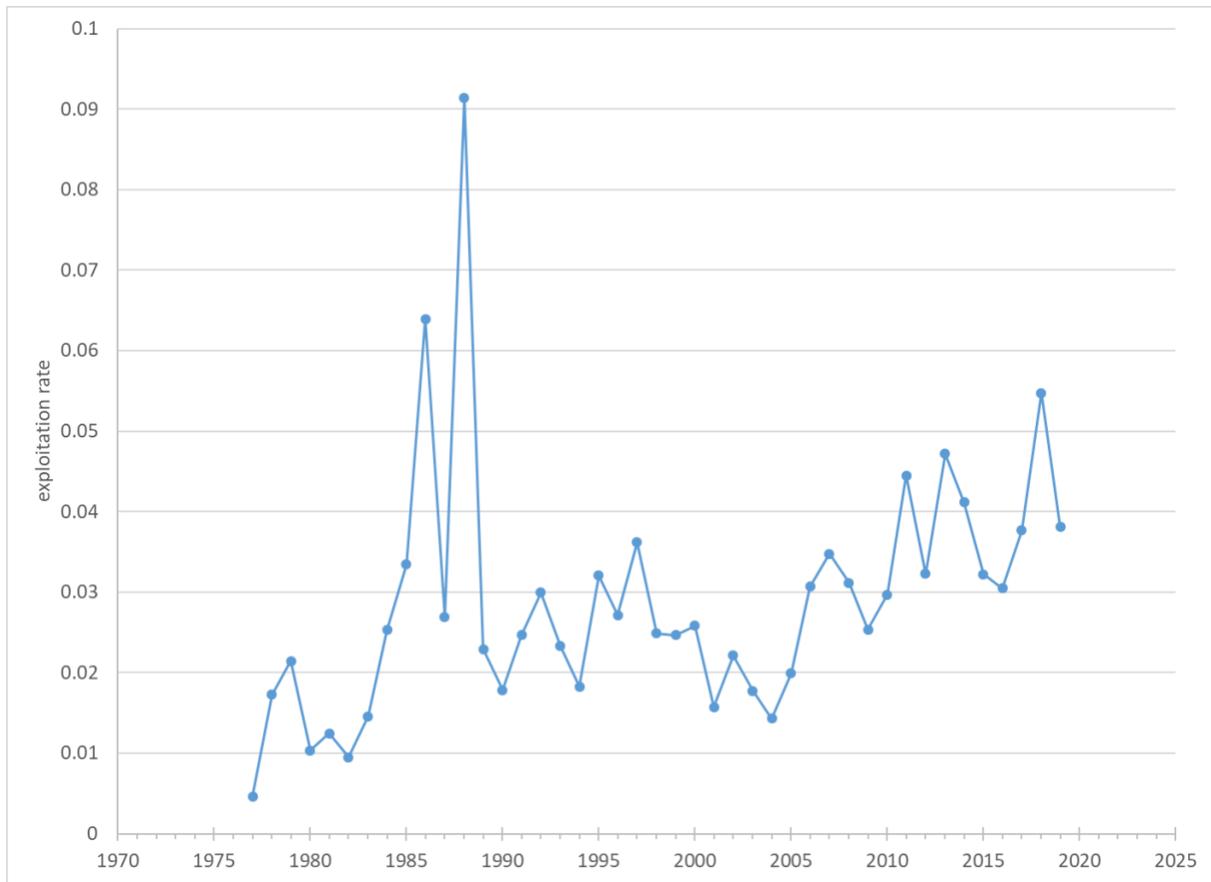


Figure 4. Exploitation rate (catch/biomass) of Alaska plaice. Exploitation fraction has averaged 3% from 1975-2019. Biomass is the model estimate of total biomass. Exploitation rates have increased in recent years as the biomass has slowly declined.