C4 Gulf of Alaska Groundfish
November 2023 Plan Team Report

Sara Cleaver, Jim Ianelli, and Chris Lunsford

December 2023, Presentation to the NPFMC
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GOA Assessment Overview

Bottom-trawl survey year for GOA
Stock Assessment and Fishery Evaluation Report (SAFE) for the NPFMC SSC/Council review
Note, links will become live as documents are completed, please "refresh" browsers, also some assessments are in an "off" year.

Ecosystem status reports:
- EBS ESR
- Aleutian Islands ESR
- GOA ESR

BSAI Introduction (with links to each chapter)
GOA Introduction (with links to each chapter)
GOA Entire SAFE (zip file, 120mb)
GOA Entire SAFE (zip file, 131mb)

Eastern Bering Sea Pollock
- Muti-species model supplement
- Aleutian Is. Pollock
- Bogoslof Pollock

GOA Pollock

GOA Pacific cod

AK Sablefish

GOA Shallow-water Flatfish

BSAI Yellowfin Sole

Gulf of Alaska (GOA)

GOA Introduction Contents
Summary
Overview of Stock Assessments
Economic Summary of the GOA commercial groundfish fisheries in 2020-2021
Ecosystem Considerations summary
Stock summaries
1. Walleye pollock
2. Pacific cod
3. Sablefish
4. Shallow water flatfish (partial)
5. Deepwater flatfish complex (partial)
6. Rex sole (partial)
7. Arrowtooth flounder (partial)
8. Flathead sole
9. Pacific ocean perch (partial)
10. Northern rockfish
11. Shortraker rockfish (no assessment)
12. Dusky rockfish
13. Roughy and blackspotted rockfish (partial)
14. Demersal shelf rockfish
15. Thunnids
16. Other rockfish (no assessment)
17. Atka mackerel (no assessment)
18. Skates (no assessment)
19. Shad
20. Octopus (no assessment)
Appendix 1. Forage species
Tables
Revenue and changes (2021-2022)

GOA First-Wholesale Revenue Change in 2021-2022
Decomposed by Species Group

- Price effect
- Quantity effect
- Net effect

Species:
- Other
- Flatfish
- Sablefish
- Pac. cod
- Pollock
2023-2024 ABC change (based on Plan Team recommendations)

Overall a 19% increase

ABC change (%) from 2023 to 2024

<table>
<thead>
<tr>
<th>Category</th>
<th>Change (%)</th>
</tr>
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<tbody>
<tr>
<td>Roundfish</td>
<td>43%</td>
</tr>
<tr>
<td>Flatfish</td>
<td>2%</td>
</tr>
<tr>
<td>Rockfish</td>
<td>3%</td>
</tr>
<tr>
<td>Sharks</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>19%</td>
</tr>
</tbody>
</table>
2023-2024 ABC change (based on Plan Team recommendations)

ABC change (tons) from 2023 to 2024

- Roundfish: 96,273
- Flatfish: 4,761
- Rockfish: 2,008
- Sharks: 0
- Total: 102,515
Percentage change in ABC, 2023-2024 (based on Plan Team recs)
GOA Catch and ABC levels

- Pollock
- Pacific Cod
- Sablefish
- Flatfish
- Arrowtooth flounder
- Rockfish
- Sharks
- Skates

Tons

ABC 2023
ABC 2024
2023 catch
**ABC changes**

**2023 ABC** (539,072 t)

- POP and Northernns: 8%
- Arrowtooth flounder: 22%
- Flathead sole: 7%
- Shallow water flatfish: 10%
- Skates: 1%
- Atka: 1%
- Other rockfish: 2%
- Other species: 2%
- Pollock: 30%
- Pacific Cod: 5%
- Sablefish: 6%
- Deep and rex sole: 5%
- Shallow water sole: 7%
- Deep and rex flatfish: 4%

**2024 ABCs** (641,587 t)

- POP and Northernns: 7%
- Arrowtooth flounder: 19%
- Flathead sole: 10%
- Shallow water flatfish: 10%
- Skates: 1%
- Atka: 1%
- Other species: 2%
- Pollock: 38%
- Pacific Cod: 5%
- Sablefish: 7%
- Shallow water sole: 4%
- Deep and rex flatfish: 4%
Stock status summary **last year**
Stock status summary **this** year
Species overviews

1. 2023 ABC/Catch and recommended changes

2. Highlights
   - New data
   - Analytic approach (changes)

3. Stock status and trend

4. ABC/OFL
   - Tier history and recommendations
   - 2024, 2025 maxABC; recommended ABC
<table>
<thead>
<tr>
<th>Assessment Type</th>
<th>GOA Stocks for 2023</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Operational Full** (full) | Pollock Pacific cod Other rockfish Roughey/Blackspotted rockfish Shortraker rockfish | • Considers all data, new model configurations, new modeling platform  
• More in-depth review |
| **Operational Update** (full) | Sablefish Deepwater flatfish Pacific ocean perch Skates | • Maintains model structure of previous full assessment  
• New data  
• Minimal changes  
• Reduced review  
• Meant to improve efficiency and streamline process |
| **Harvest Projection** (partial) | Arrowtooth flounder Dusky rockfish Flathead sole Northern/Southern rock sole Northern rockfish Rex sole Shallow water flatfish | • Executive summary  
• Runs projection model, reports new catches, catch/biomass or REMA model |
<p>| <strong>Catch Report</strong> (n/a) | Atka mackerel Demersal shelf rockfish Octopus Thornyheads Sharks | • Off-year assessment. Still monitored via recent catch, ABC, OFL |
| <strong>Other</strong> | Sculpins (eco report) | Combined w/ BSAI (presented in Joint Team report) |</p>
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<th>Species</th>
<th>2023 catch</th>
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<td>462</td>
<td>4,700</td>
<td>4,700</td>
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</tr>
<tr>
<td>Skates</td>
<td>2,741</td>
<td>6,563</td>
<td>6,036</td>
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<td>Sharks</td>
<td>1,777</td>
<td>4,891</td>
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<td>Octopus</td>
<td>154</td>
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<td>Total</td>
<td>222,863</td>
<td>539,072</td>
<td>641,587</td>
<td>up 102,515 (19%)</td>
</tr>
</tbody>
</table>

**NOTE:**
SSC had a change (stair step the increase)
GOA Pollock: Catch

Catches (thousands of tons)

- Foreign
- Joint Venture
- Domestic
- ABC/TAC

Year:
- 1970
- 1980
- 1990
- 2000
- 2010
- 2020
GOA Pollock: 2023 Shelikof Strait pollock acoustic trawl (AT) survey

- Shelikof down and few small fish
- Chirikof and Marmot Bay are both up, but within historical norm
GOA Pollock: 2023 Summer pollock AT survey

Thanks to D. McGowan
GOA Pollock: 2023 Summer NMFS bottom trawl survey results

Pollock 2023
GOA Pollock: Sequential addition of data

- Big increases with addition of NMFS BT and Shelikof data
- Moderate w/ summer AT
- Recent trend but also scale
GOA Pollock: fit to indices

- Poor fits, wrong trends for key surveys
GOA Pollock: Risk table

<table>
<thead>
<tr>
<th>Assessment-related considerations</th>
<th>Population dynamics considerations</th>
<th>Environmental/ecosystem considerations</th>
<th>Fishery Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 2: Major concern</td>
<td>Level 1: No concern</td>
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</tr>
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</table>

- Assessment concerns: poor fit to NMFS BT index, retrospective
- Population concerns: extreme low cohorts
GOA Pollock

Author’s 2023 ABC = 232,543 t
- Increase of 56% from 2023
- 2025 ABC decreases to 157,687 t
- No reduction from max ABC

Changes to model:
- No structural changes
- Converted to TB (23.0)

Concerns:
- Extremely small recent cohorts
- Poor fit to NMFS bottom trawl index

Positives:
- 2017, 2018, 2020 cohorts above average
- 2012 estimate up to ~50 billion
- Good environmental conditions

Thanks to Cole Monnahan
<table>
<thead>
<tr>
<th>Quantity/Status</th>
<th>As estimated or <em>specified last year</em> for:</th>
<th>As estimated or <em>recommended this year</em> for:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2023</td>
<td>2024</td>
</tr>
<tr>
<td>Biomass (t)</td>
<td>50,505</td>
<td>50,505</td>
</tr>
<tr>
<td>F_{0FL}</td>
<td>0.30</td>
<td>0.30</td>
</tr>
<tr>
<td>maxF_{ABC}</td>
<td>0.23</td>
<td>0.23</td>
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<td>0.23</td>
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<td>OFL (t)</td>
<td>15,150</td>
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</tr>
<tr>
<td>maxABC (t)</td>
<td>11,363</td>
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As determined *last year* for:
- Status: 2022, 2023
- Overfishing: No, n/a

As determined *this year* for:
- Status: 2023, 2024
- Overfishing: No, n/a
• Appreciated the detailed work by Dr. Monnahan and his coauthors

• Noted that GOA pollock is scheduled for a CIE review in spring 2024
  o A focus of review on data weighting and compositional input sample sizes

• Market conditions for GOA pollock poor

• ABC accepted as determined by model 23.0.

• The Team agreed with the author’s recommended model, ABC, OFL, and apportionment
## GOA Pacific cod

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GOA Pacific cod: Data

• Decreased since 2022
• Pot majority > LL > Trawl
• Large jig increase

Thanks to Pete Hulson
GOA Pacific cod: changes relative to 2022 configuration

Trawl survey

Fit to data

Longline survey
GOA Pacific cod projection considerations

- Use mean recruitment from 2014 on in projections
  - Stock can not attain current reference point
GOA Pacific cod summary

• 2024 SSB 51,959 t
  o 15% below $B_{\text{MSY}}$ proxy 61,315 t
  o On the “ramp” of FMP control rule: ~42% of $F_{\text{MSY}}$ proxy
  o Uncertainty in projections adequately covered by FMP control rule

• Declines expected to continue in near term
Maturity samples remain unprocessed
  - The Team recommended that sufficient samples be processed and analyzed so that the resulting data can be used in the assessment.

The Team noted the work devoted to developing posterior distribution

The Team agreed with the authors’ recommended model, 19.1b, and the authors’ recommended OFL and ABCs, with no reduction from the maximum permissible ABC.
## GOA Sablefish

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## GOA flatfish

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<tr>
<td>Shallow water flatfish</td>
<td>53,537</td>
<td>55,565</td>
<td>up 2,028 (4%)</td>
</tr>
<tr>
<td>Rex sole</td>
<td>20,664</td>
<td>21,364</td>
<td>up 700 (3%)</td>
</tr>
<tr>
<td><strong>Deep water flatfish</strong>*</td>
<td>5,816</td>
<td>7,062</td>
<td>up 1,246 (21%)</td>
</tr>
<tr>
<td>Flathead sole</td>
<td>39,480</td>
<td>40,503</td>
<td>up 1,023 (3%)</td>
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<td>238,982</td>
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<td>up 4,761 (2%)</td>
</tr>
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<td><strong>Subtotal (without ATF)</strong></td>
<td>119,497</td>
<td>124,494</td>
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GOA Deepwater flats: Dover sole catch trends

- Dover sole catches low (1-3% of ABC in recent years)
- Big catch in 1991 (10,196 t)
- Catches below 1,000 t since 2000
- Catches primarily in Central GOA
- Increasing proportion in discards:
  - 10% in 1998
  - ~90% in past 3 years

Thanks to Carey McGilliard
GOA Deepwater flats: Dover sole survey trend

- A shift to lower survey biomass 2015-2023

- REMA used to fill in gaps in missing survey depth/area strata

- Highest CPUE in Central GOA (similar to other years)
• Decline in fish age 30+ from 2015-2023

• Large new year classes, especially 2015
GOA Deepwater flats: Dover sole model bridging

Model 19.3.1:
- Uses new survey biomass variance estimates
- Francis re-weighting, adjusted so that shallow-coverage comp weights = full-coverage comp weights
GOA Deepwater flats

- Greenland turbot historical catches updated due to Catch Accounting System changes

- Kamchatka flounder: 
  $\text{OFL} = \max(\text{catches 2011-present})$

- Projection model for Dover sole using output from age-structured model using age 3 recruits

- 5-yr average catch of 103 t used in place of ABC for 2023-2025
## GOA Deepwater flats: Apportionment

<table>
<thead>
<tr>
<th>Species</th>
<th>Year</th>
<th>Western</th>
<th>Central</th>
<th>West Yakutat</th>
<th>Southeast</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dover Sole</td>
<td>2024</td>
<td>183</td>
<td>2,617</td>
<td>1,856</td>
<td>2,313</td>
<td>6,969</td>
</tr>
<tr>
<td></td>
<td>2025</td>
<td>180</td>
<td>2,576</td>
<td>1,827</td>
<td>2,277</td>
<td>6,860</td>
</tr>
<tr>
<td>Greenland Turbot</td>
<td>2024</td>
<td>37</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>2025</td>
<td>37</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>37</td>
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<tr>
<td>Kamchatka Flounder</td>
<td>2024</td>
<td>17</td>
<td>35</td>
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<td>0</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>2025</td>
<td>17</td>
<td>35</td>
<td>0</td>
<td>0</td>
<td>52</td>
</tr>
<tr>
<td>Deepsea Sole</td>
<td>2024</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2025</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Deepwater Flatfish</td>
<td>2024</td>
<td>237</td>
<td>2,655</td>
<td>1,856</td>
<td>2,314</td>
<td>7,062</td>
</tr>
<tr>
<td></td>
<td>2025</td>
<td>234</td>
<td>2,614</td>
<td>1,827</td>
<td>2,278</td>
<td>6,953</td>
</tr>
</tbody>
</table>
### Species Catch Comparison

<table>
<thead>
<tr>
<th>Species</th>
<th>2023 Catch</th>
<th>ABC 2023</th>
<th>ABC 2024</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pollock</td>
<td>131,892</td>
<td>160,301</td>
<td>242,292</td>
<td>up 81,991(51%)</td>
</tr>
<tr>
<td>Pacific Cod</td>
<td>14,883</td>
<td>24,634</td>
<td>32,272</td>
<td>up 7,638(31%)</td>
</tr>
<tr>
<td>Sablefish</td>
<td>22,746</td>
<td>40,502</td>
<td>47,146</td>
<td>up 6,644(16%)</td>
</tr>
<tr>
<td>Flatfish</td>
<td>2,017</td>
<td>119,497</td>
<td>124,494</td>
<td>up 4,997(4%)</td>
</tr>
<tr>
<td>Arrowtooth flounder</td>
<td>9,248</td>
<td>119,485</td>
<td>119,249</td>
<td>down 236(0%)</td>
</tr>
<tr>
<td><strong>Rockfish</strong></td>
<td><strong>36,943</strong></td>
<td><strong>57,519</strong></td>
<td><strong>59,527</strong></td>
<td>up 2,008(3%)</td>
</tr>
<tr>
<td>Atka mackerel</td>
<td>462</td>
<td>4,700</td>
<td>4,700</td>
<td>same(0%)</td>
</tr>
<tr>
<td>Skates</td>
<td>2,741</td>
<td>6,563</td>
<td>6,036</td>
<td>down 527(8%)</td>
</tr>
<tr>
<td>Sharks</td>
<td>1,777</td>
<td>4,891</td>
<td>4,891</td>
<td>same(0%)</td>
</tr>
<tr>
<td>Octopus</td>
<td>154</td>
<td>980</td>
<td>980</td>
<td>same(0%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>222,863</strong></td>
<td><strong>539,072</strong></td>
<td><strong>641,587</strong></td>
<td>up 102,515(19%)</td>
</tr>
</tbody>
</table>
**Rockfish ABC’s**

**2023 ABC (57,519 t)**
- Demersal Shelf Rockfish: 1%
- Rougheye/blackspotted Rockfish: 3%
- Dusky Rockfish: 10%
- Shortraker: 1%
- Northern rockfish: 9%

**2024 ABCs (59,527 t)**
- Demersal Shelf Rockfish: 0%
- Rougheye/blackspotted Rockfish: 2%
- Dusky Rockfish: 13%
- Shortraker: 1%
- Northern rockfish: 8%
- Pacific ocean perch: 68%
- Other rockfish: 67%
## Pacific ocean perch

<table>
<thead>
<tr>
<th>Species</th>
<th>ABC 2023</th>
<th>ABC 2024</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>POP</strong></td>
<td>37,193</td>
<td>39,719</td>
<td>up 2,526 (7%)</td>
</tr>
<tr>
<td>northern rockfish</td>
<td>4,964</td>
<td>4,815</td>
<td>down 149 (3%)</td>
</tr>
<tr>
<td>Shortraker Rockfish*</td>
<td>705</td>
<td>647</td>
<td>down 58 (8%)</td>
</tr>
<tr>
<td>Dusky</td>
<td>7,917</td>
<td>7,624</td>
<td>down 293 (4%)</td>
</tr>
<tr>
<td>Rougheye and Blackspotted Rockfish*</td>
<td>775</td>
<td>1,037</td>
<td>up 262 (34%)</td>
</tr>
<tr>
<td>Demersal shelf rockfish</td>
<td>283</td>
<td>283</td>
<td>same (0%)</td>
</tr>
<tr>
<td>Thornyhead</td>
<td>1,628</td>
<td>1,628</td>
<td>same (0%)</td>
</tr>
<tr>
<td>Other rock*</td>
<td>4,054</td>
<td>3,774</td>
<td>down 280 (7%)</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td>57,519</td>
<td>59,527</td>
<td>up 2,008 (3%)</td>
</tr>
</tbody>
</table>
GOA Pacific Ocean Perch: Data

Catches Rising
Far below historical max.

Survey up & uncertain
Patchy hauls in EGOA

Ecosystem Moderate
Increasing with warmth
2023 average conditions for adults

Thanks to Maia Kapur
GOA Pacific Ocean Perch: Model

No Changes to Model
Still underfitting to survey but improving
New model in 2025

Spawning Biomass
Up & increasing

ABC
in 2024 is 39,719 t, ~1% difference from last year
Model is structurally stable and robust to new data
GOA POP Plan Team discussions

• The Team agreed with all author-recommended assessment updates

• The Team recommended specifying OFL at the Gulf-wide level (SSC agreed)
  o To be consistent with stock status determination criteria (based on the biological definition of a “stock”)
  o Rationale included lack of a biological basis for partitioning OFL
GOA POP summary

Total Catch

Spawning biomass

Age 2 Recruitment

Total Biomass

Year

Year Class

Year
<table>
<thead>
<tr>
<th>Species</th>
<th>ABC 2023</th>
<th>ABC 2024</th>
<th>Change</th>
</tr>
</thead>
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<td>Sub Total</td>
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<td>59,527</td>
<td>up 2,008 (3%)</td>
</tr>
</tbody>
</table>
GOA Shortraker rockfish: Catch

• Overall catch decreasing
  ○ Increased use of pot gear in the sablefish fishery

• Most catch now from trawl gear (primarily in rockfish fisheries)

• Discards 25-50%

Thanks to Katy Echave, Kevin Siwicke
### GOA Shortraker rockfish: Catch

<table>
<thead>
<tr>
<th>Area</th>
<th>2023 ABC</th>
<th>2023 TAC</th>
<th>2023 OFL</th>
<th>2023 Catch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>51</td>
<td>51</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Central</td>
<td>280</td>
<td>280</td>
<td></td>
<td>157</td>
</tr>
<tr>
<td>Eastern</td>
<td>374</td>
<td>374</td>
<td></td>
<td>189</td>
</tr>
<tr>
<td>TOTAL</td>
<td>705</td>
<td>705</td>
<td>940</td>
<td>354*</td>
</tr>
</tbody>
</table>

*Catch as of Oct 3, 2023

- 2023 catch is down ~24% from 2022
- This is ~50% of gulfwide ABC
GOA Shortraker rockfish

• Tier 5 species
• Changes in the input data
  o Longline survey RPWs (2022/2023) and trawl survey biomass values (2023)
  o 1984 and 1987 GOA trawl surveys removed

• Changes in apportionment methodology
  o Use both longline and bottom trawl surveys
GOA Shortraker rockfish: survey data

• Biomass increased in 2023, still below time series mean
  ○ 1984 and 1987 data removed
GOA Shortraker rockfish: Apportionment methods

“The SSC looks forward to continued exploration of alternative apportionment methods and believes this should remain a high priority.” (SSC, December 2019)

• Two apportionment methods examined:
  o “Biomass” = standard method based on proportion of predicted biomass by area
  o “Biomass + RPW” = our proposed method based on the mean proportions of predicted biomass and predicted RPW by area

<table>
<thead>
<tr>
<th>REMA model names</th>
<th>Apportionment Method</th>
<th>WGOA</th>
<th>CGOA</th>
<th>EGOA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M19*</td>
<td>Biomass</td>
<td>5.3%</td>
<td>29.5%</td>
<td>65.2%</td>
</tr>
<tr>
<td>M19*</td>
<td>Biomass + RPW</td>
<td>8.4%</td>
<td>20.7%</td>
<td>70.9%</td>
</tr>
<tr>
<td>M23.3</td>
<td>Biomass</td>
<td>5.2%</td>
<td>29.3%</td>
<td>65.5%</td>
</tr>
<tr>
<td>M23.3</td>
<td>Biomass + RPW</td>
<td>8.3%</td>
<td>20.7%</td>
<td>71%</td>
</tr>
</tbody>
</table>

NOTE: SSC elected status quo for apportionment
• The Team encouraged the author to evaluate area-specific exploitation rates and update the stock structure template.
  o The Team also noted that the genetic stock structure results cited in SAFE presentations this week pertain to evolutionary time scales and should be interpreted with caution with respect to their application to stock structure assumptions within assessments and risk tables.

• The Team agreed with the authors’ maximum permissible ABC under the FMP
For apportionment, the Team recommended averaging apportionment methods:

- No current concern based on available data regarding local depletion and stock structure
- An incremental approach for changing to a new method
- Caused a large decrease in the ABC apportioned to the central Gulf

NOTE: SSC elected status quo for apportionment

The Team noted considerations outside of the purview of the Team:

- Management interactions with Central GOA Rockfish Program
- Fishing distribution in some areas straddles the Central area and that of West Yakutat.

The Team encouraged the Council to engage in the Spatial Management Policy for this stock to fully consider the economic and management-related impacts of alternative spatial allocations of ABC, as well the risks of localized depletion.
## Rougheye & blackspotted rockfish

<table>
<thead>
<tr>
<th>Species</th>
<th>ABC 2023</th>
<th>ABC 2024</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>POP*</td>
<td>37,193</td>
<td>39,719</td>
<td>up 2,526(7%)</td>
</tr>
<tr>
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<tr>
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<td>7,917</td>
<td>7,624</td>
<td>down 293(4%)</td>
</tr>
<tr>
<td><strong>Rougheye and Blackspotted Rockfish</strong>*</td>
<td>775</td>
<td>1,037</td>
<td>up 262(34%)</td>
</tr>
<tr>
<td>Demersal shelf rockfish</td>
<td>283</td>
<td>283</td>
<td>same(0%)</td>
</tr>
<tr>
<td>Thornyhead</td>
<td>1,628</td>
<td>1,628</td>
<td>same(0%)</td>
</tr>
<tr>
<td>Other rock*</td>
<td>4,054</td>
<td>3,774</td>
<td>down 280(7%)</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td>57,519</td>
<td>59,527</td>
<td>up 2,008(3%)</td>
</tr>
</tbody>
</table>
GOA Rougheye-blackspotted rockfish: Indices

**LLS:** 2023 lowest on record, 34% below mean

**BTS:** increase from 2021, which was the lowest on record, and 28% below mean

Thanks to Jane Sullivan
GOA Rougheye-blackspotted rockfish: survey data & model runs

![Graph showing Longline survey RPN and Trawl survey biomass (t)]

Figure 13-1
## GOA Roughey & Blackspotted Rockfish Risk Table

**Recommend reduction from max ABC**  
**Author-recommended model was not reviewed in September**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Population Dynamics</th>
<th>Ecosystem</th>
<th>Fishery</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - Major Concern</td>
<td>2 - Major Concern</td>
<td>1 - None</td>
<td>1 - None</td>
</tr>
</tbody>
</table>

**Base model**
- Severe one-way positive retrospective bias
- High uncertainty in stock scale

**Recommended model**
- Improved stability, but poor fit and unable to account for recent declines in survey indices

- Declines in LLS and BTS indices in recent years
- 2023 LLS abundance lowest on record
- 2021 BTS lowest on record

- Average environmental conditions
- Some evidence of long-term declines in structural epifauna

- Incidental catch only
- Catch $\ll$ ABC
- Not currently constraining target fisheries

LLS = longline survey  
BTS = bottom trawl survey
GOA Rougheye-blackspotted rockfish

- Plan Team and author recommendation to split difference

<table>
<thead>
<tr>
<th>Quantity</th>
<th>As estimated or specified last year for:</th>
<th>As estimated or recommended this year for:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2023</td>
<td>2024</td>
</tr>
<tr>
<td>$M$ (natural mortality rate)</td>
<td>0.034</td>
<td>0.034</td>
</tr>
<tr>
<td>Tier</td>
<td>3a</td>
<td>3a</td>
</tr>
<tr>
<td>Projected total (ages 3+) biomass (t)</td>
<td>25,837</td>
<td>25,755</td>
</tr>
<tr>
<td>Projected female spawning biomass (t)</td>
<td>8,554</td>
<td>8,514</td>
</tr>
<tr>
<td>$B_{100%}$</td>
<td>14,776</td>
<td>14,776</td>
</tr>
<tr>
<td>$B_{40%}$</td>
<td>5,911</td>
<td>5,911</td>
</tr>
<tr>
<td>$B_{33%}$</td>
<td>5,172</td>
<td>5,172</td>
</tr>
<tr>
<td>$F_{oFL}$</td>
<td>0.046</td>
<td>0.046</td>
</tr>
<tr>
<td>$max F_{ABC}$</td>
<td>0.038</td>
<td>0.038</td>
</tr>
<tr>
<td>$F_{ABC}$</td>
<td>0.038</td>
<td>0.038</td>
</tr>
<tr>
<td>OFL (t)</td>
<td>930</td>
<td>927</td>
</tr>
<tr>
<td>$maxABC$ (t)</td>
<td>775</td>
<td>772</td>
</tr>
<tr>
<td>ABC (t)</td>
<td>775</td>
<td>772</td>
</tr>
<tr>
<td>Status</td>
<td>As determined last year for:</td>
<td>As determined this year for:</td>
</tr>
<tr>
<td></td>
<td>2021</td>
<td>2022</td>
</tr>
<tr>
<td>Overfishing</td>
<td>No</td>
<td>n/a</td>
</tr>
<tr>
<td>Overfished</td>
<td>n/a</td>
<td>No</td>
</tr>
<tr>
<td>Approaching overfished</td>
<td>n/a</td>
<td>No</td>
</tr>
</tbody>
</table>
GOA Rougheye-blackspotted rockfish apportionment

- Two-survey random effects (REMA) model first accepted in 2019
- LLS scaling parameters fixed at 1.0 to balance LLS/BTS data conflict
- Recommend estimating area-specific scaling parameters, greatly improves model performance
- Recommend using the average area-specific proportions of REMA-predicted biomass and REMA-predicted relative population weights from the LLS in order to more appropriately balance BTS/LLS data

<table>
<thead>
<tr>
<th>Stock/Assemblage</th>
<th>Area</th>
<th>OFL 2023</th>
<th>ABC 2023</th>
<th>TAC 2023</th>
<th>Catch²</th>
<th>OFL 2024</th>
<th>ABC 2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>RE/BS complex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td></td>
<td>180</td>
<td>180</td>
<td></td>
<td>101</td>
<td></td>
<td>197</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>232</td>
<td>232</td>
<td></td>
<td>135</td>
<td></td>
<td>315</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>363</td>
<td>363</td>
<td></td>
<td>149</td>
<td></td>
<td>525</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>930</td>
<td>775</td>
<td>775</td>
<td>385</td>
<td>1,555</td>
<td>1,037</td>
</tr>
</tbody>
</table>
• The Team discussed a number of issues…

• The Team agreed with the authors’ recommended model (23.1b), resulting OFLs, and the author’s recommended reduction from maxABC.
## Other Rockfish

<table>
<thead>
<tr>
<th>Species</th>
<th>ABC 2023</th>
<th>ABC 2024</th>
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<td>59,527</td>
<td>up 2,008(3%)</td>
</tr>
</tbody>
</table>
GOA Other Rockfish stock complex: Catch

Current Status

- Total GOA catch is ~ 25% of OFL

- Catch is passing TAC/ ABC in Western/Central GOA

- 2023 catch is down ~ 25% from 2022 (1,287 t)
Changes (approved by PT and SSC 2021)

• Tier 4 Model 15.2 change to REMA model framework
• Tier 5 Model 23.1 includes:
  o Change to REMA model framework
  o Alternative average weighted natural mortality as a proxy for FOFL.
  o Four Tier 5 species (reduced from 17 species) due to unreliable survey biomass.
• Tier 6 Model 23.1 includes:
  ➢ Extension of maximum catch time series to 2013-2022
  ➢ Twenty-one Tier 6 species (addition of 12 species) due to unreliable survey biomass.
Results overview

- High CVs
- 2023 Tier 4 (Sharpchin): -7%
- 2023 Tier 5 (4 species): slight increase

<table>
<thead>
<tr>
<th>Tier (# spp.)</th>
<th>Biomass (2023)</th>
<th>$F_{OFL}$</th>
<th>OFL</th>
<th>$F_{ABC}$</th>
<th>ABC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 4 (1 spp.)</td>
<td>7,008 t</td>
<td>$F_{35%} = 0.079$</td>
<td>554</td>
<td>$F_{40%} = 0.065$</td>
<td>456</td>
</tr>
<tr>
<td>Tier 5 (4 species)</td>
<td>63,291 t</td>
<td>$\bar{Wt}_{M} = 0.062$</td>
<td>3,924</td>
<td>$0.75F_{OFL}$</td>
<td>2,943</td>
</tr>
<tr>
<td>Tier 6 (21 species)</td>
<td></td>
<td></td>
<td>499</td>
<td></td>
<td>374</td>
</tr>
<tr>
<td>All Tiers</td>
<td>4,977</td>
<td></td>
<td>3,773</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
GOA Other Rockfish

2024 ABC | 2024 OFL
3,773 t  | 4,977 t
-7% from 2023 | -6% from 2023

Area Apportionment

<table>
<thead>
<tr>
<th>Area</th>
<th>2023 Catch*</th>
<th>2023 ABC</th>
<th>2024 ABC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western/ Central</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Yakutat</td>
<td>46</td>
<td>370</td>
<td>532</td>
</tr>
<tr>
<td>Eastern</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Yakutat/ Southeast</td>
<td>22</td>
<td>2,744</td>
<td>2,421</td>
</tr>
<tr>
<td>Total</td>
<td>941</td>
<td>4,054**</td>
<td>3,773</td>
</tr>
</tbody>
</table>

**Includes added Northern ABC for EGOA
*Catch as of Oct. 10, 2023
GOA Other Rockfish stock complex

• Issues:
  o Regional ABC overages continue to occur.
  o Mismatch between survey catch & fishery catch (“trawlable” & “untrawlable habitat”) → underestimating biomass based on survey (e.g., harlequin)
  o Patchy distributions → variable survey catches → subarea ABC fluctuations

• No apparent conservation concerns
  o Non-target species that are poorly sampled by trawl survey
  o No major changes in fishing behavior, but good species-specific catch data
  o Majority of biomass in SE, but no trawling allowed in SE
  o No to little genetic structure (general prelim results) & no local depletion observed
GOA Other Rockfish stock complex: Plan Team discussion

• For 2024, the Team agreed with the author and recommended that the sub-area ABCs remain.
  o However, the Team recommended that in 2025, the W/C/WYAK sub-area ABCs be combined, which would be consistent with the recent changes to DSR.
  o The Team recommended that the Council engage in the Spatial Management Policy for this stock. The Team noted the next assessment is scheduled for 2025.

NOTE: SSC elected to combine ABCs for W/C/WYAK for 2024
GOA skate complex: update assessment

- All Tier 5
- Random Effects (RE) model
- $M = 0.1$
- Updated Data
  - Catch (2022-2023 as of October 16th)
    Survey Biomass Estimate from AFSC bottom trawl survey.

Big Skate

Longnose Skate

Other Skates

Thanks to Lee Cronin-Fine
**Skate Stock Complex Overview**

<table>
<thead>
<tr>
<th>Group</th>
<th>OFL (t)</th>
<th>ABC (t)</th>
<th>Catch (t)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big</td>
<td>3,822</td>
<td>2,867</td>
<td>792</td>
</tr>
<tr>
<td>Longnose</td>
<td>3,616</td>
<td>2,712</td>
<td>1,055</td>
</tr>
<tr>
<td>Other</td>
<td>1,311</td>
<td>984</td>
<td>316</td>
</tr>
</tbody>
</table>

*As of October 16th, 2023*
GOA Skates survey trends

- By species/species/groups

![Graph of GOA Skates survey trends]
Big skate ABC/OFLs

- Tier 5
- $M = 0.1$
- $F_{OFL} = M = 0.1$
- $maxF_{ABC} = 0.75*M = 0.075$
- $F_{ABC} = 0.75*M = 0.075$

<table>
<thead>
<tr>
<th>Quantity</th>
<th>As estimated or specified last year for:</th>
<th>As estimated or recommended this year for:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2023</td>
<td>2024</td>
</tr>
<tr>
<td>Biomass (t)</td>
<td>W</td>
<td>7,882</td>
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<tr>
<td></td>
<td>C</td>
<td>19,756</td>
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<tr>
<td></td>
<td>E</td>
<td>10,581</td>
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<tr>
<td></td>
<td>GOA Wide</td>
<td>38,220</td>
</tr>
<tr>
<td>OFL (t)</td>
<td>GOA Wide</td>
<td>3,822</td>
</tr>
<tr>
<td>maxABC (t)</td>
<td>W</td>
<td>591</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>1,482</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>794</td>
</tr>
<tr>
<td>ABC (t)</td>
<td>W</td>
<td>591</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>1,482</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>794</td>
</tr>
<tr>
<td>Status</td>
<td>As determined last year for:</td>
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<tr>
<td>Overfishing?</td>
<td>No</td>
<td>n/a</td>
</tr>
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</table>
Longnose skate ABC/OFLs

- Tier 5
- $M = 0.1$
- $F_{OFL} = M = 0.1$
- $maxF_{ABC} = 0.75 * M = 0.075$
- $F_{ABC} = 0.75 * M = 0.075$

<table>
<thead>
<tr>
<th>Quantity</th>
<th>As estimated or specified last year for:</th>
<th>As estimated or recommended this year for:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2023</td>
<td>2024</td>
</tr>
<tr>
<td>Biomass (t)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>2,013</td>
<td>2,013</td>
</tr>
<tr>
<td>C</td>
<td>27,258</td>
<td>27,258</td>
</tr>
<tr>
<td>E</td>
<td>6,890</td>
<td>6,890</td>
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<tr>
<td>GOA Wide</td>
<td>36,162</td>
<td>36,162</td>
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<tr>
<td>OFL (t)</td>
<td></td>
<td></td>
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<tr>
<td>GOA Wide</td>
<td>3,616</td>
<td>3,616</td>
</tr>
</tbody>
</table>

| $maxABC$ (t) |       |       |       |      |
| W         | 151 | 151 | 104 | 104 |
| C         | 2,044 | 2,044 | 1,894 | 1,894 |
| E         | 517 | 517 | 538 | 538 |

| ABC (t) |       |       |       |      |
| W         | 151 | 151 | 104 | 104 |
| C         | 2,044 | 2,044 | 1,894 | 1,894 |
| E         | 517 | 517 | 538 | 538 |

<table>
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<tbody>
<tr>
<td></td>
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<td>2022</td>
</tr>
<tr>
<td>Overfishing?</td>
<td>No</td>
<td>n/a</td>
</tr>
</tbody>
</table>
Bathyraja skates (Other) ABC/OFLs

- Tier 5
- \( M = 0.1 \)
- \( F_{OFL} = M = 0.1 \)
- \( maxF_{ABC} = 0.75 \times M = 0.075 \)
- \( F_{ABC} = 0.75 \times M = 0.075 \)

<table>
<thead>
<tr>
<th>Quantity</th>
<th>As estimated or specified last year for:</th>
<th>As estimated or recommended this year for:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2023</td>
<td>2024</td>
</tr>
<tr>
<td>Biomass (t)</td>
<td>13,114</td>
<td>13,114</td>
</tr>
<tr>
<td>OFL (t)</td>
<td>1,311</td>
<td>1,311</td>
</tr>
<tr>
<td>maxABC (t)</td>
<td>984</td>
<td>984</td>
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<tr>
<td>ABC (t)</td>
<td>984</td>
<td>984</td>
</tr>
<tr>
<td>Status</td>
<td>2021</td>
<td>2022</td>
</tr>
<tr>
<td>Overfishing?</td>
<td>No</td>
<td>n/a</td>
</tr>
</tbody>
</table>
The Team supported the authors’ recommendations for OFLs and ABCs.

- The Team recommended that the author look at the bycatch rates of skates in the fisheries in which they are caught (e.g., what is the ton of skates caught per ton of target species across different fisheries) and present this data in the next assessment.
Partial assessments in 2023 (renamed “Harvest projections”)

Stocks
• GOA arrowtooth flounder
• GOA rex sole
• GOA shallow water flatfish (+N & S rock sole)
• GOA flathead sole
• GOA Dusky rockfish
• GOA Northern rockfish

Slide(s) on
Fishery trends
Survey trends
Updated catch
Notes
GOA Arrowtooth Flounder (Tier 3a)
Not overfishing, overfished nor approaching overfished

Fishery trends
Catch remains low (as in 2022) majority in ATF fishery, ~8-9% in rockfish and pollock fishery

Survey trends
5% increase in 2023 bottom trawl survey, VAST estimates similar

Updated catch
2023: 9,029 t
2024: 17,576 t

Notes
Catch/Biomass decreasing since 2021, now lowest in time series

Thanks to Kalei Shotwell
GOA Rex sole (Tier 3a) Not overfishing, overfished, nor approaching overfished

Fishery trends: Lower than average catches for 2021-2023

Survey trends: 2023 biomass lower than 2021

Update: Most recent: 2021  
Next: 2025

Notes: Catch/ABC low

Thanks to Carey McGilliard
<table>
<thead>
<tr>
<th><strong>Fishery trends</strong></th>
<th>Catch trend has been declining in central-eastern GOA (main catch), stable and low in western GOA</th>
</tr>
</thead>
</table>
| **Survey trends**  | Central-eastern: NRS declining, SRS sight decline in 2023  
Western: NRS declining, SRS stable |
| **Update**         | Most recent: 2021  
Next: 2025 |
| **Notes**          | Catch/ABC low |
|                    | Thanks to Meaghan Bryan |
GOA flathead sole

Fishery trends: approaching bycatch (<5% of TAC)

Survey trends: 2023: 27% lower than the 10-year average

Update: Most recent: 2022  
Next: Update in 2025

Notes: 2024 spawning biomass 96,604, trend stable

Thanks to Maia Kapur

<table>
<thead>
<tr>
<th>Quantity/Status</th>
<th>As estimated or specified last year for:</th>
<th>As estimated or recommended this year for:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2023</td>
<td>2024</td>
</tr>
<tr>
<td>Projected total (3+) biomass (t)</td>
<td>294,188</td>
<td>293,277</td>
</tr>
<tr>
<td>Projected Female spawning biomass (t)</td>
<td>94,059</td>
<td>95,932</td>
</tr>
<tr>
<td>B_{100%}</td>
<td>92,582</td>
<td>92,582</td>
</tr>
<tr>
<td>B_{40%}</td>
<td>37,033</td>
<td>37,033</td>
</tr>
<tr>
<td>B_{35%}</td>
<td>32,404</td>
<td>32,404</td>
</tr>
<tr>
<td>F_{OFL}</td>
<td>0.36</td>
<td>0.36</td>
</tr>
<tr>
<td>( \text{max} F_{\text{ABC}} )</td>
<td>0.29</td>
<td>0.29</td>
</tr>
<tr>
<td>F_{\text{ABC}}</td>
<td>0.29</td>
<td>0.29</td>
</tr>
<tr>
<td>OFL (t)</td>
<td>48,161</td>
<td>49,073</td>
</tr>
<tr>
<td>( \text{max} \text{ABC} ) (t)</td>
<td>39,480</td>
<td>40,222</td>
</tr>
<tr>
<td>ABC (t)</td>
<td>39,480</td>
<td>40,222</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Status</th>
<th>As determined last year for:</th>
<th>As determined this year for:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2022</td>
<td>2023</td>
</tr>
<tr>
<td>Overfishing</td>
<td>No</td>
<td>n/a</td>
</tr>
<tr>
<td>Overfished</td>
<td>n/a</td>
<td>No</td>
</tr>
<tr>
<td>Approaching Overfished</td>
<td>n/a</td>
<td>No</td>
</tr>
</tbody>
</table>
**Dusky rockfish**

**Fishery trends**
- Stable
- Catch < 50% of TAC

**Survey trends**
- Overall increase, but minor decline in past few years

**Update**
- Most recent: 2022
- Next: 2024

**Notes**
- 2024 spawning biomass: 43,197
- Trend decreasing

---

### Table: Quantities

<table>
<thead>
<tr>
<th>Quantity</th>
<th>As estimated or specified last year for:</th>
<th>As estimated or recommended this year for:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2023</td>
<td>2024</td>
</tr>
<tr>
<td>M (natural mortality)</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>Tier</td>
<td>3a</td>
<td>3a</td>
</tr>
<tr>
<td>Projected total (age 4+) biomass (t)</td>
<td>107,160</td>
<td>104,627</td>
</tr>
<tr>
<td>Projected female spawning biomass (t)</td>
<td>44,651</td>
<td>44,651</td>
</tr>
<tr>
<td>$B_{100%}$</td>
<td>65,565</td>
<td>65,565</td>
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<tr>
<td>$B_{20%}$</td>
<td>26,226</td>
<td>26,226</td>
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<tr>
<td>$B_{35%}$</td>
<td>22,948</td>
<td>22,948</td>
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<tr>
<td>$F_{OFL}$</td>
<td>0.11</td>
<td>0.11</td>
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<tr>
<td>$maxF_{ABC}$</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>$F_{ABC}$</td>
<td>0.09</td>
<td>0.09</td>
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<tr>
<td>OFL (t)</td>
<td>9,638</td>
<td>9,154</td>
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<tr>
<td>$maxABC$ (t)</td>
<td>7,917</td>
<td>7,520</td>
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<tr>
<td>ABC (t)</td>
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<td>7,520</td>
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### Table: Status

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<tbody>
<tr>
<td></td>
<td>2022</td>
<td>2023</td>
</tr>
<tr>
<td>Overfishing</td>
<td>No</td>
<td>n/a</td>
</tr>
<tr>
<td>Overfished</td>
<td>n/a</td>
<td>No</td>
</tr>
<tr>
<td>Approaching overfished</td>
<td>n/a</td>
<td>No</td>
</tr>
</tbody>
</table>

---

Thanks to Kristen Omori
Northern rockfish

**Fishery trends**
- Stable
- Catch < 50% of TAC

**Survey trends**
- Decrease in past few years

**Update**
- Most recent: 2022
- Next: 2024

**Notes**
- 2024 spawning biomass: 38,118; trend decreasing

Thanks to Ben Williams
Catch reports

• Atka mackerel
• SEO DSR
• Sharks
• Octopus
• Thornyheads
## Catch reports

<table>
<thead>
<tr>
<th></th>
<th>Year</th>
<th>OFL</th>
<th>ABC</th>
<th>TAC</th>
<th>Catch</th>
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<tr>
<td><strong>Atka mackerel</strong></td>
<td>2022</td>
<td>6,200</td>
<td>4,700</td>
<td>3,000</td>
<td>880</td>
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<tr>
<td></td>
<td>2023</td>
<td>6,200</td>
<td>4,700</td>
<td>3,000</td>
<td>462</td>
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<tr>
<td><strong>SEO DSR</strong></td>
<td>2022</td>
<td>579</td>
<td>365</td>
<td>365</td>
<td>163</td>
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<td></td>
<td>2023</td>
<td>376</td>
<td>283</td>
<td>283</td>
<td>188</td>
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<tr>
<td><strong>Sharks</strong></td>
<td>2022</td>
<td>5,006</td>
<td>3,755</td>
<td>3,755</td>
<td>2,160</td>
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<td>2023</td>
<td>6,521</td>
<td>4,891</td>
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<td><strong>Octopus</strong></td>
<td>2022</td>
<td>1,307</td>
<td>980</td>
<td>980</td>
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<td>2023</td>
<td>1,307</td>
<td>980</td>
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<td>2,604</td>
<td>1,953</td>
<td>1,953</td>
<td>359</td>
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<td></td>
<td>2023</td>
<td>2,170</td>
<td>1,628</td>
<td>1,628</td>
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C4 Council Actions for GOA Groundfish
Final Harvest Specifications

Sara Cleaver, December 2023
Action items for GOA Groundfish Final Harvest Specifications:

• Receive GOA ESR, GOA PT report

• Approve SAFE report

• Recommend final harvest specifications:
  • OFL and ABC for all stocks (SSC recommendations)
  • TAC for all stocks, taking into account the State waters Pacific cod and pollock fisheries.
  • Pacific halibut PSC limits and seasonal apportionments.
  • Pacific halibut discard mortality rates (DMRs)
<table>
<thead>
<tr>
<th>Species</th>
<th>Area</th>
<th>2024 SSC Recommendations</th>
<th>2025 SSC Recommendations</th>
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<tbody>
<tr>
<td></td>
<td></td>
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<td>Pollock</td>
<td>State GHL</td>
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<td></td>
<td>W (610)</td>
<td>n/a</td>
<td>38,882</td>
</tr>
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<td></td>
<td>C (620)</td>
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<td>90,937</td>
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<tr>
<td></td>
<td>C (630)</td>
<td>n/a</td>
<td>50,587</td>
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<td></td>
<td>WYAK</td>
<td>n/a</td>
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<td></td>
<td>Subtotal</td>
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<td>EYAK/SEO</td>
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<td>Total</td>
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<td>282,914</td>
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<td>W</td>
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<td>8,745</td>
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<td>C</td>
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<td>20,590</td>
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<td>2,937</td>
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<tr>
<td></td>
<td>Total</td>
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<td>38,712</td>
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<td>Pacific Cod</td>
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<td>4,699</td>
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<td>C</td>
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<td></td>
<td>E</td>
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<td>Total</td>
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<td>SEO</td>
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<td>GOA Total</td>
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<td>Alaska-wide OFL and ABC</td>
<td>AK Total</td>
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<td>Shallow-Water Flatfish</td>
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<td>23,337</td>
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<tr>
<td></td>
<td>C</td>
<td>n/a</td>
<td>27,783</td>
</tr>
<tr>
<td></td>
<td>WYAK</td>
<td>n/a</td>
<td>2,777</td>
</tr>
<tr>
<td></td>
<td>EYAK/SEO</td>
<td>n/a</td>
<td>1,667</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>68,121</td>
<td>55,565</td>
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<tr>
<td>Deep-Water Flatfish</td>
<td>W</td>
<td>n/a</td>
<td>237</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>n/a</td>
<td>2,655</td>
</tr>
<tr>
<td></td>
<td>WYAK</td>
<td>n/a</td>
<td>1,856</td>
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<tr>
<td></td>
<td>EYAK/SEO</td>
<td>n/a</td>
<td>2,314</td>
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<tr>
<td></td>
<td>Total</td>
<td>8,387</td>
<td>7,062</td>
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<tr>
<td>Rex Sole</td>
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<td>C</td>
<td>n/a</td>
<td>1,749</td>
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<td>E</td>
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<tr>
<td>E</td>
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<td>GOA-wide</td>
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<td>887</td>
<td>685</td>
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<td>1,307</td>
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Set Pacific cod & Pollock TACs to consider State Waters fisheries

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<td>Pollock</td>
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Pollock (Table 1)

Pacific cod (Table 2)
### Halibut Prohibited Species Catch (PSC) limits and seasonal apportionments

#### Tables 3-5

#### Table 3 -- Final 2024 and 2025 Pacific Halibut PSC Limits, Allowances, and Apportionments

<table>
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<tr>
<th>Trawl gear</th>
<th>Hook-and-line gear</th>
<th>Other than DSR</th>
<th>DSR</th>
<th>Amount</th>
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<tr>
<td>Season</td>
<td>Percent</td>
<td>Amount</td>
<td>Season</td>
<td>Percent</td>
</tr>
<tr>
<td>January 20 - April 1</td>
<td>30.5%</td>
<td>520</td>
<td>January 1 - June 10</td>
<td>86%</td>
</tr>
<tr>
<td>April 1 - July 1</td>
<td>20%</td>
<td>341</td>
<td>June 10 - September 1</td>
<td>2%</td>
</tr>
<tr>
<td>July 1 - August 1</td>
<td>27%</td>
<td>460</td>
<td>September 1 - December 31</td>
<td>12%</td>
</tr>
<tr>
<td>August 1 - October 1</td>
<td>7.5%</td>
<td>128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 1 - December 31</td>
<td>15%</td>
<td>256</td>
<td></td>
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<td><strong>Total</strong></td>
<td></td>
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#### Table 4 -- Final 2024 and 2025 Apportionment of the Pacific Halibut PSC Limits Apportioned Between the Trawl Gear Shallow-Water and Deep-Water Species Fisheries

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<th>Season</th>
<th>Shallow-water</th>
<th>Deep-water</th>
<th>Total</th>
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<tbody>
<tr>
<td>January 20 - April 1</td>
<td>384</td>
<td>135</td>
<td>520</td>
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<tr>
<td>April 1 - July 1</td>
<td>85</td>
<td>256</td>
<td>341</td>
</tr>
<tr>
<td>July 1 - August 1</td>
<td>121</td>
<td>341</td>
<td>460</td>
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<tr>
<td>August 1 - October 1</td>
<td>53</td>
<td>75</td>
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<tr>
<td><strong>Subtotal January 20 - October 1</strong></td>
<td>643</td>
<td>807</td>
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#### Table 5 -- Final 2024 and 2025 Apportionments of the “Other Hook and Line Fisheries” Halibut PSC Allowance Between the Hook-and-Line Gear Catcher Vessel and Catcher/Processor Sectors

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<th>Hook-and-Line gear (Other than DSR) Annual PSC Amount</th>
<th>Hook-and-Line Sector</th>
<th>Annual Amount</th>
<th>Season</th>
<th>Seasonal Percentage</th>
<th>Seasonal Amount</th>
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<td>256</td>
<td>CV</td>
<td>149</td>
<td>A</td>
<td>66%</td>
<td>128</td>
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<td></td>
<td>B</td>
<td>2%</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>12%</td>
<td>18</td>
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<td>107</td>
<td>CP</td>
<td>107</td>
<td>A</td>
<td>86%</td>
<td>92</td>
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<td>B</td>
<td>2%</td>
<td>2</td>
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<td></td>
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<tr>
<td></td>
<td>C</td>
<td>12%</td>
<td>13</td>
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<td>Gear</td>
<td>Sector</td>
<td>Groundfish fishery</td>
<td>Halibut discard mortality rate (percent)</td>
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<td>----------------------------</td>
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<tr>
<td>Pelagic trawl</td>
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<td>100</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Catcher/processor</td>
<td>All</td>
<td>100</td>
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<td>Non-pelagic trawl</td>
<td>Catcher vessel</td>
<td>Rockfish Program</td>
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<td>Catcher vessel</td>
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<td>Mothership and catcher/processor</td>
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<td>Catcher vessel and catcher/processor</td>
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Table 6 -- Final 2024 and 2025 Discard Mortality Rates for Vessels Fishing in the Gulf of Alaska [Values are percent of halibut assumed to be dead]