9. Assessment of the Pacific Ocean Perch Stock in the Gulf of Alaska

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# Executive Summary

Gulf of Alaska Pacific ocean Perch (*Sebastes alutus*, POP) is assessed on a biennial stock assessment schedule to coincide with the availability of new trawl survey data (odd years). In alternate (even) years we present an executive summary to recommend harvest levels for the next two years. Please refer to last year’s full stock assessment report for further information regarding the assessment model ([Hulson et al., 2021](https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApop.pdf)). A full stock assessment document with updated assessment and projection model results will be presented in next year’s SAFE report.

We use a statistical age-structured model as the primary assessment tool for Gulf of Alaska Pacific ocean perch which qualifies as a Tier 3 stock. For an off-cycle year, we do not re-run the assessment model, but do update the projection model with new catch information. This incorporates the most current catch information without re-estimating model parameters and biological reference points.

## Summary of Changes in Assessment Inputs

*Changes in the input data*: There were no changes made to the assessment model inputs since this was an off-cycle year. New data added to the projection model included an updated 2021 catch and new estimated catches for 2022-2024.

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

## Summary of Results

New estimates for this year’s projection model are an updated 2021 catch of 100, and new estimated 2022-2024 catches of 101 t, 3489 t, and 2884 t, respectively. The 2022 catch was estimated by expanding the October 22, 2022 catch by a factor of 1.1 using the last three complete catch years (2019-2021) to project catch through the end of the 2022 fishing year. To more accurately estimate future catch, an updated yield ratio of 0.9 was computed using the average of the ratio of catch to ABC for the last three complete catch years (2019-2021). The updated yield ratio was then multiplied against the projected ABCs for 2023 and 2024 from the 2021 assessment model to estimate future catches.

For the 2023 fishery, we recommend the maximum allowable ABC of **37104** t from the updated projection model. The corresponding reference values for Pacific ocean perch are summarized in the following table. Overfishing is not occurring, the stock is not overfished, and it is not approaching an overfished condition.

The Pacific ocean perch catch/biomass ratio has ranged from less than 0.01 to 0.05 between 1991 and 2022 (Figure 9-1). Since 2013, the catch/biomass ratio has been increasing. This is mainly a result of the fishery fully taking the ABC in all the areas where trawling is allowed.

|  | As estimated or *specified last* year for: | | As estimated or *recommended this* year for: | |
| --- | --- | --- | --- | --- |
| **Quantity/Status** | 2022 | 2023 | 2023\* | 2024\* |
| M (natural mortality) | 0.075 | 0.075 | 0.075 | 0.075 |
| Tier | 3a | 3a | 3a | 3a |
| Projected total (age 2+) biomass (t) | 650832 | 634907 | 636129 | 621249 |
| Projected female spawning biomas (t) | 216635 | 210257 | 210795 | 205713 |
| B100% | 331917 | 331917 | 331917 | 331917 |
| B40% | 132767 | 132767 | 132767 | 132767 |
| B35% | 116171 | 116171 | 116171 | 116171 |
| FOFL | 0.12 | 0.12 | 0.12 | 0.12 |
| *max*FABC | 0.1 | 0.1 | 0.1 | 0.1 |
| FABC | 0.1 | 0.1 | 0.1 | 0.1 |
| OFL (t) | 45580 | 44196 | 44302 | 43117 |
| *max*ABC (t) | 38268 | 37104 | 37193 | 36196 |
| ABC (t) | 38268 | 37104 | 37193 | 36196 |
|  | As determined *last* year for: | | As determined *this* year for: | |
| **Status** | 2021 | 2022 | 2022 | 2023 |
| Overfishing | No | n/a | No | n/a |
| Overfished | n/a | No | n/a | No |
| Approaching overfished | n/a | No | n/a | No |
| \*Projections are based on an estimated catch of 101 t for 2022 and estimates of 3,489 t and 2,884 t used in place of maximum permissible ABC for 2023 and 2024. | | | | |

## Area Apportionment

The apportionment percentages are the same as in the 2021 full assessment. The following table shows the recommended apportionment for 2023 and 2024 from the random effects model.

|  | | Western | Central | Eastern | Total |
| --- | --- | --- | --- | --- | --- |
| Area Apportionment | | 6.8% | 80.5% | 12.7% | 100% |
| 2022 | ABC (t) | 2,529 | 29,940 | 4,724 | 37,193 |
| 2022 | OFL (t) | 2,461 | 29,138 | 4,597 | 36,196 |
| 2023 | ABC (t) | 2,529 | 29,940 | 4,724 | 37,193 |
| 2023 | OFL (t) | 2,461 | 29,138 | 4,597 | 36,196 |

Amendment 41 prohibited trawling in the Eastern area east of 140° W longitude. The ratio of biomass still obtainable in the W. Yakutat area (between 147° W and 140° W) is 0.29. This results in the following apportionment of the Eastern Gulf area:

|  |  | W. Yakutat | E. Yakutat/Southeast |
| --- | --- | --- | --- |
| 2022 | ABC (t) | 1,370 | 3,354 |
| 2023 | ABC (t) | 1,333 | 3,264 |

If so are so kind as to provide tables for the plan team, place them here

## Summaries for Plan Team

| Stock | Year | Biomass1 | OFL | ABC | TAC | Catch |
| --- | --- | --- | --- | --- | --- | --- |
| Dusky Rockfish | 2020 | 54,626 | 4,492 | 3,676 | 3,676 | 2,198 |
| 2021 | 97,702 | 8,655 | 5,389 | 5,389 | 2,9022 |
| 2022 | 97,767 | 8,614 | 5,372 |  |  |
| 2023 | 95,682 | 8,146 | 5,181 |  |  |
| 1Total biomass (age 4+) estimates from age-structured model. | | | | | | |
| 2Current as of October 22, 2022 . Source: NMFS Alaska Regional Office Catch Accounting System via the AKFIN database (http://www.akfin.org). | | | | | | |

|  |  | 2021 | | | | 2022 | | 2023 | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Stock | Area | OFL | ABC | TAC | Catch2 | ABC | OFL | ABC | OFL |
| Dusky Rockfish | W |  | 270 | 270 | 144 |  | 269 |  | 259 |
| C |  | 4,548 | 4,548 | 2,727 |  | 4,534 |  | 4,373 |
| WYAK |  | 468 | 468 | 30 |  | 427 |  | 412 |
| EYAK/SEO |  | 103 | 103 | 1 |  | 142 |  | 137 |
| Total | 8,655 | 5,389 | 5,389 | 2,902 | 8,614 | 5,372 | 8,146 | 5,181 |
| 2Current as of October 22, 2022 . Source: NMFS Alaska Regional Office Catch Accounting System via the AKFIN database (http://www.akfin.org). | | | | | | | | | |

# References

# Figures



Figure 9.1. pressure