

# GOA PACIFIC COD

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NOAA FISHERIES

November 2026, Presentation to the GOA Plan Team

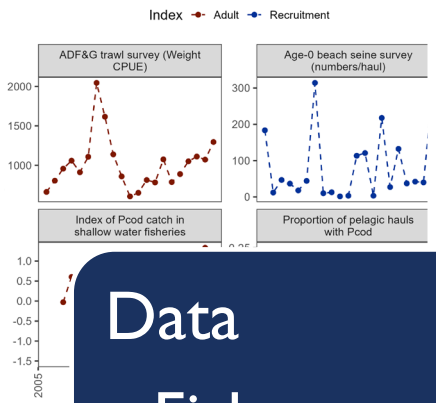
# ASSESSMENT OVERVIEW

- BLUF:
  - GOA Pacific cod: Tier 3b
  - 2026 estimated spawning biomass to be at $B_{35.2\%}$, projected in 2027 to be at $B_{32\%}$
  - 2027 recommended ABC is a 1% increase from 2026 ABC
  - Do not recommend reduction from maximum ABC

# OPERATIONAL UPDATE ASSESSMENT

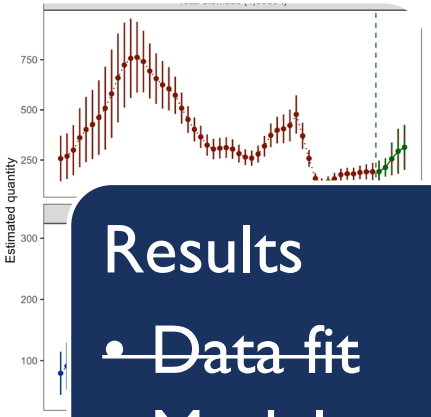
- 2026 GOA Pacific cod is an '**Operational Update**' assessment
- **Only new data through 2026 included, no model changes**
  - 2025 and 2026 Fishery catch and length comp
  - 2025 Fishery and Survey CAAL
  - Note: Update in SS3 documentation for CAAL length binning, adjusted in this assessment, small effect on results (~0.5% difference in SSB)
- **No new index data**

# UPDATE ASSESSMENT OUTLINE



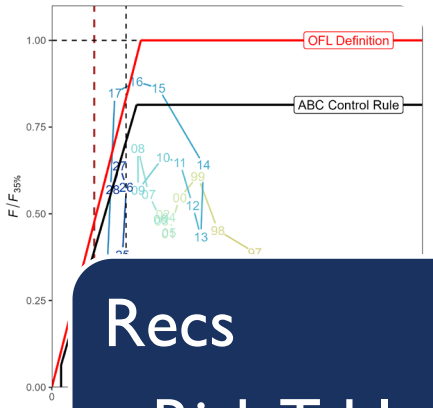

## Data

- Fishery
- ~~Survey~~
- Other




## Results

- ~~Data fit~~
- ~~Model evaluation~~
- Model estimates



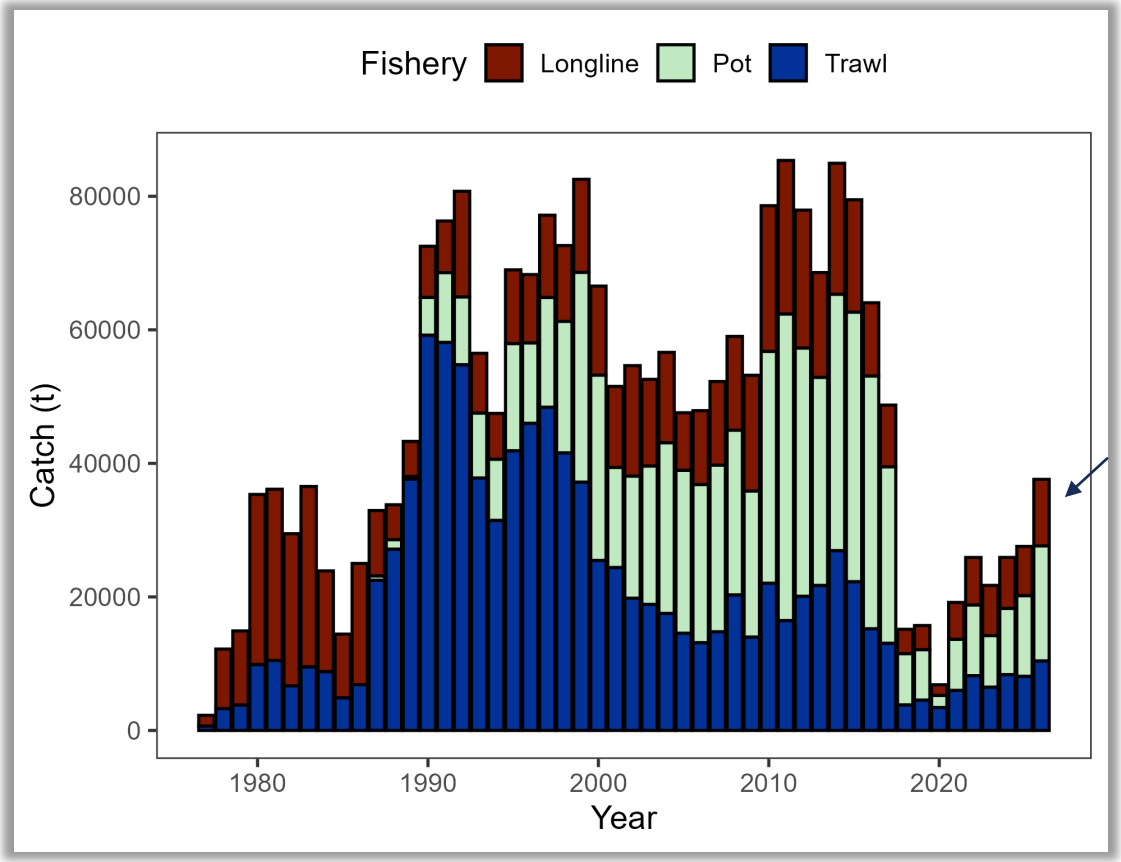

## Recs

- Risk Table
- ABC/OFL
- BRD

- Data/fits/diagnostics not shown in presentation included in SAFE document or linked online resources

# DATA - CATCH

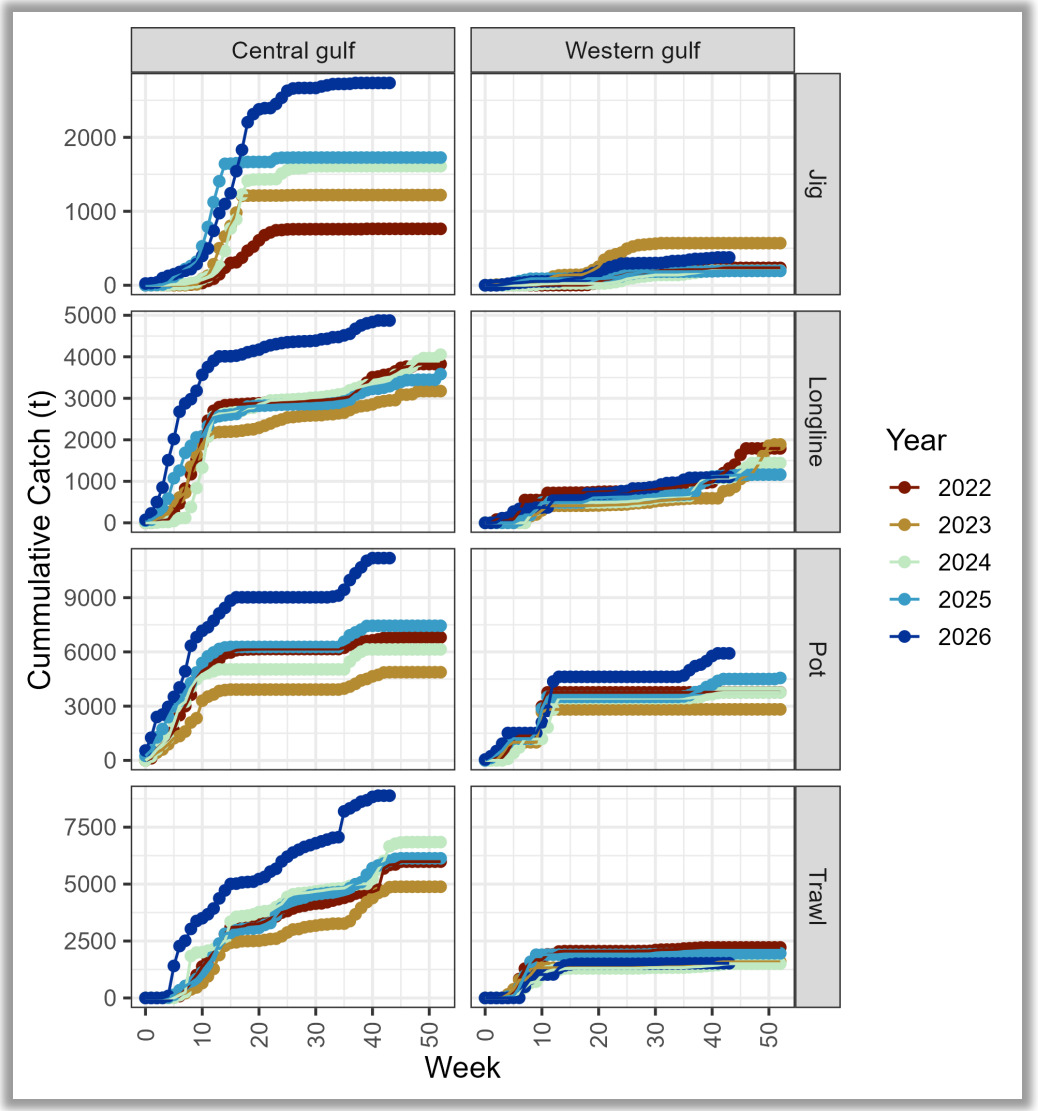
- Pot > LL > Trawl; Pot proportion of catch continues to increase (36% in 2023 to 46% in 2026), LL decreasing the most
- Jig/Other becoming more important, >8% in 2026




Through 10/26/26

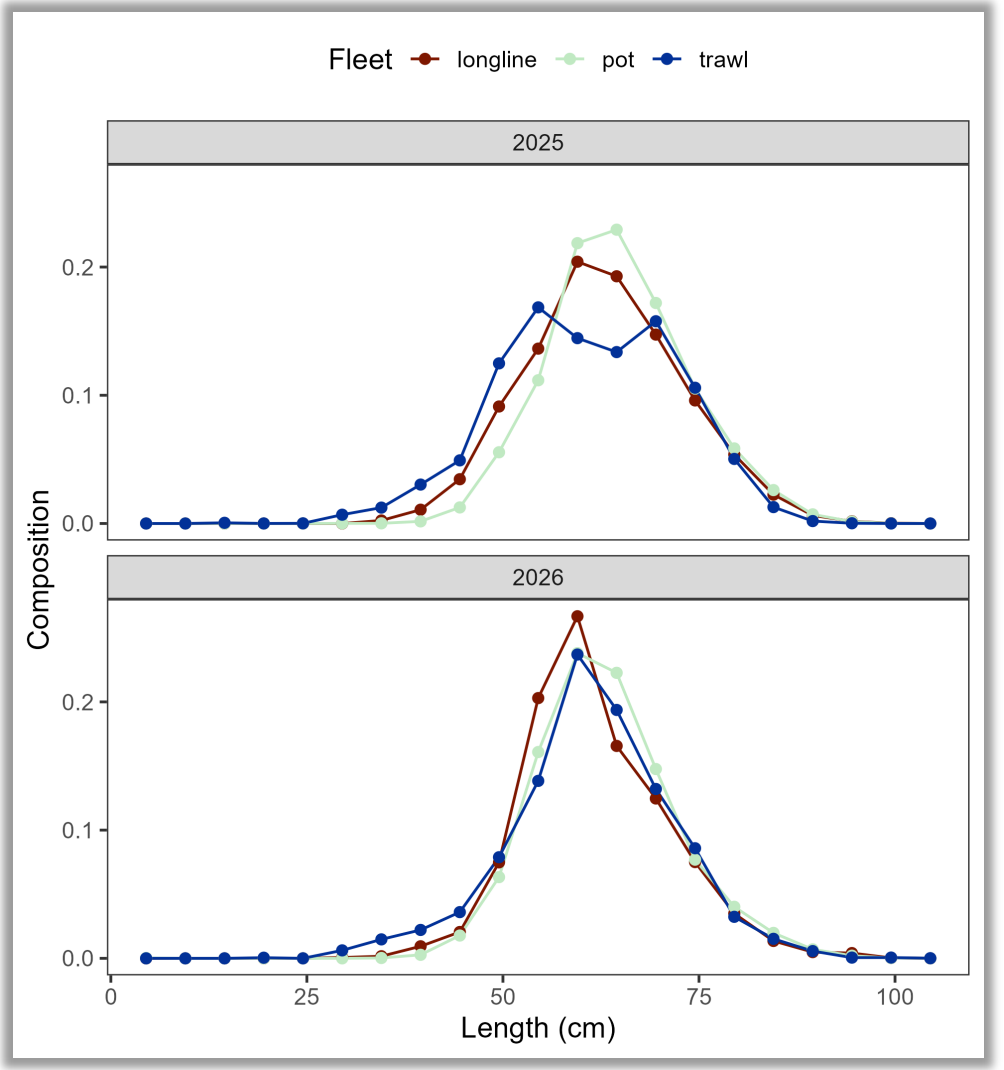
# DATA - CATCH

- Nothing inconsistent in cumulative catch compared to previous years
- CGOA larger than previous years due to increase in TAC



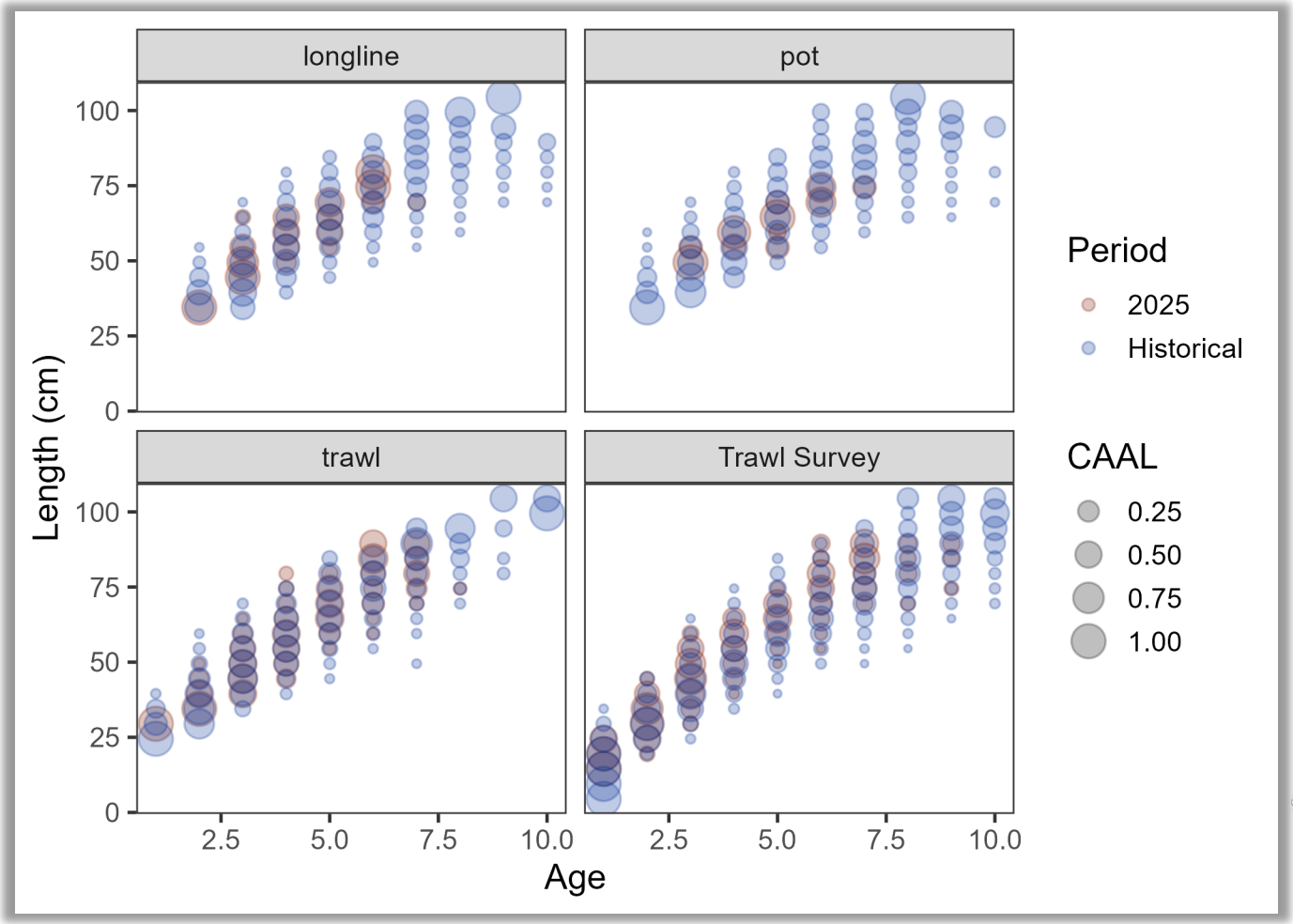
# DATA – COMPS

- 2025 and 2026 length comps by fleet
- Length across fleets similar in 2026



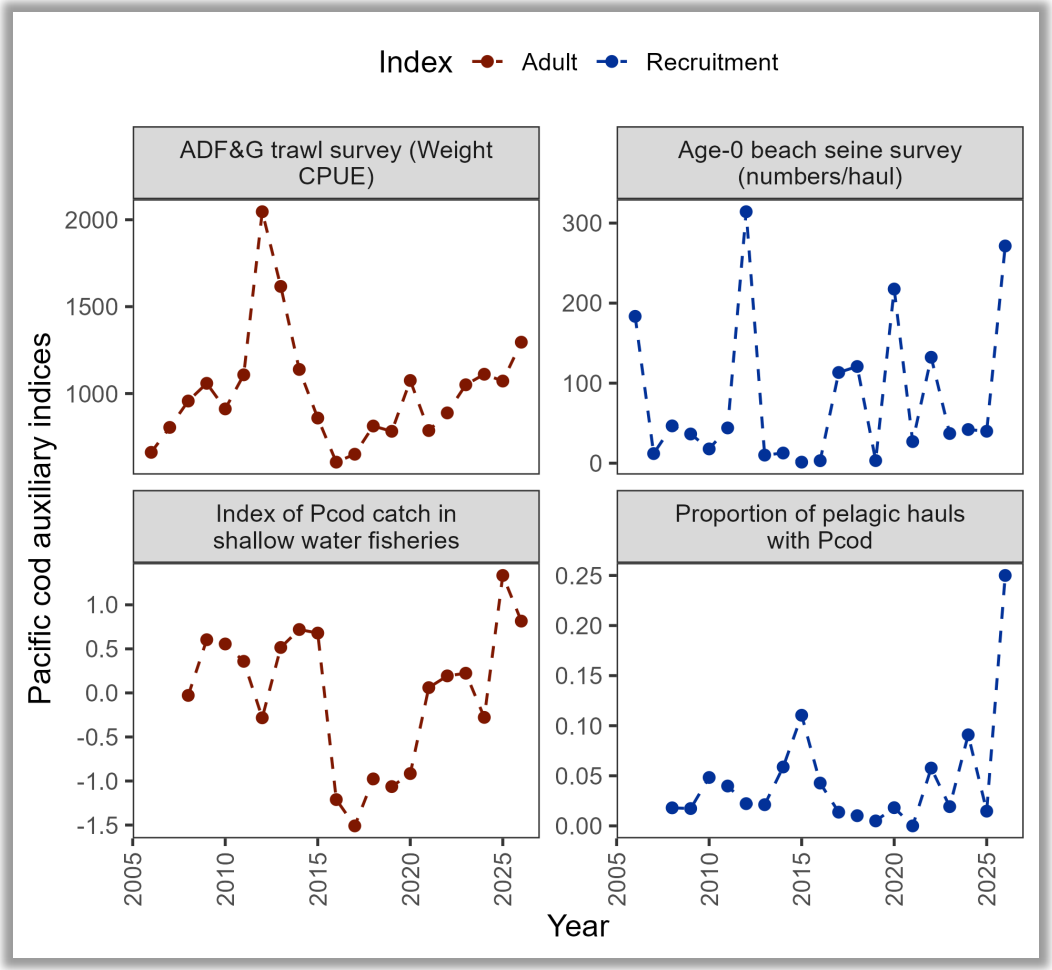
# DATA – COMPS

- 2025 CAAL compared to historical

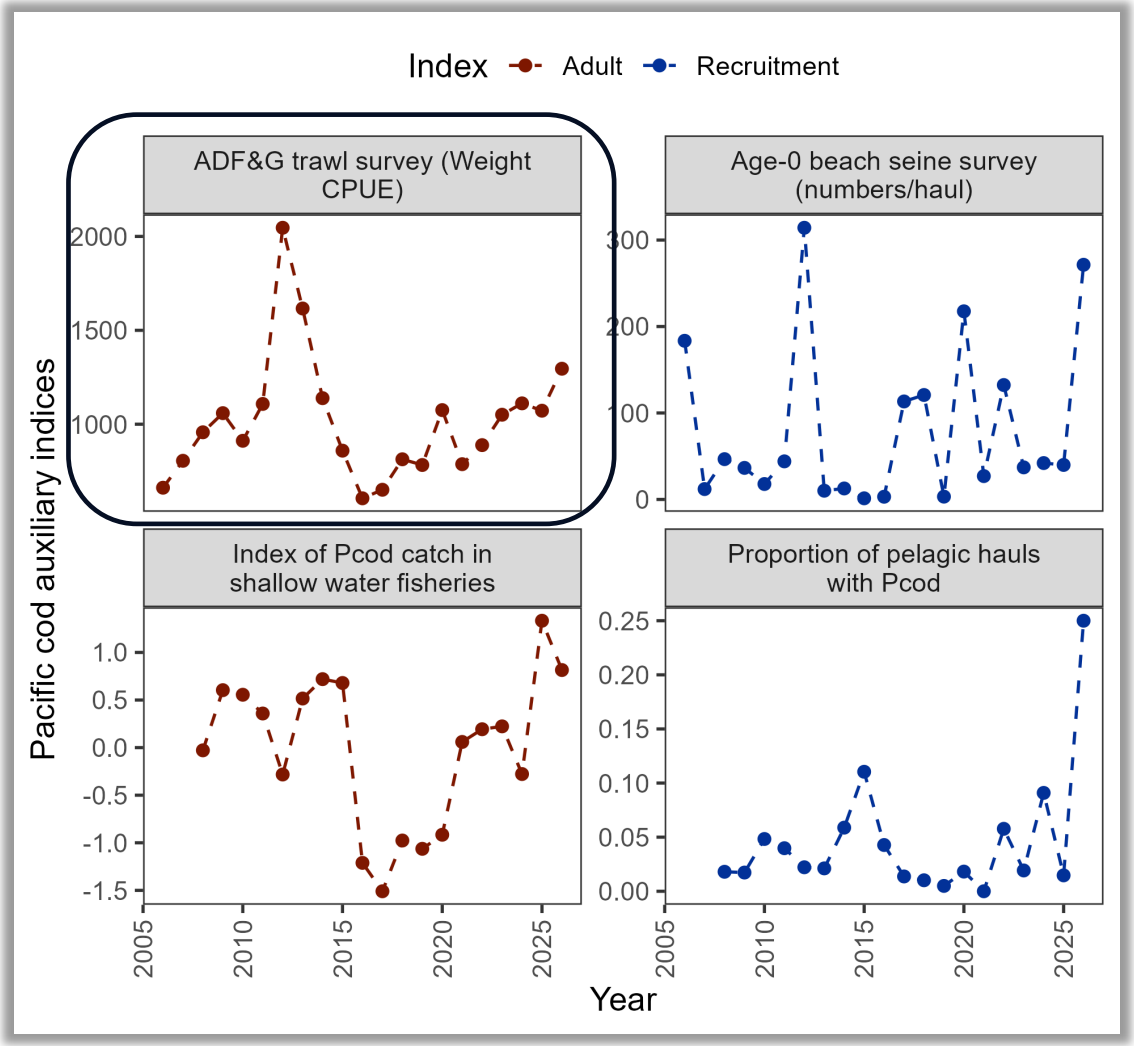


# DATA – AUXILIARY INFORMATION

- No index data in 2026, auxiliary information important for context

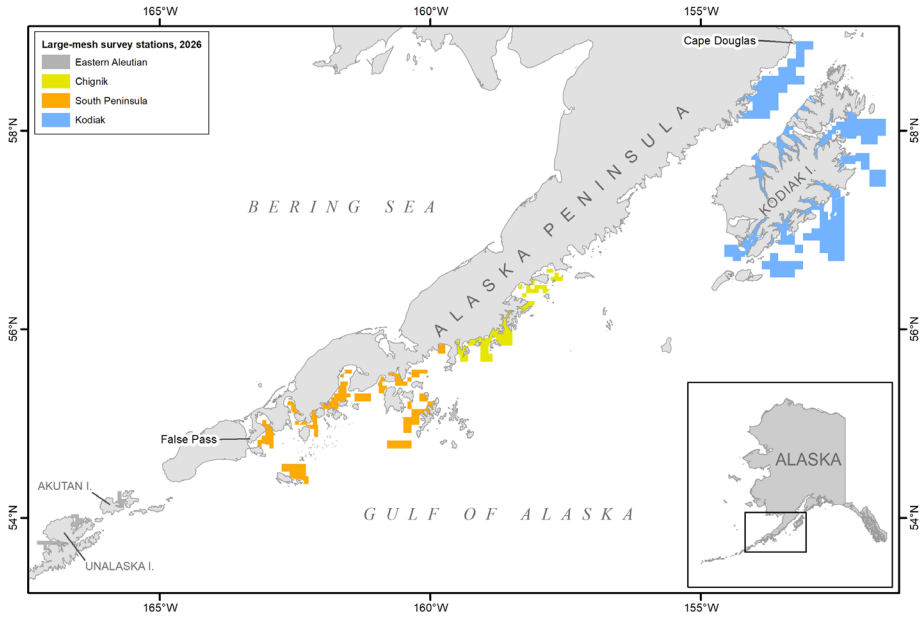


# DATA – AUXILIARY INFORMATION



# ADF&G Large-Mesh Trawl Survey

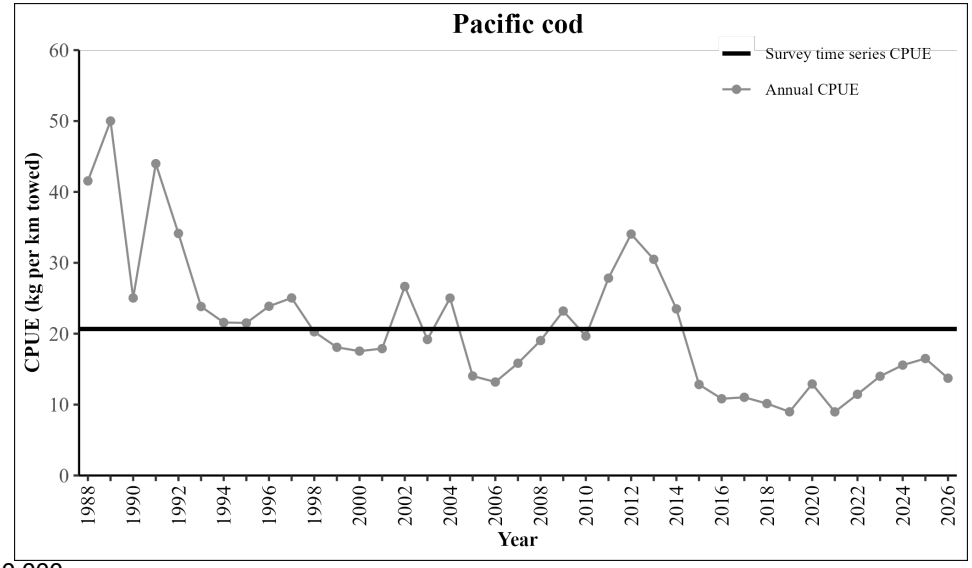
- 2026: 367 stations from Cape Douglas to Unalaska Island
- R/V Resolution, 95 feet
- 400-Eastern otter trawl is towed for 1.0 nmi
- A subsample is taken to determine species composition
- Commercially-important species are measured

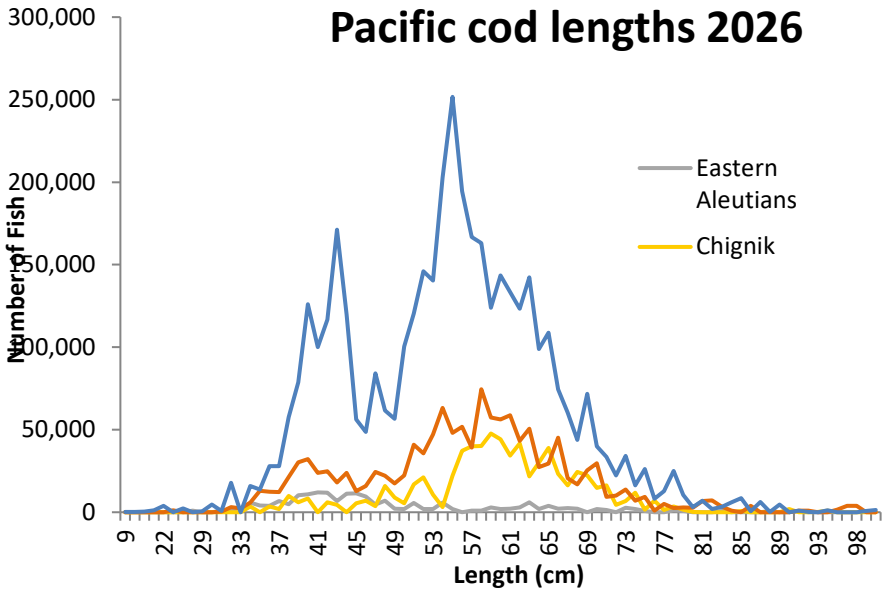


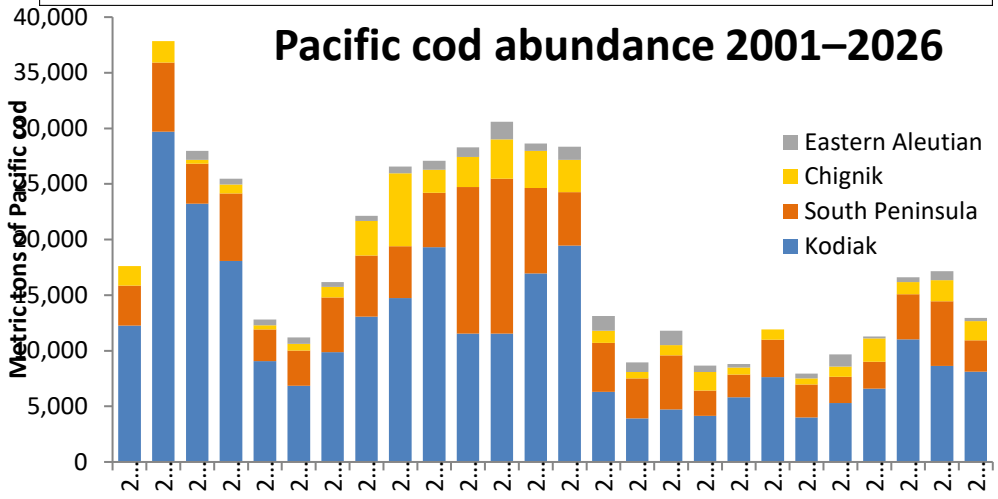



# Pacific cod results

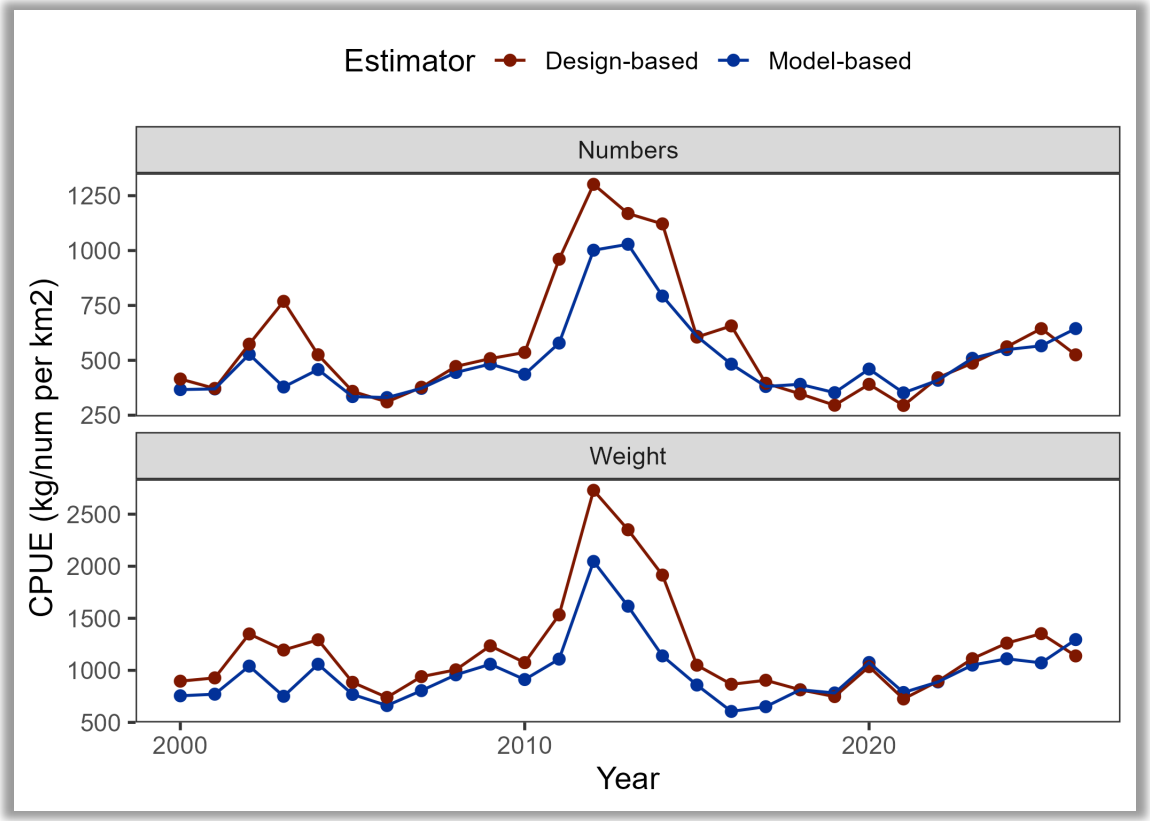
- 2026 P. cod CPUE and abundance have decreased but is still above the low levels from 2015 to 2022.
- All areas had decreasing abundance. Declines were steeper in South Peninsula and Eastern Aleutian Areas.
- Kodiak had two size modes, while size of cod measured in other areas were more evenly distributed.



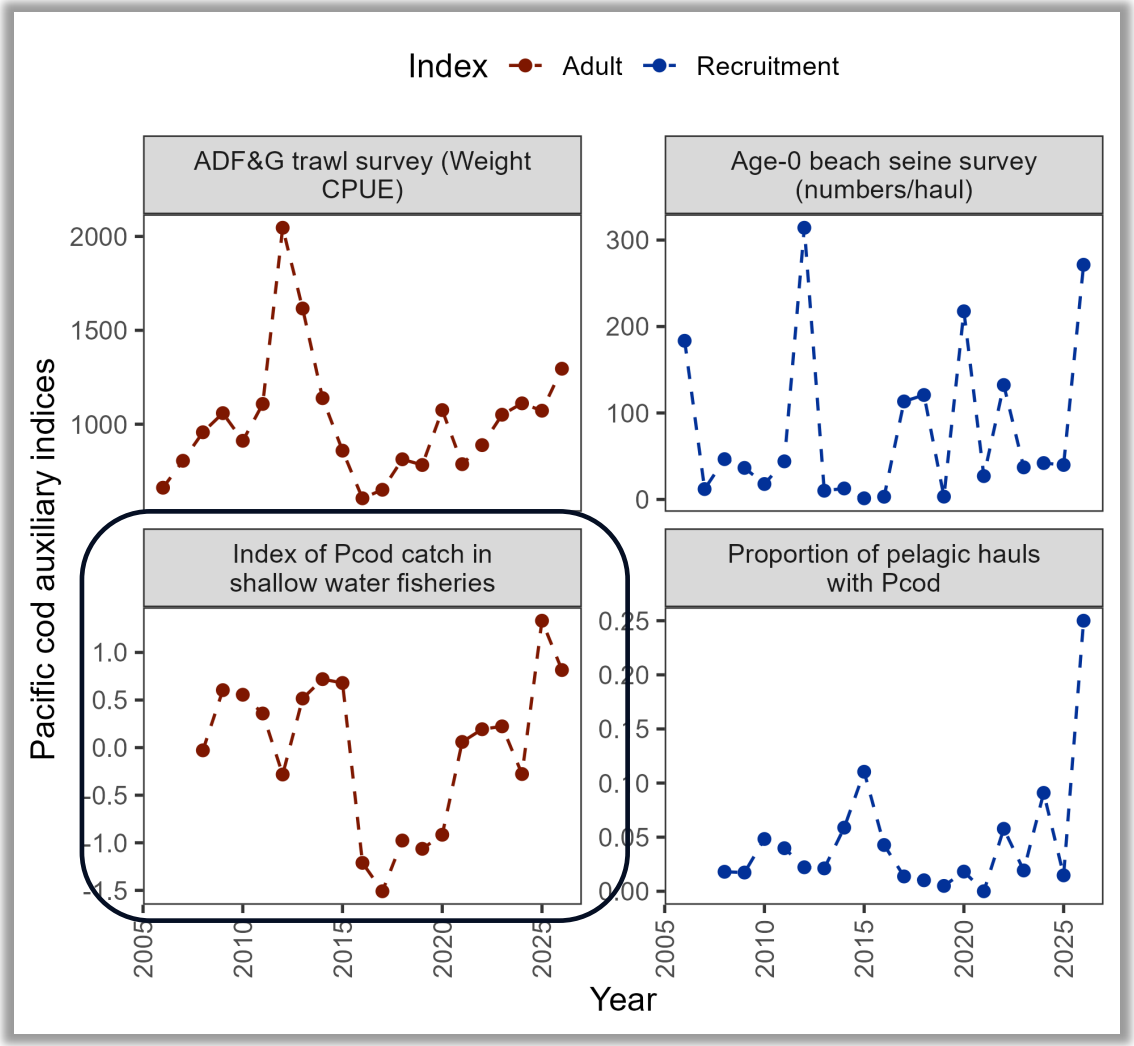



# DATA – ADF&G SURVEY



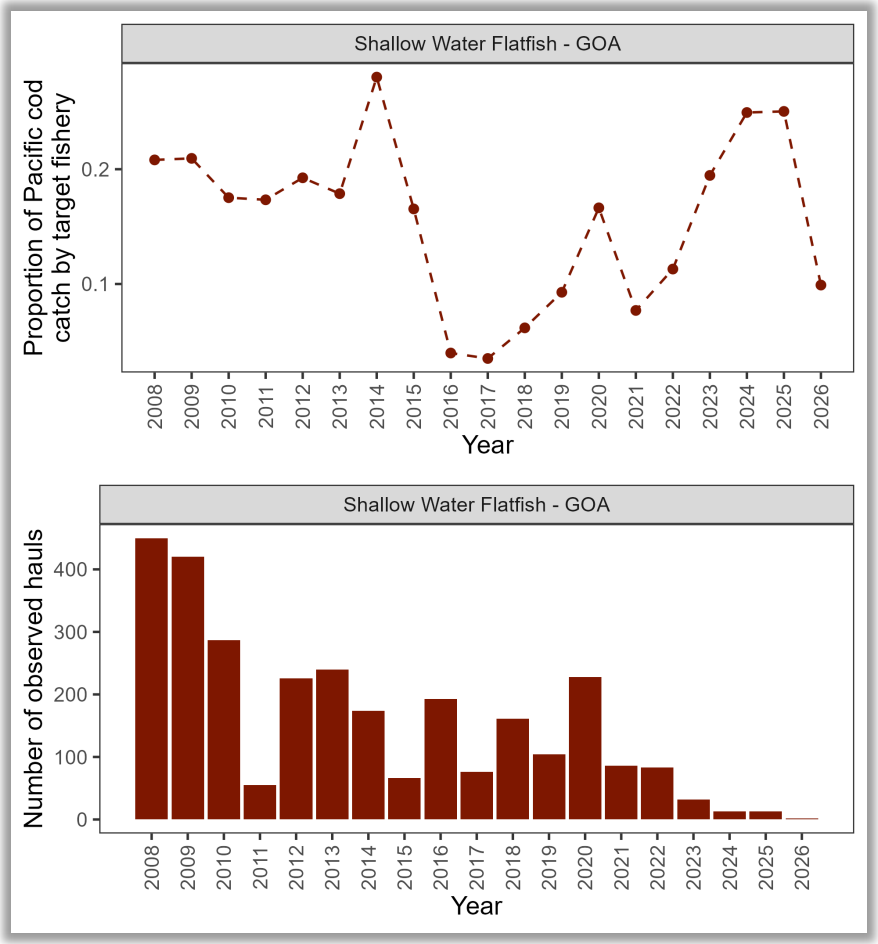

- Since at least 2020, 1st time we've seen mixed signals between design and model-based

# DATA – AUXILIARY INFORMATION



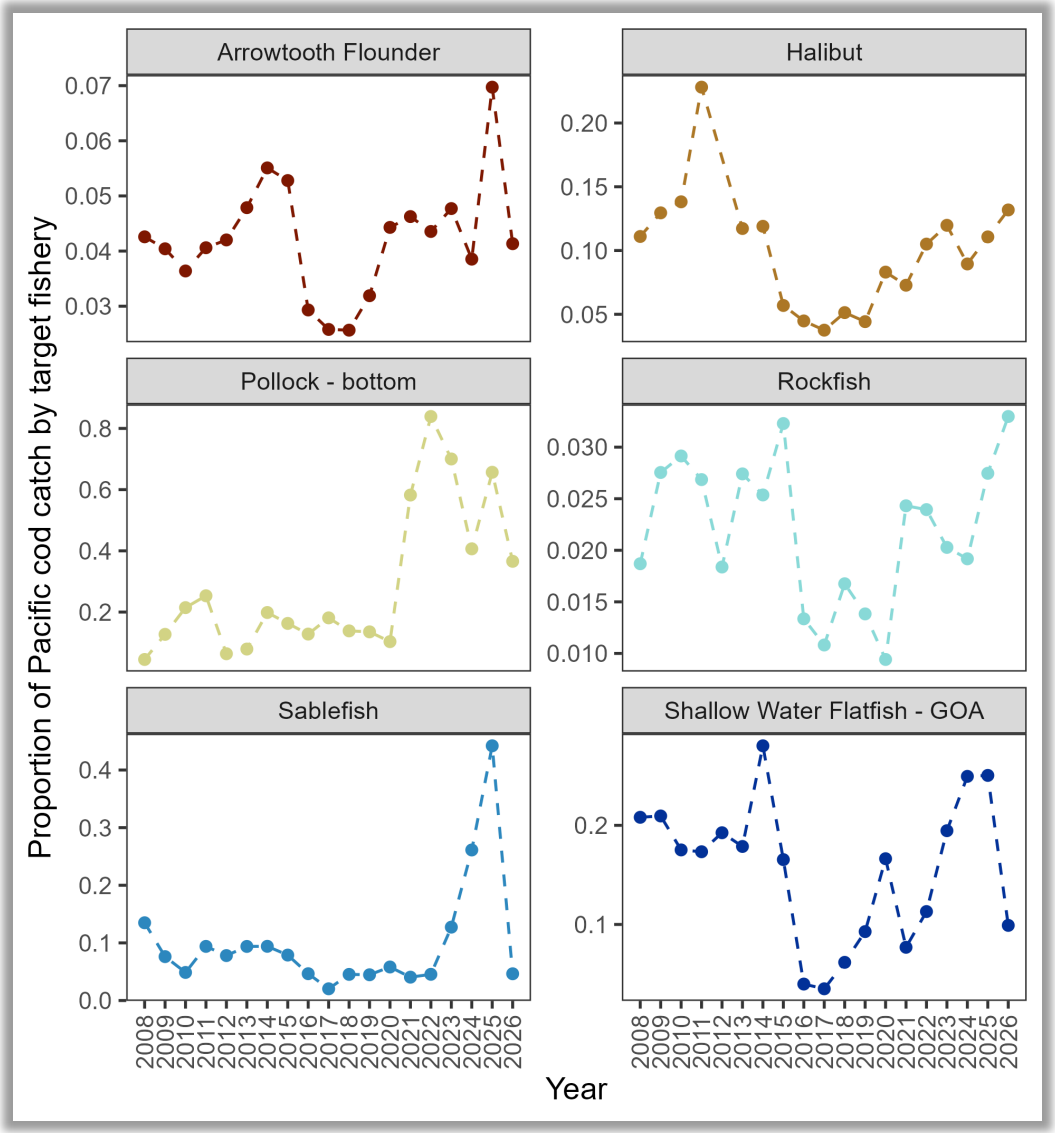
# DATA – SHALLOW WATER FISHERIES

- Shallow-water flats on its own no longer being observed at historical levels



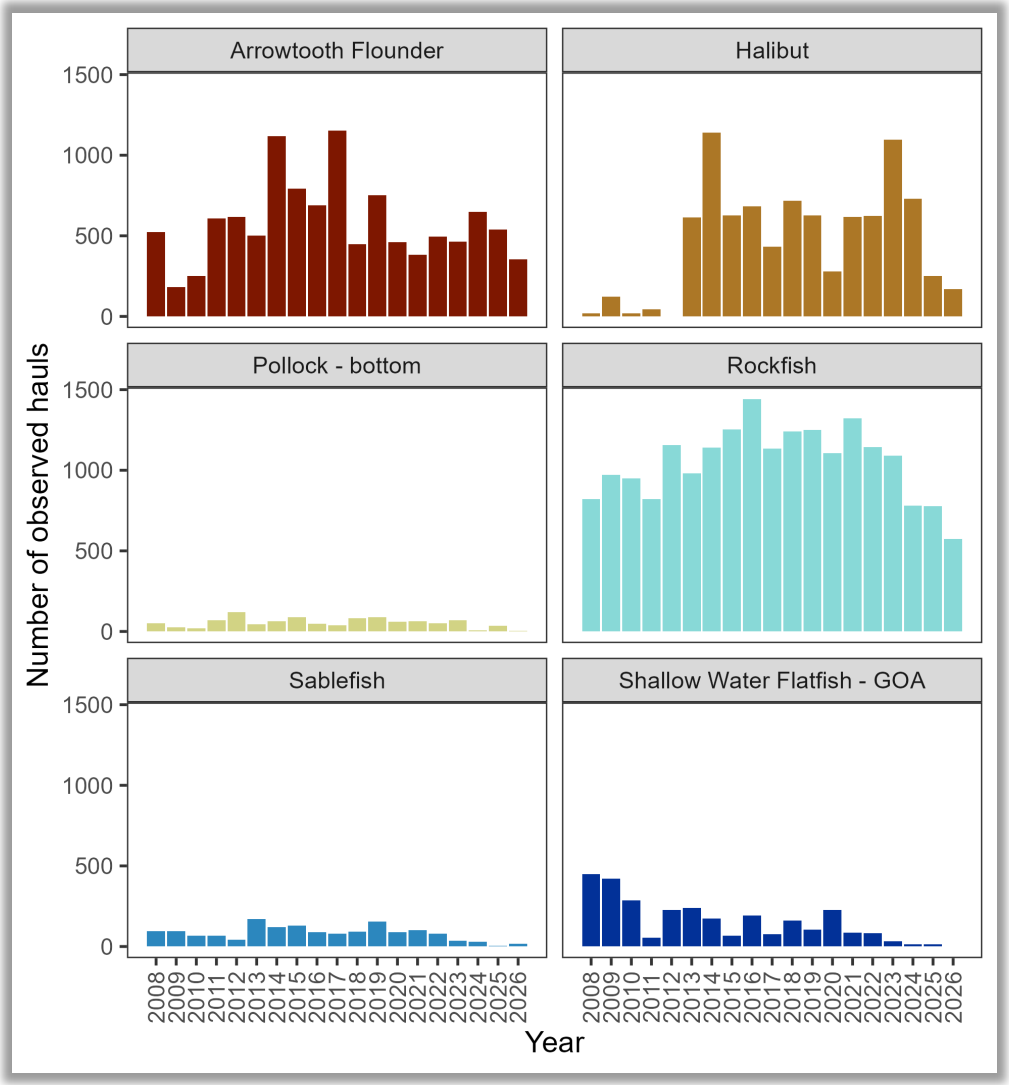
# DATA – SHALLOW WATER FISHERIES

- Thought about extending index to more than just a single fishery
- Looked for fisheries operating on bottom in shallow water (<300 m) with consistent time-series



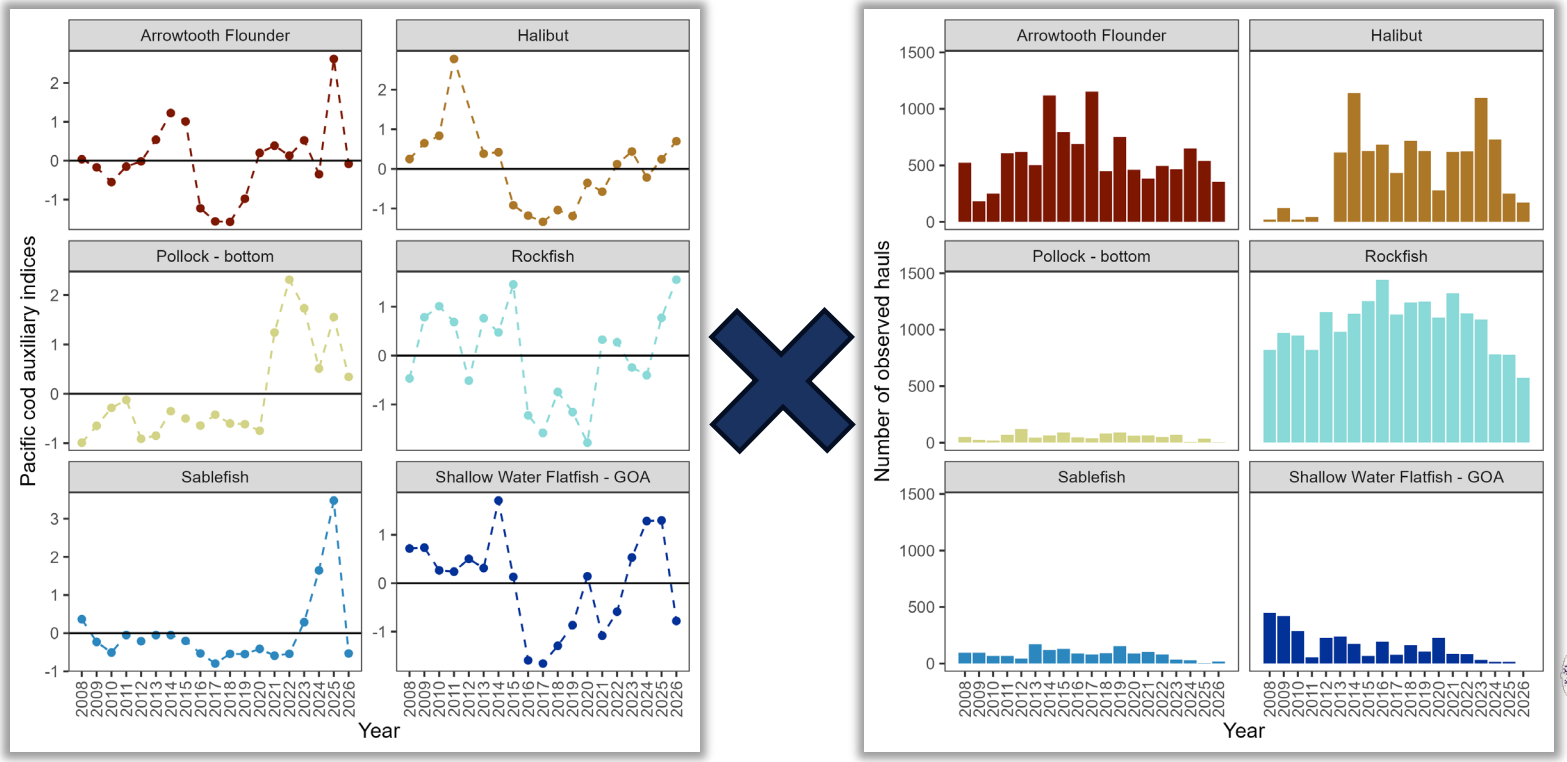
# DATA – SHALLOW WATER FISHERIES

- ATF, Halibut, and Rockfish have larger number of observer sampled hauls
- Note: Halibut and Sablefish only fisheries that have higher value than cod



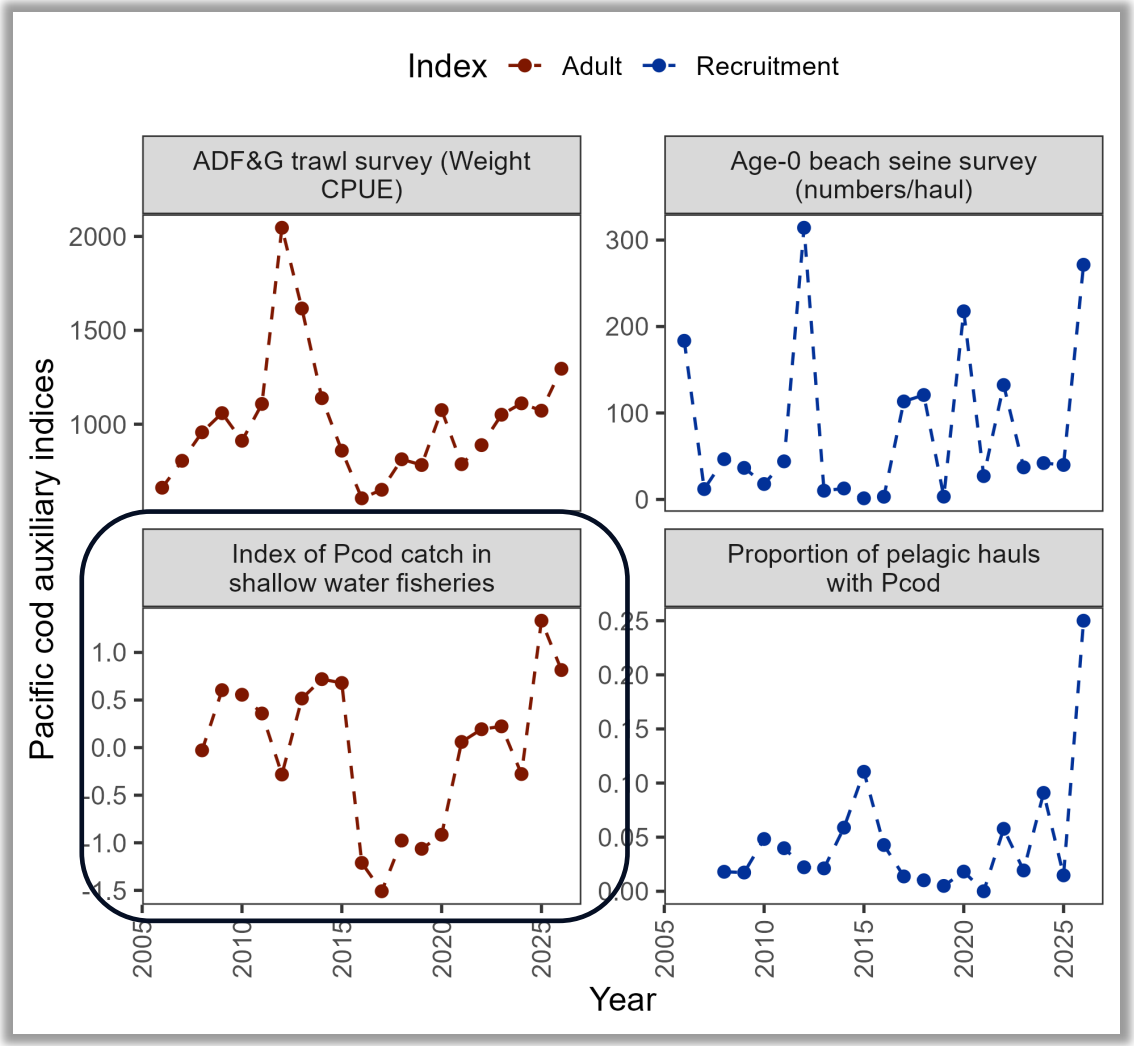
# DATA – SHALLOW WATER FISHERIES

- To construct index: standardize proportion of cod catch and weight by number of observed hauls



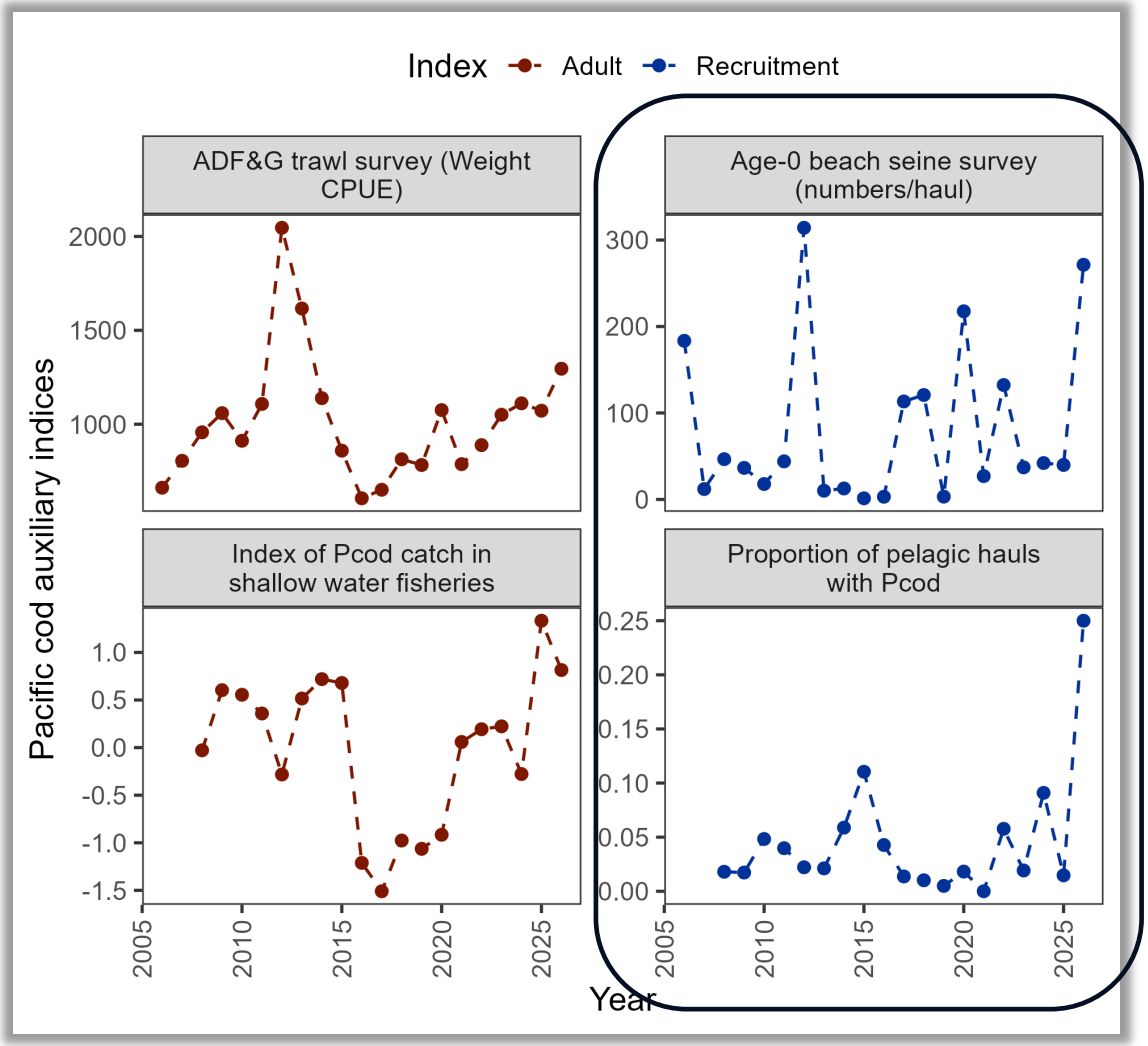
# DATA – AUXILIARY INFORMATION

- Development of this index will evolve, interested in Plan Team's thoughts
- Caveat's: Def'n of 'target' in observer data vs what the cap't target was, variable observer coverage across time
- Can we get this from logbook data?



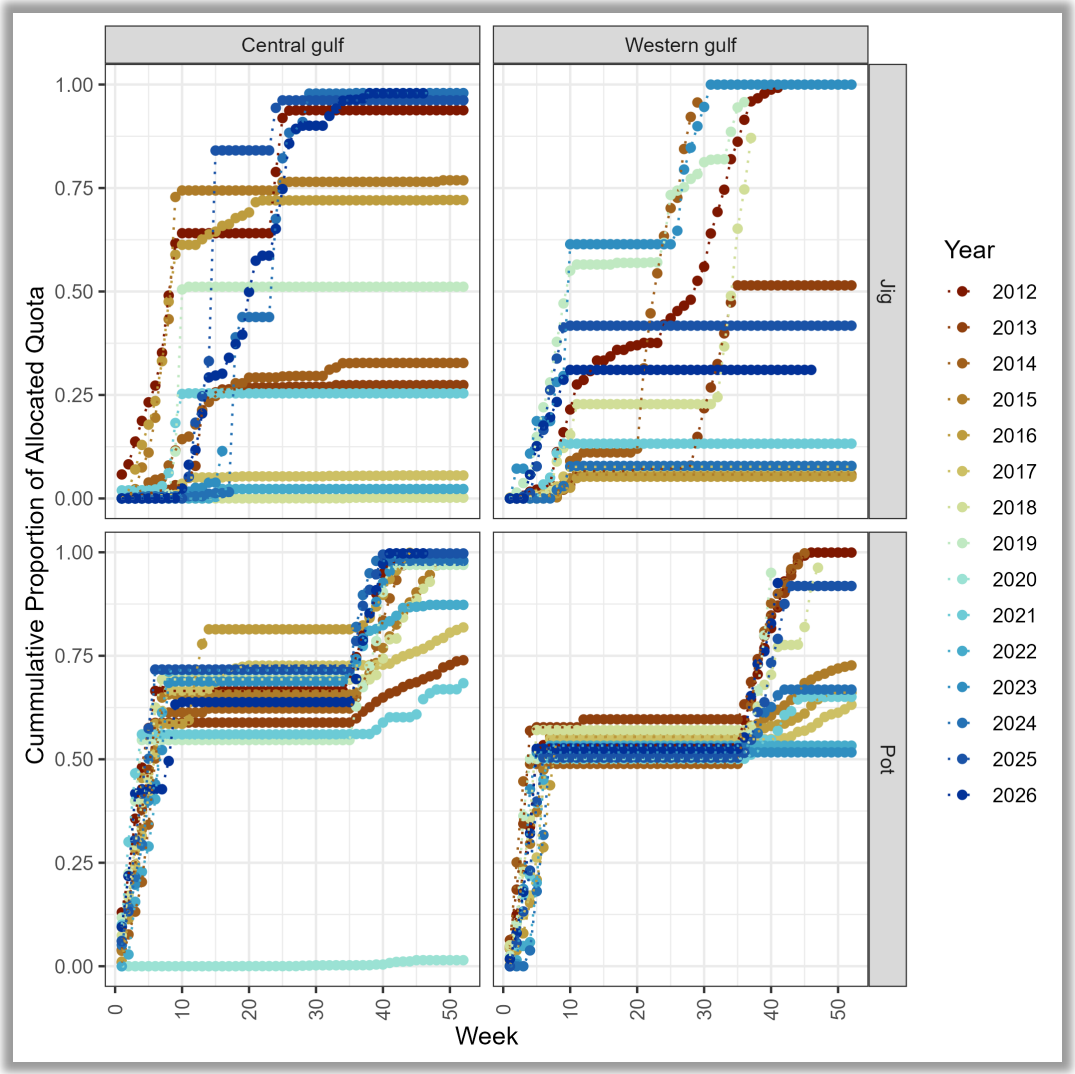
# DATA – RECRUITMENT

- 2026-year class showed up both near shore and off shore
- Will they survive??



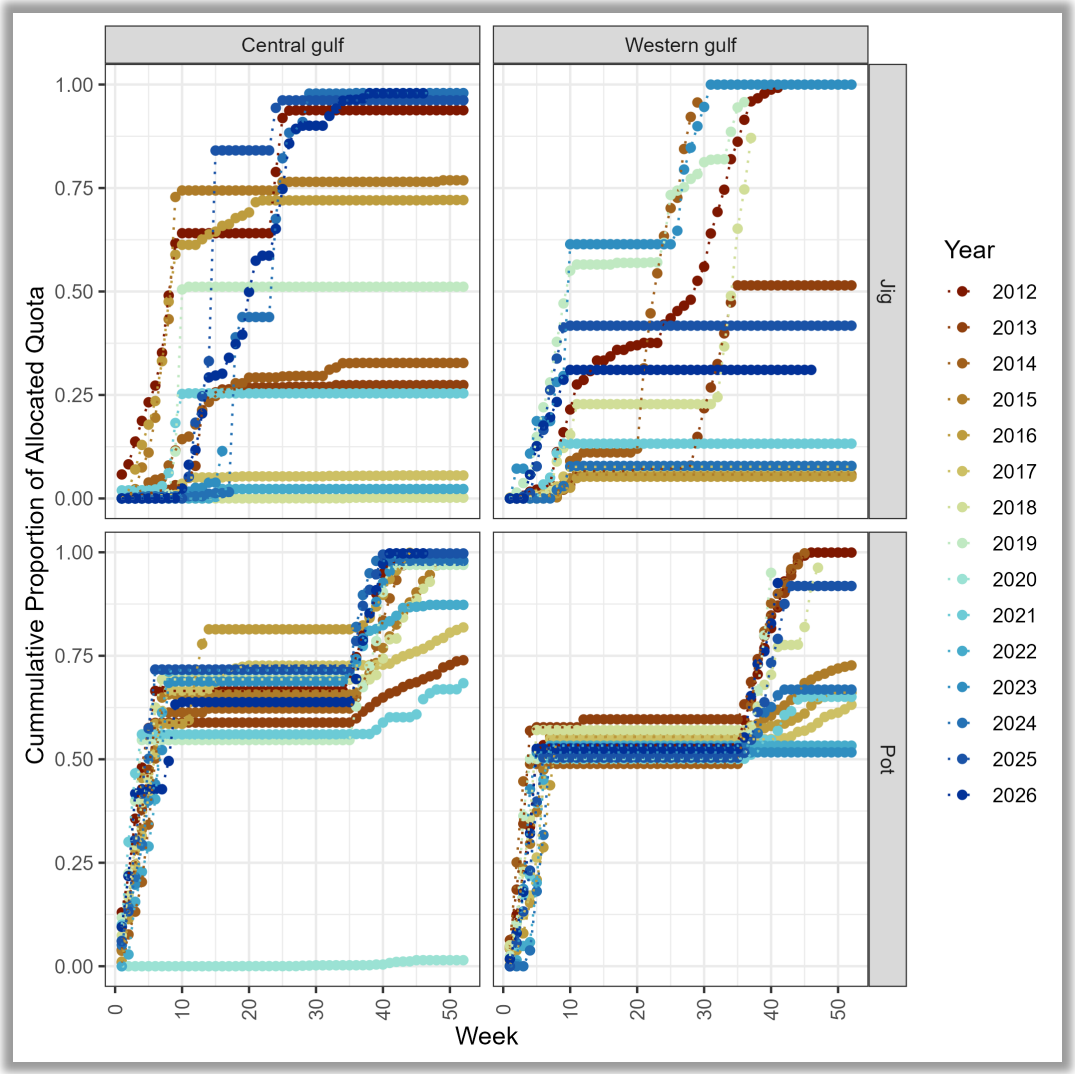
# DATA – FISHERY PERFORMANCE

- Comments about catch rates during the crash
- Dug into looking at how to quantify fishery performance during the collapse as an indicator of current conditions



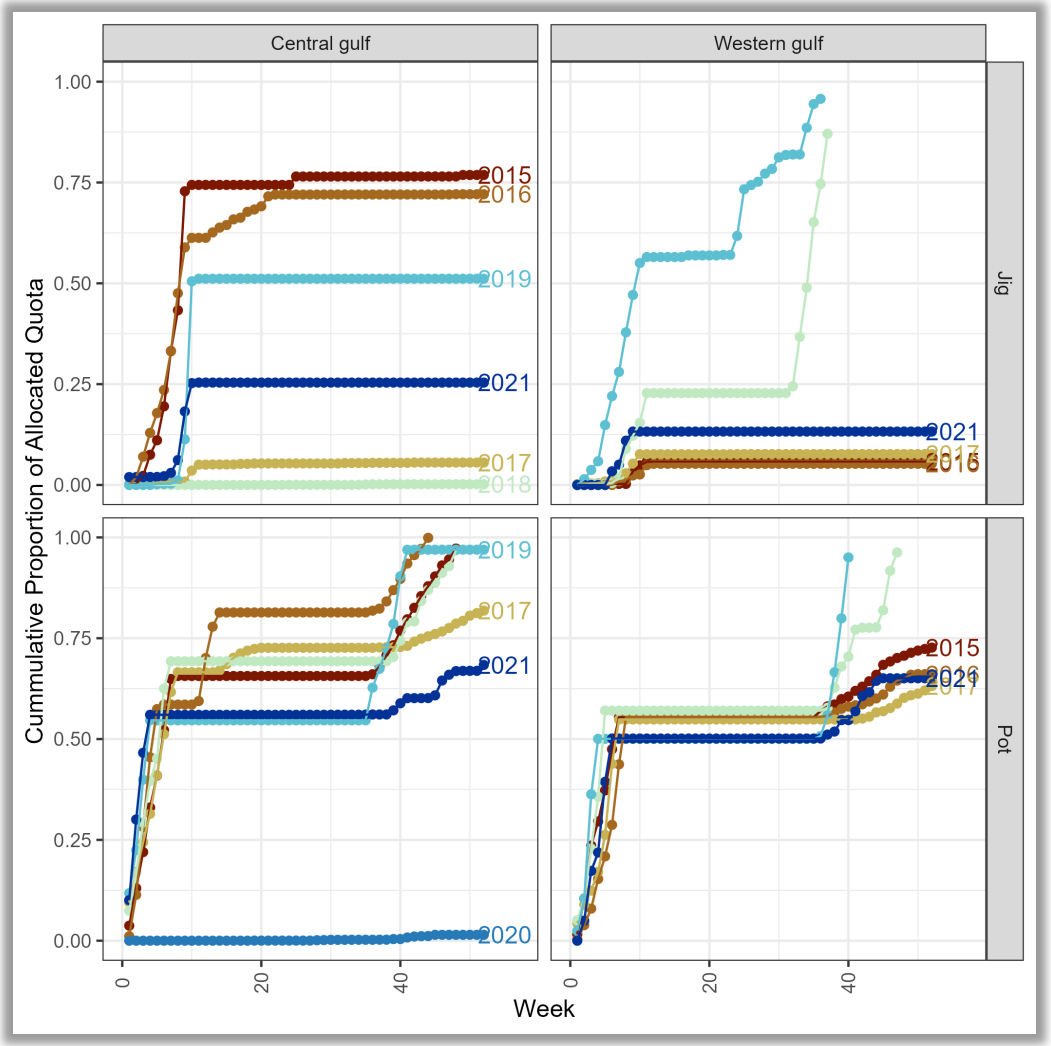
# DATA – FISHERY PERFORMANCE

- As a start, looked at Central and Wester GOA Jig and Pot fisheries
- Computed the cumulative proportion of allocated quota



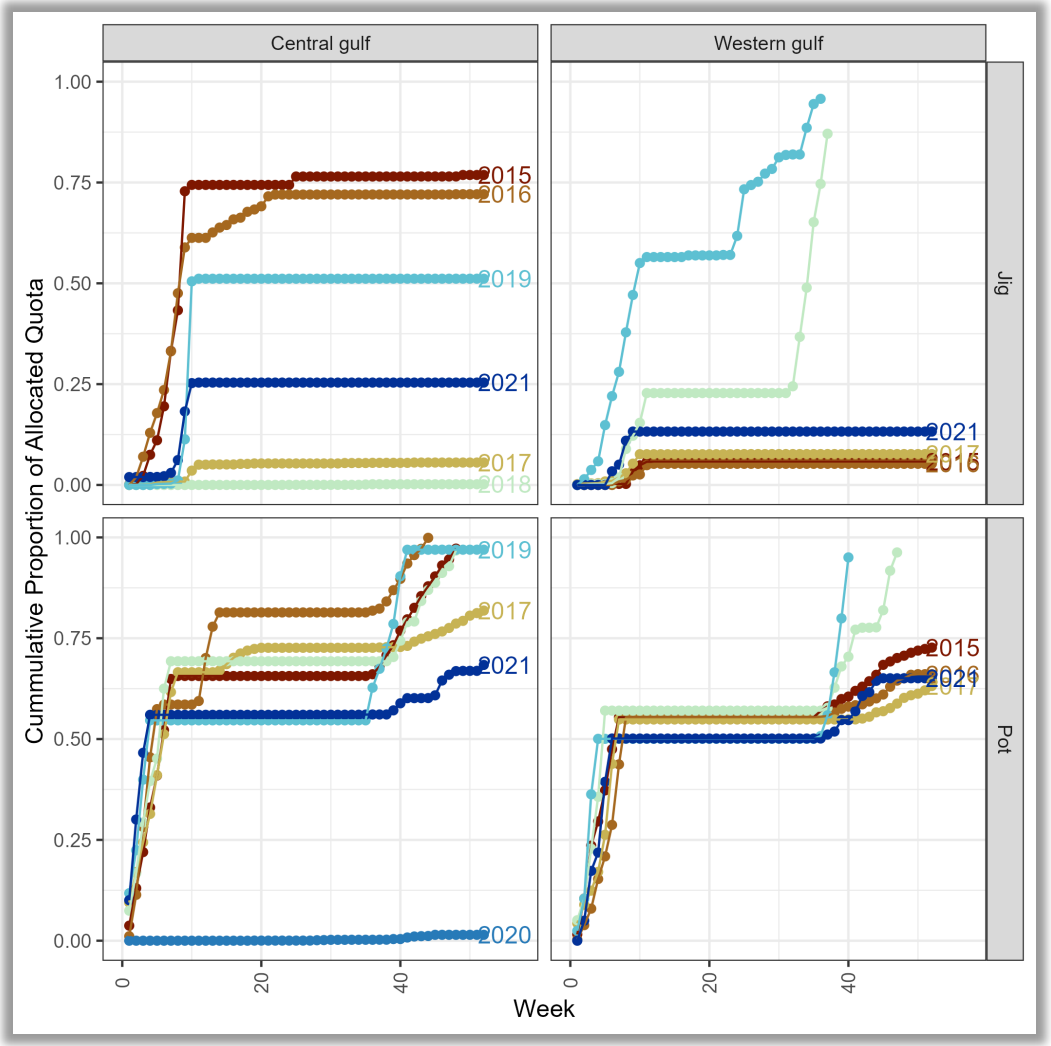
# DATA – FISHERY PERFORMANCE

- During collapse see decrease in proportion of catch to quota as population declined
- Particularly true for CGOA Jig, but also for pot



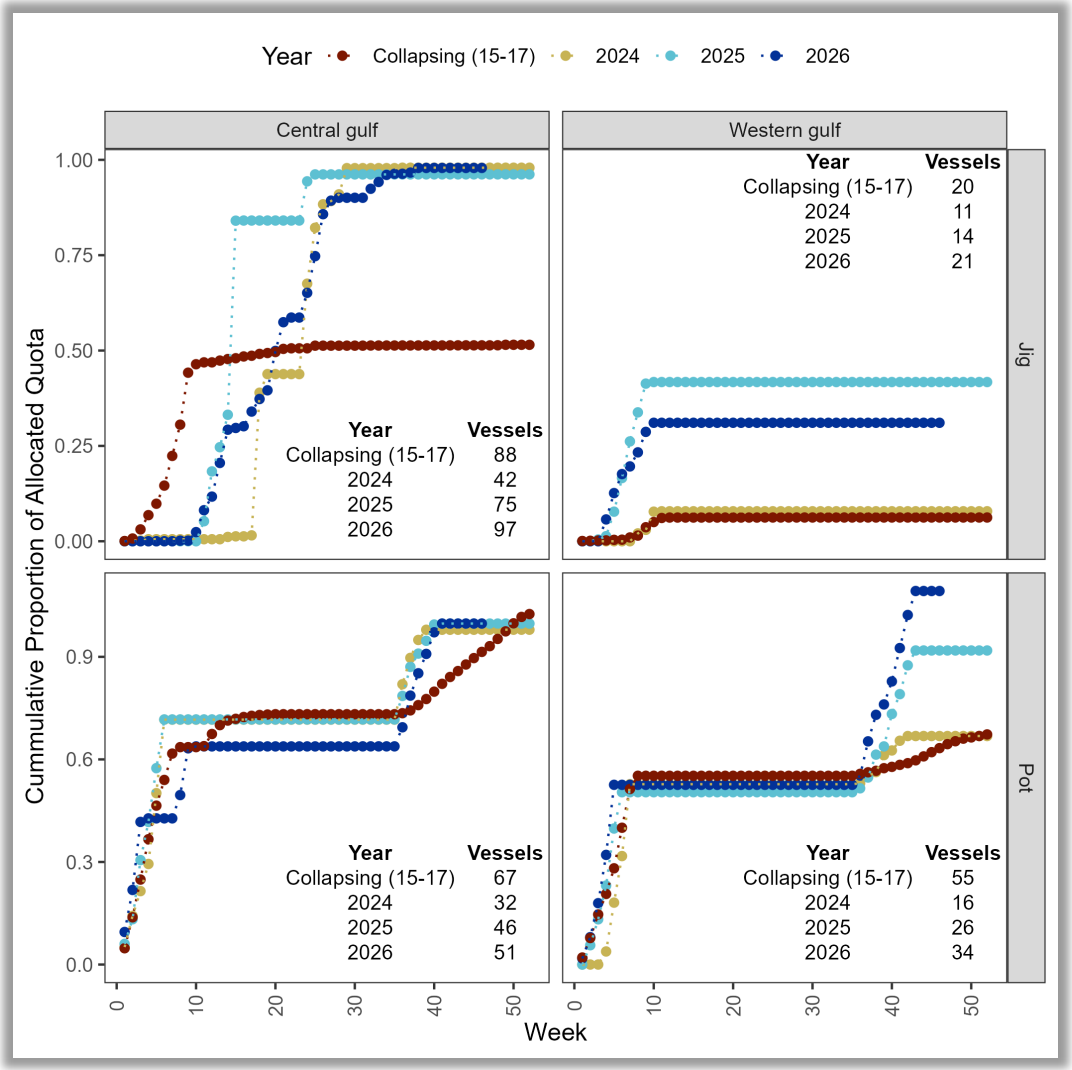
# DATA – FISHERY PERFORMANCE

- Collapse itself occurred between 2015-2017, by 2019/2020 assessment finally caught up
- Use this window of time as a ‘trigger point’ or ‘baseline’ to compare current fishery performance



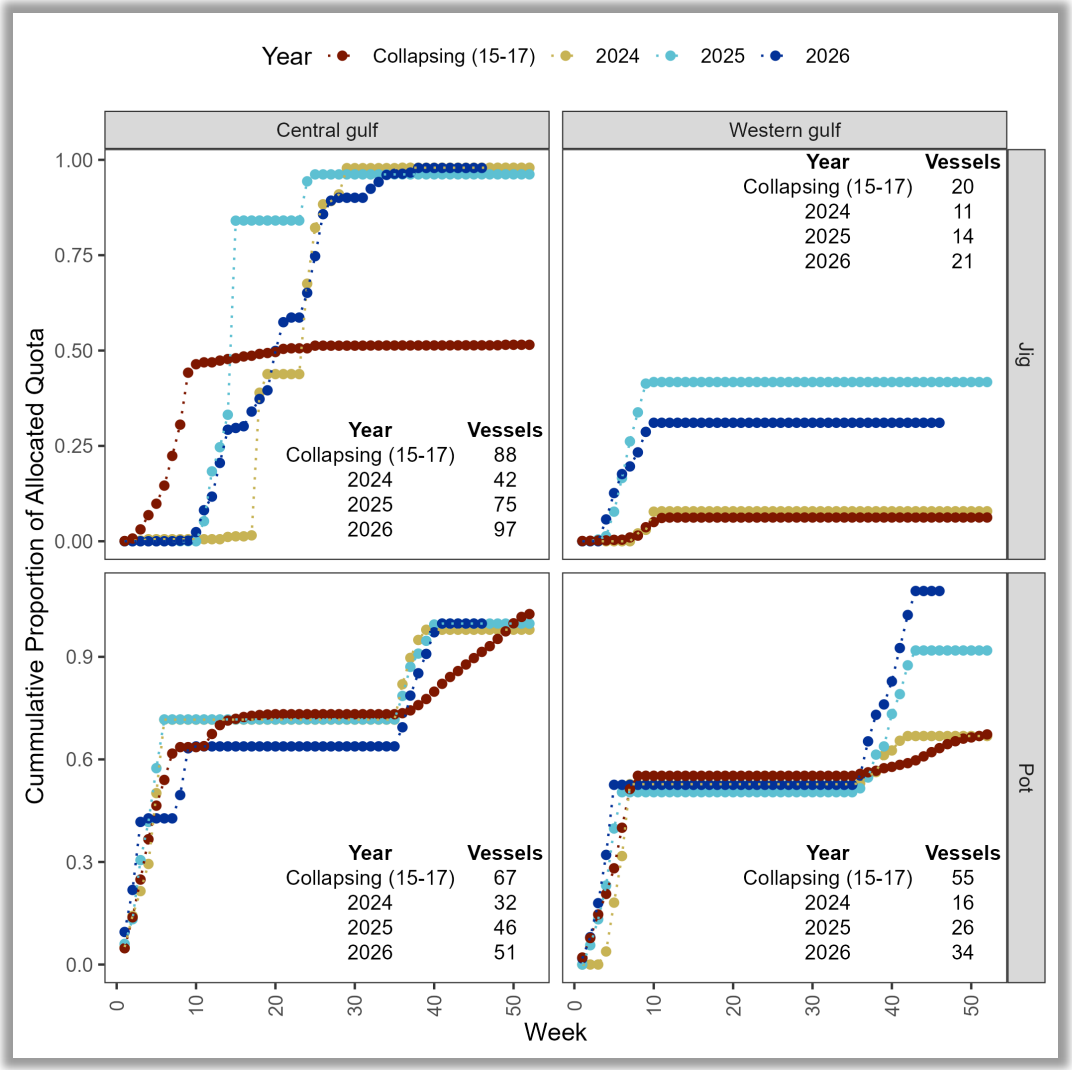
# DATA – FISHERY PERFORMANCE

- Take average proportion from 2015-2017 as ‘baseline’
- Compare with previous 3 years (2024-2026)
- Participation is also something to consider
- Not just magnitude (Jig), but also shape of cumulative catch (pot) could be important indicators



# DATA – FISHERY PERFORMANCE

- Bottom line: recent fishery performance not at collapse levels
- 2024 in WGOA at low levels, but participation still rebuilding post-closure



## RESULTS

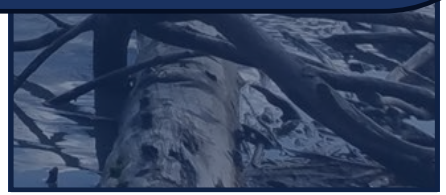
~~Data fits~~

~~Model diagnostics~~

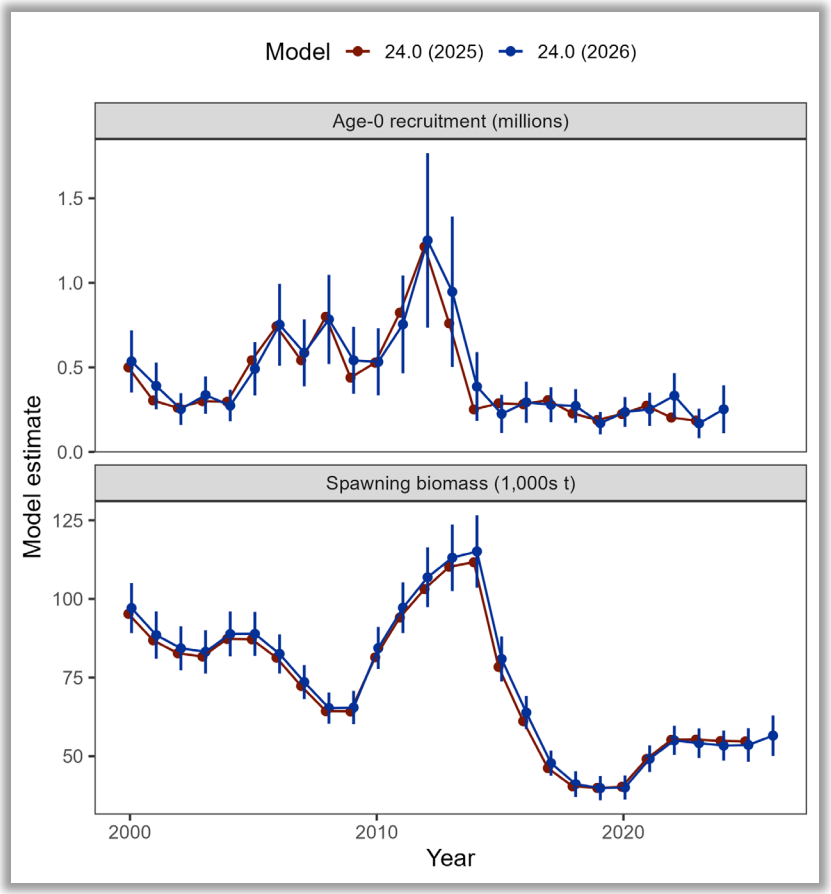
Model 24.0 results

Recommendations

- Fits and diagnostics included in SAFE document
- Data fits indistinguishable from results of 2025 version Model 24.0
- Diagnostics show no red-flags, consistent with 2025 version of Model 24.0

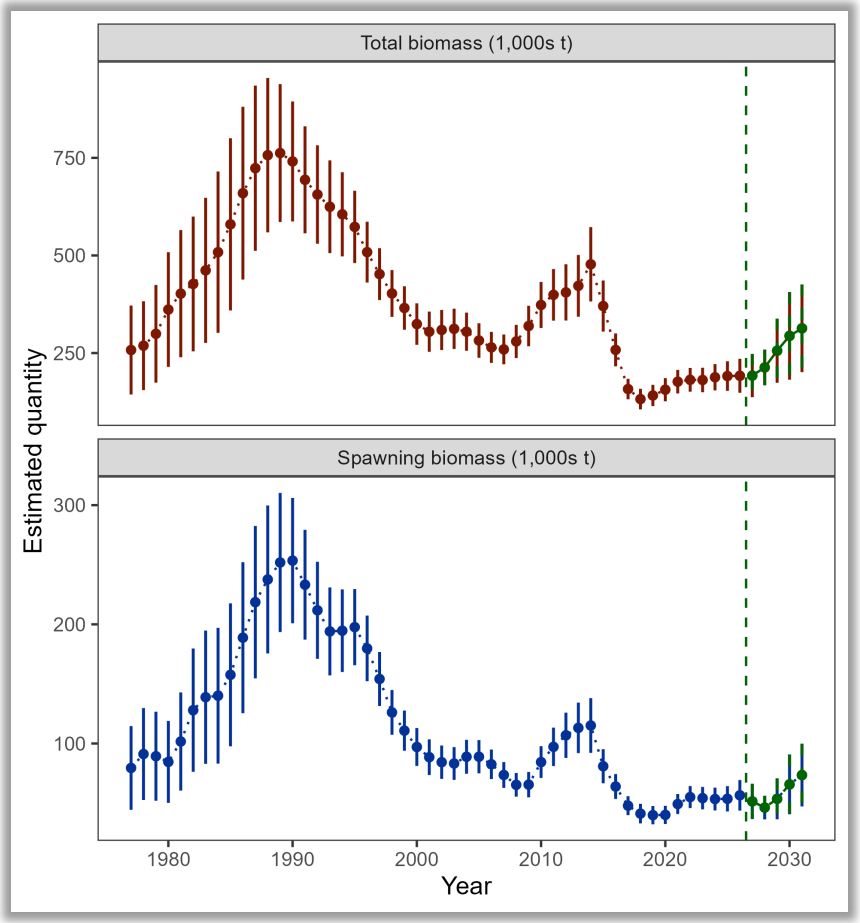


- 2026 data update in Model 24.0 consistent with 2025 version of Model 24.0
- 2026 update indicates:
  - Larger 2022-year class
  - Increase in spawning biomass in 2026




# RESULTS: 2025 VS 2026 MODEL 24.0

- Biomass projected to increase by 2030, but, based on realization of average recruitment



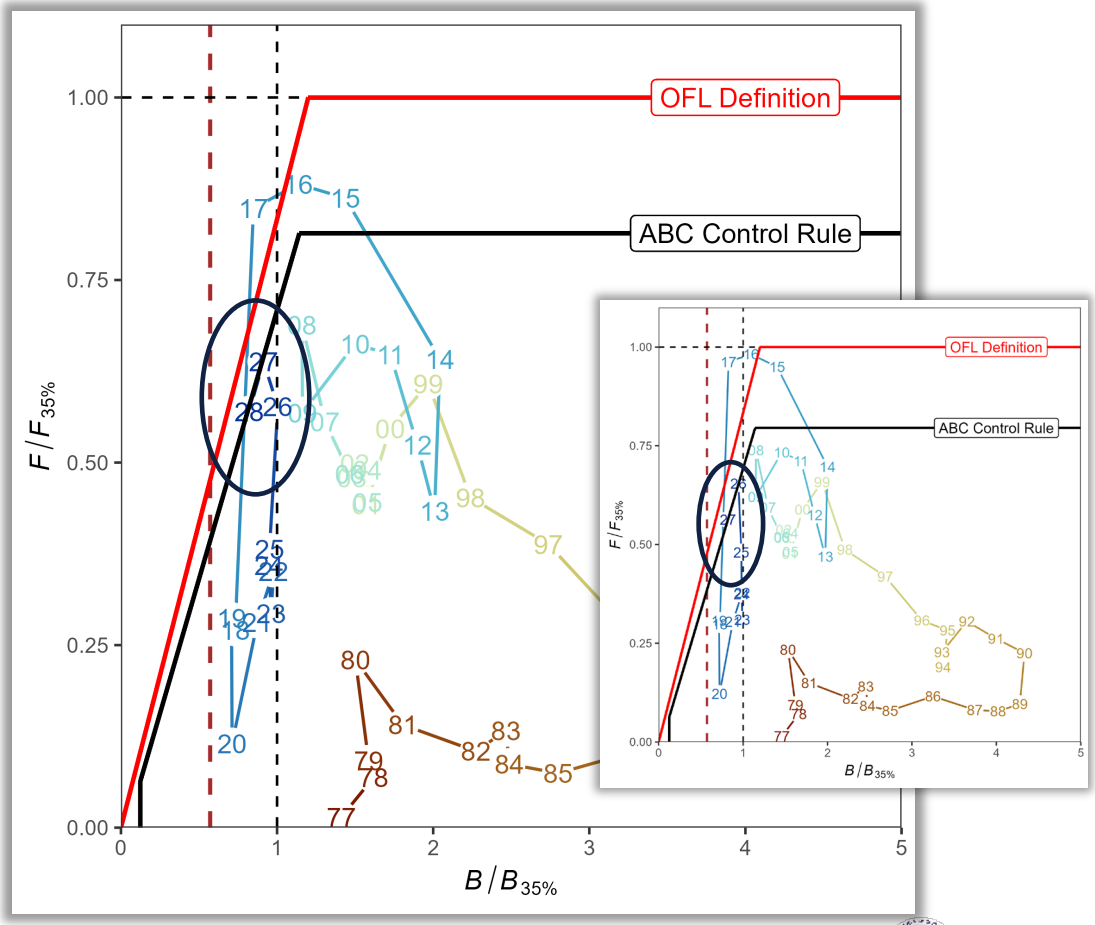

# RESULTS: BIOMASS

- Stock status
- Risk table
- ABC/OFL recommendations
- Apportionment



# STOCK STATUS

- Tier 3b: on the ramp
- Estimated to be above $B_{20\%}$ (dashed red line), 2026 = $B_{35.2\%}$
- Projected to move down the ramp in 2028



# RISK TABLE

| *Assessment-related Considerations* | *Population Dynamics Considerations* | *Ecosystem Considerations* | *Fishery-informed Stock Considerations* |
|---|---|---|---|
| **Level 1:** Normal | **Level 1:** Normal | **Level 1:** Normal | **Level 1:** Normal |
| Model 24.0 does not have a concerning retrospective pattern and fits the available data well | Stock continues to experience historically low spawning biomass coupled with below average recruitment | The adult population experienced cooler/average environmental conditions with average/above- average prey resources in 2026 (limited reporting). El Niño conditions in 2027 are not expected to impact adult survival at the population level, but reduced egg/larval survival and diminished adult prey base may occur. | Fishery performance indicators are consistent with previous years |

# ABC/OFL RECOMMENDATIONS

## Model 24.0 recommended ABC: 1% increase in 2027 ABC

| Quantity | As estimated or *specified last* year for: 2026 | 2027 | As estimated or *specified this* year for: 2027 | 2028 |
|---|---|---|---|---|
| *M* (natural mortality rate) | 0.5* | 0.5* | 0.53* | 0.53* |
| Tier | 3b | 3b | 3b | 3b |
| Projected total (age 0+) biomass (t) | 182,156 | 186,118 | 192,257 | 213,107 |
| Female spawning biomass (t) | | | | |
| Projected | 52,772 | 45,838 | 51,423 | 46,230 |
| $B_{100\%}$ | 159,595 | 159,595 | 160,874 | 160,874 |
| $B_{40\%}$ | 63,838 | 63,838 | 64,350 | 64,350 |
| $B_{35\%}$ | 55,858 | 55,858 | 56,306 | 56,306 |
| $F_{OFL}$ | 0.68 | 0.54 | 0.68 | 0.57 |
| $maxF_{ABC}$ | 0.54 | 0.47 | 0.55 | 0.49 |
| $F_{ABC}$ | 0.54 | 0.47 | 0.55 | 0.49 |
| OFL (t) | 49,782 | 38,812 | **50,194** | 43,208 |
| maxABC (t) | 41,520 | 32,209 | 41,937 | 35,866 |
| ABC (t) | 41,520 | 32,209 | **41,937** | 35,866 |
| **Status** | As determined *last* year for: 2024 | 2025 | As determined *this* year for: 2025 | 2026 |
| Overfishing | No | n/a | No | n/a |
| Overfished | n/a | No | n/a | No |
| Approaching overfished | n/a | No | n/a | No |

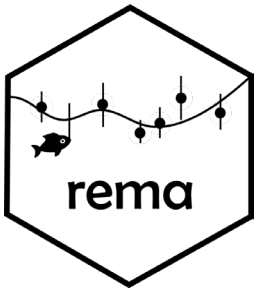
**Base natural mortality M varies between 0.53 and 0.88*

*** Assumed 2026 catch to be the 2026 ABC. For 2028 projections the 2027 catch was assumed to be at the projected ABC.*

# APPORTIONMENT

- Apportionment % among subregions unchanged from 2025 assessment, updated BRDs with 2027 ABC:

| | Western | Central | Eastern | Total |
|---|---|---|---|---|
| Area apportionment | 24.80% | 69.20% | 6% | 100% |
| 2027 BRD | 10,401 | 29,020 | 2,516 | 41,937 |
| 2028 BRD | 8,894 | 24,820 | 2,152 | 35,866 |



# APPORTIONMENT UNCERTAINTY

- Plane-ride coding
- 2-stage bootstrap:
  - Simulate sub-region biomass based on rema model estimates and uncertainty → compute apportionment %
  - Simulate ABC estimates with uncertainty from assessment projections
- Multiply simulated apportionment % with simulated ABC to determine range in BRD

# APPORTIONMENT UNCERTAINTY

- CV > 30% for each sub-area BRD based upon assessment and rema model uncertainty
- This is a 1st pass, other sources of uncertainty/biology should possibly be considered (i.e., resilience to depletion, etc)

| GOA sub-area | BRD | Lower 25% | Upper 75% | Lower 95% | Upper 95% | CV |
|---|---|---|---|---|---|---|
| Western | 10,400 | 13,593 | 7,985 | 21,960 | 4,785 | 39.5% |
| Central | 29,020 | 35,464 | 23,619 | 53,179 | 15,952 | 30.8% |
| Eastern | 2,516 | 3,384 | 1,857 | 5,952 | 1,061 | 45.8% |

# APPORTIONMENT UNCERTAINTY

- Where this will get tricky is moving BRD while remaining at or under ABC
- Give to one area means taking from another, and ensuring it stays within uncertainty bounds for each area

| GOA sub-area | BRD | Lower 25% | Upper 75% | Lower 95% | Upper 95% | CV |
|---|---|---|---|---|---|---|
| Western | 10,400 | 13,593 | 7,985 | 21,960 | 4,785 | 39.5% |
| Central | 29,020 | 35,464 | 23,619 | 53,179 | 15,952 | 30.8% |
| Eastern | 2,516 | 3,384 | 1,857 | 5,952 | 1,061 | 45.8% |

# FUTURE WORK

- Getting ‘under-the-hood’ with this assessment warranted and timely. Running list of model evaluations:
- Platform: SS3 → Rceattle/SPoRC
- Data:
  - Age vs Length comps
  - Redo of LL survey index
  - New bottom temp covariate
  - Input sample size (need fishery and LL survey)
- Model structure:
  - Selectivity: age vs length, time-invariant vs time-dependent, selectivity form
  - Growth: internal vs external, which growth model
  - Catchability: develop prior with satellite tag data

# QUESTIONS?

