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INTERNATIONAL PACIFIC HALIBUT COMMISSION

# Update on the development of the 2020 stock assessment

Agenda item 5

IPHC-2020-SRB017-07

# Topics covered

- SRB requests
- New data
- Bridging results
- Remaining data for 2020

# SRB requests

1) Explore the logistic-normal
2) Update data weighting

   - *Will be completed after the rest of the 2020 data are included*

3) Modelling framework considerations
4) Data and model updates for 2020

# 1) The logistic-normal

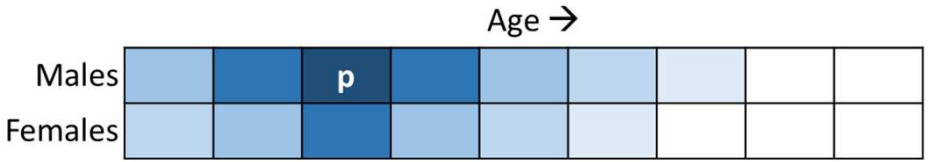
- Self-weighting (no iteration)
- Can include annual sample sizes
- Allows for (potentially complex) correlations among bins
- Requires non-zero proportions
  - compression of distribution tails
  - internal binning and/or addition of a small constant

# 1) The logistic-normal

- Francis (2014) – primary discussion reference
- Several other applications:
  - Generally don’t include more than AR(1) correlations among bins
  - Often ignore inter-annual sample size variation
  - None fit to non sex-specific data (one vector per year)

# 1) The logistic-normal

- Development for Pacific halibut:
  - Already includes tail compression and a small constant added to observed and expected proportions
  - Implement Francis' annual sample size adjustment
  - Will require a new correlation approach that can accommodate 2-dimensional structure of sex-specific data



# 1) The logistic-normal

- Next steps:
  - Further investigation for SRB018
  - Potential student project/collaboration
    - Derivation
    - Simulation testing
    - Programming/implementation
    - Application testing

# 3) Modelling framework

- Stock synthesis development continues
  - Development team remains receptive to requests from and collaboration with the IPHC
- Variance of unfished spawning biomass added in 2020 (we requested this addition during the 2019 assessment)
- MSE operating model development may help guide future assessment development avenues

# 4) Data and model updates

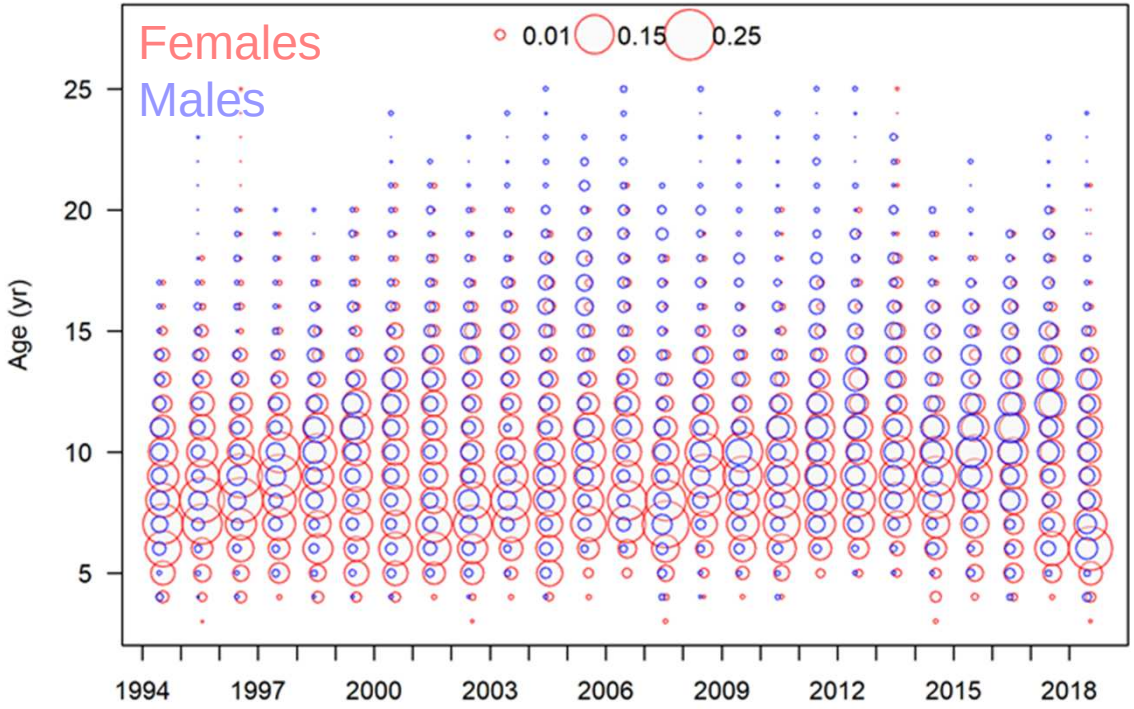
- New data
- Bridging
- Remaining data for 2020

# New data

- Sex-specific age composition information from the recreational fishery in 3A
- Sex-specific age composition information from the 2019 directed commercial fishery

# Recreational age data (included for June)

Average: 72% female, higher than expected, but little effect on model results



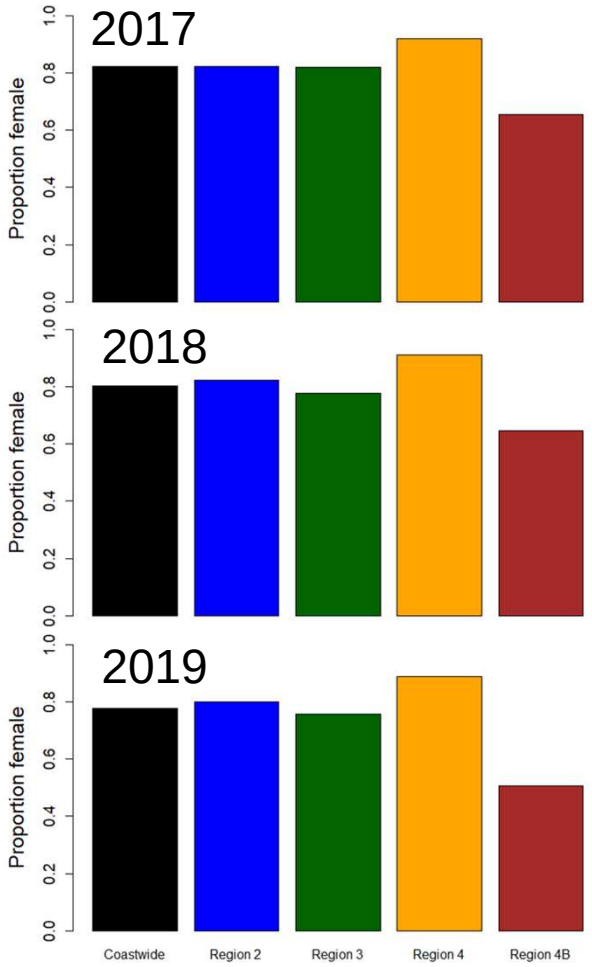

Thanks to Sarah Webster (ADFG)

# Directed commercial fishery sex-ratios

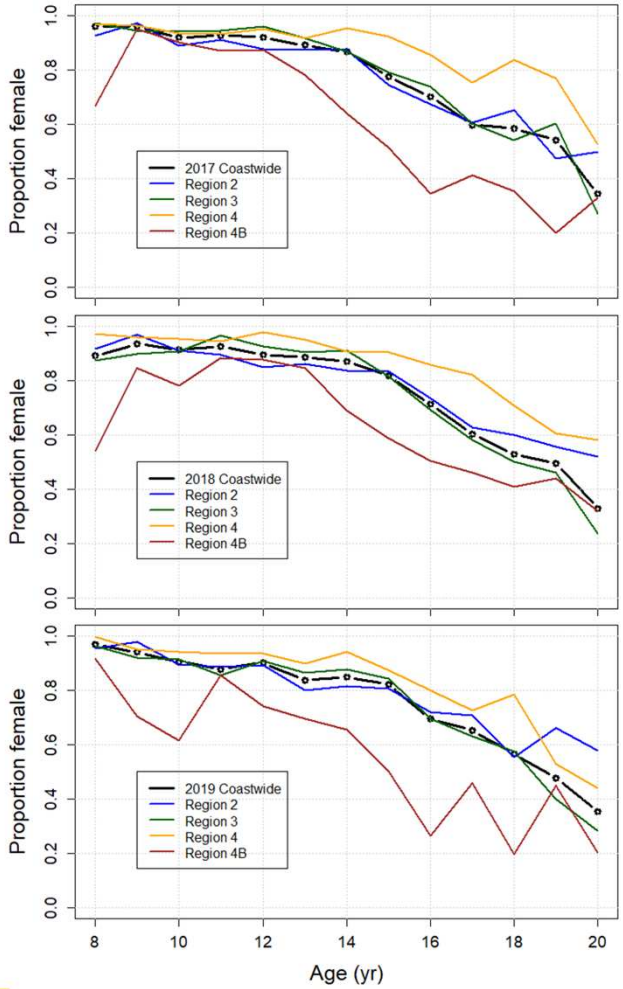
Percent female

| | Coastwide | Region 2 | Region 3 | Region 4 | Region 4B |
|---|---|---|---|---|---|
| 2017 | 82% | 82% | 82% | 92% | 65% |
| 2018 | 80% | 82% | 78% | 91% | 65% |
| 2019 | 78% | 80% | 76% | 89% | 51% |

(Note small sample sizes in 4B: ~ 10-17 trips per year)



# Directed commercial fishery sex-ratios (by age)



# Bridging analysis

- Restarted (relative to June) to add software update prior to any new data
- Three steps:
  - SS version update
  - Recreational sex-ratios at age
  - Directed commercial fishery sex-ratios at age

# Routine software update

- Variance (and covariance) now available for unfished spawning biomass in each year

Beginning of 2021 relative biomass (projected)

| | Low | Relative SB | High | $P(SB_{2021}<SB_{30\%})$ | $P(SB_{2021}<SB_{20\%})$ |
|---|---|---|---|---|---|
| **Approx. in 2019** | 20.1% | **31.5%** | 46.2% | 49 | 2 |
| **Calc. for 2020** | 19.8% | **30.3%** | 47.4% | 49 | 3 |

# Bridging

- Figures 2-5 in document
- No meaningful changes in SB or recruitment time-series
- Will be extended to include remaining data and final data reweighting

# Data to finalize the 2020 assessment

- 2020 FISS results: modelled trends and biological data
- 2020 Commercial fishery logbook and biological sampling
- Biological information from other sources (non-directed commercial and recreational)
- Mortality estimates for 2020 and updates to 2019 where necessary

# Recommendation/s

That the SRB:

a) **NOTE** paper IPHC-2020-SRB017-07 which provides a response to requests from SRB016 and a final update on model development for 2020.

b) **RECOMMEND** any further changes to be made for the final 2020 stock assessment.

c) **REQUEST** any additional analyses to be provided at SRB018, June 2021.

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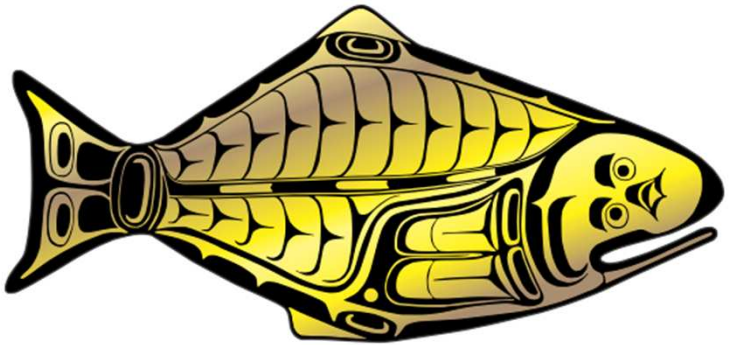

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