Yellowfin Tuna Assessment Review

Assessment Overview and Review Questions

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Yellowfin Tuna Assessment Review Workshop
Noumea, 7-13 September 2022

Overview

Assessment Overview *Selected figures from the 2020 assessment report, plus a few additional ones*

Review Questions *Fisheries and selectivities, life history, regional structure, plus group, other*

Online Infrastructure *yft-review, yft-review-analysis, shiny*

Discussion *Comprehensive list of questions, topics to cover in review report, analyses for answering questions*

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Assessment Overview

2020 Assessment Data

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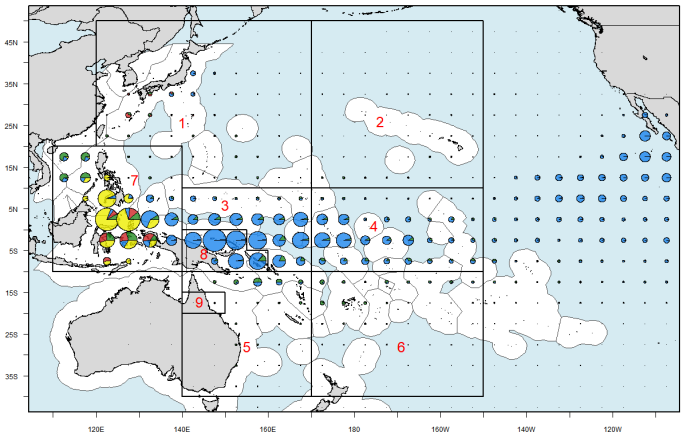
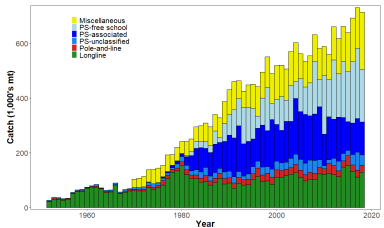
Catches

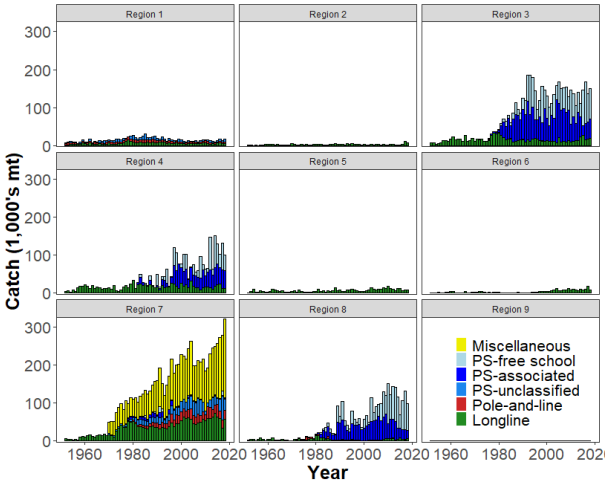
purse seine (blue), miscellaneous (yellow), longline (green), pole-and-line (red)

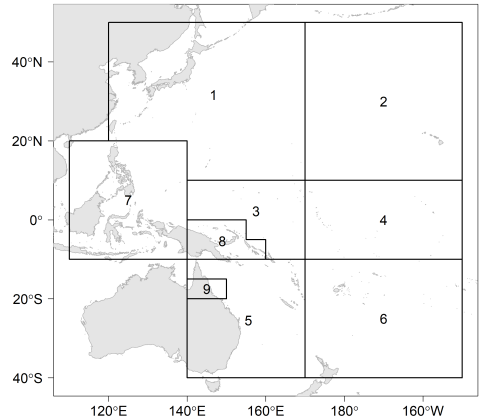




2020 Assessment Data

Catches





2020 Assessment Data

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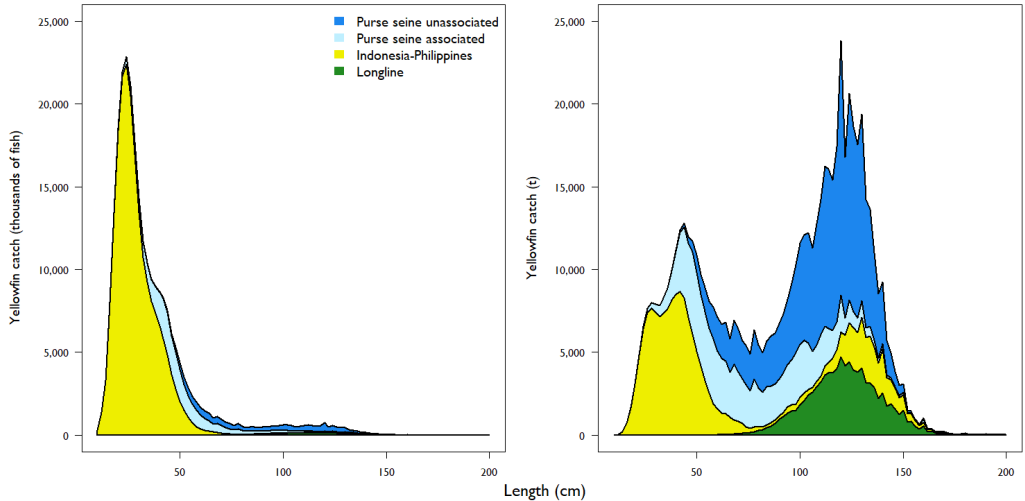
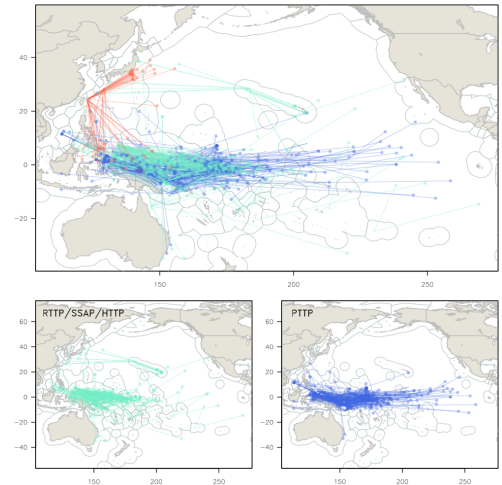
Catches



2020 Assessment Data

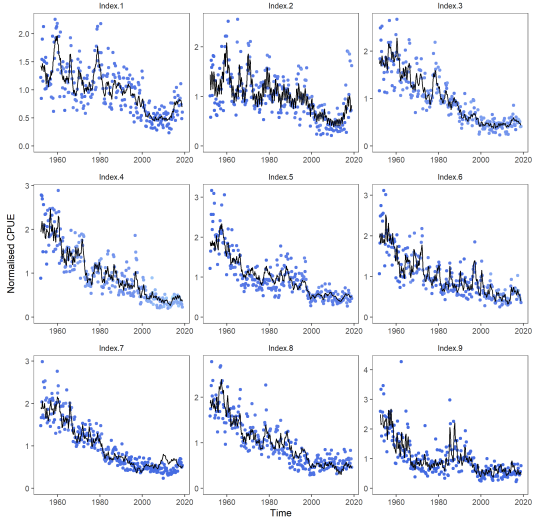
Tagging Data



Program	Years	Groups	Releases	Recoveries
JPTP	1999–2017	58	10551	1024
PTTP	2006–2017	53	79339	17002
RTTP	1989–1995	34	26235	4380

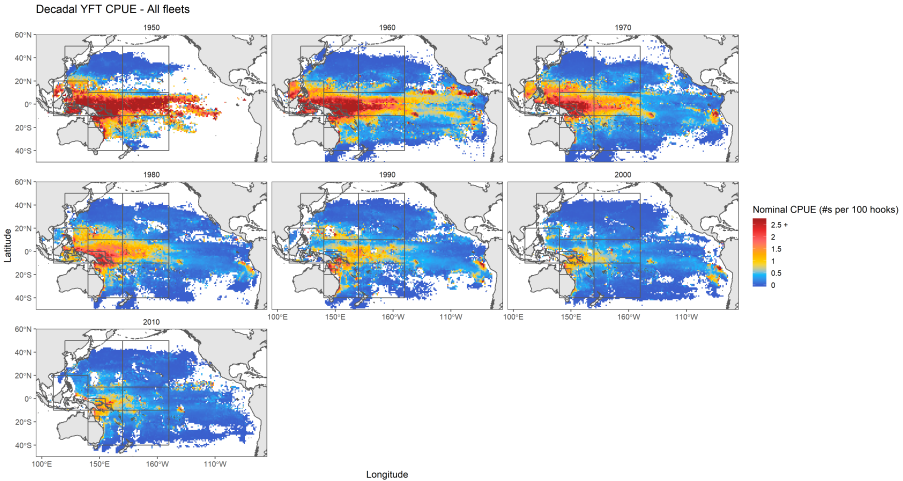
2020 Assessment Data

CPUE



2020 Assessment Data

CPUE



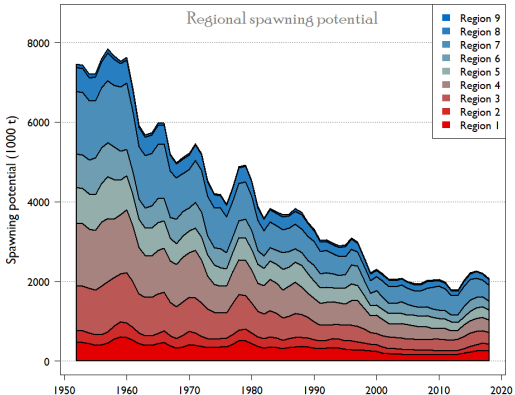
2020 Assessment Model

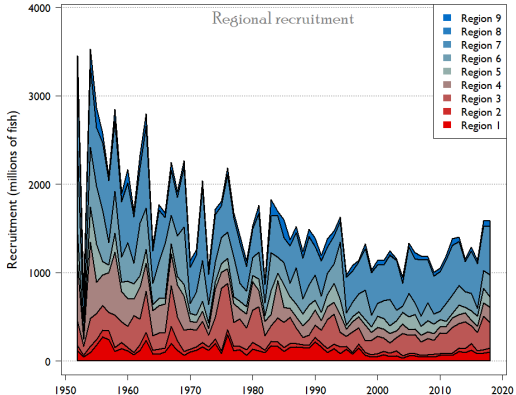
Multifan-CL with

- 9 regions
- 1962–2018, quarterly time step
- 32 extraction fisheries
- 9 index fisheries, VAST analysis of longline CPUE
- 11671 estimated parameters
- 72 models in uncertainty grid (steepness, growth, sample size, tag mixing)

2020 Assessment Results

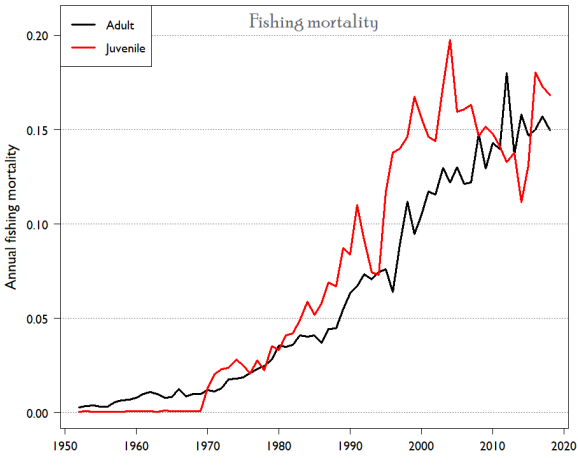
Spawning Potential and Recruitment

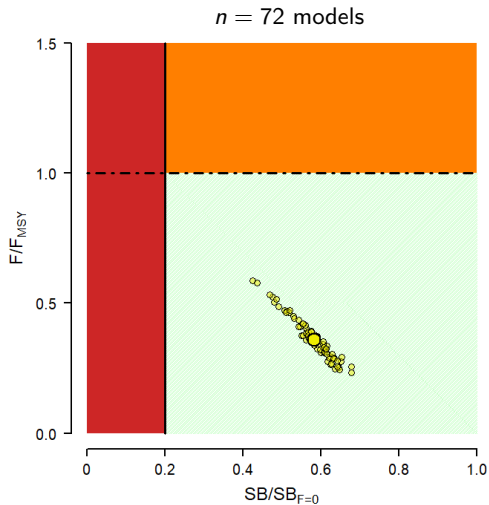




2020 Assessment Results

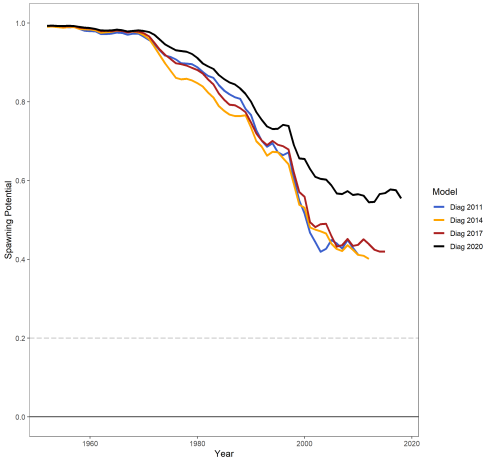
Fishing Mortality and Stock Status





2020 Assessment Results

Empirical Retrospectives



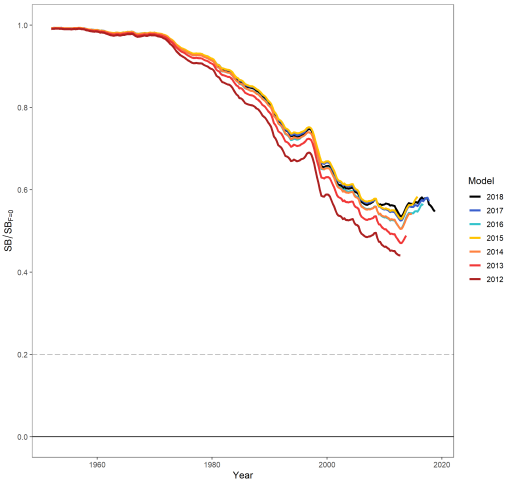
Considerably more optimistic than previous assessments — why?

New features in the 2020 assessment:

- Growth data from both otoliths and tag recaptures
- Richards growth model
- Updated M based on new growth curve
- Updated spawning potential based on maturity at length
- 'Index fishery' approach with 9 VAST CPUE series
- Tag mixing period at least 182 days, added JPTP tags
- 'Pseudo catch conditioned' estimation of F
- Increased plus group age from 7 to 10 yrs
- New length-weight relationship coefficients
- Uncoupled selectivity parameters between regions

2020 Assessment Results

Analytical Retrospectives



2020 Stepwise Model Development

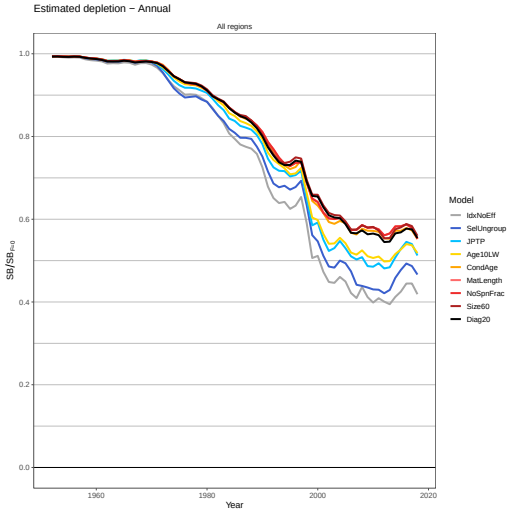
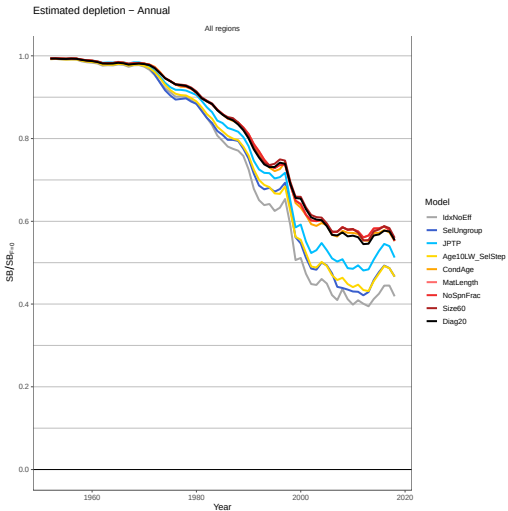


figure 14b in report



corrected version

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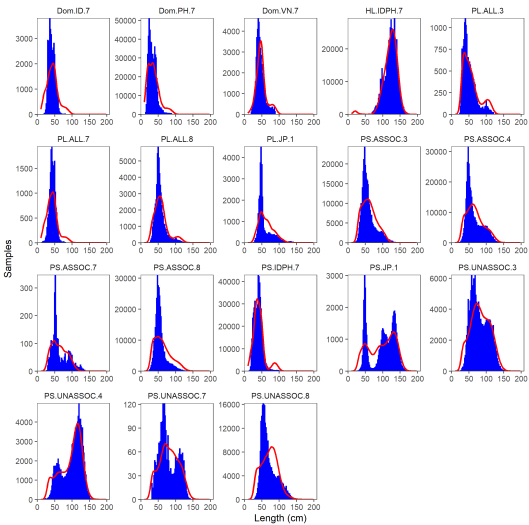
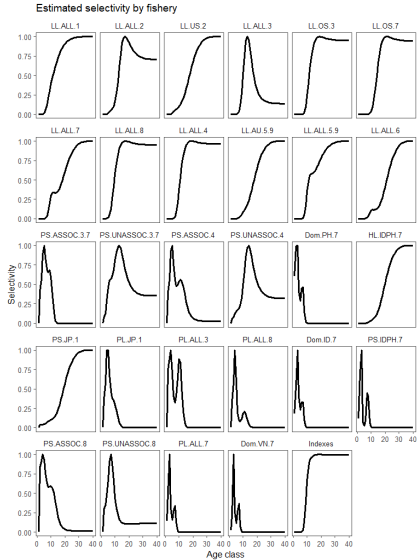
Review Questions

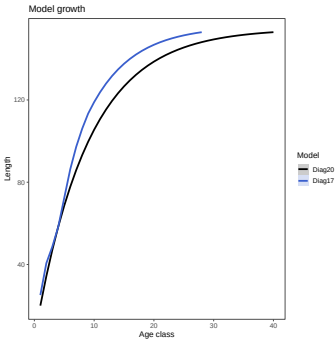
Fisheries and Selectivities

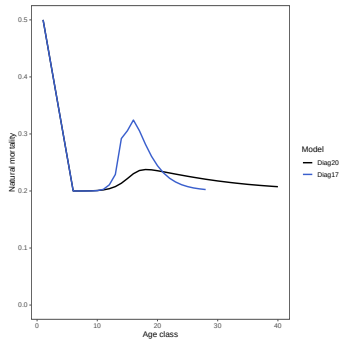


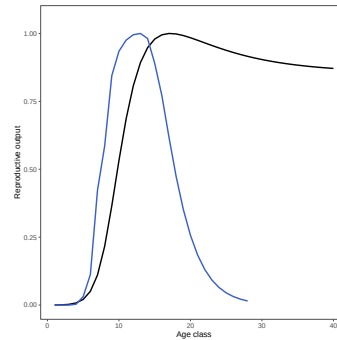


Life History

Growth, natural mortality, maturity

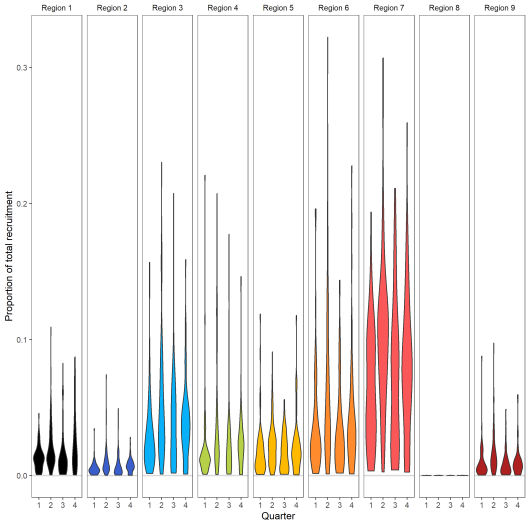


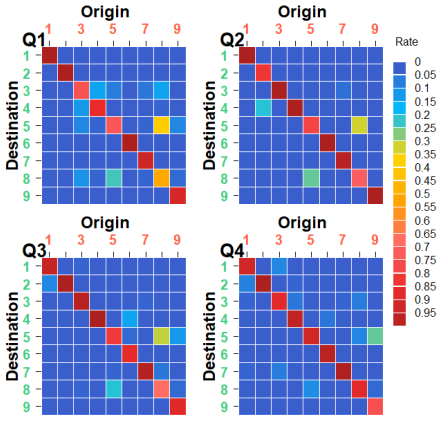




Regional Structure

Region 8 has no recruitment, receives immigration from Region 5





Regional Structure

Temperate regions have high estimated biomass but low observed catches

Estimated spawning biomass and observed catches from 2018, the last year in the assessment:

Region	SB	Catch	Domain
1	252	17	TempN
2	176	6	TempN
3	292	150	Tropical
4	306	100	Tropical
5	253	10	TempS
6	221	9	TempS
7	393	322	Tropical
8	148	98	Tropical
9	20	0	TempS

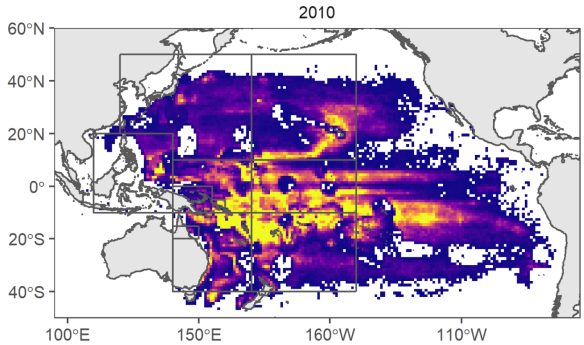
Domain	SB	Catch
TempN	427	23
Tropical	1139	670
TempS	494	19

Domain	SB	Catch
Temperate	921	43
Tropical	1139	670

Regional Structure

Temperate regions have high estimated biomass but low observed catches

There is considerable fishing effort in the temperate regions (2, 5, 6)
but yellowfin catches are low in these areas



Regional Structure

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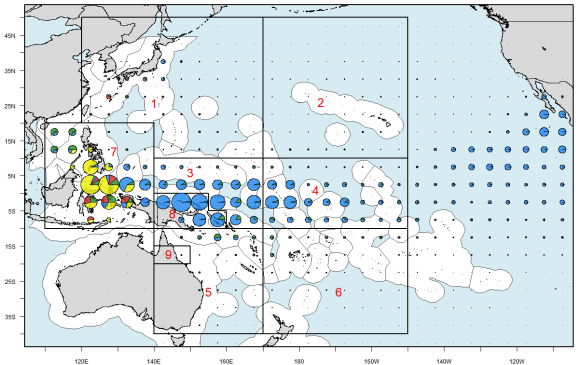
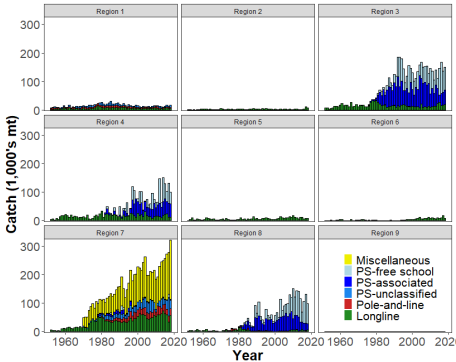
Catches

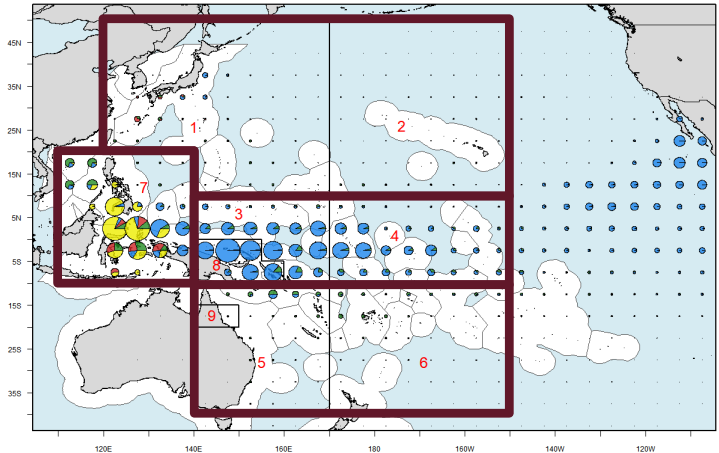
purse seine (blue), miscellaneous (yellow), longline (green), pole-and-line (red)





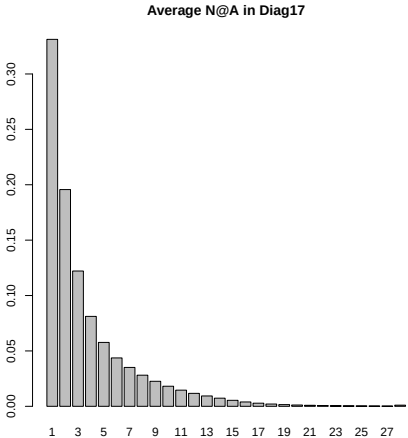
Regional Structure

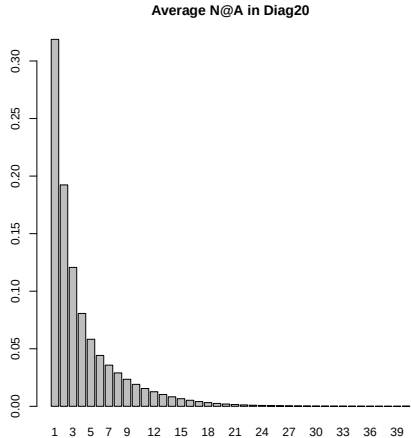
Alternative 4-region structure:



Plus Group

28 quarters in 2017 assessment, changed to 40 quarters in 2020 assessment





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Online Infrastructure

Online Infrastructure

Main review site

https://github.com/PacificCommunity/ofp-sam-yft-review

Analytical and development site

https://github.com/PacificCommunity/ofp-sam-yft-review-analysis

Shiny app

https://ofp-sam.shinyapps.io/yft-stepwise-2020

Plus other things we may produce during the review workshop

Discussion

This assessment was fraught with strife due to conflict among data inputs – M Vincent July 2020

Matt did a phenomenal job, in terms of the quantity and quality of work for the yellowfin assessment, as did Laura before him.

It is overwhelming to be next in line – but following SPC tradition, dynamic teamwork and shared expertise will save the day.

I think we can be optimistic that the review workshop will be very useful:
addressing many issues identified in the 2020 assessment,
directly improve the upcoming 2023 assessment,
and provide recommendations that will apply to other stock assessments as well.

Discussion

- Comprehensive list of questions: see link on main review website
- Topics to cover in review report
- Analyses for answering questions