Technical aspects of a potential South Pacific albacore harvest strategy

WCPFC-SC14-2018/MI-WP-02

Pilling, Scott, Scott and Hampton

Oceanic Fisheries Programme, SPC

SC14, Busan, August 2018

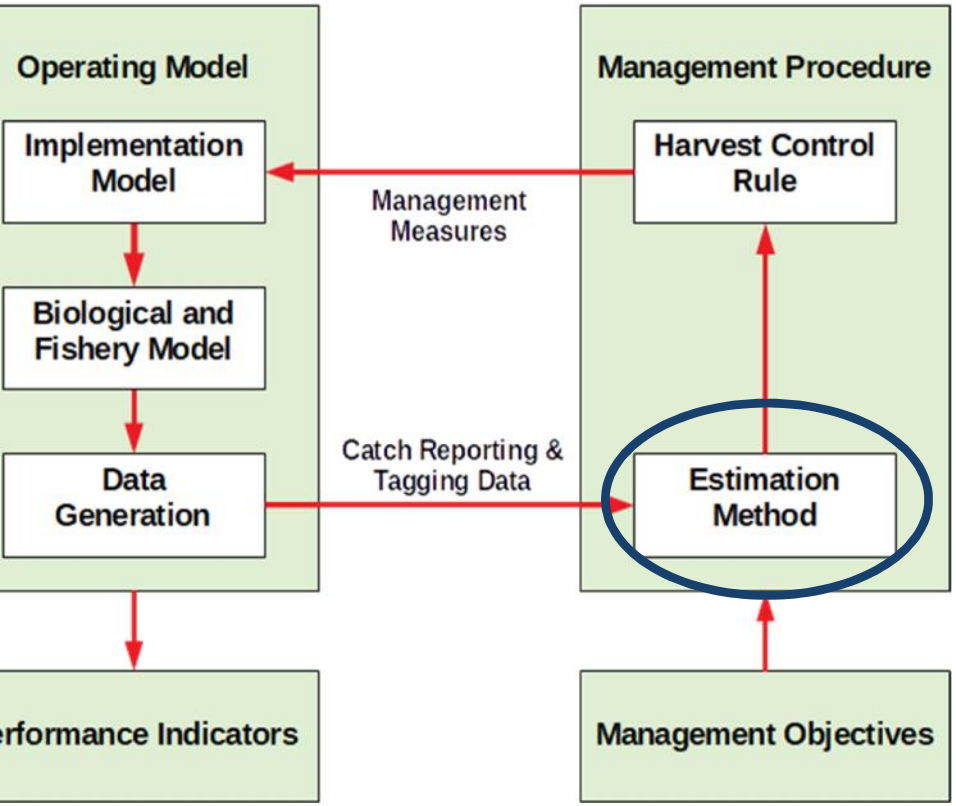
TASKING

- SC14 to provide WCPFC15 with ‘advice on technical aspects of the south Pacific albacore harvest strategy including (…) scientific elements of candidate harvest control rules and potential components of the management procedure’.

CONTENT

- Review potential elements of a HS for SPA:
  - ‘Estimation method’
  - Harvest control rules (HCRs)
  - Reference points
- Draft technical work plan
- Propose recommendations to WCPFC15

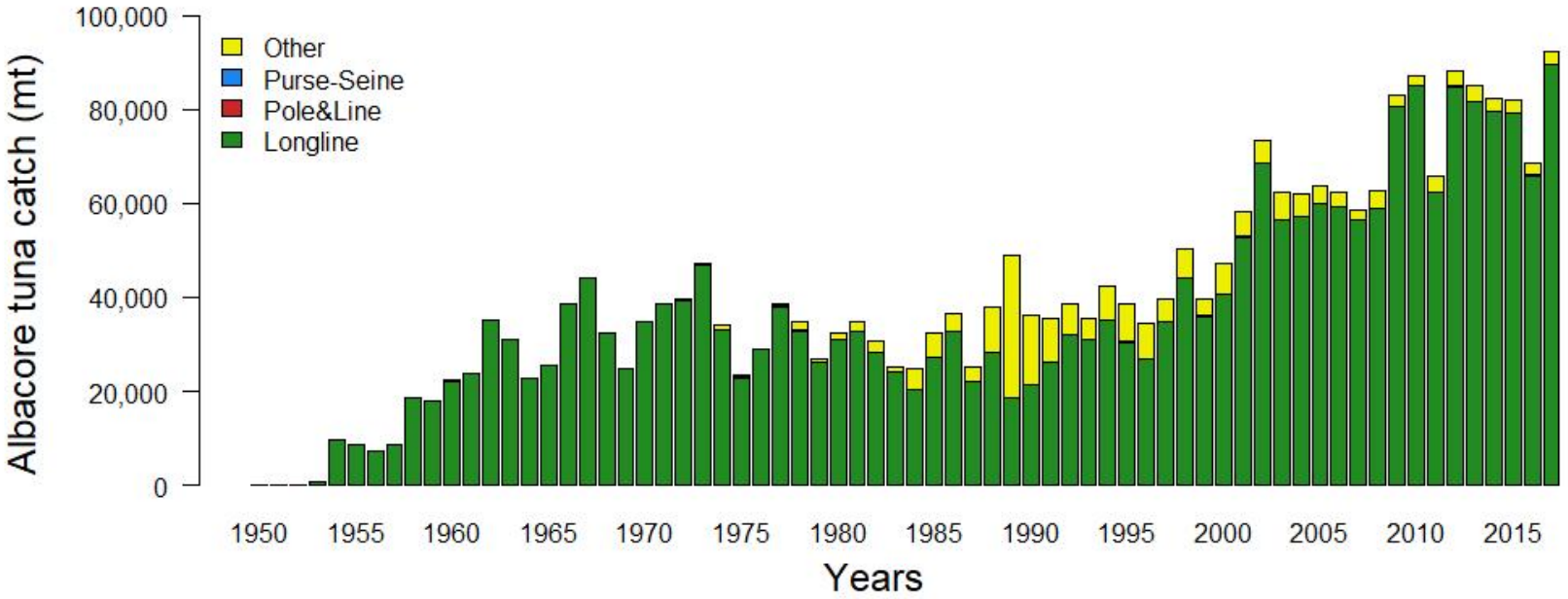
ESTIMATION METHOD



- How stock status/biomass is monitored
- Two general types:
  - Model-based (e.g. MFCL)
  - Empirical approach (e.g. CPUE)
- Recommendation:
  - Empirical approach – primary, based on CPUE
  - Model-based – secondary, potentially simpler models
- Multi-species issues - future work

CPUE INFORMATION

- Which fishery?
  - Longline – 97% of catch, CPUE series used as abundance indices
  - Troll ~ 3% of catch, NZ CPUE series not thought to relate to abundance (rather availability)



SA-WP-02
Fig 9

CPUE INFORMATION

- Which longline fleet(s)?
  - Regional-wide combined fleet index?
  - Model region individual or combined fleet?
  - ‘Reference’ fleet?
- Timeliness and availability of data to be considered

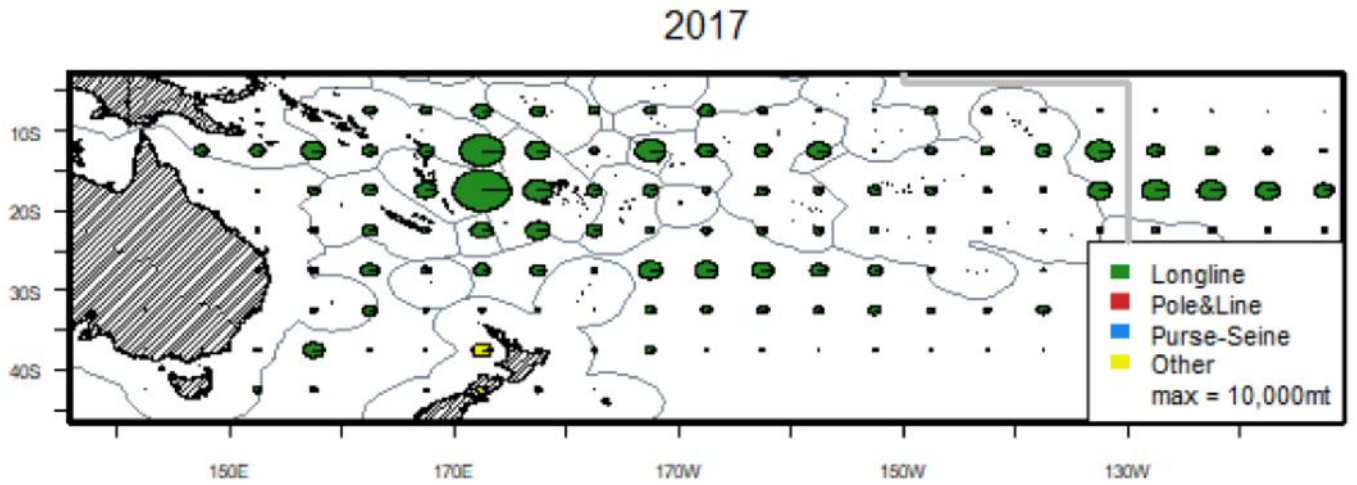


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Fig 2

CPUE INFORMATION

- Key fleet or combined fleets whose catch rates reflect regional, rather than local or seasonal, abundance.
- Stable fleet composition, reasonably consistent targeting over time/within the year.
- Time series should covers a sufficient (recent) period.
- Data readily available for both historical and future period.
- Data available soon after fishing is completed (e.g. E-reporting).
- High coverage operational level data available, verifiable through consistent and representative observer coverage (and e.g. E-monitoring), catch verifiable through unloading data.

CPUE INFORMATION

Fleet	Logsheet Coverage ('16-'17)	Observer Coverage ('16-'17)	ER?	EM?
CN	60-90%	~3-4%	?	-
TW	55-100%	~8-15%	?	-
FJ	100%	~23-31%	3 vessels	~2-6%
VU	100%	~0.5-2%	1 vessel	-
SB	-	-	Full	-
PF	100%	~3-6%	Full implementation planned	-

For standardisation – operational data preferred

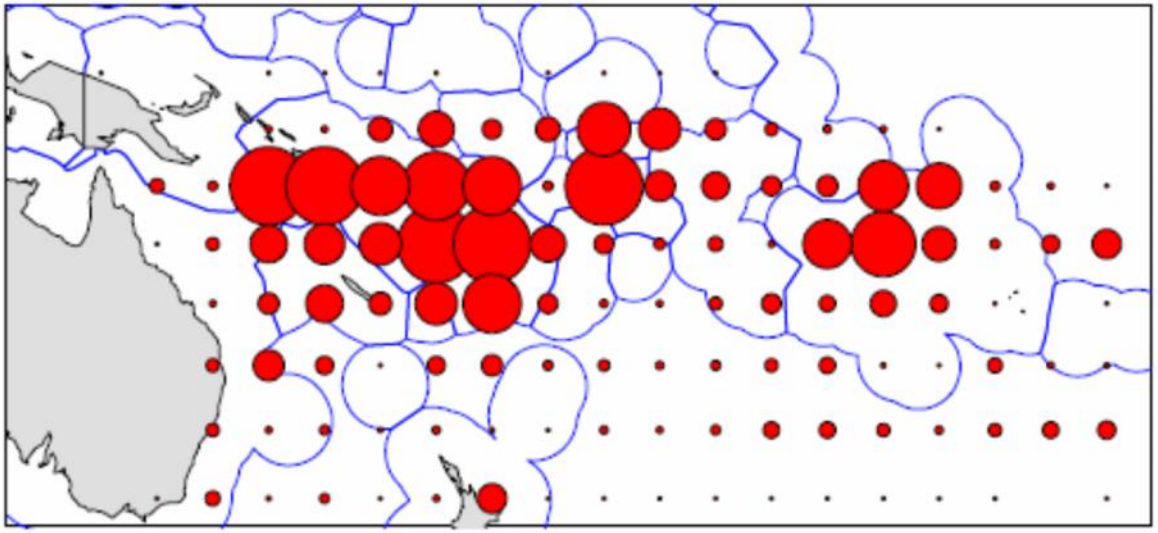


Figure 5.4.2 Distribution of effort for south Pacific albacore-target DOMESTIC longline fleets

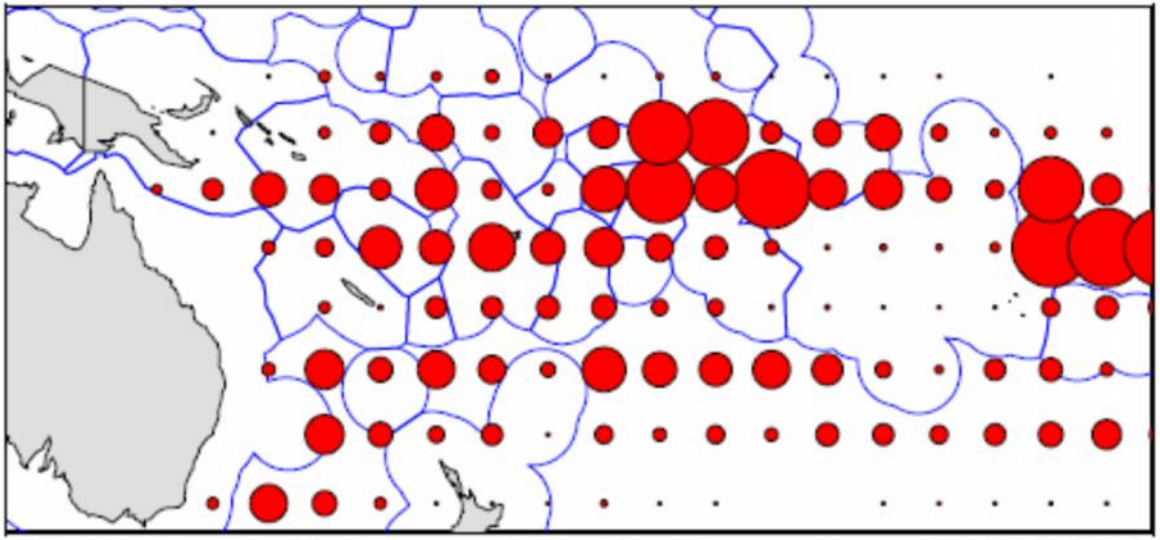
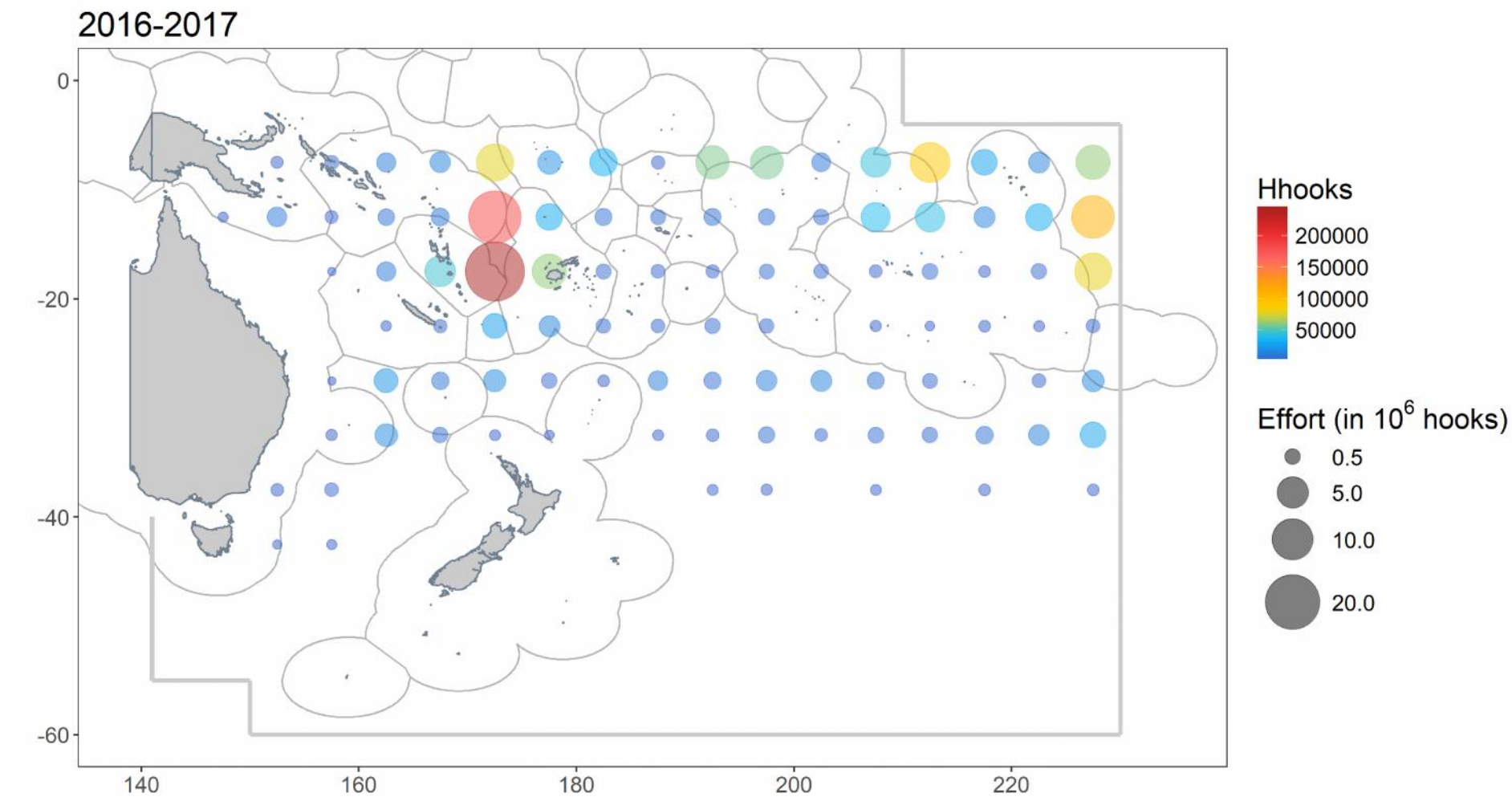


Figure 5.4.3 Distribution of effort for south Pacific albacore-target FOREIGN longline fleets

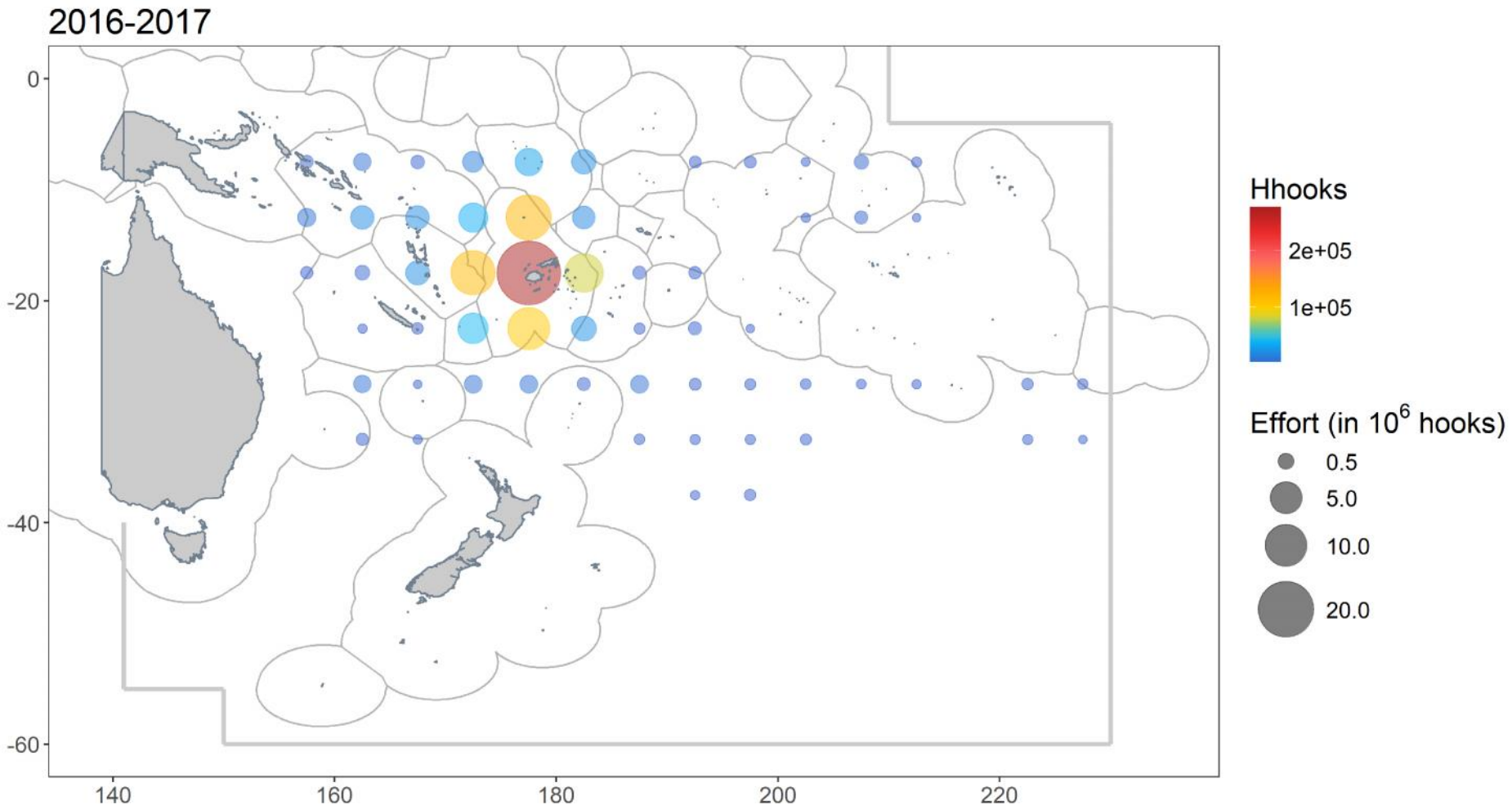
EXAMPLE SPATIAL EFFORT PATTERNS (AGG DATA)

CN



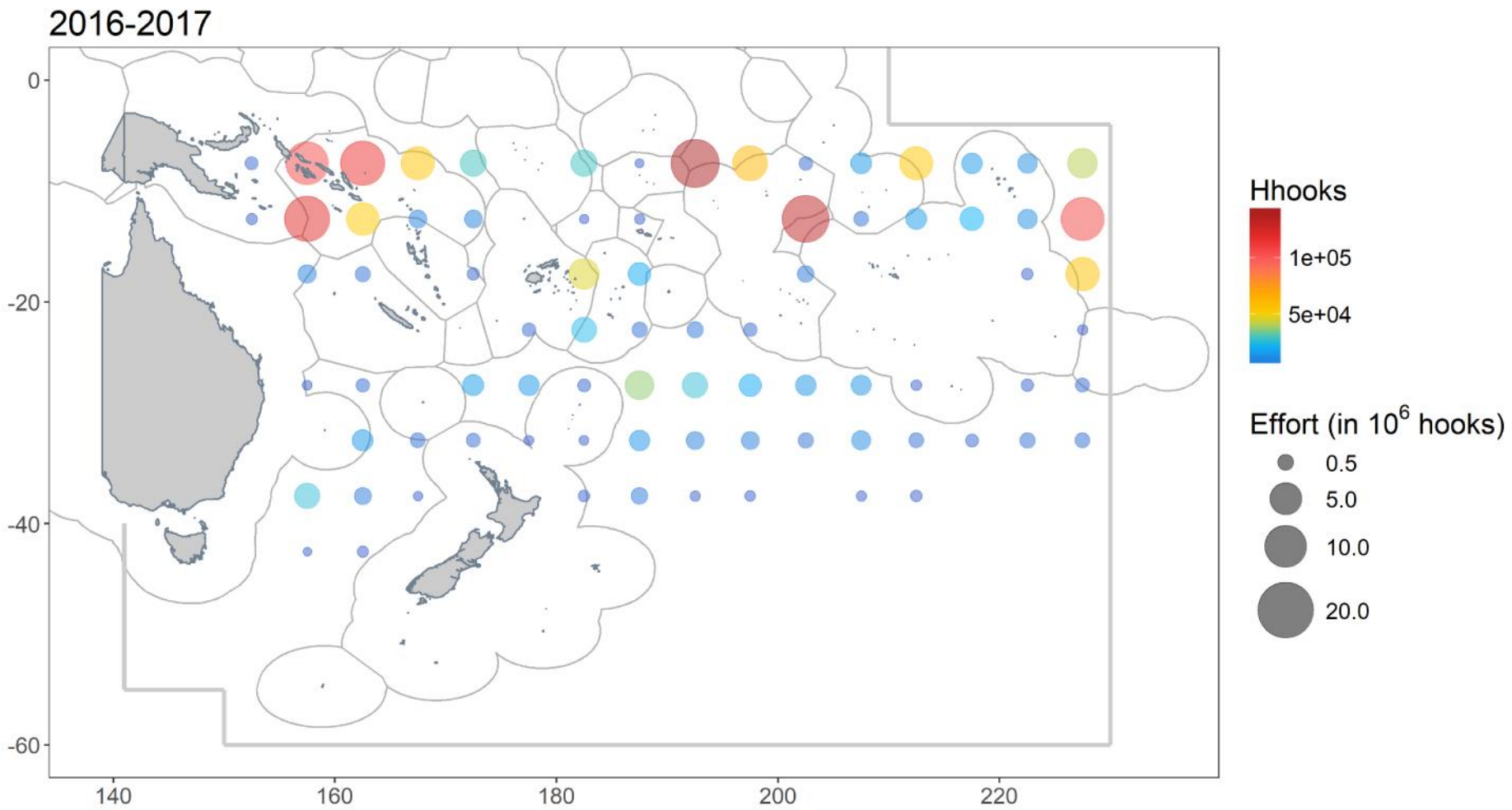
EXAMPLE SPATIAL EFFORT PATTERNS (AGG DATA)

FJ



EXAMPLE SPATIAL EFFORT PATTERNS (AGG DATA)

TW

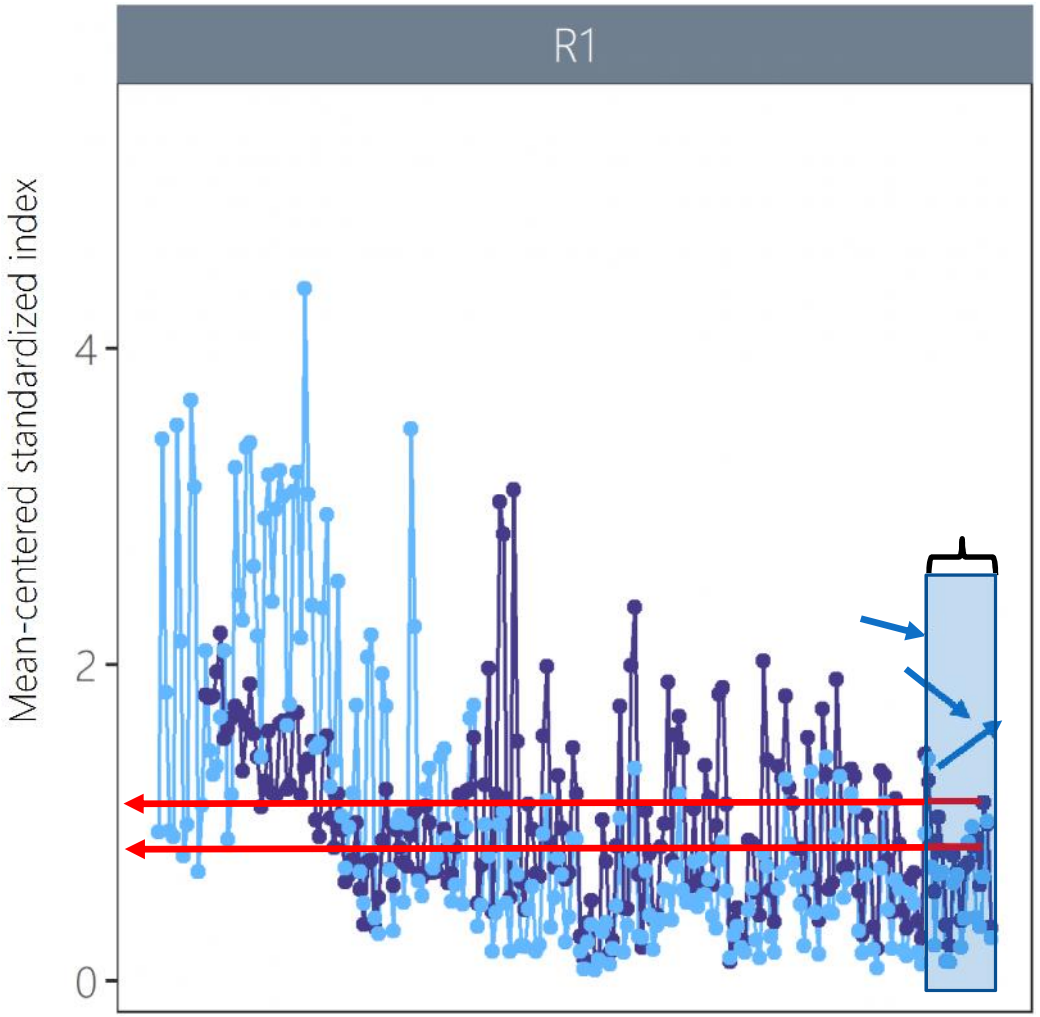


CPUE ANALYSIS

- Standardisation
  - Improves relationship between CPUE series and stock abundance
  - A level of transparency is lost
- Nominal index
  - If adequately links to stock abundance, provides a direct link to fisher's experience
- Recommendations:
  - Note need to document the data inputs and settings
  - Note potential to examine both standardised and nominal CPUE time series
  - Assess model performance using standardised vs nominal CPUE

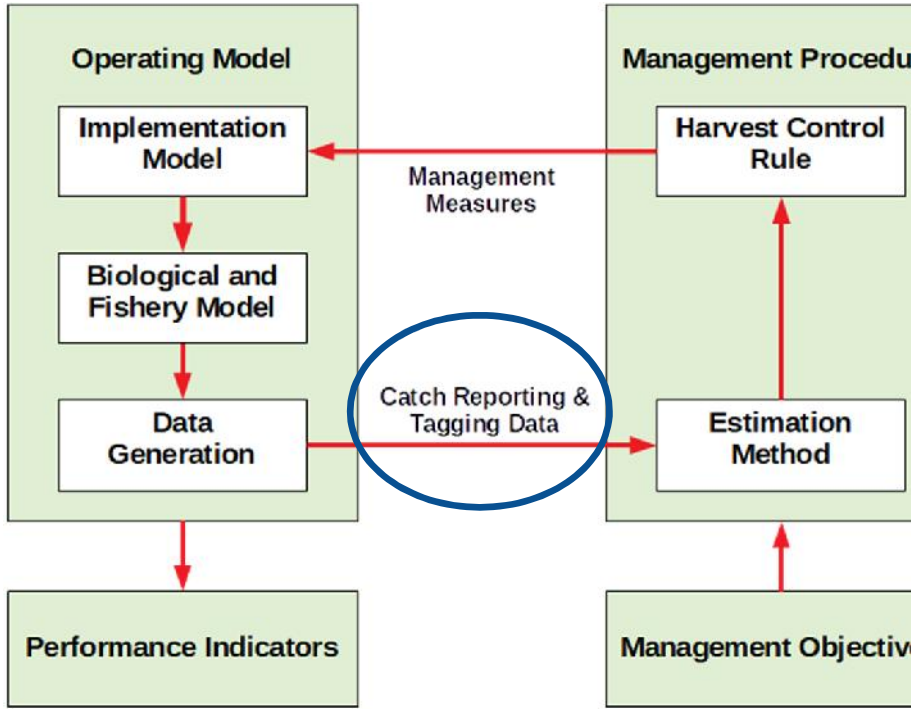
CPUE VALUE INPUTS TO AN EMPIRICAL HCR

- Absolute CPUE level
  - Nominal or standardised CPUE value at time ‘x’, or
  - Average over ‘y-x’
  - ~ economic objectives
- Trend in CPUE
  - Is relative change stable, increasing, declining?
- Both
- Need to document settings (e.g. length x-y)



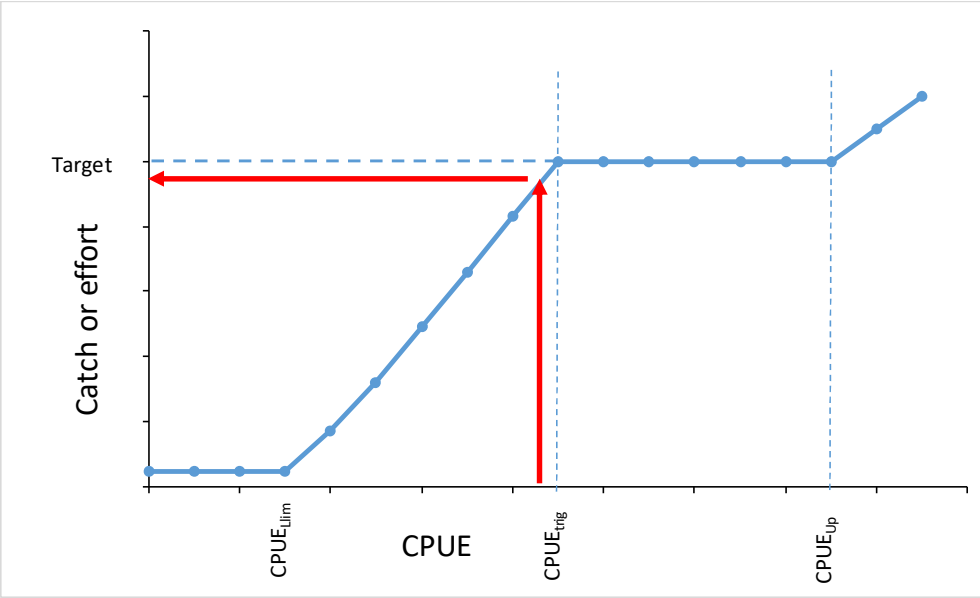
SIMULATING CPUE

- When testing the Management Procedure, need to simulate the input CPUE
- Existing MFCL processes can do this
- Models may need adjustment in light of 'indicator fleet' discussions
- Test the robustness of any MP to CPUE/abundance relationship



HARVEST CONTROL RULES

- Two key decisions to be made:
  - Which fisheries fall under the HCR?
  - How will they be 'controlled'?
    - Catch or effort or ?
- Alternative HCR forms and inputs
  - 'hockey stick' e.g. based upon absolute CPUE



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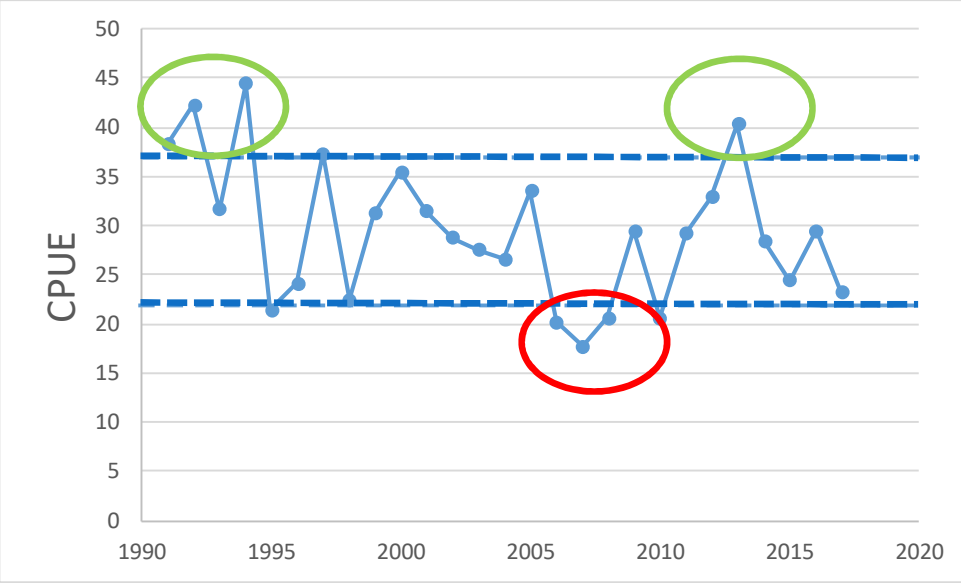
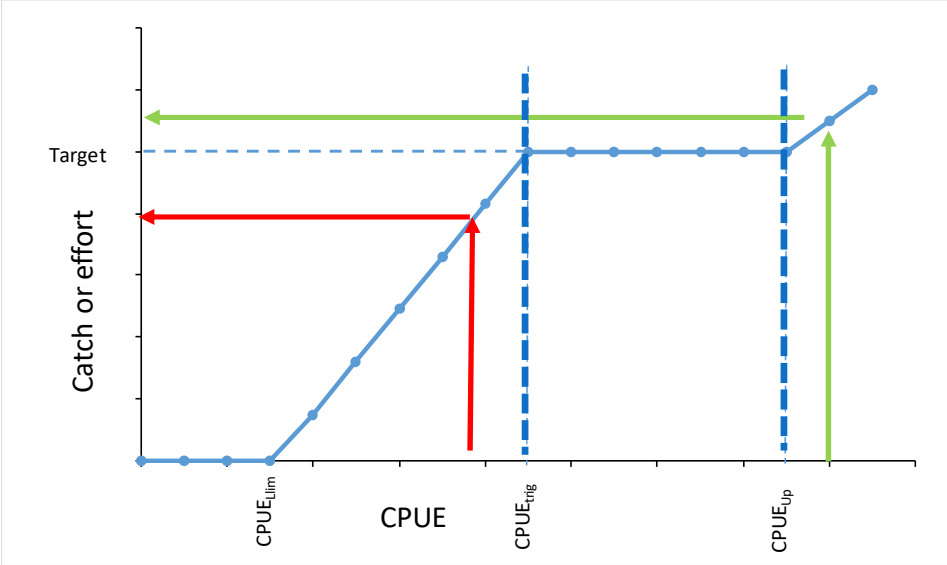
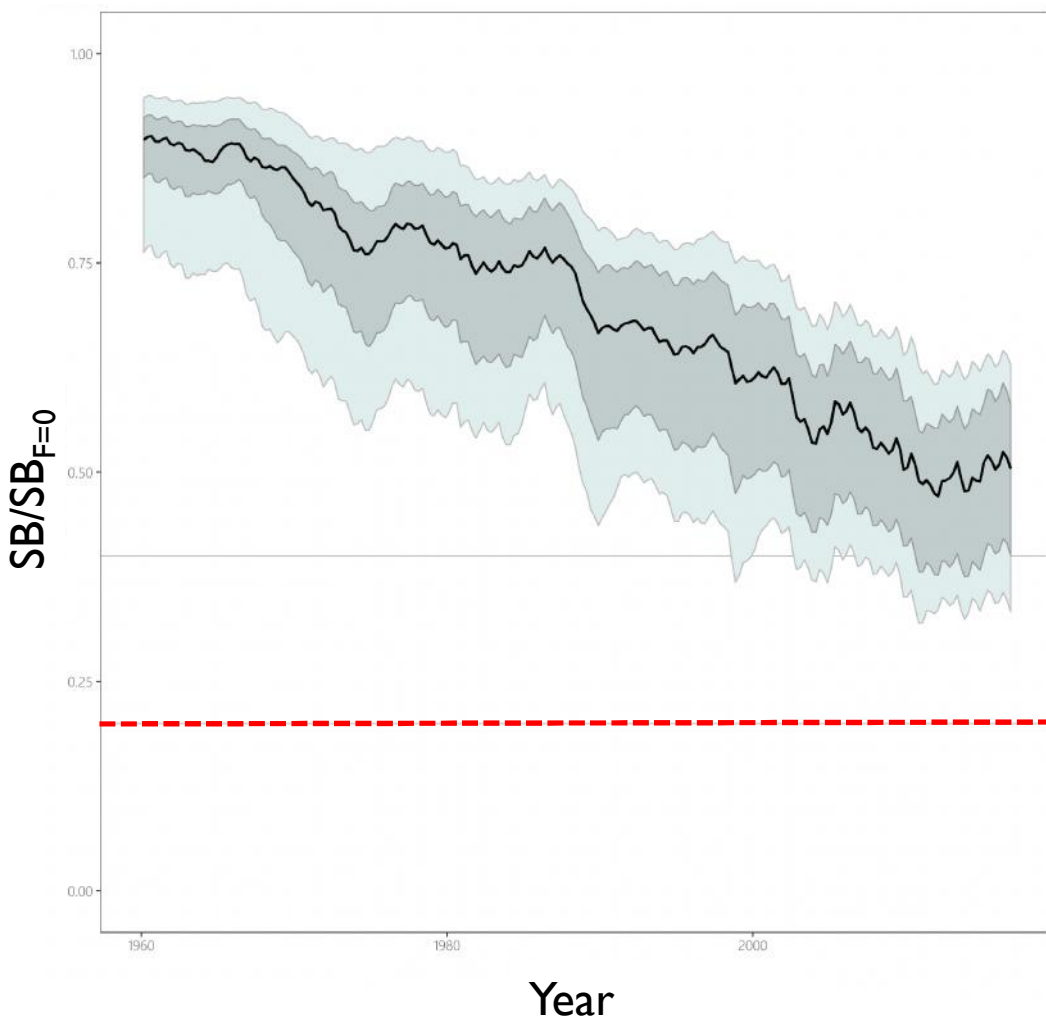
  - How will they be 'controlled'?
    - Catch or effort or ?
- Alternative HCR forms and inputs
  - 'hockey stick' e.g. based upon absolute CPUE
  - 'indicator' approach
- Other HCR features
  - Max/min changes
  - Unequal changes





REFERENCE POINTS

- LRP defined (20%$SB_{F=0}$)
- TRP discussions ongoing
  - Adjust in light of new assessment
  - Relate to noted management objectives
  - Can use %$SB_{F=0}$ as metric
    - Can translate to e.g. CPUE



MONITORING STRATEGY

- Ensure HS meeting objectives:
  - consistent with expected MSE results
  - No ‘exceptional circumstances’ occurring
- Review requirements
  - Economic objectives will require data
  - Observer data, unloadings data (+ EM)
  - Country-level socio-economic data

TECHNICAL WORK PLAN - 2018

- Identify candidate longline fleets/fleet groupings for empirical estimation method;
- Tailor OMs for individual/grouped fleets as needed;
- Examine use of standardised and nominal CPUE time series as inputs.

TECHNICAL WORK PLAN – 2019+

- At SC15:
  - agree initial range of OMs for HCR evaluation;
  - agree approach to evaluating preliminary performance indicators;
- For HCR development:
  - Evaluate use of absolute CPUE values or recent CPUE trends;
  - Wrt above, examine any averaging or relative trend time period;
  - Based upon WCPFC15 TRP and fishery control decisions (catch, effort) and a basic range of OMs, examine range of HCRs to inform initial discussions at SC15.
- Post SC15 ++
  - investigate candidate HCRs, and consult on other elements of the HCR;
  - Evaluate impact of uncertainty in form of biomass/CPUE relationship;
  - Discuss how to account for species targeting by longlines;
  - Refine fishery economics based on multi-species catches;
  - Develop the monitoring strategy for the fishery/stock.

RECOMMENDATIONS

- We invite WCPFC-SC14 to:
  - Endorse 1° focus on empirical-based estimation methods (using CPUE), and 2° on model-based approaches (e.g. surplus production model +)
  - Endorse use of longline CPUE as 1° estimation method information, and discuss candidate 'reference' longline fleets for input CPUE series
  - Note need to document CPUE index inputs, manipulations, and approach used to calculate values input to the harvest control rule
  - Request WCPFC15 guidance on 1) fisheries to be controlled (e.g. longline/troll) and 2) potential management control (e.g. catch, effort)
  - Note need for ongoing review of monitoring strategy, and efforts to gather key economic data;
  - Discuss and endorse proposed outline scientific work plan for south Pacific albacore harvest strategy development.