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Examining indicators of effort creep in the WCPO purse seine fishery

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Outline of presentation

- Background
- Candidate indicators
- Trends identified
- Utilising indicators
- Conclusions

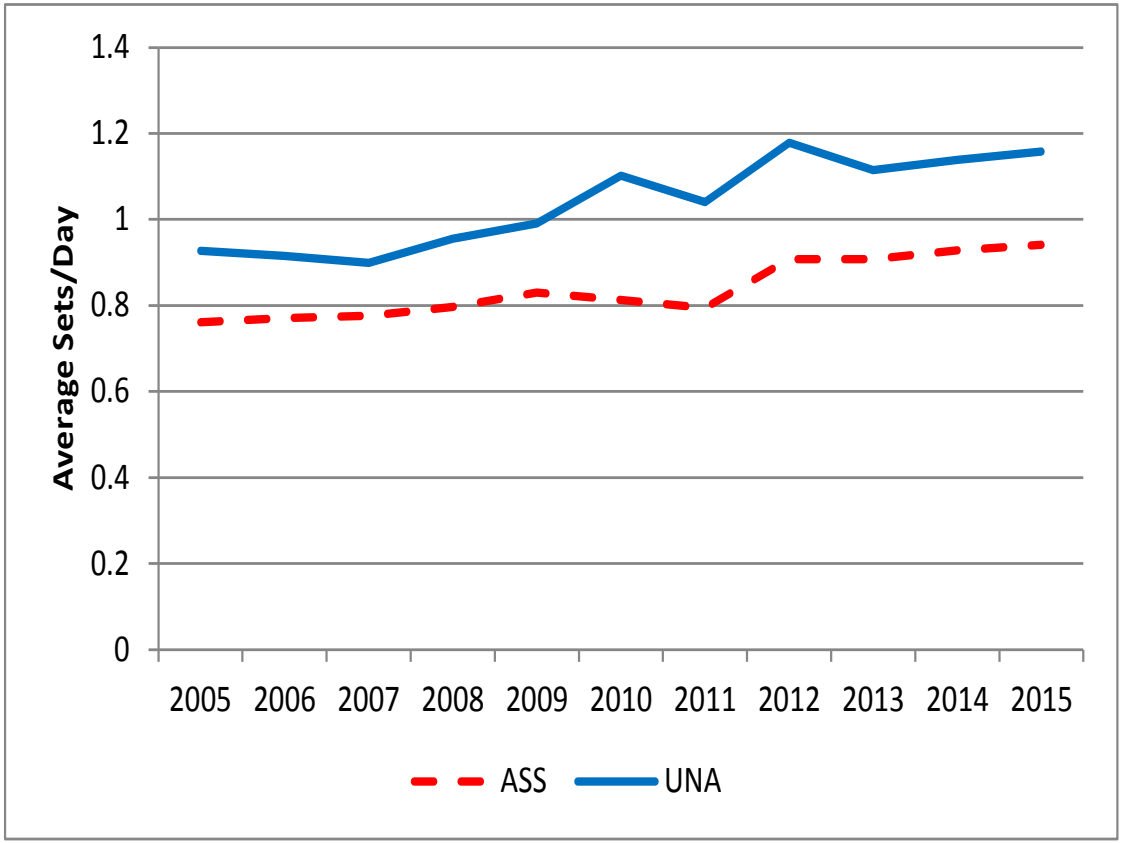
Background

- Effort creep – increased impact of a unit of effort on the stock
  - Due to improve technology
  - Due to newer more efficient vessels
- A day of fishing now may have a greater impact than a day in 2010
- Implication – effort limits in the WCPO may not achieve their aims
  - Need to understand, monitor and account for this in management

Examining indicators

- Effort – sets/day
- CPUE trends
- Overall catch
- Vessel characteristics
- MULTIFAN-CL ‘catchability’

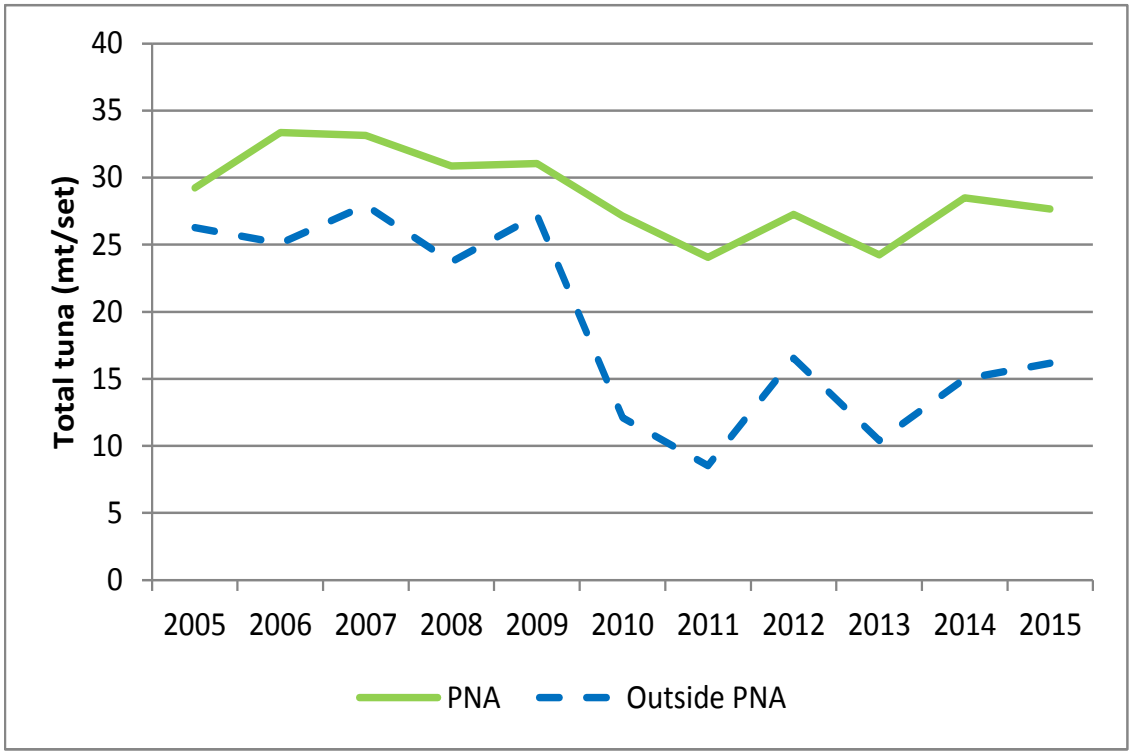
Sets/day



Avg2014/15 over Avg 2012-13
Inside PNA: +2% (total)
Outside PNA: +8% (total)

Figure 1 (PNA as example)

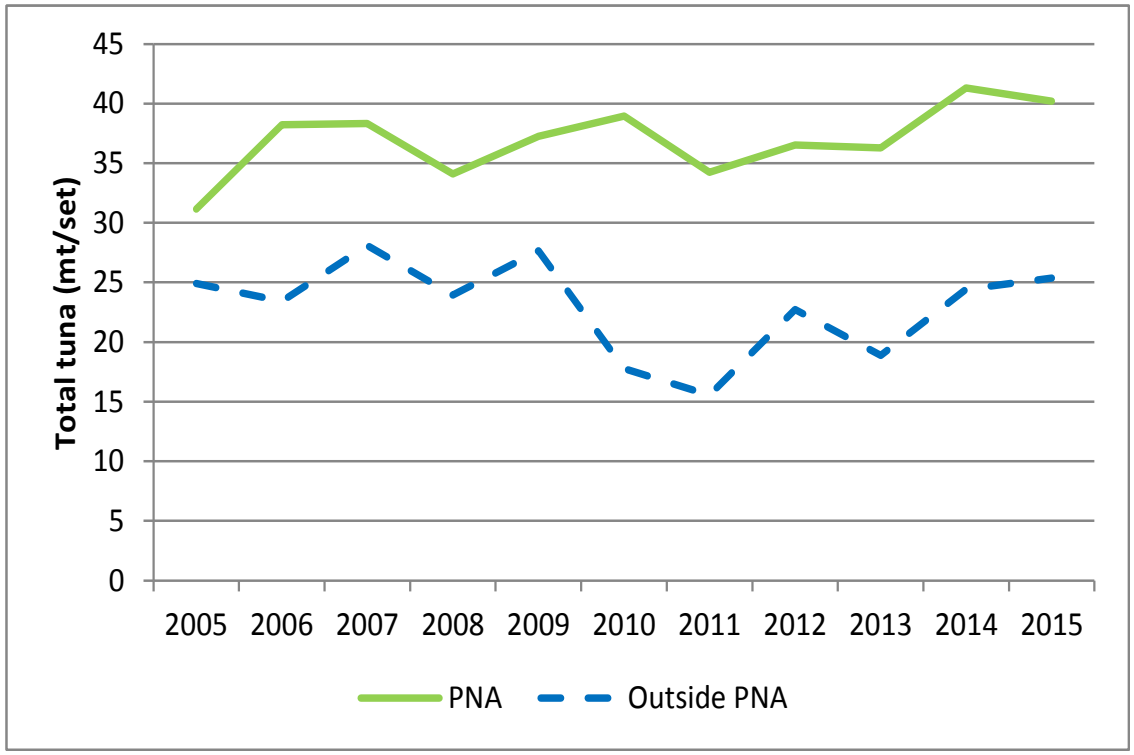
CPUE (mt/day; mt/set)



Inside PNA:+9%
Outside PNA: +25%

Figure 2

CPUE by set type (mt/set)



Associated

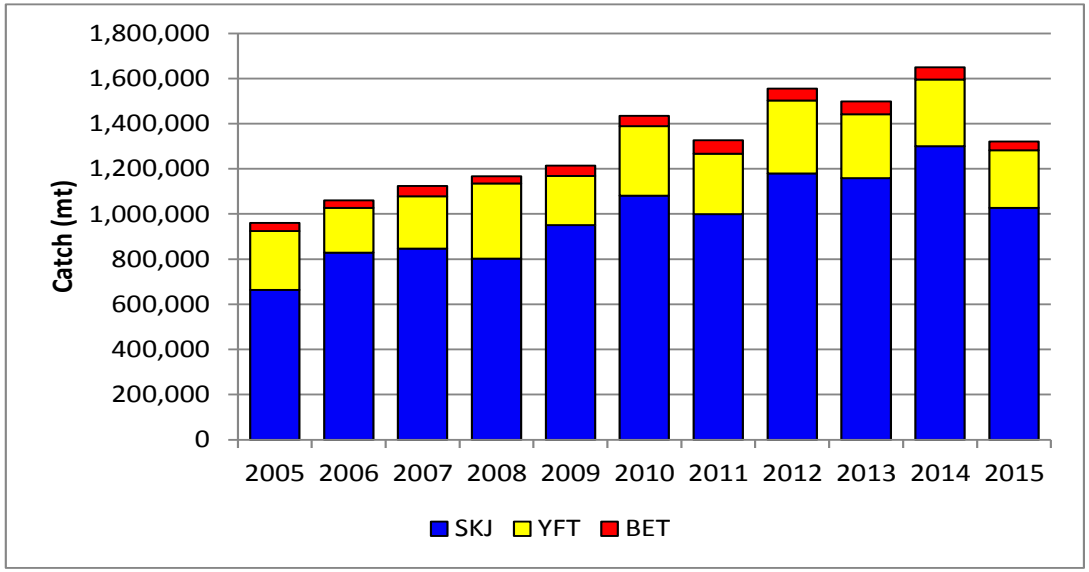
Unassociated

Inside PNA: +19%

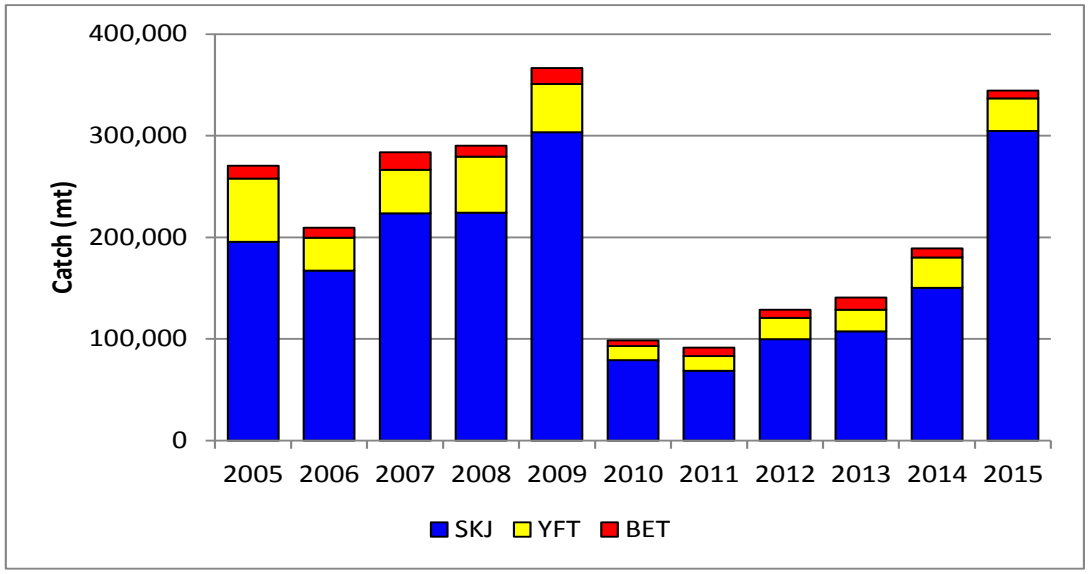
Outside PNA: +9%

Figure 3

Overall catches



Inside PNA: +3% (total)



Outside PNA: +98% (total)

Figure 4

Vessel characteristics

Characteristic	PNA	Outside PNA
Vessel length	+2%	+2%
Vessel GRT	+4%	+4%
Vessel HP	+3%	+6%
Vessel storage	+4%	+5%
Vessel age	-13%	-10%
Vessel crew	+3%	+2%

Sub Table 1

- Challenge – consistency of information
- How do they relate to effort creep?
  - Linear relationship?
  - Multiplicative relationship?
- FAD information will be particularly important

Relationship with CPUE

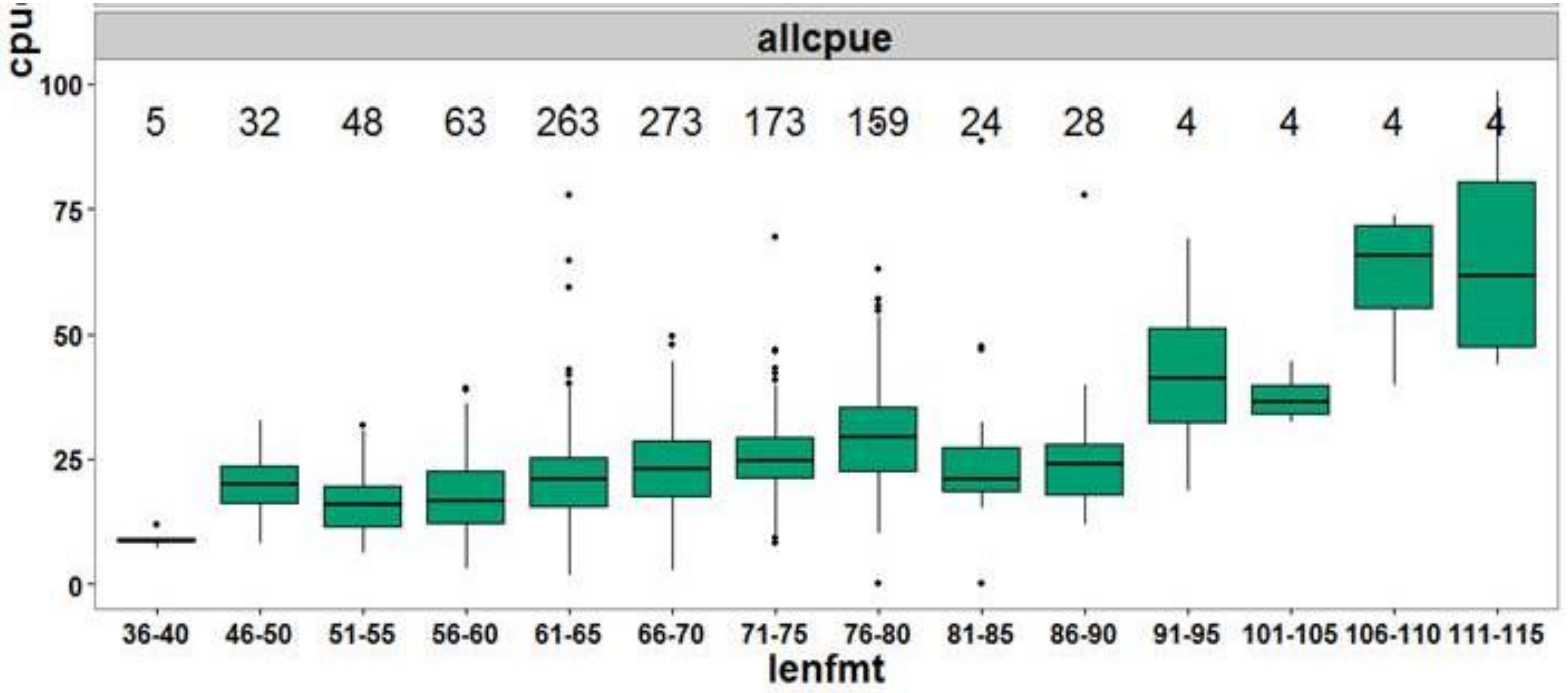


Figure 7

- Trends in overall/SKJ CPUE by e.g. vessel length

(see also Appendix 2)

Estimates of catchability

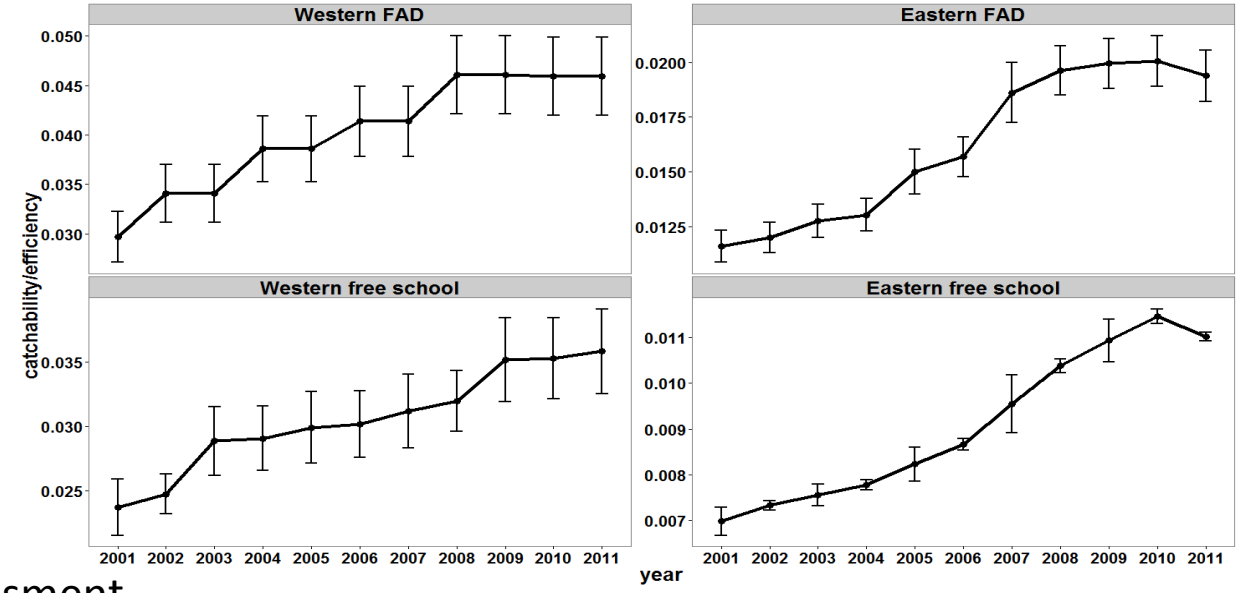


Figure 8
Note: 2014 assessment

- In theory capture trends in stocks and effort creep
- Issues:
  - Timeliness
  - Latest estimates ‘uncertain’
  - Does assessment capture recent abundance trends well?

Selecting indicators

- Dependent on how management wants to adjust for effort creep
  - Adjust overall effort levels
  - Adjust specific factors leading to effort creep
- Practical issues – utility will depend on approach taken to adjust for effort creep
  - E.g. impacts of environment on CPUE
  - E.g. market forces

Using indicators

- Recommend developing decision rules that define:
  - What to measure (averages?)
  - When to adjust
  - How much to adjust
    - Potential to have a minimum change
- Dependent on indicator, challenges with each
- Potential to include within HCRs (see MI-WP-06) & evaluate within MSE

Recommendations

- consider importance of this field of research and prioritisation within the SC work plan;
- discuss candidate indicators of effort creep, and their pros and cons;
- note trends in FAD (associated) fishery metrics, and need to ensure related information is available to understand the potential influences on effort creep;
- note importance of developing consistent and complete information on vessel characteristics;
- consider how trends in indicators might be evaluated (averages, standardisation);
- discuss potential decision rules for implementing any approach.