Harvest Strategy Framework and Reference Points for Golden King Crab (*Lithodes aequispinus*)

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King and Tanner Task Force Meeting

December 13th, 2019

What is a harvest strategy?

- **Objectives**
- **Indicators**
- **Reference Points (target, trigger, & limit)**
- **Decision Rules**

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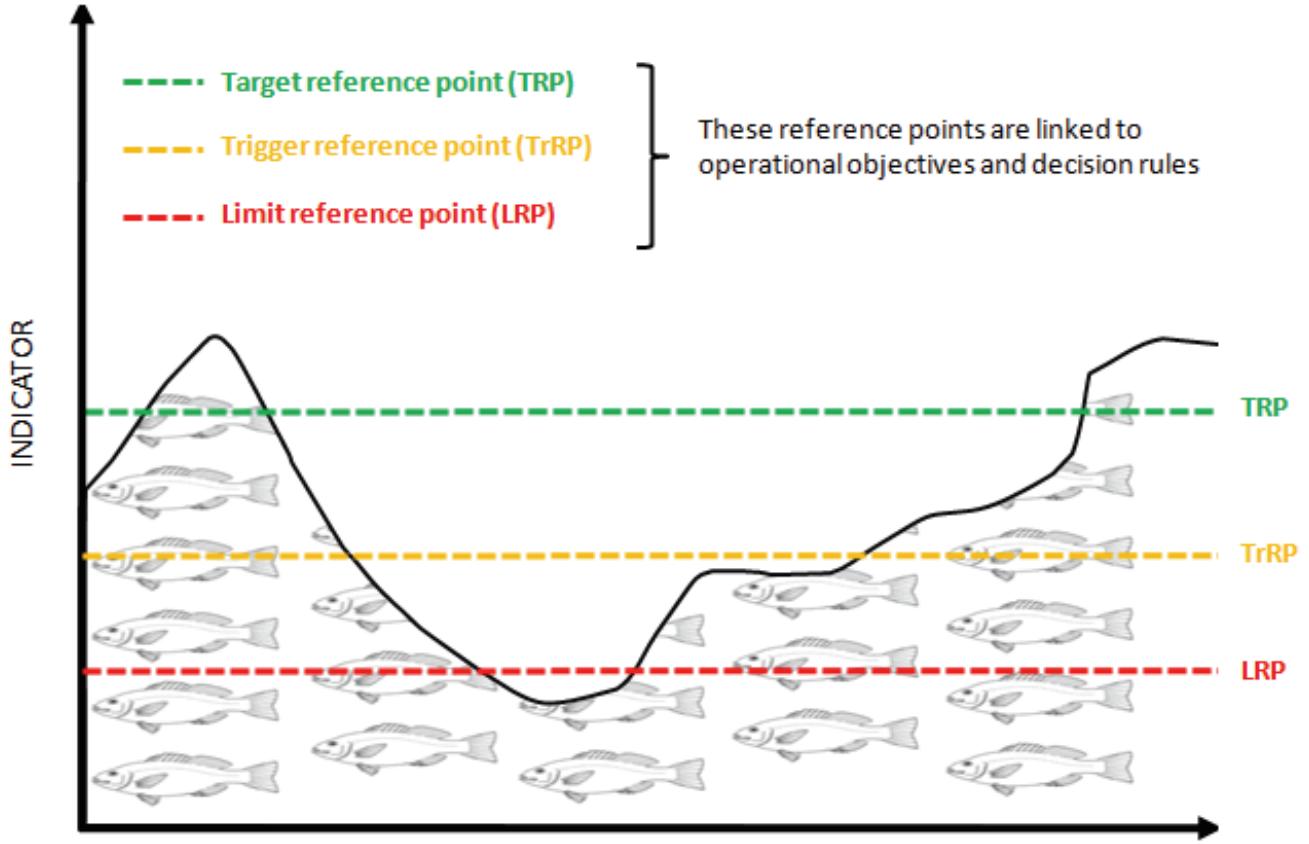

Sloan et al. 2014

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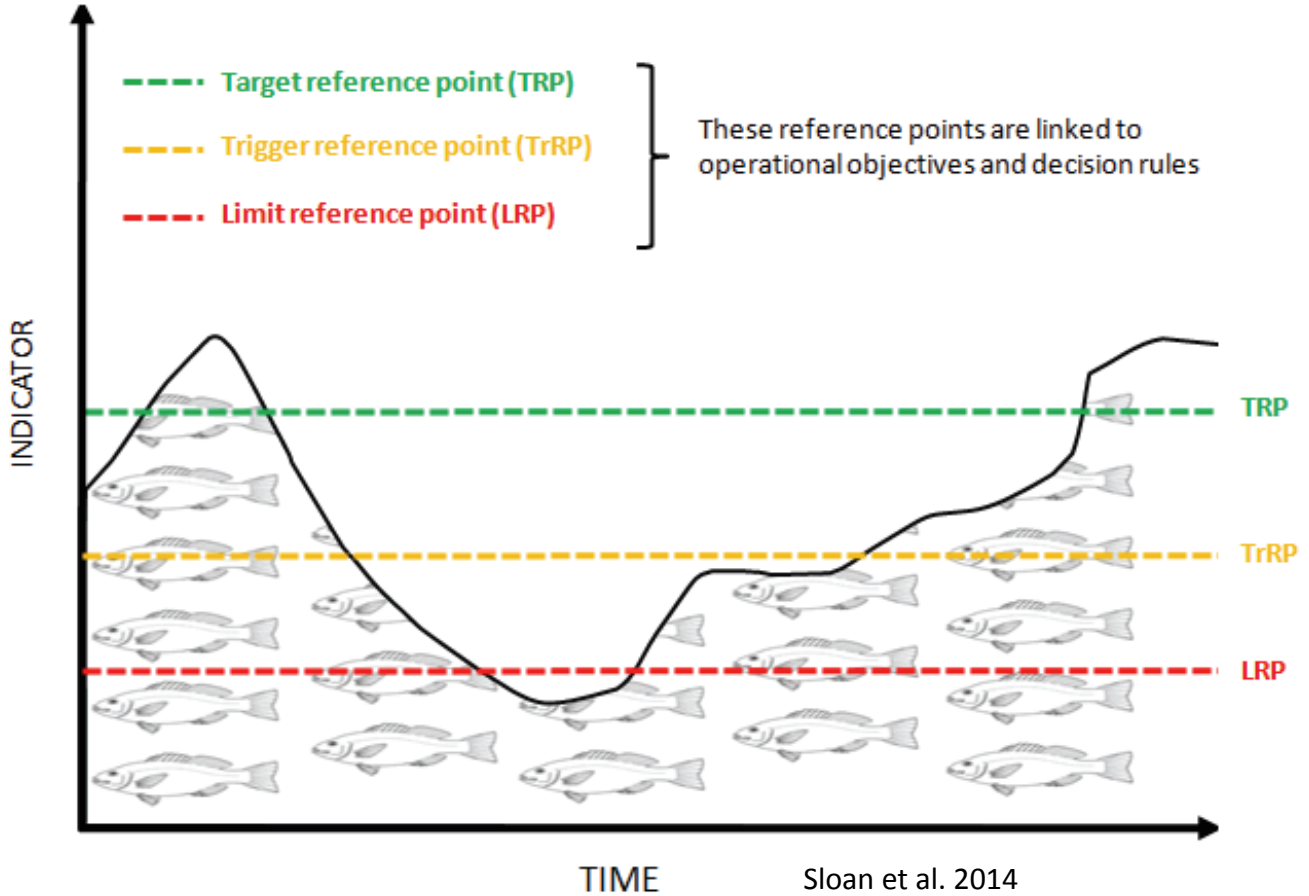

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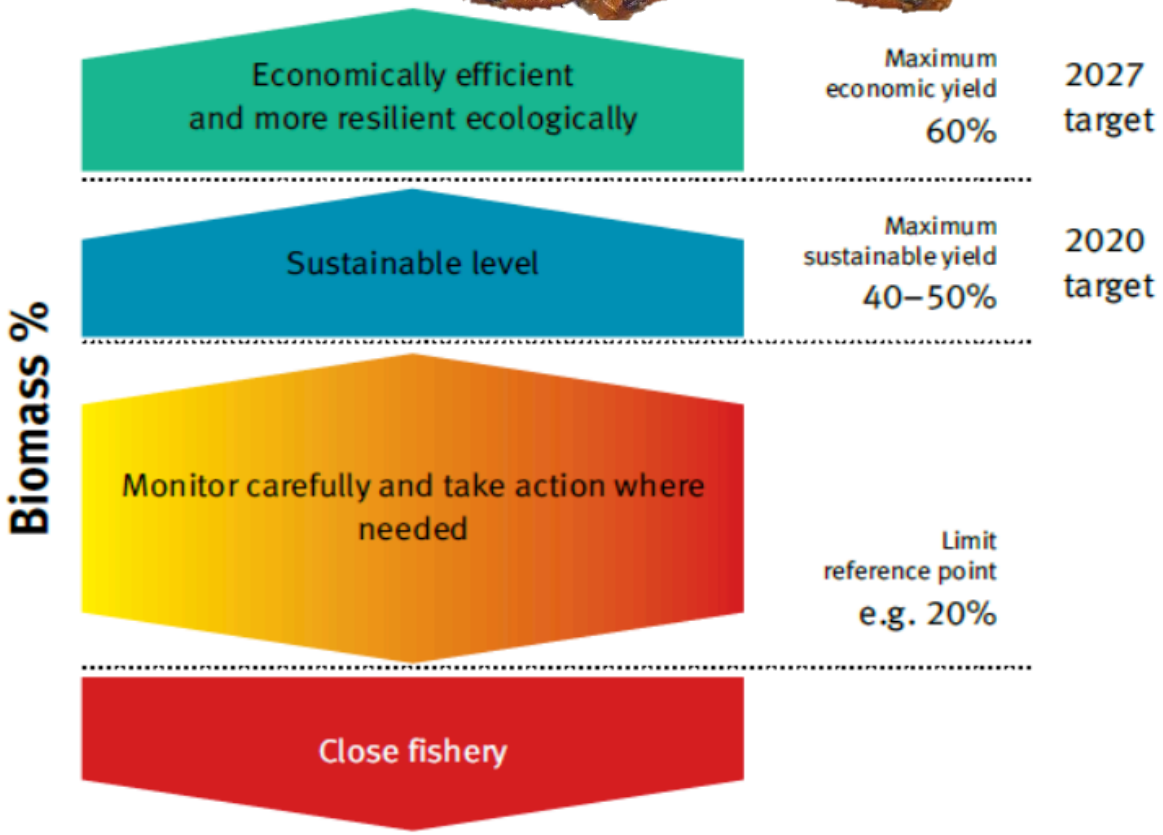
  - State what predetermined management actions will be taken and removes uncertainty in how a fishery will be managed



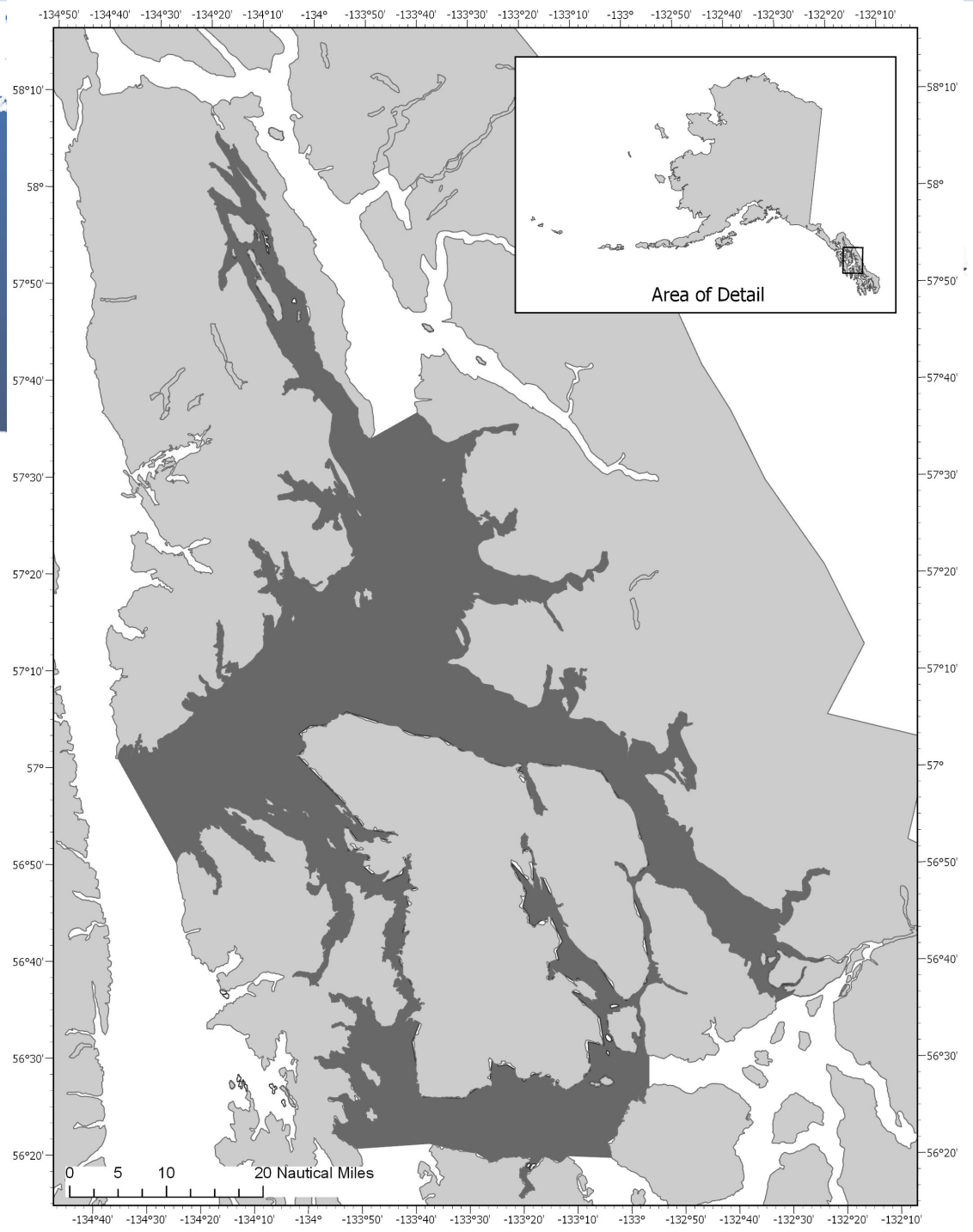
https://www.daf.qld.gov.au/business-priorities/fisheries/sustainable/sustainable-fisheries-strategy/harvest-strategy

Why for golden king crab?

- **Need to rebuild collapsed stocks**
- **Data-limited**
  - Logbook CPUE (no. crab per pot)
  - Harvest (lbs)
  - Port sampling (weight, carapace length, and shell condition)
- **Create structured frame-work to improve management**
  - Track performance overtime (biomass, catch rates, CPUE);
  - Increase transparency and communication on management decision;
  - Repeatable measure
- **Reference Points (target, trigger, & limit)**
  - Create desirable and undesirable levels of performance into a framework
- **Parallels with data-limited shellfish fisheries in AU**
  - Giant crab, mud crab, abalone, & rock lobster

Ex: East Central

- **Objectives**
  - Maintain the average commercial CPUE at or above a target level;
  - Maintain multiple size and shell age compositions for reproductive viability;
  - Increase economic value and participation
- **Indicators**
  - Logbook CPUE (no. of crab per pot)



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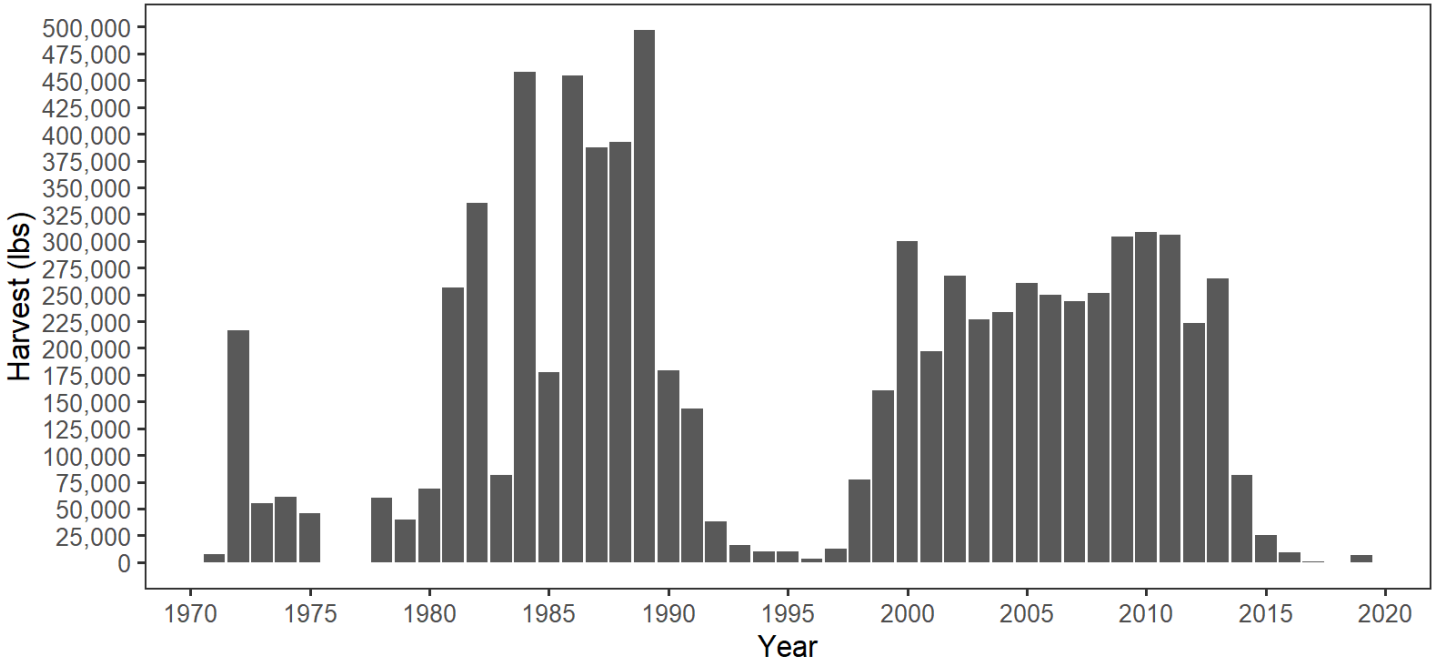
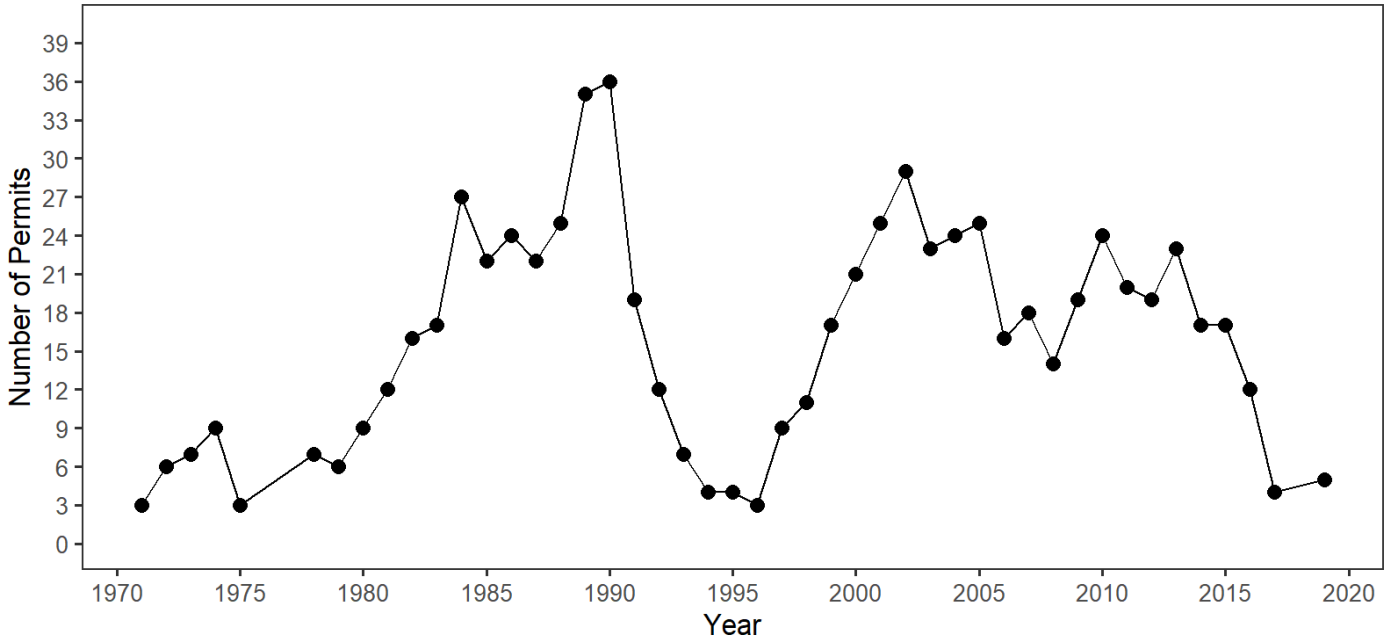


*Closed in 2018



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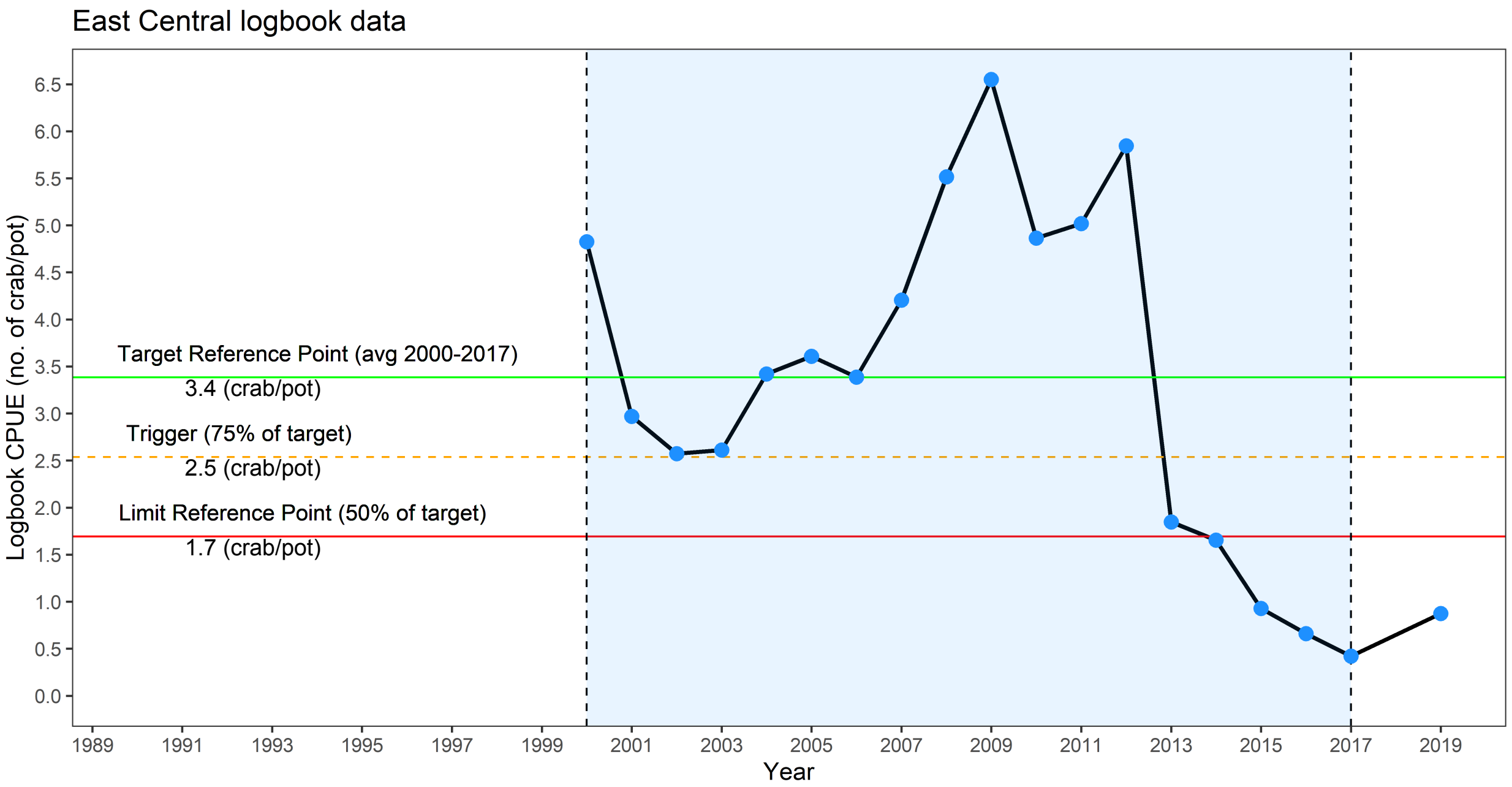
Ex: East Central

- **Reference Points**
  - Logbook CPUE

Indicators	Reference Point	Description
Target Reference Point (RP_{targ})	3.4 crab per pot	Average Commercial Logbook CPUE (2000–2017)
Trigger Reference Point (RP_{trig})	2.5 crab per pot	75% of Target Reference Point
Limit Reference Point (RP_{lim})	1.7 crab per pot	50% of Target Reference Point


East Central logbook data
Logbook CPUE (no. of crab/pot)
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Target Reference Point (avg 2000-2017)
3.4 (crab/pot)
Trigger (75% of target)
2.5 (crab/pot)
Limit Reference Point (50% of target)
1.7 (crab/pot)
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
Year

Ex: East Central

Indicators	Reference Point	Decision Rules
Target Reference Point (RP_{targ})	3.4 crab per pot	If logbook CPUE ≥ RP_{targ} no change or increase GHL the following season
Trigger Reference Point (RP_{trig})	2.5 crab per pot	If logbook CPUE ≥ RP_{trig} no change or increase GHL the following season OR If logbook CPUE < RP_{trig} close fishery early, no change or decrease GHL the following season, & reduce PU fishery bag and possession limits
Limit Reference Point (RP_{lim})	1.7 crab per pot	If logbook CPUE ≤ RP_{lim} close fishery early, subject to multiple year closure for commercial and personal use fisheries, upon re-opening set GHL and PU bag and possession limits at a reduced level

Next steps…

- **Other performance indicators?**
  - Biological (i.e. size and recruit compositions)
  - Secondary: CPUE (lbs/pot day)
  - Soak-time component to logbooks
- **Decision Rules**
  - Add ranges for triggered increases or decreases for GHLs (% or lbs)
  - More options?
- **Apply to other management areas**
- **Industry Feedback**
  - Pros and Cons
  - Collaborate with KTTF for further development

References

- Sloan, S., Smith, T., Gardner, C., Crosthwaite, K., Triantafillos, L., Jeffriess, B. and Kimber, N., 2014. National guidelines to develop fishery harvest strategies.


Questions?