

Agenda Item, C.1.c  
Supplemental Public Comment 3  
September 2014

# Comments on Pacific Sardine Harvest Parameters

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September 12, 2014

Presentation to Pacific Fishery Management Council, Agenda Item C.1



# Sardine FRACTION Alternatives

- We support **Alternative 2**: Use CalCOFI index; do not change FRACTION bounds (5-15%)
  - Alternative 2 best reflects current harvest policy
  - Alternatives 3a,b,c *more aggressive* than the status quo
- Now is not the time to move to more aggressive harvest FRACTION
  - Premature without addressing other aspects of HCR: DISTRIBUTION, OY specification, MSST, CUTOFF
  - Sardine population decline
  - Predator reproductive failures: evidence of insufficient forage

# The Need to Fix Temperature-based FRACTION

- Purpose of temperature-based FRACTION:
  - fish harder during booms (15%)
  - ease off during periods of low recruitment / declines (5%)
- SIO index originally selected in 1998
- During last 7 years, sardine have been in steep decline with low recruitment, yet FRACTION remained at 15%
- McClatchie et al. 2010: SIO index failed, should be removed
- PFMC Sardine Harvest Parameters Workshop: 2013: Replace SIO index with CalCOFI index in the HCR
- 2014: SSC adopted CalCOFI for OFL

# Alternative 2 is Closest to Status Quo HCR

	Status quo*	Alt 2	Alt 3a	Alt 3b	Alt 3c
Fraction	15%	5-15%	10-20%	5-20%	0-20%
Mean B1+ (tmt)	1208	1220	1182	1186	1187
Depletion	77%	78%	75%	75%	76%
Mean catch (tmt)	107	106	112	111	111

*Data from Prelim. Draft EA. Agenda Item C.1.a, Table 1*

Alternatives 3 a,b,c are **MORE AGGRESSIVE** than status quo:  
Higher catch and lower biomass

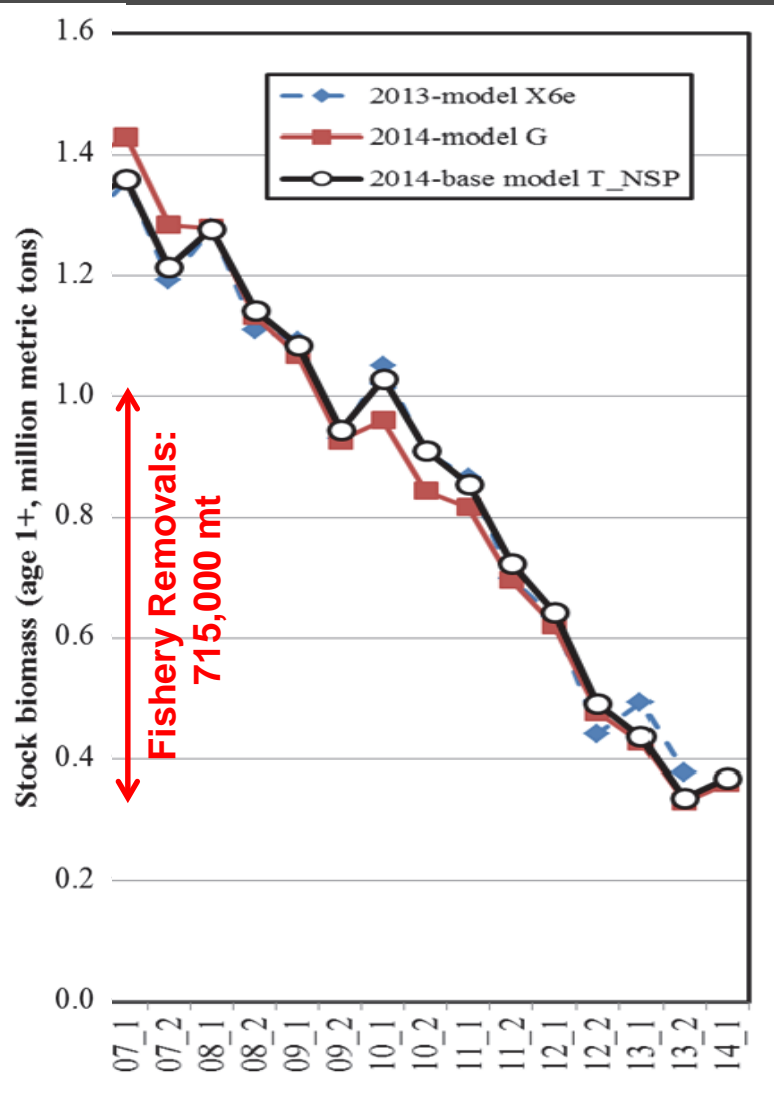
**HMS MT Presentation:** At low biomass (370,000 mt), Alts 3a,b,c result in substantially higher harvest than Alt 2 or status quo at median and upper quartile temperatures

*\*Status quo data from Scenario code 22, Table 4, Hurtado-Ferro & Punt 2014 (March 2014), as per SSC recommendation of closest approximation*

# Harvest control rules must achieve Optimum Yield and prevent overfishing

- CPS FMP has not specified or assessed Optimum Yield
- Must analyze and account for ecological, economic, social factors:
  - Effects of fishery on dependent predators
  - Effects of prey depletion on other fisheries (e.g., salmon)
  - Assessing whether there are sufficient other prey sources for predators (e.g., anchovies) when sardine stock is low
- CUTOFF is not high enough to provide adequate forage
- Minimum Stock Size Threshold (MSST = 50,000 mt) for sardine is far below follow NS1 Guidelines (1/2 Bmsy)

# Sardine Collapse: The Role of Fishing



- Decline (2007-2014):
  - 1,050,000 mt (74%) drop
- Fishery removals:
  - 715,000 mt
- No “surplus” production, low recruitment

# Evidence of Inadequate Forage

Specifically Sardine and Anchovy

- **California Sea Lions**

- 2013: Unusual Mortality Event
  - (*Melin et al., NOAA, 2014*)
- 2014: Double average pup mortality



*Ingrid Overgard/TMMC*

- **Brown Pelicans**

- 5 consecutive years of nesting failures (Harvey 2013)
- 2014: First range-wide nesting failure in 25 years of monitoring

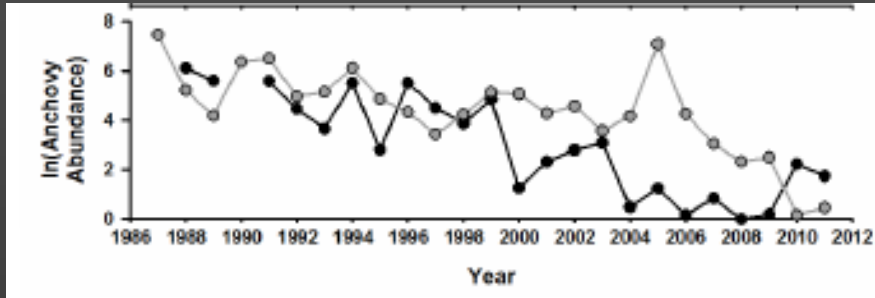


*Ingrid Taylor*

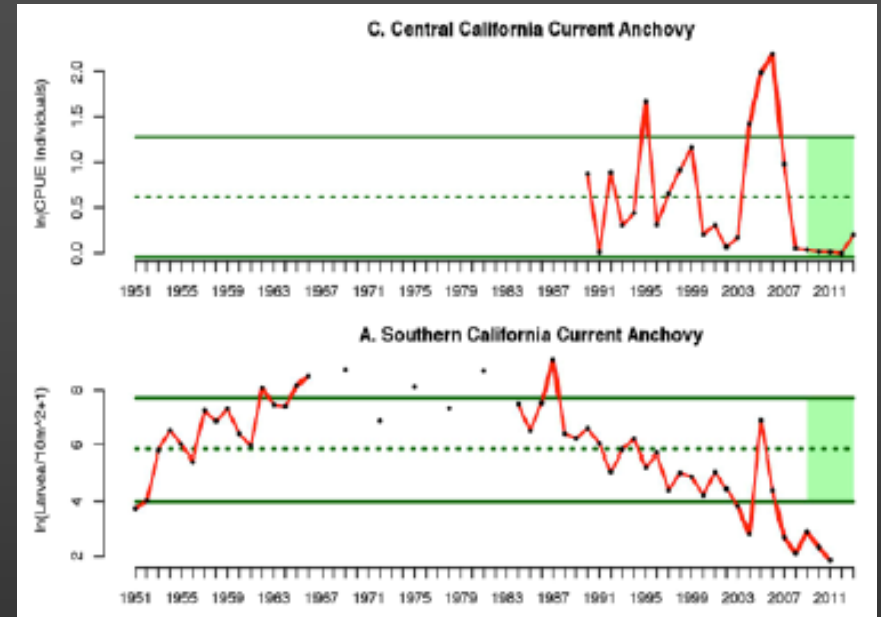
Primary forage:  
sardines &  
anchovies

*Geoff Shester/Oceana*

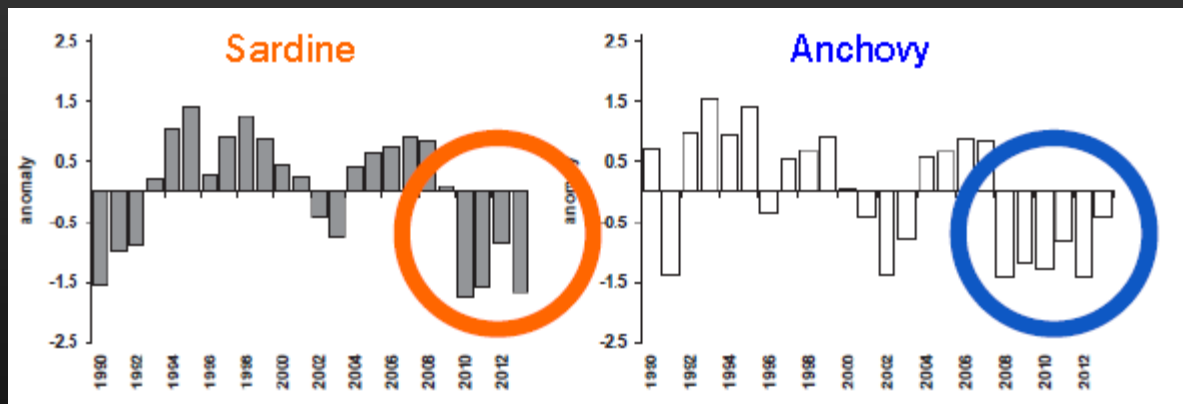
# Available Indices: Anchovies Low



CalCOFI (Sydeman et al. in press)



CC IEA, March 2014



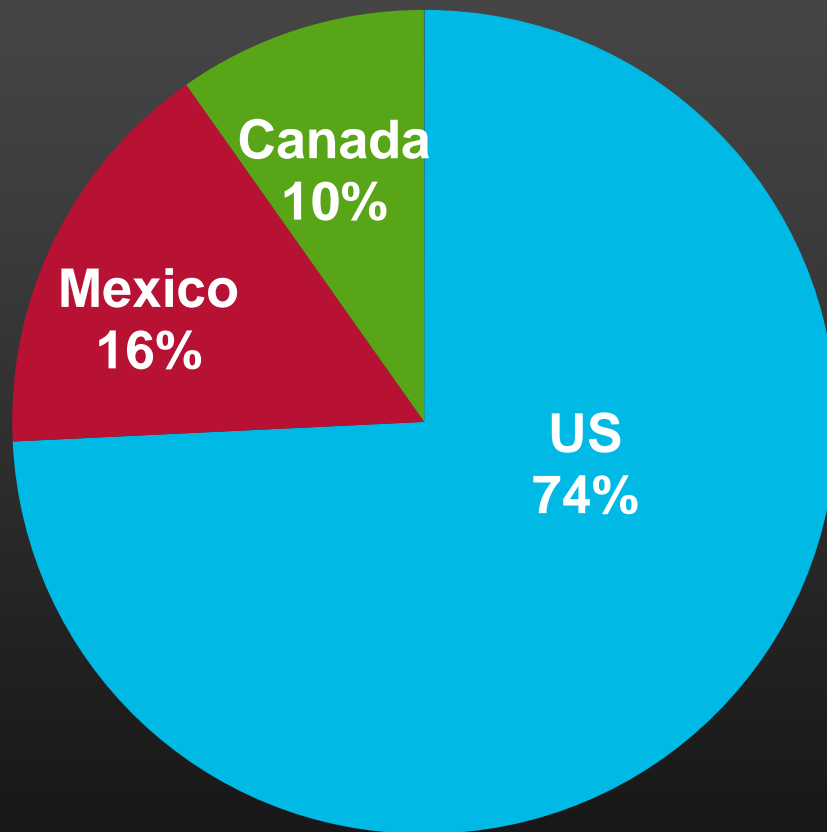
CC IEA, March 2014



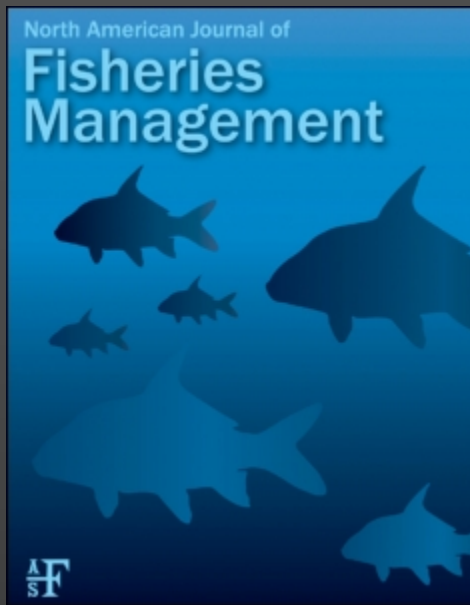
# DISTRIBUTION still needs to be fixed

(DISTRIBUTION currently set at constant 87%)

## Distribution of Pacific Sardine Landings attributed to N. Subpopn. (2004-2013)



Ramifications of assessing and managing only the Northern Subpopulation have not been addressed in the CPS FMP



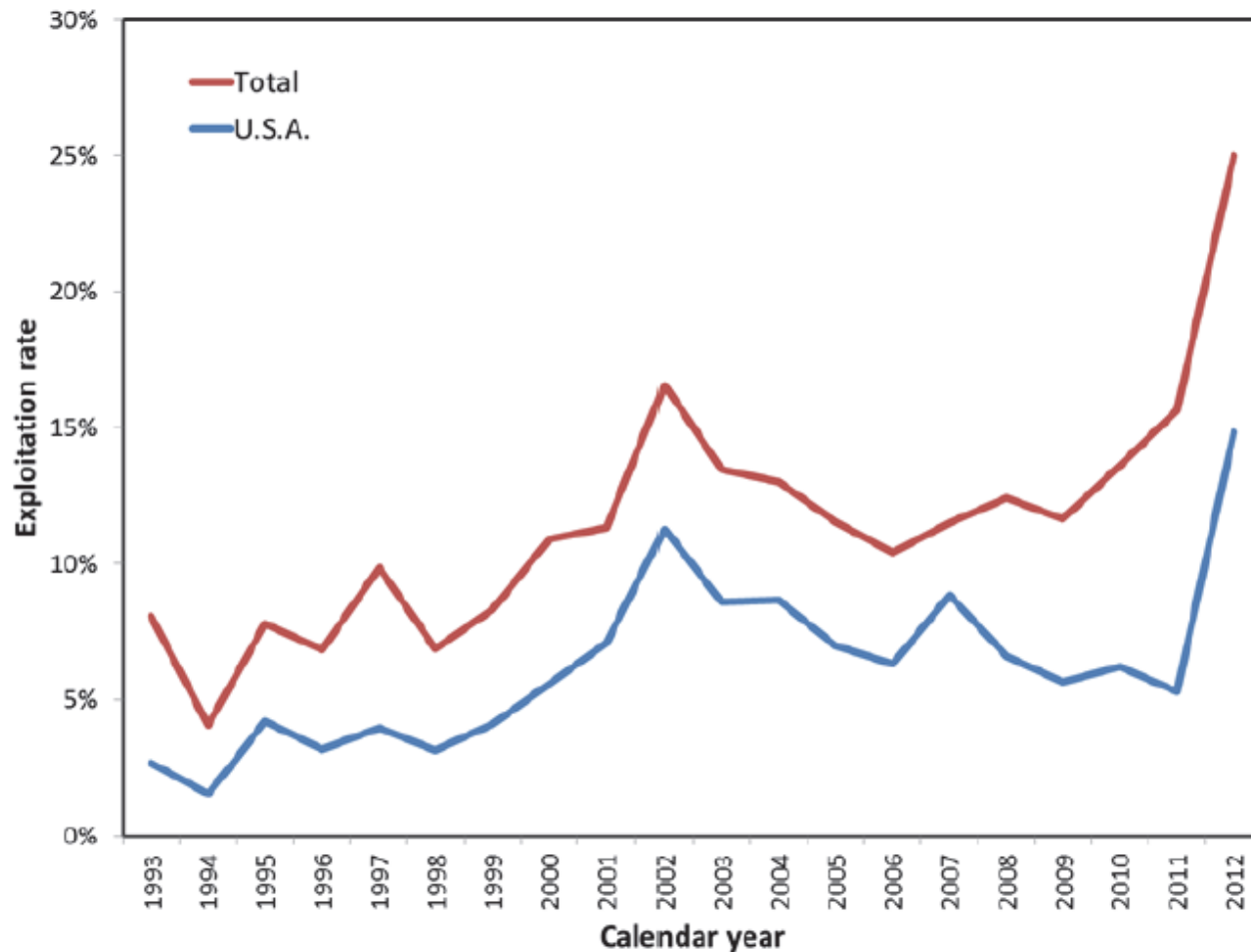
## Optimizing fishing quotas to meet target fishing fractions of an internationally exploited stock of Pacific sardine (*Sardinops sagax*)

*North American Journal of Fisheries Management, 2014*

D. A. Demer and J. P. Zwolinski (NMFS/SWFSC)

- “...the current harvest control rule for sardine has not consistently maintained a total fishing fraction below the US target value because the ‘distribution’ parameter, which is intended to account for the proportion of the stock in the US exclusive economic zone (EEZ), has **not adequately accounted for landings** of the stock at **Mexico and Canada.**”
- “The authors propose a **refinement to the harvest control rule**, which gives explicit consideration to the summed landings at Mexico and Canada, to more optimally set the annual US quota”

# Recent Assessments Indicate Coastwide Sardine Overfishing Occurred

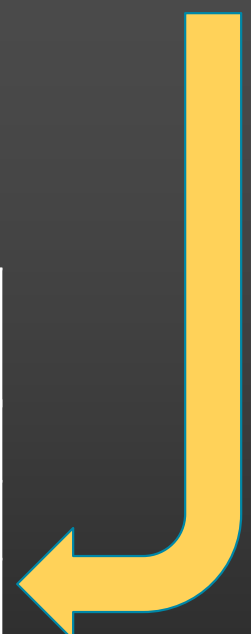


Calendar year	U.S.A.	Total
2000	5.57%	10.91%
2001	7.07%	11.34%
2002	11.26%	16.55%
2003	8.59%	13.46%
2004	8.68%	13.02%
2005	6.99%	11.53%
2006	6.33%	10.43%
2007	8.85%	11.50%
2008	6.59%	12.43%
2009	5.64%	11.64%
2010	6.23%	13.59%
2011	5.30%	15.63%
2012	14.85%	24.98%

(Overfishing Limit Set at 18%)

# Performance measures are dramatically worse if Mexico and Canada don't follow U.S. HCR:

	Status quo*	Alt 2	Alt 3a	MF*
Fraction	15%	5-15%	10-20%	5-15%
Mean B1+ (tmt)	1208	1220	1182	<b>716</b>
Depletion	77%	78%	75%	<b>46%</b>
Mean catch (tmt)	107	106	112	<b>57</b>



\*Sensitivity Run Table 6, S14, Hurtado-Ferro & Punt 2014

# In summary:

- Increasing **FRACTION** without fixing **DISTRIBUTION** or addressing needs of predators
  - ...at time when sardine population just plummeted by 74% while recruitment and biomass are at 20-year lows...
  - ...after overestimating productivity in the HG for the last 7 years
    - **Fails to prevent overfishing**
    - **Fails to achieve OY**
    - **Violates common sense responsible fishery management**
- Please select **Alternative 2** as your PPA