Agenda Item G.1.c
Supplemental Public Comment 4
(Electronic Only)
April 2015

# Comments on Sardine Management for 2015-16

Geoff Shester, Ph.D.

Oceana

Public Comment on PFMC Agenda Item G.1

# Fishing amplifies forage fish population collapses

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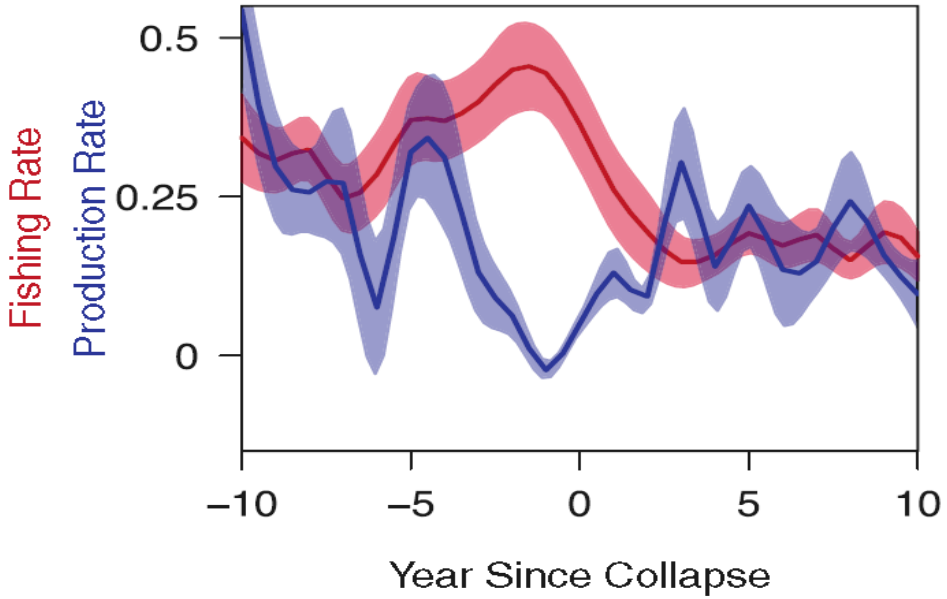
**Common characteristics of forage collapses:**

1. **High fishing pressure several years before collapse**
2. **Sharp drop in natural population productivity**
3. **Lagged response to reduce fishing pressure**

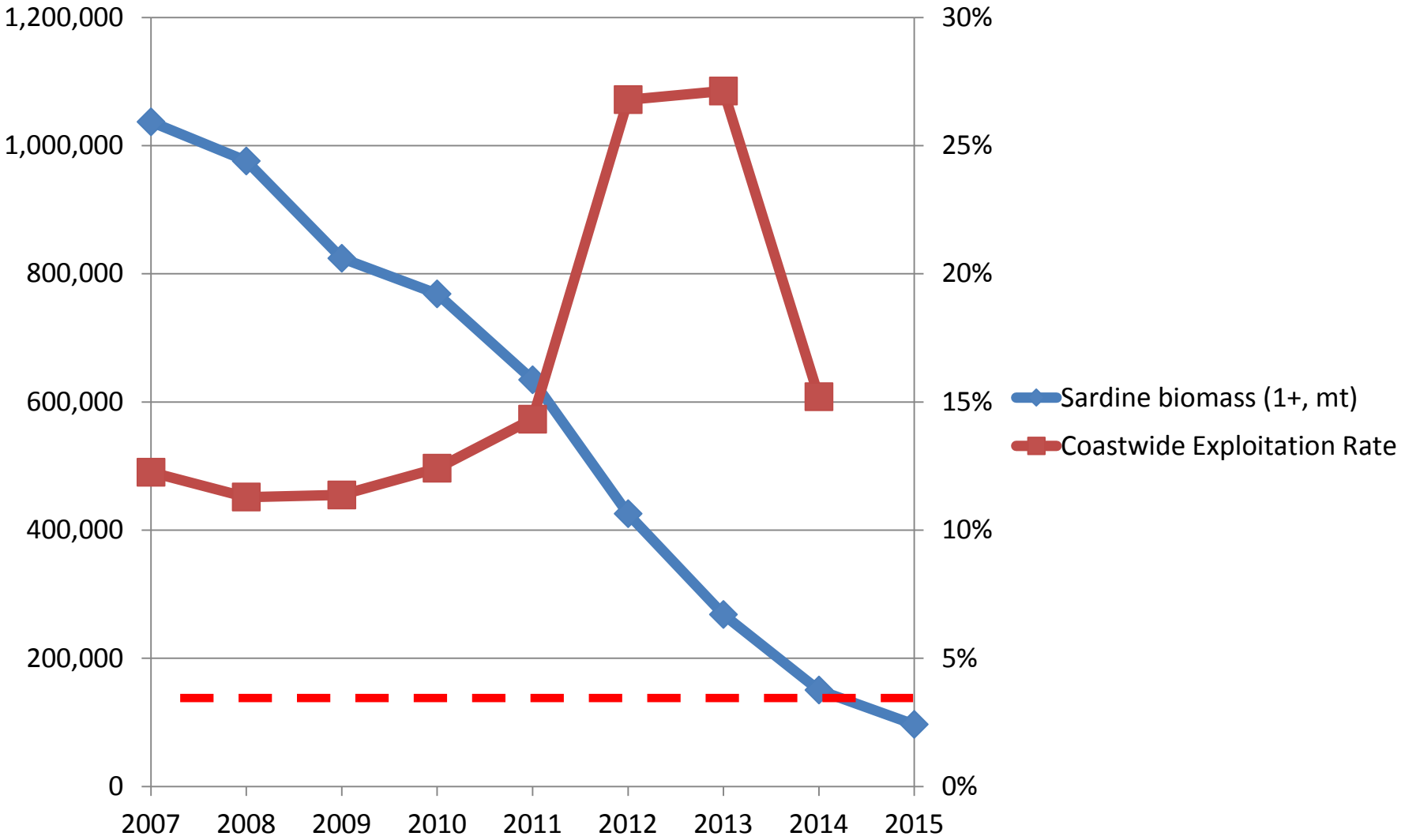
**Cutoff at one half average unfished biomass would minimize this risks, while maintaining average catch**




PNAS

March 2015.

# Harvest rates INCREASED as stock approached CUTOFF



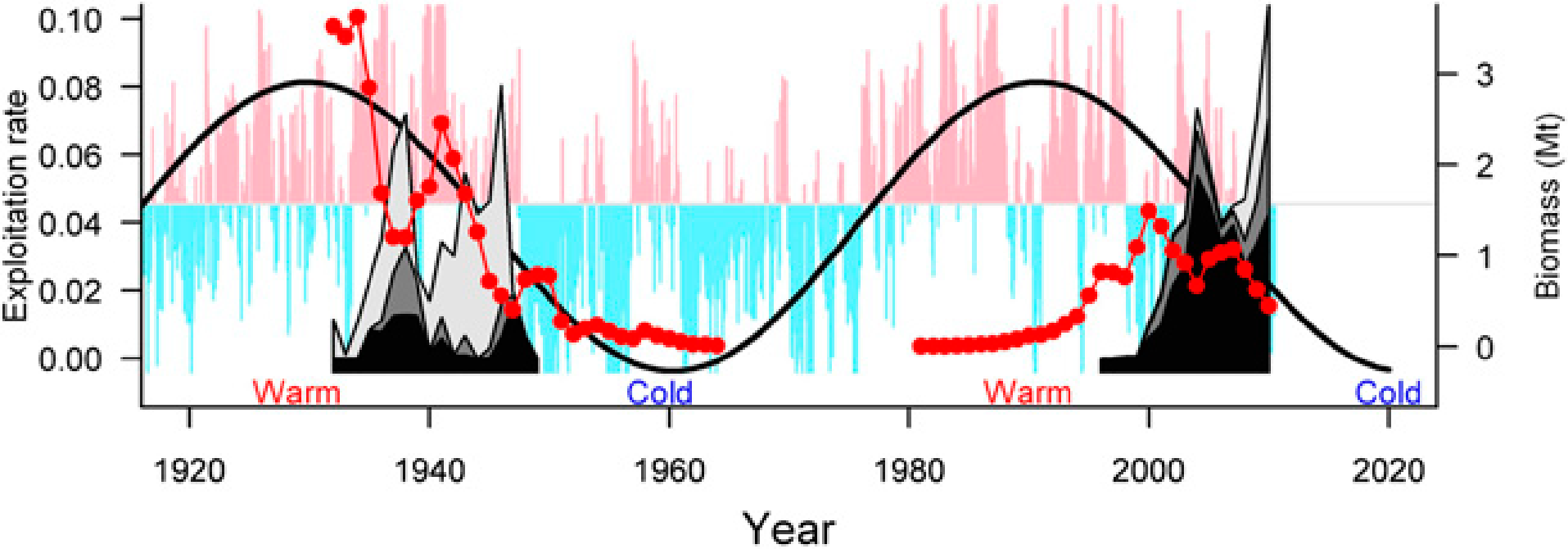

Data from on March 2015 Stock Assessment

# A cold oceanographic regime with high exploitation rates in the Northeast Pacific forecasts a collapse of the sardine stock

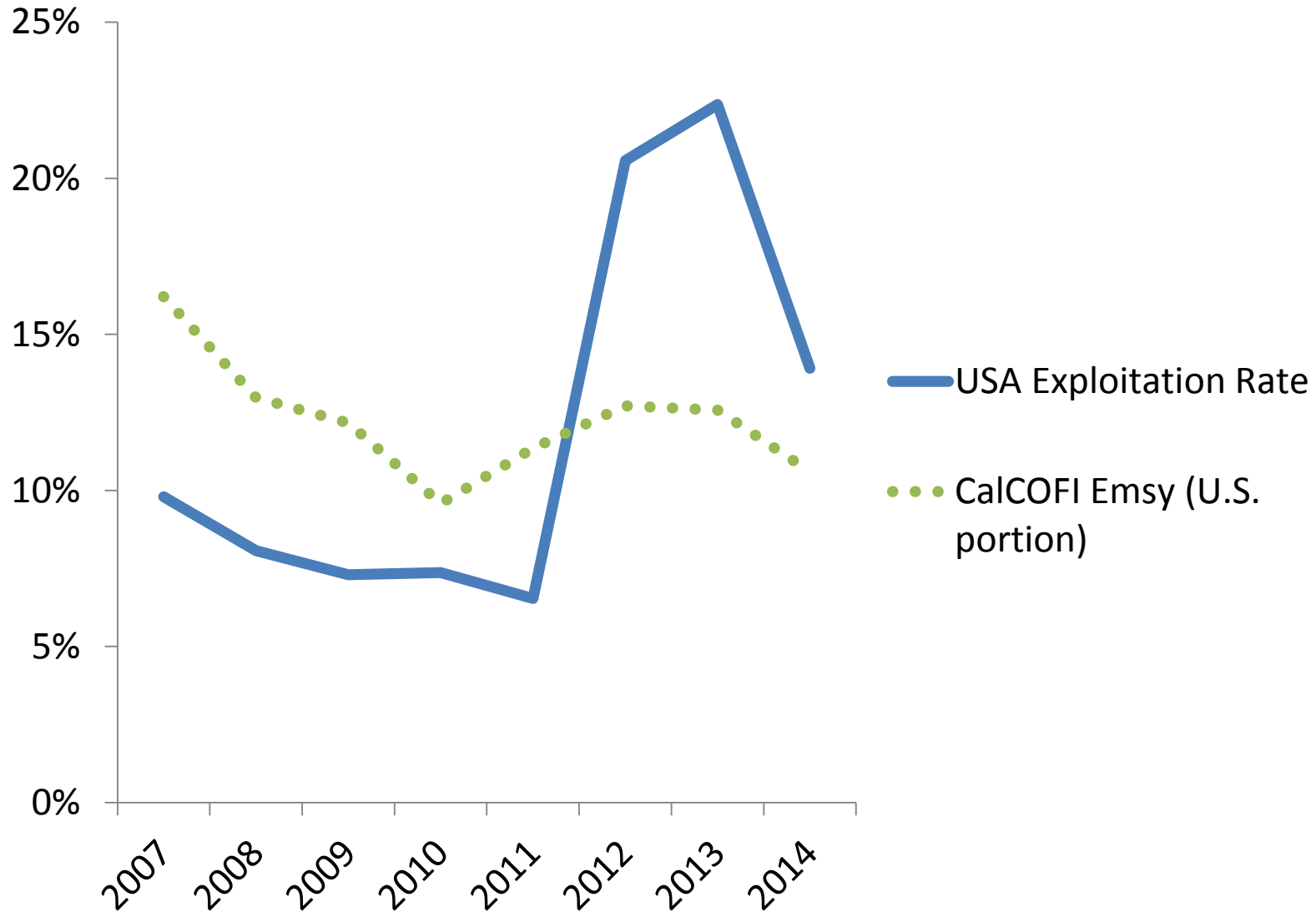
Juan P. Zwolinski[a,1] and David A. Demer[b,2]

PNAS

**Fishing pressure: increases decline, delays recovery, reduces future peaks**
**Similar oceanographic and fishery trends to 1940s when sardine collapsed**

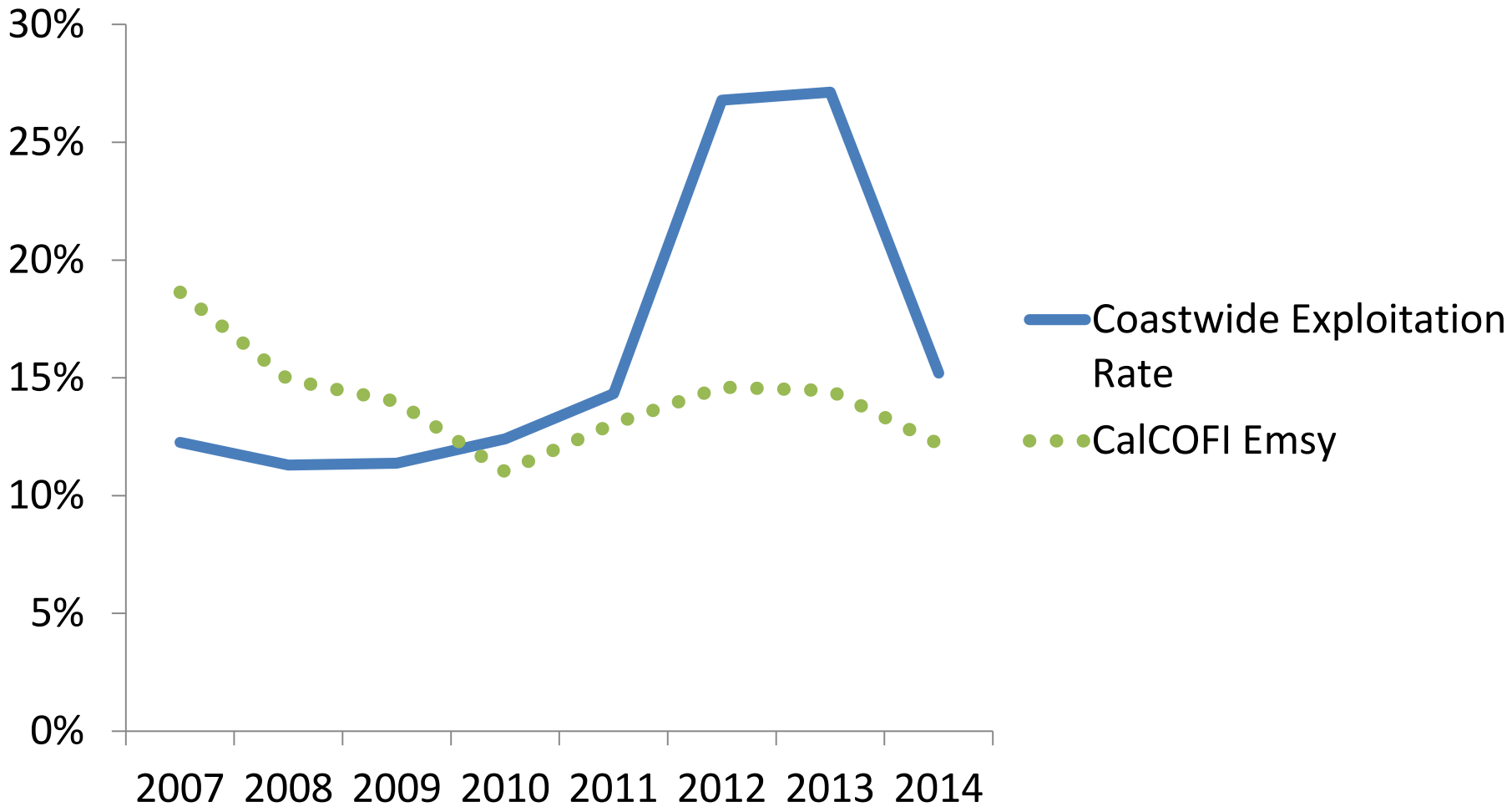


# U.S. Overfishing Occurring Since 2012




U.S. exploitation rate compared to the previous MSY rate (stochastic $E_{MSY}$) and new rate (CalCOFI $E_{MSY}$ ) for the U.S. distribution of the stock (87%). Exploitation in excess of $E_{MSY}$ demonstrates U.S. overfishing has been occurring since 2012. Data from 2015 Assessment.

# Coastwide Exploitation Rate on Sardines vs. Emsy




Coastwide (U.S., Mexico and Canada) exploitation rate compared to the previous MSY rate (stochastic $E_{MSY}$) and the new rate (CalCOFI $E_{MSY}$) for the coastwide distribution of the Northern sardine population. Exploitation in excess of $E_{MSY}$ demonstrates coastwide overfishing has been occurring since 2010.


# 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**."

- U.S. Landings as proportion of coastwide landings from 1993-2011:
- Differentiated landings of Northern stock: **70%**
- Undifferentiated landings: **53%**

The New York Times

## *Starving Sea Lions Washing Ashore by the Hundreds in California*

By JACK HEALY MARCH 12, 2015

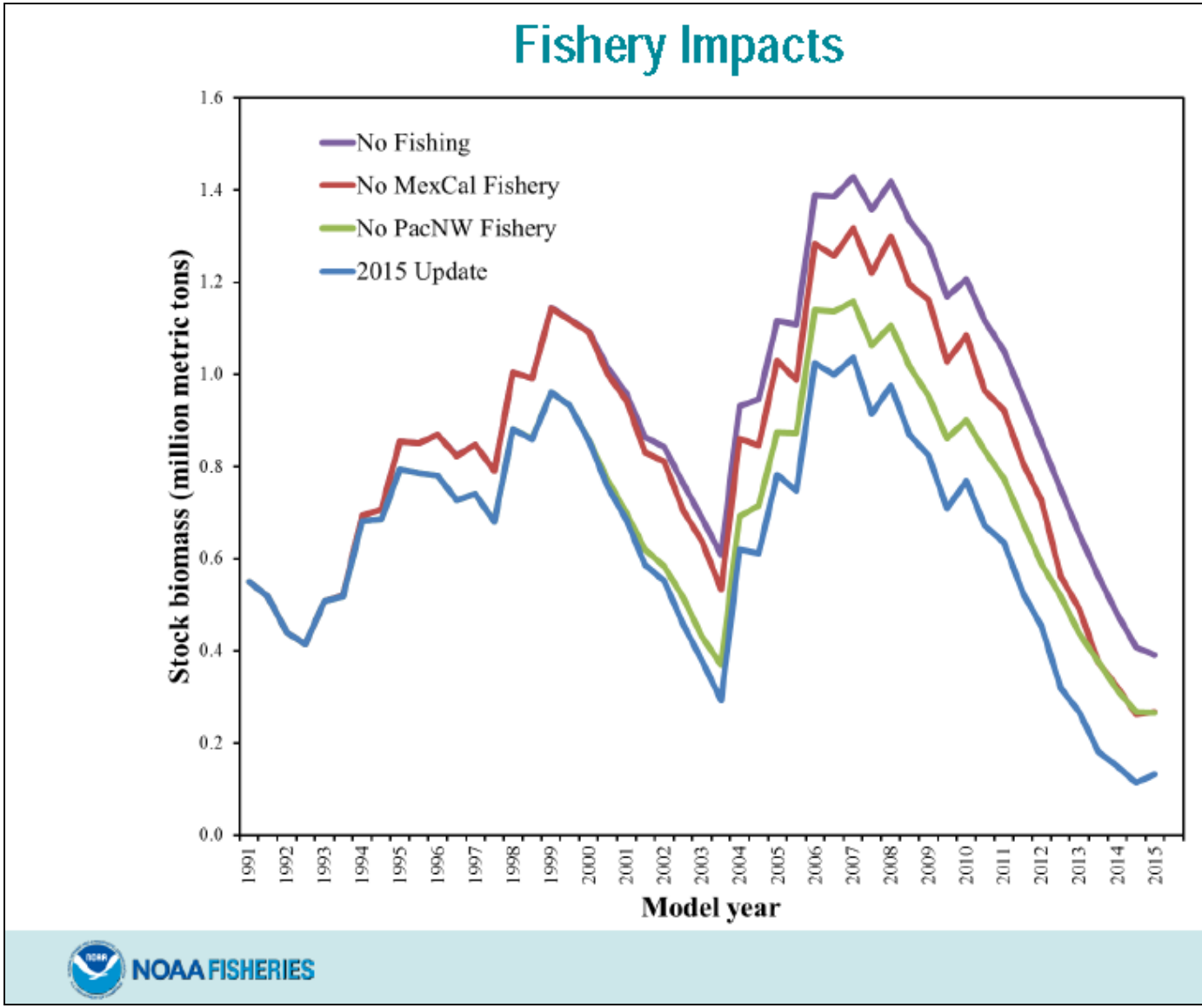
Environment on NBC NEWS.com

## Baby pelicans starving along California coast

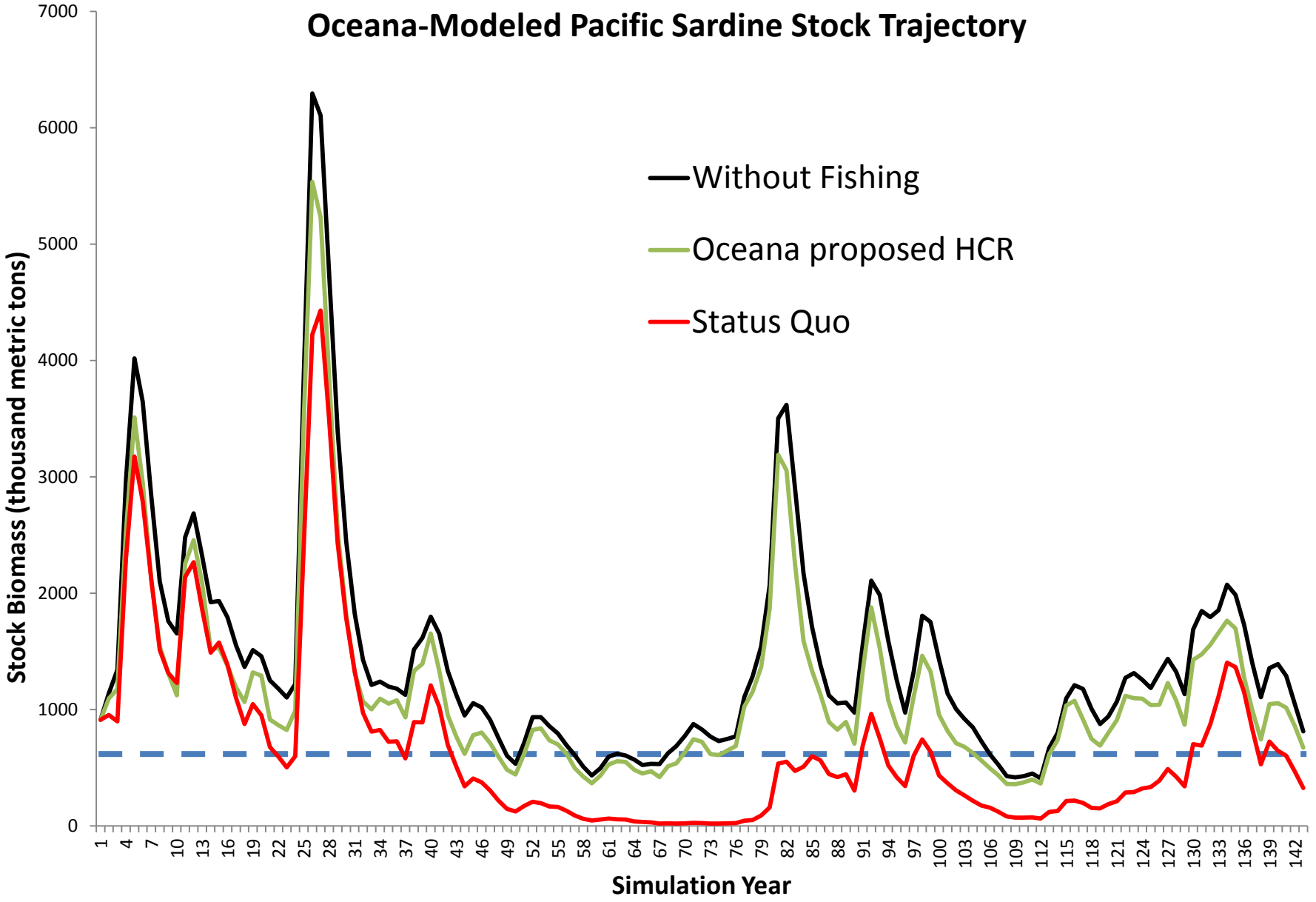
**Species has been recovering, problem might be competition for food**

# Not Just Ocean Conditions

There would be 4X more sardines out there today if we hadn't been fishing




From K. Hill 2015 Assessment Presentation to PFMC




Trajectories analyzed using 2013 Hurtado & Punt model

# Proposal for 2015-16 Specs

- CPS FMP:
- "*By the time BIOMASS falls as low as CUTOFF, the harvest rate is reduced to zero*"
- *"…the incidental amount and the amount harvested directly **must** equal the total HG"*
- *"ACT: Equal to HG or ACL, whichever value is less"*

- Set total ACL no greater than 1,000 mt
  - 1% harvest rate would be minimal, while reasonably allowing continued CPS fisheries, bait, etc.
  - Set HG = 0

- CA live bait limit = 400 mt

- Total incidental catch limit = 300 mt
  - 10% sardine limit for squid/other fisheries
  - 20% sardine limit for mackerel/anchovy
  - Triggers: Ratchet down % as total limit approached

# CA Live Sardine Bait Fishery

| Year | Harvest (mt) | % of 1+ sardine biomass |
|---|---|---|
| 2008 | 2,979 | 0.31% |
| 2009 | 2,788 | 0.34% |
| 2010 | 2,249 | 0.29% |
| 2011 | 2,057 | 0.32% |
| 2012 | 2,497 | 0.59% |
| 2013 | 1,849 | 0.69% |
| | **Average %:** | **0.42%** |

**Proportional Decrease:**

**0.42% of July 2015 1+ biomass (96,688 mt) = 406 mt**

FMP allows Council to set limits on live bait sector

Harvest data from CPS MT, Biomass based on 2015 Sardine Assessment

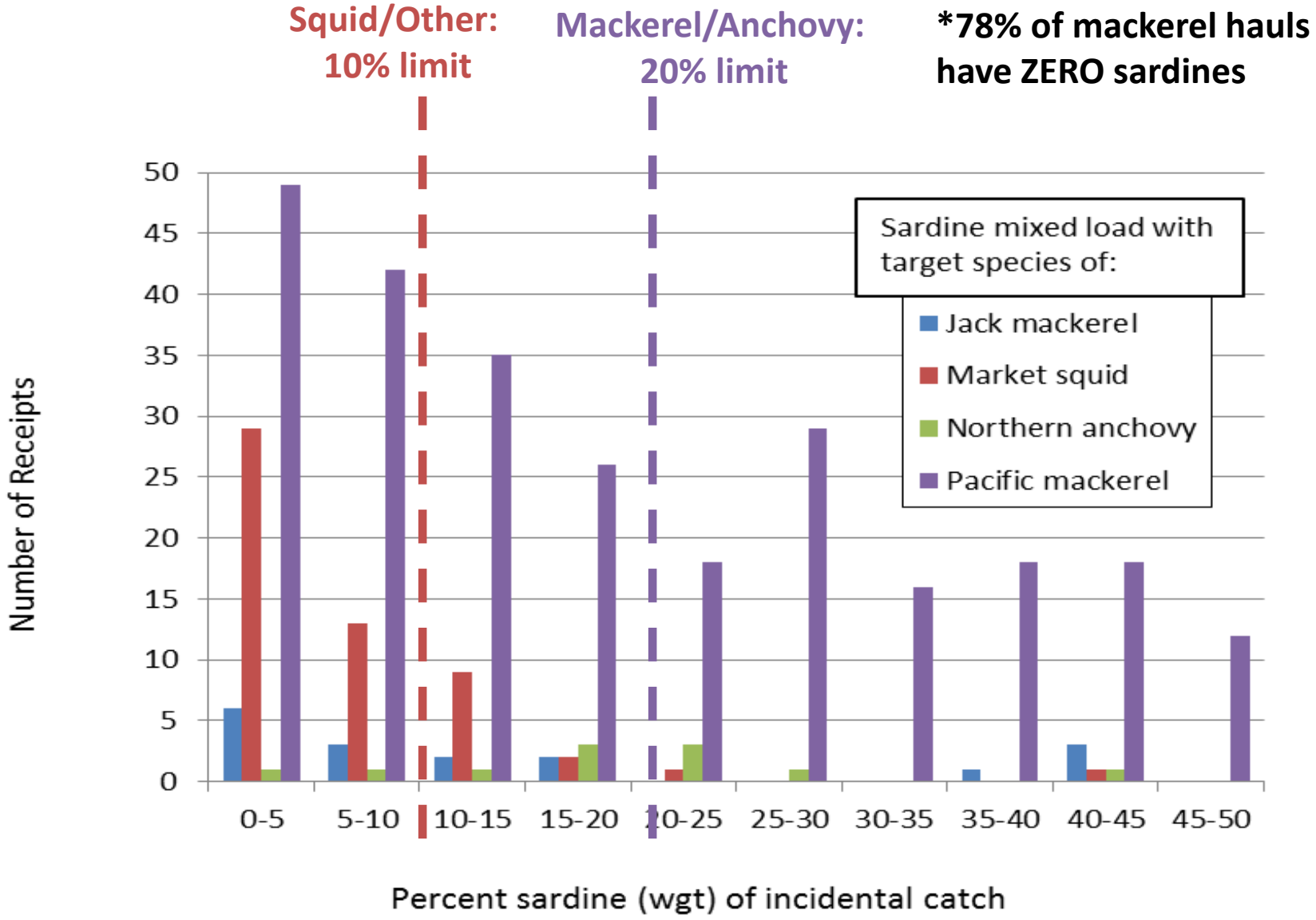
# Total Sardine Incidental Catch

Incidental Landings (mt) (≤45% Sardine in a landing for ALL gear types for OR & CA, including purse seine, regardless of whether sardine season is open or closed), Data from CPS MT:

| Year | CA | OR | WA | Total |
|---|---|---|---|---|
| 2008 | 1036.5 | 9.1 | 3.2 | 1048.8 |
| 2009 | 404.6 | 5.2 | 17.0 | 426.8 |
| 2010 | 381.7 | 1.2 | 2.3 | 385.2 |
| 2011 | 334.2 | 2.6 | 0.0 | 336.8 |
| 2012 | 413.2 | 47.8 | 0.0 | 461.0 |
| 2013 | 1327.4 | 17.1 | 0.6 | 1345.1 |
| 2014 Interim | 832.7 | 0 | 0 | 832.7 |
| 2014-15 Period 1 | 808.3 | 366.9 | 0.1 | 1175.3 |

**Limit of 300 mt generally consistent with low end of recent range, goal of incentive to minimize sardine catch, changes to fishing behavior, and lower sardine numbers**

# Proposed Per-Trip Incidental Sardine Catch Limits




Data from CPS MT only for trips with incidental sardine catch

* market squid to 2013

# Recent Incidental Catch Data

- **78% of Pacific mackerel trips and 87% of Market Squid trips had ZERO sardines in recent years**

- Less than 5% of mackerel receipts had greater than 20% incidental sardine catch

- Less than 3% of squid hauls had greater than 10% incidental sardine catch

# Summary

- Best science currently available:
  - Sardine overfishing occurring since 2010
  - Fishing worsened the current collapse
  - DISTRIBUTION flaws were a contributing factor
  - Council's HCR did not perform as intended

- Take Definitive Action to Minimize Sardine Catch
  - Zero directed sardine fishing
  - ACL < 1,000 mt
  - Per trip incidental sardine limits 5-20%

- Overhaul Sardine HCR
  - Increase CUTOFF
  - Account for predators/ecosystem impacts – "Optimum Yield"
  - Fix DISTRIBUTION and MSST
  - Incorportate stock trend