

H.1: Pacific Sardine Distribution

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November 15, 2015

Presentation to the Pacific Fishery Management Council

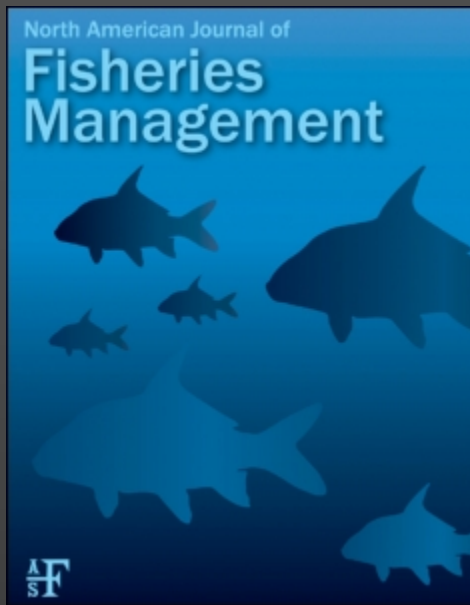


CPS FMP Objectives Include:

- Prevent overfishing
- Achieve Optimum Yield
- Provide adequate forage for predators
- Encourage cooperative international management

Problems with Current Formulation of Distribution

- Unilateral biomass-based definition inherently fails to prevent overfishing and achieve OY when a large proportion of the population is present and fished in the Mexican and/or Canadian EEZ.
- No assurance that Canada and Mexico will determine catch levels according to the U.S. estimation of the portion of the stock in respective waters
- Baumgartner et al 2015: “87% policy” antagonizes Mexican scientists, impeding collaboration
- Data issues:
 - Out of date (1965-1992)
 - Limited geographic range - Pacific NW or Canada omitted
 - Did not distinguish Northern and Southern Subpopulation fish



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

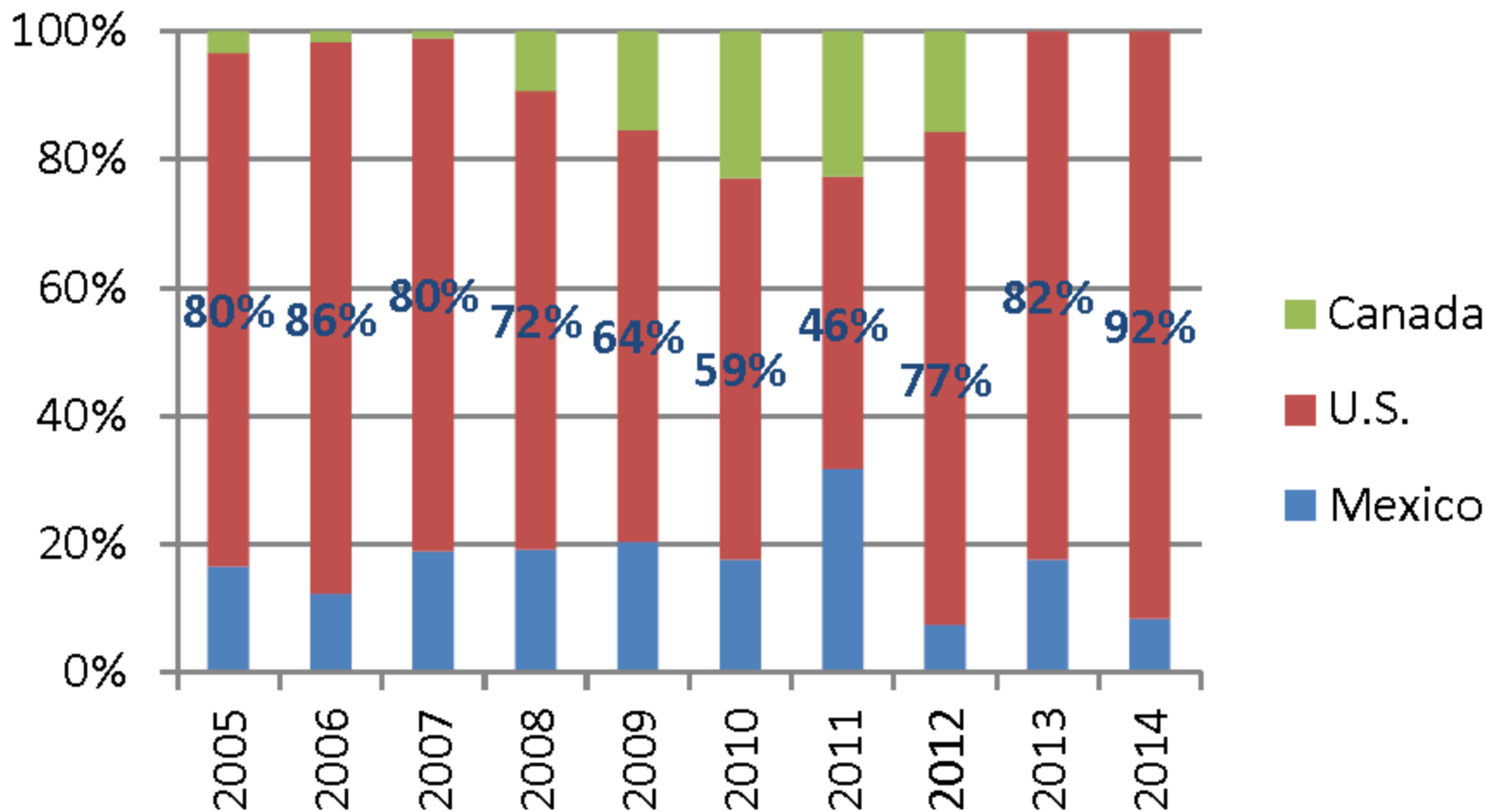
North American Journal of Fisheries Management, 2014

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.**”

Landings of NSP Sardines

Data From Hill et al. 2015 Assessment



Hurtado & Punt (2014) Harvest Parameters

Sensitivity Analysis:

“...the results are sensitive to Mexico and Canada not following the US control rule. This is the only case in which the resource is rendered extinct.”

	Mex/Can follow US rule	Mex/Can don't follow US rule
Mean B1+ (tmt)	1220	716
Mean Stock size (mean % of B0)	78%	46%
Mean catch (tmt)	106	57

*Sensitivity Run (Sardine Fraction EA 2014) when Mexico and Canada do not follow US Harvest Control Rule, Table 6, S14, Hurtado-Ferro & Punt 2014

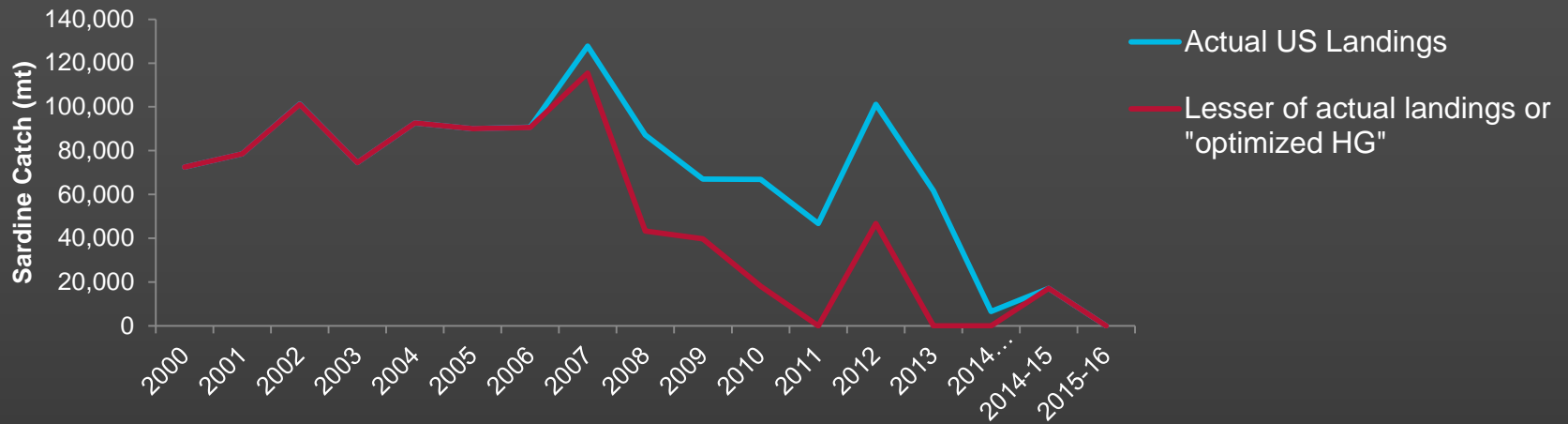
Workshop recommendation: “The MSE analyses should be repeated using realistic models for the catches off Canada and Mexico to better understand the consequences of the fisheries in these countries not being based on the HCRs used in the U.S.

Preventing Coastwide Overfishing and Achieving Optimum Yield

Workshop Recommendation:

- “The approach for accounting for the transboundary nature of the stock by subtracting foreign landings from U.S. OFLs, U.S. ABCs., and U.S. HGs aims to achieve different objectives (to prevent coastwide overfishing and achieve a target coastwide fishing rate) than the current Distribution term. This approach appears to better meet these objectives than the current approach.”

"Optimized HG" (Alt 2) Would Have Kept Coastwide Catch Below MSY



Toward Tri-National Cooperation: Consensus Workshop Recommendation

- “...there would be benefit in initiating discussions with Mexico and Canada toward more coordinated management to address the transboundary nature of the stock, which would be preferable to the status quo. The workshop participants encourage the National Marine Fisheries Service and the PFMC to work with the State Department to initiate such discussions of potential tri-national management.”

Annual Estimation of CPS Biomass and Distribution

- Acoustic trawl surveys (supplemented w/ nearshore data) conducted on entire coastwide range, including U.S., Mexico and Canada
- Will also improve assessment accuracy
- This should be top scientific priority for CPS management
- California Current as the model



Summary of Requests

- Establish goal: “move toward tri-national scientific cooperative and coordinated management of Pacific sardine”
- Send a letter to US State Dept and NOAA International to re-initiate tri-national discussions
- Establish plan to move toward coastwide, rangewide CPS surveys to get accurate, annual estimates of Biomass and Distribution
- Conduct MSE analyses recommended by workshop:
 - Current 87% parameter under realistic Mexico and Canada rules
 - Compare status quo to select alternatives

Thank You

