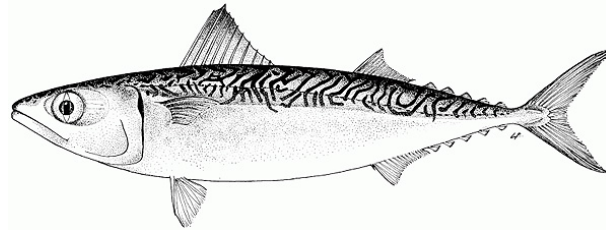




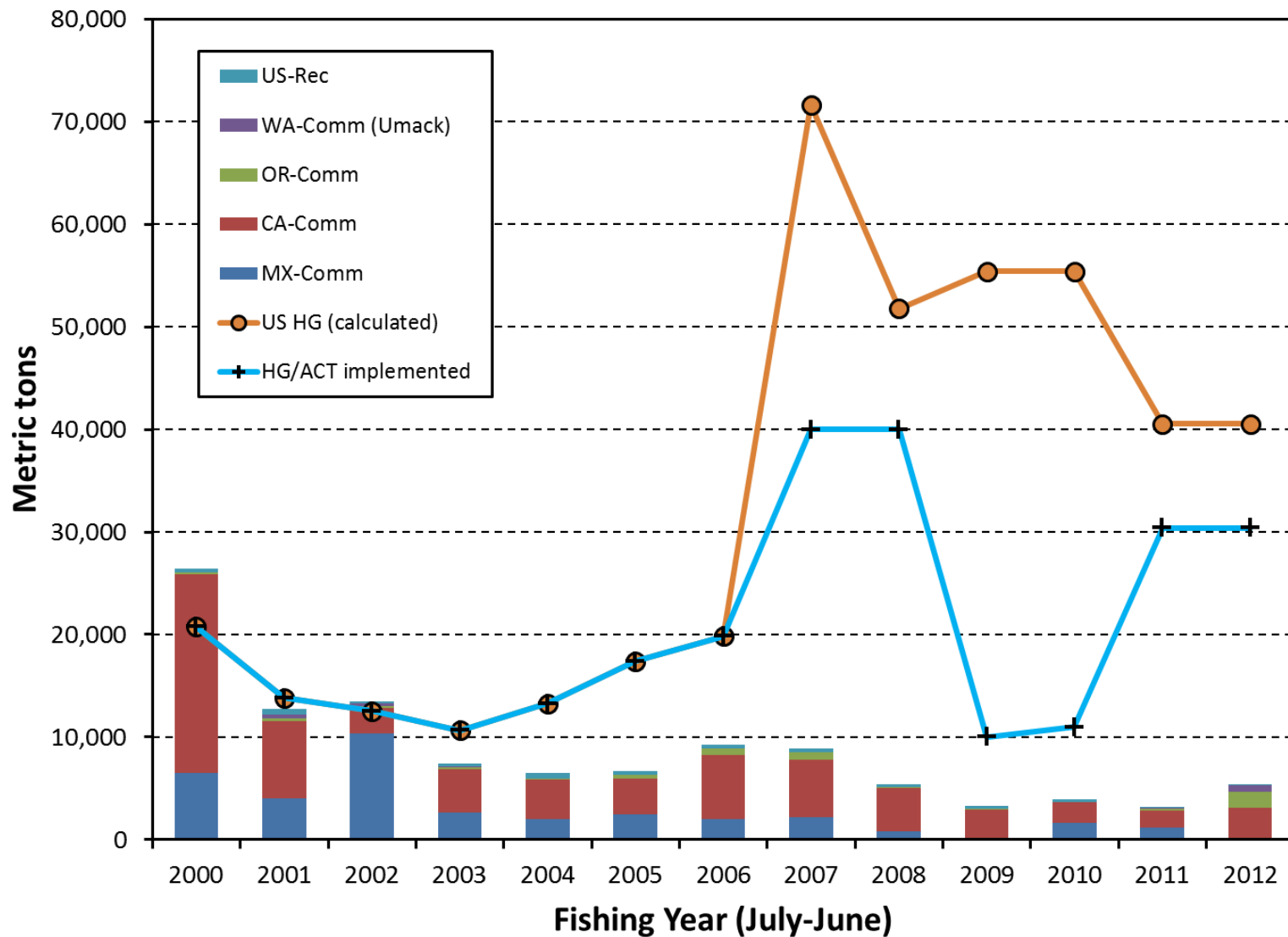
# **Pacific Mackerel Biomass Projection Estimate for the 2013-14 Fishing Year**



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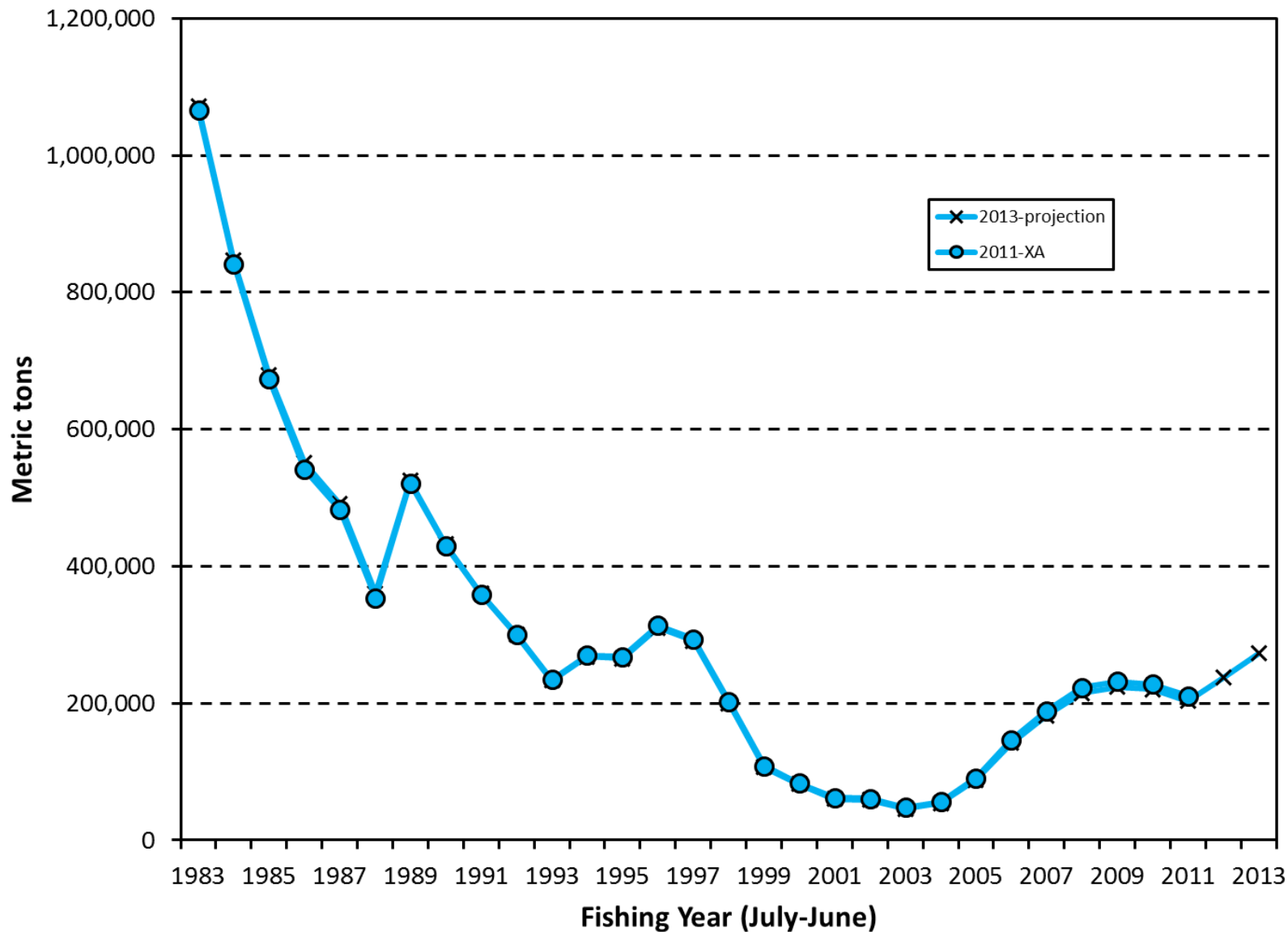


# Pacific Mackerel Management & Landings



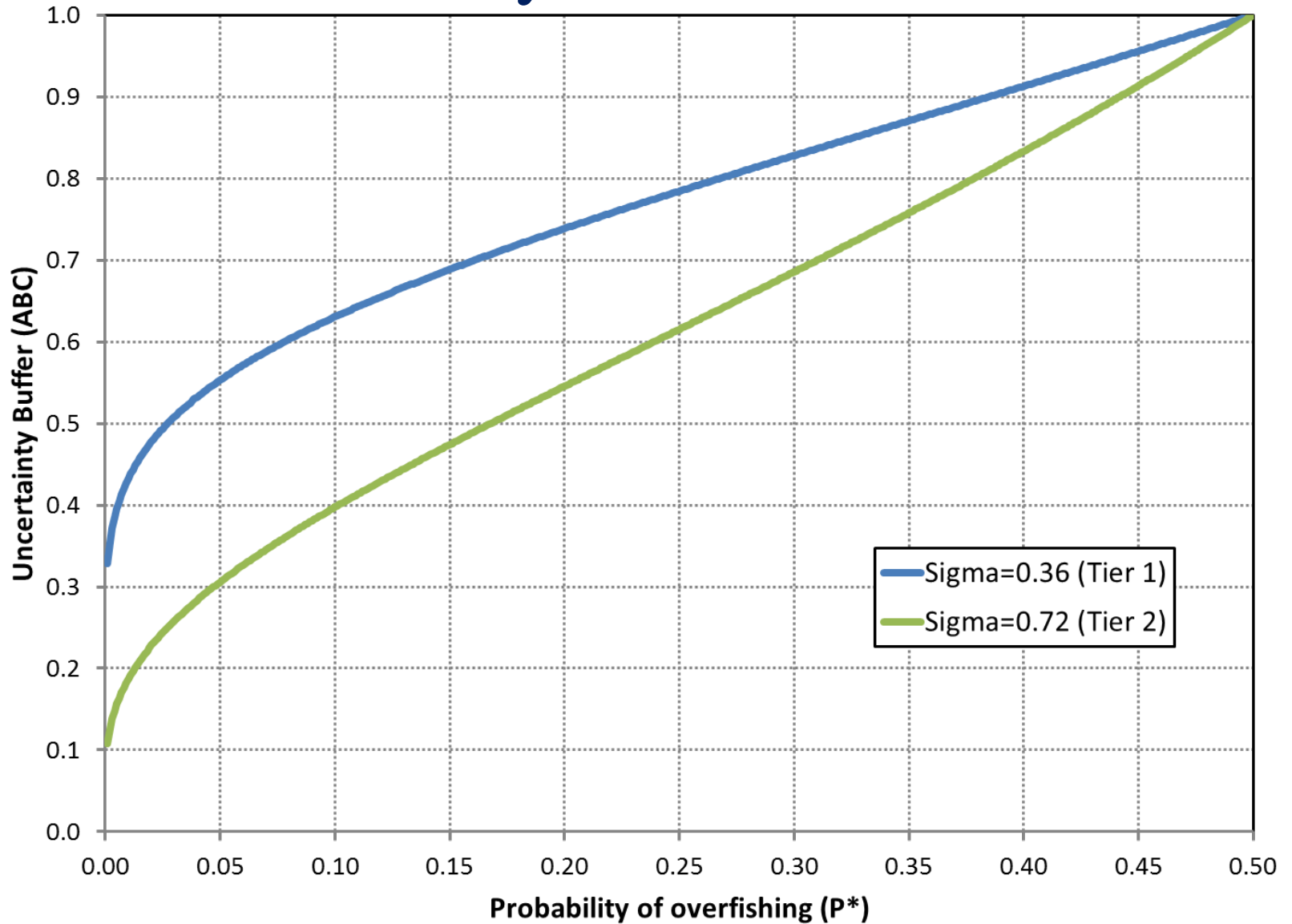


# Estimated Biomass Time Series – 2011 & 2013





# Uncertainty Buffers for ABC





# Harvest Control Rules

## 2011 Assessment Model

## 2013 Projection Model

Harvest Formula Parameters	Value			
BIOMASS (ages 1+, mt)	211,126			
Pstar (probability of overfishing)	0.45	0.4	0.3	0.2
BUFFER <sub>Pstar</sub> for Sigma=0.36	0.95577	0.91283	0.82797	0.73861
$F_{MSY}$	0.3			
FRACTION	0.3			
CUTOFF (mt)	18,200			
DISTRIBUTION (U.S.)	0.7			

Harvest Formula Parameters	Value			
BIOMASS (ages 1+, mt)	272,932			
Pstar (probability of overfishing)	0.45	0.4	0.3	0.2
BUFFER <sub>Pstar</sub> for Sigma=0.72	0.9135	0.83326	0.68553	0.54555
$F_{MSY}$	0.3			
FRACTION	0.3			
CUTOFF (mt)	18,200			
DISTRIBUTION (U.S.)	0.7			

### Amendment 13 Harvest Formulas MT

OFL = BIOMASS * $F_{MSY}$ * DISTRIBUTION	<b>44,336</b>
ABC <sub>0.45</sub> = BIOMASS * BUFFER0.45 * $F_{MSY}$ * DISTRIBUTION	<b>42,375</b>
ABC <sub>0.40</sub> = BIOMASS * BUFFER0.40 * $F_{MSY}$ * DISTRIBUTION	40,472
ABC <sub>0.30</sub> = BIOMASS * BUFFER0.30 * $F_{MSY}$ * DISTRIBUTION	36,709
ABC <sub>0.20</sub> = BIOMASS * BUFFER0.20 * $F_{MSY}$ * DISTRIBUTION	32,747
ACL/HG = (BIOMASS - CUTOFF) * FRACTION * DISTRIBUTION	<b>40,514</b>
ACT=EQUAL TO HG OR ACL, WHICHEVER VALUE IS LESS	<b>30,386</b>

### Amendment 13 Harvest Formulas MT

OFL = BIOMASS * $F_{MSY}$ * DISTRIBUTION	<b>57,316</b>
ABC <sub>0.45</sub> = BIOMASS * BUFFER0.45 * $F_{MSY}$ * DISTRIBUTION	<b>52,358</b>
ABC <sub>0.40</sub> = BIOMASS * BUFFER0.40 * $F_{MSY}$ * DISTRIBUTION	47,759
ABC <sub>0.30</sub> = BIOMASS * BUFFER0.30 * $F_{MSY}$ * DISTRIBUTION	39,292
ABC <sub>0.20</sub> = BIOMASS * BUFFER0.20 * $F_{MSY}$ * DISTRIBUTION	31,269
ACL=LESS THAN OR EQUAL TO ABC	<b>TBD</b>
HG = (BIOMASS - CUTOFF) * FRACTION * DISTRIBUTION	53,494
ACT=EQUAL TO HG OR ACL, WHICHEVER VALUE IS LESS	<b>TBD</b>