

Pacific Sardine Rebuilding Plan Final Action

Public Comment to PFMC on Agenda Item G.1. September 2020

Sept 16, 2020

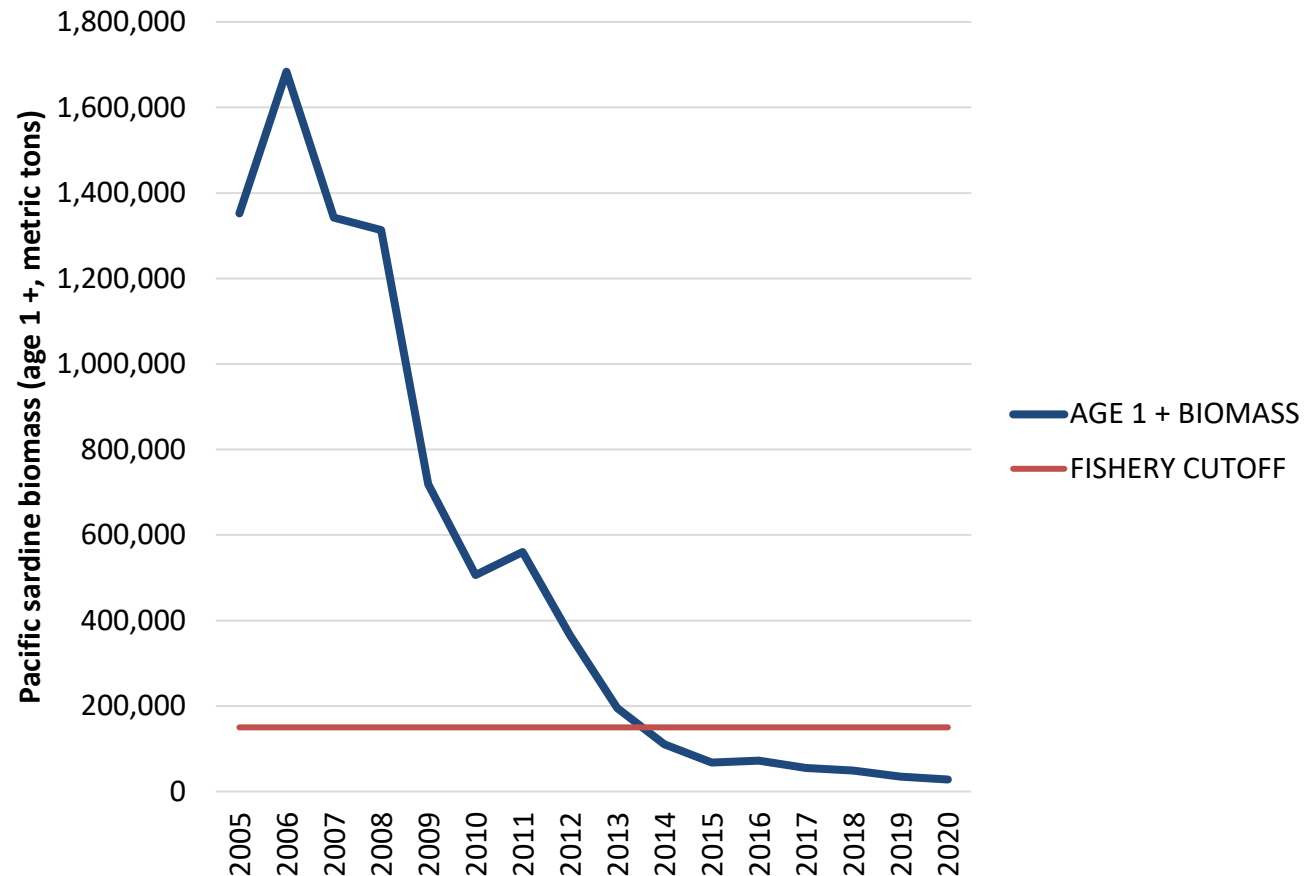
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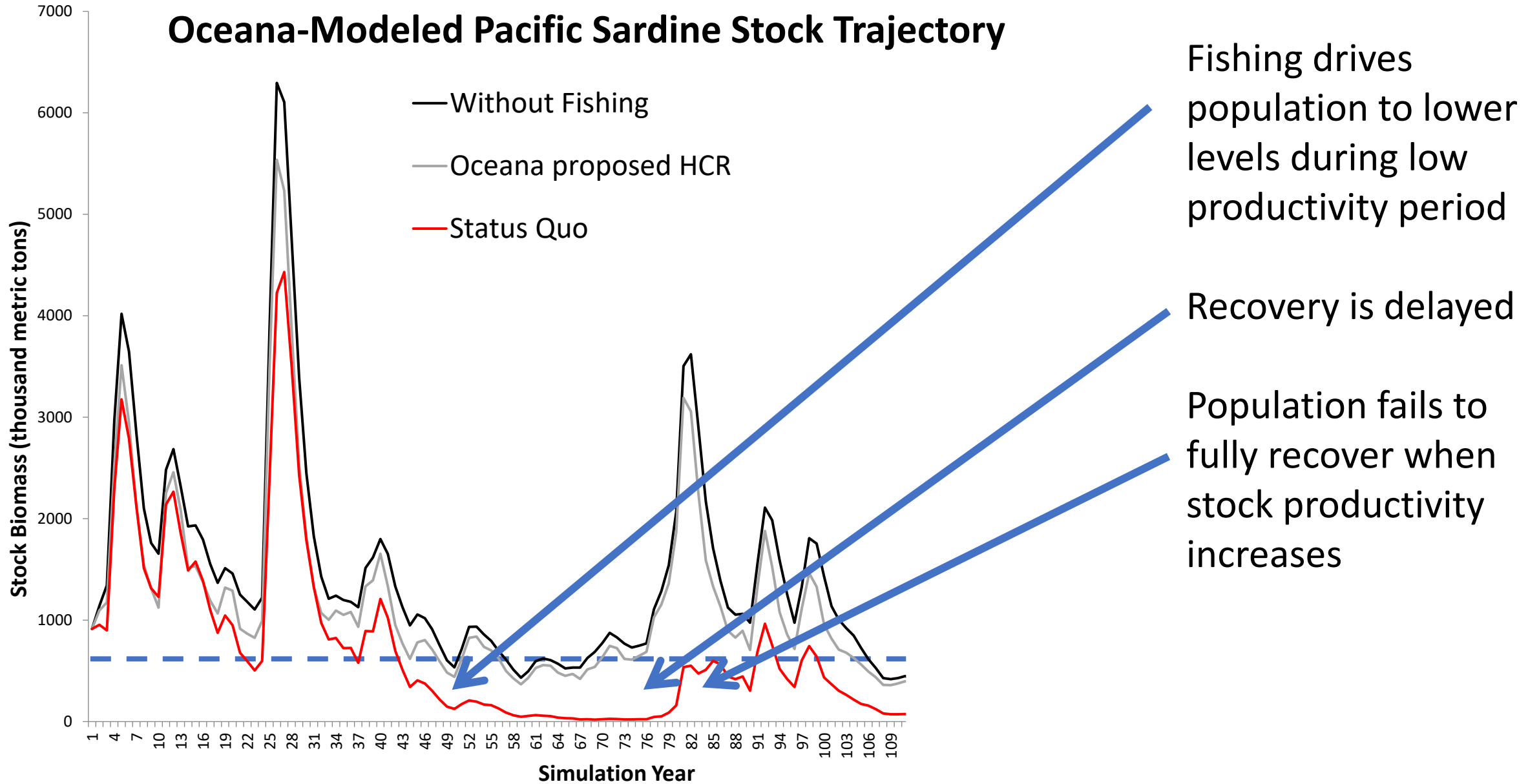


Pacific Sardine Have Collapsed



Data from: Kuriyama et al. 2020. Assessment of the Pacific sardine resource in 2020 for U.S. management in 2020-2021. Pacific Fishery Management Council, Portland, OR.

Oceana-Modeled Pacific Sardine Stock Trajectory



Trajectories analyzed using 2013 Hurtado & Punt MSE model

Analysis fails to consider boom and bust cycles of sardine recruitment – Not “realistic”

- NS1 guidelines: rebuilding must occur to MSY stock size (B_{msy}) defined as: “...*the long-term average size of the stock...* that would be achieved by fishing at F_{msy} .” **50 CFR §600.310 (e)(1)(i)(C)**
- Analysis uses 2005-2018 time series (only declining phase)
- No analysis of rebuilding times under high productivity
- Alternative models exist that reflect long-term dynamics (e.g., Hurtado & Punt 2014 MSE)

Proposed rebuilding target are set too low, does not reflect long-term Bmsy

- NMFS proposed rebuilding target: 137,700 mt (SSB)
- CPSMT proposed rebuilding target: 150,000 mt (B1+)
- CUTOFF is not where long-term MSY is achieved: Directed fishery is closed
- Inconsistent with Best Available Science on long-term Bmsy:
 - CPS FMP Amendment 8 rebuilding target (1.5 million mt B1+)
 - Hurtado & Punt MSE (Bmsy = 571,000 mt B1+)
 - Zwolinski & Demer 2012: (critical biomass threshold: 740,000 mt SSB)

Status quo is modeled incorrectly, underestimates fishing impact of currently allowable sardine catch

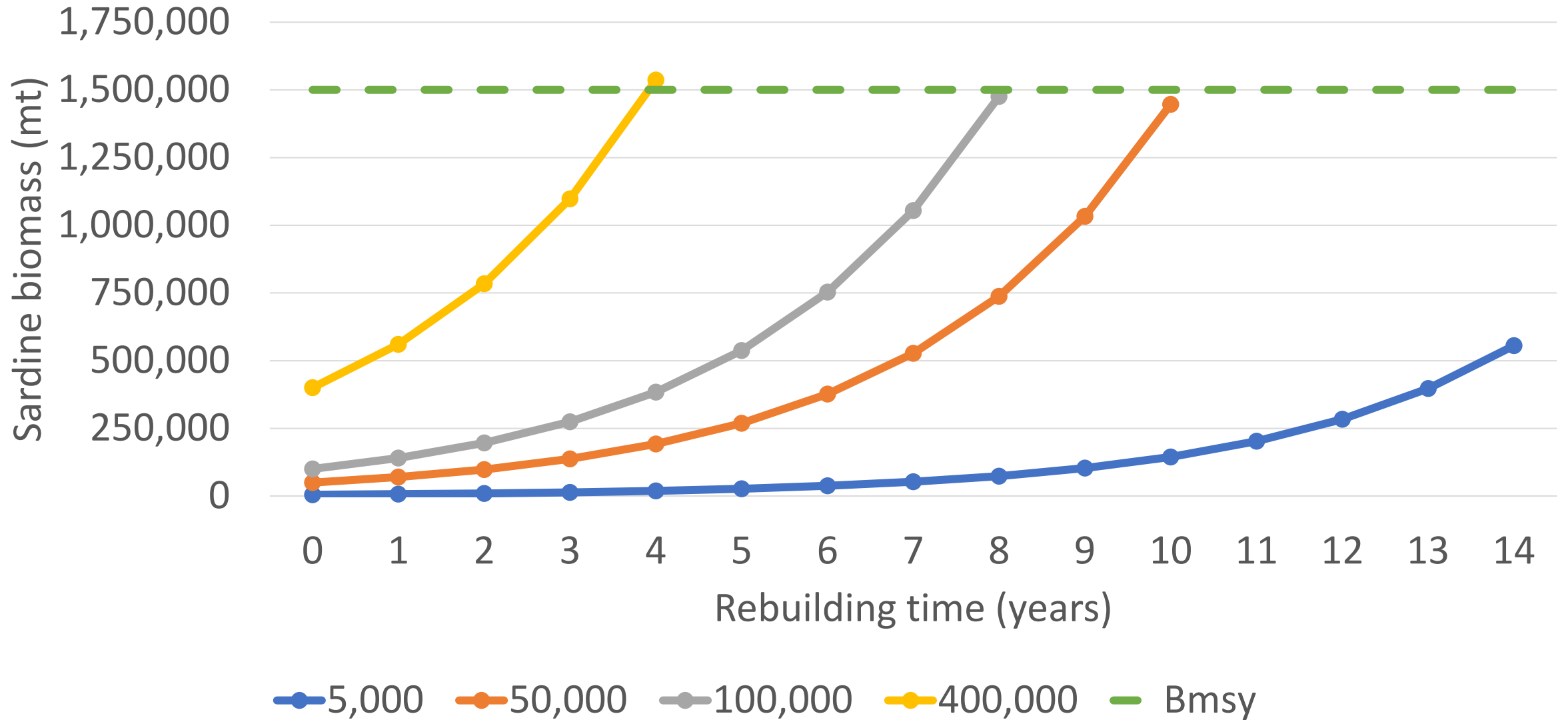
Status quo Emsy modeled as **18%**.

Actual Emsy set by PFMC/NMFS:

Season	E_{MSY}
2020-21	0.224584
2019-20	0.242675
2018-19	0.25
2017-18	0.225104
2016-17	0.25
mean	0.238473

Table 1. CalCOFI-based E_{MSY} values used in U.S. Pacific sardine management from the last five approved final NMFS stock assessments to set OFLs and ABCs.³

Sardine Rebuilding under High Productivity (40% surplus per year)



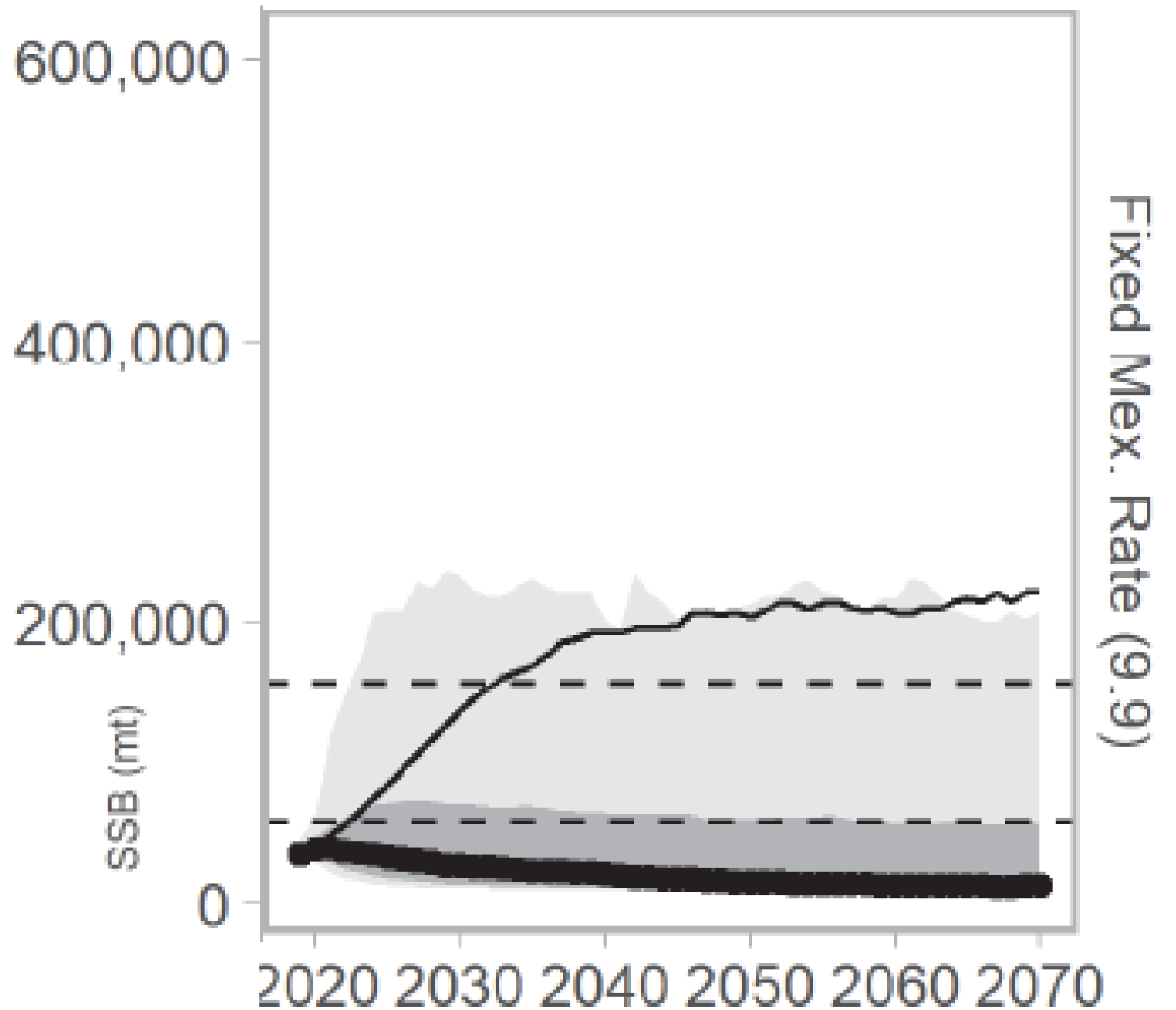
Data from CPS FMP Appendix B: Table 4.2.5.1-1. Simple compound interest model for sardine assuming 40% increase per year.

Alternative 3 (5% US catch rate) outperforms other alternatives

- Allows continued live bait and incidental sardine catch in other fisheries
- Faster rebuilding than Alternative 1 under all productivity scenarios
- Performs better than status quo in economic analysis (CPS MT Report 3):
 - Median projected catch is double Alternative 1
 - Highest present value stream of catch of all alternatives
 - More years of an unconstrained fishery
 - Lower risk to fishing communities, less chance of major cuts in harvest
- CPS FMP Amendment 8:
 - 5% harvest rate when stock is in low productivity state
- Sets reasonable limits now to avoid harsher limits in the future

NMFS Analysis: status quo does not rebuild the stock

- CPSMT Report 3: “Under Alternative 1 the Pacific sardine is **not projected to rebuild** at a 50 percent probability by the end of the reporting period in 2050.”

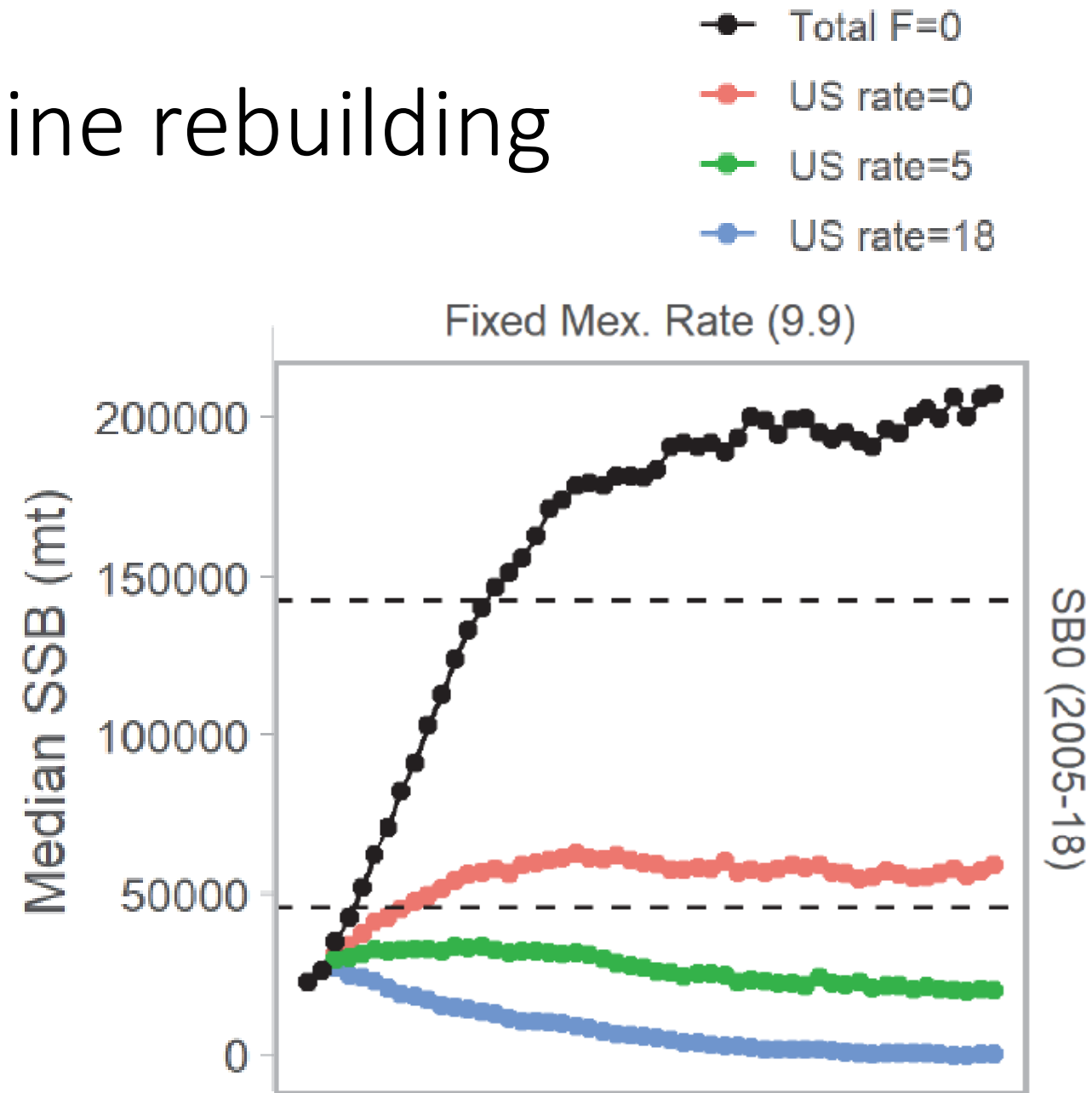


Rationale for Status Quo Not Justified

- *Rationale 1: Actual catch is likely to be below catch limits*
 - Rebuilding plan must ensure that the catch levels authorized will rebuild
 - If Council expects actual catch to be less, set catch limits at that level
 - No analysis of incidental catch limits effect on expected catch
 - See recent Oceana v. Ross (Sept 2020) Decision
- *Rationale 2: Much of US catch is of Southern Subpopulation*
 - Current catch limits allow catch of the northern subpopulation
 - Need to establish management, catch limits, and catch differentiation for southern stock
- *Rationale 3: Council has flexibility to set lower catch limits if needed*
 - Rebuilding is not discretionary; plan must rebuild stock even if maximum harvest allowed
- *Rationale 4: The environment, not fishing will dictate rebuilding*
 - Fishing has major effect at current stock levels when stock not productive
 - Rebuilding from lower initial biomass means delayed rebuilding even when environment is productive

Fishing impacts on sardine rebuilding

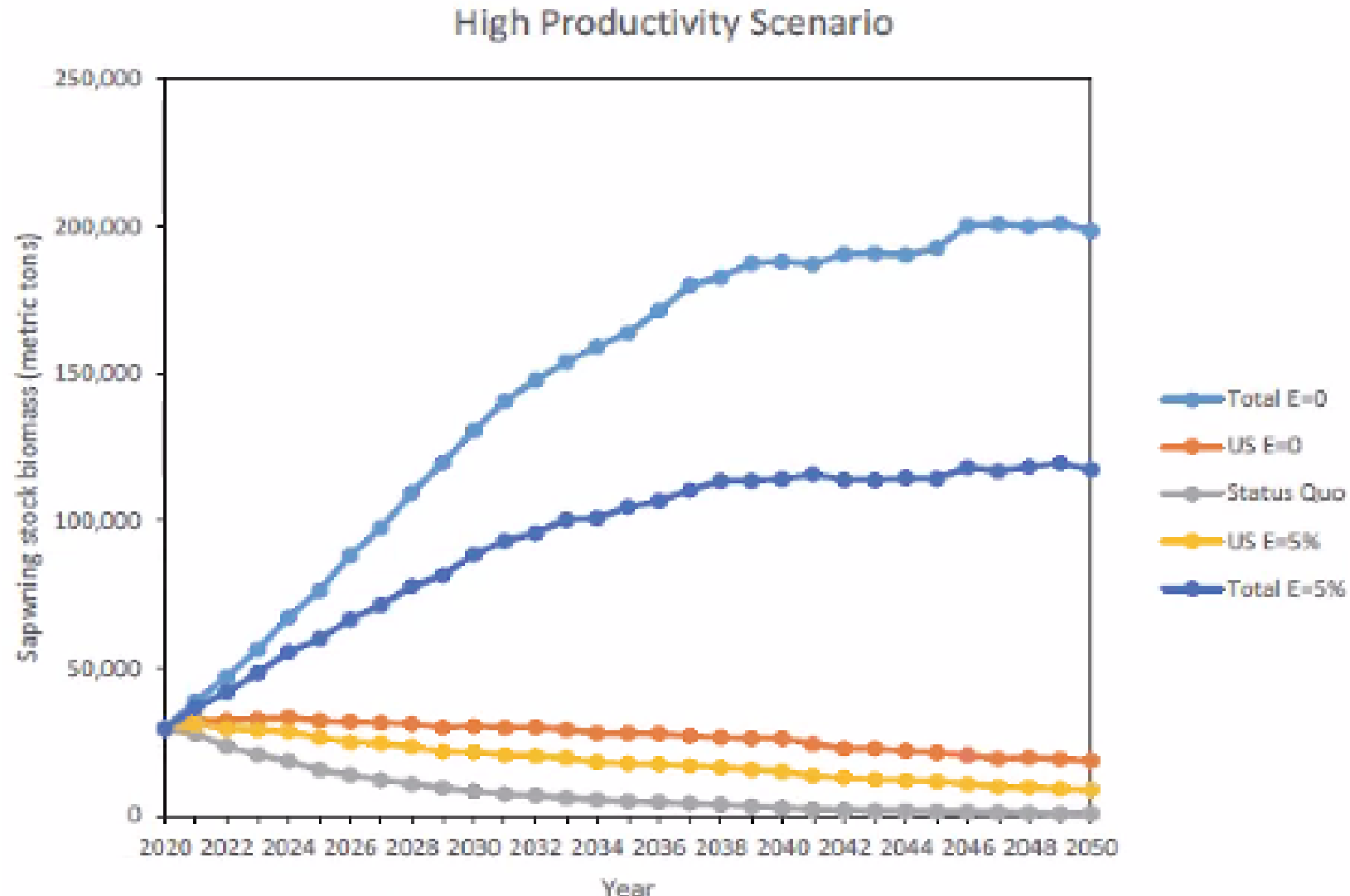
- Consistently demonstrated in sardine MSE analyses
 - CPS FMP Amendment 8 MSE
 - Hurtado & Punt 2013 MSE
 - Essington et al. 2015: Fishing amplifies forage fish collapse
 - NMFS 2020 Rebuilding Analysis



NMFS Report 1 (Sept 2020): Fig 8

Adopt Alternative 3 with commitment to work with Mexico toward coastwide 5% harvest rate

- 5% Coastwide harvest rate already analyzed by NMFS
- Coastwide E = 5%) leads to optimal rebuilding (
- Initiate discussions with Mexico via US State Dept to coordinate rebuilding



From NMFS Prelim Analysis: SSC CPS Subcommittee July 2020