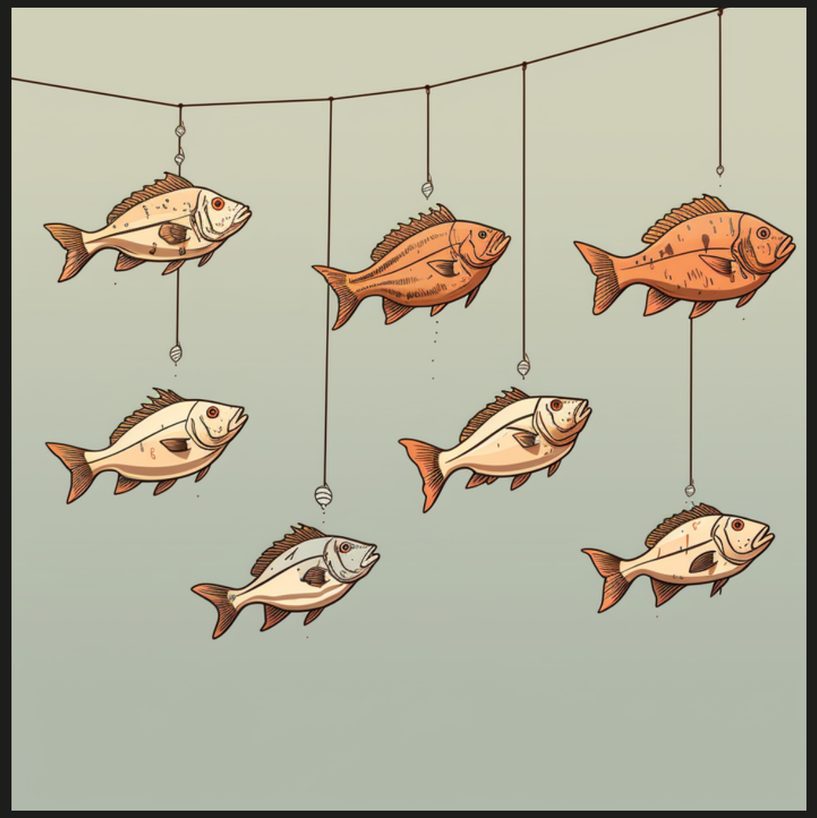
Pacific Ocean Perch (POP) Sept. 2023 GOA Plan Team

M Kapur, PJ Hulson, B Williams



Stock Overview

GOA
Pacific Ocean Perch
(*Sebastes alutus*)

Tier	3a
Area	GOA (mostly Central and Western)
Status	Not overfished/no overfishing

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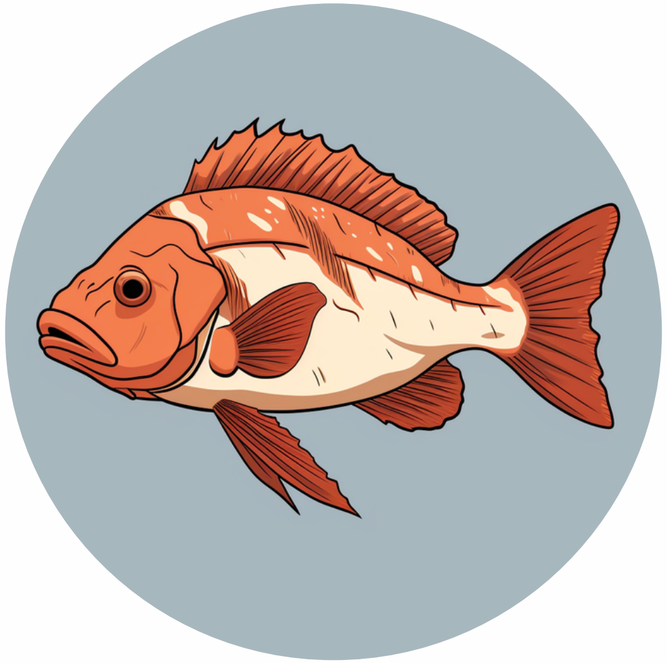
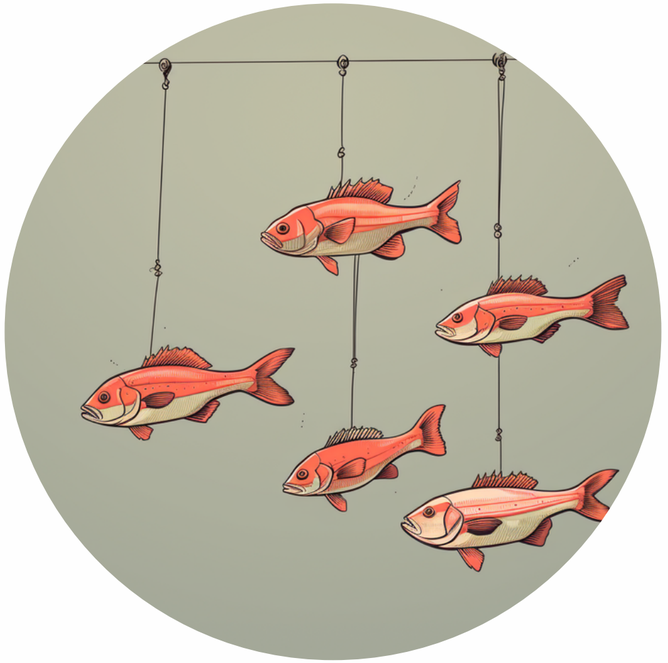
Tier	3a
Area	GOA (mostly Central and Western)
Status	Not overfished/no overfishing
This Cycle	Operational Update No modeling framework changes Update data only
Today's Talk	Response to CIE Reviews Explorations using an SS model

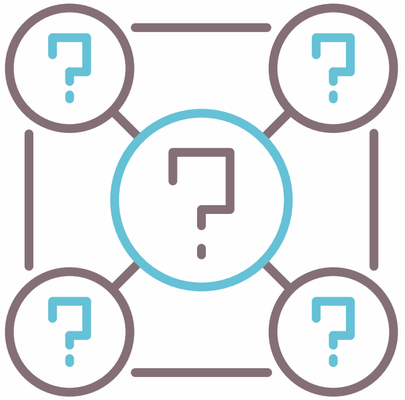
Key SSC/CIE Comments



Explore M



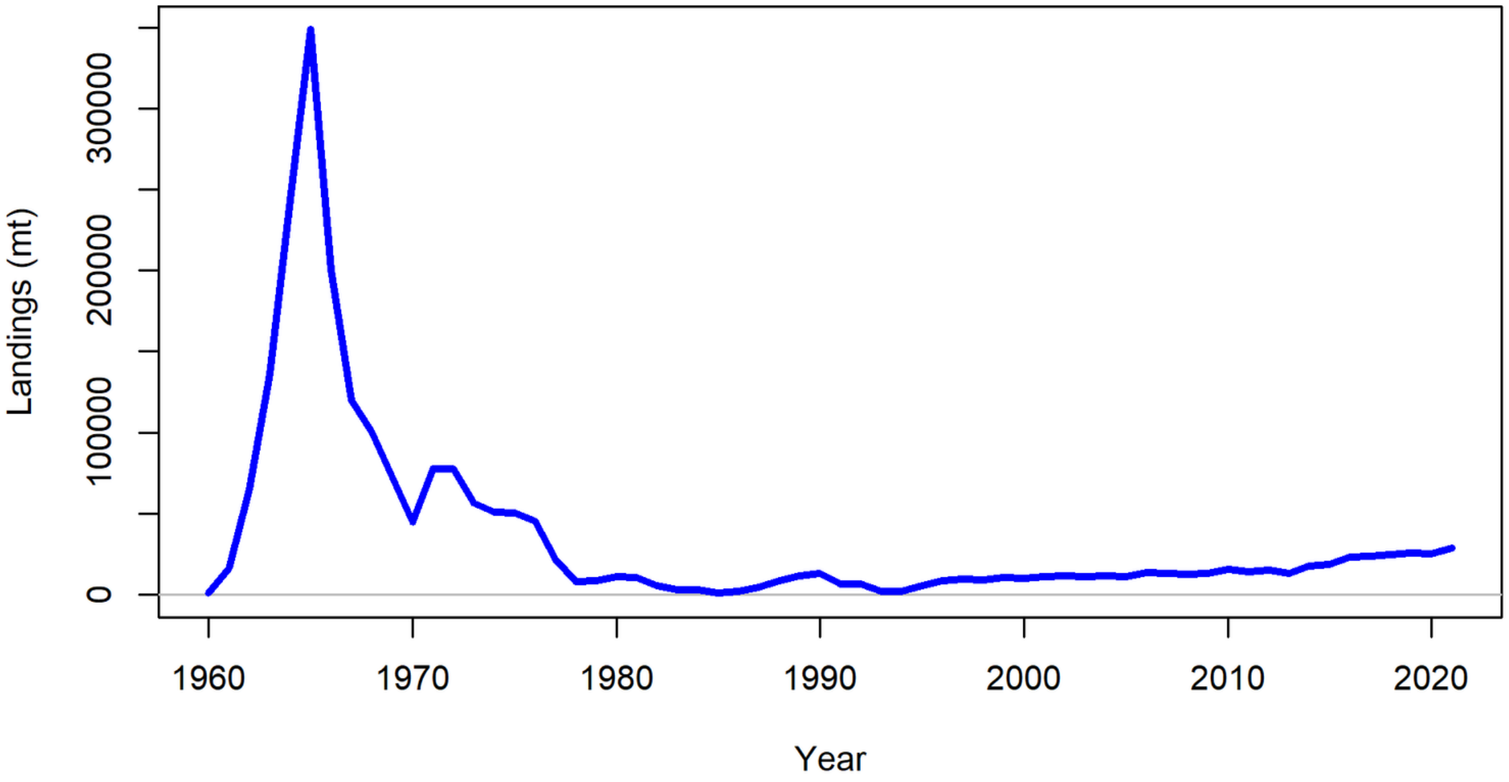
Explore Selectivity



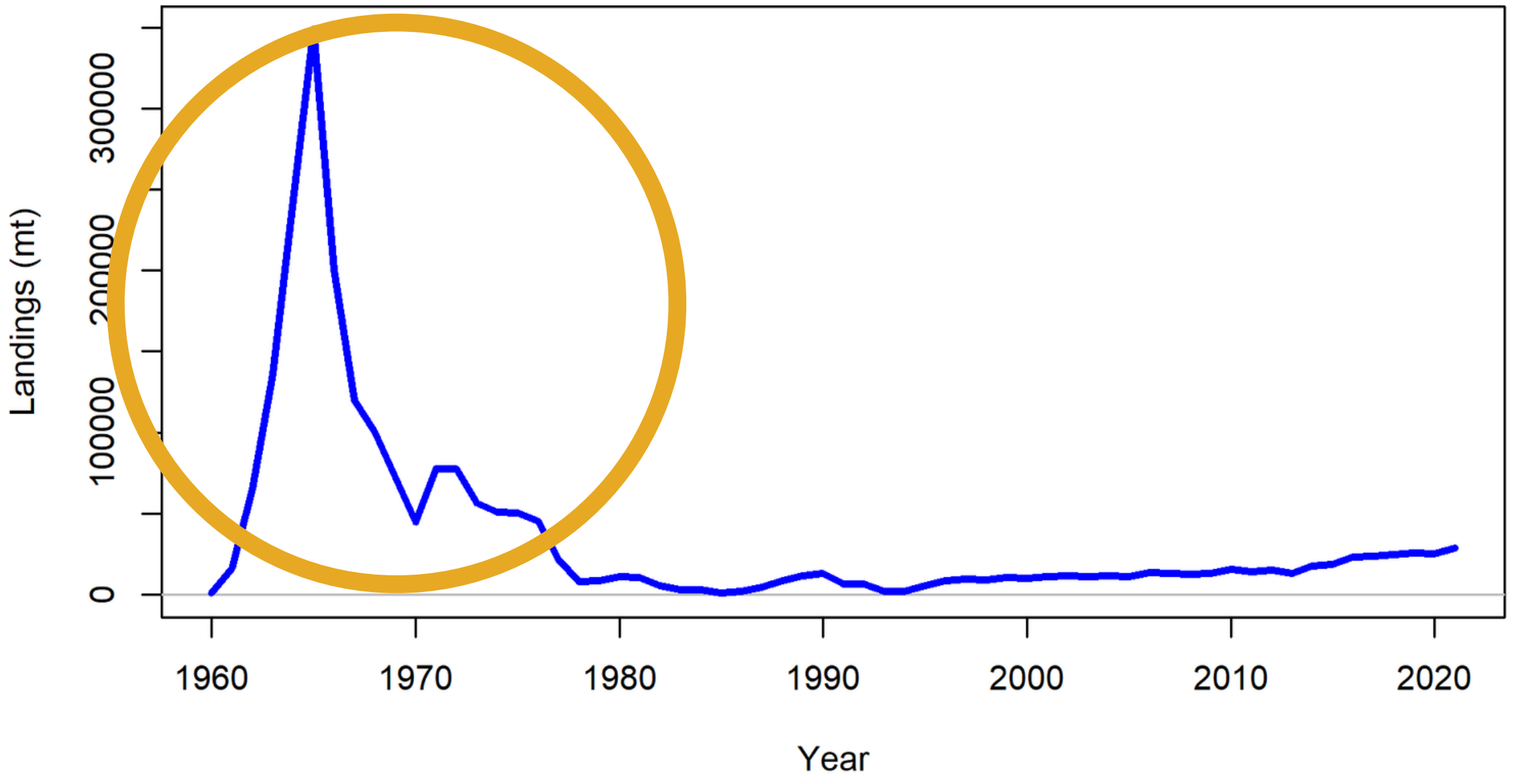
think about...

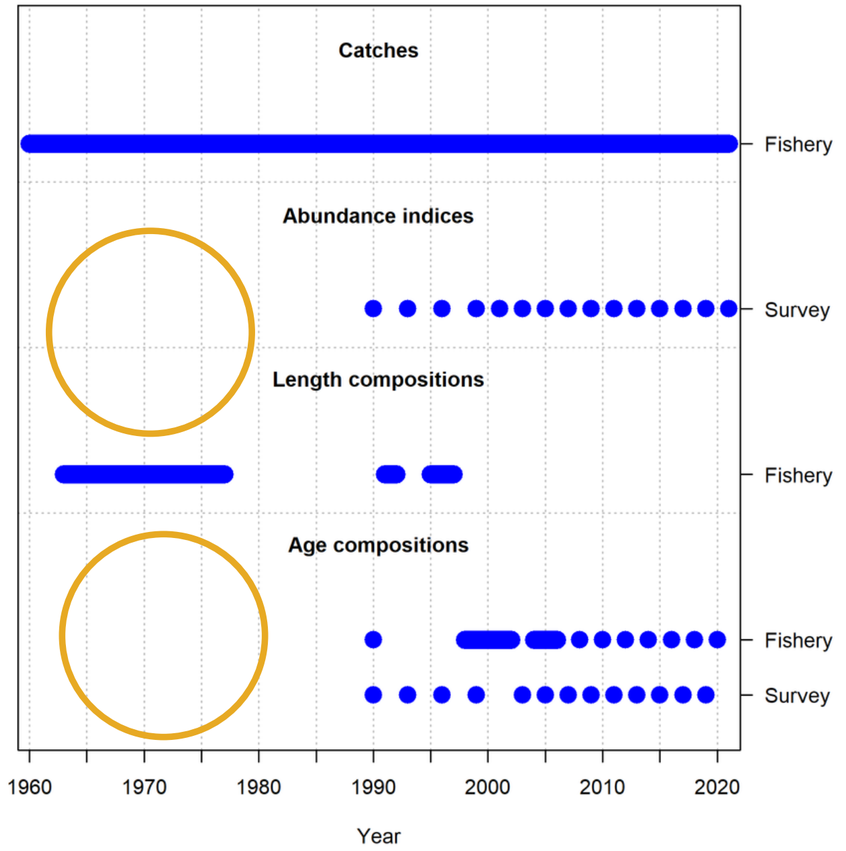
Compositional data weights
Design vs. Model-Based Surveys
Weight-at-age inputs

huge early catches...

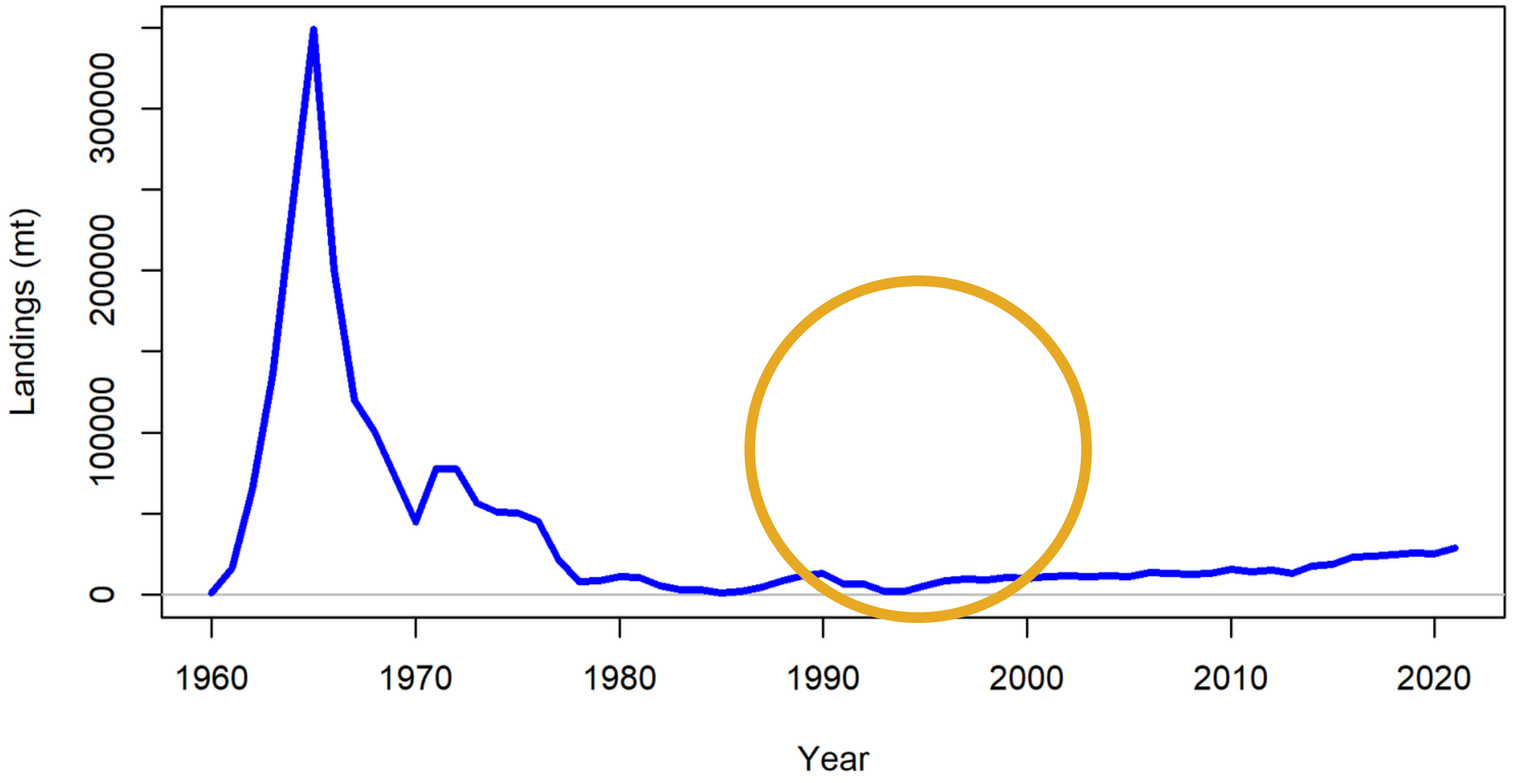


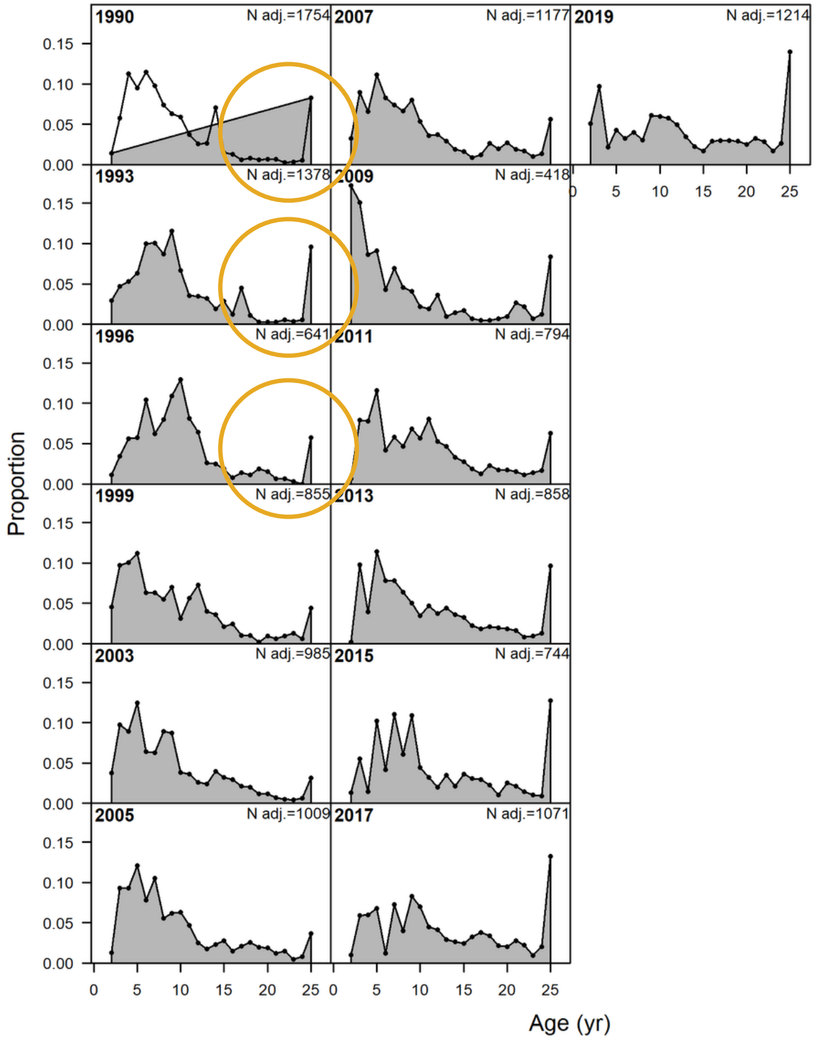
...but no abundances/ages...



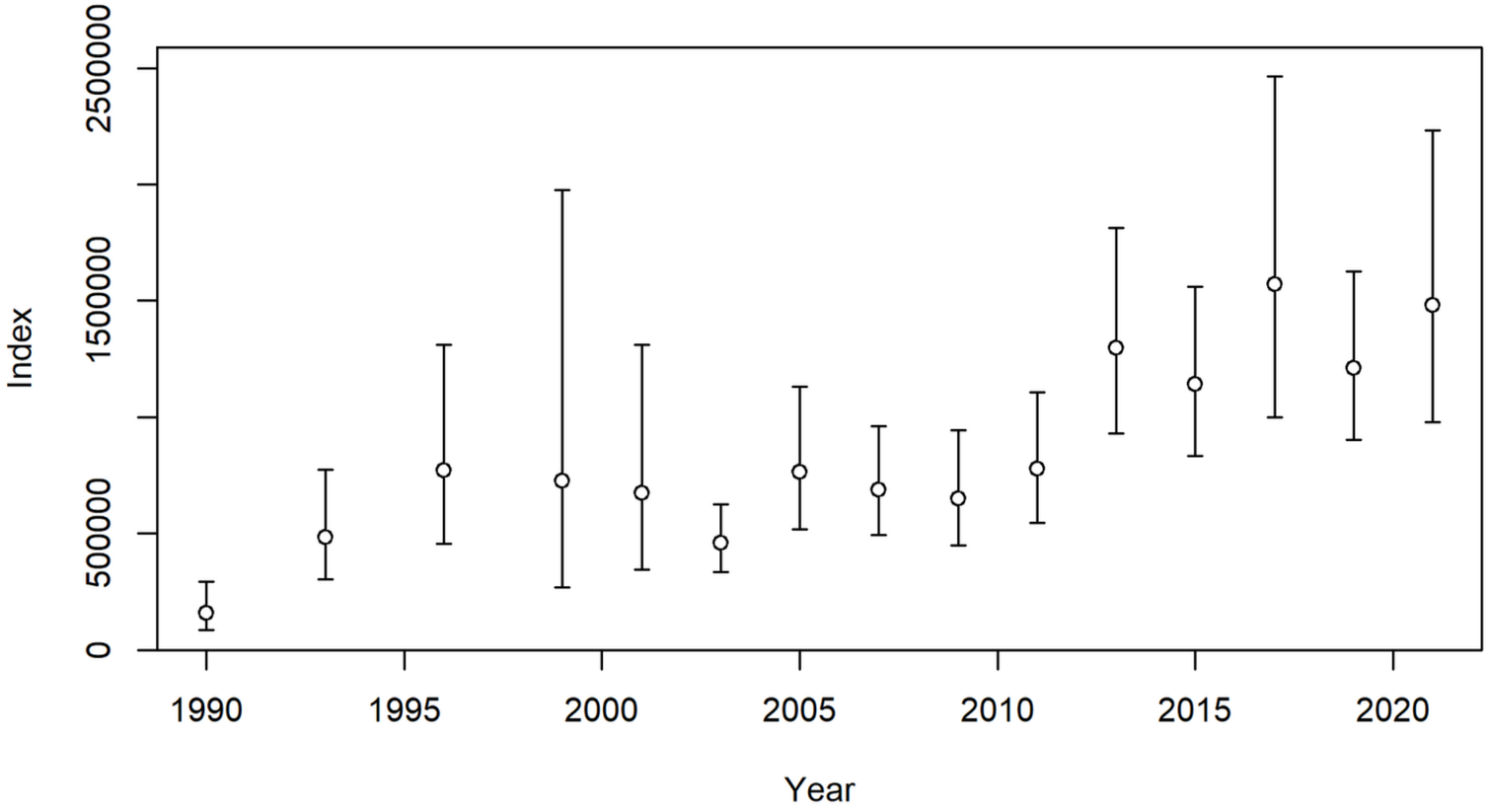


...still lots of old fish!

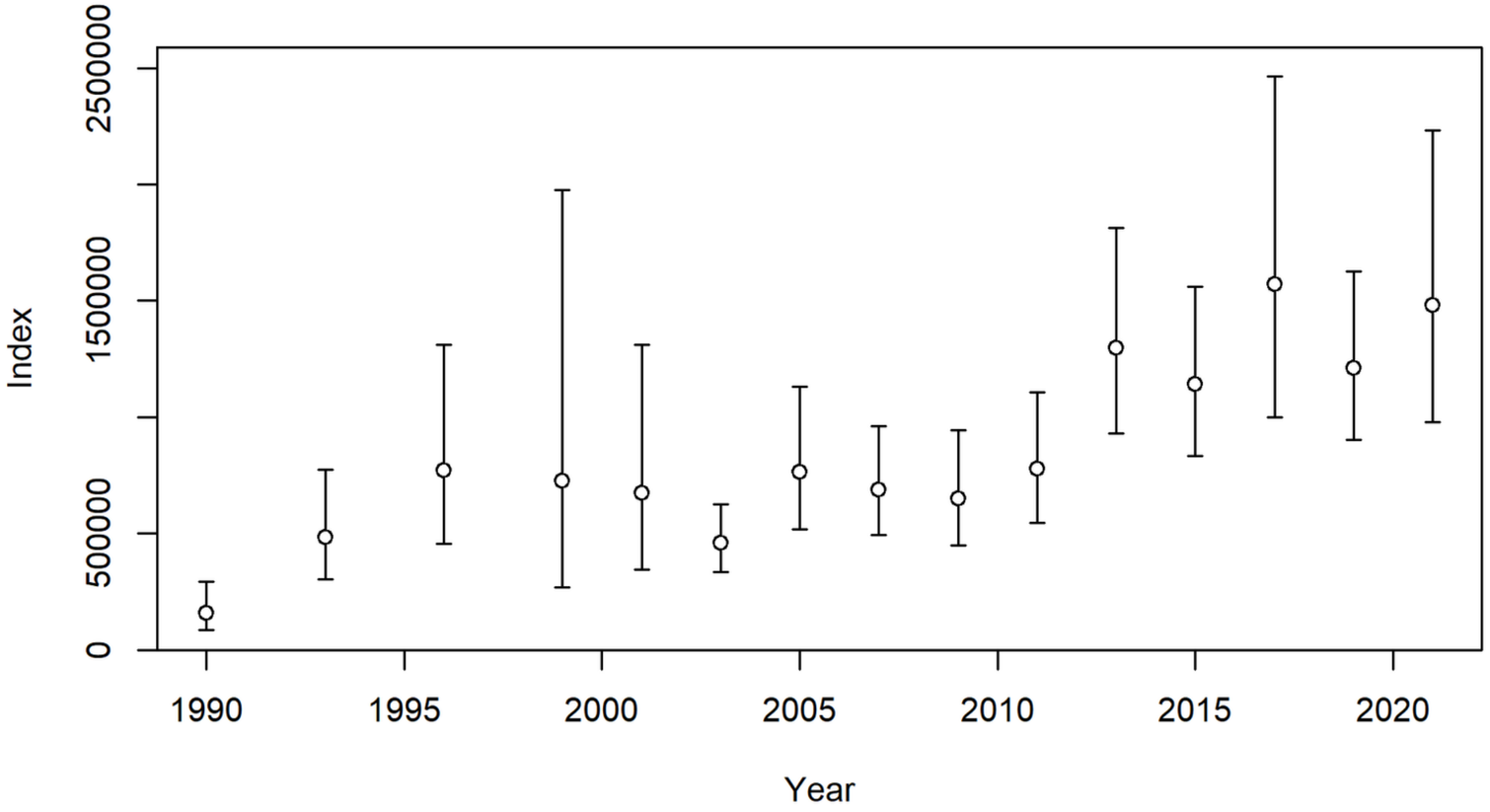




selectivity vs historical q creep



domed, timeblocked selex



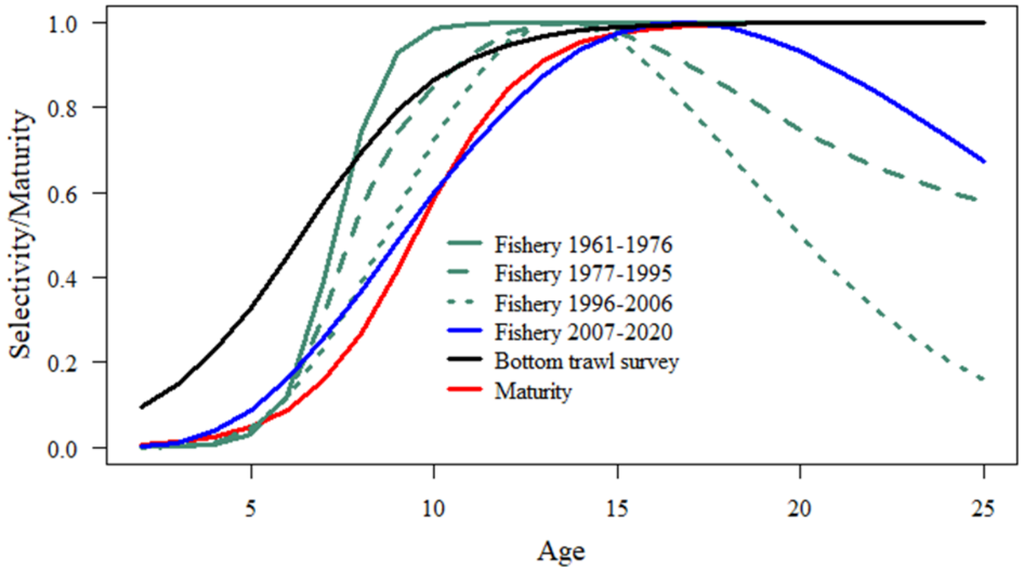
Fishery Selex Time Blocks

1961-76: Overexploitation

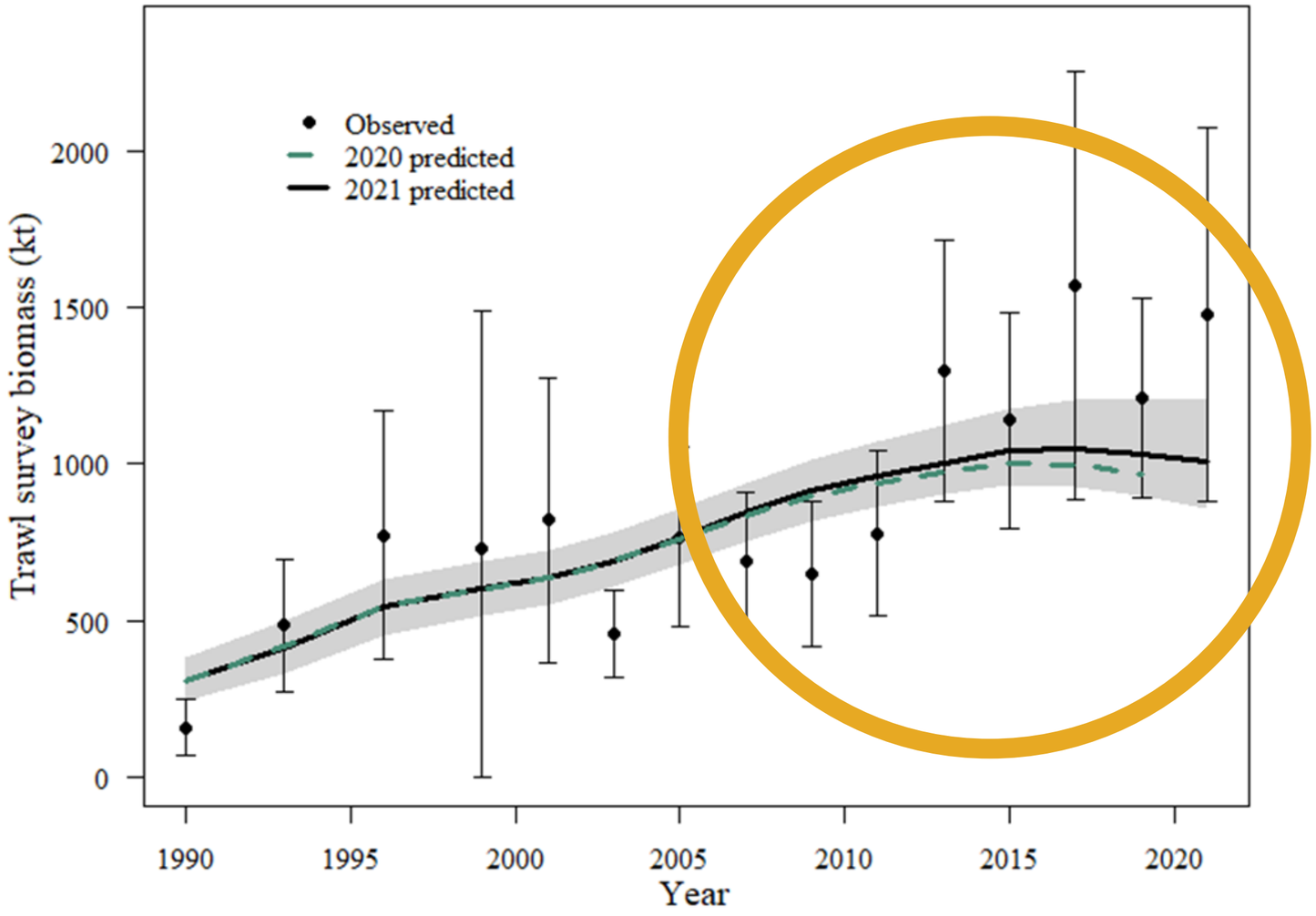
97-95: Foreign to domestic fleet

96-2006: Smaller catchers and coops, longer season

2007+: Rockfish program



still have survey misfit issues



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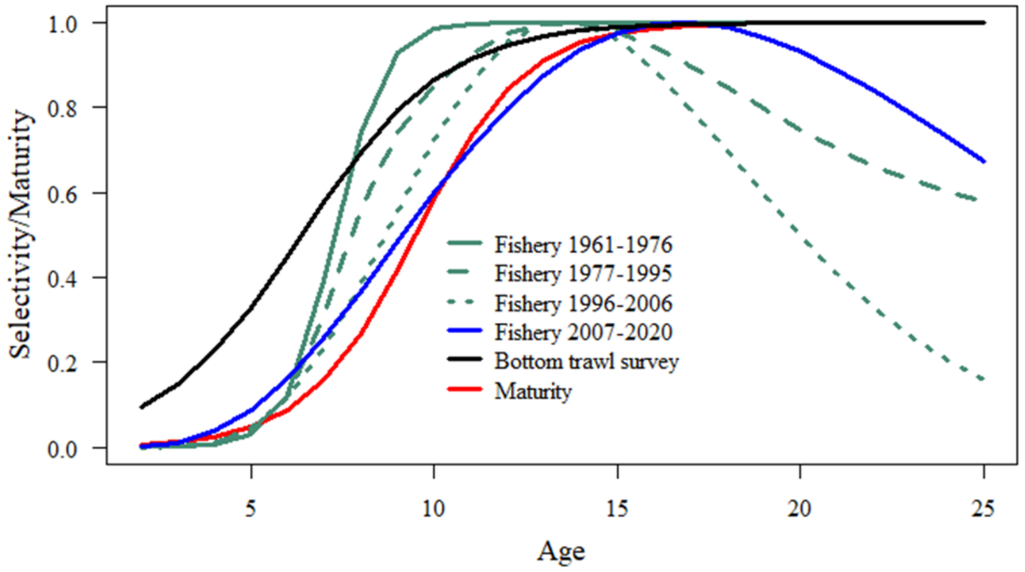
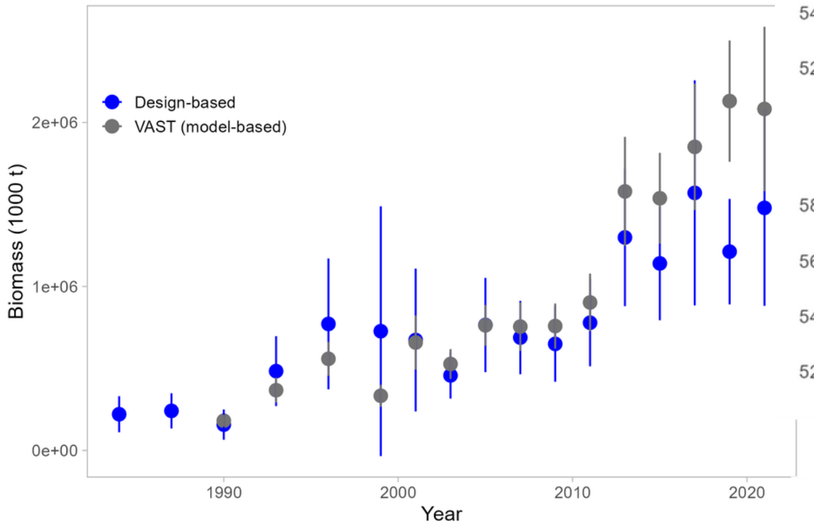
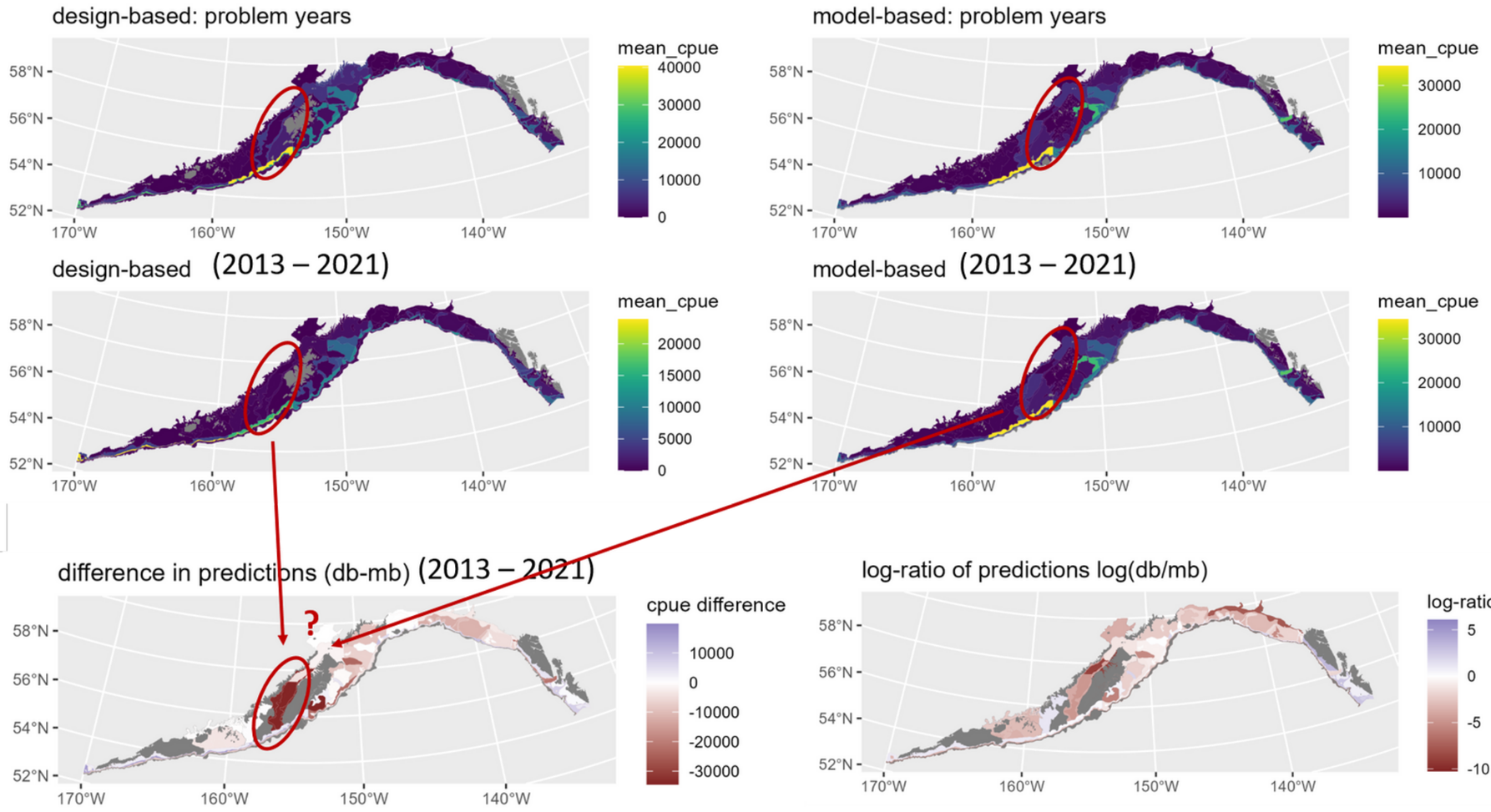
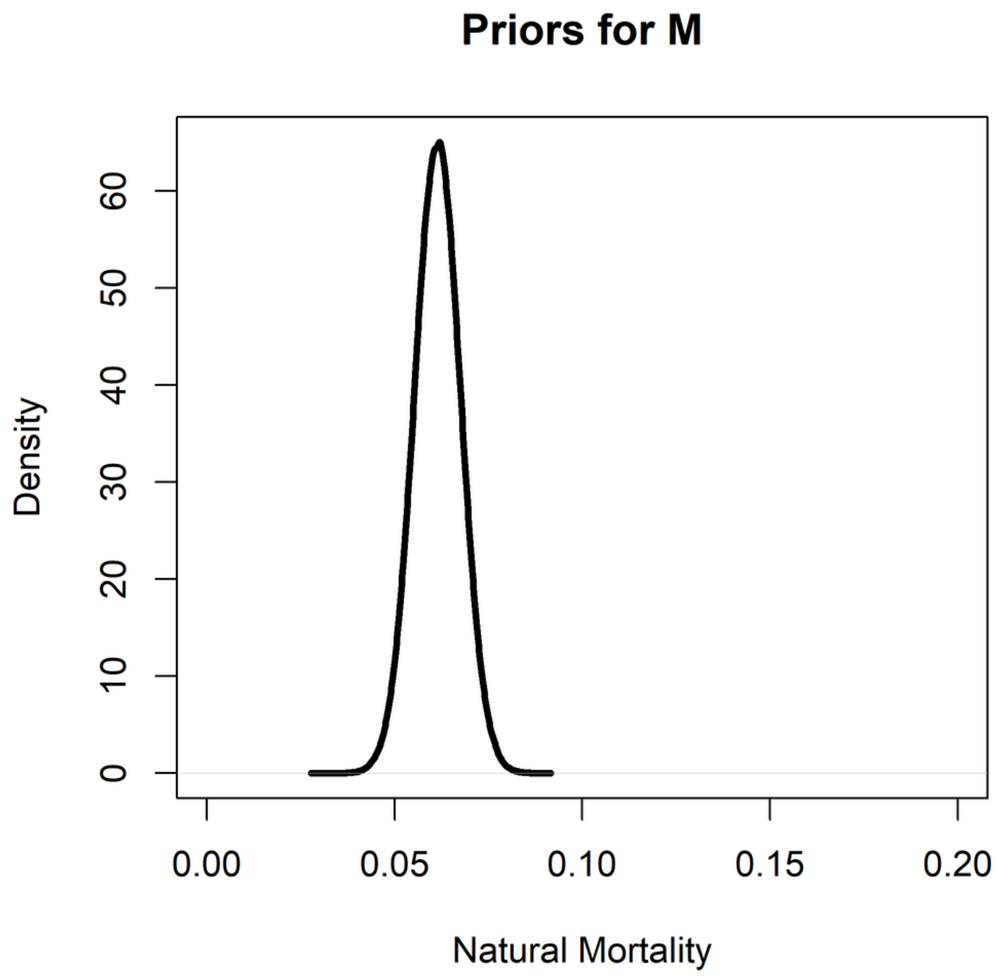


survey inputs (VAST vs design-based)





how does M respond?



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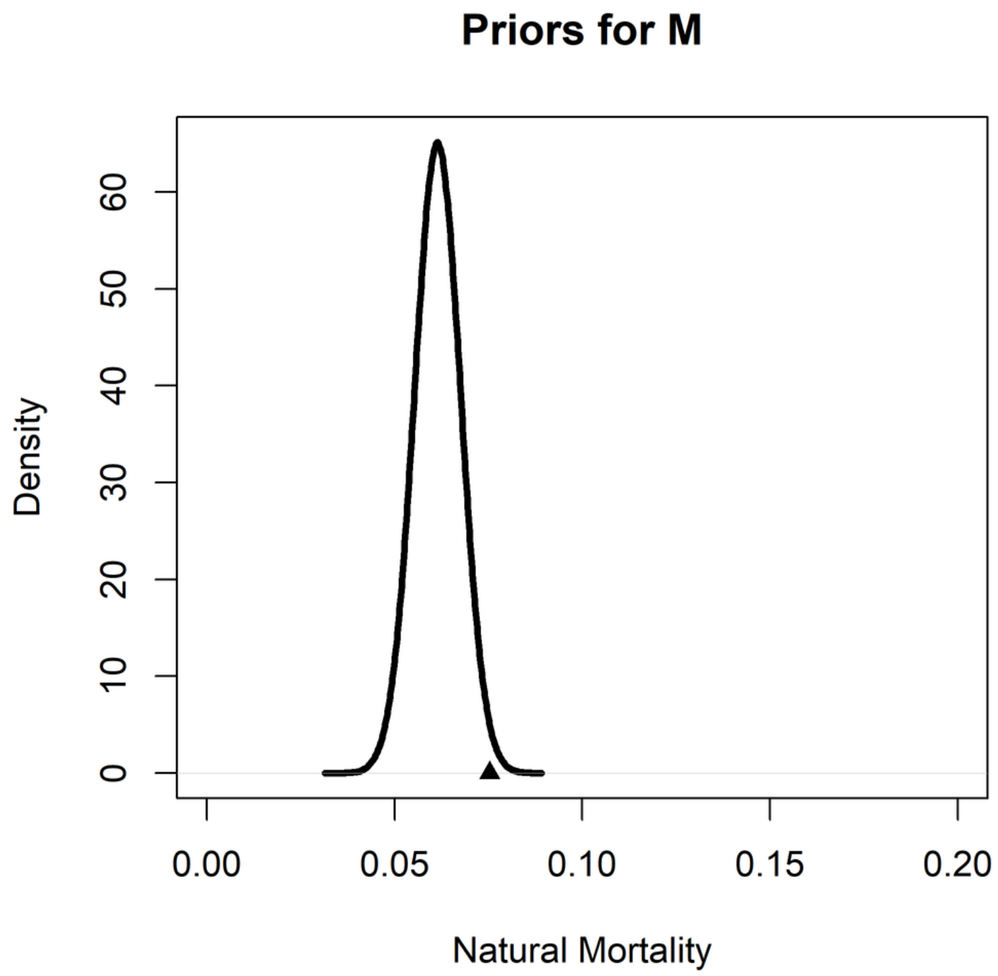

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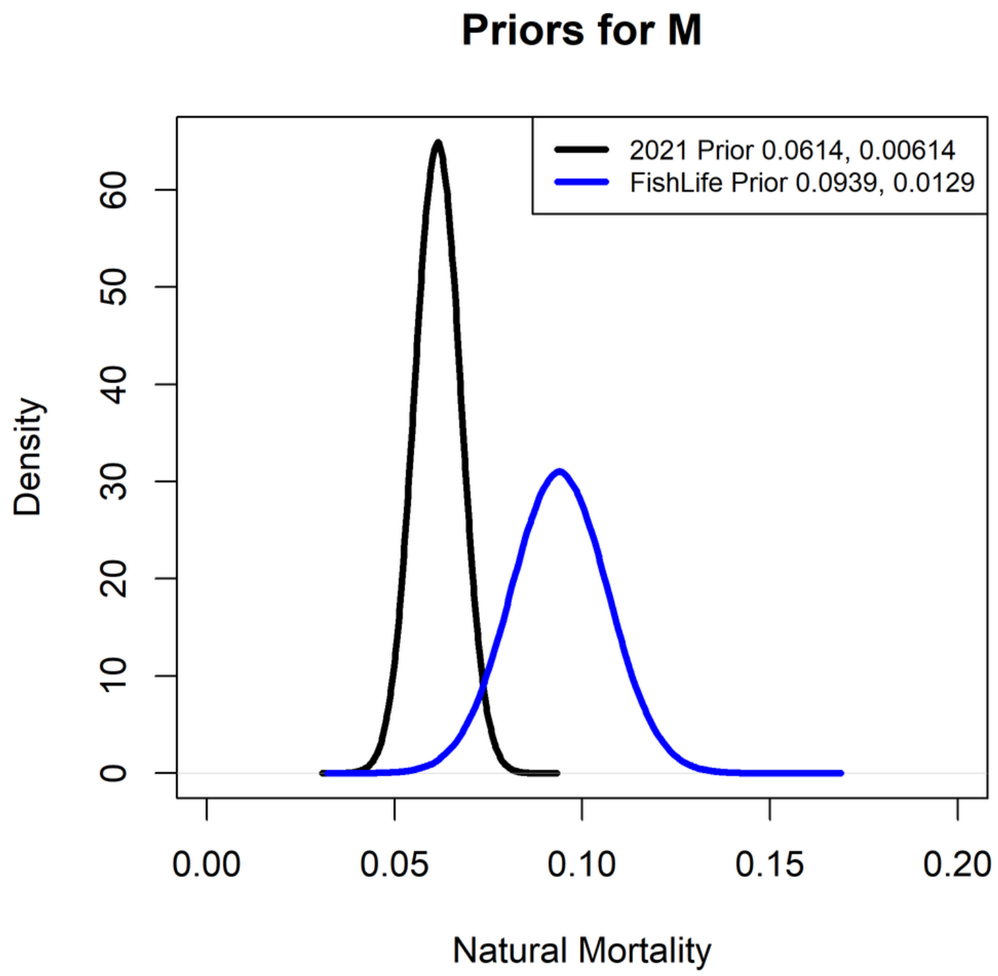

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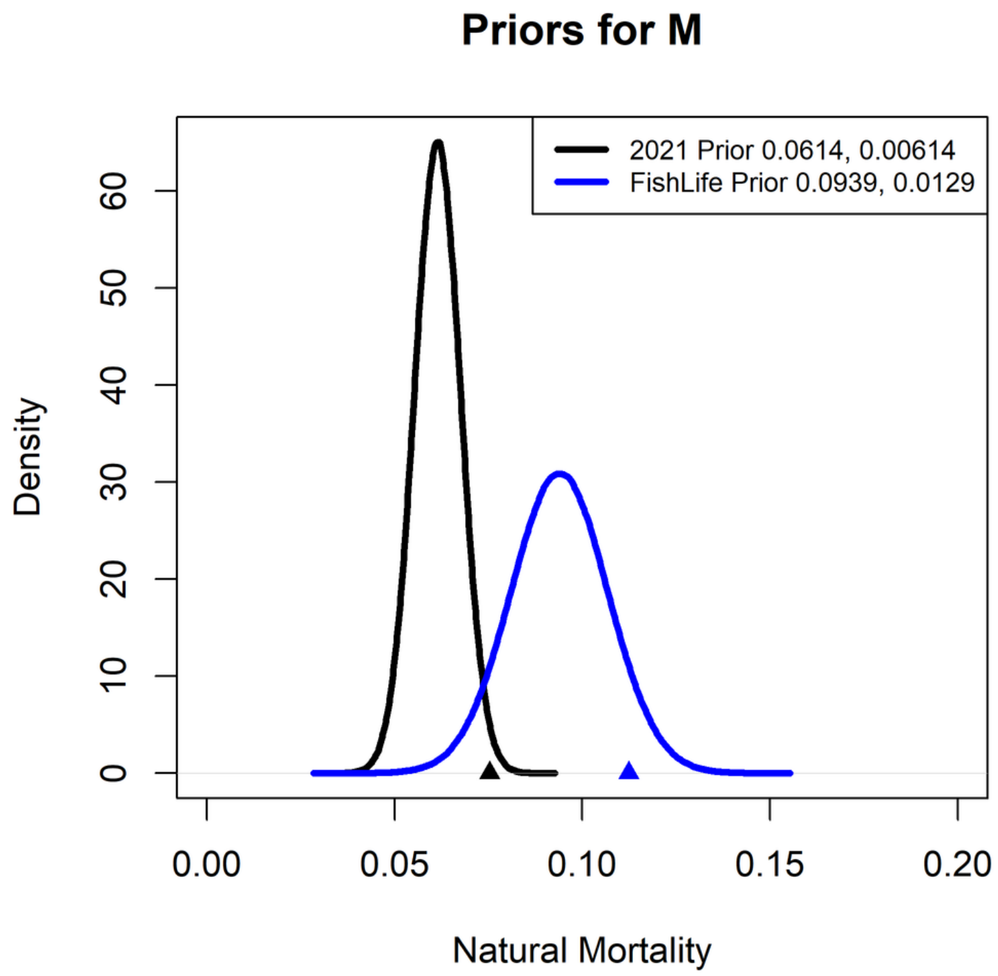

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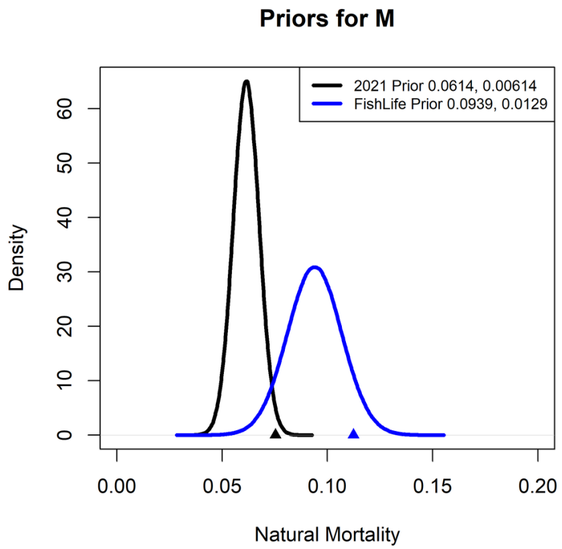

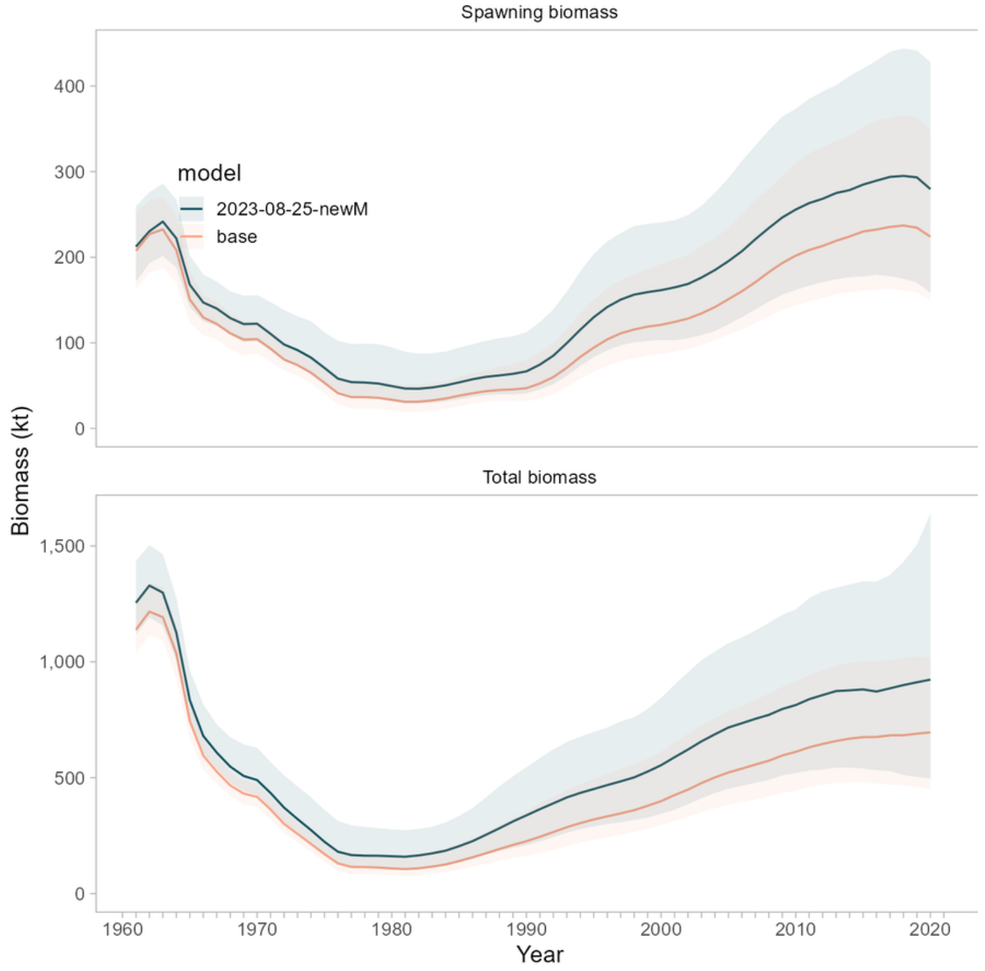

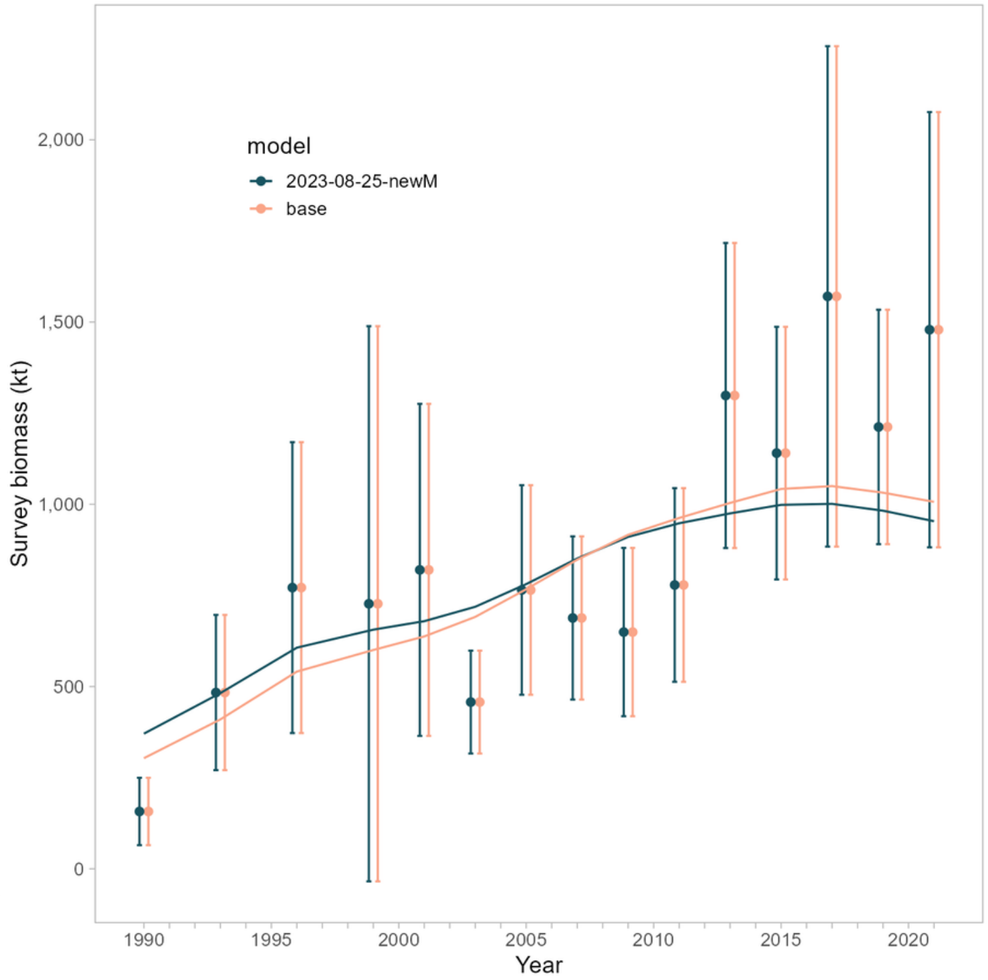

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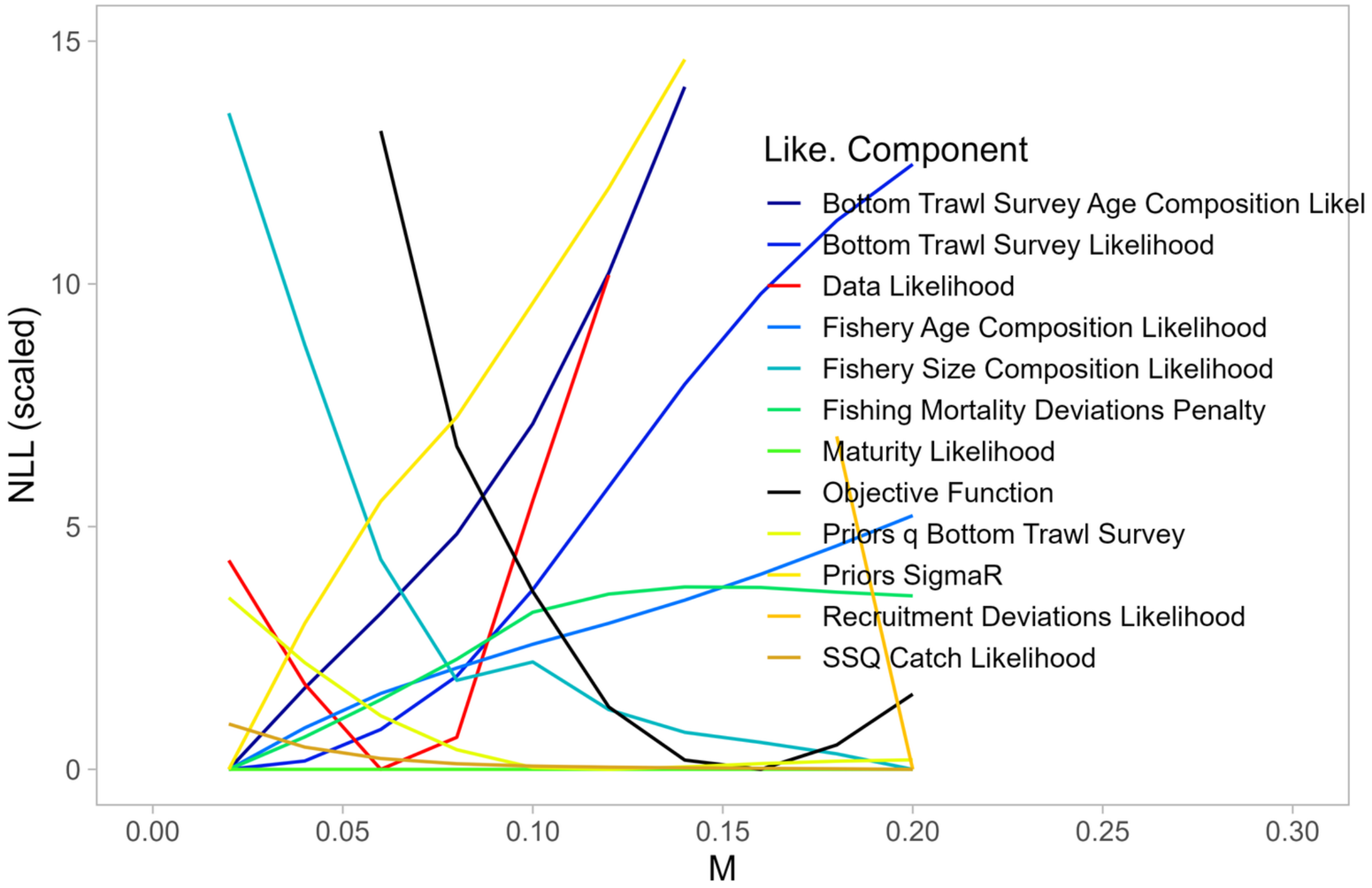


M Explorations in 2021 Base Model

M in base model

Parameter is sensitive to the prior

Wants to be higher (than current prior mean)

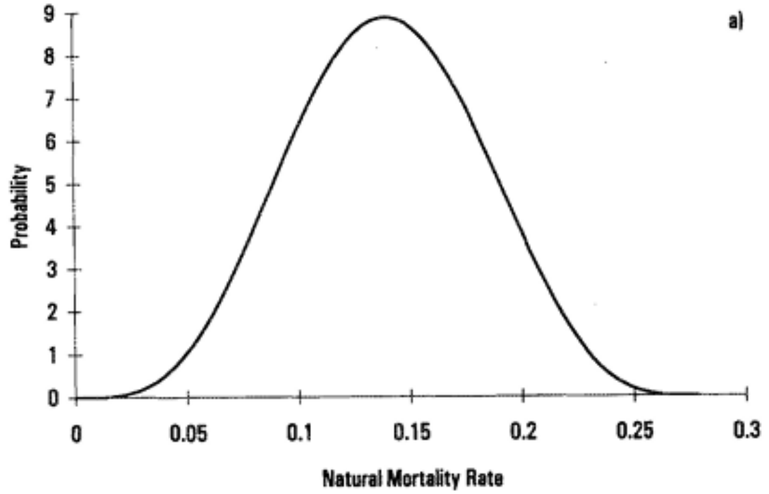
There are data conflicts

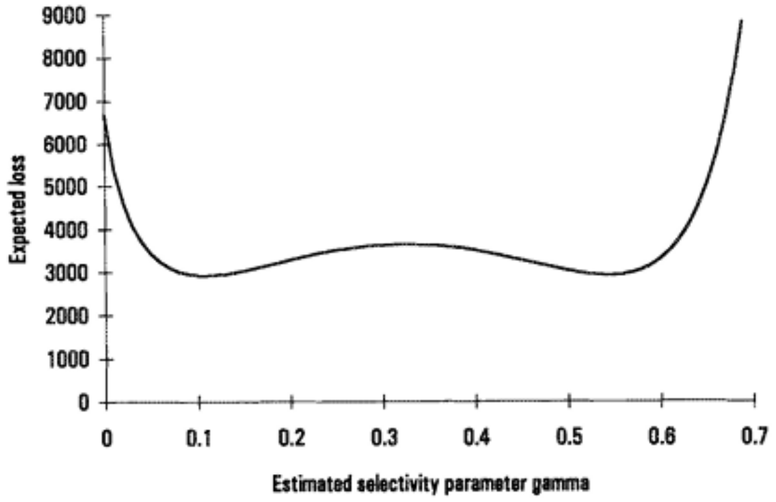
Principles

Confounding of Gear Selectivity and the Natural Mortality Rate in Cases where the Former is a Nonmonotone Function of Age

Grant G. Thompson

United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Fisheries Science Center, Resource Ecology and Fisheries Management Division, 7600 Sand Point Way NE, Seattle, WA 98115-0070, USA





SS Model
as a learning tool

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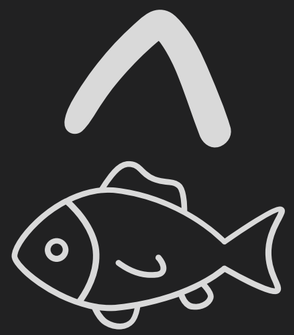
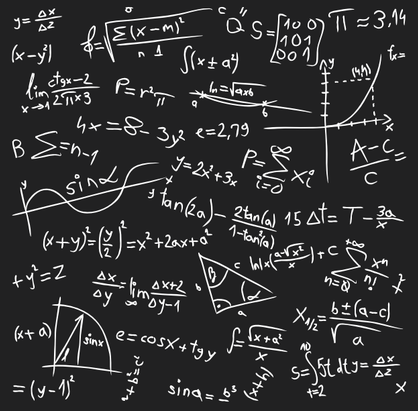
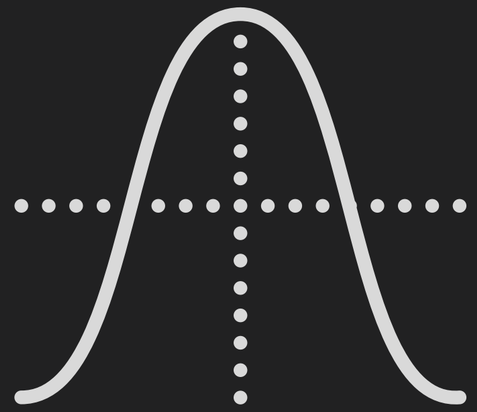
as a learning tool



Growth is estimated



q is analytical



Double normal
Fishery Selectivity

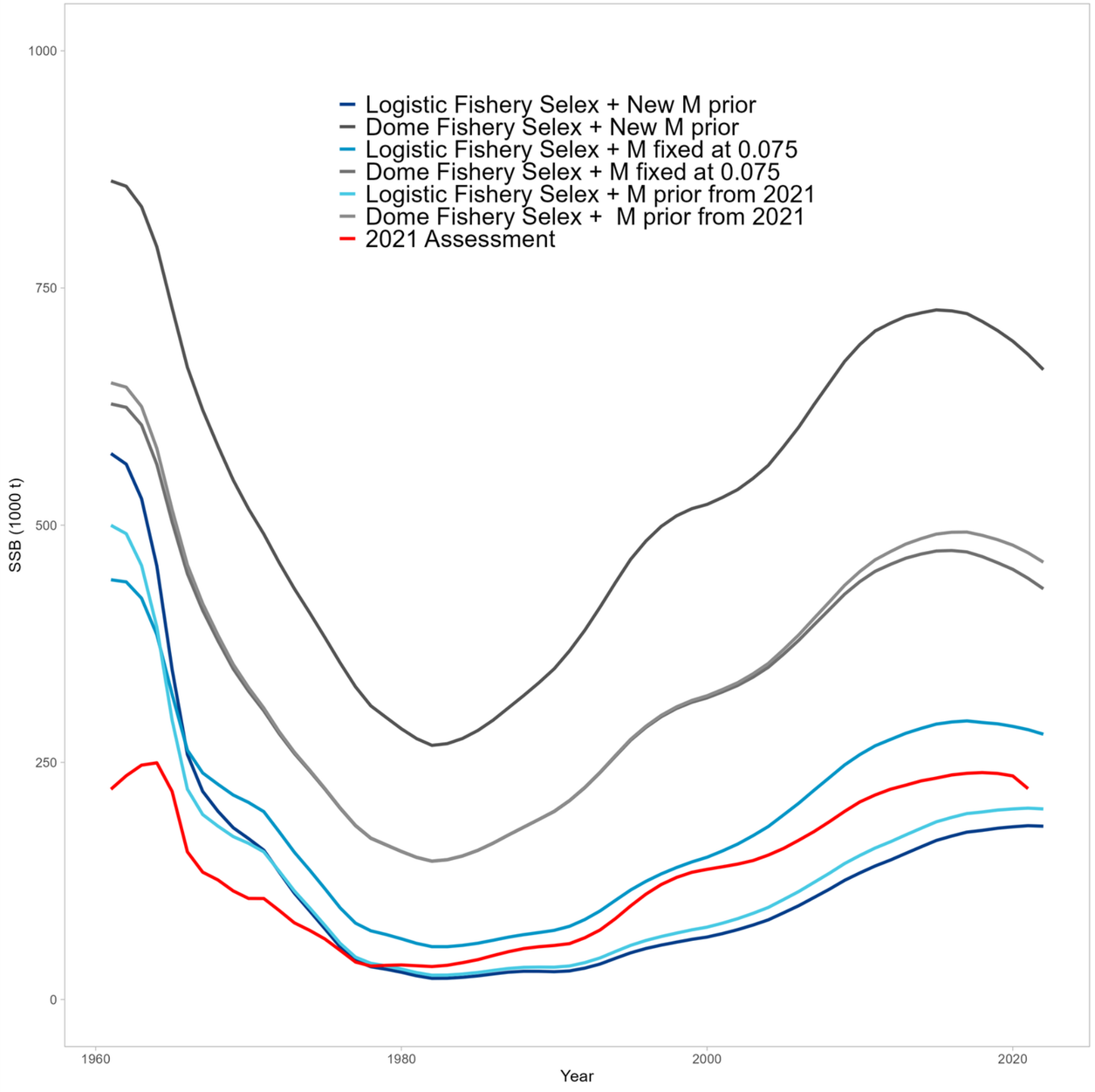
SS Model: investigations

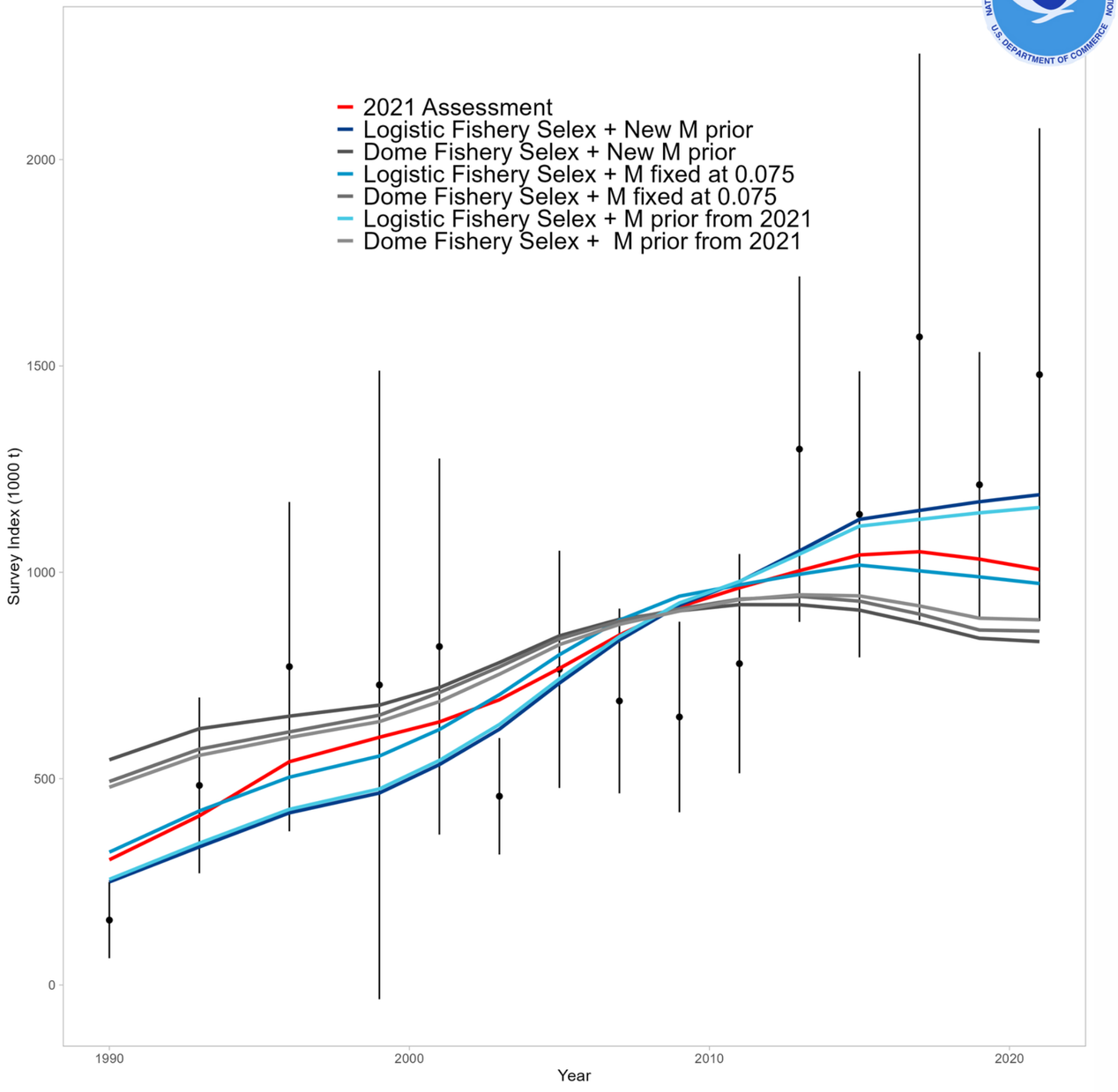
Fishery Selex

Fixed to logistic, **or**
Allowed to be dome shaped

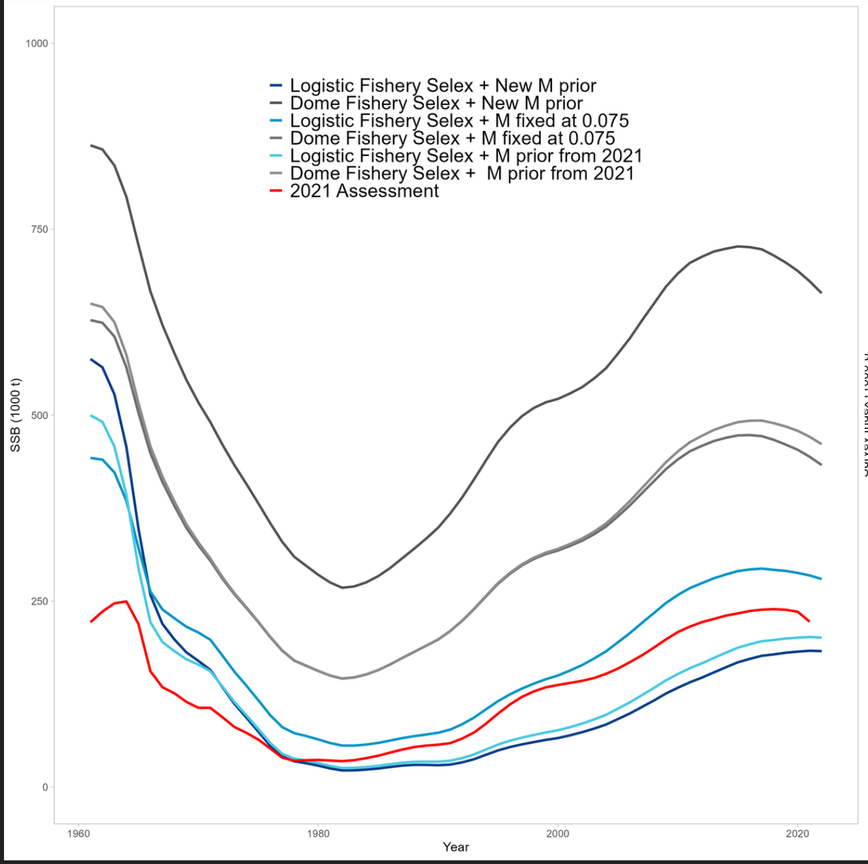
Natural Mortality

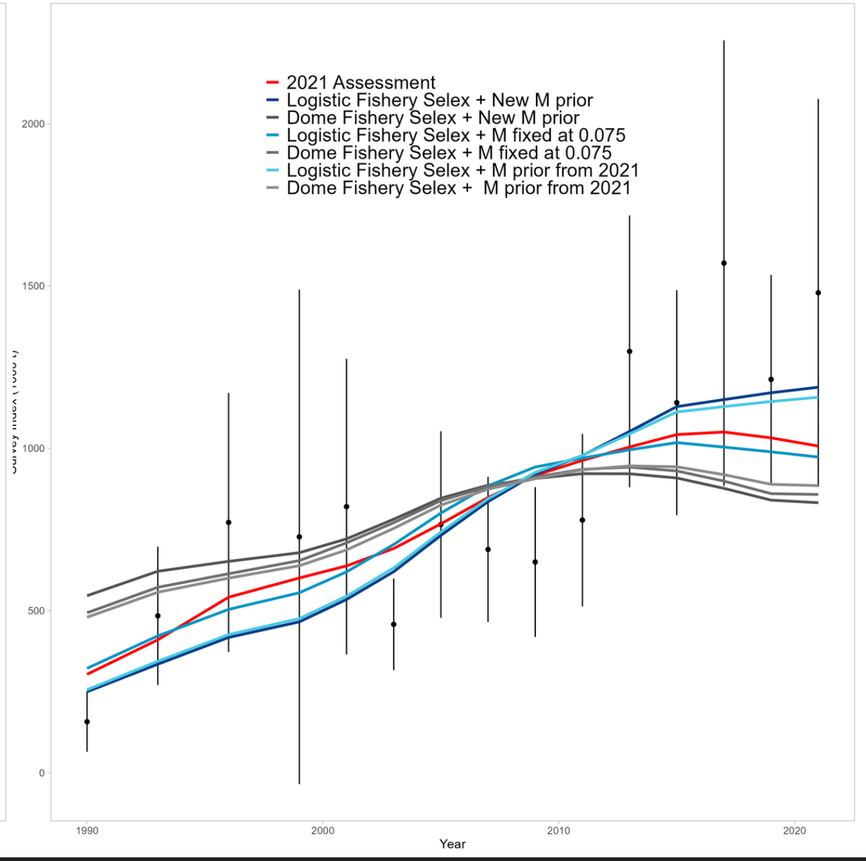
2021 prior (tighter/lower)
FishLife Prior (broader/higher)
Fix at 2021 Value (0.075)

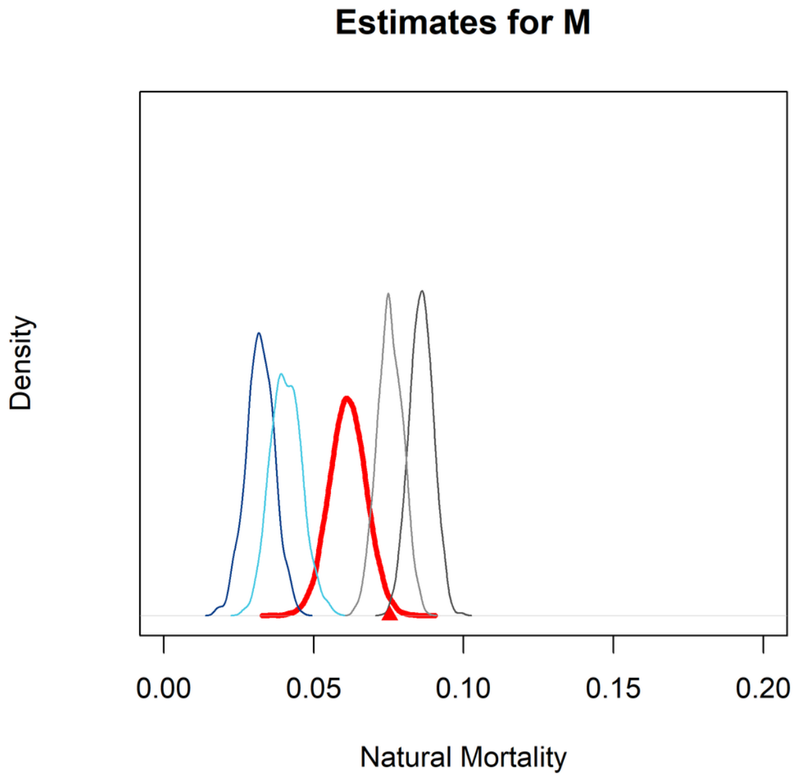

Logistic Fishery Selex + New M prior
Dome Fishery Selex + New M prior
Logistic Fishery Selex + M fixed at 0.075
Dome Fishery Selex + M fixed at 0.075
Logistic Fishery Selex + M prior from 2021
Dome Fishery Selex + M prior from 2021
2021 Assessment
SSB (1000 t)
1000
750
500
250
0
1960
1980
2000
2020
Year


2021 Assessment
Logistic Fishery Selex + New M prior
Dome Fishery Selex + New M prior
Logistic Fishery Selex + M fixed at 0.075
Dome Fishery Selex + M fixed at 0.075
Logistic Fishery Selex + M prior from 2021
Dome Fishery Selex + M prior from 2021
Survey Index (1000 t)
2000
1500
1000
500
0
1990
2000
2010
2020
Year

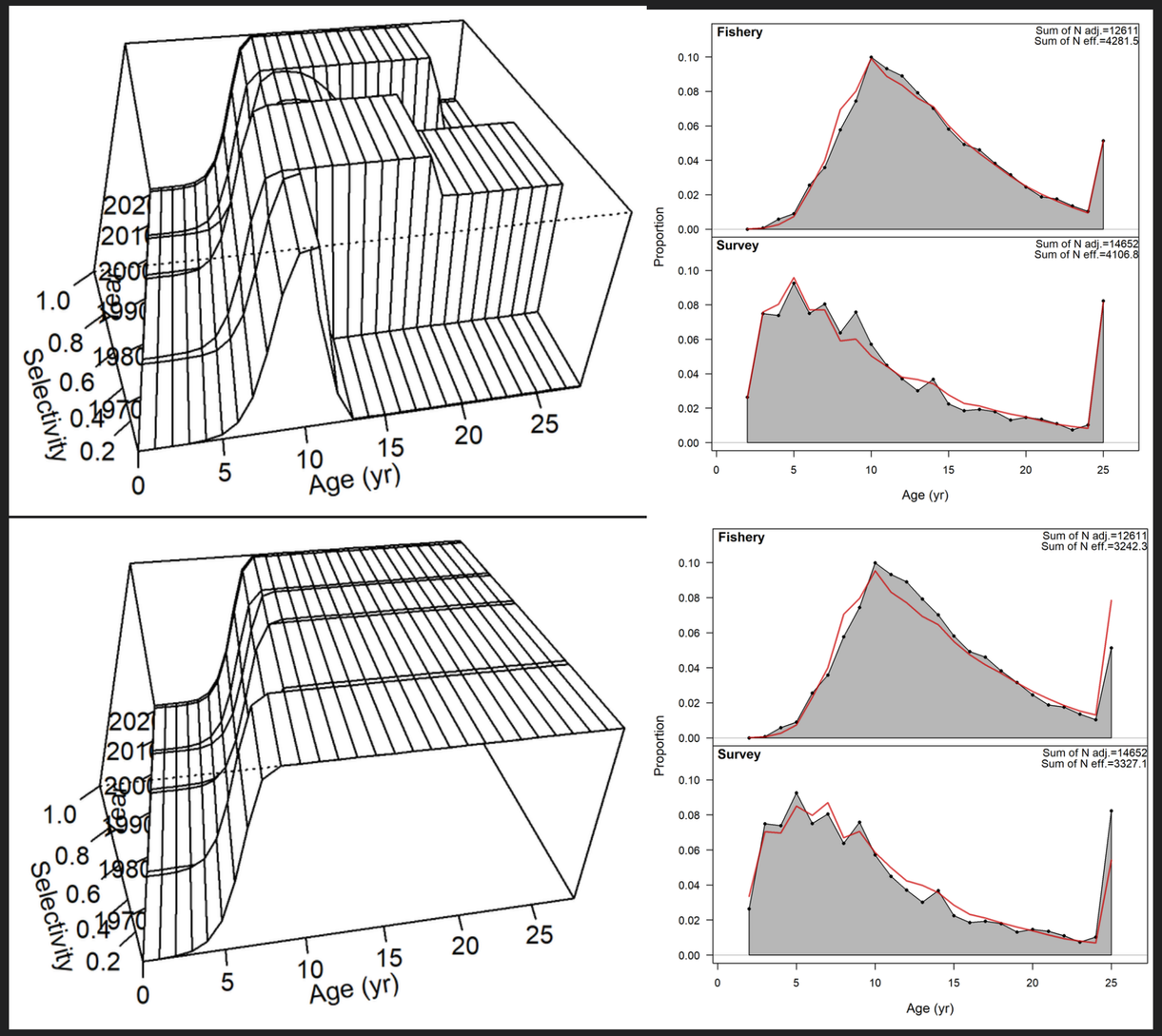
SS Model: M across models







SS Model: Tradeoffs in Selex & Comp fits



Early Period

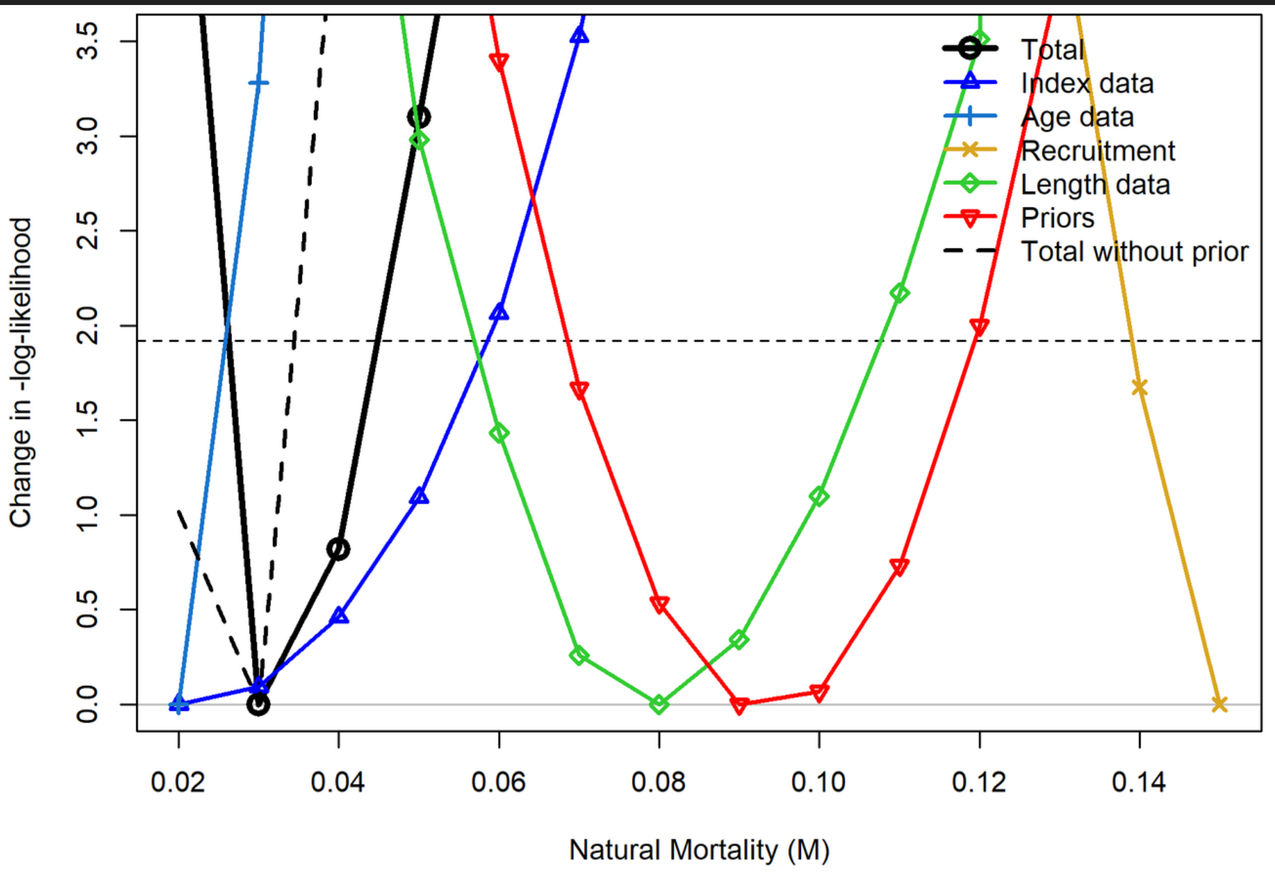
wants to be fully domed, as in BSAI

Logistic Selectivity

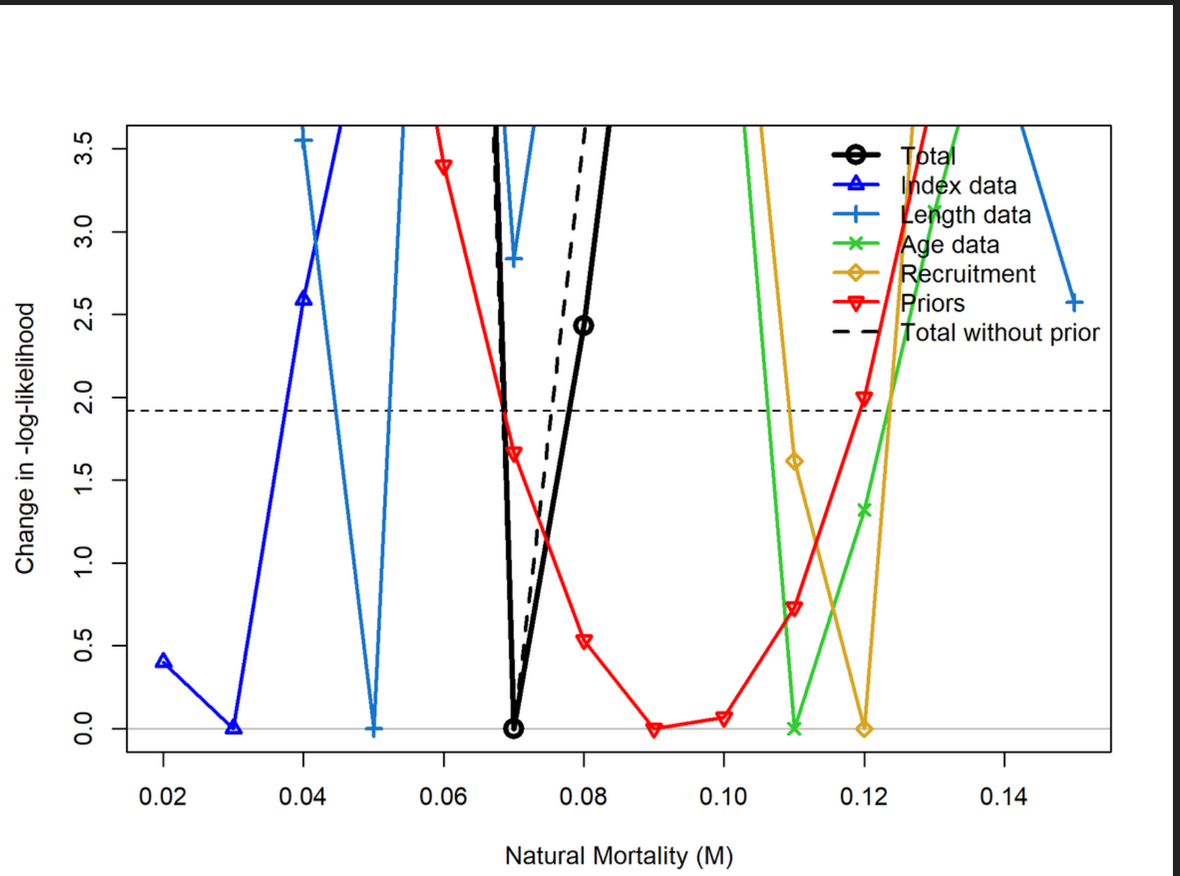
Doesn't fit the plus group very well

SS Model: Profiles on M

Logistic Selex



Dome Selex



M & Selectivity Takeaways

Our Recommendations

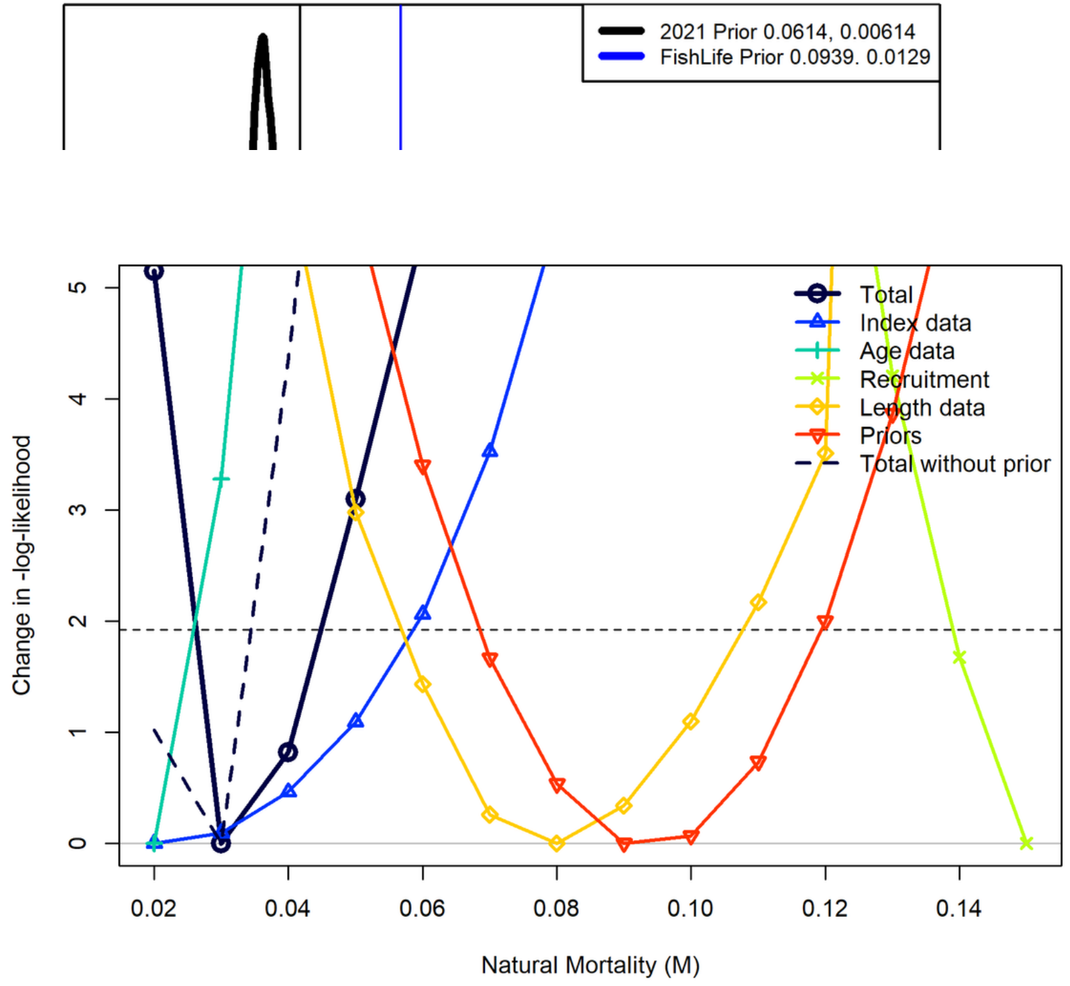
Base model is sensitive to prior and exhibits incoherence: **do not change for mgmt. purposes this cycle**

There are data conflicts: **explore comp weighting**

Dome shaped selectivity may be biasing M: revisit

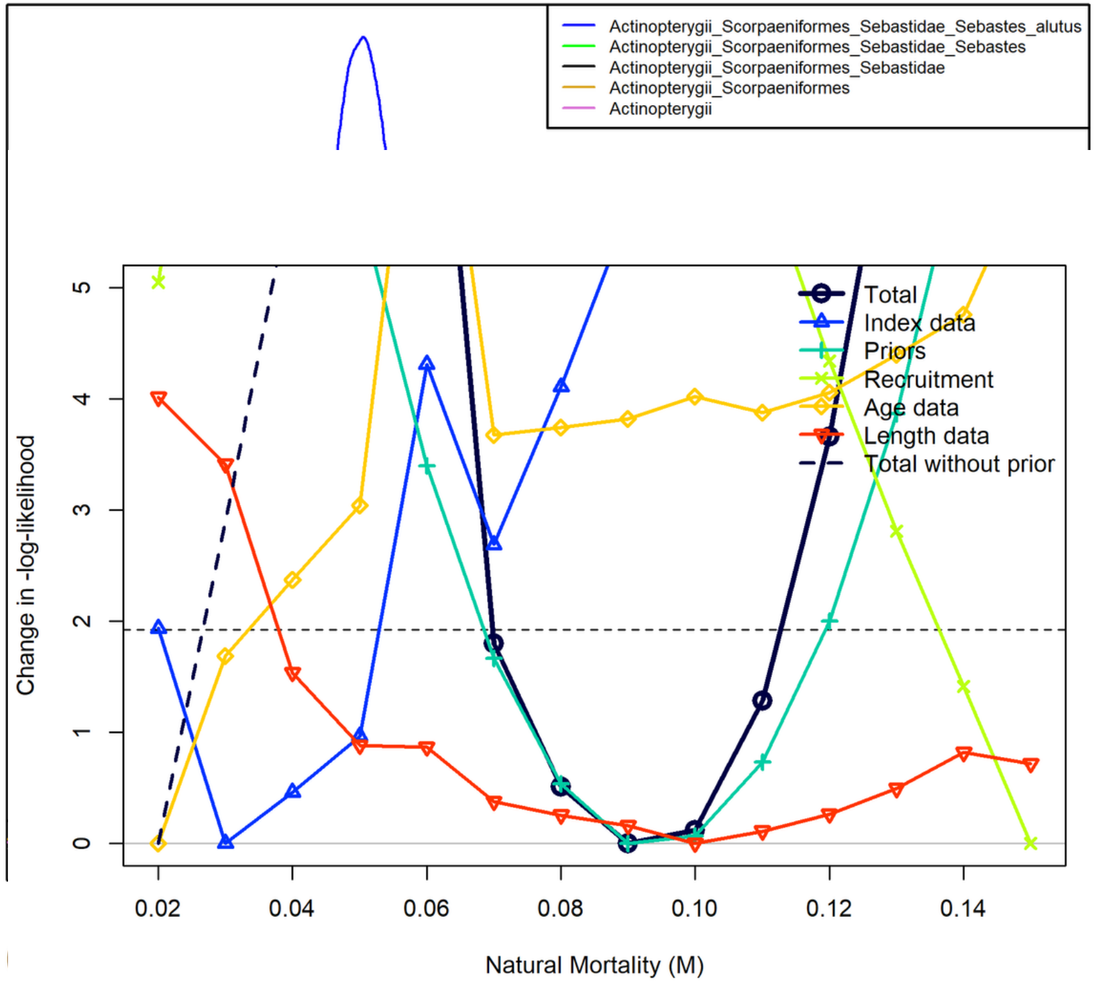
& Transition to an SS model

M Priors for POP Model



Natural Mortality M

M Priors for POP from FishLife



Natural Mortality M

Data Summary

Source	Data	Years
U.S. trawl fishery	Catch biomass	1977-2022
	Catch length composition	1982, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022
	Catch age composition	1982,
GOA bottom trawl survey	Survey biomass (design-based)	1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 2000, 2001, 2002, 2003, 2004,
	Survey length composition	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017,