

Yield per Recruit Analysis of the Hawaiian Yellowfin Tuna Fishery

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Yield Per Recruit

Simple analysis for advice to fishery management

Requires only measures of fishing and natural mortality and growth

$$Z_a = M_a + F_a \quad (1)$$

$$N_a = N_{a-\Delta a} e^{-\Delta a Z_{a-\Delta a}} \quad (2)$$

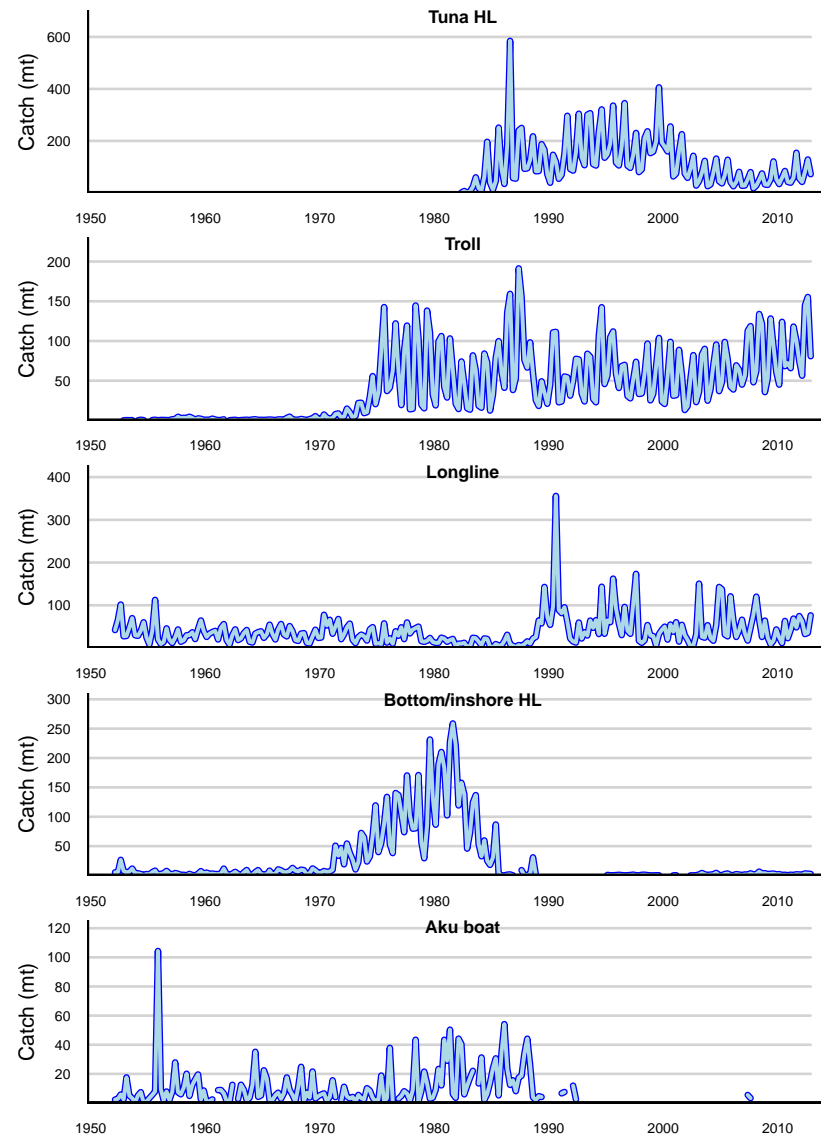
$$Y_a = F_a N_a W_a \quad (3)$$

$$\frac{Y}{R} = \sum_a Y_a. \quad (4)$$

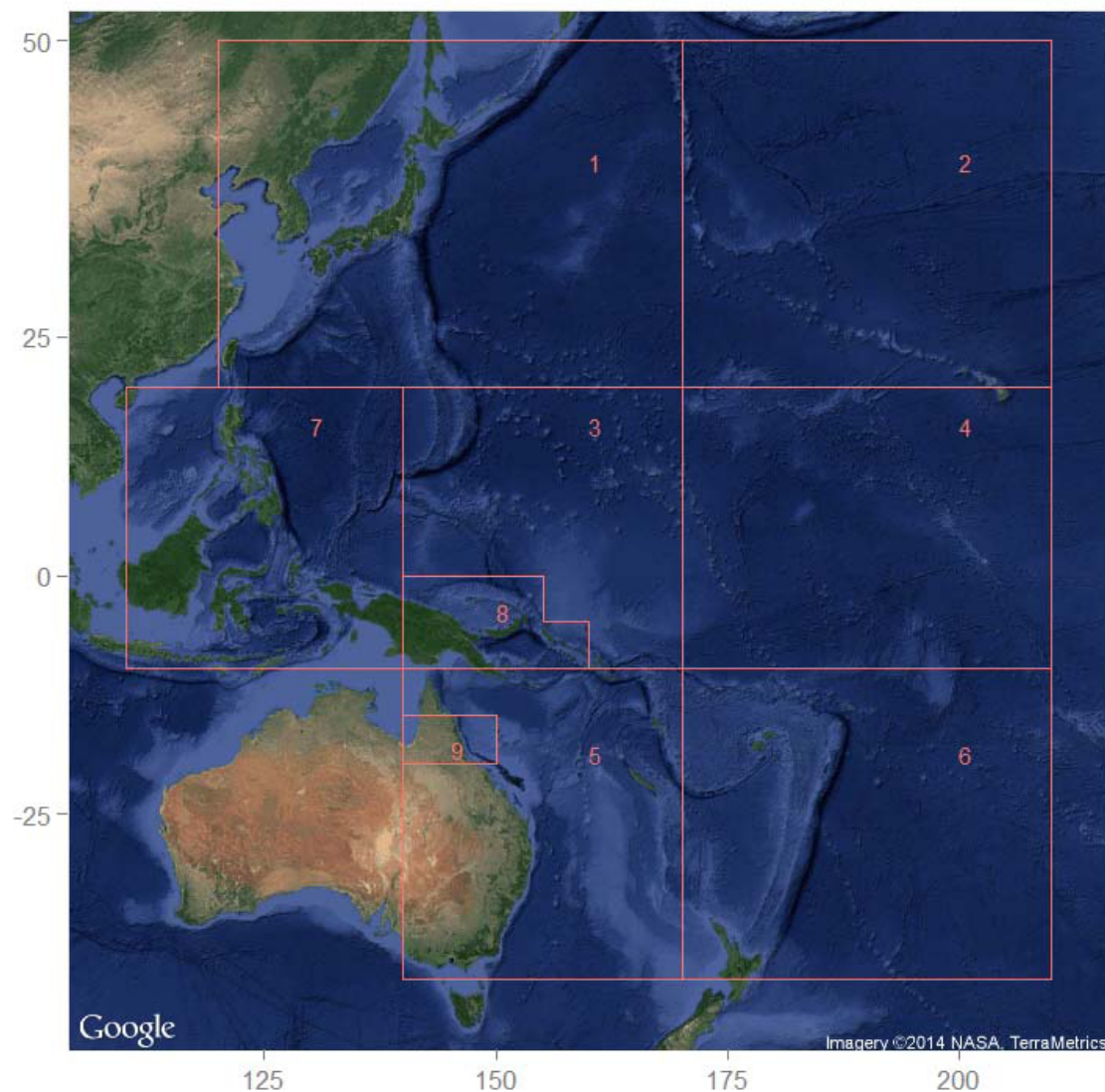
Estimates available from MFCL and HTTP

Insights into fishery, not necessarily about stocks

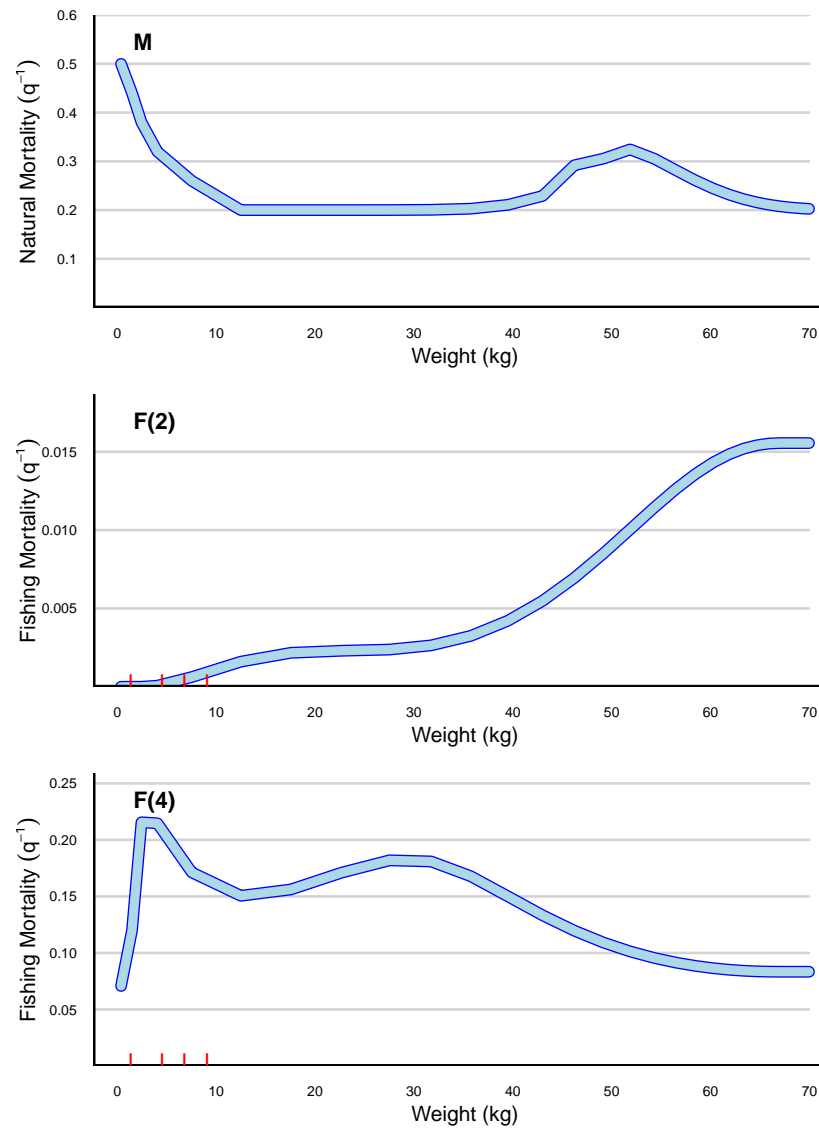
Yellowfin landings in Hawaii, 1952 – 2012



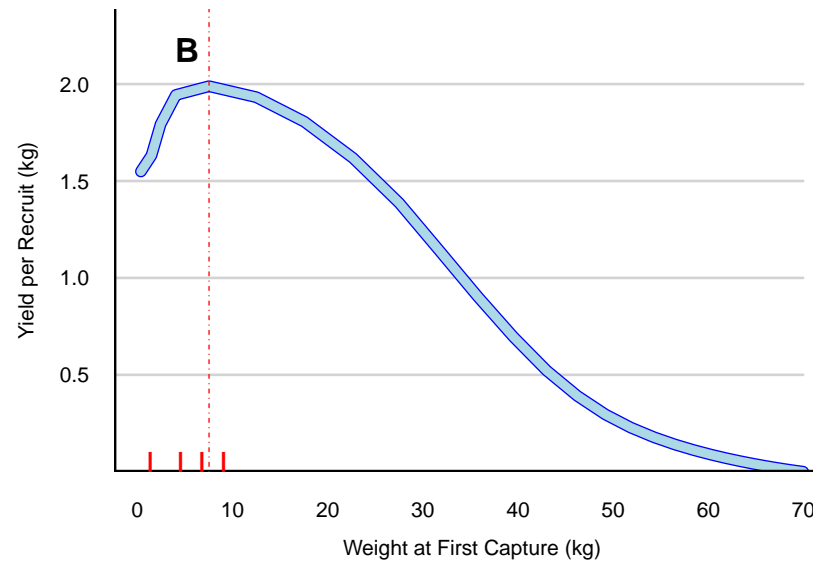
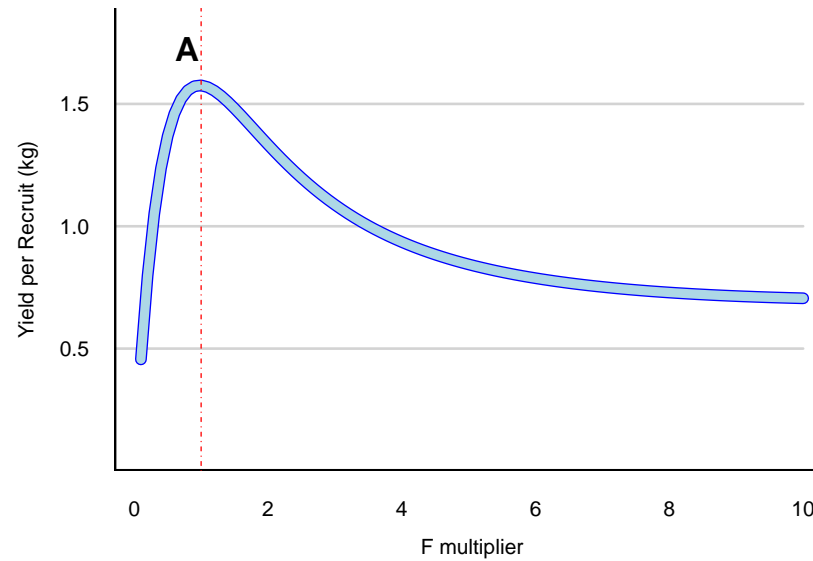
MFCL Stock Assessment



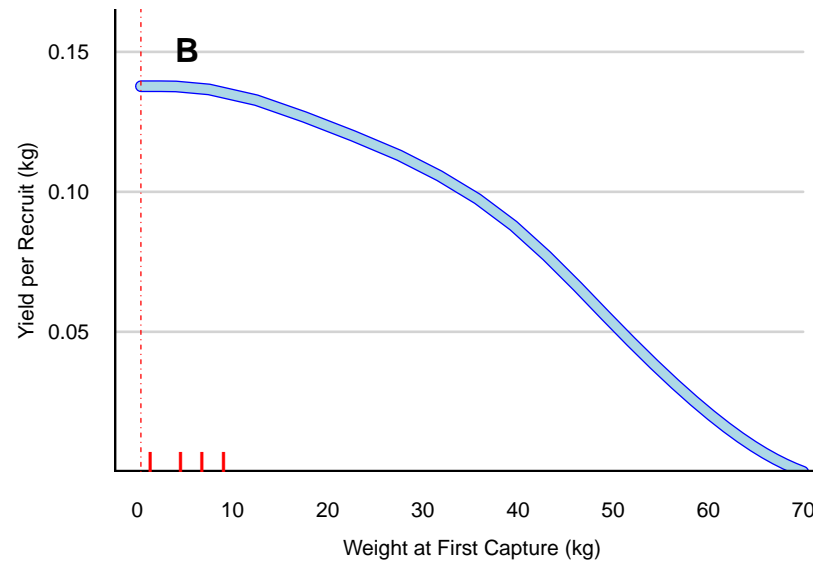
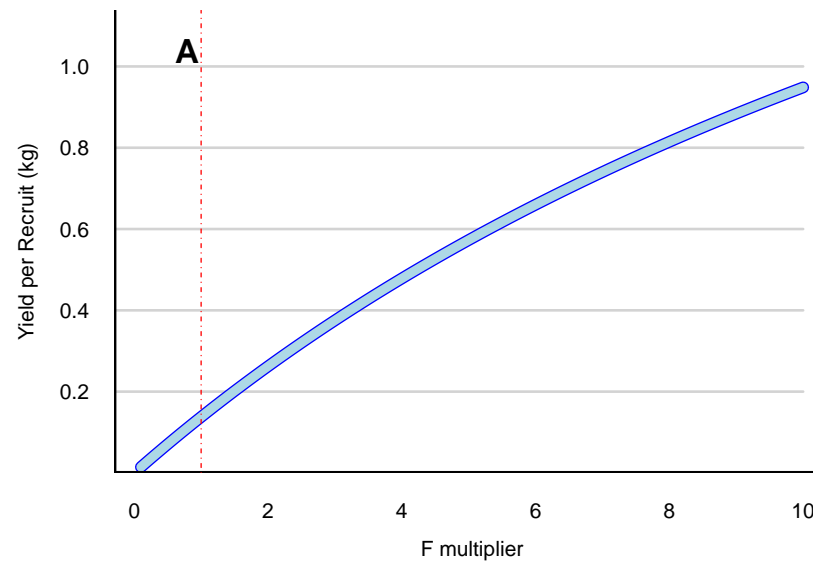
MFCL Mortality “Estimates”



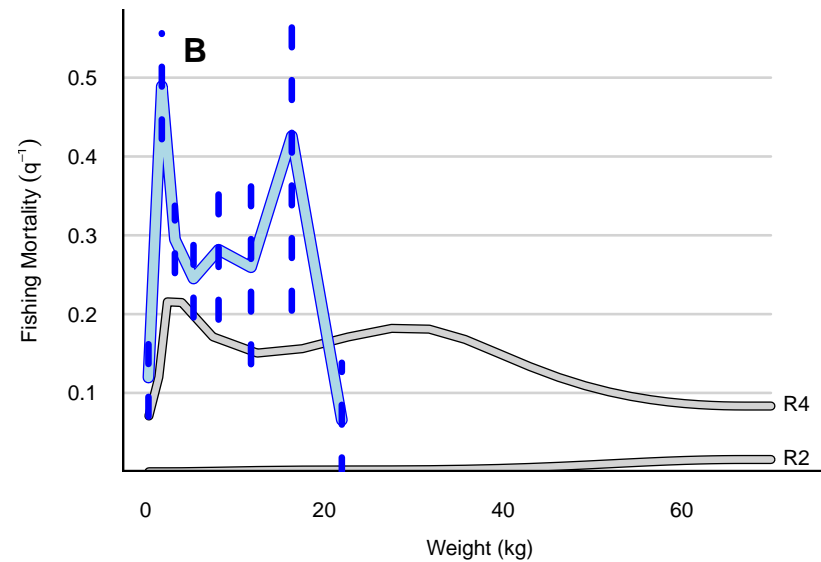
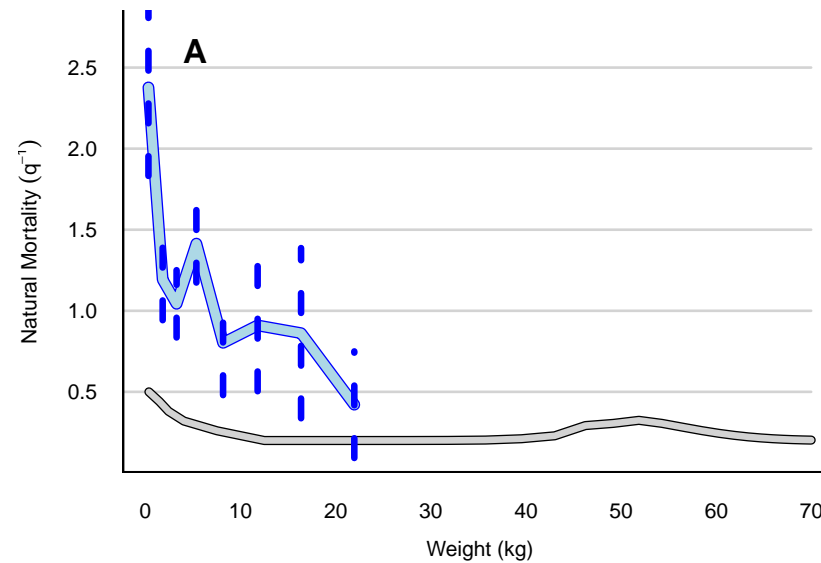
YPR MFCL Region 4



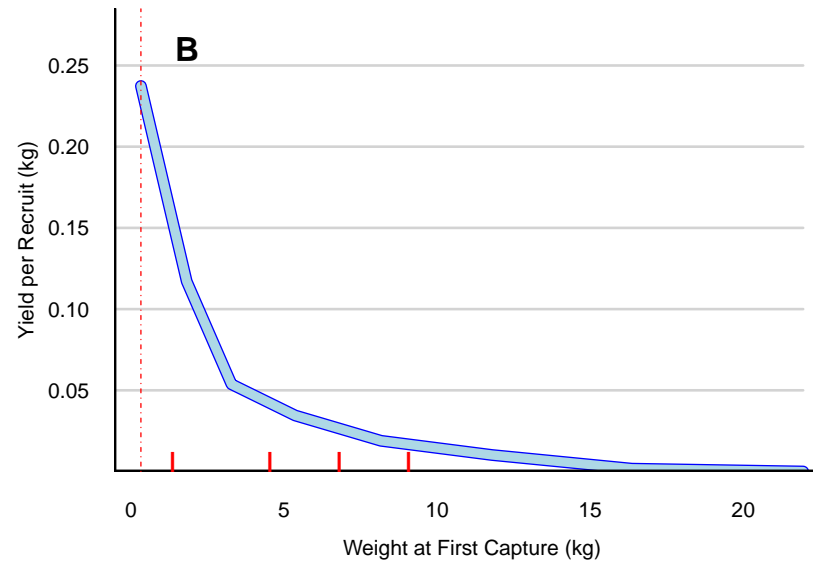
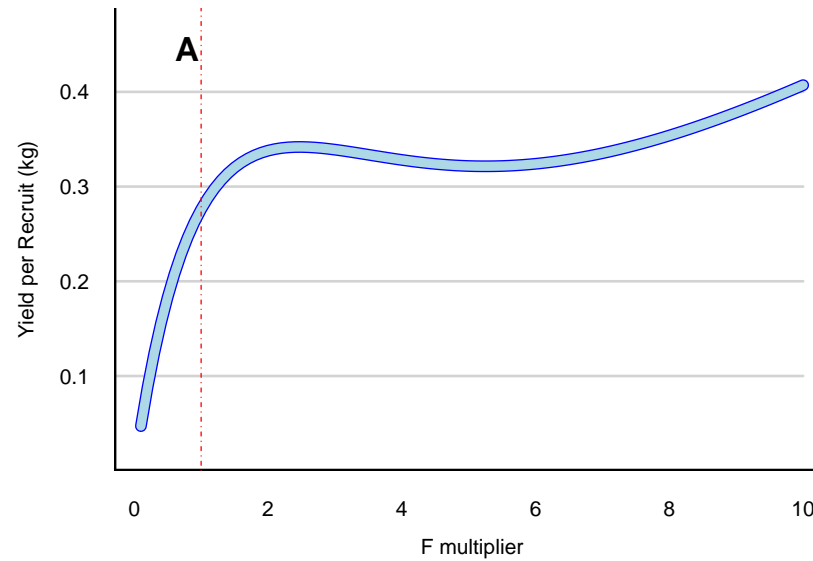
YPR MFCL Region 2



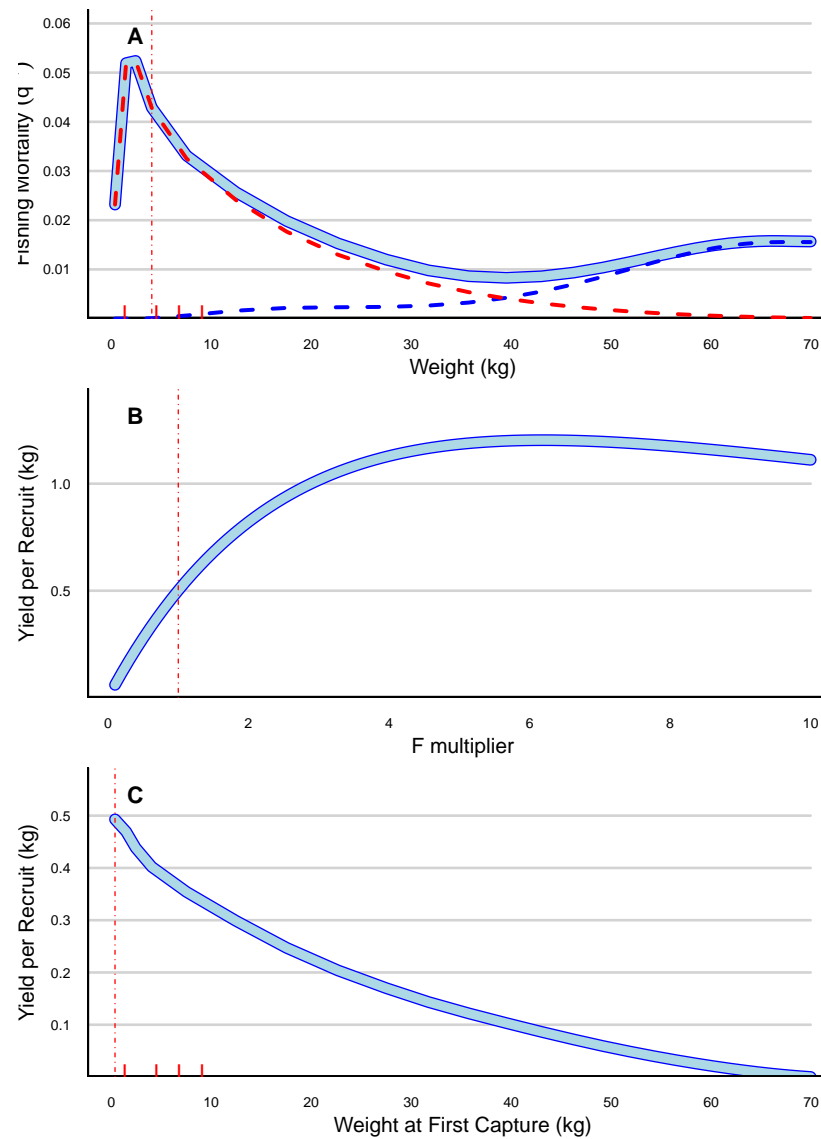
HTTP Mortality Estimates



YPR Main Hawaiian Island



Hypothetical Region 2 Fishing Mortality



Conclusions

1. The YPR analysis for MFCL Region 4 shows clearly that reducing the size at capture would increase the yield to the entire fishery. Whether change in minimum size at capture in Region 4 would benefit the MHI yellowfin fishery is not clear.
2. The YPR analysis for MFCL Region 2 is ambiguous because only longline catches from this region are included in the MFCL assessment and because the MFCL regions are ill-addapted to support management of fisheries in Hawaii.
3. The YPR analysis using mortality estimates from tagging data are are inconclusive, but there is no clear benefit to the fishery of increasing the minimum size restrictions.
4. The WCPFC convention area stock assessment is unsuitable for addressing sub-regional management issues.

HDAR Yellowfin Landings, 1949 – 2014

