

Central California Joint Cable Fisheries Liaison Committee

2018 Grant Application

A. Project Information

- 1) Project Title: **Examine the potential to obtain more benefits from the West Coast groundfish fishery**
- 2) Project Location Description: West Coast of the US, including Central California
- 3) Grant Amount Requested: \$60,000 allocated as \$30,000 in 2018 and \$30,000 in 2019
- 4) Projected Project Start Date: September 2018
- 5) Projected Project End Date: May 2020
- 6) Project Description: Dr. Hilborn and his team propose to do a retrospective analysis of management of the west coast groundfish stocks under different harvest strategies, to see what would have happened to catch, profit and abundance of individual stocks if fishing pressure after 1995 had been reduced by differing amounts including keeping fishing pressure the same as it was in the mid 1990s, and the actual outcomes.

The team will also explore the impact of the RCAs and evaluate how RCAs interact with harvest limits.

The team will use the actual recruitments that occurred for each stock, with the weak and strong years. It is now known that several stocks classified as overfished were not overfished, and that a number of stocks such as canary rockfish would have recovered without the dramatic reductions in catch associated with the rebuilding plans.

The hypothesis is that the US could be obtaining, and would historically have obtained, far more catch, profit and jobs from the fishery under different harvest strategies – most likely ones that do not have rigid rebuilding requirements, and may indeed have some stocks classified as overfished.

There are several challenges that need to deal with. The team will need to find a way to model the impact of the rockfish conservation areas, and indeed one of the strategies that will be evaluated is using rockfish conservation areas as the core protection for weak rockfish stocks, and not constraining the catch of those stocks outside the RCAs. The team will need to make assumptions about changes in the ability to target specific stocks. It is known that fishermen have dramatically reduced the relative exploitation rate on rebuilding stocks. Different scenarios will need to make reasonable assumptions backed up by historical data on relative exploitation rates. Finally the team will need to include changes in markets in our analysis. It is known that the catch of several species is seriously constrained by lack of processing capacity and markets. Also known is that the loss of markets and processing capacity has been due to some extent to the major reductions in landings.

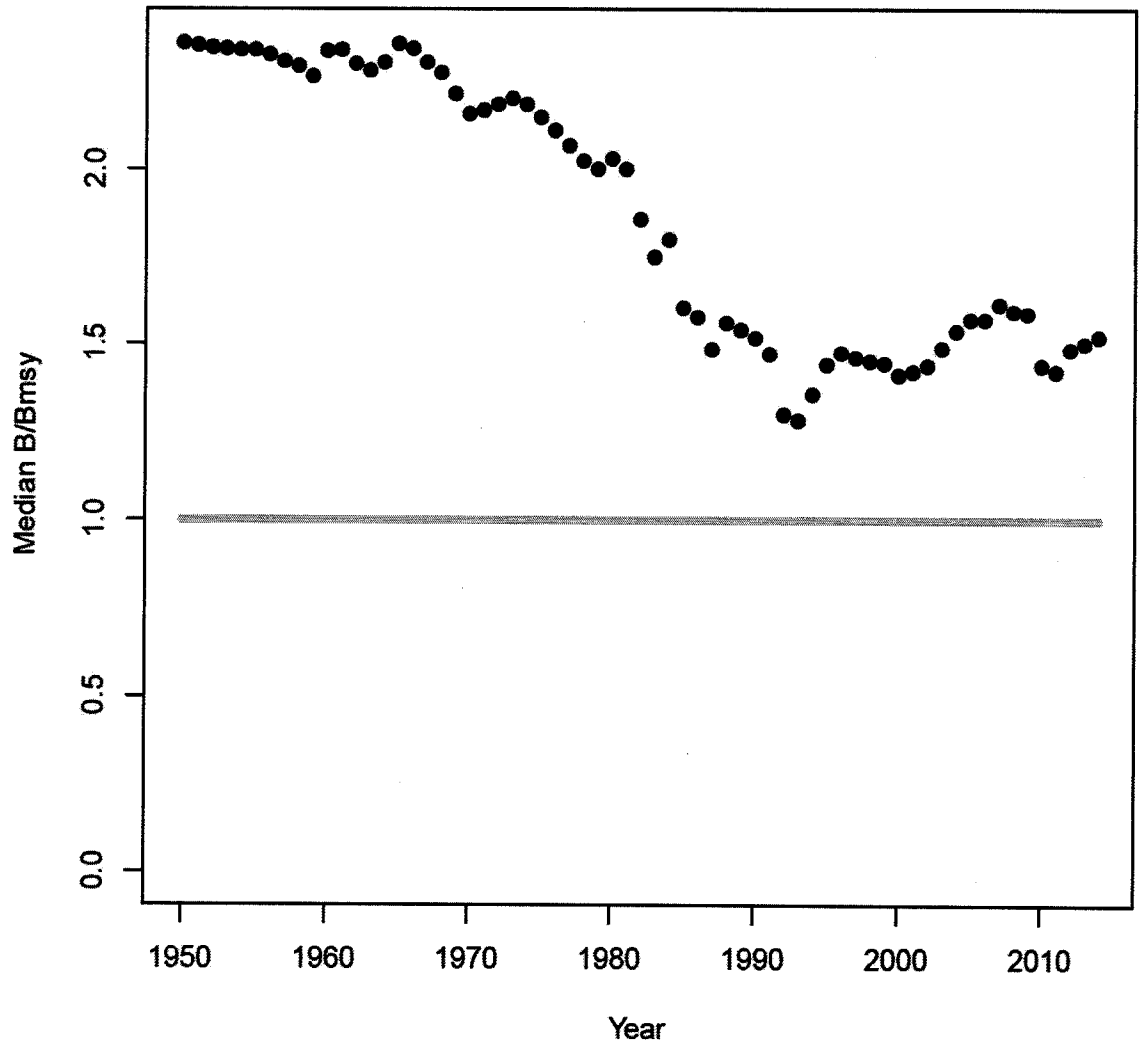


Figure 1. Median biomass divided by biomass that would produce maximum sustainable yield for west coasts groundfish. However, what is rarely discussed is the dramatic decline in catch that has occurred since the 1990s with essentially no sign of rebuilding of catch. Catch has declined to roughly 20,000 tons.

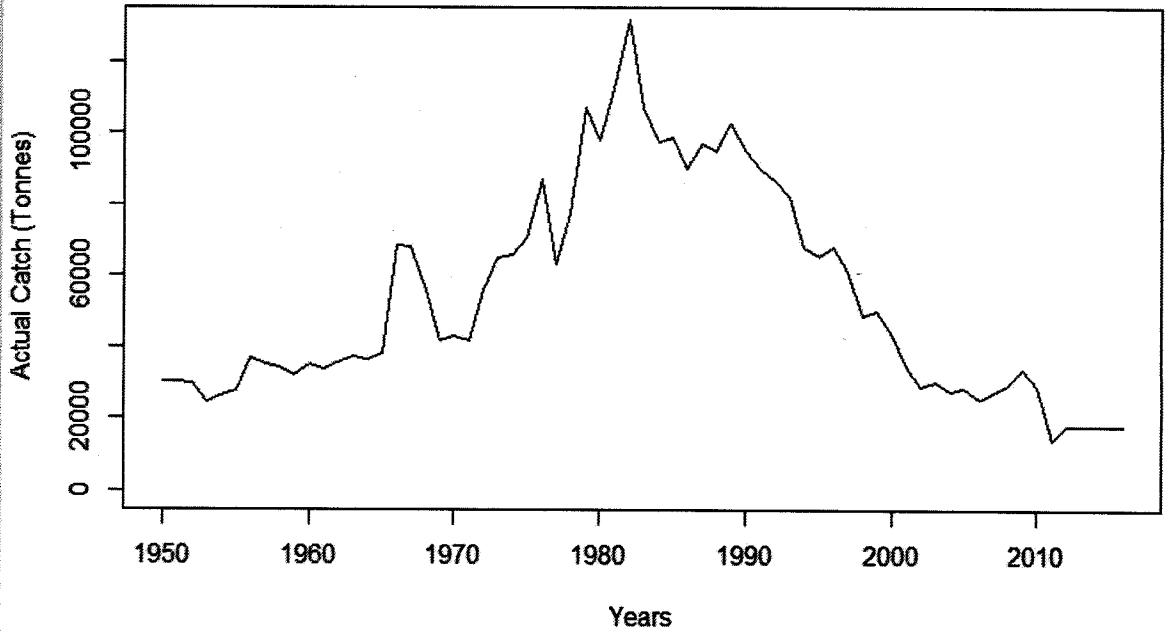


Figure 2. Trend in landings of west coast groundfish. Years 2013-2016 are estimated. Very preliminary calculations suggest that if fishing pressure had remained the same as it was in the mid 1990s the catch of groundfish would have remained at a little under 60,000 tons, almost 3 times what it is at present. But of course some stocks would have remained overfished. The graph below shows the predicted catch (dots) as well as the actual catch.

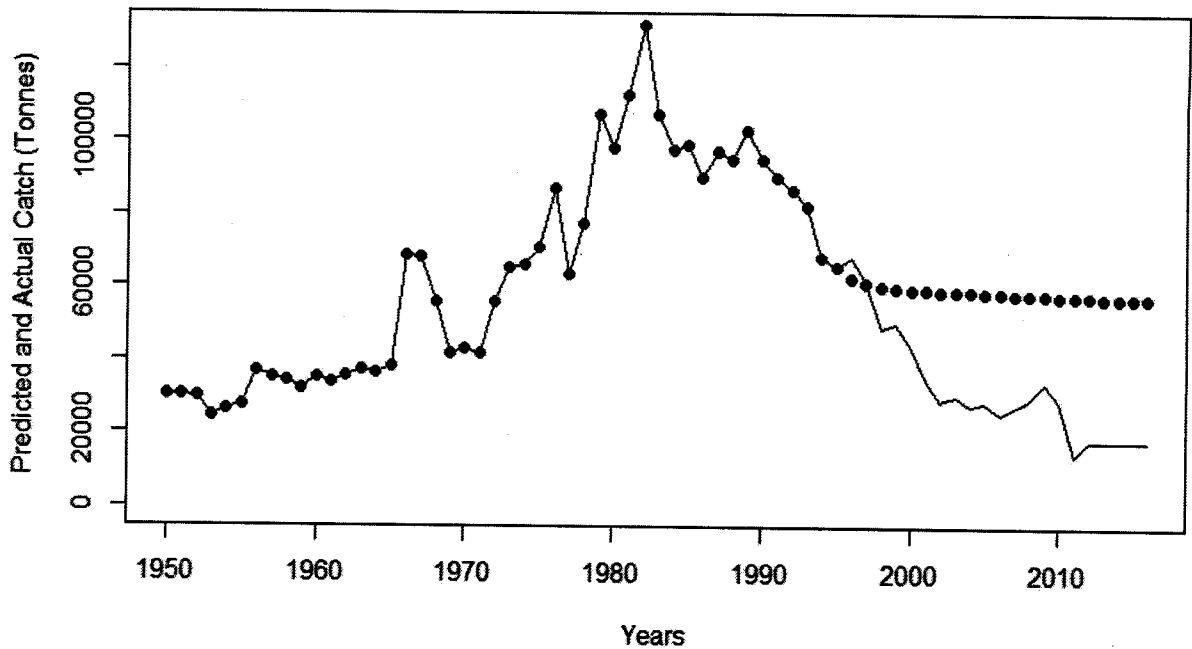


Figure 3. Actual catch as solid line, predicted catch as dots.

So why are we catching so many fewer fish? There are multiple reasons including (1) dramatic reductions in TAC to allow for rebuilding, (2) loss of markets and processing capacity, (3) lack of access to stocks in rockfish conservation areas, (4) the very low quotas on rebuilding stocks which become choke species constraining the ability to catch stocks with large TACs, and (5) the switch from trawl to pot gear to catch sablefish, causing sablefish to become a choke species.

Scientific Background

It has long been recognized that many fisheries catch multiple species and it is not possible to directly target one species without catching others. Maximization of long term yield from a mix of stocks, necessarily implies that less productive stocks will be below their MSY target, while more productive species will be above the MSY target (Ricker 1958; Paulik et al. 1963; Hilborn 1976). We explored this issue with respect to the west coast groundfish fishery in a 2012 publication (Hilborn et al. 2012). There we showed that if you wanted to have no overfished stocks you would only obtain about 30,000 t of the potential yield of about 50,000 t.

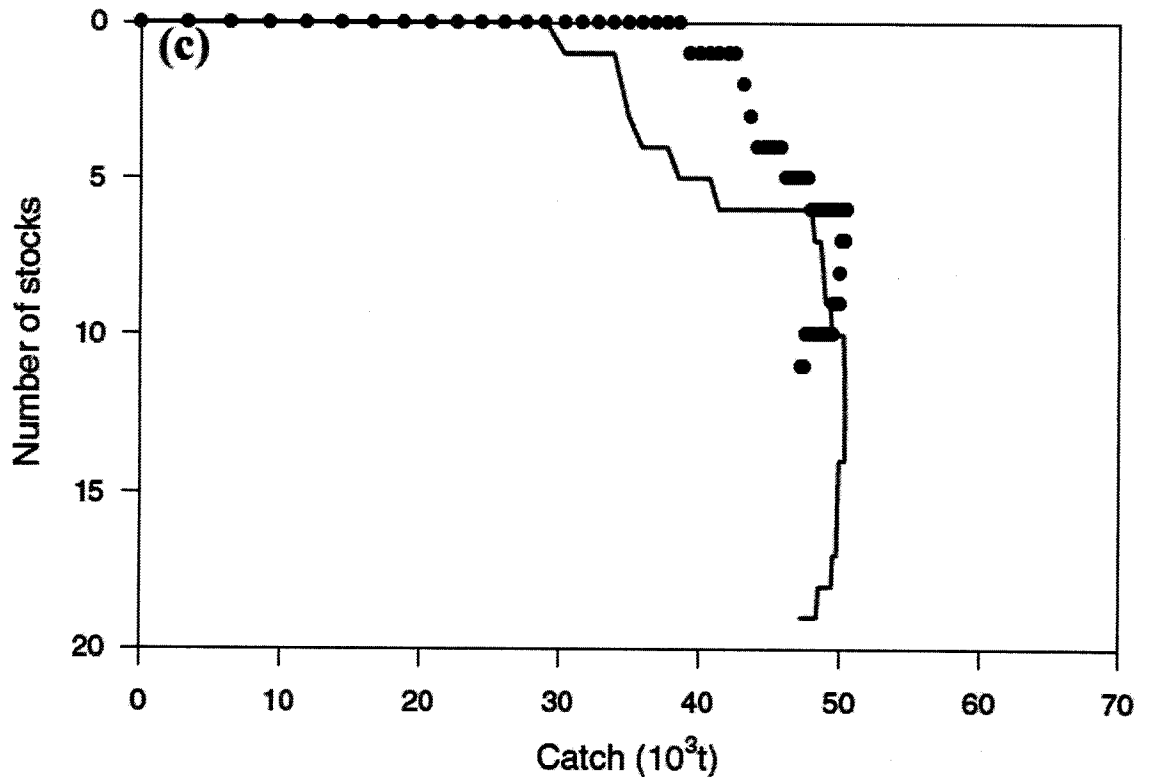


Figure 4. The solid line shows the trade-off between number of stocks overfished (Y axis) and total catch (X axis). The dots are the number of stocks collapsed (below 20% of BMSY). (From Hilborn et al. 2012)

Proposed work

We propose to do a retrospective analysis of management of the west coast groundfish stocks under different harvest strategies, to see what would have happened to catch, profit and abundance of individual stocks if fishing pressure after 1995 had been reduced by differing amounts including keeping fishing pressure the same as it was in the mid 1990s, and the actual outcomes.

Unlike the simple scenario shown in Figure 3, we will use the actual recruitments that occurred for each stock, with the weak and strong years. We now know that several stocks classified as overfished were not overfished, and that a number of stocks such as canary rockfish would have recovered without the dramatic reductions in catch associated with the rebuilding plans.

Our hypothesis is that we could be obtaining, and would historically have obtained, far more catch, profit and jobs from the fishery under different harvest strategies – most likely ones that do not have rigid rebuilding requirements, and may indeed have some stocks classified as overfished.

There are several challenges that we will need to deal with. We will need to find a way to model the impact of the rockfish conservation areas, and indeed one of the strategies we will evaluate

is using rockfish conservation areas as the core protection for weak rockfish stocks, and not constraining the catch of those stocks outside the RCAs. We will need to make assumptions about changes in the ability to target specific stocks. We know that fishermen have dramatically reduced the relative exploitation rate on rebuilding stocks. Our scenarios will need to make reasonable assumptions backed up by historical data on relative exploitation rates. Finally we will need to include changes in markets in our analysis. We know that the catch of several species is seriously constrained by lack of processing capacity and markets. We also know that the loss of markets and processing capacity has been due to some extent to the major reductions in landings.

Timeline products and budget

We are seeking funding for a 2 year masters thesis. This would begin in September 2018 and carry through the summer of 2020. The product of this research would be either 1 or 2 scientific papers summarizing our results. The cost of supporting a masters student is roughly \$60,000 per year and this covers a stipend of \$2,346 per month, health insurance and other benefits, tuition, and UW overheads. The amount of overhead can range from 0% for funds received as donations, to 55% for federal grants and contracts. We are seeking funding for the masters program from several outside sources to contribute to part of the project.

References

- Hilborn, R. 1976. Optimal Exploitation of Multiple Stocks by a Common Fishery - New Methodology. *Journal of the Fisheries Research Board of Canada*, 33: 1-5.
- Hilborn, R., Stewart, I. J., Branch, T. A., and Jensen, O. P. 2012. Defining trade-offs among conservation of species diversity abundances, profitability, and food security in the California Current bottom- trawl fishery. *Conservation Biology*, 26: 257-266.
- Paulik, G. J., Hourston, A. S., and Larkin, P. A. 1967. Exploitation of multiple stocks by a common fishery. *Journal of the Fisheries Research Board of Canada*, 24(12): 2527-2537.
- Ricker, W. E. 1958. Maximum sustained yields from fluctuating environments and mixed stocks. *Journal of the Fisheries Research Board of Canada*, 15: 991-1006.

D. Project Plan:

March 1, 2018	Award of Grant funds; half of the funds, Are requested by April 1, 2018; the remaining \$30,000 By April 1, 2019.
April 15, 2018	Execution of contract with service provider University of Washington
September 1, 2018	The study's analysis begins

May, 2020

Contractor will submit progress reports to
The Cable Committee quarterly, if requested
Contractor and applicants present results to
Cable Committee Board of Directors

E. Financial Schedule

Contractor monthly costs (max. stipend) \$two annual payments of \$30,000 each

Potential subcontractor monthly costs \$ none

Travel for length of project From grant award, 26 months

Total Project Cost \$60,000.00