Age-Structure Metrics for Precautionary Management- Can we save fish, time, and money?

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Abstract

Over the past 30 years, fisheries management on the west coast of the United States has undergone a rapid evolution. Starting with very limited management and stock assessment techniques, the complexity of fishery models and size and breadth of fishery data sets have gradually increased, which has coincided with increasingly intensive management measures used in the fishery. However, during the same period, the west coast fishery underwent a significant decline. As a symptom of this decline, several species of rockfish are currently designated as overfished, with rebuilding timelines of more than half a century. The west coast trawl fishery is a true multi-species fishery and the management protection (such as extremely low trip limits) afforded to overfished stocks has significant impacts on the economics of the trawl fleet. In order to evaluate the possible effects of these constraining species on fleet behavior and profitability, we develop a bioeconomic model of the west coast groundfish trawl fishery. We take a retrospective look, based on real data, at what could have happened in the west coast groundfish fishery if the stock of canary rockfish (Sebastes pinniger) had been managed to a range of harvest control rules starting from a time when canary rockfish were considered a healthy stock in the fishery. In particular, we are interested in how simple catch-based age-structure metrics could be used to effectively manage the stock of canary rockfish, and the tradeoffs between these and more complex techniques.