



Adapting Fisheries Management to a Changing Ecosystem
7th National Scientific Coordination Subcommittee Meeting
August 15-17, 2022, Harrigan Centennial Hall, Sitka, Alaska

Case Study 10

Is ignoring predation mortality leading to an inability to achieve management goals in Alaska?

Grant D. Adam, Kirstin Holsman, André E. Punt

ABSTRACT

The majority of tactical fisheries management relies on the use of single-species population dynamics models that explicitly assume the dynamics of individual populations are independent of one another. This is despite a large body of research demonstrating that the life history of fishes is impacted by the dynamics of their predator populations. While time-varying predation mortality is thought to represent a large proportion of mortality for groundfish in Alaska, United States, assessment models, biological reference points, and harvest control rules do not explicitly account for time-varying predation and assume time-invariant (but perhaps age-specific) natural mortality. Previous research has demonstrated that ignoring predator-prey dynamics can lead to a biased perception of stock status and poor predictive performance of assessment models. However, further research is needed to identify the relevance of time-varying predation mortality to single-species management performance while also accounting for the feedback between management strategies and fish populations through continued data collection and assessment. Here we conduct a management strategy evaluation based on two multi-species population dynamics models developed for groundfish in Alaska, United States to assess whether ignoring predation inhibits the performance of single-species management. Specifically, we use the two multi-species models developed for the Gulf of Alaska and Eastern Bering Sea as operating models to evaluate the ability of single-species management strategies to achieve single- and multi-species biological reference points, maximize catch, minimize catch variability, and reduce bias in biomass estimates.