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Kray Van Kirk* (kfvankirk@alaska.edu), 17101 Point Lena Loop Road, Juneau, AK 99801, and **Terrance J. Quinn II** and **Jeremy S. Collie**. *The influence of high trophic-level predators, data scarcity, parameter confounding, and model mis-specification on a multispecies age-structured assessment model for the Gulf of Alaska.*

A multispecies age-structured assessment model (MSASA) for the Gulf of Alaska is expanded from three species (arrow-tooth flounder (*Atheresthes stomias*), Pacific cod (*Gadus macrocephalus*), and walleye pollock (*Theragra chalcogramma*)) to include two major high trophic level predators: Pacific halibut (*Hippoglossus stenolepis*) and Steller sea lion (*Eumatopias jubatus*). Significant changes to trophic structures and predation links from the core model were observed. Inclusion of the larger predators resulted in increased predation on older prey ages, including those fully recruited into the commercial fishery. Survey selectivity and catchability are confounded with natural mortality in their relationship to determining cohort structure; including predation mortality can potentially reduce this confounding, resulting in improved model fits to catch data and survey indices. Simulation exercises show that model performance degrades more due to model misspecification and data scarcity than assumptions regarding data weighting and variance. The model structure is able to track complex population dynamics using a relatively simple predation framework, but variability in parameter estimates makes clear the need for improved stomach data. (Received September 20, 2011)