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Regional variation in the intensity of humpback whale predation on Pacific herring in the Gulf of Alaska

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ABSTRACT

We modeled the biomass of Pacific herring (*Clupea pallasii*) consumed by humpback whales (*Megaptera novaeangliae*) to determine if whales are preventing the recovery of some herring populations in the Gulf of Alaska. We estimated consumption, by whales, of two depressed (Lynn Canal, Prince William Sound) and one robust (Sitka Sound) herring populations during fall/winter of 2007-2008 and 2008-2009. Consumption estimates relied on observations of whale abundance, prey selection, and herring energy content along with published data on whale size and metabolic rate. Herring biomass removed by whales was compared with independent estimates of herring abundance to assess the impact of predation on each population. Whales removed a greater proportion of the total biomass of herring available in Lynn Canal and Prince William Sound than in Sitka Sound. Biomass removals were greatest in Prince William Sound where we observed the largest number of whales foraging on herring. The biomass of herring consumed in Prince William Sound approximated the biomass lost to natural mortality over winter as projected by age-structured stock assessments. Though whales also focused their foraging on herring during the fall in Lynn Canal, whales were less abundant resulting in lower

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