

**Foraging behavior and diving effort of a marine predator in relation to contrasting prey fields**

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Precipitous declines in pinniped populations in the North Pacific Ocean have highlighted the need for an understanding of predator-prey relationships in marine ecosystems; however, few studies have quantified pinniped foraging behavior in the context of prey availability. Pinnipeds may respond to reduced prey availability by varying time spent foraging, altering time-energy budgets, and traveling greater distances to forage. Each of these potential responses to changes in prey availability may result in increased energetic costs and ultimately population-level consequences. Our primary objectives were to determine how harbor seals adjust their foraging behavior relative to prey availability in different habitats in Glacier Bay National Park, Alaska, where seals have declined by 12.4%/year at terrestrial sites and 8.2%/year at the glacial ice site (1992-2008). Distance to foraging areas (n=76 seals) and diving behavior (n=32 seals) were quantified using VHF-telemetry and time-depth recorders from 2004-2007. Availability of pelagic prey was quantified using hydro-acoustic surveys near the two primary haulout sites in the Beardslee Islands (terrestrial site) and Johns Hopkins Inlet (glacial ice site). Across all years, prey density near terrestrial sites was greater than at the glacial ice site and the distance seals traveled to foraging areas appeared to be influenced by prey densities near those sites. The average foraging range for seals from terrestrial sites was 5.1 km compared to 35.1 km for seals from the glacial ice site. Prey fields at the terrestrial site were characterized by dense aggregations of small-schooling fish from the surface to 130 m. In contrast, prey fields at the glacial ice site were found at much deeper depths ranging to 340 m. The average maximum dive depth of seals from terrestrial sites was 191.2 m (SD=116.6) compared to 317.1 m (SD=155.7) for seals from the glacial ice site. Differences in foraging trip distances and dive effort of seals reflect contrasting prey fields in the two habitats. Seals at the glacial ice sites may travel further to forage; however, the increased trip distances and diving effort of seals may increase overall energetic costs and exposure to predators.

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