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Feeding-area home ranges for gray whales: A comparison between stocks.

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Satellite tags were applied to 59 gray whales from three stocks: 17 on Eastern gray whales (EGW) in Baja California, Mexico, in 2005; 35 on Pacific Coast Feeding Group gray whales (PCFG) off Oregon and northern California in 2009-2013; and 7 on Western gray whales (WGW) off Sakhalin Island, Russia, in 2010 and 2011. Tracking periods ranged from 3-408 days. A Bayesian switching state-space model (SSSM) was applied to Argos locations for each whale to create regularized tracks and estimate movement behavior. Migratory- and breeding-area locations, identified by visual inspection and behavioral mode classification from SSSM, were eliminated from the tracks. Local convex-hull utilization distributions were calculated for the remaining locations to determine feeding area home ranges (90% isopleths) and core areas (50% isopleths). EGWs had home ranges in the Bering and Chukchi seas, ranging from 7,066-30,650 km2. Home ranges for PCFG whales extended from northern California to Southeast Alaska and ranged from 81-13,634 km2. WGWs had very small home ranges near Sakhalin Island, ranging from 285-4,937 km2. Home ranges were significantly larger for EGWs than for either PCFG whales or WGWs (Kruskal Wallis p=0.02). Core area sizes ranged from 11-12,934 km2 for all whales and were largest for EGWs and smallest for WGWs; however these differences were not statistically significant (Kruskal Wallis p=0.06). Neither home range nor core area sizes were related to the number of days or number of SSSM locations used in the analyses (linear regressions p-values > 0.20). The differences in home-range sizes suggest differences in quality and/or quantity of food resources encountered by these three stocks and may also be a reflection of stock demographics. These results provide valuable information about high-use feeding areas for gray whales throughout the Pacific and suggest potential differences in sensitivities to changes in feeding-area habitat.