Palka, D. and Hammond, P.S. 2001. Accounting for responsive movement in line transect estimates of abundance. Can. J. Fish. Aquat. Sci. 58: 777-787.

Abstract:
A method is developed to account for effects of animal movement in response to sighting platforms in line transect density estimates using data on animal orientation. Models of expected distributions of animal orientation show that presence of responsive movement is determined by the ratio of animal sightings with angles of orientation in the third quadrant relative to the first quadrant. The distance at which response began is estimated using logistic generalized additive models of the relationship between radial distance and orientation. Density corrected for responsive movement is estimated by applying the Buckland and Turnock two-team analysis method to data poststratified into regions "close" to and "far" from (beyond the distance that responsive movement began) the observation platform instead of the original stratification by observation team. For data collected in the North Atlantic, white-sided dolphins (Lagenorhynchus acutus), harbor porpoises (Phocoena phocoena), and minke whales (Balaenoptera acutorostrata) responded by avoiding the survey ship, and white-beaked dolphins (Lagenorhynchus albitostris) were attracted to the ship. For these populations, this method to correct for responsive movement gave significantly higher estimates, from 1.4 to 2.7 times the uncorrected estimates.