Revised abundance estimate of harbor porpoise in West Greenland

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Abstract

A large-scale multispecies aerial survey conducted in August-September 2007 was used to estimate the abundance of harbour porpoises in coastal areas of West Greenland (Hansen & Heide-Jørgensen, 2013). The resultant estimate of the at-surface abundance estimate of harbor porpoises inside the surveyed area corrected for perception bias was 10,314 (cvs=0.35). Information from satellite tracking of 9 porpoises was used to estimate the proportion of porpoises that can be expected to be outside the survey strata during the survey period. The 9 porpoises spent a total of 73 % (cvs=0.13) of their days in August-September 2012 and 2013 inside the strata covered by the aerial survey. Correcting for this increases the at-surface abundance estimate to 14,129 (cvs=0.37) porpoises. Two porpoises tracked from July 2012 through October 2013 provided data on the time spent at the surface during daytime in August-September in both years. The average proportion of time spent at 0 m depth was 5.14 (cvs=0.13). Correcting the at-surface abundance estimate for porpoises detected breaking the surface provided a fully corrected abundance estimate 274,883 (cvs=0.39, 95% CI 130,954-576,909) harbour porpoises in West Greenland 2007.

Introduction

An abundance estimate of harbour porpoise in West Greenland was presented by Hansen and Heide-Jørgensen (2013). It was based on a multispecies aerial survey of cetaceans conducted along West Greenland in August-September 2007 (Fig. 1). The survey was flown at an altitude of 700 feet and was conducted as a double platform survey to allow for estimation of perception bias. The total effort was 6098 linear kilometers completed in sea states less than 3 and this provided a total of 35 sightings of harbour porpoises. The resultant estimate of the at-surface abundance estimate of harbour porpoises corrected for perception bias was 10,314 (cvs=0.35).

The estimate from the survey in 2007 covered the continental shelf areas of West Greenland and including a correction factor for detection of harbour porpoises in Danish waters to 1 m depth. However, recent satellite tracking of harbour porpoises have demonstrated that the porpoises that supply the coastal catches are recruited from a wider offshore area than included in the survey. Furthermore, new data on the availability of harbor porpoises to be detected at the water surface from telemetry studies in West Greenland provide estimate useful for correcting the at-surface abundance estimates to fully corrected estimates. Finally the correction for availability bias presented in Hansen and Heide-Jørgensen (2013) was considered unrealistic because it assumed detection to 1 m depth.

In this paper data from harbour porpoises tracked by satellite in West Greenland in 2012-13 were used to correct the at-surface estimate from 2007 for presence inside/outside the survey area and for the probability of detection at the surface.

Material and Methods