

Assessment runs for harbour porpoise in West Greenland

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ABSTRACT

I use an abundance estimate from 2007, historical catches starting from 1975, age-structure data from three periods, and an age- and sex-structured population model with exponential or density regulated growth to perform Bayesian assessment runs for harbour porpoise (*Phocoena phocoena*) in West Greenland. These runs combine two different availability corrections of the abundance estimate, with three different estimates of the historical catches, to provide initial runs that inform on the possible population dynamics of harbour porpoise in West Greenland.

INTRODUCTION

In this paper we build population models in order to examine the population dynamics of harbour porpoise (*Phocoena phocoena*) in West Greenland. The modelling framework is sex and age-structured, and it is used to reconstruct the historical trajectories from 1975 to 2020 based on abundance, catch and age-structure data. The underlying dynamics is assumed to be either uncheckered exponential growth or density regulated dynamics.

Our modelling is based on Bayesian statistics (Berger 1985; Press 1989), which is particularly useful when faced with limited or uncertain information. Major data uncertainties are often associated with life-history estimates, imprecise abundance estimates, additional variation in time-series of abundance estimates, and catch histories with uncertain loss and reporting rates. Our description of the dynamics aim to incorporate these uncertainties, and we use Bayes factor ratios in an attempt to identify the population dynamic model/s that provide the best description of the dynamics.

At the end we recalculate the uncertainty into management related estimates, including a trade-off space between assumed future catches and the probability of fulfilling a specified management objective. The method is useful in the sense that it integrates uncertainties on many factors into a single one-dimensional trade-off space with particular relevance to management issues.