

Reference number 3443

ICES CM 2013/K:10

Population models quantifying the value of coastal habitats for exploited species

Romuald N. Lipcius, David B. Eggleston, Joel Fodrie, Julia Moore, Sebastian J.

Schreiber, Jaap van der Meer, Karen van de Wolfshaar, Rita Vasconcelos

Abstract:

Although coastal habitats are recognized as important factors that influence demographic rates of exploited species, their specific effects on population dynamics and fishery production have rarely been quantified. We examined a suite of population models available to assess quantitative value of coastal habitats. These included (i) continuous time/differential equation, (ii) discrete time/matrix projection, (iii) integral projection, (iv) dynamic energy budget, (v) individual based, and (vi) statistical models. We provide an overview of the features and advantages of the different approaches, and we present examples of their use with diverse species of exploited fish and invertebrates such as Pacific halibut, eastern oyster, Atlantic red drum, and the Baltic clam. We also conclude that to attain quantitative estimates of the importance of habitats for fish and invertebrates, we need information not only on population fitness in different habitats (habitat quality), but we also need quantitative estimates of the availability of different habitat types (habitat quantity), specifically comprehensive habitat maps.

Keywords: Coastal Habitat, Population Dynamics, Quantitative Habitat Value, Fishery Production

*Contact Author: R. Lipcius, Virginia Institute of Marine Science, College of William & Mary, P.O. Box 1346, Gloucester Point, Virginia 23062, U.S.A., rom@vims.edu