

Patterns of Horseshoe Crab Egg Depletion by Foraging Shorebirds in Delaware Bay

Sarah M. Karpanty, *Department of Fisheries and Wildlife Sciences, 150 Cheatham Hall, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061*

James D. Fraser, *Department of Fisheries and Wildlife Sciences, 106 Cheatham Hall, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061*

Jonathan Cohen, *Department of Fisheries and Wildlife Sciences, 106 Cheatham Hall, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061*

Abstract: It has been postulated that the declining population of red knots (*Calidris canutus rufa*) is limited by the amount and availability of horseshoe crab eggs at Delaware Bay, a major stopover site. To test this hypothesis, we quantified rates of horseshoe crab egg depletion by foraging shorebirds from 15 May 2005–3 June 2005 on eight beaches on Delaware Bay. We compared the 1) numbers of eggs lost and 2) proportion of eggs lost directly between plots where birds were allowed to forage versus plots from which they were excluded in three beach microhabitats: wrack line (e.g., intertidal zone concentrations of organic debris), crab nest depressions, and randomly-selected sandy locations. When considering samples from wrack line alone, we found a net 86% egg loss between control plots where birds were allowed to feed versus areas from which they were excluded. With microhabitats pooled, we found no evidence of bird-induced depletion of either surface (< 1 cm) or sub-surface (1–3.5 cm) eggs. The proportion of eggs lost from wrack line sub-surface samples was negatively related to the initial number of horseshoe crab eggs on the study beach (AIC Ri = 0.45) and the number of spawning depressions on the beach (AIC Ri = 0.40). We found no relationship between initial crab egg density on the study beaches and rates of egg loss for either surface or sub-surface samples. Our finding that shorebirds foraging in Delaware Bay in 2005 did not measurably deplete crab eggs at the beach level is inconsistent with the hypothesis that red knots are currently limited by the availability of horseshoe crab eggs. Management for the recovery of the red knot population must consider factors outside of the Delaware Bay stopover in addition to the availability of food resources at this single site.

Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 61:115