ID: W2337561254

TITLE: Linking eelgrass decline and impacts on associated fish communities to European green crab Carcinus maenas invasion

AUTHOR: ['Kyle Matheson', 'Cynthia H. McKenzie', 'Robert S. Gregory', 'David Robichaud', 'Ian Bradbury', 'Paul V. R. Snelgrove', 'George A. Rose']

ABSTRACT:

MEPS Marine Ecology Progress Series Contact the journal Facebook Twitter RSS Mailing List Subscribe to our mailing list via Mailchimp HomeLatest VolumeAbout the JournalEditorsTheme Sections MEPS 548:31-45 (2016) - DOI: https://doi.org/10.3354/meps11674 Linking eelgrass decline and impacts on associated fish communities to European green crab Carcinus maenas invasion K. Matheson1,*, C. H. McKenzie1, R. S. Gregory1, D. A. Robichaud2, I. R. Bradbury1, P. V. R. Snelgrove3, G. A. Rose4 1Fisheries and Oceans Canada, Ecological Sciences Section, Northwest Atlantic Fisheries Centre, St. John?s, Newfoundland and Labrador A1C 5X1, Canada 2LGL Limited, Sidney, British Columbia V8L 3Y8, Canada 3Department of Ocean Sciences and Biology Department, Memorial University of Newfoundland, St. John?s, Newfoundland and Labrador A1C 5S7, Canada 4Centre for Fisheries Ecosystems Research, Fisheries and Marine Institute of Memorial University of Newfoundland, St. John?s, Newfoundland and Labrador A1C 5R3, Canada *Corresponding author: kyle.matheson@dfo-mpo.gc.ca ABSTRACT: Following their first detection in Newfoundland in 2007, populations of invasive European green crabs Carcinus maenas (Linnaeus, 1758) have increased and spread throughout eelgrass Zostera marina meadows. Green crabs can reduce eelgrass biomass by damaging rhizomes and plant shoots when burrowing for shelter and digging for prey. Empirically demonstrating large spatial-scale impacts of green crabs on eelgrass and subsequent cascading effects on the ecosystem has proven difficult because of the general absence of effective baseline studies prior to an invasion of green crabs. We conducted surveys in Placentia and Bonavista bays, Newfoundland (20 sites) to compare eelgrass and associated fish communities before and after an invasion of green crabs. We analyzed eelgrass surveys from 1998 and 1999 (before green crab) and again in 2012 (after green crab) using a Before-After-Control-Impact (BACI) study design in order to isolate effects of crab-induced eelgrass loss from effects independent of green crabs. Underwater video sampling evaluated eelgrass change over time and indicated a 50% decline in eelgrass percent cover since 1998 at sites with green crabs, and eelgrass declines up to 100% at sites with highest abundances and longest established presence of green crabs. Beach seining showed a sharp decline in abundance and biomass of fish (~10-fold between sites with and without green crabs) and indicated changes in fish community structure after green crab arrival at a site. Our results suggest cascading effects on fish communities and substantial potential impacts in coastal ecosystems occur following green crab invasion. KEY WORDS: Invasive species · Green crab · Eelgrass · Fish community · Before-After-Control-Impact · BACI Full text in pdf format PreviousNextCite this article as: Matheson K, McKenzie CH, Gregory RS, Robichaud DA, Bradbury IR, Snelgrove PVR, Rose GA (2016) Linking eelgrass decline and impacts on associated fish communities to European green crab Carcinus maenas invasion. Mar Ecol Prog Ser 548:31-45. https://doi.org/10.3354/meps11674 Export citation RSS - Facebook - Tweet - linkedIn Cited by Published in MEPS Vol. 548. Online publication date: April 21, 2016 Print ISSN: 0171-8630; Online ISSN: 1616-1599 

SOURCE: Marine ecology. Progress series

PDF URL: None

CITED BY COUNT: 64

PUBLICATION YEAR: 2016

TYPE: article

CONCEPTS: ['Carcinus maenas', 'Zostera marina', 'Fishery', 'Marine ecosystem', 'Geography', 'Seagrass', 'Biology', 'Ecosystem', 'Ecology', 'Decapoda', 'Crustacean']