Author's Accepted Manuscript

Towards 'ecological coherence': assessing larval dispersal within a network of existing Marine Protected Areas

Rebecca E. Ross, W. Alex M. Nimmo-Smith, Kerry L. Howell

www.elsevier.com

PII: S0967-0637(17)30094-8
DOI: http://dx.doi.org/10.1016/j.dsr.2017.06.004
Reference: DSRI2809

To appear in: *Deep-Sea Research Part I*

Received date: 15 March 2017
Revised date: 23 May 2017
Accepted date: 14 June 2017

Cite this article as: Rebecca E. Ross, W. Alex M. Nimmo-Smith and Kerry L Howell, Towards 'ecological coherence': assessing larval dispersal within a network of existing Marine Protected Areas, *Deep-Sea Research Part I* http://dx.doi.org/10.1016/j.dsr.2017.06.004

This is a PDF file of an unedited manuscript that has been accepted fo publication. As a service to our customers we are providing this early version o the manuscript. The manuscript will undergo copyediting, typesetting, an review of the resulting galley proof before it is published in its final citable form Please note that during the production process errors may be discovered whic could affect the content, and all legal disclaimers that apply to the journal pertain

ACCEPTED MANUSCRIPT

Towards 'ecological coherence': assessing larval dispersal within a network of existing Marine Protected Areas

Rebecca E. Ross*, W. Alex M. Nimmo-Smith, Kerry L. Howell

School of Biological & Marine Sciences, Plymouth University, Drake Circus, Plymouth, PL4 8AA, UK.
*Rebecca.Ross@plymouth.ac.uk

Abstract

The Convention on Biological Diversity mandates the establishment of Marine Protected Area (MPA) networks worldwide, with recommendations stating the importance of 'ecological coherence' (a responsibility to support and perpetuate the existing ecosystem) implying the need to sustain population connectivity. While recommendations exist for integrating connectivity data into MPA planning, little advice exists on how to assess the connectivity of existing networks. This study makes use of recently observed larval characteristics and freely available models to demonstrate how such an assessment could be undertaken. The cold water coral (CWC) *Lophelia pertusa* (Linnaeus, 1758) is used as a model species, as much of the NE Atlantic MPA network has been designated for CWC reef protection, but the ecological coherence of the network has yet to be assessed. Simulations are run for different behavioural null models allowing a comparison of 'passive' (current driven) and 'active' (currents + vertical migration) dispersal, while an average prediction is used for MPA assessment. This model suggests that the network may support widespread larval exchange and has good local retention rates but still has room for improvement. The best performing MPAs were large and central to the network facilitating transport across local dispersal barriers. On average, passive and active dispersal simulations gave statistically similar results, providing encouragement to future local dispersal assessments where active characteristics are unknown.

Accepted manuscript

Download English Version:

https://daneshyari.com/en/article/5764655

Download Persian Version:

https://daneshyari.com/article/5764655

Daneshyari.com