Conservation Letters
A journal of the Society for Conservation Biology
Open Access

CORRESPONDENCE

Reply to White et al.: Providing Perspective on Ocean Conservation Targets

Bethan C. O'Leary[1], Marit Winther-Janson[1,2], John M. Bainbridge[1], Jemma Aitken[1], Julie P. Hawkins[1], & Callum M. Roberts[1]

[1] Environment Department, University of York, Wentworth Way, Heslington, York, YO10 5NG, UK
[2] Sharks and Rays Australia, 4870 Cairns, Queensland, Australia

Keywords
CBD; global conservation targets; marine protected areas; models; quantitative synthesis; SDG14.

Correspondence
Bethan C. O'Leary, Environment Department, University of York, Wentworth Way, Heslington, York, YO10 5NG, UK.
Tel: 01904 322999; fax: 01904 322998.
E-mail: bethan.oleary@york.ac.uk

Received
31 March 2017
Accepted
26 April 2017

Editor
Edward T. Game

doi: 10.1111/conl.12380

Abstract

In O'Leary *et al.* (2016), we undertook a quantitative synthesis (rather than a true statistical meta-analysis) of research to consider how much of the sea should be protected to achieve various conservation and management goals. We aimed to provide perspective on the appropriateness of global marine protected area coverage targets, particularly the United Nations Sustainable Development Goal 14/Convention on Biological Diversity goals to protect >10% of the sea by 2020. White *et al.* (2017) question the methodology of our approach, and we offer the following response.

In O'Leary *et al.* (2016), we undertook a quantitative synthesis (rather than a true statistical meta-analysis) of research to consider how much of the sea should be protected to achieve various conservation and management goals. We aimed to provide perspective on the appropriateness of global marine protected area (MPA) coverage targets, particularly the United Nations Sustainable Development Goal 14/Convention on Biological Diversity goals to protect ≥10% of the sea by 2020. White *et al.* (2017) question the methodology of our approach, and we offer the following response.

White *et al.* (2017) make two criticisms: (1) the premise of using MPA models to explore required protection coverage and (2) our use of midpoints where models reported a range of required MPA coverage. In response to the first, we disagree that models provide no insight to the scale at which protection should be applied. For all their shortcomings, models represent one of the best means to understand system behaviour in situations where experiments are impractical or impossible. For example, evaluating the appropriateness of global MPA coverage targets based on real-world data would require large-scale, coordinated experiments throughout the oceans across decades. Alternatively, models can be used to explore the outcomes of different management approaches in mathematical "space," and have long been used to guide policy in fisheries management. They are also widely applied to explore issues such as what fraction of a coast should be protected versus fished to achieve maximum yields (Tanner 2001), ensure population connectivity (Botsford *et al.* 2001), or avoid stock decline (Grafton *et al.* 2009). Our use of the modeling literature represents a logical consolidation of these to explore the generality and robustness of their findings.

Regarding White *et al.*'s (2017) second criticism, we accept that for models designed to explore MPA coverage under a variety of external factors using the median value for reported MPA coverage required to achieve the goal(s) set is a simplification of the nuances these studies present. Recognizing that this approach cannot produce a

precise result, nor indeed should, since a single coverage target cannot achieve all goals; we avoided recommending an MPA percentage target figure. Instead, we drew two conclusions we believe are robust and well-founded considering the high consistency in outcomes from the various studies used: (1) the current UN target for 10% MPA coverage will not be enough to achieve many of the stated goals of this policy, and (2) that higher targets, in the region of several tens-of-percent coverage are necessary.

More broadly, White *et al.* (2017) criticize the value of having a single global protection target stating that required MPA coverage will vary with differing conservation/management objectives and local ecological and human factors. This is an important point that we raised in our article but we disagree that coverage targets hold no value. Most powerfully, they promote collective action worldwide that cumulatively will contribute to improved ocean management.

References

Botsford, L.W., Hastings, A. & Gaines, S.D. (2001). Dependence of sustainability on the configuration of marine reserves and larval dispersal distance. *Ecol. Lett.*, **4**, 144-150.

Grafton, R.Q., Kompas, T. & Pham Van, H. (2009). Cod today and none tomorrow: the economic value of a marine reserve. *Land Econ.*, **85**, 454-469.

O'Leary, B.C., Winther-Janson, M., Bainbridge, J.M., Aitken, J., Hawkins, J.P. & Roberts, C.M. (2016). Effective coverage targets for ocean protection. *Conserv. Lett.*, **9**, 398-404.

Tanner, J.E. (2001). Influence of harvest refugia on penaeid prawn population dynamics and sustainable catch. *Can. J. Fish. Aquat. Sci.*, **58**, 1794-1804.

White, J.W., Nickols, K.J. & Botsford, L.W. (2017). Response to O'Leary et al.: misuse of models leads to misguided conservation recommendations. *Conserv. Lett.*, **10**, 1-2.

