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Effective marine offsets for the Great Barrier Reef World Heritage Area



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ABSTRACT

Biodiversity offsets are a prevalent mechanism to compensate for development impacts to natural resources, but the appropriateness and efficacy of offsets remain the subjects of research and debate. Effective offsets for impacts to marine resources present even more challenges than those for terrestrial impacts. The Great Barrier Reef World Heritage Area is globally valuable for both biodiversity and heritage, but coastal development is undermining these values, and more effective offsets are needed to compensate for the damage. To improve the effectiveness of marine offsets for the Great Barrier Reef, we recommend that: (1) proponents be required to follow and document their adherence to the mitigation hierarchy, which considers offsets only as a last resort after avoidance and mitigation, (2) proponents and regulators consider the risk of offsetability prior to offset design, (3) the Australian government require offsets to achieve additional, measurable net benefits, relative to the counterfactual baseline, for all affected values, (4) specialist third parties (not government or proponents) design and implement marine offsets, (5) offsets are direct and specific to the affected values, with very minimal investment into research, (6) offsets are consolidated into strategic implementation sites, with long-term legal protection, that are consistent with the zoning of the Great Barrier Reef Marine Park and adjacent coastal land uses, (7) the time between impact and net benefit should be minimized, and net benefits should be maintained in perpetuity, (8) proponents pay the full cost of offset implementation, monitoring and evaluation, and cost is agreed upon before the development is approved, and (9) monitoring of the efficacy of offsets is separate to but coordinated with regional monitoring programs for ecosystem health, and monitoring data are made publically available. Within this context, and with careful and rigorous methods as described herein, offsets can contribute to maintaining the Outstanding Universal Value of the multiple-use World Heritage Area.

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1. Introduction

It has been estimated that, globally, business activities cause about US\$7.3 trillion worth of damage annually to the environment that is not paid for (formally, “externalities,” [TEEB, 2013](#)). Communities and governments are increasingly requiring businesses to compensate for this loss ([Houdet et al., 2012](#)). One way of doing so is for governments to require proponents of developments (hereafter, “proponents”) to compensate for their negative impacts by implementing activities aimed at restoring and maintaining biodiversity and ecosystem services (hereafter “offsets”).

Despite their prevalence, the appropriateness and efficacy of biodiversity offsets remain the subjects of debate ([Blundell, 2006](#); [Bull et al., 2013a](#); [Susie et al., 2013](#)). Offsets have been criticized for not meeting ecological targets due to a variety of factors including inadequate planning, compliance, and monitoring ([Race and Fonseca, 1996](#); [NRC, 2001](#); [Bentivoglio, 2003](#); [Levrel et al., 2012](#); [Maron et al., 2012](#); [Bull et al., 2013a](#)). Contrary to their intended purpose, offsets can contribute to biodiversity decline ([Walker et al., 2009](#); [Gibbons, 2010](#)). Poor offset planning is partly due to offset policies that are vague ([Bronner et al., 2013](#)) and inadequate ([Pickett et al., 2013](#)).

Studies of the efficacy of marine offsets are “scarce and patchy” compared to those for freshwater and terrestrial ecosystems ([Levrel et al., 2012](#)). In Canada, a comprehensive review of fish-habitat mitigation revealed that 86% of projects could not even be evaluated for effectiveness due to poor monitoring and records ([Harper and Quigley, 2005](#)). Among the few available marine assessments, [Bentivoglio \(2003\)](#) found that marine mitigation projects in the U.S. Pacific Islands required under wetland regulations have been only 65% effective.

While there is longstanding international support for the principle that polluters pay for their impacts ([OECD, 1972](#)), concerns remain that businesses should not be allowed to purchase the right to harm the environment ([McKenney and Kiesecker, 2010](#)). Even for those who believe that businesses should pay for compensatory actions, there is the complicating issue of equity: impacts to and benefits from the environment are shared by many, so requiring some but not all stakeholders to pay can be controversial. In this paper, we do not engage in the debate about whether offsets should be allowed. Rather, we assume that the current trend towards using offsets will continue, and investigate how to maximize the beneficial outcomes of these offsets while minimizing risks.

Two main types of environmental offsets are carbon offsets and biodiversity offsets, and each of these types can be mandatory or voluntary. This paper focuses exclusively on one type of environmental offset: mandatory biodiversity offsets that are required of proponents as part of legal approvals for development projects. In particular, the paper investigates offsets that are required for impacts to marine biodiversity and ecosystem services in the Great Barrier Reef World Heritage Area (GBRWHA).

The region is an important test case because of its global significance combined with increasing pressures on its biodiversity from major coastal developments ([Brodie and](#)

[Waterhouse, 2012](#); [GBRMPA, 2013](#)). The GBRWHA is also the focus of debate and policy formulation around marine offsets. The region was designated as a World Heritage Area in 1981 to recognize and protect the “Outstanding Universal Value,” which includes 62 biodiversity and heritage values (in this paper, the term “value” refers to these biodiversity and heritage values except when specific mention is made to “economic value,” [GBRMPA, 2013](#)). This designation is in danger because of concerns by the United Nations Educational, Scientific, and Cultural Organization over the Australian and Queensland Governments’ management of mining and associated port developments in and adjacent to the GBRWHA ([Douve and Badman, 2012](#)). In July 2013, the health was downgraded from “moderate” to “poor” ([Government of Queensland, 2013](#)).

The Australian and Queensland governments manage the GBRWHA through an intergovernmental agreement (1978) and a complex system of laws, regulations, and policies. The Great Barrier Reef Marine Park Authority (GBRMPA) is an independent statutory agency with primary responsibility for managing the Great Barrier Reef (GBRMP Act 1975) and assisting with the management of World Heritage values of the Great Barrier Reef, but several Commonwealth and Queensland agencies have jurisdiction over matters related to Great Barrier Reef health. The legislation that is most relevant to offsets is the federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act),¹ which requires that all impacts to the Great Barrier Reef from development must be avoided, mitigated, or offset. To guide the design and assessment of offsets, the Australian Department of the Environment implemented a biodiversity offsets policy (hereafter “Policy”) in October 2012.²

To date, over \$185 million dollars of marine offsets have been required under the Policy for the GBRWHA.³ These monies have not yet been spent due to scientific and political uncertainties. With large offset investments about to be made, and continuing development pressure along the GBRWHA coast that will involve further offsets, a critical analysis of the Policy and intended application to marine offsets is urgently needed to guide the development of effective marine offsets for the GBRWHA. This paper intends to inform the design of recently approved but not yet implemented offsets, and the future design, assessment, and approvals of marine offsets in the region.

The background section of this paper provides the context for this study by reviewing key concepts related to offsets, identifying challenges that are unique to marine offsets as opposed to terrestrial offsets, and drawing from the literature to identify nine core principles for effective design and implementation of offsets. Section 3 outlines current practice for designing and approving marine offsets in the GBRWHA

¹ <http://www.environment.gov.au/epbc/>.

² <http://www.environment.gov.au/epbc/publications/environmental-offsets-policy.html>.

³ Including the following referral numbers: EPBC 2009/4977, EPBC 2008/4402, EPBC 2008/4057, EPBC 2008/4468, and EPBC 2010/5521 (<http://www.environment.gov.au/topics/about-us/legislation/environment-protection-and-biodiversity-conservation-act-1999/public>).

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