



# Marine conservation in Oceania: Past, present, and future

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## ABSTRACT

The people of Oceania have long relied on the ocean for sustenance, commerce, and cultural identity, which promulgated a sophisticated understanding of the marine environment and its conservation. Global declines in ocean health now require innovative solutions that can benefit from customary knowledge and practices, which in the past led to sustainable marine resource use. The resurgence of local stewardship, which incorporates customary practices and governance, has shown promise in many locations throughout the Pacific, although a complete return to past practices is not fully implementable owing to the loss of traditional knowledge, centralized governmental structures, economic development, and globalization. Hybrid systems that incorporate elements of customary and contemporary management can overcome some of these limitations to implementation of successful local management, and lead to greater food security, social cohesion, and the creation of an adaptive system that can potentially mitigate the effects of climate change and other stressors.

## 1. Introduction

Owing to the failures of conventional ocean management, there is a growing interest in exploring new and innovative approaches to conserving marine ecosystems and the benefits they provide to current and future generations. Nowhere is this more critical than in the islands of Oceania, where the ocean has provided important cultural connections and life sustaining services for millennia. The knowledge and values of indigenous peoples are increasingly being recognized as essential to the sustainable management of the coupled human-natural world (Berkes, 2012). Integrating traditional ecological knowledge and customary management practices into contemporary marine management has shown promise in many places, and these practices provide adaptive approaches to confront changing socio-economic and environmental conditions (Johannes, 2002a; Cinner and Aswani, 2007). Because of their long history of ocean use, much can be learned from the indigenous practices of the people of Oceania, and how these practices can contribute to innovative thinking about ecosystem-based management in the modern-day world.

In this article, I explore the knowledge and values that allowed the people of Oceania to develop sustainable use of their marine resources, followed by the demise of these systems after western colonization and the breakdown of traditional societies. The current renaissance of customary stewardship has resulted in not only more effective management, but also a cultural reawakening in many of these island nations. The integration of customary and contemporary management regimes

holds great promise for reducing reliance on foreign goods and services, while also improving social cohesion. Finally, I explore how the future management of the region's marine resources may be affected by climate change and other global, as well as local stressors, and how these management regimes may be able to adapt to these changes.

This review is based on my 35+ years of experience working throughout the Pacific region, with an emphasis on artisanal fisheries and traditional and local ecological knowledge. While much has been written about various aspects of marine conservation in Oceania, this work strives to take a more holistic view of how current practices have been influenced by the culture and history of the region and how these can help inform sustainability of people and place well into the future. I conducted a comprehensive review of the literature and attempted to synthesize these findings based on my previous experiences, as well as a multitude of discussions with practitioners, researchers, and governmental and non-governmental actors. Although it is not possible to fully describe the wealth of knowledge and information found within this vast region, attempts were made to be as wide-ranging and unbiased as possible. The intent of this review is to provide a broad overview of past, present, and potential future stewardship and conservation approaches across Oceania, which can also help identify solutions to ocean degradation elsewhere around the world.

## 2. Early colonization

The focus of this article is on what is described as remote Oceania,

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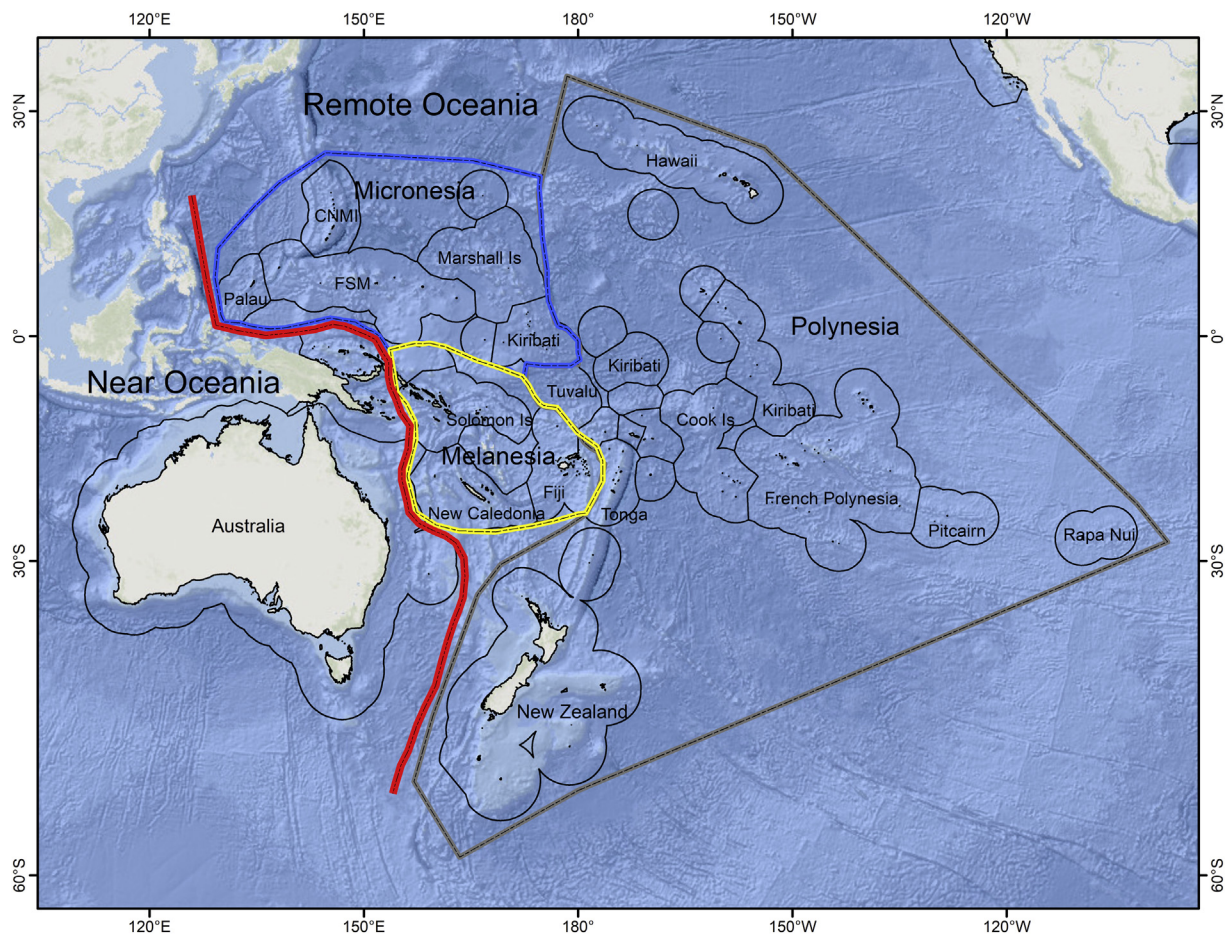


Fig. 1. Near and remote Oceania.  
(From Johannes (1978) and Bambridge (2016).)

which included the islands of Polynesia, Melanesia (excluding New Guinea), and Micronesia (Fig. 1, Table 1, Johannes, 1978; Bambridge, 2016). Melanesian ancestors arrived first to the region, settling in the high islands of the Western Pacific where they found abundant resources and complex topographies (Bellwood, 1980). In contrast, the resource-poor low islands of Polynesia and Micronesia provided the impetus for extensive sea travels and expansion into the outer edges of the Pacific (Sheppard et al., 2011). The first colonists to this region likely came from Southeast Asia between 4000 and 2000 BCE, with the earliest archaeological evidence found on the island of Saipan in the Northern Marianas Islands, dating back to ~1500 BCE (Carson and Kurashina, 2012). As colonization continued to the east across ever increasing distances between islands, these people developed progressively more sophisticated navigational skills and a growing knowledge of the oceanic environment. Long before Europeans were sailing out of sight of land, Pacific Island navigators were voyaging thousands of kilometers across the entire Pacific (Finney, 1977). The knowledge acquired as these islanders crossed this vast region led to the creation of social systems that fostered sustainable use of the marine environment.

While there is evidence that the regions that make up Oceania had different processes of cultural diversification owing in part to environmental settings and the differential size of the islands (Sand, 2002), many communities throughout the tropical Pacific share a similar knowledge of basic resource conservation principles that are the result of centuries of continuing experimentation and innovation (Wilhelm et al., 2014). Localized adaptive management was based on customary knowledge and practices and was responsive to changes in local environmental and social conditions (Ruddle, 1996; Johannes, 1998a). Long before western societies recognized the limits of ocean

resources, the people of Oceania developed methods to safeguard against the collapse of these invaluable resources (Johannes, 1978). Their long history of conservation was motivated by scarcity, limited resources, and climate variability. Some species were referred to as ‘famine foods’, suggesting that food needs were not always met (Titcomb, 1972). Some Pacific Island cultures learned that their resources were limited and introduced appropriate conservation measures, while others exceeded those limits, which ultimately led them to overshoot their carrying capacity (Johannes, 2002a; Tainter, 2006).

Not all these practices were developed for conservation purposes; many had cultural roots and were designed to maintain political structure and order (Ruddle, 1996; Colding and Folke, 2001). In contrast to the densely populated islands of Polynesia and Micronesia, human population densities in parts of Melanesia prior to European colonial intrusions were likely too low to have generated sufficient fishing pressure to drive the evolution of a conservation ethic (Foale et al., 2011; 2016). Therefore, customary marine tenure and fishing taboos in this region were primarily designed to manage relationships between social groups, rather than to sustain food security (Foale et al., 2016). Although tenure and taboo systems were not inherently designed to ensure sustainable management outcomes in these areas, stable resource availability for local use was sometimes a by-product (Jupiter, 2017).

In parts of Oceania, especially lightly populated coastal areas of Melanesia, marine resources existed in quantities sufficient for the needs of the local populations to be met (Johannes, 1989). In some of these areas, there is little evidence of a marine conservation ethic, because people never experienced overexploitation of these resources (Johannes and MacFarlane, 1991) or relied more heavily on terrestrial

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