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Who trusts whom in the Great Barrier Reef? Exploring trust and communication in natural resource management

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ABSTRACT

Trust is an important element of social capital that is increasingly recognized as integral to effective natural resource management, yet the concept remains relatively unexplored in the environmental social sciences. In large, complex resource systems where numerous and diverse stakeholders receive information from a variety of sources, managers must make efficient use of limited financial and human resources by communicating effectively with the public and targeting engagement efforts to build trust where needed. Using Australia's Great Barrier Reef (GBR) as a case study, we investigated to what degree stakeholders trust reef-related information from five sources: research institutions, non-government organizations (NGOs), the Great Barrier Reef Marine Park Authority (GBRMPA), industry groups, and friends, family and coworkers. Additionally, we explored whether trust is demographically differentiated among resource users (n = 2985), considering four demographic variables: age, gender, residential location (north, central, and south), and stakeholder group (tourism operators, commercial fishers, indigenous residents, and non-indigenous residents). Overall, research institutions were the most trusted source of information, followed by friends, family, and coworkers, NGOs, the GBRMPA, and industry groups. Trust did not differ with gender, and was negatively related to age for all sources of information except friends, family and coworkers. Stakeholders living in the northern GBR region were less trusting of research institutions compared to those living in the central and southern regions. Finally, for most information sources, trust was differentiated across stakeholder groups, with commercial fishers reporting the lowest levels of trust in the GBRMPA, research institutions, and non-government organizations. In demonstrating the heterogeneous nature of trust in the GBR, this study presents a necessary first step towards developing targeted strategies to build trust, improve communication, and promote stewardship in a large, complex natural resource system.

1. Introduction

Social capital is widely recognized for its potential to contribute to the collective management of natural resources (Pretty, 2003; Ostrom, 2009), and collaborative management arrangements – which seek to build social capital – are becoming increasingly common (e.g. Gutiérrez et al., 2011; Cinner et al., 2012). Social capital represents "features of social organization such as networks, norms, and trust that facilitate coordination and cooperation for mutual benefit" (Putnam et al., 1993). In particular, shared understanding of resource-related issues and other common problems, elements of cognitive social capital, can increase the likelihood of collective action in natural resource management (Ostrom, 2005; Brondizio et al., 2009). This mutual understanding is developed through the transfer, sharing, and exchange of information and knowledge at various scales of organization (Bodin and Prell, 2011).

Trust, an element of relational social capital, is considered fundamental to human relationships (Cook, 2001), and is recognized as integral to effective resource management (Pretty and Ward, 2001; Smith et al., 2013). Defined as a "willingness to accept vulnerability based upon positive expectations of the intentions or behaviours of another" (Rousseau et al., 1998:395), trust facilitates cooperation by lowering the transaction costs of working together (Pretty, 2003). Despite its recent emergence as a research focus in natural resource management, several studies have already demonstrated links between trust and positive outcomes. For example, trust in leaders and management

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agencies has been shown to: 1) increase support of management decisions (Winter and Cvetkovich, 2010); 2) minimize resistance to planning efforts (Vaske et al., 2007; Lachapelle and McCool, 2012); 3) drive cooperation and compliance with regulations (Leahy and Anderson, 2008); 4) promote stewardship (Gilmour et al., 2011); 5) contribute to perceived legitimacy of management institutions (Turner et al., 2016); and 6) relate to perceived benefits of protected area management (Diedrich et al., 2017). This work emphasizes the important role of trust in natural resource management, and highlights the need for management agencies to build and maintain trust with resource users.

Trust is also important for effective communication (Hill et al., 2009) because people's willingness to accept communicative messages is related to the degree to which they trust the information and its source (Thiede, 2005; Pieniak et al., 2007). Trust can therefore influence how information flows through social systems and the level of influence it can achieve. For management agencies aiming to influence stewardship and compliance behaviour among resource users, soft policy measures – based on information dissemination and persuasion techniques – are commonly used to promote environmental awareness and concern. However, simply providing information is often not sufficient to influence attitudes and behaviour (Gardner and Stern, 1996; Stern, 2000) – a number of factors can play a role (Stern, 2000), including trust in the information source. To date, however, trust in different sources of information remains underexplored in natural resource management contexts (but see Sabatier et al., 2005; Leahy and Anderson, 2008; Mase et al., 2015).

Understanding who people trust for natural resource information is important, as it can facilitate targeted engagement and communication strategies aimed at influencing stewardship and compliance behaviour. By identifying patterns of differentiation in trust across information sources and demographic subgroups of resource users, management agencies can target efforts to: 1) build trust where needed; and 2) communicate more effectively by disseminating information through trusted networks. This is likely to be of particular importance in large resource systems where limited financial and human resources must be used efficiently to communicate with numerous and diverse stakeholders. The few studies that have investigated trust in management related information (e.g. Leahy and Anderson, 2008; Mase et al., 2015) have examined patterns of differentiation with respect to multiple sources of natural resource information, but have not explored social and/or demographic differentiation in trust. Indeed, to the best of our knowledge, this paper presents the first study to simultaneously explore how trust is differentiated across information sources and demographic subgroups in a natural resource management context.

This paper aims to reveal patterns of differentiation in trust in natural resource communication, using Australia's Great Barrier Reef (GBR) as a case study. The GBR, the world's largest coral reef ecosystem, encompasses numerous resource users from diverse stakeholder groups including residents, commercial fishers and tourism operators (Marshall et al., 2016). Resource users in the GBR region may obtain reef-related information from a variety of sources including industry representatives, research institutions, government managers, non-government organizations (NGOs), as well as friends, family and co-workers. Here we investigate to what degree resource users trust the reef-related information they receive from different sources, and explore whether trust is demographically differentiated. By providing a snapshot of trust in a natural resource management context, the knowledge gained from this study may aid managers in targeting communication and engagement efforts to build trust and foster stewardship in a large, complex resource system.

2. Methods

2.1. Great Barrier Reef

The GBR is a UNESCO World Heritage Site located on the largest coral reef system in the world, spanning over 2000 km along Australia's northeastern coast (Fig. 1). The multiple-use marine park uses an extensive zoning system to manage various human activities including fishing, recreation and tourism (Day, 2002). The Great Barrier Reef Marine Park Authority (GBRMPA) is the main statutory body for the GBR, operating under what can be considered a hierarchical system of governance. Federal, state and local agencies are involved in managing the GBR, and governance has been described as highly centralized as most resource users are not directly involved in decision-making (Evans et al., 2014). The ecological effectiveness of the GBR marine park is highly dependent on users' compliance (McCook et al., 2010), and the GBRMPA recognizes the importance of fostering stewardship and voluntary compliance (GBRMPA, 2014). The GBR faces increasing pressures from climate change, poor water quality and coastal development, and compliance with fishing regulations remains an issue in both the recreational and commercial fishing sector (GBRMPA, 2014). Given the important role of trust in contributing to positive biological and social outcomes, coupled with the complexity and scale of the resource system, the GBR provides a valuable opportunity to explore how trust in natural resource communication is differentiated across a large sample of stakeholders.

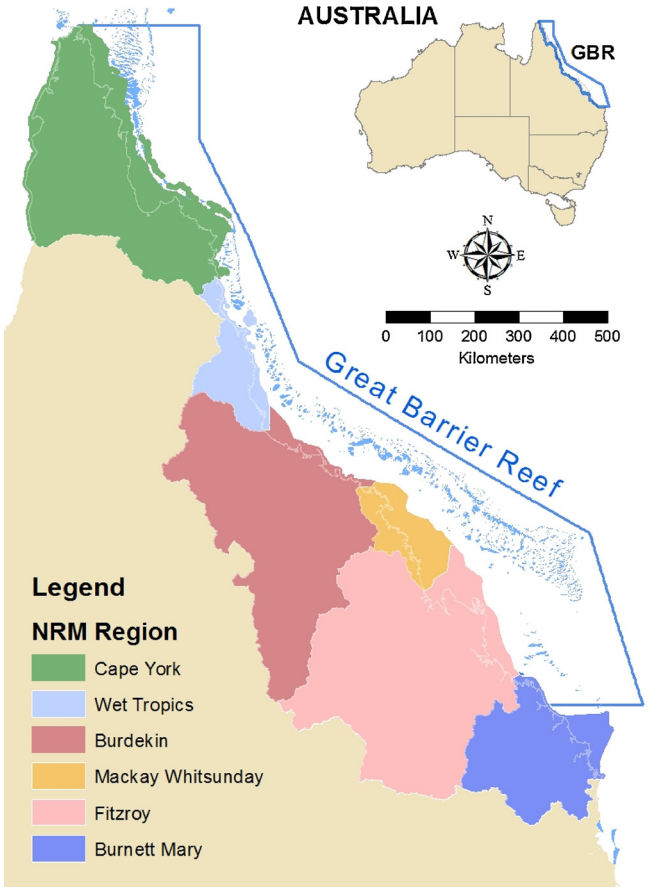

Fig. 1. Map of the Great Barrier Reef (Queensland, Australia), showing the six regional natural resource management areas. This study divided the six areas into three regions: North (Cape York + Wet Tropics), Central (Burdekin + MacKay-Whitsunday), and South (Fitzroy + Burnett Mary).

2.2. Sampling

We collected data on trust in GBR-related information through surveys with 2985 individuals in 2013 (Table 1; Marshall et al., 2016). Surveys were comprised of primarily closed ended, Likert scale questions. Respondents belonged to one of four key GBR stakeholder groups: