



A typology of graziers to inform a more targeted approach for developing natural resource management policies and agricultural extension programs

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ABSTRACT

The use of landholder typologies to assist in the development of natural resource management (NRM) policies and agricultural extension programs has increased considerably in the past decade. In this paper we explore the potential of developing a typology of graziers to more effectively tailor policies and programs with the aim of improving land management outcomes. This is of particular importance since growing public concern about the environmental performance of the beef industry has led to increasing pressures on graziers to change their land management practices to decrease off-property impacts. To gain a better understanding of graziers' land management practices and the factors that inform their decisions on how they manage their land we first developed a conceptual model of the relationship between grazer and grazing land where both can, ideally, thrive through conscious and timely land management decisions made and implemented by the grazer. A successful grazer land relationship is likely to be consistent with value systems and social and economic factors, although the particulars of any individual approach may vary spatially and temporally. These factors, in particular graziers' values and motivations to follow a particular management strategy, guided the development of our typology of graziers. Australia's Bowen–Broken basin, which has been identified as a major contributor of sediment and nutrients that enter the Great Barrier Reef lagoon, served as a case study for this research. Three broad types of graziers emerged: (1) traditionalists, (2) diversifiers, and (3) innovators. The authors argue that by understanding graziers' values and motivations underlying each of the grazer types, government agencies and NRM organisations can more effectively tailor their policy and extension programs towards specific types of graziers and can work with specific groups to achieve reductions in sediment and nutrient runoff from grazing properties.

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Introduction

It is broadly accepted that developing effective natural resource management (NRM) policies and agricultural extension programs necessitates better understanding of the people who manage these resources, including their socio-economic circumstances and value systems (e.g. Costa and Rehman, 1999; Cary et al., 2001, 2002; Webb et al., 2004; Vanclay, 2004; Pannell et al., 2006; Kuehne et al., 2007; Lankester et al., 2009; Sherren et al., 2010; Greiner and Gregg, 2011). Cody (2004) argues that the condition of the natural resource base, a land manager's social and demographic characteristics, management practices and financial circumstances are all interrelated. This poses a major challenge to policy makers,

NRM and agricultural extension program designers who are trying to avoid a blanket approach to the development of policy instruments while recognising that it is impossible to tailor policies and programs to individual circumstances for maximum uptake. Many researchers have recommended the use of landholder typologies to improve the effectiveness of agricultural, forestry and NRM policies and extension programs (e.g. Boon et al., 2004; Emtage, 2004; Vanclay, 2005; Emtage et al., 2006, 2007; Van Herzele and Van Gossum, 2008).

The aim of our research was to develop a typology of graziers in the Bowen–Broken basin, Australia, and to explore its potential for supporting NRM policies and agricultural extension programs tailored to decrease off-property impacts. The Bowen–Broken basin, which has been identified as a major contributor of sediment and nutrients that enter the Great Barrier Reef (GBR) lagoon, served as case study (Prosser et al., 2001; Brodie et al., 2003; Bartley et al., 2004; O'Reagain et al., 2005). Loss of sediment and nutrients

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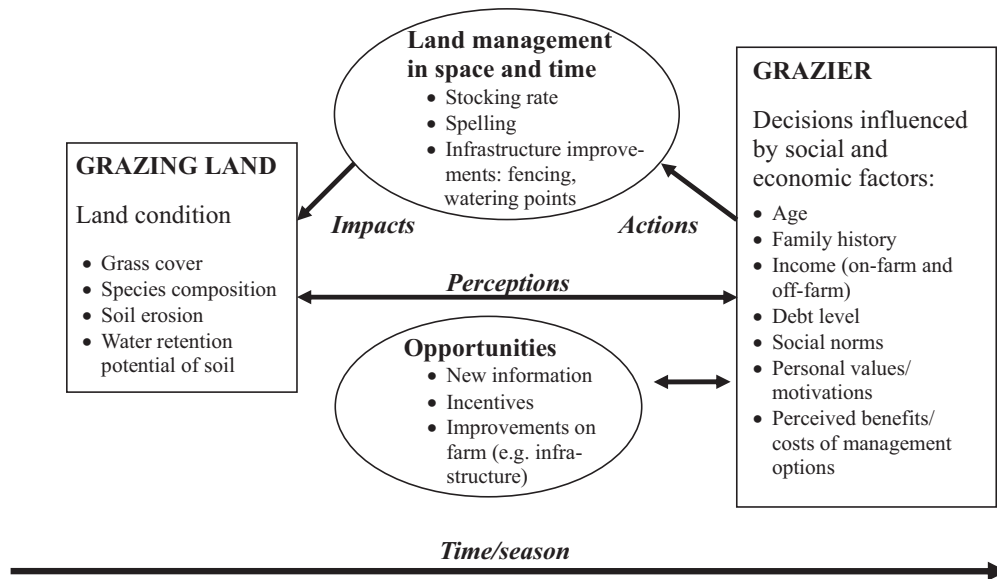


Fig. 1. Conceptual model of the dynamic relationship between grazer and grazing land.

not only affects livestock production, future productivity and profitability of grazing enterprises in the Bowen-Broken basin, but also impacts upon and threatens the long-term ecological, social and economic sustainability of the GBR (Access Economics, 2007). This has led to growing public concern about the environmental performance of the beef industry and pressure on graziers to change their management practices to decrease off-property impacts.

While individual approaches to grazing land management may vary spatially and temporally across the Bowen-Broken basin, there are likely to be consistent characteristics and patterns of value systems, motivations and social and economic factors which influence graziers' decision-making (e.g. Beedell and Rehman, 1999; Costa and Rehman, 1999; Barr and Cary, 2000; Fielding et al., 2005; Pannell et al., 2006; Greiner et al., 2008; Richards and Lawrence, 2009). Taking a transdisciplinary systems approach (Tress and Tress, 2001), these underlying characteristics and patterns of value systems, motivations and social and economic factors that are founded on graziers' perceptions of their land, guided the development of our typology of graziers. Thereby our typology contributes to the development of the less advanced and more contentious typologies which are based primarily on values and motivations and not on quantifiable indicators (Emtage et al., 2007). We argue that the typology's underlying patterns of value systems and motivations provides policy makers, NRM and agricultural extension program designers with critical social and economic information to more effectively tailor their policies and programs aimed at influencing graziers to adopt more sustainable land management practices (e.g. Emtage et al., 2007; Kuehne et al., 2007; Greiner et al., 2008; Greiner and Gregg, 2011). It also supports Roger's (2003) theory that it is the adopter's perception of the innovation that affects its adoption.

This paper is structured to first introduce the conceptual model of the dynamic relationship between grazer and grazing land, which we developed at the beginning of the project to form the theoretical basis for this research. The conceptual model determined the methods used to develop a grazer typology for the Bowen-Broken basin. Three types of graziers: *traditionalists*, *diversifiers* and *innovators* emerged from the analysis which we present including the defining features of each type. We then discuss the implications of our typology for developing NRM policies and agricultural extension programs to reduce sediment and nutrient runoff from

grazing properties. Finally, we conclude the paper by highlighting the contribution of our typology to the academic literature and future research needs.

Conceptual model of the relationship between grazer and grazing land

To gain an increased understanding of graziers' relationship to their land and their capacity to achieve sustainable land management practices, it was necessary to develop a theoretical foundation for our research. The conceptual model that we subsequently developed is based on a transdisciplinary systems approach to landscape research (Tress and Tress, 2001) where the grazer and the grazing land he/she manages is part of a larger grazing ecosystem. The model also builds on the notion that the condition of grazing lands is largely the outcome of graziers' land management practices in space and time, and the primary factor directly influencing the accelerated loss of sediment and nutrients (e.g. McIvor et al., 1995; Stafford Smith et al., 2000) into riverine systems (e.g. Prosser et al., 2001). Some key social and economic factors influence graziers' decisions on how they manage their land and whether or not they change their current practices (Fig. 1). Age, family history, history of the grazing property, land tenure, income (on-farm and off-farm), debt level, social norms, personal values and motivations and perceived benefits and costs of change are considered key factors that influence graziers' perceptions, management decisions and actions (e.g. Abel et al., 1998; Emtage et al., 2006; Pannell et al., 2006; Greiner and Gregg, 2011). Depending on the perceived current condition of the land, that is the amount and quality of feed in the paddock, the grazer may act by adjusting land management practices such as stocking rate, spelling (i.e. resting of grazed land), fencing and/or watering points (Kilpatrick et al., 1999). The effects on land condition will be perceived by the grazer through, for example, changes in grass cover, species composition, soil erosion and water retention potential of the soil. Based on the perceived benefits, the grazer may maintain the management practice based on the perceived and anticipated benefits (Landsberg et al., 1998). In our conceptual model we assume, that access to new information, incentive schemes and opportunities to carry out improvements on farms may help or stimulate graziers

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