

Reshaping the Management of Property Rights, Restrictions and Responsibilities

Rohan BENNETT, Australia

Key words: land administration, RRRs, property interest, property object.

SUMMARY

Property rights are managed well by the modern economy. They are supported both theoretically and administratively- by a framework of legal and economic theory and sophisticated registration systems. In contrast, the restrictions and responsibilities imposed on land users in support of sustainable development are not well managed. They lack theoretical support, administrative coherence and basic information systems.

For the first time, a technical capacity to manage land information without the constraints of history or administrative silos is available. Land administration literature now suggests that all rights, restrictions and responsibilities (RRRs) should be included in the land administration system. However, without a framework for differentiating, comparing and understanding RRRs holistically, inclusion is impracticable and can only occur on a case by case basis.

This article provides the first step in developing an overall and coherent approach to the problem. It redefines all property rights, restrictions and responsibilities as *property objects* and identifies five key attributes: objective, action regulated, spatial extent, duration and people impacted. Individual property objects can be classified according to their attributes. This allows us to select appropriate administration strategies for RRRs, strategies that will reshape the management of land and ultimately assist in the achievement of sustainable development objectives.

Reshaping the Management of Property Rights, Restrictions and Responsibilities

Rohan BENNETT, Australia

1. INTRODUCTION

In 2005, the Australian state of Victoria had over 523 Acts applying rights, restrictions and responsibilities (RRRs) to land (Bennett et al, 2005). The RRRs regulate a diverse range of land based activities, ranging from the complex management of national parks and water catchments, to the more obscure declaration of nude bathing areas and controls over rain making activities. This enormous increase in government-created RRRs occurred over the last 50 years and has produced complicated and disparate administrative systems. Moreover, with environmental and social sustainability issues driving government policy, RRRs and isolated administrative systems are being created at an increased rate. A clear problem now exists with the enforcement of some laws and the management of disparate sets of land information.

This article is written at a time when analysis is in an intermediary phase; it is questionable whether existing land administration systems can manage *all* rights, restrictions and responsibilities. The phrase RRRs is therefore used by land administration practitioners to refer to the perceived failure of national governments to comprehensively identify how they regulate land. Much has been published on the need to manage RRRs better (Kaufmann and Steudler, 1998; Ting and Williamson 1998 and 1999; Ting 2002; Lyons et al, 2004; Enemark et al, 2005). The visionary document, Cadastre 2014, suggested that future land administration systems reveal the complete legal situation of land, including all public rights and restrictions (Kaufmann and Steudler, 1998). Enemark et al's (2005) Land Management Paradigm proposed that mere information integration is not enough; we must proceed further and integrate the actual management processes of land use, tenure and development. These articles along with numerous government initiatives suggest that rights and other interests, especially those created by public administration, should be treated holistically. This is correct: holistic treatment of land information generated by a nation's administration and land market is no longer arguable; it is essential.

The substantial body of literature that deals with holistically managing RRRs contrasts with the limited amount that deals with actually implementing the concept. Significantly, Lyons et al (2002) and (2004) did offer a clever implementation pathway; however, its 'one size fits all' large-scale recentralization of land administration also assumes that a single strategy can solve the problems of organizing all RRRs. This model does not consider the substantial costs of employing such a system or the fact that many of the existing systems work well. Moreover, they do not consider that existing cadastral and property registration systems risk becoming cluttered and unworkable if they are used to administer all RRRs.

Interests in land and resources can be treated within a well organized, holistic, information framework without each being managed in the same way by a single organization. This paper attempts to develop an analytical framework or ontology to define and differentiate RRRs by building on this previous research. The expression “rights, restrictions and responsibilities” is too general and has led to the large, generalized, ‘one size fits all’ administration proposals. More precise definitions are needed to help governments design appropriate RRRs and administration systems which are suitable for different circumstances.

Governments have many options when creating RRRs (what interest they create over the land, where they apply, who they apply to, when they apply, how they will be enforced) and depending on what choices are made, different human behaviours will result. Consequently different administrative responses may be required. For example, in Victoria, the right to own private property (*Property Law Act 1958*, Vic, Section 18A-20) and the right for a cadastral surveyor to enter private space (*Surveying Act 2004*, Vic, Section 58) are both RRRs; however, they are very different in nature. A private owner is entitled to transfer the property, make alterations to the property, and profit from the use of the property; a surveyor cannot do any of this, he or she may only enter the property. Conversely, a surveyor’s interest applies to all land in a jurisdiction, whereas, the private owner’s interest only applies to a single parcel. Only registered persons can hold the surveyor’s entry right whereas anyone can attain private property. Ownership of land is property, and receives all the opportunities of this classification; the entry right is not.

This example shows just how different two RRRs can be. Although both are defined as RRRs, the reasons for their creation, the actual interests created, who they apply to, when they apply and where they apply are very different. Consequently the administrative arrangements are different. The surveyor’s right has few variables and does not need to be listed on a title, it does not require anywhere near the same amount of administration as the rights of a private property owner.

That the term RRRs is too broadly defined is further supported by the results of a complete study of all the diverse RRRs in legislation in the Victorian and Australian Government statute books (Bennett et al, 2005). The study revealed that the classification “rights, restrictions and responsibilities” was too broad to provide administrative guidance. The experience in daily practice of a property lawyer supports this view because standard enquiries cover specific rights and restrictions. The need for tailored administrative responses is also supported in other fields of research. RRRs administration relates closely to the broader field of Information Management: both apply systems theory and information technologies to organize data. Information Management literature suggests that many of the terms used within the discipline require more precise classification. For example, Cullen et al’s (2004) paper on IT Outsourcing recommends that different outsourcing arrangements can be very diverse in nature and therefore a model capable of differentiating them is required.

Therefore, *how do we best describe and classify property rights, restrictions and responsibilities?* This question is answered by introducing the *property object* concept, a precise but flexible analytical framework capable of applying to all RRRs whilst identifying

their specific attributes. The property object is defined as *an advanced descriptive framework of the key attributes that make up an individual property right, restriction or responsibility*. The property object permits a holistic treatment of all RRRs, whilst allowing for meaningful contrast between RRRs. It conveys the essential information needed by Government and citizens about land and resources in an appropriate administrative framework while delivering sustainable development objectives.

This paper uses Cullen et al's (2004) IT Outsourcing paper as a guiding framework to introduce the property object concept. It defines the five attributes of an individual *property object* and then explains why the concept matters and how it can be used to create order and understanding out of the masses of legislation. Case studies are used to demonstrate how the property concept can be used to differentiate between RRRs and how they may require different administrative approaches. Moreover, it shows that regardless of the RRRs design, certain attribute information must be made available when creating and managing all property objects.

2. FIVE KEY ATTRIBUTES OF PROPERTY OBJECTS

It is possible to describe RRRs in many ways, but the descriptions are inescapably deficient. The fields of law and economics offer different approaches to RRRs and will identify features of rights and responsibilities that are important to their disciplines. This paper abandons these established approaches in favour of a neutral method which focuses on the information needed to perform essential land and resource related tasks of government and business. From the perspective of land management and administration, a study of state and federal statute books suggests that the five attributes in Figure 1 help us understand the nature of, and difference between, individual RRRs.

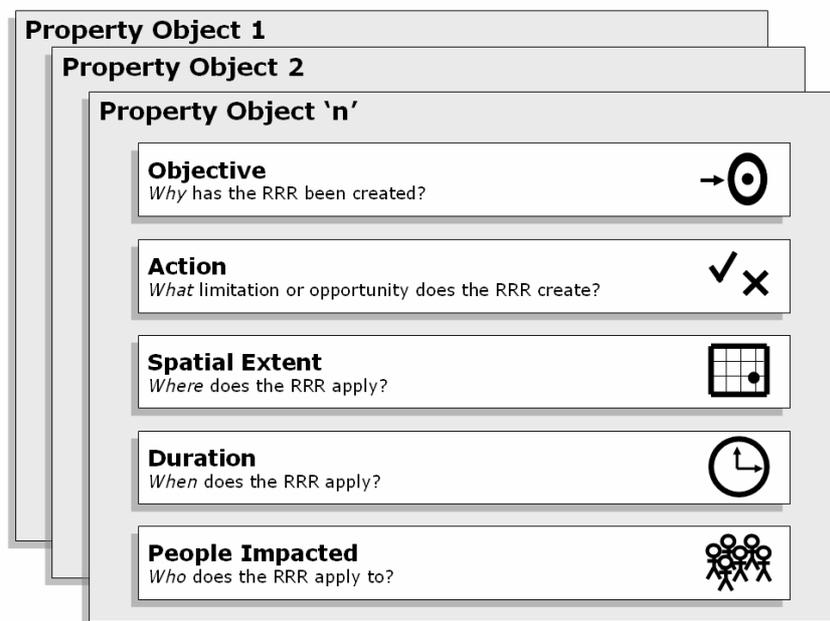


Figure 1. The five key attributes of a *property object*

2.1 Objective

The *objective* attribute describes the reason(s) for enacting the RRR in legislation or contract. Different objectives may prompt the creation of particular RRRs. Government policy drivers and personal objectives will change over time: Table 1 (see below) outlines the key objectives behind RRRs, in no particular order. RRRs with similar objectives often need to be managed together in a portfolio arrangement: historically, the failure to do this has prompted confusion and information voids for citizens and government agencies.

Table 1. Objectives behind the creation of RRRs/ *property objects*

Options	Description	Examples
Environmental conservation	RRRs created with the intention of conserving, protecting and regenerating the flora and fauna of the natural environment.	<ul style="list-style-type: none"> • Crop growing restrictions • Tree clearing restrictions • Carbon trading rights • Post-mining rehabilitation responsibilities
Social conservation and equity	RRRs created with the intention of protecting cultural landmarks and ensuring fair access to land, natural resources and housing	<ul style="list-style-type: none"> • Public housing rights • Native title land rights • Heritage restrictions • Archaeological preservation restrictions
Economic growth and savings	RRRs created with the intention of using land and natural resources for the generation of wealth at individual and wider community levels.	<ul style="list-style-type: none"> • Land ownership and transfer rights • Land tax responsibilities • Unbundling of rights to land and natural resources
Tenure organization and legal procedure requirements	RRRs that manage the creation, variation and removal of the different public and private tenures that exist over land, natural resources and the built environment.	<ul style="list-style-type: none"> • Compulsory acquisition rights of land • Residential and retail landlord and tenant rights and responsibilities • Property trust rights and restrictions
Industry management	RRRs that manage the land and non-land based activities of different industries.	<ul style="list-style-type: none"> • Gambling outlet and liquor retail restrictions • Utility operator restrictions and responsibilities • Medical, Surveying, Architectural practicing restrictions etc.
Public safety and order	RRRs that control public behaviours and promote safety within the community on land.	<ul style="list-style-type: none"> • Road safety restrictions • Liquor and tobacco consumption restrictions • Nuclear activity restrictions • Nudity areas restrictions • Terrorist activity restrictions • Building fabric and utility supply standards

2.2 Action

The *Action* attribute refers to the particular activities that an RRR can regulate, with regard to land and natural resources. Schlager and Ostrom (1992) provide a framework for differentiating between the types of actions (Table 2). RRR statutes may define a number of these authorized actions. The attributes are listed in order from the least authority (Access) to the greatest authority (Alienate). The higher forms of authority are of greater economic value and usually demand more extensive forms of administration and management.

Table 2. Actions regulated by RRRs/ *property objects*

Options	Description	Examples
Access	The ability to enter a defined physical area and enjoy non-subtractive benefits.	<ul style="list-style-type: none"> Authorized officers entering lands for purposes of inspection and works e.g. surveyors, police officers etc. Entry by citizens onto public parklands
Management	Transformation (changing the resource): The ability to transform the resource by making improvements.	<ul style="list-style-type: none"> Limitation on excavation on areas of land found to have cultural importance Requirement of holders of mining leases to rehabilitate the excavated area on cessation of mining
	Usage (merely undertaking an activity on the resource): The ability to regulate use patterns that occur on the resource.	<ul style="list-style-type: none"> Gaming licenses allowing the operation gaming machines on the premises Building regulations that dictate standards for the construction of dwellings
Withdrawal	The ability to obtain resource units or products from the resource.	<ul style="list-style-type: none"> Licenses allowing harvesting of fish from waterways Water irrigation entitlements Timber harvesting agreements
Exclusion	The ability to determine who will have access rights and withdrawal rights, and how those rights may be transferred.	<ul style="list-style-type: none"> Non transferable license for a particular fishery A 5 year site lease for a retailer
Alienation	The ability to sell, lease or mortgage management and exclusion rights.	<ul style="list-style-type: none"> Ownership of property by private citizen, government or community Ability to transfer and sell fishery license to another party

Adapted from Schlager and Ostrom 1992

2.3 Spatial Extent

Spatial extent refers to the geographic area over which the RRR applies. All property objects can be divided into parcel and non-parcel (Table 3). A parcel is the smallest unit of land ownership and the basic building block of the cadastre. Most RRRs are parcel based, however, RRRs that are non-parcel in nature are being increasingly used (Figure 2). This trend reflects the shift from formal jurisdiction and parcel polygons to regional management which incorporates environmental features.

Whatever definition of area is adopted, spatial extent is a vital attribute. GPS now provides for a definition and location of spatial extent which is much faster, cheaper and more accurate than its predecessors. Other new spatial technologies such as next generation GIS, spatially enabled databases and web mapping services allow information to be organized using geographic coordinates: different datasets can be grouped according to location. This allows us to combine and view RRRs and has diminished the need to attach every RRR to a parcel. These advances present as yet unrealized opportunities to administer RRR information.

Table 3. Spatial extent of RRRs/ *property objects*

Options		Description	Examples
Parcel	Specific	RRRs that apply to a specific parcel or small number of parcels located within a small geographic area.	<ul style="list-style-type: none"> Melbourne Cricket Ground Land Act Ararat Land Act Footscray Land Act Australian Grand Prix Act
	Patchwork	RRRs that may/may not apply to a given parcel <i>or</i> RRRs applied to every parcel within a jurisdiction applied differently in each case	<ul style="list-style-type: none"> Heritage restriction Vegetation clearing restriction Aboriginal sacred site protected area Land tax restriction
	Blanket	RRRs that apply to all parcels uniformly across the whole jurisdiction.	<ul style="list-style-type: none"> Compulsory acquisition power over any parcel Provisions relating to the construction of fences between properties
Non-parcel	Point/ Object	RRRs that apply to non-real property or specific points rather than a parcel.	<ul style="list-style-type: none"> Aboriginal relic and sacred site protection schemes
	Network	RRRs that apply to infrastructure networks rather than the parcels they overlay.	<ul style="list-style-type: none"> Road management restrictions and controls Electrical and gas pipeline restrictions
	Polygon	RRRs that apply to natural boundaries or administrative boundaries other than ownership parcels.	<ul style="list-style-type: none"> Water catchments areas Livestock disease control areas Mining leases and licensed areas Marine waterway management provisions
	Dynamic	RRRs that apply to different areas over time.	<ul style="list-style-type: none"> Fisheries defined by position of stocks Water right regimes Wildlife protection areas defined by location of animals rather than set boundary zones

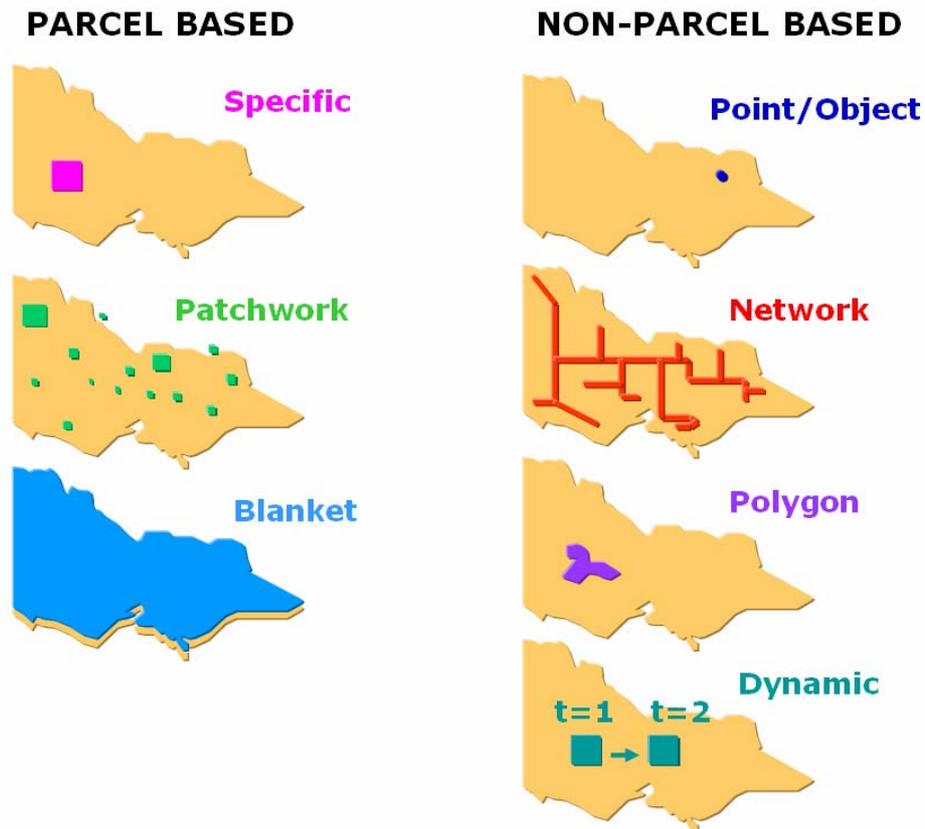


Figure 2. Different spatial extents of RRRs/property objects

2.4 Duration

Duration refers to the period of time over which the RRR applies (Figure 4). Legislation has traditionally failed to define duration, with the effect that many RRRs remain applicable long after they can be justified. For example, during WWII in metropolitan Melbourne, rent controls were placed on dwellings to keep housing affordable. Instances of this RRR remain even 50 years after the cessation of hostilities, keeping rent well below market levels (*Residential Tenancies Act 1997* (Vic), Section 14). Other RRRs remain on the public record despite being unnecessary (*Planning and Environment Act 1987* (Vic), Section 173). Orders registered on a title for breach of human habitation and planning standards are sometimes not removed when the property is altered.

Table 4. Duration of RRRs/ *property objects*

Options	Description	Examples
Once/ short term/ set period	RRRs that are applied only once usually for a specific purpose.	<ul style="list-style-type: none"> • Transfer of public utility assets to private companies
Repeat	RRRs that apply for a specific period at the same time every year or cycle.	<ul style="list-style-type: none"> • Certain types of fishery licenses • Seasonal duck hunting permits • Land tax and utility service bills
Ad-hoc	RRRs that can begin and end at any time desired by the participating parties.	<ul style="list-style-type: none"> • Land management agreements between private citizens and government • Residential and retail leases • Restrictive covenants on private titles
Indefinite	RRRs established without a sunset clause.	<ul style="list-style-type: none"> • Rent controlled housing • Terrorism and anti nuclear activity restrictions

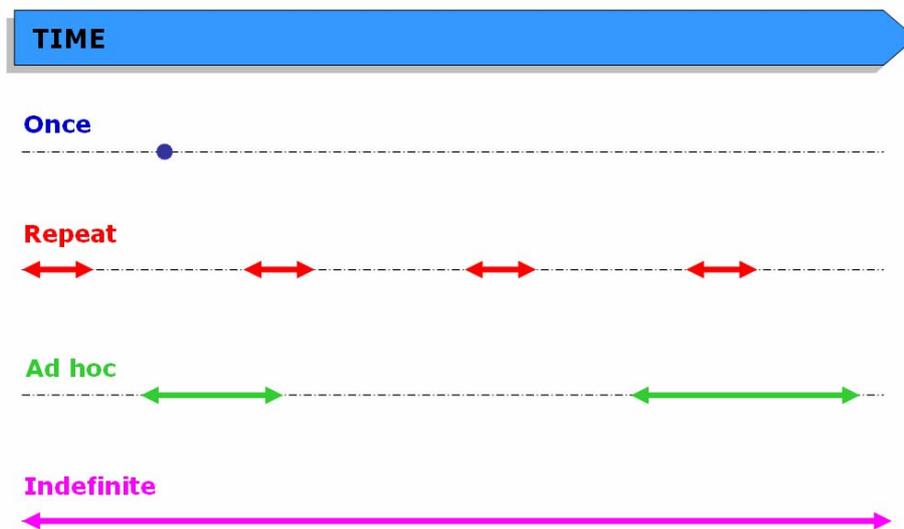


Figure 4. Duration of RRRs

2.5 People Impacted

People impacted denotes the group of people affected by the RRR. Tenure theory provides four main typologies- Private, Public, Common and Open Space (Prosterman, 2002). As RRRs are primarily about regulating human behaviour with respect to land, knowing to whom an RRR applies is very important. Each RRR involves two groups- one benefiting from the RRR and the other bound by it. For example, a restriction on clearing vegetation from private land benefits the whole community while limiting the actions of the owner. If the owner is compensated, s/he benefits at the expense of the community. RRRs can exist between two people in the same tenure typology: for example, private easements may be created between two private land owners. Government departments may require identified statutory authorities to maintain land and roads.

While RRR legislation in Victoria broadly defines the interested parties, in practice our ability to identify an individual who might be affected is poor. For example, a government decision to collect taxes on land held in trust or to charge a capital gains tax will have problematic and uneven application where no information base has identified the relevant transactions and parcels.

Table 5. The types of people impacted by RRRs/ *property objects*

Options	Description	Examples
Private	RRRs that apply to privately owned property and other subclasses of private property such as leased land, mortgaged land and land held in trusts.	<ul style="list-style-type: none"> • Taxation of private land by the government. • Compulsory acquisition rights by government. • Land conservation agreements between the government and private land holders • Private easements affecting two adjacent land parcels
Public/Government	RRRs that apply to public lands including land held by statutory authorities, government departments, local councils and other non-private bodies.	<ul style="list-style-type: none"> • Creation of national parks for the benefit of community • Restrictions applying to alpine resorts and regions • Coastal water restrictions and management plans
Communal	RRRs that apply only to communal lands. If they exist and are formalised.	<ul style="list-style-type: none"> • Native title land restrictions on sale • Native title restrictions on use and management
All	RRRs that apply to all tenures and inhabitants	<ul style="list-style-type: none"> • Acquisition power over any parcel of land by the government • Provisions relating to the construction of fences between properties • Mining leases
Open Space/other jurisdiction	RRRs that apply to unclaimed land, open space or another jurisdiction. By definition no RRRs can be readily enforced in such areas.	<ul style="list-style-type: none"> • N/A

3. WHY THE PROPERTY OBJECT CONCEPT IS IMPORTANT

The following four cases show how the framework makes sense of and organizes the masses of legislation relating to RRRs. By engaging in a process of description and comparison we can begin to understand why information availability is so important to successful property administration. The numbers in brackets indicate the design attribute being discussed: [1] Object, [2] Action, [3] Spatial Extent, [4] Duration, [5] People Impacted.

3.1 Example 1 - Ownership in Australia

These legal interests promote economic growth [1] by offering private individuals [5] the opportunity to invest in and alienate [2] individual land parcels [3] for what is usually an indefinite period [4]. Property ownership rights in Australia have historically been well designed and administered. Private ownership is a corner stone of modern, market-based societies. Economic wealth is generated through the transfer, subdivision and complex commodification of property rights. The huge number of transactions that deal with these rights requires a secure, efficient and easily accessible administration system. Australia uses the Torrens System, a single, easily accessible, authoritative and government secured registry. It records key attributes such as who owns the land, what interests are created, duration and spatial coverage. The system is efficient in terms of cost, time and access to information. The authoritative registry effectively secures rights and assists in dispute resolution and enforcement decisions. The system underpins Australia's property markets and provides a good example of a property object with an appropriate administrative framework.

3.2 Example 2 - Vegetation clearing restrictions in South-East Queensland

In the late 1990s the Queensland state government introduced the *Vegetation Management Act 1999* in order to promote environmental sustainability [1]. Vegetation clearing and management restrictions [2] were applied to both private citizens and public authorities [5] and were spatially defined using non-parcel polygons and points [3]. The restrictions were to be in place until 2006 [4] when all broad-acre clearing would be forbidden. Vegetation across the state was classified using maps which outlined whether clearing would be completely restriction, unrestricted or would require a permit.

While the objectives were undeniably important, the restrictions were poorly administered, creating information access and enforceability problems. Maps were not always available in digital format and were poorly overlaid with the underlying cadastre [3]. This made information difficult for farmers to access and required the involvement of land surveyors, at considerable cost to farmers which in some cases exceeded the penalties for illegally clearing the land. The permit process was also problematic and lengthy. Some farmers factored fines into their economic forecasts and cleared land illegally. In this case the objective [1] was not met because the RRR was poorly designed. Information was too costly to acquire (on ground surveys) and enforcement measures were not effective (penalties were too small). A more accurate and timely information source- including easily understood spatial extent [3], people

impacted [5] and what actions they could take [2]- would have mitigated the problems of both farmers and the government.

3.3 Example 3- Water entitlements in rural Victoria

The management of water entitlements in Victoria over the last 10 years demonstrates why integrated information management is so important. Under Victoria's *Water Act 1989* property owners with bulk water entitlements were able to transfer [2] the rights to other parties. Farmers could effectively retire their farms from production for the greater good of environmental sustainability [1]. The transferred rights had no duration restrictions and would exist for an indefinite period [4], be linked to a parcel/property [3] and involve two private parties [5].

Problems arose because a number of the key property object attributes were not well considered or managed. Many struggling farmers with failing farms chose to sell their water rights to other parties. Many of these same farmers also had mortgages [2], another form of property object, over their properties. Mortgages were managed independently to water entitlements. If the land was about to be repossessed by the bank, the bank could not prevent separate sale of the water right. Consequently banks and new land owners lost value on their asset through no fault of their own: the administrative regimes were inadequate. The property object attributes of land and water ownership are similar, an ideal administrative regime would manage the two resource and their respective information sets together. Essentially, the creation of an RRR required more foresight: how would such a restriction apply to future owners?

As these examples demonstrate, the property object concept enables us to discuss and understand individual RRRs. The framework is generic enough to assist in describing all RRRs, but complex enough to reflect the huge diversity between RRRs. Furthermore, it provides us with a basic understanding of why certain RRRs work and others fail and which administrative arrangements are appropriate. Regardless of the characteristics of a particular property object, the basic attribute information must be well thought out and easily accessible.

4. CONCLUSION

This paper has argued that RRRs can be quite diverse; it is thus wrong to treat and administer all RRRs in the same way. The different RRRs can be understood using a new analytical framework called the *property object*. It consists of five attributes- objective, action regulated, spatial extent, duration and people impacted. These attributes must be carefully considered when designing RRRs; they contain key information that will need to be administered and made available to the public when a new RRR is created.

Future work must focus on using the framework to create well-designed property objects and accompanying administrative systems. Furthermore, existing RRRs and their administrative systems need to be re-engineered and integrated with one another: the framework can help in

this process. Holistic, integrated management of natural resources is required if sustainability objectives are to be achieved.

REFERENCES

- Bennett, R.M., Wallace, J., and Williamson, I.P., 2005, Achieving sustainable development objectives through better management of property rights, restrictions and responsibilities, *Proceedings of the Expert Group Meeting on Incorporating Sustainable Development Objectives into ICT Enabled Land Administration Systems*, 9-11 November 2005, Centre for Spatial Data Infrastructures and Land Administration, The University of Melbourne, Australia.
- Cullen, S., and Seddon, P.B., 2004, IT Outsourcing Configuration: A Key Concept for Understanding IT Outsourcing Arrangements, *The Eighth Pacific-Asia Conference on Information Systems (PACIS)*, July 8 - 11 2004, Shanghai
- Enemark, S., Williamson, I.P., and Wallace, J., 2004, Building modern land markets in developed economies, *Journal of Spatial Sciences*, Vol. 50, No. 2, 51-68
- Kaufmann, J., and Steudler, D., 1998, *Cadastrre 2014: A vision for a future cadastral system*, Working Group 1 of FIG Commission 7, Switzerland
- Lyons, D.,K., Cottrell, E.C., and Davies, K.J., 2002, *On the Efficiency of Property Rights Administration in Queensland*, Research Report, Queensland Government, Department of Natural Resources and Mines, Brisbane. Australia.
- Lyons, D.,K., Cottrell, E.C., Davies, K.J., 2004, *A Summary of the Paper "On the efficiency of property rights administration"*, Research Report, Queensland Government, Department of Natural Resources and Mines, Brisbane. URL: www.anzlic.org.au/pubinfo/2393092707 (Accessed 18 August 2004).
- Prosterman, R., and Hanstad, T., 1999, Legal Impediments to Effective Rural Land Relations in Eastern Europe and Central Asia: A Comparative Perspective, World Bank Technical Paper No 436, *Europe and Central Asia Environmentally and Socially Sustainable Rural Development Series*, Washington.
- Schlager, E., and Ostrom, E., 1992, Property-Rights Regimes and Natural Resources: A Conceptual Analysis, *Land Economics*, 68 (3).
- Ting, L., 2002, *Principles for an Integrated Land Administration System to Support Sustainable Development*, PhD Thesis, The University of Melbourne
- Ting, L., and Williamson, I.P., 1998, Cadastral Trends: A Synthesis. *Australian Surveyor*, 4(1), p46-54.
- Ting, L., Williamson, I.P., Parker, I., and Grant, D., 1999, Understanding the Evolution of Western Societies' Land Administration Systems: A basis for cadastral reform, *Survey Review*, 35 (272) p83-102.

LEGISLATION

Moreland Private Land Local Legislation, (Moreland City Council)
Surveying Act 2004, (Vic)
Planning and Environment Act 1987, (Vic)

Property Law Act 1958, (Vic)
Residential Tenancies Act 1997, (Vic)
Vegetation Management Act 1999, (Qld)
Water Act 1989, (Vic)

BIOGRAPHICAL NOTES

Academic experience: Completed a double degree in of Geomatic Engineering and Information Systems in 2003 at the Department of Geomatics, The University of Melbourne.

Current position: Currently undertaking his second year of a PhD under the supervision of Prof. Ian Williamson and Jude Wallace at the same institution with The Centre for Spatial Data Infrastructures and Land Administration. The research will focus on determining new strategies for managing property rights, restrictions and responsibilities. The role ICT and other spatial technologies can play along with legal and institutional issues will be key considerations.

Publications: Recently presented PhD related papers at SSC 2005 in Melbourne and the Expert Group Meeting on Sustainability and Land Administration also in Melbourne.

Practical Experience: Cadastral and engineering field surveyor experience in the Victorian property development sector. Tutors in Subdivision Design, Land Administration, Organizational Analysis and Change and Telecommunications Concepts.

Professional membership: Spatial Sciences Institute of Australia (SSI), Institute of Surveyors in Victoria (ISV)

Family: Rohan and his wife Sarah have been married for a year and welcomed their first child, Eve Elizabeth, into the world in May.

ACKNOWLEDGEMENTS

I wish to gratefully acknowledge the assistance of my colleagues in the Centre for SDI and Land Administration, Department of Geomatics, University of Melbourne in the preparation of the article. I also wish to acknowledge the Department of Education, Sciences and Training (DEST), for their assistance through the *Backing Australia's Ability* and *Science Linkages* Programs. I also wish to acknowledge the Department of Sustainability and Environment, Victorian Government for their support of the Centre for SDI and LA. I also wish to thank PSMA, Government of NSW, Government of WA and Moreland City Council for their guidance and assistance with data collection.

CONTACTS

Mr Bennett, Rohan
Centre for Spatial Data Infrastructures and Land Administration, Department of Geomatics,
The University of Melbourne
Victoria 3010 Australia
Melbourne
AUSTRALIA
Tel. +61 3 8344 4509

Fax + 61 3 9347 2916

Email: rohanb@unimelb.edu.au

Web site: http://www.geom.unimelb.edu.au/research/SDI_research/RRR/