Title
Towards sustainable land management: a tool for describing and holistically understanding property interests

Abstract
Property ownership rights are well managed and understood in developed countries. They are backed by long standing theoretical, legal and institutional frameworks. Over the last fifty years new land interests have emerged. Created by governments in response to environmental degradation, the pressures of globalisation and concerns for social equity, these interests lack holistic theoretical and legislative frameworks. Examples include the alienation of land for use as national parks, the unbundling of water rights from private land and the reallocation of land rights to indigenous people. The new interests are often poorly designed and administered; this creates confusion and ultimately results in lesser adherence by the community. If we are to achieve sustainability objectives the management of these new interests needs to be improved. Holistic theoretical, policy and administrative frameworks must be developed that enable coherent, integrated management of all land interests. As a first step in this process, this paper introduces the property object, a tool for describing, comparing and classifying all interests in land and natural resources using five key attributes: the objective, actions regulated, spatial extent, duration and the people impacted. The property object was developed by analysing all the legislated land interests within the three levels of government in Australia; federal, state and local. The tool can be used to determine the importance of a particular land interest and consequently sheds light on the type of administration that will be required. It prescribes what information must be recorded and made available to the public when a new interest is created and also identifies interests which might need to be managed together. The tool is not intended to be a panacea for all problems relating to the management of property interests. It is a first step in achieving a holistic shared understanding of land, as we begin redesigning our land administrative systems to better achieve sustainable development objectives.

Keywords
land administration, property rights, property interests, property object, sustainable development
1. Introduction

Property ownership is well understood and respected in developed countries. The concept is backed by theoretical, legislative and institutional frameworks that were established over hundreds of years. They are typically listed on government secured titles or deeds, stored in a registry and are usually easily available to the public. This secure system underpins much of the capital generated in modern economies.

Property Ownership – having all the rights to an item that = ownership in that context
Property – any right, restriction or interest

Over the last fifty years many new property interests have emerged. These interests have been legislated by governments in response to environmental degradation, the pressures of globalisation and the concerns for social equity. These interests give powers to governments or other mandated bodies and are aimed at controlling the community’s behaviour in relation to land; examples include the alienation of land for use as national parks, the unbundling of water and timber rights from private land and the reallocation of land rights to indigenous people. In addition to these highly visible interests, there is also many other lower profile interests; the prescription of nude bathing areas and allocation of private parking spaces are examples. The volume of legislation is enormous; a recent study found that in the Australian state of Victoria, there were over five hundred individual statutes that applied some type of control over land (Bennett et al, 2005). The number of these interests continues to increase. An investigation into the regulatory environment in Australia by the federal government’s Regulation Taskforce found that since 1990 the Australia Parliament has passed more legislation that in the previous ninety years of federation (Regulation Taskforce, 2006).

The masses of new legislative and institutional arrangements are a problem for governments and citizens alike. An analysis of the land administration literature (Enemark et al, 2005; Kaufman and Steudler, 1998; Lyons et al, 2002 and 2004; Ting, 2002; Ting and Williamson, 1998; Ting et al 1999) sheds light on the three main issues. First, some interests are poorly designed. They may be unenforceable by authorities or may provide little incentive for those who are supposed to adhere to them. Second, some interests are poorly administered. The administration system may offer only limited public information access, have slow permit and licence processing times, or might be administered in complete isolation to other related interests. Finally, some interests do not exist where they ought to. For example, there are minimal controls preventing people from building on contaminated land or creating subdivisions where land locked parcels would result.
To date, the literature focused on solving the second of these problems, the poorly administered interests. Cadastre 2014, suggested that future land administration systems would reveal the complete legal situation of land, including all public rights and restrictions (Kaufmann and Steudler, 1998). Enemark’s Land Management Paradigm proposed that information integration was not enough; governments must proceed further and integrate the actual management processes of land use, tenure and development (Enemark et al, 2005). These articles along with numerous government initiatives suggest that rights and other interests, especially those created by public administration, should be treated more holistically if sustainability objectives are to be achieved. This paper agrees that 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 holistic management of interests contrasts with the limited amount that deals with implementing the concept. The question within government has been whether the successful, existing property administration system, the land titles register, should be extended to manage all new interests or whether the register should be kept separate, acting as one small part of a much larger integrated, whole-of-government land information system. Lyons et al (2002) and (2004) offered an implementation pathway; however, it focused on a large scale institutional recentralization and did not examine the substantial costs of employing the system. The fact that many alternate administration systems work well is not considered. The risk of the land registry becoming cluttered and unworkable if used to administer all interests remains a concern.

This literature is an important first step in creating discourse and raising awareness of the problem; however, it has been impeded by the underlying assumption that all property interests are the same and therefore a single administrative solution will suffice. We propose, alternatively, that all property interests are different and that in order to provide more meaningful advice to governments and policy makers, a framework for describing, classifying and differentiating between property interests is required.

Governments have many options when creating interests (what action they will permit on the land, where it applies, who it affected, when it applies, how it will be enforced). Depending on what choices are made, different human behaviours will prevail and different administrative responses will be required. For example, in Victoria, the right to own private property (Property Law Act 1958, Vic, Section 18A-19) and the right of a cadastral surveyor to enter private space (Surveying...
Act 2004, Vic, Section 58) are both property interests; however, they are very different in nature. A private owner is entitled to transfer, alter 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 the single parcel. Only registered persons can hold the surveyor’s entry right whereas anyone can own private property. Ownership of land is a proprietary interest, and receives all the opportunities of this classification; the entry right is not.

This example shows just how different two property interests can be. Although both are defined as property interests, 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.

Solutions to the administrative problem, or any of the problems relating to property interests, will continue to be flawed unless we consider why these problems have occurred in the first place. Why are ownership rights so well managed and other interests so poorly managed? The historical context provides the answer. Unlike ownership rights, many of the new interests were created without a theoretical framework, overall administrative coherence or basic information systems. Consequently, they are poorly understood and less accepted by the community. Unless we go back and develop these holistic theoretical and policy frameworks, the problems with the administration of land interests will continue unabated.

English common law, alternate property systems

In this paper we introduce the property object, a concept that will assist government policy makers to compare and classify property interests. The precise but flexible analytical framework is capable of applying to all property interests 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 property interests, from ownership down to simple access powers, and also allows for meaningful contrast between different interests. The framework conveys the essential information needed by governments and citizens about land and resources to deliver sustainable development objectives.
A detailed description of the property object and its utility follows. The methodology used to develop the framework is discussed followed and the five key attributes that make up an individual property object are introduced. Examples demonstrate the usefulness of the concept including the ability to; identify the more important interests, explain why some interests fail in practice and determine which interests must be managed together.

2. Materials and methods

The property object concept is the outcome of an analysis of all the legislated property interests creating controls or powers over land at three levels of government; the Australian Government at the federal level, the Victorian Government at the state level and Moreland City Council at the local level. These authorities represent the different levels of federated government in Australia. All three create and manage various property interests. The statute books of each jurisdiction were analysed to identify and record every piece of legislation that created an interest in land. As legislation is continually being created and updated, a specific ‘snap shot’ date was chosen for each jurisdiction. Table 1 provides these dates and details the findings from the initial analysis.

Once an interest was recognized, the information in Table 2 was recorded. Each interest was assessed at a number of levels including policy, legislative, administrative, ICT and public accessibility perspectives. These broad categories were based on the land administration “best practice” concept (Williamson, 2001). Where clarification of specific interests was required, discussions were undertaken with the appropriate government agencies. Non-legislated interests such as those listed in body corporate arrangements, some private agreements, and implied but not legislated interests were also examined. The information on each property interest was recorded in a database which then enabled all interests to be comparatively analysed.

3. Results

Analyses of all the property interests demonstrated that every property interest is different in nature and, depending on the perspective taken, different classification schemes are equally valid. The fields of law and economics offer different approaches to understanding property interests and identify the features important in their respective disciplines. From the viewpoint of land administration and information management the focus is on the information needed to perform the land and resource related tasks of government and business. Here the five attributes in Figure 1 are most important. The five attributes determine what information must be recorded and made
available when a property interest is created. They provide an understanding of the nature, and differences between, specific property interests. Considered together the attributes help determine what type of administrative approach would be most appropriate for each interest.

3.1 Objective
The objective attribute describes the reasons for enacting the property interests in legislation or contract. Different objectives may prompt the creation of particular interests. Government policy drivers and personal objectives will change over time. Table 3 outlines the common objectives behind property interests, in no particular order.

Property interests with similar objectives often need to be managed together in a portfolio arrangement: historically, the lack of comprehensive management prompted confusion and information voids for citizens and government agencies. For example, under Victoria’s Water Act 1989 property owners with bulk water entitlements were able to transfer the rights to other parties. Farmers could effectively retire their farms from production for the greater good of environmental sustainability. Problems arose because many struggling farmers with failing farms chose to sell their water rights to other parties. Many of these same farmers also had mortgages, another form of property interest, over their properties. The land and water titles were managed independently. If the land was about to be repossessed on default, the bank could not prevent separate sale of the water right by the farmer. Consequently banks and new land owners lost value on their asset through no fault of their own. The administrative regimes were inadequate and needed more integration.

3.2 Action
The action attribute refers to the particular activities that the property interest permits, with regard to land and natural resources. There have been many attempts to categorise all the possible actions. Most definitions of ownership rely on three qualities; the ability to exclude others, the ability to receive income or benefits; and the ability to sell or alienate the interest (Sheehan and Small, 2002). In this way ownership can be seen as comprising a ‘bundle’ of individual opportunities. Authors disagree on the exact number of individual actions; however, all definitions include the three listed above as a minimum. Schlager and Ostrom (1992), provide perhaps the most comprehensive framework for differentiating between the available actions of different property interests (Table 4). The attributes are listed in order from the least authority of ‘access’, to the greatest authority of ‘alienation’, which usually equates to ownership. New government created property interests are
usually at the lower end of the scale, granting access or management controls to statutory authorities. The level of interest created plays a key role in determining the most effective system for titling and registration (ACIL Tasman et al, 2004). For example, higher forms of authority are generally of greater economic value and therefore usually demand more extensive forms of administration and management.

### 3.3 Spatial Extent

The spatial extent attribute refers to the geographic area over which the interest applies. All property objects can be divided into parcel and non-parcel (Table 5). A parcel is the smallest unit of land ownership and the basic building block of the cadastre. Most property interests are parcel based, however, interests 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. In Australia, the creation of water catchment management bodies are an example. In general, interests which are patchwork and dynamic tend to require more administration than specific or blanket interests.

Whatever definition of area is adopted, spatial extent is a vital attribute. The Global Positioning System (GPS) now provides for a definition and location of spatial extent which is much faster, cheaper and more accurate than earlier on-ground survey methods. An analysis of the literature (Elfick, 2005; OGC, 2005; Farley, 2004) reveals that other new spatial technologies such as next generation Geographic Information Systems (GIS), spatially enabled databases and newly defined web mapping services allow information to be organized using geographic coordinates: different datasets can be grouped according to location. This allows property interests to be viewed together and diminishes the need to attach every interest to a parcel. These advances present as yet unrealized opportunities to administer property interest information.

### 3.4 Duration

*Duration* refers to the period of time over which the property interest applies (Table 6, Figure 3). Legislation traditionally does not define duration, with the effect that many interests 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 property interest remain even fifty years after the cessation of hostilities, keeping rent well below market levels (*Residential Tenancies Act 1997* (Vic), Section 14). Other interests remain on the public record despite being unnecessary. Orders registered on a title for breach of human habitation and
planning standards (*Planning and Environment Act 1987* (Vic), Section 173) are sometimes not removed when the property is altered. In general, ad hoc and repeat interests tend to have more administrative support than those that only apply over a short period or indefinitely.

### 3.5 People Impacted

The people impacted attribute denotes the group of people affected by the property interest. As property interests are primarily about regulating human behaviour with respect to land, knowing to whom an interest applies is very important. In the past governments have tended to only consider and record the people who benefit from the interest. Legal positivism suggests that this is not enough: a property right only exists when the community supports and protects the exclusive use and enjoyment of that entitlement (Sprankling, 1999; National Competition Council, 2001). This means that each interest involves two parties; one benefiting from the interest and the other bound by it (Figure 4).

The duel or bifurcated nature of property interests is further supported by the influential ‘system of jural relations’ constructed by Wesley Newcomb Hohfeld in the first half of the twentieth century. Hohfeld expressed concerns about the vague definitions of rights: the term was being “used indiscriminately to cover what in a given case may be a privilege, a power, or immunity, rather than a right in the strictest sense” (Cole and Grossman, 2002). Hohfeld’s jural relations suggest that in order to establish a right, as opposed to some other lesser interest, one must be able to identify the corresponding duty, or restriction, that someone else possesses. For example, a restriction on clearing vegetation from private land benefits the whole community while limiting the actions of the owner. If the owners are compensated, they benefit at the expense of the community. Table 6 shows how tenure theory provides four main typologies that can be used to identify either of the two parties-private, public, common and open space (Prosterman, 2002). Property interests can exist between two parties 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; the community benefits.

While 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.
4. Discussion and conclusions

The property object can be used as the guiding framework for discussing and providing solutions for the property interest management problems. Four examples below are used to demonstrate the utility of the concept.

4.1 Identifying the less important property interests

To date the land administration literature has suggested that all property interests be managed in a single centralized system, perhaps the existing registry. In the case of Victoria, this would mean placing the administration of 620 Acts or at least the information generated by their administration into one department. Clearly this idea would be unworkable and create massive information management issues. This is not to say the registry should not handle some of the property interests. It is a highly efficient tool for managing important interests, particularly interests that need to be secured by government. The question is then: which property interests ought to be managed within the registry and which ought not?

The property object concept can assist in making these determinations. The ownership rights that are currently managed by the registry have the following characteristics: Action = Alienate, Spatial Extent = Patchwork, Duration = Ad-hoc, People = Private. So the main business of the registry is to deal with interests that are marketable, dynamic, easily defined spatially and that can be held by private people. The unbundling of natural resources from land will result in many new interests being created. It would be wise for registries to take an active role in securing and administering these new commodities. Sustainability demands that land and natural resources are managed holistically and the registry represents the best available tool for integrating the administration of these most important property interests.

Other non-marketable, less dynamic interests do not require as extensive or secure administration. A cadastral surveyor’s right to enter private is a good example; the guarantee and security of the land registry are simply not required. Why is this case though? Because the attributes Action = Access, Spatial extent = Blanket or Specific, Time = Once/Short term/Indefinite, People = all, are simply less important. That is, they are either highly specific or extremely broad, have less value/power attached to them and are therefore generally of less interest to citizens. This criteria identifies 500 of the 620 of the Victorian Acts as being of less importance. Of the remaining 120, only 66 have the characteristics that equate them to ownership rights managed in the registry (Figure 5). The administrative challenge for the registry suddenly appears much more manageable.
4.2 Identifying poorly designed property interests


Moreland City Council is a local government municipality located in the northern suburbs of Melbourne, Australia. The old suburb of Brunswick lies within the municipality and includes old derelict buildings which are no longer in use and in a state of disrepair. Developers often sit on these properties, ‘land-banking’ them, waiting for an opportunity to redevelop or sell them during economic up-turns (Lucas, 2006). For the purposes of public safety [1] a by-law exists (*Private Land Local Legislation*, Moreland, Section 9.1) which states that all buildings on privately held land [5] must be safe and secure [2] at all times [4], otherwise fines can be applied to individual parcels/properties [3]. Property owners who have been served with these fines often ignore them. While they still pay their local services rates, they do not respond to safety enforcement notices; most probably because it is cheaper to ignore them. An enforcement problem exists with this law and the initial policy objective of community safety [1] is clearly not being met. A system of enforcement needs to be designed to enable land clearance [2] of the offending parcels [3] by the authority [5] at the expense of the owner [5]. Moreland City Council [5] is looking at increasing rates [2] on the properties [3] for the owners [5] who do not clean up (Kelly, 2006). Regardless of the chosen remedy, this example demonstrates the usefulness of the property object concept for understanding why legislation has failed and produced undesirable human behaviours. Furthermore, the concept can help in guiding discussions of possible solutions.

4.3 Allowing for more advanced searching of property interest information

Finding out where certain interests apply, to whom they apply, when they apply, why they exist and how they can be changed is of significant interest to citizens. Until now, our systems for delivering this information have been very poor. New spatial data infrastructure initiatives offer the opportunity to use a common IT infrastructure across government to integrate datasets virtually using the spatial attribute; a web client can be used by citizens to access this database of property information. The state government of Western Australia’s whole-of-government Shared Land Information Platform (SLIP) and web service known as Register of Interests (ROI) provides an example of this type of arrangement.
In Victoria, creating this architecture would result in information generated under 620 Acts and countless other datasets being integrated and made available to the public over the internet with the utility of visualisation. While this would cut much of the search time currently required when looking for property information, the problem of determining which interests are important for a particular citizen or activity would still remain. Western Australia’s ROI prototype conducts searches using parcel identifiers and classifies interests using common business activities such as property development and emergency management. The property object concept can advance these search typologies even further.

If the property object attribute values of each property interest were to be recorded in a uniform fashion, advanced searches could be conducted using a range of different user inputs. Figure 6 provides an example. This advanced search would allow citizens to search based on the information they had access to, be it people information, location information, activities of interest or individual Acts. The search result would produce a list of interests that are deemed relevant to the customised search. The more attribute fields that are filled in, the more specific the returned information. The search may also reduce the need to classify interests, as citizens could filter their searches for particular occasions; however, an overall importance classification as discussed earlier could be included. This type of searching can only be enabled if all the attribute information for each property interest is geo-coded and also recorded by the custodian agency in a common way.

4.4 Identifying which property interests should be managed together

There is no need to manage all interests through a single agency. In most cases only the information need be integrated. This can be achieved using the spatial data infrastructure concept (Williamson et al, 2003). However, property objects with similar attributes are ideally administered by a single organization with integrated processes. The example in section 3.1 dealing with the management water and land ownership interests provides a good illustration. The attributes of land and water property interests are similar and therefore an ideal administrative regime would manage the two resource and other similar interests together in a portfolio arrangement (Figure 7).

4.5 The future

The rapid increase in property related legislation has created administrative and enforcement problems. Legislative regimes have not substantially achieved sustainability. A new framework for understanding and managing interests in land is needed. Introduction of the property object,
consisting of five key attributes, is a first step in developing this framework. The utility of the concept was demonstrated by applying it to four current issues related to property interests: determining the importance of different interests, searching for property information, understanding why certain legislation fails and determining which interests need to be managed by a single organization. Further work will focus on developing different classifications of property interests using the framework. The usefulness of the concept to the user sector also needs to be tested further. Finally, the concept is not a panacea for all problems relating to property interests, nor is it meant to be. It is merely a first step in understanding and redesigning our existing land administrative systems so they are better able to meet the demands of sustainable development.

Acknowledgements

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References


**Legislation**

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)
Water Act 1989 (Vic)
### Tables

#### Table 1: The amount of land related legislation in each jurisdiction

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Snapshot date</th>
<th>Total Acts</th>
<th>Acts creating interests in land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Government of Australia</td>
<td>23.08.2005</td>
<td>1427</td>
<td>514</td>
</tr>
<tr>
<td>State Government of Victoria, Australia</td>
<td>11.01.2006</td>
<td>1045</td>
<td>620</td>
</tr>
<tr>
<td>Moreland City Council</td>
<td>29.03.2006</td>
<td>11</td>
<td>9</td>
</tr>
</tbody>
</table>

#### Table 2: The information recorded on each property interest

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Possible options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policy and Legal Aspects</strong></td>
<td></td>
</tr>
<tr>
<td>Legislative Origins</td>
<td>National, State, Local</td>
</tr>
<tr>
<td>Type of Legislation</td>
<td>Prescriptive, Descriptive</td>
</tr>
<tr>
<td>Period of Creation</td>
<td>1950 → 2000</td>
</tr>
<tr>
<td>Driver for Creation</td>
<td>Government, Public Driven</td>
</tr>
<tr>
<td>Type of Land Affected</td>
<td>Urban, Rural, Marine Environment</td>
</tr>
<tr>
<td>Type of Interest Created</td>
<td>Access, Management, Withdrawal, Exclusion, Alienation</td>
</tr>
<tr>
<td><strong>Administrative Aspects</strong></td>
<td></td>
</tr>
<tr>
<td>Type of Administration Body</td>
<td>Minister, Government Department, Local Council, Statutory Authority</td>
</tr>
<tr>
<td>Private Sector Involvement</td>
<td>Public Private Partnership, None</td>
</tr>
<tr>
<td>Allocation Method</td>
<td>Systematic, Sporadic</td>
</tr>
<tr>
<td>Registration Method</td>
<td>Single Register, Multiple Registers, Negative Register, No Register, Torrens, Deeds</td>
</tr>
<tr>
<td>Update Method</td>
<td>On request, None</td>
</tr>
<tr>
<td>Removal Method</td>
<td>Time Based, Request Based, None</td>
</tr>
<tr>
<td>Level of ICT</td>
<td>Automated Online, Automated Onsite, Paper Based</td>
</tr>
<tr>
<td><strong>Access Aspects</strong></td>
<td></td>
</tr>
<tr>
<td>Price to access</td>
<td>Transaction Fee vs. Cost Recovery vs. Nothing</td>
</tr>
<tr>
<td>Access Point</td>
<td>Automated Online, Automated Onsite, Onsite, Unavailable</td>
</tr>
<tr>
<td>Altering Information</td>
<td>Online, Onsite, Unavailable</td>
</tr>
<tr>
<td><strong>Relationship to Property Ownership</strong></td>
<td></td>
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<tr>
<td>Tenures Affected</td>
<td>Private vs. Public vs. Communal vs. Open Access</td>
</tr>
<tr>
<td>Relationship to the Cadastral Map</td>
<td>Parcel Based, Non-Parcel Based</td>
</tr>
<tr>
<td>Relationship to Land Registry</td>
<td>Recorded in Registry, Link to Registry using ID, No Relationship</td>
</tr>
<tr>
<td><strong>Spatial Aspects</strong></td>
<td></td>
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<tr>
<td>Spatial Unit</td>
<td>Parcel (Polygon), Network, Points, Lines, None</td>
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<tr>
<td>Identifier</td>
<td>Parcel ID, Property ID, Council Number</td>
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<tr>
<td>Mapping Status</td>
<td>Complete Automated Online Map, Incomplete Automated Online Map, Automated offline Map, Paper Based Map, None</td>
</tr>
</tbody>
</table>
### Table 3: Objectives behind the creation of property objects

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **Environmental conservation**      | RRRs created with the intention of conserving, protecting and regenerating the flora and fauna of the natural environment. | • 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 | • 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. | • 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. | • 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. | • 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. | • Road safety restrictions  
• Liquor and tobacco consumption restrictions  
• Nuclear activity restrictions  
• Nudity areas restrictions  
• Terrorist activity restrictions  
• Building fabric and utility supply standards |

Adapted from Schlager and Ostrom 1992

### Table 4: Actions regulated by property objects

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **Access**  | The ability to enter a defined physical area and enjoy non-subtractive benefits. | • 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. | • Limitation on excavation on areas of land found to have cultural importance  
• Requirement of mining lease holders 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. | • 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. | • 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. | • 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. | • 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
### Table 5: The spatial extent of property objects

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parcel</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Specific         | RRRs that apply to a specific parcel or small number of parcels located within a small geographic area. | • 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 or RRRs applied to every parcel within a jurisdiction applied differently in each case. | • 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.      | • 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. | • Aboriginal relic and sacred site protection schemes |
| Network          | RRRs that apply to infrastructure networks rather than the parcels they overlay. | • Road management restrictions and controls  
• Electrical and gas pipeline restrictions |
| Polygon          | RRRs that apply to natural boundaries or administrative boundaries other than ownership parcels. | • 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.                               | • Fisheries defined by position of stocks  
• Water right regimes  
• Wildlife protection areas defined by location of animals rather than set boundary zones |

### Table 6: The duration of property objects

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Once/ short term/ set period</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Time</td>
<td>RRRs that are applied only once usually for a specific purpose.</td>
<td>• Transfer of public utility assets to private companies</td>
</tr>
</tbody>
</table>
| Repeat                       | RRRs that apply for a specific period at the same time every year or cycle. | • 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. | • Land management agreements between private citizens and government  
• Residential and retail leases  
• Restrictive covenants on private titles |
| Indefinite                   | RRRs established without a sunset clause.                                   | • Rent controlled housing  
• Terrorism and anti nuclear activity restrictions |
<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Private</strong></td>
<td>RRRs that apply to privately owned property and other subclasses of private</td>
<td>• Taxation of private land by the government.</td>
</tr>
<tr>
<td></td>
<td>property such as leased land, mortgaged land and land held in trusts.</td>
<td>• Compulsory acquisition rights by government.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Land conservation agreements between the government and private land holders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Private easements affecting two adjacent land parcels</td>
</tr>
<tr>
<td><strong>Public/Government</strong></td>
<td>RRRs that apply to public lands including land held by statutory authorities,</td>
<td>• Creation of national parks for the benefit of community</td>
</tr>
<tr>
<td></td>
<td>government departments, local councils and other non-private bodies.</td>
<td>• Restrictions applying to alpine resorts and regions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Coastal water restrictions and management plans</td>
</tr>
<tr>
<td><strong>Communal</strong></td>
<td>RRRs that apply only to communal lands. If they exist and are formalised.</td>
<td>• Native title land restrictions on sale</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Native title restrictions on use and management</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td>RRRs that apply to all tenures and inhabitants</td>
<td>• Acquisition power over any parcel of land by the government</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provisions relating to the construction of fences between properties</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Mining leases</td>
</tr>
<tr>
<td><strong>Open Space/other jurisdiction</strong></td>
<td>RRRs that apply to unclaimed land, open space or another jurisdiction. By definition no</td>
<td>• N/A</td>
</tr>
<tr>
<td></td>
<td>RRRs can be readily enforced in such areas.</td>
<td></td>
</tr>
</tbody>
</table>
Figure captions

Figure 1: The five key attributes of a property object
Figure 2: The possible spatial extents of a property object
Figure 3: The possible durations of a property object
Figure 4: The duel nature of a property object – each has a beneficiary and a subservient party
Figure 5: Identifying the most important property interests in the State of Victoria, Australia
Figure 6: Using the property object would allow for more advanced property information searching
Figure 7: Similar property objects should be managed together in a portfolio arrangement