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Providing for a diverse range of outdoor recreation opportunities: a "micro-ROS" approach to planning and management

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Abstract

In South East Queensland, a consortium of public sector agencies are developing a "micro-ROS" approach to the recording of outdoor recreation opportunities across a range of public land tenures. The basis of this data gathering process is a landscape classification system that describes individual recreational sites according to their biophysical, social and managerial attributes. This process will allow the current range of combinations of outdoor recreation activity and landscape setting to be recorded and facilitate an activity x setting *approach to recreation planning and management.*

Such a coordinated and uniform approach to the collection of outdoor recreation data has not previously occurred in South East Queensland. This project will significantly contribute to effective and efficient provision of public sector outdoor recreation services, provision of a wide range of high quality outdoor recreation opportunities at a regional level and more effective integration of outdoor recreation in land use decision making.

Introduction

The provision and management of outdoor recreation opportunities on public lands is a complex business. The determination of appropriate settings in which recreators may obtain a particular recreational experience is equally challenging. One of the tools available to recreation planners and land managers to meet these challenges is the Recreational Opportunity Spectrum (ROS). The ROS is a conceptual framework designed to help clarify relationships between recreational settings, activities and experiences (Clark & Stankey 1979; Clark 1982). In this framework, biophysical, social and managerial attributes are used to describe recreation sites. It was first used by the United States Department of Agriculture Forest Service in the late 1970's. Since then, many agencies (including many Australian land and natural resource management agencies) have adopted the original Clark and Stankey ROS as part of their recreation planning frameworks or have modified it for specific purposes (Driver et al 1987).

ROS literature is extensive. Authors have written about its application (Clark 1982; Manning 1985 & 1999; Jubenville 1989, Smith & Lipscombe 1999), its misuse (Van Oosterzee 1984, Richards & Heywood 1999b) and the operational constraints inherent in it (Jubenville, Twight & Becker 1987). The ROS can be used for a variety of management purposes (Driver & Brown 1978; Stankey & Wood 1982; Clark 1982), or - in its most basic form - to promote recreational diversity (Manning 1986; Hammitt & Cole 1987). It can also be used to identify existing or potential recreation opportunities in an area or used to define the relative sensitivity of an area to recreational impact (Clark 1982).

It has also been reported that the ROS has been used inappropriately to allocate recreational settings in relatively small individual landholdings rather than on a

regional basis (Van Oosterzee 1984). Other criticisms of the ROS system stem from attempts to apply the ROS's zone-based procedure to the classification of individual settings (Richards & Heywood 1999a). However, classification of individual recreational settings is an important consideration - especially, where particular types of settings are rare (eg. small isolated areas of naturalness in otherwise large areas of modified landscape) or unique (eg. the only site in a large area which is suitable for a particular outdoor recreation activity).

Given that most of the valid criticisms of ROS refer to misuse of the concept rather than fundamental flaws in the concept, it is reasonable to accept that the underlying philosophy and intent of the ROS are sound. This assumption is supported by the fact that a number of well accepted and regularly used recreation planning and management concepts including Limits of Acceptable Change (LAC) (Stankey et al 1985, Prosser 1985), Visitor Activity Management Process (VAMP) (Environment Canada & Park Service 1991) and Visitor Impact Management (VIM) (Graefe, Kuss & Loomis 1986, Graefe, Kuss & Vaske 1990) are either derived from the ROS or strongly related to it.

Used for the purpose for which it was intended, the ROS provides a vehicle to integrate and coordinate recreation activities spatially and temporally with other resource uses and management activities. The development of a "micro-ROS" approach to the identification and management of outdoor recreation sites across the landscape will further enhance the value of the ROS concept as a planning and management tool.

The "micro-ROS" Concept

There are several advantages of an information rich "micro-ROS" approach. Firstly, the concept recognises that small areas of relatively rare recreation settings are just as important as large areas for the provision of recreational opportunities. The concept also allows relatively small activity-sites to be identified and described appropriately, thus ensuring that small, but significant sites are properly considered, rather than being lost in broadscale decisions.

The "micro-ROS" concept is not new to the recreation planning and management literature. Jubenville (1989) and Richards and Heywood (1999a) have expressed the need to consider individual recreation nodes within broader categories. The recreation setting inventory and classification system devised by Richards and Heywood (1999a) encapsulates the concept of a micro-ROS approach to the planning and management of recreation opportunities. Their system considers individual recreation sites as opposed to the broadscale zonal approach of the original Clark and Stankey ROS.

Richard and Heywood's multiple attribute approach to landscape classification also has a number of distinct advantages over the implied lineal relationship between classes in the ROS. This failing was also highlighted by Manning (1985 & 1999). However, a limitation of Richards and Heywood's classification system is that it does not consider individual settings which are small and heterogeneous in character (eg. small bush clearings that are used occasionally) or large and homogeneous in nature (eg. grassed floodways) as settings where outdoor recreation may occur (1999a, p44). It is clear that while Richards and Heywood's classification system has progressed our knowledge, use and availability of recreational land classification planning tools, it does not provide for a full taxonomy of combinations of outdoor recreation activities and settings.

To be of value, a recreational landscape classification system should be capable of identifying even small areas of relatively rare outdoor recreation settings independent of the tenure of the land on which they are located.

This is important because a significant proportion of recreation planners, decision makers and participants assume that land tenure is reliably related to the biophysical, social and managerial characteristics of an activity site. A frequent assumption is that all wild-natural-remote sites are located in national parks or that all national parks contain wild-natural-remote sites. However, in Queensland at least, some state forests, some private lands and even grazing leases contain significant areas that are relatively wild, natural and remote.

In the landscape classification system proposed in this paper, recreational sites are categorised by their relative naturalness derived from assessment of a number of biophysical, social and managerial criteria. Again this is not a new development. The idea that naturalness can be expressed on a range from wild-natural-remote to urban-developed-industrial, depending on the proportion of natural and human modified elements in the landscape was proposed by Driver and Brown in 1978. As a result, settings can range from totally natural (eg. a wild remote area) through to partially natural (eg. an extensive grazing landscape with significant areas of remnant native vegetation left along creeks and ridges) to completely modified (eg. a large sporting complex with manicured lawns, planted trees and artificial lighting) regardless of size.

While naturalness is not an absolute condition, a landscape classification system should have the ability to identify and respond to changes in naturalness spatially and temporally. A "micro-ROS" approach will allow subtle changes in naturalness to be recorded, fulfilling a range of outdoor recreation planning and management needs.

A "micro-ROS" landscape classification system allows the objective identification of individual recreation settings. In turn, this allows planners and managers to respond to the diversity of outdoor recreation demands and to consider outdoor recreation values in the context of other potential land uses.

The development of a "micro-ROS" system for the classification of landscapes

Landscape Classification System methodology

The Queensland Department of Natural Resources (DNR) Forest Resources', Forest Management and Forest Allocation and Use units are committed to the Montreal Process (MPIG 1998) and the development of indicators of sustainable forest management. They are also committed to the development of a truly representative landscape classification system. DNR Forest Resource field staff have been trialing a recreational Landscape Classification System (LCS) since 1996. The LCS has now reached a stage of robustness as a planning tool where it forms a part of many of the decision making tools used to plan and manage the multiple use of Queensland's forest resources. Examples include their RecValue Assessment Process, MUMPS (Multiple Use Management Planning System) and SPI (Sound Practice Indicators) systems.

In essence, the LCS is an adaptation of the original ROS. It recognises that a recreation opportunity involves three separate elements: participation in desired activities; use of specific settings; and, the achievement of a particular recreational experience (Stankey & Wood 1982). It allows recreation planners and managers to provide a range of desired outdoor recreation settings in which recreators may realise a variety of experiences by participating in their preferred activities. These settings may range from wild-natural-remote through to urban-developed-industrial.

Like the ROS, the LCS framework is a recreation management concept which systematically describes recreation settings in terms of a site's biophysical, social and managerial attributes. However, while the ROS

recognised six landscape classes (primitive; semi-primitive non-motorised, semi-primitive motorised; roaded natural; rural; modern-urban)(Clark 1982), the LCS allows for a range of recreation settings from 'Class 1' (wild-natural-remote the most natural) through to 'Class 9' (urban-developed-industrial - the least natural) (Figure 1).

Figure 1: Range of naturalness of outdoor recreation settings.
(Source: adapted from Batt 1998a p229)

Wild/ natural/ remote								Urban/ developed/ industrial
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Examples: Totally natural area		*Very natural area*		*Extensive grazing area*		*Suburban park*		*Indoor sports stadium*

With adequately precise information on biophysical, social and managerial attributes, these nine classes could be further sub-divided.

In contrast to the ROS, LCS focuses on the biophysical, social and managerial attributes of individual activity-sites. Activity-sites are defined as places in which a particular outdoor recreation activity occurs. This feature effectively eliminates the predominance of the setting to be determined by preset factors by describing actual conditions, a feature recognised as a failing in other recreation opportunity classifications (Manning 1985; Jubenville 1989; Richards & Heywood 1999). The use of numerical setting classes also lessens the likelihood of value judgements based upon preconceived notions associated with words such as *primitive*, *rural* and *urban*. This is helpful when training staff to use the LCS or explaining conceptual issues to other land managers or recreators.

Classifying landscapes

A site's biophysical, social and managerial classes are determined by appraising setting descriptors (Table 1). These setting descriptors are objective criteria that are assessed to give a site a numerical biophysical, social and managerial score. While it is acknowledged that some minor variability between assessments by different individuals may occur, the setting descriptors and assessment processes are robust enough for different individuals to score particular attributes within an acceptable range. The intent is to characterise the average condition of each descriptor of a setting, while capturing the variability in its individual character. This will allow the factor(s) which dominate at the site to influence the site's landscape class.

A significant difference between the LCS and the ROS is that the LCS allows recreation opportunity settings to be classified irrespective of the size of the setting. Original ROS criteria inferred that an area had to be a certain size before it could be classified as 'primitive' or 'semi-primitive non-motorised'. By taking the minimum size criteria out of the LCS, relatively small areas can be recognised. That is, it is now possible to identify isolated 'pockets' of recreation opportunities (such as a deep, isolated gully; or a viewing point where a city can be seen in an otherwise very natural area) which can be identified and managed appropriately.

Table 1: Biophysical, Social and Managerial setting descriptors used to determine the landscape class of a site

Biophysical Class	Social Class	Managerial Class
• Prevalence and permanence of recreation impacts	• Evidence of human activity (eg. sights, sounds and smells)	• Access to site
• Viewscape (360^{o})	• Sense of isolation and opportunity for solitude	• Evidence of management personnel
• Indicative appearance	• Interparty encounters while travelling	• Presence and extent of signage
• Prevalence and durability of impacts from non-recreation land uses	• Interparty encounters while at nodes and destinations	• Rules, regulations and law enforcement
• Naturalness of overstorey	• Dependence upon outdoor skills	• Presence of management and visitor infrastructure
• Naturalness of understorey	• Density per hectare (eg. people at one time)	
• Water Quality		

As Table 1 shows, the LCS criteria are not designed to be mutually exclusive. There is some overlap between particular criteria. Where this has occurred, it is either because it was practically unavoidable, or in the opinion of the designers, necessary to provide a more balanced assessment of the setting. The benefit of having a range of setting descriptors is to ensure that more than one feature is responsible for a site's landscape classification. Having overlap in the descriptors ensures that all features of a site are reflected in its landscape class allowing a "sense of place" or "setting feeling" to be assigned.

The landscape class of a site is expressed as a numerical score derived from the site's biophysical, social or managerial features, or as an overall assessment. The biophysical, social and managerial scores are based upon the averaging of individual setting descriptors in each of the three categories. For example, the biophysical class of a site may have setting descriptors that range from Class 2 through to Class 4 but average out at 3.3, while the social and managerial classes may have averages of 4.9 and 4.4, with descriptors that range between Classes 4 to 6 and Classes 3 to 6 respectively (Table 2). The overall class of a site is determined by the category with the highest average class (ie. closest to 9), as this characteristic will dominate the "feeling" of the site. The Table 2 illustration details that the Social Setting has the highest average score (ie. 4.9), in this example the social setting would be the dominant feature of the activity site, thus influencing the site's overall landscape class.

Table 2: Landscape class site summary

Landscape Categories	Landscape Class (1 –9)		
	Average	Min	Max
Biophysical Setting	3.1	2	4
Social Setting	4.9	4	6
Management Setting	4.4	3	6
Overall Landscape Class	**4.9**	**2**	**6**

The biophysical, social and managerial attributes of a place define its character and determine its landscape class. A classification system based upon a number of relatively objective biophysical, social and managerial criteria will allow a more thorough understanding of recreation settings and the range of attributes which can be found in these settings.

LCS advantages

The LCS allows managers and planners to allocate and regulate recreation opportunities based upon the characteristics of a setting. It can also be used to encourage appropriate activities and to discourage inappropriate activities by assigning a preferred suite of setting descriptors to an activity site. This is attained by manipulating the biophysical, social, or managerial attributes of an activity site until a desired landscape class is achieved. By assessing present landscape condition and comparing it with desired patterns of use, recreation resource managers and planners can then begin to influence user behaviour by allocating and regulating opportunities based upon the site's present characteristics and desired management intent.

The use of the LCS will allow land management agencies to determine which particular combinations of outdoor recreation activities and settings (ie. market opportunities) can best be provided on the areas under their control given their legislative obligations and the nature of those areas. It would be unreasonable to expect a single a land management agency to provide all combinations of outdoor recreation activities and settings that are in demand on a single landholding, or across all of their landholdings (Manning 1999). For example, it is unlikely that an agency that is primarily responsible for nature conservation - and which consequently has acquired land primarily for its biodiversity values - would (or would be expected to) provide highly developed recreation settings. Similarly, a local government agency would not be expected to provide wild-natural-remote landscape class settings in an urban environment. While individual agencies will need to determine what combinations of activity and setting they can provide given the nature of areas they manage, their statutory obligations and their resources, the provision of a wide range of recreation settings within a region allows for delivery of diverse recreation opportunities.

The LCS is also a means for managing recreation succession in natural areas. Recreation succession is a process by which the quality or condition of recreation settings deteriorate and/or change as a consequence of the impacts of recreation use and/or the actions of management (Batt 1998a). It occurs when the quality or character of a recreation setting changes beyond the tolerance of existing users which in turn causes a change in the mix of recreators/participants who use a particular site and/or the types of recreation activities that can be undertaken there. The LCS allows managers and planners to determine functional setting descriptors on which a 'limits of acceptable change' approach to the management of individual activity sites and the

provision of the widest possible range of high quality recreation opportunities.

Application of the Landscape Classification System: the SEQ Outdoor Recreation Inventory Project

The SEQ Outdoor Recreation Inventory Project is an attempt to overcome the present situation where no multi-agency, multi-tenure inventory of outdoor recreation sites exists. It applies the Landscape Classification System (LCS) on a cross-agency, cross-tenure basis, so that comparable information on outdoor recreation over a highly variable region may be collected.

State and Local government organisations involved in this project include: the Department of Natural Resources' Forest Management, Regional Landscape and State Water Projects Units, Department of Communication and Information, Local Government, Planning and Sport - Sport and Recreation Queensland, Queensland Parks and Wildlife Service, South East Queensland Waterboard, Department of Transport's Maritime Division and each local council in SEQ (ie. Beaudesert, Boonah, Brisbane, Caboolture, Caloundra, Esk, Gatton, Gold Coast, Ipswich, Kilcoy, Laidley, Logan, Maroochy, Noosa, Pine Rivers, Redcliffe, Redland, and Toowoomba) (Figure 2). Such a coordinated and uniform approach to the application of a particular landscape classification system and the collection of outdoor recreation data has not previously occurred in any region of Australia.

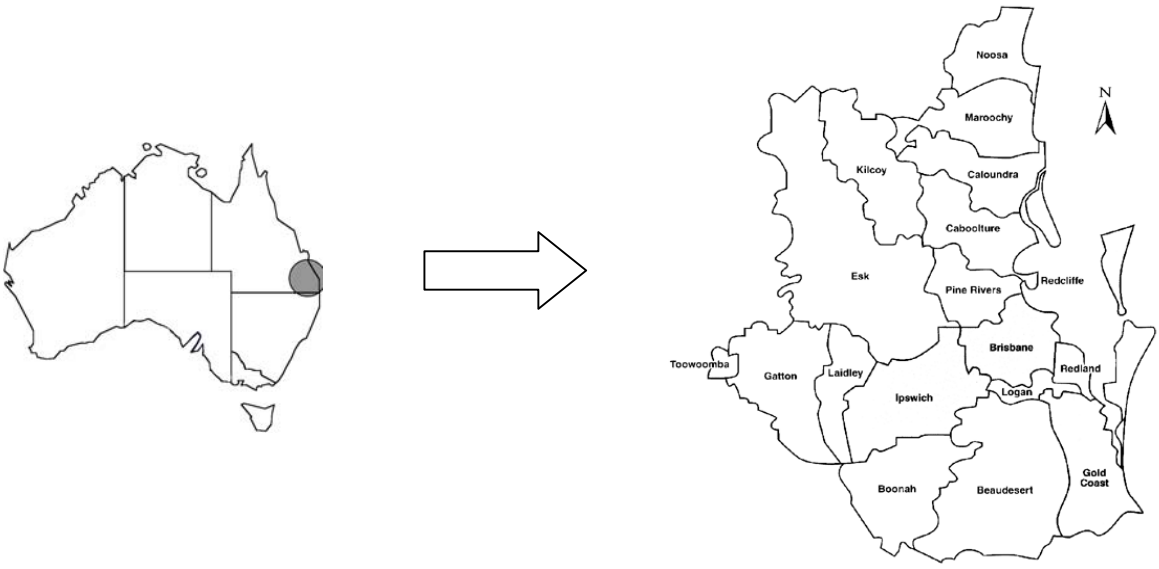

Figure 2: Project Location

Note: For this project, South East Queensland is defined as the Local Government areas of: Beaudesert, Boonah, Brisbane, Caboolture, Caloundra, Esk, Gatton, Gold Coast, Ipswich, Kilcoy, Laidley, Logan, Maroochy, Noosa, Pine Rivers, Redcliffe, Redland, Toowoomba, the Bay Islands and specific locations that are known (based upon QPWS and DNR camping data) to be heavily patronised by SEQ residents additional to these local authorities (eg. Bunya Mountains, Girraween, Fraser Island, Cooloola etc.)

Project Scope

The SEQ Outdoor Recreation Project encompasses 22 primary outdoor recreation activity types (Table 3). The 22 activity types are not exhaustive. However, previous research (including the *SEQ Outdoor Recreation Demand Study* (1998)) and opinions of key outdoor recreation professionals suggest strongly that these 22 outdoor recreation activities cover most outdoor recreation undertaken in south east Queensland. The activity types were determined on the basis of characteristics which could be used to delineate specific outdoor recreation styles/activities and for this project, are those that:

1. Are undertaken in the outdoors in natural or predominantly natural settings;
2. Generally, do not involve organised competition or formal rules.

Table 3: SEQ Outdoor Recreation Activity Types

• Bicycle riding	• Hunting (recreational)	• Sailing
• Camping	• Motor boat use	• Scuba diving / Snorkelling
• Canyoning	• Motor vehicle use	• Surfing
• Caving	• Orienteering	• Swimming
• Fishing (recreational)	• Paddling	• Viewing
• Fossicking (recreational)	• Picnicking / BBQ / etc.	• Walking / Hiking
• Hang gliding	• Rock climbing / Abseiling	
• Horse riding	• Rowing	

For the purpose of this project an *activity-site* is the geographic location where an outdoor recreation activity occurs. It includes the total area that may be used by a person or group of people for participating in a particular outdoor recreation activity. Sites to be investigated during the project include locations utilised for land-based activities (eg. walking, camping, rock climbing), water-based activities (eg. swimming, canoeing, recreational fishing) and one air based activity (ie. hang gliding). Maritime outdoor recreation activities conducted in Moreton Bay and the Great Sandy Straits are not included in this project. This information will be collected at a later date.

Geo-referenced spatial data and specific outdoor recreation activity data are being collected (Table 4). An *activity* x *setting* focus forms the basis of the inventory data. Each combination of *activity* x *setting* provides a different recreation opportunity. This allows each opportunity to be described, protected and maintained as appropriate, rather than blended into an overall recreation setting that does not reflect the full range of opportunities available. The landscape class of each activity site is one of most critical pieces of information to be collected. Thus, a "micro-ROS" approach to landscape classification underpins the whole project.

The data collection phase of this project has started. Training workshops have been conducted for nominated DNR, QPWS and SEQ Local Government field staff. These workshops provided participants with training in the use of the Landscape Classification System and how to complete the Outdoor Recreation Inventory Form. A *User Manual* has also been developed to assist participants in the collection of data. While this project is designed to occur over a 12 month period, the majority of data will be collected by early 2000. An official launch of

the Outdoor recreation Inventory for south east Queensland is scheduled for mid 2000.

Table 4: Outdoor recreation inventory project data to be collected

Data to be collected for each activity site include:
• The specific outdoor recreation activity undertaken at the site (eg. rock climbing);
• The name of the specific site where the activity is undertaken (eg. Frog Buttress);
• The name of the landholding on which the site is located (eg. Mt. French National Park);
• The site's geographical position (ie. longitude/latitude and/or AMG details);
• Brief site description (eg. why someone would visit the site);
• The site's landscape class (ie. based upon the sites biophysical, social and managerial settings);
• Site management - access and/or use restrictions (ie. site and activity);
• Public access to the site (eg. by bus, 2WD, 4WD, bicycle, walking, etc.);
• On-site services and facilities (eg. presence of toilets, drinking water, picnic shelters etc.);
• Popularity and peak usage times (estimated on a daily and monthly basis);

Project Benefits

The benefits of a "micro-ROS" approach to the collection of outdoor recreation data includes the ability to gain high quality information on a regional level which will provide reliable baseline data for outdoor recreation planning and management and for marketing information. Data collection at an *activity x setting* level will also allow each stakeholder:

- to analyse and determine the supply and management of activity specific outdoor recreation sites locally and across SEQ;
- to maximise investment outcomes for outdoor recreation services within their jurisdiction/locality;
- to identify potential market opportunities for government and local private sector organisations; and
- to increase SEQ residents' and visitors' awareness of suitable outdoor recreation sites at which they may pursue their preferred outdoor recreation activity.

For outdoor recreation planners and land managers, it will allow them to answer questions such as:

- Who is the provider of each public outdoor recreation *activity* x *setting* in SEQ? (eg. *Which agency currently provides for camp/walking ?… and in what settings?*)
- Which *activity* x *setting* combinations are poorly/over supplied? (eg. *How many Class 5 camp/walk … sites are there within 200km of Brisbane? … in Rainforest?*)
- Where does each combination of *activity* x *setting* currently occur? (eg. *Show me the location of all of the existing camp/walking sites in Class 3 settings*).
- Are there any differences in the quality of recreation opportunities in each setting? (eg. *On average, which* activity *x* setting *combinations are on unacceptably impacted sites?*)

And for recreators, the inventory will allow them to make informed decisions about where they

may wish to undertake their recreational activity. For example:

- *Show me all the places where I can go camping in a very natural setting within 2hrs of Brisbane that have showers, toilets and a kiosk nearby. What other activities can I do at or within 100m of those sites?*

Clearly, a "micro-ROS" approach to the collection of *activity x setting* data will enable a more complete picture of the supply of outdoor recreation opportunities across publicly owned lands to be developed.

Conclusion

The SEQ Outdoor Recreation Inventory Project is an innovative attempt to trial two integrative forms of management planning: a "micro-ROS' approach to the classification of landscapes and an *activity x setting* approach to the collection of outdoor recreation data for management and planning purposes. It is also an attempt to overcome the present situation where a lack of substantive primary data relating to outdoor recreation activities and site classifications is limiting the effectiveness and reliability of outdoor recreation planning and management in the SEQ region.

The project will complement the 1997 *SEQ Outdoor Recreation Demand Study* and will contribute to the understanding of outdoor recreation supply and demand in the region on two accounts. Firstly, it will be a source of key data for outdoor recreation planning and management. And secondly, it will form the basis of marketing information that will match people, activities and location.

In the absence of an inventory of outdoor recreation resources and the adoption of a truly representative landscape classification system, the efficiency and effectiveness of both public and private sector outdoor recreation planning and management decisions and the consequent provision of outdoor recreation services is severely limited. The Landscape Classification System and the SEQ Outdoor Recreation Inventory Project will enhance the delivery of recreational services on publicly owned lands throughout SEQ.

The classification of settings based upon their biophysical, social and managerial characteristics, regardless of size, is absolutely essential in understanding the fundamental products and outputs of outdoor recreation planning and management. This is because each *activity* x *setting* combination represents a distinct entity, which will attract particular types of participants/users and requires specific management styles/approaches/inputs.

Data obtained from the inventory project will also greatly benefit the wider community. Outdoor recreation activity participants will have access to information about appropriate sites for their preferred outdoor recreation activity/activities and desired landscape setting/s. Cross-agency cooperation on the inventory project will also enable land/recreation managers and planners to share knowledge and expertise. This will enable the maintenance and/or development of safe and sustainable outdoor recreation opportunities across an array of tenures that meet the demands of current and future outdoor recreators.

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