An exploratory study of community expectations regarding public forests in Western Australia

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Summary

For much of the 20th century the management of public forests in Western Australia focused on timber production and economic outputs. Shifts in environmental attitudes over the last four decades have contributed to a much broader set of community expectations. This paper analysed these expectations regarding public forests in south-western Australia at the start of the 21st century. A two-stage survey approach included a face-to-face interview followed by a questionnaire. The questionnaire consisted of a comprehensive list of 176 items that forests potentially provide, such as conservation, scenery, bushwalking and timber products, and respondents were asked to indicate the extent of their support for each. Those surveyed covered a range of ages and affiliations including academia, conservation, forestry, primary production, Indigenous interests and young people. Clearly evident was strong support for the aesthetic values of these forests and their natural environment, with weaker but still notable support for using forest resources. The comprehensive list of items in the questionnaire provides a novel, rapid means of assessing community expectations, with potential benefits for forestry planning and policy development.

Keywords: forests; public domain; public opinion; community involvement; values; policy; Western Australia

Introduction

Over the last four decades management of forests on public lands in Australia and elsewhere has been driven by two major influences: the change in community expectations regarding forests and increasing demands for the inclusion of community members and others outside government in the processes of policy formulation. In Western Australia prior to the 1970s the state's forests were valued and managed almost solely for their timber products (Williamson *et al.* 2005; Underwood 2009). These 'public forests' are defined as any forests on Crown land where management responsibility has been delegated to government agencies, local governments and other instrumentalities (DAFF 1992). The 1970s to the present day has seen a broadening of community expectations beyond predominantly timber production to encompass recreation, tourism and nature conservation, with these expectations in turn reflected in forest management (FDWA 1977; Williamson 1981; Bradshaw 1991).

This broadening in community expectations has also contributed to a greater need for public consultation in the management of native forests (Carr *et al.* 1998) to ensure that managers are aware of and can consider this breadth of community interests in their management activities. It makes good sense to include the community, on whose behalf public forests are managed, in policy formulation to ensure that society's social, economic and environmental requirements are met (McKelvey 1979; McIntyre *et al.* 2004; Webb *et al.* 2008). Ensuring that the views of all citizens are considered in forest policy formulation is a critical challenge for forest management agencies given the diversity of today's society (Tranel and Hall 2003; Bengston 2004; Harshaw and Tindall 2005). Australia's National Forest Policy Statement (DAFF 1992) requires states to develop management plans based on extensive public consultation.

Community expectations regarding public forests have been frequently researched in the past within the heading of forest values. While 'value' has many meanings (Rokeach 1973; Brown 1984; Reser and Bentrupperbaumer 2005; Winter 2005; Ford *et al.* 2009) it is used in this study to cover a broad spectrum including natural and aesthetic values, recreation, conservation and resource use values through to those associated with forest management. Techniques for identifying and measuring forest values have included literature reviews, content analyses, focus groups and surveys (Shindler *et al.* 1993; Xu and Bengston 1997; Bengston *et al.* 1999; Manning *et al.* 1999; McIntyre *et al.* 2004; Winter and Lockwood 2005; Webb *et al.* 2008; Larson 2009). A literature review and survey of residents by Manning *et al.* (1999) identified 11 values including aesthetic, ecological, recreation, education, moral/ethic, historical/cultural, therapeutic, intellectual, spiritual, economic and scientific.

Xu and Bengston (1997) used content analysis of media reports and identified four distinct ways people value forests—economic/utilitarian, life support, aesthetic and moral/spiritual. Webb *et al.* (2008) also used content analysis to study forest values expressed in Australian news media during the period 1997 to 2004. Winter (2005) used a survey of Australian respondents to develop a

'natural area scale' including intrinsic, non-use, use and recreation value items. In the Eden region of NSW a study involved a focus group that explored personal values about the forest and identified economic, social, cultural, historic, aesthetic, environmental, recreation and education values (DPIE 1998).

Generally, these forest values fall within two broad yet distinct categories that have been described and variously referred to as instrumental and intrinsic (Bengston 1994; Winter 2005), instrumental and non-instrumental (Xu and Bengston 1997), use and non-use (Winter 2005), and anthropocentric and biocentric (Steel *et al.* 1994). Instrumental and anthropocentric values relate to satisfying human needs and wants. Intrinsic, non-instrumental and biocentric values regard the worth of something as an end in itself (McFarlane and Boxall 2000). These studies have collectively highlighted a shift in values for both forest professionals and the general public from a utilitarian (instrumental, use) towards a more biocentric (non-instrumental, intrinsic, non-use) orientation (McIntyre *et al.* 2004).

Interest in forest values by researchers and managers alike is ongoing, with the United States Department of Agriculture Forest Service recently publishing a guide for their managers to help them identify the values, beliefs and attitudes of their stakeholders regarding national forests (Allen *et al*. 2009). Researchers such as Bengston (1994) have emphasised the importance of continuing to explore societal expectations regarding forests, as these will continue to change as societal values change. The study reported in this paper contributes to this fundamental interest in accessing and understanding societal expectations regarding public forests and their management.

The broad categories of values identified in previous studies provided the basis, in this study, for the selection of a comprehensive array of items that enabled respondents to describe their expectations regarding the public forests of south-western Australia. These items ranged from beauty, tranquillity and sightseeing to timber products and chipwood, and make an important contribution to better understanding the values held by Western Australians for their public forests. Additionally, the item list provides a potential ongoing tool for accessing the social data required as a precursor to successful forest planning and policy development.

Research methods

While Western Australia is largely arid and semi-arid, public forests dominated by eucalypt species occupy about 2.5 million ha of its south-western corner. Land tenures include state forest, national park and nature reserve managed by the WA Department of Environment and Conservation for conservation, recreation and tourism, water catchment protection and timber production (GWA 2009).

This study relied on a short personal interview immediately followed by a questionnaire, both administered by the researcher. This approach ensured that once a person agreed to participate both the interview and questionnaire components were completed. Both purposive and opportunistic sampling approaches (Frankfort-Nachmias and Nachmias 2006) were used to ensure a broad range of people was included from a variety of affiliations. Given the exploratory nature of this study, trialling a list of items and reporting on the diversity of expectations across the community, it was essential to access as broad a range of respondents as possible.

Interviews

The interview questions asked respondents for their experience and knowledge of forests, for their thoughts on hearing the word 'forest', how forests were important to them, what they liked and disliked about forests, and what they wanted forests to provide. These open-ended questions allowed the researcher to explore respondents' affective associations (Neuman 2000) with the forest, given the link between emotions and forest values. Such questions were essential to ensure this study accessed a comprehensive range of expectations regarding forests. The interview concluded with questions on the respondent's age, postcode, and affiliation that most closely described their situation.

The interviews were digitally recorded and then analysed using content analysis (Miles and Huberman 1994). The content analysis occurred at two levels—first, to identify from the responses to the questions a small number of category descriptors for analysing and presenting the results (e.g. natural environment values, Table 1). The second level of analysis was allocating the responses to each question to a category and selecting illustrative quotes for each category. The selected quotes represent ideas widely evident from the interviews.

Questionnaire

The aim of the questionnaire, and central to the purpose of this paper, was exploring and further developing a comprehensive list of items representing the widest possible range of community expectations regarding public forests and the extent of support for them. Each respondent was presented with a list of items collectively encompassing all expectations regarding, or potentially associated with, public forests in Western Australia. Collectively, the items reflected the values identified in earlier studies (e.g. Bengston 1994; Winter 2005). The items were listed in alphabetical order to avoid any suggestion of imposed preference.

The first author developed the comprehensive list based on 40 years of experience as a forester and conservationist. It extends the list of values provided by Lee and Abbott (2004), in their analysis of Western Australian forest policy, by including recreation and forest resource use and having a greater emphasis on intrinsic and aesthetic values. Respondents were asked to indicate their level of support for each item using a 5-point Likert scale ranging from strongly against (1) through to strongly in favour (5). In addition to addressing the items listed in the questionnaire, respondents were invited to add any other items that they associated with forests.

For consistency in analysis the results from the questionnaire regarding the support given to each item have also been presented according to the same categories that emerged from the interview results. Items relating to managing the forest rather than forest values themselves have been placed in a fifth category 'managing the forest'. The questionnaire results have been analysed and presented as means (1 = strongly against through to 5 = strongly in favour) and combined-in-favour percentages (CIF%). The CIF% is the sum of the 'in favour' and 'strongly in favour' responses

for each item (i.e. a score of 4 or 5 on the 5-point Likert scale) expressed as a percentage of the total responses for that item. The higher the CIF% for an item, the greater the support for it.

Apart from descriptive statistics, no other statistical analyses were undertaken. There are two reasons for this. First, as an exploratory study the focus was on eliciting a comprehensive range of meanings and associations the community has regarding public forests. Selection of respondents was based on purposive rather than random sampling to obtain as broad a range of views as possible. In this context inferential statistics based on random sampling and then analyses to generalise the findings to a broader population were neither applicable nor relevant. Second, although it would be interesting to undertake between-group analyses (e.g. expectations of recreationists compared to forest managers) this was not the intention of this study. If these divisions in the data were made, the resultant small group sizes would adversely affect the reliability of the findings.

Results

Interviews

A total of 69 people were interviewed ranging in age from 14 to 92 y, with 48% females and 52% males. Most were from Perth (85%), the capital of Western Australia, with the remaining 15% from regional areas. Affiliations included citizen (20%), conservation (17%), forestry (17%), professional (16%), academia (12%), primary production (6%), Indigenous people (6%) and young people (6%). Indigenous and young people have been noted as under-represented in similar surveys (Dale *et al.* 2001; Bengston 2004). About half of the respondents (55%) felt that they had a little knowledge of the forest, 20% felt they knew quite a bit while 25% reported they knew a great deal. Respondents commented that they had visited a number of the south-western forests. Some reported visiting forests daily as part of their work while others had visited only a few times. Walking (38%) was the most common activity, followed by living in (22%), working in (17%), driving through (17%) and camping in (16%) forest areas.

Respondents' expectations regarding forests obtained from the interviews are presented according to four categories: natural environment, aesthetic, recreation and resource use. These categories 'emerged' from the interviews and were informed by categorisations used by other researchers (e.g. Bengston 1994; Winter 2005). When asked what they think about *when they hear the word 'forests'* 90% of responses related to the natural environment, with less than 20% of responses relating to other values including aesthetic, recreation and resource use (Table 1, column 2). The spread of responses when asked about *the importance of forests* was similar, with 85% referring to the natural environment using words such as birds, animals, old growth forest and the ecosystem. Aesthetic, recreation and resource use received a quarter or less of the responses (Table 1, column 2).

When asked what they *liked about forests*, respondents again highlighted the natural environment (75%), although more responses related to aesthetic (48%, see Table 1, column 3) than did the responses to the previous two questions (Table 1, column 2). A total of 33% of the respondents stated that there was nothing they disliked about forests. Others commented on activities that can result in negative impacts including logging (especially clear-felling and wood-chipping), clearing for farming, bauxite mining, rubbish dumping, feral animals and weeds, dieback (*Phytophthora cinnamomi*), four-wheel-driving, rally driving and horse riding. The last of the expectations-focused

Table 1. Respondents' thoughts about forests and their importance, what they like about forests and what they would like forests to provide (from the interviews)

Category	Respondents' thoughts about forests, and what they consider important about forests (illustrative responses)[A,B,C]	What respondents like about forests (illustrative responses)[A,B]	What respondents would like forests to provide (illustrative responses)[A,B]
Natural environment	Beautiful eucalypts, lots of large trees, trees everywhere, birds, animals, old growth forest, the ecosystem Thoughts = 90% Importance = 85%	Wilderness, wildlife, big trees (75%)	A place to go and appreciate nature, biodiversity, full range of forest values (66%)
Aesthetic	Healing, de-stress, sanctuary, peace, beauty, calming Thoughts = 17% Importance = 25%	Inspiring, quietness, beauty, beautiful places, restful (48%)	Beauty, solitude, serenity, peacefulness, spiritual renewal (36%)
Recreation	Camping trips, parents and picnics, walking Thoughts = 17% Importance = 15%	Recreation, bushwalking (14%)	Areas for recreation, walking, recreation, hiking, camping, 4WD (52%)
Resource use	Multiple use, wood-chipping, industry Thoughts = 4% Importance = 4%	Timber production (2%)	Wood, paper, sustainable supply of forest products, everything, multiple use (35%)

[A]Percentage (%) = Number of favourable responses allocated to a category (e.g. resource use) divided by the total number of responses to the question.
[B]The figures do not sum to 100% as respondents often provided a response in several categories.
[C]There are two percentages in each cell of column 2: the one on the top reporting on 'thoughts on forests' and the one on the bottom reporting on 'what is important about forests'. The illustrative responses to these two questions were combined because of their great similarity.

questions asked respondents *what they would like forests to provide*. A broad range of expectations was evident with each of the four categories receiving a third or more (35–66%) of the total number of responses (Table 1, column 4).

Questionnaire

Given that both the CIF% and mean scores for all items showed similar relative trends, for simplicity only the CIF% is discussed here although both are given for all items in Table 2. Of the 69 people surveyed not all responded to every item, with responses to each item ranging from 53 to 63 in number. As for the interview component, a broad range of strongly favoured values, including natural environment, aesthetic, recreation and resource use, were attributed to public forests (Table 2). Managing the forest was also strongly favoured. Aesthetic received the greatest support, with a mean CIF of 94% (Table 2). There was also strong support for the forest's natural environment (86%) and managing the forest (85%). Recreation was next with a CIF of 70%, with resource use the lowest at 38%.

A number of items from the above-mentioned categories had combined-in-favour percentages of 100%, emphasising the wide range of expectations and the strong support for them (Table 2). The *natural environment* items of conservation and healthy ecosystems, the *aesthetic* items of beauty and scenery, and the items of prevention of dumping rubbish and removal of feral animals as part of *managing the forest* all had CIFs of 100%. None of the resource use items had CIF%s of 100% (Table 2). A CIF% of 50% or greater meant an item was favoured to strongly favoured and 70% of all the items were assessed as such by respondents, including some of the *resource use* items.

Additional items suggested by respondents were mostly variations on items in the existing list. The Indigenous respondents, however, suggested new items that could be part of future surveys. These included Aboriginal men's and women's cultural sites, dreaming trails and burial sites as well as Aboriginal smoking ceremonies and meeting places.

Discussion

The broad range of expectations and the strong support expressed for them in this study complements findings from other research. For example, Manning *et al*. (1999) found that most values of the

Table 2. Strength of support for the 176 items from the questionnaire organised using the categories from the interview as in Table 1 (CIF% = combined-in-favour percentage)

Natural Environment Values (NEV)

Item	Mean score[A]	CIF%
Conservation	4.7	100
Healthy ecosystems	4.7	100
Catchment protection	4.6	98
Education	4.6	98
Habitat for living things (native)	4.7	98
Oxygen	4.7	98
Shade	4.6	98
Birds	4.6	97
Maintaining biodiversity	4.6	97
Regeneration	4.6	97
Wetlands	4.6	97
Ecosystems	4.4	95
Native plants	4.1	95
Wildlife conservation	4.4	95
Reduction of noise	4.5	94
Shelter	4.4	94
Special places	4.5	94
Preservation of culture	4.4	93
Biodiversity	4.3	92
Insects	4.4	92
Soil protection	4.5	92
Heritage	4.4	90
Information	4.3	90
Nesting sites	4.3	90
Wilderness values	4.3	87
Climate amelioration	4.0	84
Wind break	4.4	84
Coolness	4.2	82
Lichen	4.2	82
Discovery centres	3.9	76
Leaf litter	4.1	76
Snakes	3.6	75
Carbon sequestration	3.8	73
White ants	3.6	69
Algae	3.5	44
Smoke from forest fires	3.0	35
Bushfires	2.6	31
No. of items in category	*37*	*37*
NEV category mean	**4.2**	**86**
NEV category range	**2.6–4.7**	**31–100**

[A]Five-point scale ranging from strongly against (1) through to strongly in favour (5)

Aesthetic Values (AEV)

Item	Mean score	CIF%
Beauty	4.7	100
Scenery	4.6	100
Tranquillity	4.6	98
Communion with nature	4.6	97
Views	4.4	97
Aesthetics	4.6	95
Emotional attachment	4.5	95
Inspiration	4.6	95
Photography	4.5	94
Recharging the batteries	4.5	94
Solitude	4.5	92
Landscape vistas	4.4	90
Wilderness experience	4.3	87
Spirituality	4.4	85
No. of items in category	*14*	*14*
AEV category mean	**4.5**	**94**
AEV category range	**4.3–4.7**	**85–100**

Managing The Forest (MTF)[B]

Item	Mean score	CIF%
Dumping rubbish—prevention	5.0	100
Dumping stolen cars—prevention	5.0	100
Feral cats —removal	4.9	100

Table 2. (continued)

Feral pigs—removal	4.9	100
Foxes—removal	4.9	100
Pest animals—removal	4.9	100
Dumping dead bodies—prevention	4.7	97
Rehabilitating the forest	4.6	97
Research	4.6	97
Weeds—removal	4.7	97
Rabbits—removal	4.8	95
Regenerating the forest	4.5	94
Forest management	4.2	89
Fire management	4.3	87
Prescribed burning	4.1	79
Fire suppression	4.1	77
Ecosystem-based forestry	3.9	73
Boardwalks	3.7	71
Controlled burning	3.5	69
Bridges	3.2	58
Airstrips for fire fighting	2.7	51
Roads	3.1	48
No. of items in category	*22*	*22*
MTF category mean	**4.3**	**85**
MTF category range	**2.7–5.0**	**48–100**

[B]Category added for items related to forest management rather than values *per se*

Recreation Values (RECV)

Item	Mean score	CIF%
Bush walking	4.6	98
Walking	4.6	98
Admiring large/tall trees	4.7	97
Hiking	4.5	95
Long distance walking	4.4	95
Nature study	4.5	95
Admiring the wild flowers	4.6	94
Bird watching	4.4	90
Cultural experience	4.0	90
Painting (artistic)	4.2	90
Picnicking	4.0	90
Sight seeing	4.3	90
Canoeing	4.2	89
Recreation	4.2	89
Trails	3.8	87
Ecotourism	4.0	85
Tracks	3.7	80
Camping	4.0	79
Swimming	4.0	79
Visiting visitor centres	4.0	79
Orienteering	4.0	78
Self reliance	4.1	77
Caveing	3.7	75
Picnic spots	3.9	74
Visitor centres	3.3	72
Driving through the forest	3.4	69
Rock climbing	3.8	68
Rogaining	3.6	66
Fishing	3.6	65
Amorous assignations	3.9	63
Commercial tourism	3.2	52
Marroning	3.4	51
Accommodation	3.1	45
Horse riding	3.0	45
Mountain-bike riding	3.0	44

Column 1 (continued)

Protest sites	2.9	39
Four-wheel driving	2.3	27
Rally driving	1.9	16
Trailbike riding	2.0	16
Hunting	1.9	14
Paint-balling	1.8	10
No. of items in category	*41*	*41*
RECV category mean	**3.7**	**70**
RECV category range	**1.8–4.7**	**10–98**

Resource Use Values (RUV)

Item	Mean score	CIF%
Antiseptics	3.5	75
Medicinal values plants	3.7	74
Employment	3.9	73
Furniture wood	3.6	70
Job creation	3.8	69
Eucalyptus oil	3.3	68
Honey	3.4	67
Bush tucker	3.6	66
Clean water	3.5	64
Products from trees	3.2	64
Renewable resources	3.4	63
Craft wood	3.3	61
Sandalwood oil	3.1	57
Gum nuts	3.4	55
Wood sculptures	3.2	50
Mushrooms	3.0	48
Roads	3.0	48
Firewood	3.0	46
Fish	3.0	46
Gum	3.2	46
Perfumes	2.8	46
Marron	3.0	45
Flora	2.8	44
Fungi	2.9	44
Leaves	3.0	44
Utility corridors	3.1	42
Veneer	2.8	42
Bark	2.7	41
Charcoal	2.7	41
Logging	2.7	41
Timber products	2.8	40
Wildflowers	2.8	40
Sawlogs	2.5	38
Royal show log-chop logs	2.8	36
Tannin	2.6	34
Scantling	2.5	33
Fauna	2.5	32
Shingles	2.5	32
Old-growth forests	2.2	31
Paper	2.4	31
Poles	2.5	31
Chipwood	2.3	28
Rafters	2.4	28
Piles	2.4	27
Pulpwood	2.2	27
Railways	2.6	26
Utility corridors–water supply	2.5	26
Christmas trees	2.3	25
Mining timber	2.1	22
Railway sleepers	2.2	22

Table 2. (continued).

Protesters' platforms	2.1	21
Native animals	1.7	20
Collecting things	2.3	19
Defence force training	2.3	19
Utility corridors—irrigation	2.3	18
Gravel	2.1	16
Utility corridors—electricity	2.2	16
Utility corridors—gas	2.2	15
Grazing	1.9	13
Minerals	1.9	11
Utility corridors—bauxite	1.9	8
Mining	1.6	6
No. of items in category	*62*	*62*
RUV category mean	**2.7**	**38**
RUV category range	**1.6–3.9**	**6–75**

Green Mountain National Forest in Vermont were judged to be relatively important by respondents. Of their 11 values of interest, 8 received an average rating of at least moderately important (a value of 4 on a 6-point scale). In their study almost two-thirds (64%) of items were regarded favourably to very favourably.

The early work by Bengston (1994) developed the idea of forest values from a multi-dimensional perspective. He argued that given this perspective, forest values are unable to be reduced to a single dimension. The many values in his study encompassed natural environment, aesthetic, recreation, and resource use values, plus managing the forest. Other studies have similarly emphasised multiple values. Xu and Bengston (1997) identified and coded on economic/utilitarian, life support, aesthetic and moral/spiritual values. Bengston *et al*. (1999) worked with six statistically significant forest values (significant in their contribution to explaining respondents' attitudes to forest management): ecological, aesthetic, spiritual, moral/ethical, economic and scientific. Webb *et al*. (2008) based their analysis on three value categories: commodity, ecological and moral/spiritual/aesthetic.

As was the case from our study and other research, the multi-dimensionality of public forests values were apparent, with some more favoured than others. Non-instrumental values were clearly favoured, with the natural environment, aesthetic, managing the forest and recreation with mean CIF%s of 70% or greater (Table 2). Resource use had the lowest mean CIF% (38%). Manning *et al*. (1999) similarly noted aesthetic and ecological values as most important with economic values least important.

Aesthetic values had the highest mean CIF% (94%) of all the categories in this study (Table 2). Scenery, conservation and beauty were supported by all respondents. Xu and Bengston's (1997) research on the national forests of the United States emphasised the importance of aesthetic and spiritual values. Natural environment values, including the items of conservation and biodiversity, also had a high mean CIF% (86%) in this study of the south-western forests. Webb *et al*. (2008) noted the important place of natural environment values in today's forestry in Australia.

Recreation values also had a moderately high mean CIF% (70%) in this study (Table 2). Bengston *et al.* (1999) found that by 1996, the last year of their study, that recreation was more frequently mentioned in the media than all the other values combined. The category *managing the forest* also had a high mean CIF% of 85%. This was largely because of strong societal expectations regarding active management to remove threats to forests, such as feral animals, and preventing activities damaging to forests, such as rubbish dumping. Both of these items had CIF%s of 100%.

Part of the purpose of this study was to determine the usefulness of a questionnaire based on a comprehensive list of items expressed in everyday language and covering community expectations regarding public forests. The results presented here attest to the usefulness of this item list. Collectively, the items capture the extent and complexity of societal expectations regarding public forests in south-western Australia in the opening years of the 21st century. They provide a readily accessible overview of societal concerns and expectations that can be used as one of the essential sets of social data informing forest planning and policy development.

Several opportunities for future research, building on the approach taken in this study, are evident. To progress to widespread use of a mail-based questionnaire, a reduction in the number of items is essential. This could be achieved by a larger survey than the one conducted for this study, accompanied by factor analyses to reduce the number of items for use in subsequent surveys. Revision of the items to produce variables amenable to quantitative measurement (Lantz 2008) is another potential development. Additionally to investigating expectations, Tindall (2003) and Ford *et al.* (2009) recommend investigating the underlying human beliefs.

The selection of items for use in questionnaires obviously influences the results (Frankfort-Nachmias and Nachmias 2006). To that end the questionnaire used in this study relied on simple words and on occasion used very similar words (e.g. views, scenery and aesthetics, and feral cats, feral pigs, foxes, rabbits and pest animals) to make sure people could access the full range of forest values. Although this ensured all values were readily available for response, it potentially contributed to the means of the value categories being more influenced by some items than others. For example, for the Managing the Forest category it is likely that pest animals—with 5 of the 22 value items in this category related to pest animals—had a strong influence on this category mean (Table 2). Although for pest animals, removing the means for feral cats, feral pigs, foxes and rabbits changes the category mean only from 4.3 to 4.2, a cautious approach to comparisons between categories is well warranted.

The qualitative, interview-based component of this study was valuable for its reminder about how much the wording of questions influences responses. For example, when asked in the interviews about the *importance* of forests only 15% of responses related to recreation, but when respondents were asked about *what they would like* from forests the percentage for recreation increased to 52% (Table 1). Therefore, the precursor or guiding questions for any survey seeking information on expectations and related values must be carefully worded. Asking about peoples' aspirations ('wants' in this study) is likely to evoke the broadest possible range of expectations.

Conclusion

The broad range of expectations expressed in this study regarding public forests reflects a major societal shift over the last few

decades to an appreciation of forests for their intrinsic as well as their instrumental values. Similar findings are evident from related research elsewhere in Australia and in the United States and Canada (Bengston 1994; Steel *et al*. 1994; Xu and Bengston 1997; Manning *et al*. 1999; Tindall 2003; Winter 2005; Winter and Lockwood 2005). It is important that public forests are managed for this breadth of values, with intrinsic ones clearly included. An awareness of the values held by community members is an essential precursor to any forest planning, policy development and management (Allen *et al*. 2009).

Understanding societal expectations is essential for good forest management and the approach taken in this study involving a comprehensive list of specific items associated with forests makes a contribution to this understanding. Given the fluidity of societal values and expectations regarding forests, this kind of survey needs to be periodically repeated, ideally before a new management plan is to be prepared.

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