

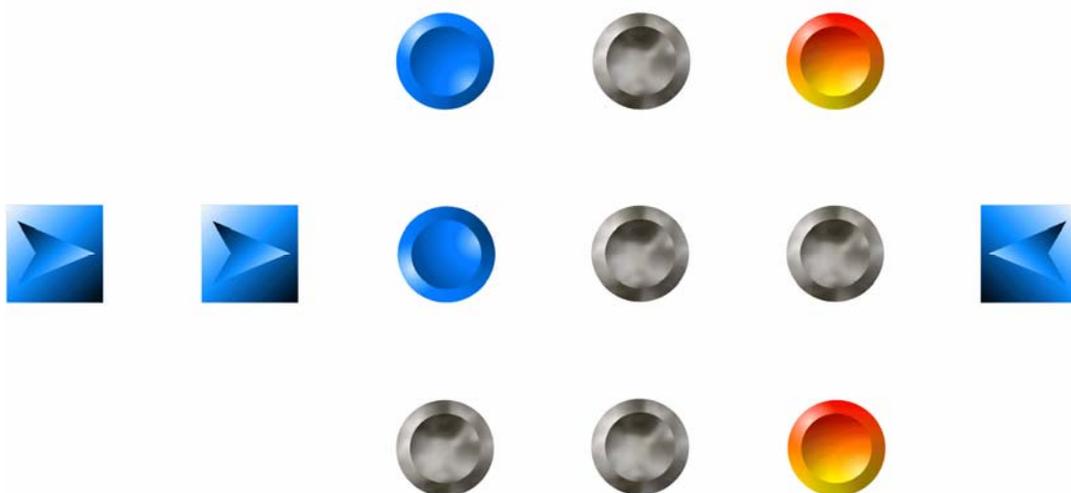
South West of Western Australia Water Catchment Management Issues Drinking Water Policy and Logue Brook Dam

Community Survey Results

Prepared for
Department of Water

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Brief Summary of Results: Logue Brook Dam Surveys

To provide information to assist in evaluating a proposal to change the status of Logue Brook Dam from *irrigation and recreation* to *irrigation and drinking water*, two separate but related research and engagement processes were conducted to gauge public opinion on the issue. These two processes used similar surveys to collect information about water catchment management issues in general as well as the Logue Brook Dam proposal. However, the sampling and participation methods were very different

The first process involved a large-scale, random sample community survey. 7000 surveys were sent to residents of Perth, Bunbury, and the region in between. These recipients were randomly chosen from the WA Electoral Roll, giving the most representative practical sample of the population. 1017 useable returned surveys were analysed, with the sample weighted to match the population profile. The main findings of the community survey were:

- 83% felt that drinking water should be protected by preventing possible contamination rather than relying on treating water that was used for other purposes as well.
- 70% felt that safety and protection of drinking water sources should take priority over all other issues and possible uses of dams and the water. It was found that this was *the* critical factor in predicting reactions to the Logue Brook proposal, and to management practices generally.
- 67% preferred to keep the current policy of separating drinking water and recreation.
- 69% would *at least quite strongly* support the proposal to change the status of the dam.

The second process was a Dialogue Forum held in Harvey (near Logue Brook Dam), attended by nearly 200 people. Approximately one third of participants responded to invitations sent with the random community survey, one third were people who directly responded to adverts for the forum, and one third were invited stakeholders. Participants completed a slightly shortened version of the community survey at the beginning of the forum, deliberated on the issues and asked questions of experts throughout the day; and then completed the survey again at the close of the day. 144 of the attendees completed both surveys. This enabled an examination of whether the views of the Forum changed as a result of deliberation. In addition, it could be discerned whether the views of the Forum participants were representative of the general population. The comparative views of the dialogue participants (from the post-forum survey) were:

- 64% felt that we should rely on treatment technologies to make drinking water safe, allowing development and recreation in drinking water dams and their catchments
- Only 22% felt that safety and protection of drinking water sources should take priority over all other issues and possible uses of dams and the water.
- 75% preferred the current policy of separating drinking water and recreation to be reviewed.
- Only 13% would *at least quite strongly* support the proposal to change the status of the dam.

While there was strong support from community survey respondents for both the Logue Brook Dam proposal and the current policy of separating drinking water and recreation from the community survey respondents, there was little support from those people who participated in the Dialogue Forum.

Most community survey respondents (70%) were 'risk averse' to using drinking water sources for other purposes (eg. recreation). This appeared to be the key driver for their support to change the status of Logue Brook to drinking water and retain the current water management practices that do not allow recreation around drinking water sources. On the other hand, most Dialogue Forum participants (73%) were 'risk tolerant' towards combining drinking water sources with other uses (including recreation) prior to the day's deliberations, and this increased to 78% by the end of the Forum.

Directly comparing the views of the two groups is not appropriate due to the different sampling and participation processes. However, it is clear that the views of participants at the Dialogue Forum were not typical of the general population. Those who chose to attend the deliberation Forum clearly favoured the retention of Logue Brook for recreation purposes, and those views did not change throughout the course of the day.

What was common to both groups, though, was the importance of water and dams. The two processes show that there are competing needs for our limited supplies of water and preferences for how these should be managed, and suggest that finding the balance will be an on-going challenge for the community and for Government.



Executive Summary

A community engagement process has been used to consider a number of water catchment management issues including the future of Logue Brook Dam. This process was overseen by a Steering Team of stakeholders. It commenced with a traditional random sample community survey posted to seven thousand households across Perth and the South West in June 2006 and the following report outlines the results of that survey.

The community survey was followed by a 21st Century Dialogue meeting which aimed to enhance opportunities for understanding and deliberation. The Dialogue was held in Harvey on 22 July 2006, and it included a second survey conducted as a 'deliberative survey' where participants were asked to complete the same survey at the beginning and end of the Dialogue Forum (a separate report on the deliberative survey is available and is recommended reading alongside this report).

The following results were obtained from a statistically reliable and representative survey of residents from Perth and the SW area between Perth and Bunbury.

The main conclusions from the community survey were:

1. **The community is generally very conservative about protecting drinking water sources.**
 - a. 68% felt that drinking water sources should not be used for any other purpose.
 - b. 83% felt that drinking water protection should be ensured by prevention of contamination rather than treatment of water used for other activities.
 - c. 70% felt the safety and protection of drinking water supplies should be given the highest consideration, and that achieving the lowest level of risk should take priority over all other issues and possible uses.
 - d. 67% preferred to keep the current policy of separating drinking water and recreation.

2. **There is quite strong support in the community across Perth and the Perth-Bunbury area of the South West for converting the Logue Brook Dam from an irrigation and recreation dam to an irrigation and drinking water dam.**

69% would *at least quite strongly* support the basic proposal to change the status of the dam, and this figure increased to 77% after consideration of some of the possible 'trade-offs' that could be offered to mitigate the impact of the loss of recreational facilities.

Recreational users of the dam and a more risk tolerant segment of the population were initially opposed to the change (41%), but after consideration of the possible trade-offs became more supportive (63%).

3. **The biggest predictor of attitudes towards water catchment management and also towards the Logue Brook Dam proposal is the level of risk tolerance shown towards protection of drinking water supplies.**

People who are prepared to consider other issues beyond simply the protection of the water supply over all other considerations (ie. people willing to possibly accept a little more risk) have significantly different views about catchment management, and are less disposed to the Logue Brook proposal in its black and white "recreation or drinking water" form. It appears that this segment of the community is around 27%.



4. There are several other segments within the population whose attitudes towards catchment management vary in specific ways.
 - a. **Three-quarters (75%) of the community respondents felt that water should meet local needs before feeding into the integrated water supply.** This segment includes the 27% who were most risk tolerant.
 - b. Of the 25% who feel that all water should be integrated to best meet the needs of the state, **11% thought it more appropriate to focus on reducing water use**, while **14% felt it more appropriate to concentrate on finding new sources of water.**

5. **If a practical way of separating supplies of drinking water from non-drinking household water can be found, then there appears to be a latent willingness in the community to treat the two differently**, including accepting different levels of multi-purpose use of dams.



1. Background and Methodology

1.1 Background

Water has historically been a significant issue in Western Australia, and with the state's increasing population and an apparent decline in natural rainfall in catchment areas, it is sure to remain so for some time to come. The management of water resources is therefore of considerable concern across all sectors of the community. The newly formed Department of Water has the mandate to ensure a sustainable water supply to the state.

Western Australia has a longstanding policy of protecting sources of public drinking water through (amongst other things) the prohibition of recreation in or near drinking water dams. This policy is strongly advocated by the Department of Health, and has not been altered despite several previous reviews.

However, Western Australians are part of a water loving culture, and non-drinking water dams are an important component of the WA recreational landscape. Water is also critical to the State's agricultural and industrial activities, which are themselves core elements of the economy and community.

With demand on the water supply growing, it is inevitable that pressure will ebb and flow to alter the usage patterns of some water sources and dams to optimise the overall mix. An example of this growing pressure has emerged at Logue Brook Dam (LBD) in the south west, near Yarloop.

LBD was constructed to provide irrigation water for local agriculture, and has since developed as an important recreational venue for both local residents and for visitors (primarily from Perth). The irrigation system fed from LBD is an open channel system, and it has been estimated that around 30% of the water which enters the system is lost through processes such as evaporation and seepage.

A proposal to alter the usage of LBD has been submitted to Government by Harvey Water (an irrigators co-operative using LBD) and the Water Corporation. The proposal is for Water Corporation to provide funding to construct a more efficient piped irrigation system, and in return the water saved each year would be made available to the Integrated Water Supply System (IWSS)..

The IWSS is the piped scheme water supply for the Perth metropolitan area, some towns in the South West, and towns and farms of the Central Wheatbelt through to Kalgoorlie-Boulder which are connected to the Goldfields Pipeline from Mundaring Weir. The capacity of the IWSS to meet growing demand is being challenged, and there is an immediate need to find additional sources of water for this supply.

The LBD proposal is an attractive option to the Water Corporation as it offers a relatively inexpensive on-going source of water for the IWSS. The proposal is of obvious benefit to the irrigators co-operative through an improved piped and pressurised irrigation system. Harvey Water is also looking at other options to help them fund a piped system.

If the current proposal was approved by Government, then the status of LBD would change from irrigation and recreation to irrigation and drinking water. This decision would then trigger existing drinking water protection policy resulting in the water and land surrounding LBD becoming off-limits for recreational use. Such a decision would impact on both the range of recreational opportunities in the area, and recreation demands on other dam sites.

The question for Government when considering the proposal is to determine the best value use of LBD. While the question to be resolved at LBD is already a difficult one, it is further compounded by the wider context. It is possible that similar questions will be asked in the future about other dams, and the decision on LBD will inevitably be seen as something of a precedent in terms of both the process and outcomes.

Therefore, in considering the proposal for the future of LBD, there are some wider water catchment management issues that need to be included, as well as direct consideration of this particular dam.



While in a representative democracy the ultimate *decision* on the proposal must be made by the elected Government, there is still an important role for the community to play in the decision making *process*.

Traditional community consultation processes have often failed to have a meaningful and constructive effect, often because they lack representativeness of the wider community and /or true opportunities to deliberate on the issues and potential solutions. More contemporary community engagement processes are designed to improve these facets, intending to provide a better outcome for both the agencies engaging with the community and with the community members who participate. While there is not yet a culture of participation in 'deliberative democracy', it is hoped that through more positive experiences of the process that such a culture can in time be developed.

As part of the Government's consideration of the LBD proposal, the Department of Water was supported to undertake a Community Engagement Process (CEP) – the first time this process has been applied to water management issues in WA. The CEP consisted of two integrated components:

1. A large-scale traditional survey of community attitudes undertaken in June 2006; and
2. A Dialogue Forum held in Harvey on 22 July 2006 where participants completed a deliberative survey.

The first of these two components is a relatively standard methodology, with such surveys being widely used by both Governments and private sector businesses across western societies. When properly executed, such surveys are practical and effective ways of measuring prevailing attitudes and preferences at a community level.

One of the limitations of a traditional survey is that they are only capable of measuring existing attitudes or preferences – but not *possible* attitudes or preferences. This distinction is important when the issues being considered are incompletely or inaccurately understood in the community, or in the absence of an opportunity to discuss and explore the issues and possible solutions. While the relevance of prevailing attitudes and preferences can never be discounted, there are times when measuring these *alone* are not sufficient to make informed decisions, and it is important to also know what the community *might* think if they had access to more information and a chance to discuss the issues with other people.

A deliberative survey is a technique which allows this type of information to be collected and is a variation of the standard scientific methodology of pre-and-post testing. In this methodology data is collected prior to some 'intervention', and then again after the intervention – with the intention being to identify what the effect of the intervention has been. This type of survey involves participants completing a survey prior to a deliberative experience (usually some form of interactive workshop) and then again after the experience. The theory is that the post-experience results provide an indication of what the community might feel if all people were given a similar type of experience. If a deliberative survey shows a substantial change in attitudes or preferences, then this may need to be considered alongside prevailing attitudes and preferences in the decision making process.

The combination of the two methodologies has been designed to give the Western Australian Government maximum insight into community attitudes towards the issues of relevance in the decision on the future of Logue Brook Dam.

This report only contains the results of the Community Survey. Results from the Deliberative Survey can be seen in a separate report.

Additional reference: More information on the LBD proposal and Dialogue Forum (including copies of this report and the separate deliberative survey report) can be located on the Department of Water's website at - www.water.wa.gov.au. Follow the links from the homepage to 'Drinking Water' and then under Projects open 'Logue Brook Dam'.



1.2 Community Survey Methodology

Objectives

The objective of the community survey was to generate reliable, representative data on the views of the community with respect to both water catchment management in general and to the issue of the future of the Logue Brook Dam (LBD) in particular.

The specific informational objectives of the survey were to determine:

- The relative importance of water as an issue in the South West of WA
- The relative importance of different uses of water
- Perceptions of appropriate uses of water sources
- Perceptions of appropriate activities in drinking water sources and their catchments
- Preferred approaches to catchment management and drinking water protection issues
- Perceptions of the value of likely outcomes associated with changing the status of LBD from irrigation and recreation to irrigation and drinking water
- Support for the basic proposal to change the status of LBD
- The impact of possible trade-offs to mitigate the loss of recreation at LBD on support for the proposal
- Preferred alternative sources of drinking water should be proposal to change the status of LBD be rejected
- Attitudes towards potential changes to other irrigation and recreation dams in the area.

Questionnaire

The questionnaire was designed by an independent research consultant, in conjunction with the project steering committee. The steering committee was made up of representatives from (in alphabetical order):

- Camp Logue Brook
- Department of Environment and Conservation
- Department of Fisheries
- Department of Health
- Department of Sport and Recreation
- Department of Water
- Harvey Water
- Recreation representatives
- Shire of Harvey
- Shire of Waroona
- Water Corporation

A copy of the community survey questionnaire used can be seen in Appendix A of this report.

Data collection approach

The survey was distributed by random cold mailing, and returned by mail using an enclosed reply paid envelope.

The mail survey methodology was chosen to allow more complex questions than would be practical to complete over the phone (such as multi-part questions) and to allow the detailed introductions and explanations necessary for respondents to provide meaningful answers.



Sample frame

There were two populations of interest to this survey – residents of Perth and residents of the South West (from the boundary of Perth to Bunbury). In raw size, the Perth population is something like 40 times larger than the population of the South West – yet the location of the Logue Brook Dam in the South West dictates that the views of residents of this region are very important.

Therefore, it was decided to establish a 50:50 ratio of Perth and South West respondents in the survey. The South West sample was further broken down to Bunbury (19.5%) and the region between Perth and Bunbury (“South West Regional”, 30.5%)¹. This is known as a stratified sample.

Table 1: Areas included in the community survey sample area.

Area	Perth (50%)	South West (50%)	
		South West Regional	Bunbury
Stratification	50%	30.5%	19.5%
Included:	All Perth metropolitan postcodes	Shires of: <ul style="list-style-type: none">• Serpentine-Jarrahdale,• Murray,• Boddington,• Waroona, and• Harvey.	City of Bunbury

Representativeness

There are two essential technical characteristics of a survey sample: representativeness and reliability. Assuming representativeness requirements are met, reliability is primarily a function of sample size (and will be dealt with below).

Representativeness is the extent to which the sample represents the total population. There are a number of ‘structural variables’ that can be used to ensure that the sample accurately reflects the structure of the population. Most commonly age, gender and location are used as structural variables, although others can be used where there are known population benchmarks to refer to. In this case though, these three variables were used to structure the sample.

The principle of representativeness requires that the sample used for the survey matches the age and gender profiles of each of the three regions included. This is achieved in two ways. First, surveys are initially sent to a random sample of recipients in each region. The random selection is in itself important for representativeness – any form of self-selection or other selection biases can introduce a systematic skew in the sample that precludes it from attitudinal representativeness – but by including age and gender groups at incidence levels, it also effectively creates a representative structural profile.

In theory, random selection contributes to representativeness by giving each person in the target population an equal chance of being selected in the survey sample. In practice, this requires a comprehensive database of all people – and such a database simply does not exist. The closest thing to it is the Electoral Roll, which is the most comprehensive and up-to-date database of all people aged 18+ in Western Australia. Recipients of the survey were selected at random from the Electoral Roll across each of the three areas, and both the Department of Water and the researchers would like to acknowledge and thank the WA Electoral Commission for efficiently and effectively providing the sample data for the survey.

While this approach creates a practically representative *recipient* sample, it is inevitable that the *returned* sample will not retain a strict structural integrity. Different segments of the population always respond in different ways – typically older people are more likely to respond than younger people, and particularly younger males. Thus, the raw sample needs to be ‘weighted’ to match the sample profile to the population profile for analysis.

¹ The relative proportions of the Bunbury and South West Regional samples were based on their population sizes in the 2001 census data.



This is an important part of any statistical analysis, and the weighting ensures the sample reflects the structural properties of the population. However, weighting a sample does impact on its effective sample size, and thus on the reliability of the sample. This was allowed for in the design of the survey, and its effects are detailed in section 1.3.

Sample size and reliability

The reliability of a sample is primarily a function of the sample size and the population size. Reliability is usually expressed as 'maximum sample error' and stated as $\pm X\%$ at a specified confidence level. The most often used sample error target in social research is $\pm 5\%$ at the 95% confidence level – and this level is specified by the WA Office of the Auditor General.

" $\pm 5\%$ at the 95% confidence level" literally means that 95% of the time we can be confident that the results from the sample are no more than $\pm 5\%$ different to those that we would have got from conducting a census of every person in the population.

For any population greater than 5,000 people, and assuming a representative sampling methodology has been used, an *effective sample size* of $N_{\text{eff}} > 384$ will meet this reliability level. It is important to note that the effective sample size, not the raw sample size, must be larger than 384 to meet this reliability target. When weighting data the effective sample size is significantly reduced (see section 1.3), and allowing for up to 25% loss is prudent. Thus, the minimum returned sample size target for the survey was $N=500$ completed surveys.

The typical response rate for a cold mailed survey of this nature is around 10-20%. Although it was expected that the response rate for a survey on the topical subject of water would attract a response rate at the higher end of this range, the lower figure was used in estimating the distribution size to obtain a suitable sample size – which indicated a minimum distribution of 5,000 surveys. In order to obtain larger sub-samples within the data, a slightly higher figure of 7,000 was chosen for the initial distribution – 3,000 to Perth, 3,000 to the South West Regional area and 1,000 to the City of Bunbury.

Note: See section 1.3 for information about the sample itself, including weighting and reliability estimates.



1.3 Community Survey Sample

A total of 1,059 at least partly completed questionnaires were received from the community survey. However, 42 of these surveys lacked data on at least one of the three structural variables (age, gender, and location), and thus could not be included in the weighting process or analysis. This left a final raw sample size of 1,017.

This gives an overall response rate of 14.5% - within the expected 10-20% range, although only in the middle of this range rather than at the higher end was thought likely given the topical nature of the survey subject. Response rates varied across the three sample areas, and as the table below shows, was highest in Perth and lowest in the SW Regional area. Presumably this gives some indication of the relative perceived importance of the subject across these areas.

Table 2: Response rates across the survey areas.

Sample area	Distribution	Received	Response rate
Perth	3,000	612	20%
South West	4,000	405	10%
<i>SW Regional</i>	3,000	275	9%
<i>Bunbury</i>	1,000	130	13%
Total	7,000	1422	14.5%

The process of weighting the sample data involves comparing the sample proportions to the correct population proportions. Table 3 shows the age by gender proportions that should be seen within each of the three areas, while the following table shows the observed proportions.

Table 3: Correct population proportions for each of the three areas. [Source: 2001 ABS census data]

	Perth			SW Regional			Bunbury		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
18-29	12%	12%	23%	9%	9%	17%	12%	12%	24%
30-39	10%	10%	20%	10%	11%	21%	10%	10%	19%
40-49	10%	11%	20%	12%	11%	23%	10%	10%	20%
50-64	11%	11%	21%	13%	12%	24%	10%	10%	20%
65+	7%	9%	15%	7%	7%	15%	7%	10%	17%
Total	48%	52%	100%	50%	50%	100%	49%	51%	100%

Table 4: Raw sample proportions for each of the three areas.

	Perth			SW Regional			Bunbury		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
18-29	1%	3%	4%	2%	2%	4%	5%	2%	6%
30-39	6%	7%	14%	7%	5%	12%	5%	5%	10%
40-49	9%	9%	18%	14%	13%	27%	8%	15%	23%
50-64	17%	17%	35%	17%	15%	33%	14%	17%	31%
65+	16%	13%	29%	12%	13%	24%	19%	11%	30%
Total	50%	50%	100%	52%	48%	100%	51%	49%	100%

It is clear from these two tables that the 18-29 age group is dramatically under-represented in each of the three areas, while the 30-39 age groups is also somewhat under-represented. It is typical for younger people to participate less in surveys, but it is unusual to see such a large discrepancy as was seen for the 18-29 age group. This is particularly problematic because the amount of data from the 18-29 age group is so low that it is insufficient to allow reliable weighting to take place, and thus it



is necessary to drop this age group from the analysis entirely. While this is not desirable, it is the only way to conduct a reliable analysis on the data from the 30+ population.

The following tables show the population and sample proportions for people aged 30+ only.

Table 5: Correct 30+ population proportions for each of the three areas. [Source: 2001 ABS census data]

	Perth			SW Regional			Bunbury		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
30-39	13%	14%	26%	12%	13%	25%	13%	13%	25%
40-49	13%	14%	26%	14%	14%	28%	13%	13%	26%
50-64	14%	14%	27%	15%	14%	29%	13%	13%	26%
65+	8%	11%	20%	9%	9%	18%	9%	13%	22%
Total	48%	52%	100%	50%	50%	100%	48%	52%	100%

Table 6: Raw 30+ sample proportions for each of the three areas.

	Perth			SW Regional			Bunbury		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
30-39	7%	8%	14%	7%	5%	12%	5%	6%	11%
40-49	10%	9%	19%	14%	14%	28%	9%	16%	25%
50-64	18%	18%	36%	18%	16%	34%	15%	18%	33%
65+	17%	14%	30%	12%	13%	25%	20%	11%	32%
Total	51%	49%	100%	52%	48%	100%	49%	51%	100%

While the sample is still skewed towards the older age groups, this is not so dramatic that it cannot be corrected by weighting. Once this has been established, the third structural variable that also needed to be accounted for in the weighting needs to be incorporated – location across the three areas. Table 7 shows the expected population within each cell of the matrix after multiplying in the area proportions.

Table 7: Expected age x gender x area proportions. [Source: 2001 ABS census data]

	Perth – 50%			SW Regional – 30.5%			Bunbury – 19.5%		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
30-39	6%	7%	13%	4%	4%	8%	2%	2%	5%
40-49	6%	7%	13%	4%	4%	9%	3%	3%	5%
50-64	7%	7%	14%	5%	4%	9%	3%	3%	5%
65+	4%	6%	10%	3%	3%	5%	2%	2%	4%
Total	23.9%	26.1%	50.0%	15.4%	15.1%	30.5%	9.4%	10.1%	19.5%

Table 8: Observed age x gender x area proportions.

	Perth – 50%			SW Regional – 30.5%			Bunbury – 19.5%		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
30-39	4%	5%	9%	2%	1%	3%	1%	1%	1%
40-49	6%	6%	11%	4%	4%	8%	1%	2%	3%
50-64	11%	11%	22%	5%	4%	9%	2%	2%	4%
65+	10%	8%	18%	3%	4%	7%	3%	1%	4%
Total	30.9%	29.5%	60.4%	14.0%	13.1%	27.1%	6.2%	6.4%	12.5%

The weights required to correct the remaining variations are calculated as the population proportion divided by the sample proportion, and can be seen below.



Table 9: Observed age x gender x area proportions.

	Perth – 50%			SW Regional – 30.5%			Bunbury – 19.5%		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
30-39	1.5979	1.4682	1.5284	1.9869	2.7907	2.3386	4.0172	3.4145	3.6926
40-49	1.0850	1.2138	1.1483	1.1163	1.1108	1.1136	2.2408	1.3447	1.6733
50-64	0.6264	0.6247	0.6256	0.9446	0.9816	0.9619	1.4155	1.1193	1.2526
65+	0.4217	0.6851	0.5401	0.8239	0.7366	0.7783	0.7041	1.7157	1.0673

While some of the weights for the 30-39 age group are higher than ideal, they are at least based on sufficient cases to be effective, and the weights were able to correct each of the sample cells to within $\pm 0.1\%$.

Effective sample size and sample reliability

After removing the 18-29 data from the sample, the raw sample size was N=974. After weighting the effective sample size was calculated to be $N_{eff}=749$. An overall sample of this size from a large population has an estimated maximum sample reliability of $\pm 3.6\%$ - well under the $\pm 5\%$ target.

Table 10: Estimated effective sample sizes and sample reliabilities for each area.

Sample area	Raw size	Effective size	Estimated reliability
Perth	588	490	$\pm 4.4\%$
South West	386	303	$\pm 5.6\%$
<i>SW Regional</i>	264	222	$\pm 6.6\%$
<i>Bunbury</i>	122	94	$\pm 10.1\%$
Total	974	749	$\pm 3.6\%$

Demographic characteristics of the community sample

In each of the three samples the largest proportion of respondents lived in urban areas, but the SW Regional sample had the highest proportion of non-urban respondents.

Table 11: Style of living.

Which of the following best describes where you live?	Urban area	Semi-rural area	Rural area
Perth	63%	28%	9%
South West	58%	26%	16%
<i>SW Regional</i>	38%	36%	26%
<i>Bunbury</i>	89%	11%	-
Total	61%	27%	12%

Casual recreation was the most common type of recreational use of dams and natural water bodies.

Respondents from the SW Regional sample were the most likely to have used Logue Brook Dam for recreational activities in the last 12 months, and the combined South West sample were a little more likely than Perth respondents to have used any dam for recreation. There was no difference in the use of natural water bodies.

In the total sample, 17% of respondents had done some form of recreation at Logue Brook Dam in the last 12 months; 48% had used any dam for recreation; and 60% had used a natural water body for recreation at some stage in the last year.



Table 12: Recreational use of dams and natural water bodies.

In the last 12 months, which of the following have you done...	Active recreation swimming, walking, skiing etc			Casual recreation picnicking, BBQ etc			Stayed overnight			Any of these		
	Perth	SW Regional	Bunbury	Perth	SW Regional	Bunbury	Perth	SW Regional	Bunbury	Perth	SW Regional	Bunbury
At Logue Brook Dam	5%	16%	6%	7%	19%	12%	3%	4%	1%	11%	26%	17%
At another dam	20%	29%	29%	33%	46%	40%	6%	9%	15%	41%	57%	56%
At a natural lake or river	37%	37%	41%	42%	38%	44%	15%	19%	20%	60%	58%	65%

4% of all respondents were current users of irrigation water – 2% of the Perth group, 10% of the SW Regional group and 0% of the Bunbury group.

1.4 Limitations

No research or engagement process can ever be ‘perfect’, as practical constraints of time, budget and participation choices will always have some impact. The approach of researchers and engagement specialists is to be aware of the major potential problems and to overcome each of them as much as is possible. While this won’t ever be perfect, in most cases it is possible to design and execute a methodology that is not compromised to the point of being misleading or ineffective.

Overall, the research consultant is satisfied with the intended and actual methodology used in the community survey.

The use of random sampling from the Electoral Rolls and statistical weighting should deliver as close as practical to a random, representative sample for the community survey. While it is possible that some systematic biases in participation could occur - people choosing not to participate can skew the results in any survey – this is very difficult to detect.

The response rates for the community survey were within expected ranges, suggesting that the questionnaire was suitable for the audience. The overall sample size for the community survey was sufficient even after weighting to allow for detailed analysis and exploration, with the overall sample and the Perth sub-sample both being under the target sample reliability level of $\pm 5\%$. While the South West sample did not *quite* reach this level, at $\pm 5.6\%$ it was very close to this target.

The primary limitation of the community survey was clearly the non-participation of 18-29 year olds, resulting in this age group having to be dropped out of the data used for analysis. It is normal for younger people to participate at lower levels in surveys and other community engagement activities – although it might have been expected that the subject of this particular survey would have been or importance and relevance to this group. This lack of data from the 18-29 age group is unfortunate, although it does not diminish the capacity of the survey to represent the 30+ population.

While a higher participation rate from all age groups would be preferred from a research perspective, it is not possible to coerce citizens to participate in the process of deliberative democracy. It is to be hoped that a culture of participation develops over time, as this will further improve our confidence in the capacity of survey data to represent the views of the community. In particular, encouraging greater participation from 18-29 year olds would be valuable.



The community survey sample did not appear to be overly or unreasonably dominated by users of the Logue Brook Dam, which could potentially have lessened its capacity to represent the wider community. 17% of respondents claimed to have visited the Dam in the last 12 months, which is probably a little above the strict proportion of the population that would have done so. However, it is not overstated to the point where this sub-group unrealistically dominates the sample.

Overall, the research consultant is satisfied that the community sample is largely representative of the specified target population, and sufficiently sized to allow reliable analysis and interpretation.

Note about 18-29 year olds

It is regrettable that no data from the 18-29 age group has been able to be included in this report. However, there is a very small amount of data from this age group, and at the conclusion of the main analysis some basic consideration of the data from the 18-29 group will be included in a separate section of the report (see section 4).

The purpose of this is simply to identify whether the indicative views of the few respondents from this age group appear broadly comparable with those from other age groups. No definitive conclusions will be made, but this will at least provide what information on this group can be gleaned from the survey process.



2. Detailed Results

Note: the results presented here are for the 30+ population, due to the lack of data from the 18-29 age group (see section for details).

2.1 Importance of Water and Recreation as issues in the South West

Rating importance and performance

Overall, water was seen as a more important issue than recreation (and tourism) for the South West. Ensuring adequate drinking water was ranked most important from the list of issues, with managing / planning for population growth and conservation of the natural environment as the next two most important issues.

Irrigation water for agriculture was considered next most important. Water for industry and recreation for residents and for attracting visitors were considered the least important issues in the least, and all rated as *very important* by less than half of all respondents.

Table 13: Importance of key issues in the South West, and perceptions of current performance. (ranked by % 'very important' + % 'quite important')

	A) How important do you think this is for the South West?				B) How well is the South West doing at the moment?			
	Very	Quite	Not very	Not sure	Very well	Quite well	Not very well	Not sure
Ensuring adequate drinking water supplies	86%	10%	3%	1%	13%	46%	26%	15%
Managing and planning for population growth	81%	14%	3%	2%	4%	44%	30%	22%
Conserving the natural environment	75%	21%	3%	1%	6%	47%	35%	12%
Ensuring adequate irrigation water supplies for agriculture	62%	29%	4%	5%	12%	47%	13%	28%
The range and number of jobs available	57%	32%	5%	6%	7%	44%	20%	29%
Promoting tourism to the area	38%	48%	13%	1%	12%	60%	17%	11%
Ensuring adequate supplies of water for industry	42%	43%	10%	5%	10%	44%	11%	35%
Providing recreational opportunities and facilities for residents	42%	42%	15%	1%	11%	54%	20%	15%
Providing recreational opportunities that <u>encourage visitors</u> to come to the area	34%	41%	22%	3%	10%	51%	22%	17%

[Source: Community sample]

Bold figures in this column indicate where more than 50% of respondents answered 'very important'

Bold figures in this column indicate where more than 25% of respondents answered 'not very well'

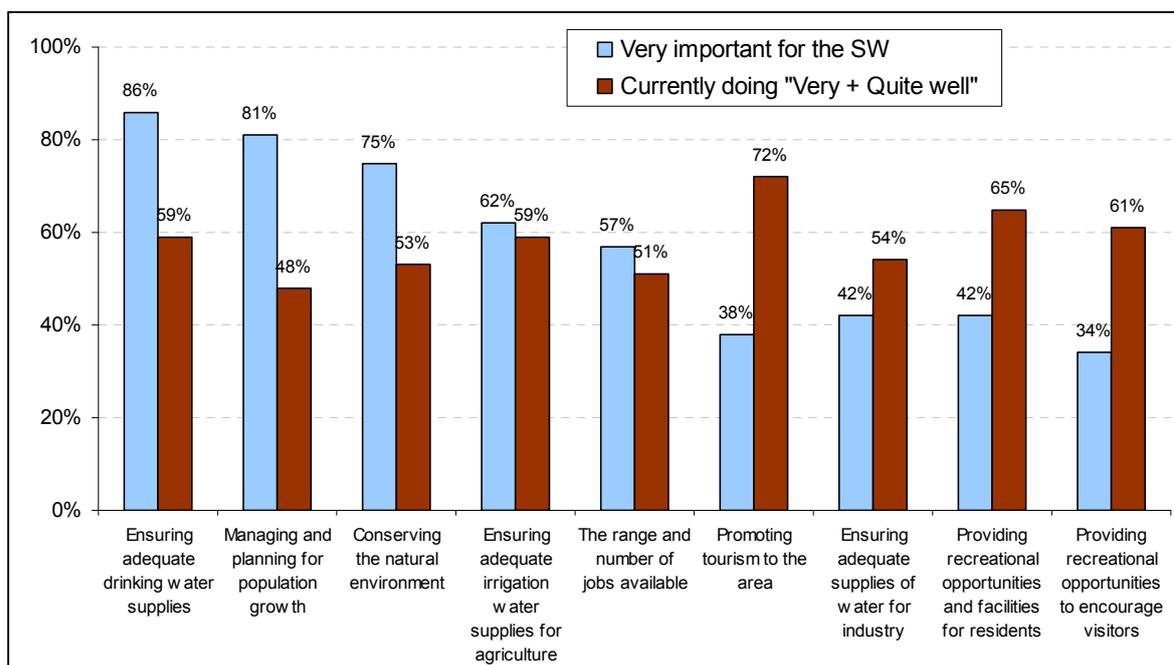
It is notable in Table 13 that the three issues considered most important were also the only three issues where more than 1-in-4 respondents felt the areas was not doing very well currently.

This is shown graphically in Figure 14 (where the blue 'importance' ratings are almost inversely arranged by comparison to the brown 'performance' ratings) which also shows that the best



performing issues are the ones seen to be least important (which may explain *why* they are considered less important).

Figure 14: Performance versus importance of issues for the South West.



[Source: Community sample]

South West residents versus Perth residents

People who lived in the South West were a little more likely to rate some issues as *very important*, but in no case was the difference greater than 10% between Perth and the South West.

There were more distinct differences in how well they thought the South West was currently doing though, with SW residents having a significantly more positive perception of performance.

Table 15: Differences in perceptions of how well the SW is doing from Perth and SW residents.

Issue	Very well + Quite well		Not sure
	Perth	SW	
Managing and planning for population growth	41%	54%	30%
Ensuring adequate drinking water supplies	48%	68%	24%
Ensuring adequate irrigation water supplies for agriculture	50%	66%	37%
Ensuring adequate supplies of water for industry	45%	64%	44%
Providing recreational opportunities and facilities for <u>residents</u>	60%	70%	23%
The range and number of jobs available	39%	63%	39%



Recreational users of Logue Brook Dam versus non-users

Recreational users of LBD felt that several of these issues were more important than non-users, and some of these differences did change the interpretation of this group's preferences:

- 52% of users felt that promoting tourism was *very important*, compared to 35% of non-users.
- 61% of users thought that providing recreational opportunities / facilities for residents was *very important*, compared to 38% of non-users.
 - The equivalent figures for recreational facilities that encourage visitors to the area were 49% and 32% respectively.

There were also important differences in terms of how well users of LBD thought the SW was currently doing. Recreational users felt that the SW was doing...

- Better in terms of:
 - Managing and planning for population growth.
 - Ensuring adequate irrigation water.
 - Ensuring adequate water for industry.
- Worse in terms of:
 - Providing recreational opportunities / facilities for residents.
 - Providing recreational opportunities that encourage visitors.

This pattern of results suggests that recreational users of LBD – by comparison to non-users - feel that the area has more water available for non-drinking purposes but that it is also not offering as good a range of recreational facilities.

Ranking important issues

The relative importance of issues identified purely from the importance ratings was carried through into the ranking exercise (which can on occasions identify slightly different patterns). The relative order of the ranked issues was identical to that seen in the previous results.

Table 16: Most important issues

Issue	# 1 most important	Top 3 most important
Ensuring adequate drinking water supplies	37%	83%
Managing and planning for population growth	33%	69%
Conserving the natural environment	20%	61%
Ensuring adequate irrigation water supplies for agriculture	4%	33%
The range and number of jobs available	3%	17%
Promoting tourism to the area	1%	11%
Ensuring adequate supplies of water for industry	<1%	9%
Providing recreational opportunities and facilities for <u>residents</u>	1%	10%
Providing recreational opportunities that <u>encourage visitors</u>	1%	7%

[Source: Community sample]

39% of non-recreational users of LBD ranked drinking water as the number one priority, compared to just 26% of people who had used the dam for recreation, however this remained the issue most often included in the top 3 for both groups.



Most important uses of water

There was a very clear prioritisation of water use indicated by respondents:

- Three quarters of them ranked household / drinking uses as most important and 93% as one of the two most important uses.
- Agriculture and food production was second most important, rated as most important by 1-in-4 respondents and as one of the top two uses by over 90%.
- Industry and recreation / tourism were both ranked as one of the top two uses by less than 10% of respondents, with recreation / tourism rated as the least important use by two thirds of respondents.

Table 17: Relative importance of different uses for water in South West dams.

What do you consider to be the most important use of dams in the South West?	Most important	2 nd most important	3 rd most important	Least important	Average ranking
Household use (inc. drinking)	73%	20%	5%	2%	1.4
Agriculture and food production	27%	65%	6%	2%	1.8
Industry	2%	6%	60%	32%	3.2
Recreation and tourism	3%	7%	26%	64%	3.5

[Source: Community sample]

Bold = Most common ranking

Av = Average (range 1.0 ← → 4.0)

There were no significant differences in the views of Perth residents versus South West residents.

However, recreational users of LBD did take a somewhat different view (see table below). As this table shows, while recreational users of LBD do not generally put recreation and tourism ahead of household / drinking or agriculture, they *do* move it ahead of industrial usage.

Table 18: Relative importance of different uses for water in South West dams – LDB users only.

What do you consider to be the most important use of dams in the South West?	Most important	2 nd most important	3 rd most important	Least important	Average ranking
Household use (inc. drinking)	64%	22%	10%	4%	1.6
Agriculture and food production	36%	50%	13%	1%	1.8
Industry	1%	8%	40%	51%	3.4
Recreation and tourism	4%	19%	35%	42%	3.1

Bold = Most common ranking

Av = Average (range 1.0 ← → 4.0)



2.2 Appropriate Uses of Water Bodies

There are several different types of water bodies. Broadly these fall into two categories – natural (rivers, lakes, etc) and artificial (dams). Artificial dams can have one of several different primary purposes, with the main ones being drinking water, irrigation water and recreation. Reaction to how these types of water sources could be used were interesting.

Table 19: What do you think are appropriate uses of each of the following sources of water or water bodies?

Type of water source→ ↓ Use	Natural lakes, rivers and creeks	Artificial dams used for:		
		Drinking water	Irrigation water	Recreation
Nothing other than <input checked="" type="checkbox"/>	28%	68%	26%	55%
Water for human consumption (ie: drinking water)	26%	<input checked="" type="checkbox"/>	18%	12%
Water for non-drinking household use (eg: showering, toilets, gardens and clothes washing)	29%	17%	54%	25%
Water for water based recreation (eg: boating, skiing, swimming, fishing etc)	47%	5%	25%	<input checked="" type="checkbox"/>
Water to enhance land-based recreation (eg: view from walking and cycle trails, picnic spots, etc)	46%	14%	25%	<input checked="" type="checkbox"/>
Water for farmland irrigation (ie: food production, stock animals)	30%	7%	<input checked="" type="checkbox"/>	22%
Water for industry (eg: mining, factories, etc)	18%	4%	52%	24%
Water for the natural environment (plants and animals)	<input checked="" type="checkbox"/>	14%	30%	25%

[Source: Community sample]

Multiple responses allowed, so columns will not add to 100%.

Bold ≥ 50%

normal ≈ 50%

Two thirds of respondents felt that drinking water sources should not be used for any other purpose, and over half felt that dams which are used for recreation should not be used for any other purpose. For both of these types of water source, no more than 1-in-4 respondents supported any particular activity in them.

However, possible other uses for natural water sources and irrigation water sources were more widely considered appropriate. No more than 1-in-4 respondents thought that these types of water bodies or sources should be 'single purpose', but what was considered appropriate differed between the two.

- Around half the respondents thought is appropriate for irrigation dams to be used for non-drinking household use (a type of use which does not strictly exist at this time) and for industry. Only 25% felt that it was appropriate to use irrigation dams for recreation.
- About half the respondents thought it appropriate for natural water bodies to be used for recreation.



This pattern of perceived appropriate use is interesting, because it suggests that there is not an intuitive link between irrigation and recreational use of dams. Recreation was not widely seen as an appropriate use of irrigation dams, and recreation dams were apparently seen more as single purpose dedicated facilities. This is not inconsistent with the substantially higher importance placed on irrigation water in comparison to recreational water, although this linkage is only hypothetical.

The results also indicate that respondents did distinguish between drinking water and household water for non-drinking purposes. While these two uses are not currently able to be separated when sourced through the IWSS, it is clear that the community does consider them to be different issues. This suggests that should some form of separation become practical in the future that different sources could be considered for each.

Differences between Perth and South West residents

There were no particularly substantial differences in opinion between SW residents and Perth residents. The only 10%+ difference between the two was that 29% of SW residents thought it appropriate to use recreation dams for industry, compared to 18% of Perth residents.

Differences between users and non-users of Logue Brook Dam

There were more differences in what was considered appropriate between people who used LBD for recreation and those who did not. Recreational users of LBD were more likely to feel that it was appropriate to use...

- Drinking water sources to enhance land-based recreation (25% vs 12%)
- Irrigation water sources for:
 - Non-drinking household use (63% vs 53%)
 - Water based recreation (42% vs 22%)
 - Enhancing land based recreation (37% vs 23%)
- Recreation dams for:
 - Human consumption (21% vs 10%)
 - Non-drinking household use (37% vs 23%)
 - Irrigation (34% vs 19%)
 - Industry (32% vs 22%).

It is worth noting that while these differences are statistically significant, they do not change the fundamental interpretation of the data. In none of these highlighted cases does the change take the proportional support for a use from a minority (<50%) to majority (>50%) position – the closest is an increase from 22% to 42% for using irrigation water for water based recreation.

So, even with the greater acceptance of multiple uses of irrigation and recreation dams, even users of LBD do not really feel that recreation dams should be multi-purpose dams.



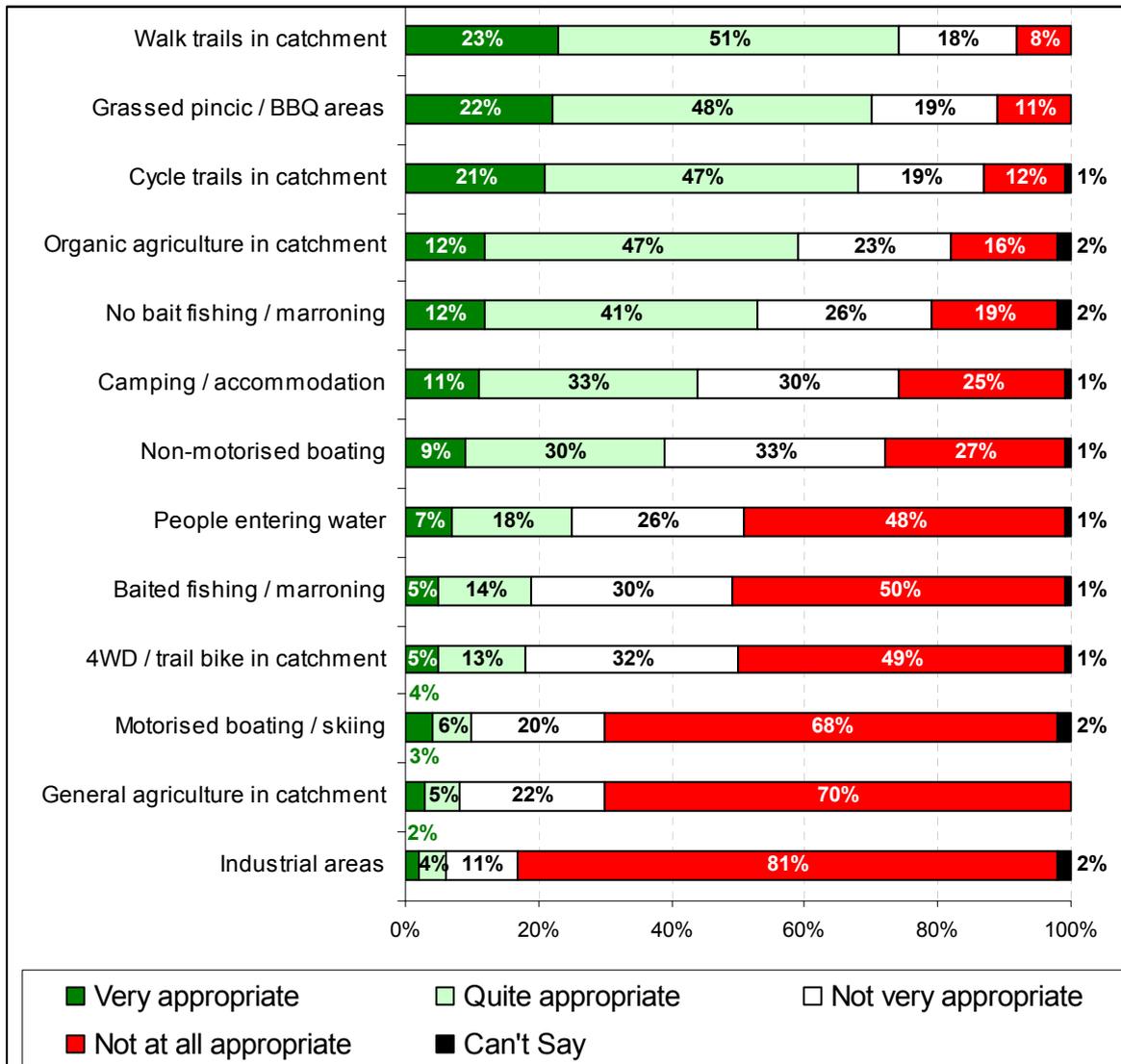
2.3 Appropriate Activities In and Around Drinking Water Sources

Survey respondents were given some very basic information about the possible risk of contamination to drinking water sources:

Any activity in and around sources of drinking water can be a potential risk to the quality and safety of that water. Contamination from the presence of humans and domestic animals in particular pose threats to drinking water quality. At present, dam water for the integrated supply has only minimal treatment once it leaves the dam.

Given this, they were asked what they thought was appropriate activity to take place in and around drinking water sources.

Figure 20: Appropriate activities in and around drinking water sources – Community Sample.



[Source: Community sample]

It is important to note that the survey does not define the actual risk of any of the above activities, but rather respondents' perceptions of appropriateness, and the risk to drinking water from any of the above activities may in fact be high despite them being widely considered appropriate.

It is very clear from this chart that respondents gave very different responses to different activities. For each of the top five activities in the chart, more than 50% of respondents felt that the activity was *at least quite appropriate* (although none of the activities were considered *very appropriate* by more than 1-in-4 respondents).



By comparison, the bottom six were all considered *at least quite appropriate* by less than 20% of respondents – but perhaps more significantly as *not at all appropriate* by ½ or more of the respondents (people entering the water was included in this group because it clearly matches the pattern of this group, even if its ‘*not at all appropriate*’ rating was 48%, rather than 50%+).

Amongst the more interesting results in Figure 20 are the distinctions made between:

- Walking ✓ and cycle ✓ trails, and 4WD / trailbike trails ✗.
- Organic agriculture ✓ and general agriculture ✗.
- Non-bait fishing / marroning ✓ and fishing / marroning with bait ✗.
- Non-motorised boating ✓ and motorised boating ✗.

Differences between Perth and South West residents

There were few differences in the views of Perth and South West respondents.

South West respondents were more likely to feel it was *at least quite appropriate* to fish or marron without bait (58% vs 47%); to have camping and accommodation areas (50% vs 36%); and to use 4WD / trailbikes in a catchment area (22% vs 14%).

Differences between users and non-users of Logue Brook Dam

However, in almost every case recreational users of LBD had significantly different opinions of what was appropriate in and around drinking water sources – being far more willing to see almost all activities in and around drinking water sources.

	% Very + Quite Appropriate	
	Recreational users of LBD	Non-Users of LBD
Walk trails through surrounding water catchment areas	87%	71%
Grassed picnic and BBQ areas on the dam’s foreshore	85%	67%
Cycle trails through surrounding water catchment areas	81%	65%
‘Organic’ agricultural activities in the catchment (ie: no use of chemicals)	71%	56%
Fishing or marroning <u>without</u> bait (eg: using lures, snares or scoops)	72%	49%
Camping and accommodation areas and associated facilities	61%	40%
Non-motorised boating (eg: canoes, sailboats)	53%	35%
Activities where people enter the water (eg: swimming, some types of fishing or marroning)	38%	21%
Fishing or marroning <u>with</u> bait	35%	15%
4WD and trail-bike use in surrounding water catchment areas	34%	15%
Motorised boating and water skiing	20%	9%
General agricultural activity in the catchment (including possible use of chemicals and fertilisers)	12%	7%
Industrial areas (eg: mining, factories, power stations)	7%	7%



2.4 Water Catchment Management Philosophies

One of the important objectives of the community engagement project was to understand the community's attitudes towards general water catchment management issues. In particular, there are a number of issues where the underlying philosophy of the management approach could lean in one direction or another. Often the choices between these approaches – if not exactly mutually exclusive – do require one to at least have priority over the other.

In these situations, it is not appropriate to ask people how much they like each alternative, but rather to indicate their preference between the two. The survey gave respondents some back ground information (see italicised text below) and then asked them to indicate a preferred alternative between six paired descriptions.

Questionnaire introduction and question:

At present, dam water going into the integrated water supply system is not heavily “treated”. Instead, the quality and safety of the water is protected mainly by strict controls on dams that feed water into the integrated supply. This protection includes prohibiting any development or recreational activity on the dams, or within a 2km protection area around the dam. These controls only apply to dams that supply drinking water, and are considered in Western Australia to be the best way to ensure safe, good quality drinking water. This approach has so far delivered safe drinking water in WA, and at a minimum cost to consumers.

However, as dams are increasingly being used for drinking water, there are fewer opportunities for people who want to develop land and recreate around these sites. Other approaches could be adopted that would allow more development and recreation opportunities on and around our drinking water dams and in their catchments. However, they would also increase the cost of water due to additional treatment that would be needed. Such treatment may also not be able to deliver the same quality and safety of the water supplied.

Given the above information, what do you feel should be the main guiding principles behind the management of water sources and catchments in Western Australia?

Tick ONE box for each pair of options

- *Please note that in some cases the choices given could both happen – but we are interested in which you would prefer to be the stronger influence or the most visible.*
- *If you like both options, you should choose the one you like the most. If you dislike both options, you should choose the one you dislike least.*

For each of the six paired alternatives in this section, results are shown for five groups:

- **Community** The total community survey sample (N_{eff}=749)
- **Perth** The Perth sample from the community survey (50%)
- **SW** The South West sample from the community survey (50%)
- **LBD Users** Recreational users of Logue Brook Dam in the community survey (17%)
- **Non-users** Non-users of LBD from the community survey (83%)

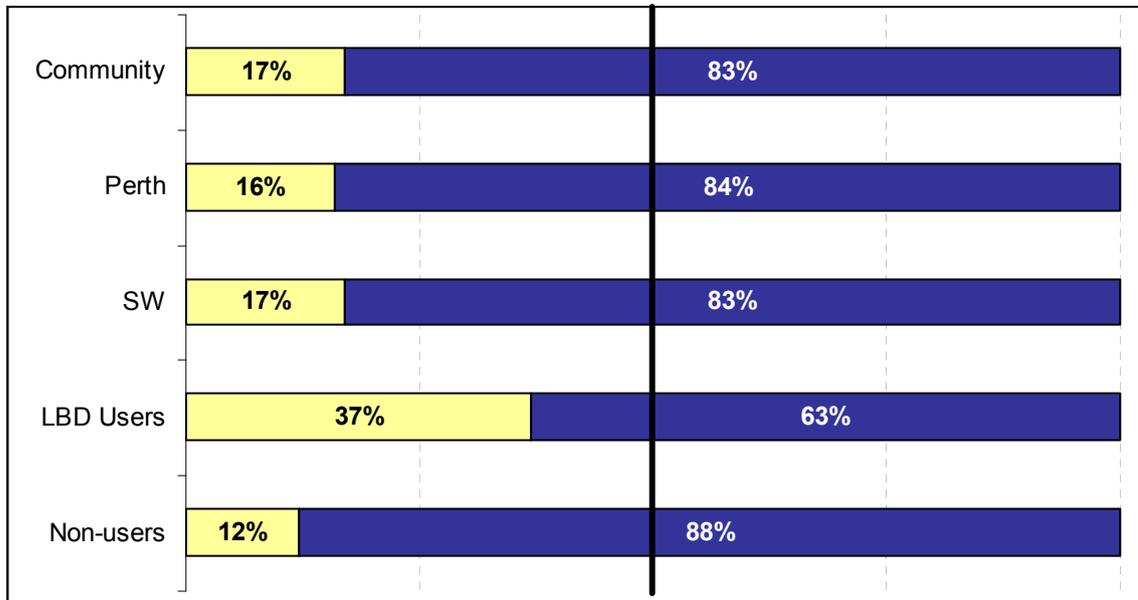


Treatment Vs Prevention

Rely on treatment technologies to make our drinking water safe – which is more expensive but allows more potentially contaminating development and recreational activities to occur in our drinking water catchments

Or

Protect our water by avoiding potentially contaminating development or recreational activities in our drinking water catchments



A substantial majority of the community as a whole (83%) preferred to ensure a safe supply of drinking water by taking a preventative approach rather than allowing more activity and then treating the water.

- Females had a slightly stronger preference for prevention than males (89% vs 78%).

There were no differences in the views of Perth and South West residents on this issue.

Recreational users of the Logue Brook Dam were more likely than non-users to prefer a treatment approach rather than a preventative approach, but even amongst this group only a little over 1-in-3 respondents disagreed with the overall community preference.

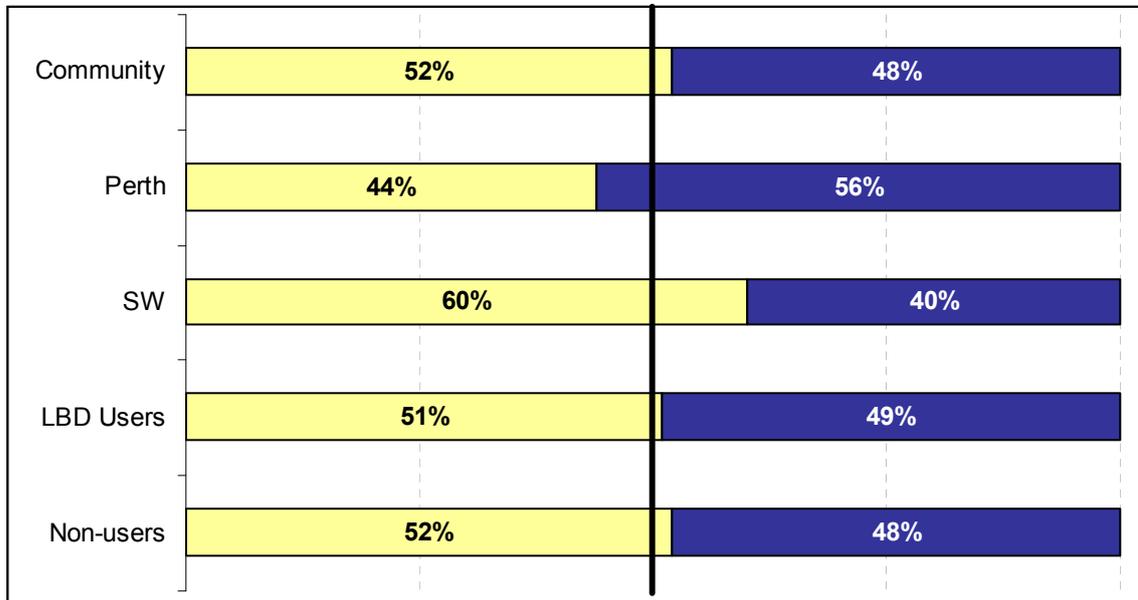


Reducing usage Vs Increasing supply

Efforts are focussed on reducing water usage in the community to get more value from our existing water supplies

Or

Efforts are focussed on finding new sources of additional water to minimise the changes in current usage that is required



The community as a whole was split evenly between preferring an emphasis on reducing usage to maximise the value of existing water resources and on focussing efforts towards finding new water sources that would allow minimal changes to be made to current usage patterns.

- 63% of people aged 30-39 preferred to reduce usage, compared to half the people aged 40-64 and 36% of those aged 65+.

People who lived in Perth were a little more likely to prefer to find new sources, and people who lived in the South West were a little more likely to prefer to reduce current usage levels.

There were no differences in the views of people who used LBD recreationally and those who do not.

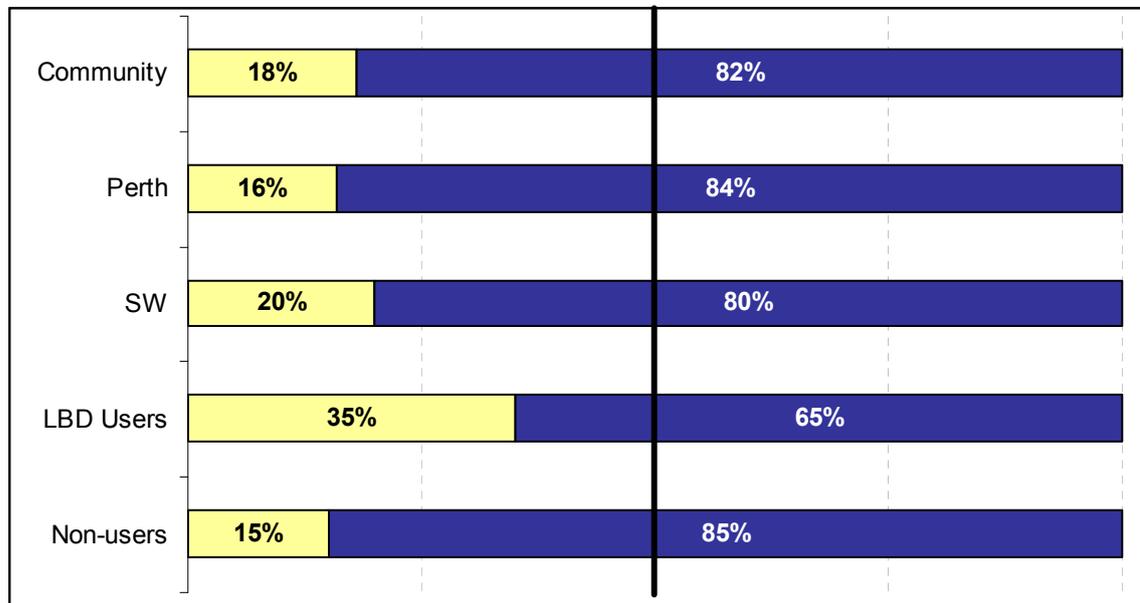


Equalisation Vs User pays

Everyone should pay more for treated drinking water, allowing people and organisations who want to use dams for recreational purposes to do so

Or

People and organisations who use dams for recreational activities should pay for the additional costs of treating the water that they use



A very similar pattern was seen in terms of who should pay for treatment of drinking water if recreational activity was allowed as was seen on the prevention versus treatment question. The community sample as a whole strongly took the view that users should pay for the additional costs of treating water used recreationally.

- Preference for the 'user pays' approach increased with age – from 77% of the 30-39 age group up to 88% of the 65+ group.
- 87% of females preferred the 'user pays' approach, compared to 77% of males.

This view did not change between Perth and South West respondents.

Recreational users of LBD were more likely to say that everyone should pay more for treated water, thereby allowing expanded recreational facilities to be available. This view is not surprising, and in fact if there is a surprise here it is that only 1-in-3 recreational users disagreed with the user-pays approach.

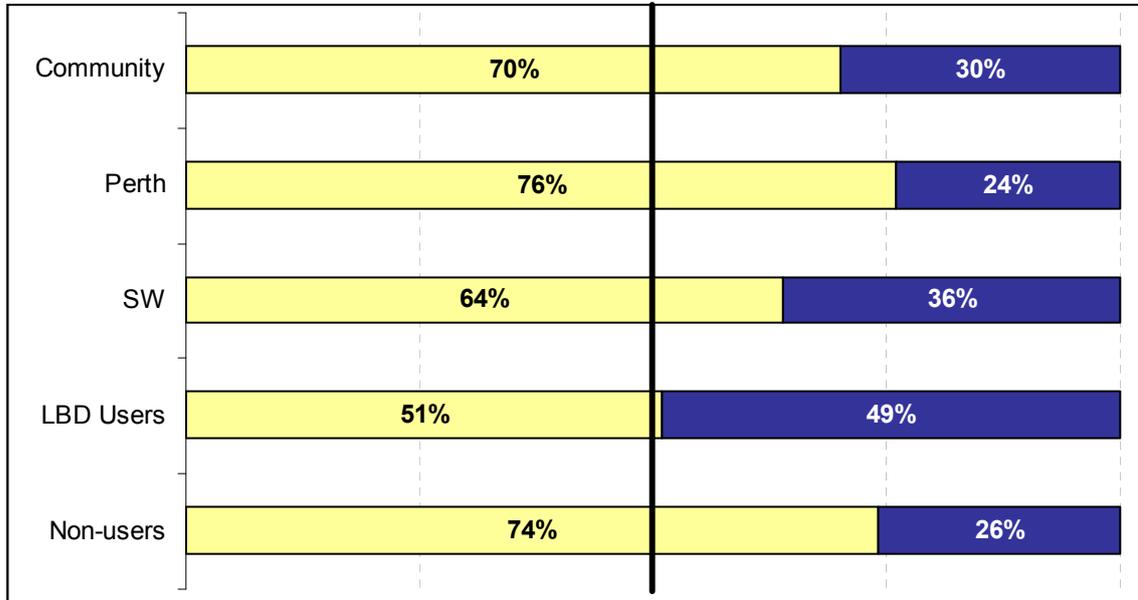


Risk tolerance

The safety and protection of our drinking water supplies is given the highest consideration, and achieving the lowest possible level of risk to the water takes priority over all other issues or uses of dams and their water

Or

While the safety and protection of our drinking water is considered very important, the acceptable level of risk takes into account other issues and possible uses of the dams and their water



The community sample was quite risk intolerant – with 70% of respondents preferring to see that achieving the lowest possible level of risk to drinking water supplies takes preference over all other issues or uses of dams and their water.

- The 30-39 age group was slightly more risk tolerant than the 40+ groups – but only by a small degree (63% vs 73% for the 40+ groups combined).
- 75% of females preferred to take minimal risks with the water supply, compared to 65% of males.

Perth respondents were significantly less risk tolerant than the South West respondents – but a clear majority preference for minimising risk was seen in both areas.

Recreational users of LBD were evenly divided on whether they thought that the acceptable level of risk should or should not take into account other issues and possible uses of dams and their water. There was a very clear preference for risk minimisation from non-users of the dam.

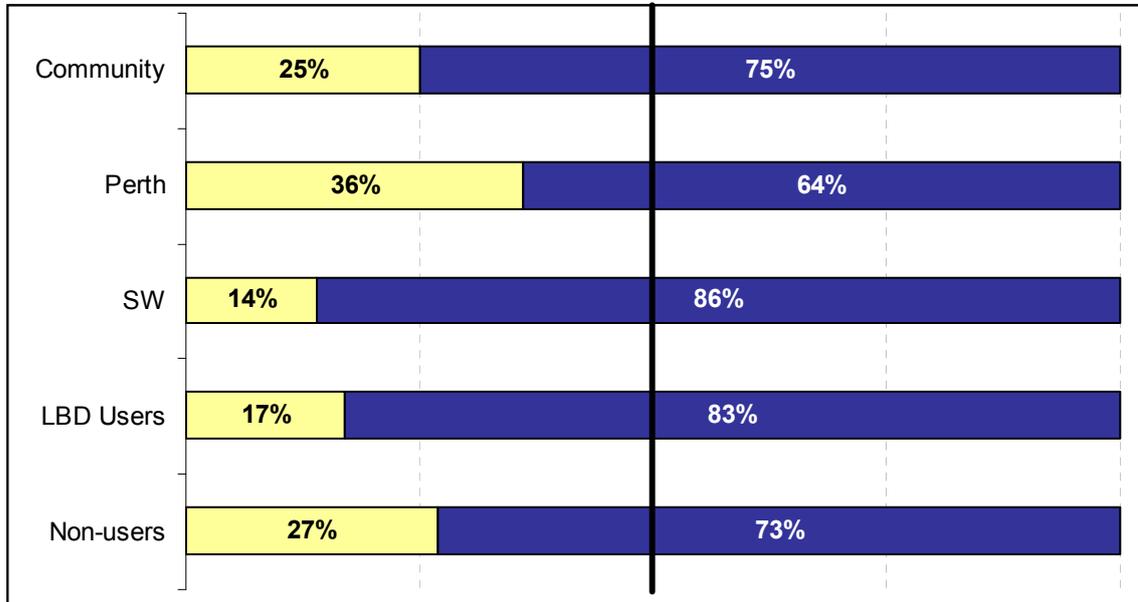


Integrated supply Vs Local supply

All water practically available in the State is combined into a single water supply to best meet the needs to the whole State

Or

Water that naturally occurs in an area is first used to meet the needs of that area, with any extra water going to meet the needs of other areas where local demand exceeds the natural supply



Three quarters of the community sample felt that water naturally occurring in an area should be first used to meet the needs of that area, with any extra water going to other areas where demand exceeds supply. Only 1-in-4 respondents felt that all water practically available should be combined into a single water supply to meet the needs of the state as a whole.

While a preference for meeting local needs might have been expected in the relatively better supplied South West area, this overall prevailing view was also the prevailing view in Perth – although by a 2:1 ratio rather than a 6:1 ratio as seen in the South West.

Logue Brook Dam users were a little more likely than non-users to feel that local needs should be met first – but strong majorities of both groups felt this way.

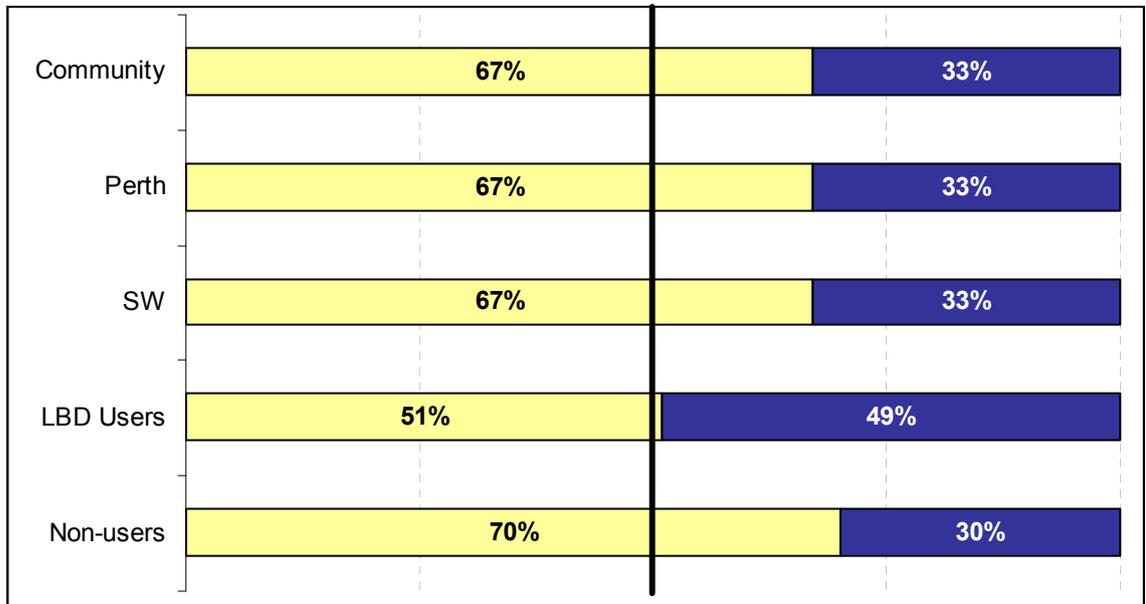


Support for reviewing the policy of separating drinking water and recreation

The current policy of keeping recreation and drinking water separate is maintained, accepting that this will potentially put more and more limitations on recreational opportunities in public dams

Or

The policy of keeping recreation totally separate from drinking water is reviewed and possibly changed, acknowledging that the limitations it puts on recreation may no longer be justifiable or financially viable



Two thirds of respondents in the community survey preferred to keep the existing policy of separating drinking water and recreation, accepting that this will potentially put increasingly limitations on recreation at public dams.

There was no difference in the preferences of Perth and South West respondents.

Half of the recreational users of LBD held the same view as the majority of the community sample – while the other half preferred to see the policy reviewed and possibly changed.



2.5 The Future of Logue Brook Dam

After the first section of the survey examined respondent's attitudes and preferences about water management issues more generally, the second half focussed quite specifically on the future of Logue Brook Dam.

One of the main reasons for choosing a mail methodology for the community survey was to allow space to provide background information for some questions – allowing respondents to make a more informed and considered response to questions than might otherwise be possible. The following italicised text is the introduction to the LBD section of the survey.

The next set of questions specifically addresses the future of dams in the Harvey-Waroona area south of Perth (see included map). The issues here are important right now for this area, but they will be important across the State as demand for water continues to grow. The views of all parts of the community on how to deal with these issues are very important.

There are six major dams in the Harvey-Waroona area. Their size and main current uses are:

Dam	Harvey	Stirling	Logue Brook	Waroona	Samson	Drakes Brook
Size (in Gigalitres)	56.4	53.8	24.3	14.9	8.0	2.3
Used for: Drinking + Irrigation		✓			✓	
Used for: Irrigation + Recreation	✓ Limited rec.		✓	✓		✓ Limited rec.

Due to low rainfall and increasing population, there is a need to find additional sources for the integrated water supply. Logue Brook Dam is being looked at for this purpose. The dam was built to provide irrigation water for local agriculture, and is also used for a variety of recreational activities. Of the four irrigation / recreation dams in the area it is one of the most heavily used for recreation. The dam and its facilities (including a camping ground and accommodation at a caravan park) are used by local residents and visitors from other areas, particularly from Perth.

A proposal is being considered by Government that would make Logue Brook Dam a drinking water source. Currently, water from the dam feeds into an open-channel irrigation system, from which about 30% of the water is lost through evaporation and 'seepage'. The proposal is for Government funding to be provided to build a new piped irrigation system, and the water saved through reduced loss would be made available to the integrated water supply (about five gigalitres per year).

If this happened, the existing policy for the protection of drinking water sources would apply to Logue Brook Dam, preventing any recreational use of the dam.

Following this introduction, respondents worked through a series of questions about the dam.



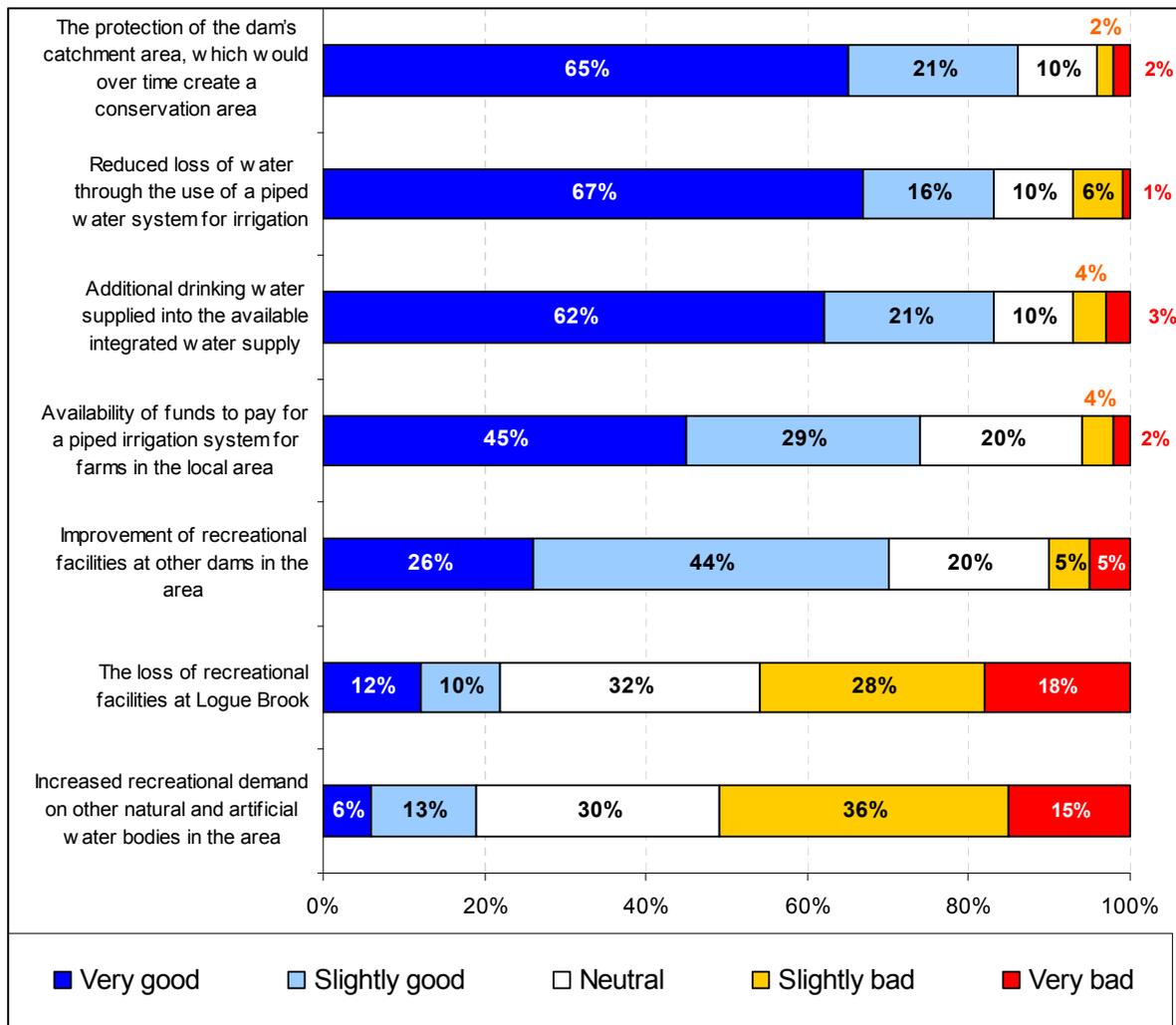
Value of outcomes

There were three outcomes of converting the Logue Brook Dam to an irrigation and drinking water dam that were considered *very good* by around two thirds of respondents to the community survey:

- The *de facto* creation of a conservation area in the protected catchment;
- More efficient use of water in the irrigation system; and
- Additional drinking water for the IWSS.

It is interesting that the last two of these are the primary intended positive outcomes to the proposal's protagonists – but the first one is an incidental benefit of high perceived value in the community.

Figure 21: Perceived value of likely outcomes of converting Logue Brook Dam from an irrigation and recreation dam to an irrigation and drinking water dam.



[Source: Community sample]

The availability of funds to pay for a piped irrigation system and the possible improvement of recreational facilities at other dams in the area were both seen as positive outcomes generally – although not as positive as the three previously mentioned.

The loss of recreational facilities at Logue Brook Dam and the increased demand on other water bodies in the area were seen as negative outcomes overall, with 46% and 51% of respondents respectively thinking they were bad outcomes. However, less than 20% of respondents thought either of these outcomes was *very bad*.



There were several statistically significant variations in responses based on gender and age. However, in general these did not reflect fundamentally different views, but rather just variations of 5-10% across the groups – and these do not change the interpretation of the data in any way. Perhaps the only variation worth noting was that older people were less likely to say that the loss of recreational facilities at LBD or the increased demand on other water bodies in the area were bad outcomes.

Differences in the opinions of Perth and South West Respondents

As was the case with age and gender difference, there were some statistically significant differences in the responses of people who lived in Perth and those who lived in the South West – but nothing that suggested there were meaningful differences in the opinions of these groups.

Perth respondents were a little more likely to feel that creating additional drinking water was a *very good* outcome (67% vs 57%), but this was the only variation worthy of note.

Differences in the opinions of recreational users of Logue Brook Dam versus non-users

Not surprisingly, recreational users of LBD had quite different views on the value of some of the possible outcomes covered. However, as Table 22 shows, only in one case did the magnitude of these differences really change the overall interpretation of the data (bold box in the table).

70% of recreational users thought that the loss of recreational facilities at Logue Brook was a bad outcome, compared to 41% of non-users.

In each of the other cases, while the differences are both statistically significant and substantial in magnitude, they don't really change the views that creating a conservation area and making additional drinking water available are good outcomes; or that the increased demand on other water bodies in the area is a bad outcome.

Table 22: Differences in the perceived value of likely outcomes of converting Logue Brook Dam – Recreational users versus non-users.

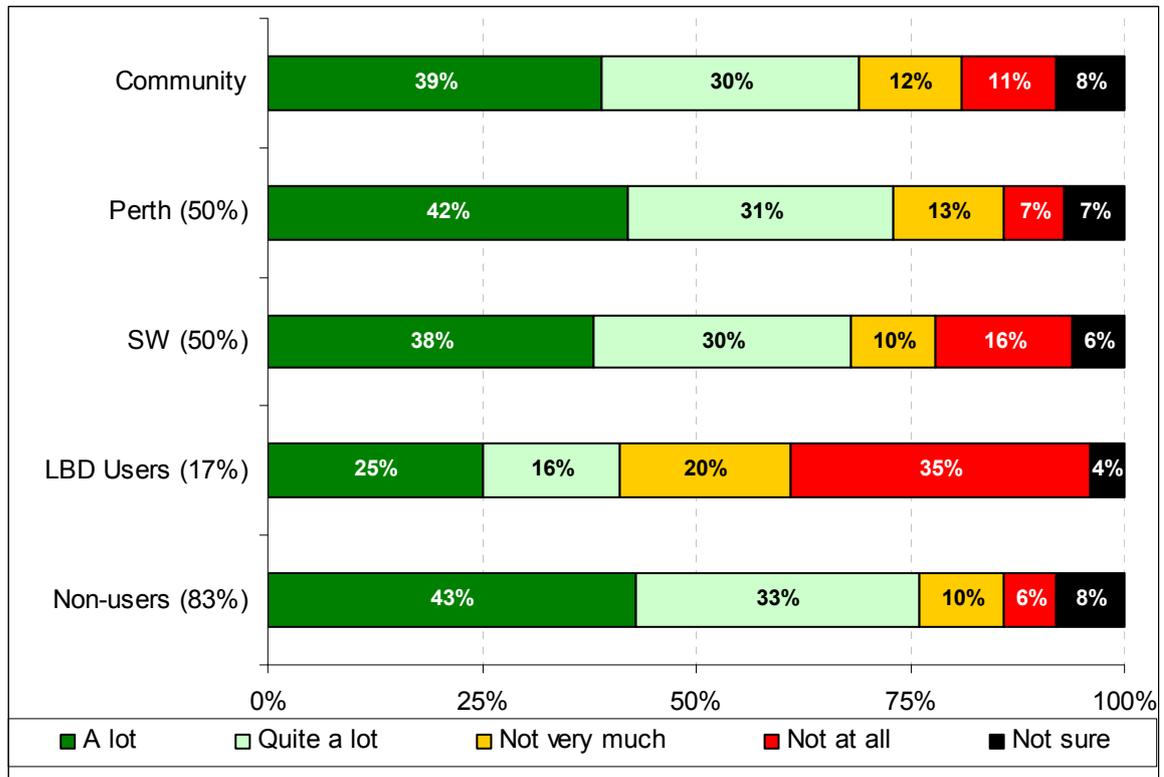
		<u>Good outcome</u>	<u>Neutral outcome</u>	<u>Bad outcome</u>
The protection of the dam's catchment area, which would over time create a conservation area	<i>LBD users</i>	70%	18%	12%
	<i>Non-users</i>	89%	8%	3%
Additional drinking water supplied into the available integrated water supply	<i>LBD users</i>	64%	17%	19%
	<i>Non-users</i>	87%	9%	4%
The loss of recreational facilities at Logue Brook	<i>LBD users</i>	17%	13%	70%
	<i>Non-users</i>	22%	37%	41%
Increased recreational demand on other natural and artificial water bodies in the area	<i>LBD users</i>	20%	20%	60%
	<i>Non-users</i>	20%	30%	50%



Support for basic proposal to change the status of Logue Brook Dam

There was strong support from both the Perth and South West segments in the community survey for the basic proposal of converting LBD to an irrigation and drinking water dam, although recreational users of the dam did not support the change. Support for the change increased a little with age, and females were a little more likely to support it than males, but across all age and gender groups there was 60%+ support.

Figure 23: How much would you support the use of Logue Brook Dam being changed from 'irrigation and recreation' to 'irrigation and drinking water'?



[Source: Community sample]

Possible trade-offs to make the change of status more acceptable

Given that only 39% of the community sample gave the highest level of support ('a lot') to the basic proposal, there is conceivably room for some 'negotiation' – trade-offs that would make the proposal more acceptable (ie: increase the level of support).

Note: The analysis of the trade-off data only looks at respondents who did not support the basic proposal a lot.

Figure 24 on the following page shows the importance of each of eight possible trade-offs that could be offered to make the proposed change to the LBD more acceptable to all segments of the community.

Overall, there was little dramatic difference in the attractiveness of the trade-off alternatives – with all considered *essential* by between 16% and 27%, and all *at least very important* to between 46% and 73%. The three most attractive trade-offs were walk trails were available at other dams, enhancing recreation sites at other dams, and ensuring the continuity of the Munda Biddi long distance cycle trail.

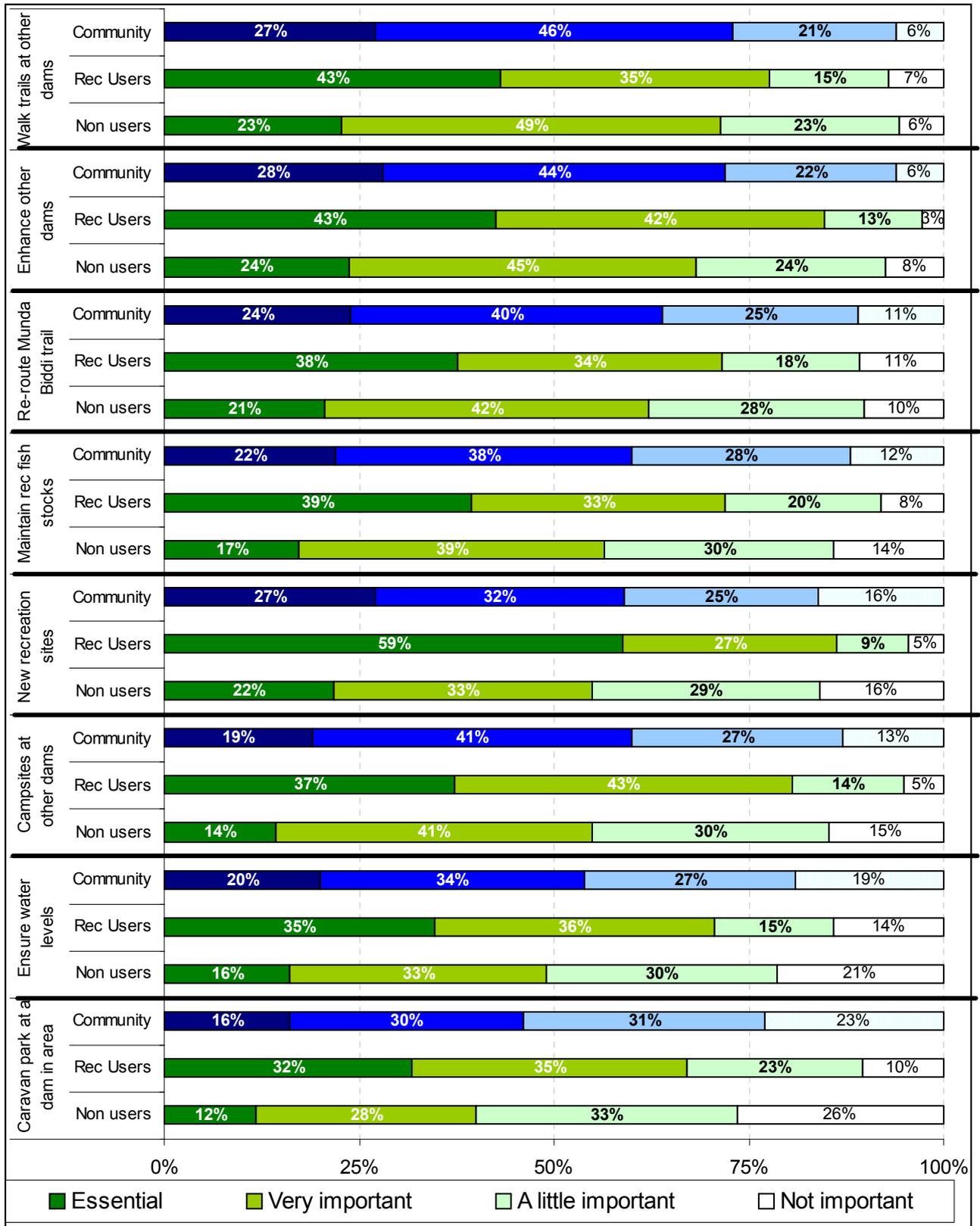
As might be expected, all of the trade-offs were more attractive to people who used the dam for recreation in the previous 12 months. However, the most attractive trade-offs for users were a little



different than to the community as a whole – providing new recreation sites, enhancing existing recreation sites at other dams and ensuring adequate campsites at other dams.

Figure 24: Attractiveness of trade-off alternatives.

If you assume Logue Brook dam was approved as a drinking water source, how important would the following options be to you as a way of making up for the loss of recreation from this dam?



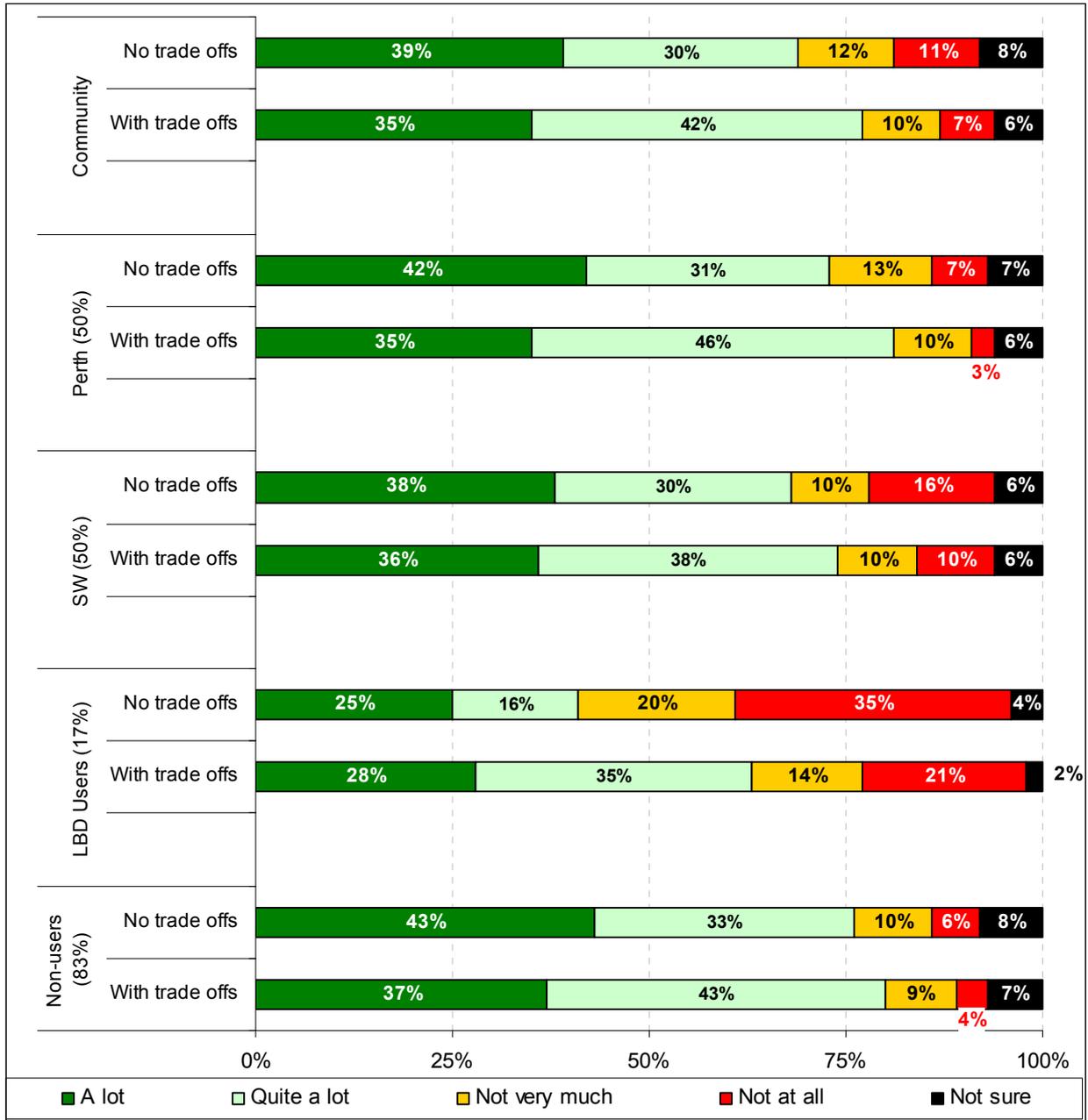
[Source: Community sample – support for basic proposal less than ‘a lot’]



Support for the proposal to change the status of LBD with trade-offs

While there did not appear to be any particular trade-off(s) that were dramatically appealing to respondents in the community survey, the main question around the trade-offs was whether their presence in the process would affect levels of support for the proposed change to the dam’s status.

Figure 25: Change in support for the proposed change to Logue Brook Dam assuming that any essential or very important trade-offs actually happened.



[Source: Community sample]

On average, respondents in the community sample who would support the basic proposal *a lot* indicated that 3-4 of the trade-offs were at least very important to them. Respondents who would support the proposal *quite a lot* nominated 4-5 trade-offs as being important, and people who would not support the proposal nominated 5-6 trade-offs as important. This pattern is as would be expected.



Any respondent who did not indicate that *any* trade-offs were *essential* or *very important* to them was not asked to provide a second indication of their support assuming that the trade-offs occurred. For this group, it was assumed that the presence of the trade-offs would have no impact on their level of support.

However, those who *did* indicate that one or more trade-off was *at least very important* to them were asked to indicate their support for the proposal assuming that all the trade-offs that were *essential* or *very important* actually happened.

Consideration of the trade-offs had an interesting effect on respondent's level of support, as can be seen in Figure 25.

Community as a whole

Rather unexpectedly though, the proportion in the overall community sample who would support the proposal *a lot* actually declined a little after considering trade-offs. In fact, 28% of respondents who initially would have supported the proposal *a lot* actually decreased their support after considering the trade-offs. However, this was offset by the more expected effect that the presence of some trade-offs increased the level of support across respondents who had originally offered lower levels of support.

Overall though, the total proportion of the community sample who would support the proposal at least quite a lot increased a little from 69% to 77%.

Table 26: How level of support for the proposal changed after consideration of the trade-offs.

Initial support →	A lot	Quite a lot	Not very much	Not at all	Not sure
↓After trade-offs	39%	30%	12%	11%	8%
A lot [35%]	72%	12%	14%	8%	5%
Quite a lot [42%]	22%	80%	41%	19%	30%
Not very much [10%]	3%	6%	41%	19%	3%
Not at all [7%]	2%	-	-	53%	-
Not sure [6%]	1%	2%	4%	1%	62%

Grey cells are 'no change'.

Red numbers are decreased support

Green numbers are increased support

[Source: Community sample]

Perth versus the South West

The same pattern of results described above at the level of the total community sample was also seen in both the Perth and the South West samples – although the slightly higher level of support seen in Perth continued to be seen.

Recreational users of Logue Brook Dam

Probably the most important result that can be seen in Figure 25 is the increased support for the proposal of recreational users of the dam. With trade-offs, the level of *at least quite strong* support for the change increased from 41% of users to 63%, and the proportion who would *not support the proposal at all* decreased from 35% to 21%.

Given that the trade-offs were effective in increasing the level of support for the proposal, it is of interest to look at how those particular individuals whose support changed reacted to the different trade-off alternatives.

However, it did not appear that there was any particular trade-off that had driven their change of heart, with the importance ratings of each of the trade-offs being basically the same for this group as it was for the total group of LBD users. Rather, it would seem that the higher support given by some users after consideration of the trade-offs was more of an holistic reaction to the concept of balancing the consequences of the change, rather than being triggered by any particular element of what was offered.



Alternatives to changing the status of Logue Brook Dam

An additional question asked people what alternatives they would like to see pursued to obtain more drinking water for the IWSS if the Logue Brook proposal did not go ahead.

Clearly the most preferred option was to look at water treatment and recycling technology, being the most preferred alternative amongst all groups. Transporting water and catchment thinning were the least attractive options.

Table 27: Preferred possible alternative sources of drinking water to be explored if the change to Logue Brook Dam does not go ahead.

Water treatment and recycling technology (eg: use of treated 'Grey' water)	72%
Desalination technology	52%
Looking to change the status of <u>other</u> irrigation / recreation dams	48%
Underground water supply (aquifers)	46%
Transporting water from within WA or from interstate	30%
Thinning of catchment vegetation at existing dams to increase the amount of water collected	26%

[Source: Community sample]

Looking at underground water supplies was more preferred in Perth (52%, ranked 2nd) than in the South West (41%, ranked 4th). Changing the status of other irrigation / recreation dams was an attractive option to 50% of non LBD users (ranked 3rd), but to only 39% of LBD users (4th). Catchment thinning was particularly unattractive to the 30-39 age group, but was ranked last across all age groups.



2.6 Beyond Logue Brook

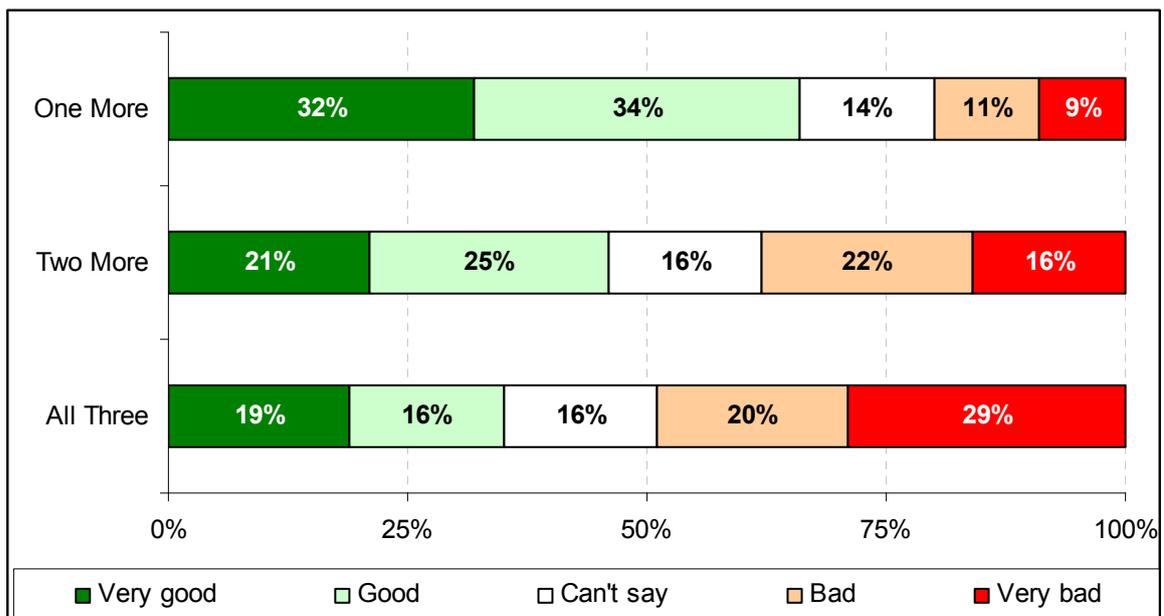
As mentioned in the introductory discussions around this study, the issue of Logue Brook Dam's future is complicated by the wider context in which any decision needs to be viewed. Depending on the balance between rainfall and demand, it is possible (even likely) that the circumstances currently being considered at Logue Brook will be replicated around the area and the state. There were several questions asked of survey respondents that addressed some of these wider contextual issues.

What about other dams in the Harvey-Waroona area?

There are three other dams in the Harvey-Waroona area that are classified as irrigation / recreation – (Harvey, Waroona and Drakesbrook). There are currently no plans to consider the future usage of any of these dams. However, it is possible at some point in the future that, as demands on the available water supply increase, one or more of these dams may also be looked at as a potential supply of more water for the integrated water supply (as well as other dams around the State).

Respondents were asked how they would feel about one, two or all three of these dams becoming drinking water dams and off limits for recreation – assuming that this had already happened at Logue Brook.

Figure 28: Reaction to converting one or more of the other three irrigation / recreation dams to a drinking water source – assuming that Logue Brook had already been converted.



[Source: Community sample]

Two thirds of respondents (66%) would feel *good* or *very good* about converting one more dam in the Harvey-Waroona area *after* Logue Brook. Support for converting two more dropped to 46%, with 38% opposed. Only 1-in-3 respondents (35%) supported converting all of the dams in the area to drinking water sources, while 49% opposed that.

Support for converting the dams increased with age, while males were a little more likely than females to feel *very bad* about converting more dams.

Perth versus South West respondents

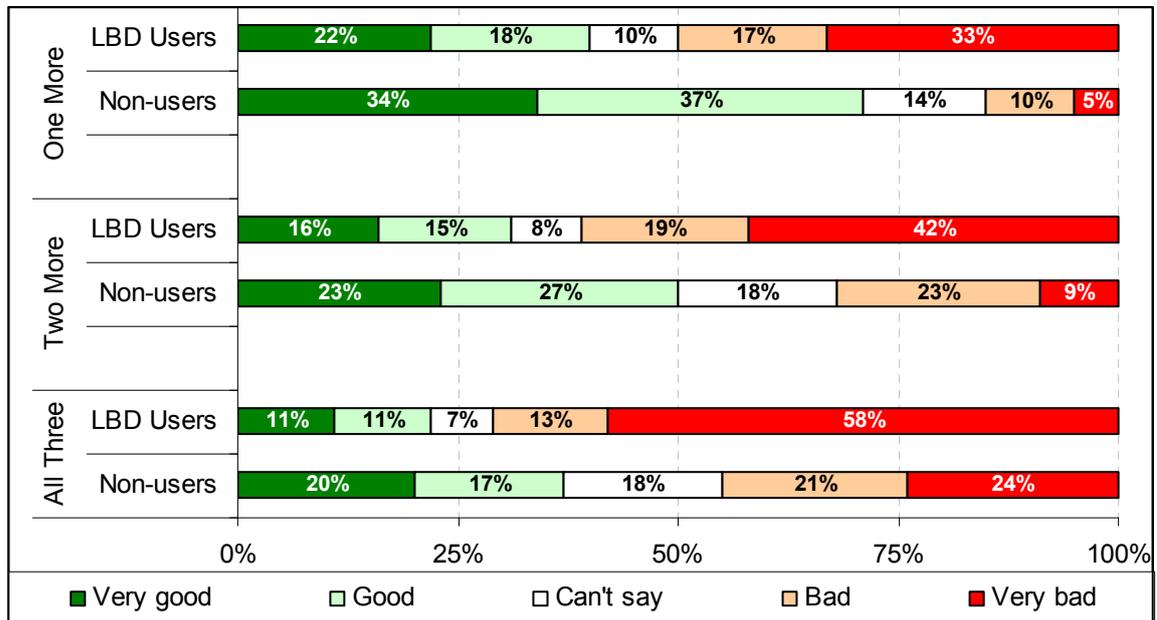
Support for converting dams was a little higher in Perth than in the South West, although only to a small extent. The greatest difference between the two areas was a higher proportion of respondents in the South West who would feel *very bad* about additional dams being converted (14% vs 5% to convert one more dam; 22% vs 9% to convert two more; and 34% vs 34% to convert all three).



Recreational users of Logue Brook Dam versus Non-users

As might be expected, respondents who were users of LBD were far less receptive to the concept of converting other dams in the area to drinking water sources.

Figure 29: Comparison of Logue Brook Dam users' and non users' reactions to converting other dams in the Harvey-Waroona area to drinking water sources.



[Source: Community sample]

How strongly does the community support the current risk minimisation policy?

The final issue to consider is support for the drinking water protection policy itself. While this issue had been addressed indirectly through the course of the survey, a question to directly measure how much respondents would support the policy being reviewed was included at the end of the survey. The wording of the question was:

How strongly would you support the Government reviewing the current policy of protecting drinking water sources by prohibiting recreation?

Unfortunately, it appears that the question was misunderstood by a proportion of respondents, and the data from the question cannot be reliably used. Although the question did not appear to cause any problems when the survey was piloted, the results very strongly indicate that some respondents interpreted the wording in a way that was contrary to the intended meaning.

This became evident in comparing the responses of LBD users versus non-users. To be consistent with other answering patterns, it would be expected that LBD users would be significantly more likely to want to see the policy reviewed than non-users. However, the reverse pattern was seen. It would seem that some respondents interpreted the question as being how much would they support “reviewing by prohibiting recreation, the policy of protecting water sources”, rather than the intended meaning of how much they would support “a review of the policy of protecting drinking water sources through prohibition of recreation”.

As a result of this misinterpretation, the data from the question can not be reported.

However, there is an earlier result in the survey that gives us a clear idea of how the community sample *may* have responded to this question.



In the Water Catchment Management section (Section 2.4) one of the questions was an 'either / or' format question in which respondents were forced to choose between the following two options:

The current policy of keeping recreation and drinking water separate is maintained, accepting that this will potentially put more and more limitations on recreational opportunities in public dams

Or The policy of keeping recreation totally separate from drinking water is reviewed and possibly changed, acknowledging that the limitations it puts on recreation may no longer be justifiable or financially viable

In this either / or question, 67% of the community sample preferred the first of the two options – to maintain the current policy in preference to reviewing it. It would seem likely that this is the best indicator of support (or lack of) for a review of the protection policy.



3. Segmentation of the Community Sample

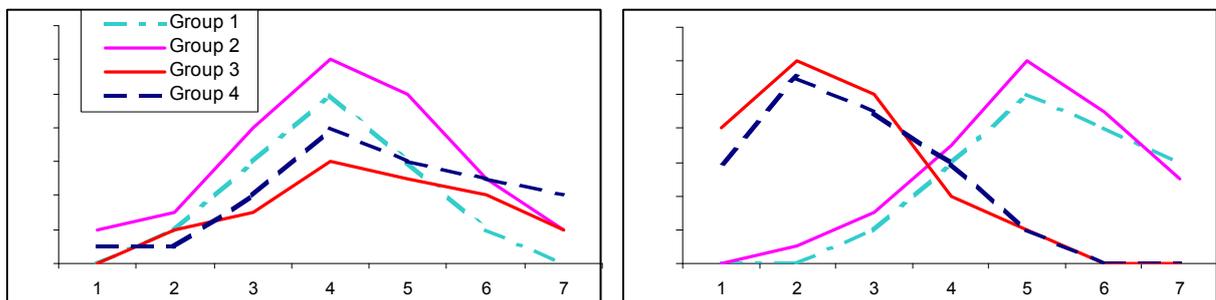
3.1 Overview

It is usual within a large survey to find several segments within the sample – groups of respondents who have responded in a consistent manner across the survey questions. Identifying these groups, their defining characteristics and their patterns of responses, can often provide a greater insight into the psyche of the respondents and the population.

Such explorations are often done by seeing which variables are the best predictors of the key responses (regression). Alternatively, they can be done by looking for clusters across ‘antecedent’ attitudinal questions – ie: those questions most likely to reveal underlying stable attitudes which manifest themselves in responses to the key questions (cluster analysis).

In this case, finding meaningful segments was both easy and difficult. Both regression against the overall level of support for the proposed change and a cluster analysis of the water catchment management philosophy questions identified a link between the two. However, while the cluster analysis in particular yielded interesting segments – there appeared to be little dramatic difference between most of these groups in their ultimate level of support for the proposal.

This suggests that there is a reasonable level of homogeneity in the community on the issue, and that the overall community level ‘average’ results really are reflective of the typical community member. This is not always the case – as the diagram below shows, it is possible for an ‘average’ result to mask a variety of disparate attitudinal profiles. In both these examples the ‘average’ result would be the same (~4), yet the underlying population looks very different. This is important because while in the left hand example the average of 4 is representative of the typical member of the population, in the right hand example it is misleading because there are actually very few members of the population at that point.



In this case, the relatively subtle segmentation suggests that the left hand example is a better analogy to the community’s response to the Logue Brook Dam proposal, and that the results can be interpreted largely at face value, without needing to delve deeply into individual segment responses to understand them.

3.2 Final Segmentation

The most meaningful segmentation of the community survey data was a four segment model based on the water catchment management philosophy questions (Section 2.4). This was partly based on the finding of an exploratory regression analysis which indicated that the single most important predictor of the level of support for the proposal was respondent’s level of risk tolerance (as indicated by part 4 of this section).

Figure 30 (on the following page) shows the way the four segments fell across each of the items within the catchment management section. Each of the circles in the figure shows the group’s average – allowing a visual profile of the strength of each segments’ views to be seen.



Figure 30: Visual representation of the four-segment model of responses to the water catchment management philosophy questions.

Level of consensus with statements:	Strong	Moderate	Moderate	Strong	
Rely on treatment technologies to make our drinking water safe – which is more expensive but allows more potentially contaminating development and recreational activities to occur in our drinking water catchments				 	Protect our water by avoiding potentially contaminating development or recreational activities in our drinking water catchments
Efforts are focussed on reducing water usage in the community to get more value from our existing water supplies					Efforts are focussed on finding new sources of additional water to minimise the changes in current usage that is required
Everyone should pay more for treated drinking water, allowing people and organisations who want to use dams for recreational purposes to do so				 	People and organisations who use dams for recreational activities should pay for the additional costs of treating the water that they use
The safety and protection of our drinking water supplies is given the highest consideration, and achieving the lowest possible level of risk to the water takes priority over <u>all</u> other issues or uses of dams and their water	 				While the safety and protection of our drinking water is considered very important, the acceptable level of risk takes into account other issues and possible uses of the dams and their water
All water <u>practically</u> available in the State is combined into a single water supply to best meet the needs to the whole State				 	Water that naturally occurs in an area is first used to meet the needs of that area, with any extra water going to meet the needs of other areas where local demand exceeds the natural supply
The current policy of keeping recreation and drinking water separate is maintained, accepting that this will potentially put more and more limitations on recreational opportunities in public dams	 				The policy of keeping recreation totally separate from drinking water is reviewed and <u>possibly</u> changed, acknowledging that the limitations it puts on recreation may no longer be justifiable or financially viable

[Source: Community sample]

	Group 1 27%		Group 2 48%		Group 3 11%		Group 4 14%
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It is evident from this chart that Group 1 is quite distinct from the three other groups, but that each of the other three has its own decisive characteristic.

- **Group 1** is most clearly defined as being the only group that would prefer to see the policy of separating drinking water and recreation reviewed, but was also the only group to not very strongly feel that the safety of drinking water supplies should take priority over all other considerations. This group also strongly believed that water should be first used to meet the needs of the local area, with only excess water being made available to other areas, but was less consistent across the other issues.
- **Group 2** is the largest group, and as is often the case with the 'mainstream' segment, it has no totally unique attitudes that define it. However, its members strongly believe in



prevention over treatment; in a 'user pays' approach to treat water after recreation; that safety of drinking water takes precedence over all other considerations; that water should first be used in the local area where it occurs; and that the policy of protecting water should be retained.

Clearly, the mainstream segment is also a very conservative / risk averse segment when it comes to protecting drinking water supplies.

- **Group 3 and Group 4** are closely related, and differ from the mainstream segment in terms of a) their views that all water should be integrated for the good of the state rather than used locally first; and b) their views on focussing efforts on reducing consumption or on finding new sources.

On the first of these points, Gp 3 and Gp 4 are of a single view, and one which is contrary to the strong view of the mainstream segment (Gp 2) and also of Gp 1.

However, the two groups themselves disagree on the issue of reducing consumption versus increasing supply – and it is only because of this disagreement that the two groups are not a single segment. On this issue Gp 2 members are in fact rather inconsistent – whereas this is clearly an issue of importance to Gp 3 and Gp 4.

Demographic characteristics of the groups

None of the four groups has a radically different demographic profile. Although there are structural differences between the groups, these do not seem to be the dominant explanation of the segmentation – rather it would seem that there are attitudinal and / or experiential factors that underlie the groups.

Groups 1 and 2 were a little less likely to include respondents from Perth, while Groups 3 and 4 were more likely to include Perth residents. Males were slightly more likely to appear in Groups 1 and 4, while females were a little more likely in Group 2. 30% of members of Group 1 were recreational users of LBD – the highest of any of the groups, but far from a dominating proportion.

Table 31: Demographic breakdown of the four segments.

Group	Perth : SW balance	Recreational users of LBD	Age	Male : Female balance
Gp 1	45% : 55%	30%	No significant variations	57% : 43%
Gp 2	43% : 57%	13%		43% : 57%
Gp 3	65% : 35%	13%		50% : 50%
Gp 4	71% : 29%	9%		55% : 45%

Naming the groups

It is normal to name segments based on their defining characteristics. To summarise the groups and to give them simple, descriptive labels:

- Group 1 is the most **recreation / risk tolerant** group.
- Group 2 is the **conservative mainstream** group.
- Group 3 prefers to **integrate supply** and **reduce use**.
- Group 4 prefers to **integrate supply** and **find more water**.



3.3 Differences in the Opinions of the Groups

While the appearance of the four groups within the data is of interest, it is not in itself surprising and the main point of interest in the segmentation is how the different groups react to the main issues within the survey.

This section looks across the survey to see where significant differences in the views of the segments occur, and to see whether individually and collectively they increase the insight we can extract from the survey results.

Important issues in the South West

Group 1 – the recreation / risk tolerant group - was the most different from the overall average results. This group tended to think that the most important issues were a little less important, but that the recreation and tourism issues (which were considered least important overall) were of greater importance.

The issues of relatively higher importance for the mainstream group (Gp 2) were managing and planning for population growth, and conservation.

Group 3 and Group 4 showed their similar natures by having very similar views across all but one of the issues. Group 3 – which is the reduce usage group – rated conservation as much more important than Group 4 – which is the find more water group. Otherwise, these two groups were similar to the views of the mainstream group.

Table 32: Differences in perception of important issues across the four segments.

	% very important				Total
	Gp 1	Gp 2	Gp 3	Gp 4	
4. Ensuring adequate drinking water supplies	79%↓	91%	90%	86%	86%
1. Managing and planning for population growth	78%	87%↑	78%	82%	81%
2. Conserving the natural environment	70%↓	83%↑	87%↑	61%↓	75%
5. Ensuring adequate irrigation water supplies for agriculture	No Differences				62%
9. The range and number of jobs available	No Differences				57%
6. Ensuring adequate supplies of water for industry	No Differences				42%
7. Providing recreational opportunities and facilities for <u>residents</u>	60%↑	36%	40%	36%	42%
3. Promoting tourism to the area	46%↑	36%	36%	37%	38%
8. Providing recreational opportunities that <u>encourage visitors</u> to come to the area	50%↑	37%	34%	32%	34%

Arrows are to give an indication of where differences between the groups lie.

Important uses of water

Group 1 was the only group to significantly differ from the overall average in terms of its members' views on the most important uses of water in South West dams, tending to rate recreational use of water a little higher than the other groups.



Appropriate uses of water sources and bodies

There were only relatively minor differences in the views of the four segments in terms of what was appropriate use of different water bodies or sources.

In keeping with their greater risk tolerance, Group 1 was more willing to use all sources of water for multiple purposes, although this was generally only to a relatively minor extent.

Group 3 was generally a little more willing than Group 2 to use water sources for a variety of purposes, while Group 4 was a little less willing than Group 2 to make water sources multi-purpose.

Appropriate activities in and around drinking water sources and their catchments

Group 1 was, unsurprisingly, more willing to see each of the activities being done in and around drinking water sources. In several cases (marked with an * in the table) the level of support for an activity was greater than 50% amongst this group's members while being below 50% in the overall community.

By comparison to the differences between Group 1 and the other groups, the variations between Groups 2, 3 and 4 were generally very minor. Group 3 felt that grassed picnic areas were less appropriate than Groups 2 or 4, while being a little more willing to consider non-motorised boating or activities where people entered the water – although in each of these cases these variations did not change the overall interpretation of the result.

Table 33: Differences in appropriate activities in and around drinking water sources across the four segments.

	% very appropriate + quite appropriate				
	Gp 1	Gp 2	Gp 3	Gp 4	Total
6. Walk trails through surrounding water catchment areas	83%↑	70%	71%	69%	74%
12. Grassed picnic and BBQ areas on the dam's foreshore	83%↑	68%	55%↓	69%	70%
7. Cycle trails through surrounding water catchment areas	80%↑	63%	67%	65%	68%
9. 'Organic' agricultural activities in the catchment (ie: no use of chemicals)	71%↑	53%	63%	52%	59%
4. Fishing or marroning <u>without</u> bait (eg: using lures, snares or scoops)	78%↑	44%	48%	40%↓	53%
13. Camping and accommodation areas and associated facilities	61%*↑	38%	34%	33%	44%
3. Non-motorised boating (eg: canoes, sailboats)	63%*↑	29%↓	35%	28%↓	39%
1. Activities where people enter the water (eg: swimming, some types of fishing or marroning)	49%↑	14%↓	24%	16%↓	25%
5. Fishing or marroning <u>with</u> bait	36%↑	13%	12%	9%	19%
8. 4WD and trail-bike use in surrounding water catchment areas	33%↑	14%	11%	12%	18%
2. Motorised boating and water skiing	25%↑	5%	9%	5%	10%
10. General agricultural activity in the catchment (including possible use of chemicals and fertilisers)	No Differences				8%
11. Industrial areas (eg: mining, factories, power stations)	14%↑	5%	6%	3%	6%

Arrows are to give an indication of where differences between the groups lie.



Logue Brook Dam

Outcomes

Group 1 differed from the other three groups in terms of its evaluation of most of the outcomes, and where there was a difference being more negative about each of them (either less likely to agree that positive outcomes were good, or more likely to feel that negative outcomes were bad).

However, Group 4 was least likely to feel that the availability of funds to pay for piped irrigation or the reduced loss of water from a piped irrigation system were *very good* outcomes – being less positive than even Group 1 about these outcomes.

Support for the basic proposal

While there have been some variations between Groups 2, 3 and 4, it is apparent both from the segmentation itself and from the results reported above that these three groups are more similar than different – and that the greatest difference lies between these three groups and Group 1.

This was reflected very clearly in the level of support for the proposal to change the status of Logue Brook Dam. More than three-quarters of each of Groups 2, 3 and 4 *at least quite strongly* supported the basic proposal – compared to only half of Group 1

Table 34: Differences in the level of support for the basic proposal across the four segments.

	A lot	Quite a lot	At least quite a lot	Not very much	Not at all	Not sure
Group 1	20%	26%	46%	20%	26%	8%
Group 2	47%	30%	77%	9%	6%	8%
Group 3	49%	37%	86%	5%	6%	3%
Group 4	45%	34%	79%	10%	5%	6%
Total	39%	30%	69%	12%	11%	8%

Support for the proposal after considering trade-offs

All of the four groups showed an increase in the total proportion of members who would support the proposal *at least quite strongly* once they considered the trade-offs.

In each of the groups the proportion who would support the proposal *very strongly* actually fell a little, but the proportion who would support it *quite strongly* grew to a larger extent. Interestingly, the biggest effect of the trade-offs was on Group 1, which increased the proportion who support the proposal *at least quite strongly* from 46% to 65%.

Table 35: Differences in the level of support for the proposal across the four segments after considering the possible trade-offs.

	A lot	Quite a lot	At least quite a lot	Not very much	Not at all	Not sure
Group 1	21%	44%	65%	17%	13%	5%
Group 2	43%	37%	80%	9%	5%	6%
Group 3	38%	48%	86%	5%	4%	5%
Group 4	38%	49%	87%	6%	2%	5%
Total	35%	42%	77%	12%	7%	6%



Preferred alternatives to converting Logue Brook to a drinking water source

The different groups responded more or less favourably to a number of the alternatives to converting LBD.

The most popular option of water treatment / recycling (overall average 72%) was equally appealing to Group 1 (78%) and Group 2 (77%) – but less attractive to Group 3 (63%) and Group 4 (53%) (the two groups who preferred to maximise the integrated water supply rather than using water locally first).

Despite the lower attraction to this option though, it remained the most attractive to Group 3, and was one of four alternatives that were of interest to 50-60% of Group 4. Group 4 were more attracted than the other groups to underground water and thinning of catchment vegetation.

Reaction to converting other dams

Group 1 were much more opposed to the conversion of other dams in the Harvey-Warooka area than the other three groups (between whom there were no differences).

The proportion of Group 1 who would feel *good or very good* about converting one more dam was 42%, compared to 74% of the other three groups. The equivalent proportions for converting two more dams were 25% and 54%, and 20% and 40% for all three remaining dams.

3.4 Discussion of Segments

The segmentation of this data has been an interesting exercise, perhaps more interesting for the lack of distinctive segmentation than for what emerged.

Sometimes when interpreting social research data the underlying segments can hold dramatically different views, and it is only through the use of the segment-level results that sense can be made of the overall results. On other occasions, the segmentation reveals that there are not any dramatically different groups within the community, but rather that it is quite homogenous.

This latter scenario was very much to the fore in this case. While four attitudinal segments were identified, and while these segments did have interesting defining characteristics, in truth three of the segments were predominantly more similar to each other than distinct. They are legitimate segments, holding strongly different views on important issues – but while these differences are an important insight into water catchment management principles in general, these different opinions appeared to have little or no impact on reactions to the specific case of Logue Brook Dam.

The exception to this was seen in the remaining group, whose views were very distinct from the other three groups on almost every point in the survey. The defining characteristic of this group was the level of risk tolerance and preparedness to look at considerations other than pure drinking water supply safety when working out an acceptable level of risk. Of all the catchment management principles canvassed in the survey, it appears that this one has the greatest overall impact – and the only one whose impact extends to views on the Logue Brook Dam proposal.

When looking at the results from Group 1, the reader will no doubt have been reminded of the pattern of results seen from recreational users of Logue Brook Dam throughout the detailed results section. A closer inspection shows that the two sets of results are not directly comparable – just the two most differentiated groups in the survey. It is perhaps of no surprise though to see that half of the LBD-users group fell into Group 1 (with most of the remainder in Group 2). However, LBD-users made up only 30% of Group 1, so it is clear that there are many non-users whose views contribute to the group – and whose views are obviously mostly compatible with the user group.

Overall then, the segmentation tells us that the total community level results are a fair indication of the typical attitudes of respondents. While there is a minority group of about 1-in-4 respondents whose views differ considerably, the overall results of the survey are indicative of the majority of respondents.



4. Indicative Data from the 18-29 Year Old Age Group

Only the most basic of inspections of the 18-29 year old age group data from the community survey was conducted, as the representativeness and reliability of the data from this age group was far too doubtful to warrant more detailed analysis. For the same reason, no numerical results will be reported here, due to the high likelihood of them then being used in ways that cannot be supported.

The most obvious thing about the 18-29 year old age group data is the lack of it – the response rate to the survey from this age group was *very* low. Perhaps some of the reason for this can be inferred from the small amount of data that was obtained though. The first question in the survey is about the relative importance of different issues, trying to get an understanding of the relative importance of water by comparison to other issues.

Ensuring adequate supplies of drinking water was identified as *the* most important issue by 37% of the 30+ community sample (the highest of any issue) and one of the top 3 most important issues by 83%. Of the few 18-29 year olds who returned the survey, it was considered an important issue by a much smaller proportion. While this is far from conclusive, it may be that this lower level of importance placed on the subject gives an insight into the reasons for the low participation level from this age group.

Other than this, the inspection of the 43 surveys received from 18-29 year olds showed a surprisingly high level of similarity to the overall results. In places the results were virtually identical to the overall community numbers, and there were no places in the survey where it appeared that the 18-29 year olds held radically different views.

This is consistent with the generally homogenous nature of the community on this issue which has come through the survey.

While the results are by no means conclusive about the attitudes of the 18-29 year old age group, the only indication that can be drawn from this data is that this age group seems to broadly concur with the views of the wider community.



5. Discussion and Conclusions

5.1 Reflections on the Processes

Community Survey process

The Community Survey allows Government to better understand attitudes in the community about water catchment management practices, and to provide guidance on the future of a proposal to change the status of Logue Brook Dam from *irrigation and recreation* to *irrigation and drinking water*. It was a large scale survey of residents of Perth and the South West area between Perth and Bunbury, intended to give a highly representative and reliable view of community opinions – and it fulfilled its role nearly perfectly.

The only major glitch was such a low participation level from the 18-29 age group that they had to be excluded from the analysis, with the final results reflecting the 30+ rather than the 18+ population. What little data was obtained from the 18-29 age group suggested that water is not seen as such an important issue by this age group, and that may have contributed to the low participation rate. The small amount of 18-29 data that was available did not appear to differ substantially from the 30+ data, although this can be only taken as indicative at best.

The response rate (15%) and total effective sample size ($N_{\text{eff}} = 749$) for the survey were both within the targeted ranges. The 17% of respondents to the survey who indicated they had used Logue Brook Dam for recreation in the last 12 months probably overstates the real usage level a little – but does not overly dominate the sample and gives us sufficient data from users to explore attitudes of this group in more detail.

The views of users *did* vary substantially from non-users, and this was one of the main differentiating factors in the results. Interestingly, the views of users of Logue Brook also differed from users of other dams, which suggests that either Logue Brook users are different to other dam users (unlikely), or that a 'halo effect' was operating in which reactions to the proposal colour responses to all other associated issues (more likely).

A segmentation of the community survey data showed that there was a fairly homogenous reaction to the survey issues – in particular to the Logue Brook Dam questions. The segmentation was based on water catchment management philosophies, and identified four segments which varied significantly from each other. However, only one group – one that was defined primarily by a higher risk tolerance with respect to safety of drinking water sources – differed in its reactions to the Logue Brook Dam proposal. This group, which made up 27% of the community sample, was far less willing to lose the recreation facilities at Logue Brook simply for the sake of additional drinking water. This group had a higher concentration of Logue Brook users – but was far from dominated by such users.

The homogeneity of community attitudes were reinforced by finding only minor difference based on age or gender, or between Perth and South West respondents – and none of these results really impacted the overall interpretation of the results.

Comparing the Community Survey results to the Deliberative Survey results

The key reflection for the Harvey Forum deliberative survey is how representative the Forum participant sample was. This is important both to the degree of deliberation achieved during the forum, and for understanding any changes that may or may not have been seen across the two waves of the deliberative survey. It was expected that because of the recruitment model used for the Forum, the deliberative survey was not likely to be as robustly representative as the community sample in a statistical sense.

Comparing the two groups on stable and fundamental values is a critical step for any reader who wishes to fully understand the information provided by the two methodologies. There are two particular sets of results that the reader should consider in putting the community sample into context against the deliberative sample:



1. The proportion of recreational users of Logue Brook Dam in the two samples, and the differences in views expressed by users and non-users in both surveys: and
2. The water catchment philosophy questions (section 2.4 of both reports). These questions address underlying values of respondents, and a comparison of the pre-forum deliberative survey results to the community survey results will provide considerable insight.

In particular, the segmentation of the community survey data found that *the* key defining characteristic of the most differentiated segment was their willingness to consider issues beyond only the safety of drinking water when determining an appropriate level of risk around water sources. 27% of the community sample fell into this segment, and 30% of all respondents indicated such a willingness to consider wider issues. In contrast, in the deliberative sample three quarters of the participants indicated a greater degree of risk tolerance.

The reader is cautioned about drawing conclusions from the data in either this report or the deliberative survey report on their own. For a complete understanding of the issues this report should be read together with the deliberative survey report dealing with the same subject matter. In this way, the significant difference in conclusions evident in the traditional community survey and the deliberative survey can be understood, and the value of both survey types better appreciated.

The researcher cautions the reader to be diligent in understanding these issues before making comparative interpretations and drawing subjective conclusions about how the results should be used in the overall decision making process.

It is clear that such a complex and difficult project as this one is not going to be decided solely by the survey work completed here or in the deliberative survey report, and there are many other factors that will need to be considered in the final decision by Government on the future of Logue Brook Dam.



5.2 Key Results

Water Catchment Management Issues

Importance of water as an issue

Water is a very topical issue in Western Australia, and this was reflected in that *ensuring adequate drinking water supplies* was considered the most important issue (of those canvassed) in the South West of WA at the moment, ahead of *planning for and managing population growth* and *conservation of the natural environment*.

Both drinking water and irrigation water were seen as considerably more important than tourism / recreation opportunities – although water for industry was seen as no more important than these.

Users of Logue Brook Dam were more likely to rate tourism / recreation as being important.

Uses of water

The most important use for water – universally – was for drinking, ahead of irrigation / food production.

Most people in the community then put industry slightly ahead of recreation – although users of Logue Brook and members of the risk tolerant segment tended to put recreation slightly ahead of industry.

Appropriate uses of water sources

68% of respondents in the community survey thought that drinking water dams should not be used for any other purpose. Interestingly, 55% thought that recreation dams should be single-purpose as well.

Other than recreation dams, natural water bodies were seen as the most appropriate venue for recreation activities – substantially ahead of irrigation dams. This is interesting, as it suggests that the combination of irrigation and recreation uses is not overly intuitive in the community – and even amongst recreational users of Logue Brook (who rated all source as being more suitable for recreation than non-users) it was far from a dominant view.

The other interesting aspect to emerge from this data was that respondents clearly differentiated between household drinking water and household water for non-drinking purposes. While this distinction does not practically exist currently, clearly there is an existing psychological distinction which could be harnessed if and when a practical separation of the two was able to be offered.

Activity in and around drinking water sources

While respondents in the community sample were, on the whole, fairly conservative about drinking water protection, there were five activities which were considered *at least quite appropriate* by more than 50%:

- Walking trails through the catchment
- Grassed picnic / BBQ areas on the foreshore
- Cycling trails through the catchment
- Organic agriculture in the catchment
- Fishing / marroning without bait.

More than half of recreational users of Logue Brook also thought that camping / accommodation and non-motorised boating were also *at least quite appropriate*. It was quite clear that motorised activity was considered far less appropriate than the analogous non-motorised activity.

It should be noted that these results reflect respondents views on what they think is 'appropriate', and they do not necessarily reflect the actual risks to drinking water quality.



Catchment management philosophies

The community survey respondents held quite clear views on five of the six catchment management choices offered.

- 83% preferred to protect drinking water supplies by prevention rather than by treatment. Users of Logue Brook were a little less consistent in their view, but 63% of users took the same view.
- The respondents were evenly split between preferring to focus on reducing water usage and finding more sources of additional water. Perth residents were a little more likely to want to find more water, while South West residents a little more likely to want to make better use of existing water supplies.
- 82% thought that if recreation activities were to be allowed in drinking water sources, then the people and organisations who used the dams for recreation should pay for the treatment of the water, rather than everyone paying a little more and opening up the dams for recreation. 65% of users of Logue Brook agreed with this position.
- 70% felt that the safety and protection of drinking water supplies should be given the highest consideration – ahead of *all* other issues or uses of dams and water. Only 30% felt that the acceptable level of risk should take into account other issues and possible uses. Perth respondents took this view a little more strongly than South West respondents (76% vs 64%), while users of Logue Brook were evenly split.

This result is particularly important as this seems to be the single biggest predictor of likely reactions to the Logue Brook Dam proposal. It was also the main factor that differentiated the one distinctive segment in the community survey. If a single result was to be used as an indicator of an individual's likely position on water catchment management, this would be it.

- 75% thought that water which is naturally occurring in an area should first be used to meet the needs of the local community, with any excess going to meet the needs of other areas. This result is not entirely surprising in the South West where the supply : demand ratio is a little better, but was a little more surprising in Perth where this ratio is under more strain. 86% of South West respondents preferred a 'local use first' approach – but so did 64% of Perth residents.
- There is very limited support in the community to review the policy of protecting drinking water by prohibiting recreation. 67% of the community sample favoured retaining this policy, although users of Logue Brook were evenly split on retention versus reviewing the policy.

These results indicate a generally conservative approach to protection of water supplies, and there were not any sub-groups within the community respondents who consistently held views counter to the majority.

Logue Brook Dam

Value of outcomes

There were three possible outcomes of the Logue Brook proposal that two-thirds of the community sample thought were *very good* and over 80% felt were *at least quite good*: creating a conservation area, reduced loss of water through a piped irrigation system, and increased drinking water for the integrated supply.

There were two possible outcomes that were seen as *at least quite bad* by 46-51% of the community sample – the loss of recreation at Logue Brook and the increased demand on other sites. Less than 20% of the total sample said either of these were *very bad*.



By a small margin, more respondents rated having funding available to pipe the irrigation system and enhancing recreation facilities at other dams as positive outcomes than rated the loss of recreation at LBD or the higher impact on other sites as negative outcomes.

Support for the basic proposal

69% of the community sample would support the basic proposal to convert Logue Brook Dam from an irrigation and recreation dam to an irrigation and drinking water dam, including 39% who would support it *a lot*.

Recreational users of Logue Brook, not surprisingly, were less positive – with only 41% supportive and 55% opposed.

Trade-offs

Of the eight categories of trade-offs suggested to mitigate the impact on recreation of a change of Logue Brooks status, there were no dramatically more effective ones.

All were seen as important by the community sample as a whole, with the *most* important being walk trails at other dams, enhancing other dams recreation facilities and ensuring the continuity of the Munda Bididi cycling trail. For users of Logue Brook, enhancing facilities at other dams, creating new facilities and ensuring adequate campsites were most important.

Support for the proposal after considering the trade-offs

It would be expected that the effect of the trade-offs (if any) would be to increase the level of support for the proposal. Even though there were no stand-out elements of the possible trade-offs, overall the effect of the trade-offs *was* to increase support – although there was actually a small drop in the proportion who would support it *a lot*.

The total proportion who would support the proposal *at least quite a lot* increased from 69% to 77% after consideration of the trade-offs. Importantly, the level of support amongst Logue Brook users increased from 41% to 65%.

Alternatives

Clearly the most preferred alternative to obtain additional water for the Integrated Supply if the Logue Brook proposal did not go ahead is water treatment / recycling (72%). Three other alternatives – desalination, changing a different irrigation / recreation dam, and underground sources were attractive options to between 46-52% of the community survey respondents.

Converting more dams in the Harvey-Waroona area

Two-thirds of the community sample were happy with the concept of converting a second dam in the area to irrigation and drinking water as well as Logue Brook. Support dropped to 46% for two more dams, and to one third for all three other dams. Logue Brook users were much more opposed to converting any more dams after Logue Brook.



5.3 Conclusions

1. This survey has shown the community is, on the whole, very conservative about protecting drinking water sources. The majority of respondents felt that:
 - a. Drinking water sources should not be used for any other purpose.
 - b. Protection should be ensured by prevention of contamination rather than treatment.
 - c. The safety and protection of drinking water supplies should be given the highest consideration, and achieving the lowest level of risk takes priority over all other issues and possible uses.
 - d. The current policy of separating drinking water and recreation should be retained.

Despite this, there were a number of non-motorised activities they thought were appropriate around drinking water dams, such as walking and cycle trails in catchments and grassed foreshore areas (bearing in mind that a perceived level of appropriateness does not necessarily equate to a low level of actual risk).

2. There is quite strong support in the community across Perth and the Perth-Bunbury area of the South West for converting the Logue Brook Dam from an irrigation and recreation dam to an irrigation and drinking water dam.

Recreational users of the dam are naturally less supportive of this change than non-users. However, after consideration of a suite of possible trade-offs – and indicating that virtually all of these would be important elements of the trade-off – the majority of Logue Brook users would also support the change of status of the dam.

3. The biggest predictor of attitudes towards water catchment management and also towards the Logue Brook Dam proposal is the level of risk tolerance shown towards protection of drinking water supplies.

People who are prepared to consider other issues beyond simply the protection of the water supply over all other considerations (ie. people willing to possibly accept a little more risk) have significantly different views about catchment management, and are less disposed to the Logue Brook proposal in its black and white “recreation or drinking water” form. It appears that this segment of the community is around 27%.

4. There are several other segments within the population whose attitudes towards catchment management vary in specific ways.
 - a. Three-quarters of the community respondents felt that water should meet local needs before feeding into the integrated water supply. This segment includes the 27% who were most risk tolerant.
 - b. Of the 25% who feel that all water should be integrated to best meet the needs of the state, 11% thought it more appropriate to focus on reducing water use, while 14% felt it more appropriate to concentrate on finding new sources of water.
5. If a practical way of separating supplies of drinking water from non-drinking household water can be found, then there appears to be a latent willingness in the community to treat the two differently, including accepting different levels of multi-purpose use of dams.

The reader is cautioned about drawing conclusions from the data in either this report or the deliberative survey report on their own. For a complete understanding of the issues this report should be read together with the deliberative survey report dealing with the same subject matter.

More information on the LBD proposal and Dialogue Forum (including copies of this report and the separate deliberative survey report) can be located on the Department of Water’s website at - www.water.wa.gov.au. Follow the links from the homepage to ‘Drinking Water’ and then under Projects open ‘Logue Brook Dam’.



6. Appendices





Community Survey

Water Catchment Management Issues

Whether or not you are living in the South West, we would like to know your thoughts on a range of issues that are critical to better management of water in Western Australia.

1. In your opinion:

A) How **important** are each of these issues **for the South West corner** of WA; and

B) How **well** do you think the South West is doing **at the moment**?

	A) How important do you think this is for the South West?				B) How well is the South West doing at the moment?			
	Very	Quite	Not very	Not sure	Very well	Quite well	Not very well	Not sure
1. Managing and planning for population growth	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
2. Conserving the natural environment	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
3. Promoting tourism to the area	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
4. Ensuring adequate drinking water supplies	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
5. Ensuring adequate irrigation water supplies for agriculture	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
6. Ensuring adequate supplies of water for industry	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
7. Providing recreational opportunities and facilities for <u>residents</u>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
8. Providing recreational opportunities that <u>encourage visitors</u> to come to the area	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
9. The range and number of jobs available	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

2. Which **three** of the above issues do you think are the **MOST** important?

Write one number in each box

Most important 2nd most important 3rd most important

3. What do you consider to be the most important use of dams in the South West? Please **rank** these four types of use in order of importance: Write one number in each box

Water used for (in alphabetical order):	Ranking 1 = "most important" → 4 = "least important"
Agriculture and food production	<input type="text"/>
Household use (including drinking)	<input type="text"/>
Industry	<input type="text"/>





4. What do you think are **appropriate** uses of each of the following sources of water or water bodies?
Tick as many as you feel are appropriate.

↓ Use	Type of water source→	Artificial dams used for:		
		Natural lakes, rivers and creeks	Drinking water	Irrigation water
Water for human consumption (ie: drinking water)	<input type="checkbox"/> 1	<input checked="" type="checkbox"/>	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Water for non-drinking household use (eg: showering, toilets, gardens and clothes washing)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Water for water based recreation (eg: boating, skiing, swimming, fishing etc)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input checked="" type="checkbox"/>
Water to enhance land-based recreation (eg: view from walking and cycle trails, picnic spots, etc)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input checked="" type="checkbox"/>
Water for farmland irrigation (ie: food production, stock animals)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input checked="" type="checkbox"/>	<input type="checkbox"/> 4
Water for industry (eg: mining, factories, etc)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Water for the natural environment (plants and animals)	<input checked="" type="checkbox"/>	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

5. Any activity in and around sources of drinking water can be a potential risk to the quality and safety of that water. Contamination from the presence of humans and domestic animals in particular pose threats to drinking water quality. At present, dam water for the integrated supply has only minimal treatment once it leaves the dam.

Given this, how appropriate do you think it is for each of the following activities to happen in, on and around sources of **public drinking water**? Tick one box on each line

	Very appropriate	Quite appropriate	Not very appropriate	Not at all appropriate	Can't say
1. Activities where people enter the water (eg: swimming, some types of fishing or marroning)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
2. Motorised boating and water skiing	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
3. Non-motorised boating (eg: canoes, sailboats)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
4. Fishing or marroning <u>without</u> bait (eg: using lures, snares or scoops)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
5. Fishing or marroning <u>with</u> bait	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
6. Walk trails through surrounding water catchment areas	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
7. Cycle trails through surrounding water catchment areas	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
8. 4WD and trail-bike use in surrounding water catchment areas	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
9. 'Organic' agricultural activities in the catchment (ie: no use of chemicals)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
10. General agricultural activity in the catchment (including possible use of chemicals and fertilisers)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
11. Industrial areas (eg: mining, factories, power stations)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
12. Grassed picnic and BBQ areas on the dam's foreshore	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5



13. **Camping and accommodation areas and associated facilities**

₁ ₂ ₃ ₄ ₅

At present, dam water going into the integrated water supply system is not heavily “treated”. Instead, the quality and safety of the water is protected mainly by strict controls on dams that feed water into the integrated supply. This protection includes prohibiting any development or recreational activity on the dams, or within a 2km protection area around the dam. These controls only apply to dams that supply drinking water, and are considered in Western Australia to be the best way to ensure safe, good quality drinking water. This approach has so far delivered safe drinking water in WA, and at a minimum cost to consumers.

However, as dams are increasingly being used for drinking water, there are fewer opportunities for people who want to develop land and recreate around these sites. Other approaches could be adopted that would allow more development and recreation opportunities on and around our drinking water dams and in their catchments. However, they would also increase the cost of water due to additional treatment that would be needed. Such treatment may also not be able to deliver the same quality and safety of the water supplied.

6. Given the above information, what do you feel should be the main guiding principles behind the management of water sources and catchments in Western Australia?

Tick ONE box for each pair of options

- Please note that in some cases the choices given could both happen – but we are interested in which you would prefer to be the stronger influence or the most visible.
- If you like both options, you should choose the one you like the most. If you dislike both options, you should choose the one you dislike least.

<input type="checkbox"/>	<p>Rely on treatment technologies to make our drinking water safe – which is more expensive but allows more potentially contaminating development and recreational activities to occur in our drinking water catchments</p>	Or	<input type="checkbox"/>	<p>Protect our water by avoiding potentially contaminating development or recreational activities in our drinking water catchments</p>
<input type="checkbox"/>	<p>Efforts are focussed on reducing water usage in the community to get more value from our existing water supplies</p>	Or	<input type="checkbox"/>	<p>Efforts are focussed on finding new sources of additional water to minimise the changes in current usage that is required</p>
<input type="checkbox"/>	<p>Everyone should pay more for treated drinking water, allowing people and organisations who want to use dams for recreational purposes to do so</p>	Or	<input type="checkbox"/>	<p>People and organisations who use dams for recreational activities should pay for the additional costs of treating the water that they use</p>
<input type="checkbox"/>	<p>The safety and protection of our drinking water supplies is given the highest consideration, and achieving the lowest possible level of risk to the water takes priority over <u>all</u> other issues or uses of dams and their water</p>	Or	<input type="checkbox"/>	<p>While the safety and protection of our drinking water is considered very important, the acceptable level of risk takes into account other issues and possible uses of the dams and their water</p>
<input type="checkbox"/>	<p>All water <u>practically</u> available in the State is combined into a single water supply to best meet the needs to the whole State</p>	Or	<input type="checkbox"/>	<p>Water that naturally occurs in an area is first used to meet the needs of that area, with any extra water going to meet the needs of other areas where local demand exceeds the natural supply</p>
<input type="checkbox"/>	<p>The current policy of keeping recreation and drinking water separate is maintained, accepting that this will potentially put more and more limitations on recreational opportunities in public dams</p>	Or	<input type="checkbox"/>	<p>The policy of keeping recreation totally separate from drinking water is reviewed and <u>possibly</u> changed, acknowledging that the limitations it puts on recreation may no longer be justifiable or financially viable</p>



The next set of questions specifically addresses the future of dams in the Harvey-Waroona area south of Perth (see included map). The issues here are important right now for this area, but they will be important across the State as demand for water continues to grow. The views of all parts of the community on how to deal with these issues are very important.

There are six major dams in the Harvey-Waroona area. Their size and main current uses are:

Dam	Harvey	Stirling	Logue Brook	Waroona	Samson	Drakes Brook
Size (in Gigalitres)	56.4	53.8	24.3	14.9	8.0	2.3
Used for: Drinking + Irrigation		✓			✓	
Used for: Irrigation + Recreation	✓ Limited rec.		✓	✓		✓ Limited rec.

Due to low rainfall and increasing population, there is a need to find additional sources for the integrated water supply. Logue Brook Dam is being looked at for this purpose. The dam was built to provide irrigation water for local agriculture, and is also used for a variety of recreational activities. Of the four irrigation / recreation dams in the area it is one of the most heavily used for recreation. The dam and its facilities (including a camping ground and accommodation at a caravan park) are used by local residents and visitors from other areas, particularly from Perth.

A proposal is being considered by Government that would make Logue Brook Dam a drinking water source. Currently, water from the dam feeds into an open-channel irrigation system, from which about 30% of the water is lost through evaporation and 'seepage'. The proposal is for Government funding to be provided to build a new piped irrigation system, and the water saved through reduced loss would be made available to the integrated water supply (about five gigalitres per year).

If this happened, the existing policy for the protection of drinking water sources would apply to Logue Brook Dam, preventing any recreational use of the dam.

7. There are a number of likely outcomes of converting the Logue Brook Dam from an 'irrigation and recreation' dam to an 'irrigation and drinking water' dam. How good or bad do you personally see each of these possible outcomes? Tick one box on each line

	Very good outcome	Slightly good outcome	Neutral outcome	Slightly bad outcome	Very bad outcome
Additional drinking water supplied into the available integrated water supply	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
The loss of recreational facilities at Logue Brook	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Increased recreational demand on other natural and artificial water bodies in the area	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Improvement of recreational facilities at other dams in the area	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Availability of funds to pay for a piped irrigation system for farms in the local area	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Reduced loss of water through the use of a piped water system for irrigation	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
The protection of the dam's catchment area, which would over time create a conservation area	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5



8. How much would you support the use of Logue Brook Dam being changed from 'irrigation and recreation' to 'irrigation and drinking water'?

A lot <input type="checkbox"/> 1	Quite a lot <input type="checkbox"/> 2	Not very much <input type="checkbox"/> 3	Not at all <input type="checkbox"/> 4	Not sure <input type="checkbox"/> 5
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When a dam becomes a drinking water source it is required to meet public health guidelines and as a result recreation is no longer permitted. Where practical the recreation activities are moved to alternative sites in the surrounding area.

9. If you assume Logue Brook dam was approved as a drinking water source, how important would the following options be to you as a way of making up for the loss of recreation from this dam? Please tick one answer on each line

	Essential	Very important	A little important	Not important
Providing new recreation sites (ie: increasing the number of recreation sites available by making other, existing dams available for recreation)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Enhancing existing recreation facilities at other dams (ie: improving facilities at sites that already exist)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Ensuring water levels at existing dams were kept high enough to guarantee recreation use (especially for skiing)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Ensuring a caravan park was available at a dam in the area	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Ensuring adequate campsites are available at other dams	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Introducing and maintaining fish stocks in dams that allow recreational fishing	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Ensuring walk trails are available at other dams	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Ensuring the Munda Biddi long distance cycling trail is maintained and re-routed if necessary	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

If you did not tick any of the things in question 9 as being "Essential" or "Very important": → skip to question 11.

10. If all of the things that you ticked as being "Essential" or "Very important" in question 9 happened, how much would you then support the proposed change?

A lot <input type="checkbox"/> 1	Quite a lot <input type="checkbox"/> 2	Not very much <input type="checkbox"/> 3	Not at all <input type="checkbox"/> 4	Not sure <input type="checkbox"/> 5
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11. If the change of Logue Brook to a drinking water source did not go ahead, which of the following options would you like to see explored as an alternative way of obtaining more water for the integrated water supply to meet the demands of a growing populations? Tick *all that apply*

- Underground water supply (aquifers) 1
- Transporting water from within WA or from interstate 2
- Looking to change the status of other irrigation / recreation dams 3
- Desalination technology 4
- Water treatment and recycling technology (eg: use of treated 'Grey' water) 5
- Thinning of catchment vegetation at existing dams to increase the amount of water collected 6
- Anything else? Please briefly describe



12. There are currently no plans to consider the future usage of any of the other three irrigation and recreation dams in the Harvey-Waroona area (Harvey, Waroona and Drakesbrook). However, it is possible at some point in the future that, as demands on the available water supply increase, one or more of these dams may also be looked at as a potential supply of more water for the integrated water supply (as well as other dams around the State).

If Logue Brook Dam had already become part of the drinking water supply, how would you feel about:

	Very good	Good	Can't say	Bad	Very bad
1. <u>One</u> other dam becoming a drinking water source, and off limits for recreation?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
2. <u>Two</u> other dams becoming a drinking water source, and off limits for recreation?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
3. All <u>three</u> of the other dams becoming a drinking water source, and off limits for recreation?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

13. How strongly would you support the Government reviewing the current policy of protecting drinking water sources by prohibiting recreation?

Very strongly	Quite strongly	Not very strongly	Not at all	Not sure
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

The last section of the questionnaire is about you. This information is very important to allow us to make sure we have a good cross section of the community in the survey, and to allow us to see if different groups in the community have different opinions.

To make sure the survey represents the total population, we match the age and gender balance of the returned sample to the population profile. This cannot be done with any surveys that don't provide this information, and they are therefore not able to be used in the analysis.

Similarly, if a survey has more than one set of information here, it also cannot be used. If more than one person helped to complete the survey, please provide just the details of the person it was originally mailed to.

14. Which of the following age group are you in?

- 1 18-29 3 30-39 3 40-49 4 50-64 5 65+

15. Which gender are you?

- 1 Male 2 Female

16. What is the postcode where you live?

17. Which of the following best describes where you live?

- 1 In an urban area 2 In a semi-rural area 3 In a rural area

18. In the last 12 months, which of the following have you done? *Tick all that apply*

	Active recreation swimming, walking, skiing etc	Casual recreation picnicking, BBQ etc	Stayed overnight	None of these
At Logue Brook Dam	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
At another dam	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
At a natural lake or river	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

19. Are you a current user of irrigation water for agricultural production?

- 1 Yes 2 No

**Thank you – please don't forget to return the survey to us
now you have taken the time to complete it!**

