



Gnangara Sustainability Strategy

Community Forums

May to June 2008

Analysis Report

DISCLAIMER

The information contained in this report is based on sources believed to be reliable. The views expressed in this report are not necessarily held by the author. While every care has been taken in the preparation of this report, BlueSands Environmental give no warranty that the said base sources are correct and accepts no responsibility for any resultant errors contained herein and any damage or loss, howsoever caused, suffered by any individual or corporation.

If a Third Party uses or relies on the facts, content, opinions or subject matter contained in this report with or without the consent of BlueSands Environmental, BlueSands Environmental disclaims all risk and the Third Party assumes all risk and releases and indemnifies and agrees to keep indemnified BlueSands Environmental from any loss, damage, claim or liability arising directly or indirectly from the use of or reliance on this report.

Version	Date	Prepared by	Reviewed by
V1	23 rd July 2008	Lucy Sands	

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY4

2. WORKSHOP METHODOLOGY5

3. WORKSHOP RESULTS.....6

 3.1 SOCIAL VALUES6

 3.2 PUBLIC WATER SUPPLY8

 3.3 GNANGARA PARK9

 3.4 WETLANDS11

 3.5 BANKSIA BURNING13

 3.6 WATER USE EFFICIENCY15

 3.7 WATER PRICING17

 3.8 PINE PLANTATIONS18

 3.9 HORTICULTURE20

 3.10 URBANISATION22

 3.11 ADDITIONAL COMMENTS23

4. INTERPRETATION OF WORKSHOP RESULTS23

1. EXECUTIVE SUMMARY

As part of the community consultation process for the Gnangara Sustainability Strategy, a series of community forums were held during May and June 2008.

The purpose of the forums was to update the community on the progress of the Gnangara Sustainability Strategy and provide background information on prominent issues relating to management of the Gnangara groundwater system.

In addition, a key aim of the forums was to identify community values and understand community feeling toward potential trade-offs associated with long term management of the Gnangara groundwater system. Understanding community values and feelings is considered to be an important part of developing viable options for long term management of the Gnangara groundwater system.

The responses obtained during the workshop sessions indicated that those attending had a comprehensive understanding of the issues relating to water resource management and management of the Gnangara groundwater system.

In particular, respondents had a good understanding about the relationship between biodiversity and water values and were aware of the social, cultural and environmental attributes of these values.

There was a strong belief that water resources are significantly undervalued by the community which is leading to a slow uptake of water use efficiencies and reuse technologies by the majority of sectors. There was a good understanding of alternative water supply options and the need to incorporate these into everyday water resource management and reduce our reliance on traditional water sources.

Land use options were considered by attendees and there was support to retain the horticulture industry close to Perth, in particular viticulture in the Swan Valley. Economic considerations such as transport costs and local employment were expressed as critical issues to retain the land use.

The pine plantations were considered to have economic and social values to some attendees, but it was acknowledged that they are high water users with low biodiversity value and will eventually be removed. It was expressed that the proposed Gnangara Park should incorporate a variety of land uses including conservation, recreation, urbanisation and sustainable tree cropping, to replace the timber industry to some extent.

The information obtained from the community forums will provide an insight into the community's values and perceptions of water, biodiversity and land use management on the Gnangara groundwater system. It is proposed that this information will be used to further the decision support system model and options for the Gnangara Sustainability Strategy, which will be presented to the community at a second round of forums in late 2008.

2. WORKSHOP METHODOLOGY

An invitation was sent to approximately 1300 community stakeholders in the northern suburbs, informing them of the community forums. An invitation was also posted on the Gngangara Sustainability Strategy website and advertised in community newspapers.

Four forums were held across the northern suburbs, each following the same format but with a varying focus on issues, so that local issues could be discussed in detail. Table 1 outlines the location and prominent issues discussed at each forum.

Table 1 Location of Gngangara Sustainability Strategy Community Forums and prominent issues

Location	Date	Prominent issues
Burswood	15 th May 2008	wetlands, water use efficiency, water pricing, Gngangara park, Banksia burning, horticulture
Ellen Brook	5 th June 2008	Gngangara park, Banksia burning, horticulture, pine plantations, public water supply
Floreat	12 th June 2008	wetlands, water use efficiency, water pricing, Gngangara park, Banksia burning, public water supply
Yanchep	26 th June 2008	wetlands, pine plantations, urbanisation, public water supply

At the commencement of each forum, attendees were provided with an overview of the Gngangara Sustainability Strategy, including its purpose and the agencies and projects that are contributing to its development. Following this, there was a presentation on the potential and modelled impacts that climate change and land use change may have on groundwater levels. Then a series of presentations were made with the aim of providing attendees with background information on local prominent issues.

Following the presentations, attendees were asked to take part in a group workshop session. Prior to the forum, attendees were allocated to a colour-coded group to ensure there was representative mix of attendees on each table. Each table had a designated facilitator and scribe, who were mostly members of the Gngangara Sustainability Strategy Taskforce. Individuals representing State government agencies who were not facilitators or scribes were observers and were not involved in group discussions.

The facilitated workshop session required attendees to respond to a series of focus questions provided in table booklets. The focus questions were developed by the facilitator and Gngangara Sustainability Strategy Taskforce and were designed to identify community attitudes and perceptions toward local prominent issues. Therefore, questions varied according to the forum location. Section 3 indicates the prominent issue questions that were asked at each forum. In addition to the questions on local prominent issues, attendees at all forums were asked questions relating to social values.

Group discussion was guided by the table facilitators and the table scribes recorded notes of the group's discussion in a 'group booklet'. Booklets were distributed to attendees prior to the forum to encourage individuals to consider and respond to the questions prior to attending. Consequently, some individuals provided comprehensive responses in their individual booklets and were encouraged to submit their individual booklets so that their notes could be considered for inclusion in this report.

3. WORKSHOP RESULTS

The following results provide an accumulation of the values and perceptions provided by respondents to each of the questions posed at the forums. This information has been derived from individual and group booklets. There were 137 people who attended the forums, including 71 community representatives and 66 other representatives (including State government representatives and Taskforce members).

There were 71 booklets submitted for inclusion in the analysis, 14 of which were group booklets completed by the table (57 individual booklets were submitted). It should be noted that not all community representatives submitted their individual booklets, possibly feeling their responses were adequately incorporated in the group booklet.

It should also be noted that some individuals chose not to respond to some questions or responded very briefly (due to time constraints or level of interest in the question).

Where there were a considerable number of responses provided to a question, the information has been presented in tables and ranked according to the most popular responses. Where a limited response was generated by the question, the following analysis provides a summary of the key responses.

3.1 SOCIAL VALUES

Question: What geographical features or places on the Gngangara groundwater system are important to you and why are they important? How often do you visit these places? (All workshops)

Questions regarding social values were asked at all forums. The majority of responses identified natural areas such as wetlands and bushland as being most important. Many responses included the name of the geographical feature, including Yanchep National Park (19 responses), Whiteman Park (9 responses) and Yellagonga Regional Park (8 responses). Landscape features such as Banksia woodland (10 responses) and coastal areas (8 responses) were considered important for their environmental, social and cultural values.

Agricultural areas, including the Swan Valley viticulture industry (14 responses) and other farming/rural areas (6 responses) were considered important for their economic and social values.

There were few comments on how often individuals visited a place. Those that did comment indicated that they visited those places that were local to them most frequently. One interesting comment in regards to natural areas was that although we may not visit them often, it is important to know they are there for biodiversity values.

Table 2 provides a summary of geographical features and places and the number of booklets that identified them as being important.

Question: How strongly do you feel if future generations were no longer able to visit these places? (All workshops)

Almost all respondents indicated that they had strong negative feelings about future generations not being able to visit these places. Many respondents suggested that access to places of environmental significance should be restricted and managed in a way to protect them for future generations (*6 respondents*). There were also a few comments in regards to involving the community and educating younger generations (*6 respondents*).

Some additional responses included;

- Explore eco-tourism opportunities
- Natural environments provide opportunities for physical activity which needs to be maintained
- Concerns about increasing food miles if the horticulture precinct is pushed out of the urban area.
- There needs to be consideration given to the appropriate level of bushland retention. Considered by some that 10% is not enough, 30% is better especially in higher population densities where the traditional ‘backyard’ is lost.

3.2 PUBLIC WATER SUPPLY

Question: Do you think there are benefits to continuing to supply drinking water from the Gngangara groundwater system? Why/why not? (Ellen Brook, Floreat and Yanchep workshops)

All but two responses to this question supported the continuation of public water supply from the Gngangara groundwater system. Most respondents indicated that there were limited alternative water sources that can entirely replace the Gngangara groundwater system so it will continue to be necessary to use the system for public water supply.

However, some respondents indicated that they were concerned about allocating over the sustainable yield and there was a need for the Government to develop and promote contingency plans. One respondent indicated that they were concerned about the risks of geological instability and subsidence caused by over abstraction of groundwater.

The majority of respondents indicated that Water Corporation abstraction should be minimised through improvements to water use efficiencies and development of alternative water sources, although there is an identified need for alternative supplies to be located as close to the user as possible to reduce transport costs and emissions.

Suggested alternative water sources included;

- Aquifer recharge
- Rainwater tanks
- Grey water and wastewater recycling and reuse
- Desalination
- Pine harvesting
- Stormwater harvesting
- Kimberley water supply

There was some discussion over the use of desalination. Some respondents viewed the technology to be unfavourable due to its high energy use and emissions. Others cautioned that it should not be relied upon as the only alternative source.

3.3 GNANGARA PARK

Question: There have been calls to develop an integrated management plan for the long-term management of the proposed Gngangara Park. What issues should be covered by the plan? (Burswood, Ellen Brook and Floreat workshops)

Most respondents indicated that the management of natural areas should be a key component of the plan. This included the provision of wildlife corridors (*15 respondents*), protection and conservation (*8 respondents*), plant and animal biodiversity (*6 respondents*), disease threats (*6 respondents*), restoration (*4 respondents*) and pests and weed management (*2 respondents*).

Some respondents (*8 respondents*) listed accessibility as an issue that should be addressed by the plan. Respondents suggested that access should be managed so that some areas are restricted or limited to low impact activities and others have open access for high impact activities. Table 3 provides a summary and ranking of the issues that respondents would like to have addressed by the proposed plan and a suggested list of topics that should be considered.

Table 3. Issues that respondents would like to be addressed by an integrated management plan

Issues that should be covered by the proposed Gngangara Park integrated management plan	No. booklets that identified the issue (n=61)	Comments/suggestions
<p><u>Bushland/Natural Areas Management</u> Fragmentation of bushland/provision of wildlife corridors Protection/conservation Plant & animal biodiversity Restoration Disease threats – dieback Pests and weeds</p>	<p>15 8 6 4 6 2</p>	<ul style="list-style-type: none"> • Need to provide large areas of bushland that are interconnected to enable movement of fauna • Reconnect fragmented bush • Ecological linkages • Buffer zones between bushland and other uses • Threatened Ecological Communities • Western Swamp Tortoise • Migratory birds • For environmental stewardship 30% of various ecological communities should be restored • Better representation of vegetation types and soils types • Replace lost wetlands • Manage infrastructure corridors to benefit nature

Issues that should be covered by the proposed Gngalara Park integrated management plan	No. booklets that identified the issue (n=61)	Comments/suggestions
Access management	8	<ul style="list-style-type: none"> • Restrict access - keep some places untouched/sacred • Access ranging from open/high impact to limited/low impact
Water quality & quantity	8	<ul style="list-style-type: none"> • Groundwater protection/abstraction • Surface water protection • Limit water abstraction to natural recharge rate • Determine what would be lost 'naturally' under climate • Recharge areas • Water efficient design. Composting toilets • Recharge aquifer with tertiary treated wastewater
Urban growth management	6	<ul style="list-style-type: none"> • Urban interface • Limit urban development
Fire management	7	<ul style="list-style-type: none"> • Fire regime designed to maintain suite of species
Pines/timber industry	6	<ul style="list-style-type: none"> • Plant other tree species to support the timber industry (eg. Mallees for oil, sandalwood). Sustainable forestry • Forestry can also provide biodiversity • Removal of pines
Horticulture industry	4	<ul style="list-style-type: none"> • Protect horticulture precinct • Look at opportunities for horticulture in areas where soil and fertiliser use is suitable
<u>Recreation management</u> Passive recreation Active recreation	4	<ul style="list-style-type: none"> • Active recreation requires large areas of land which is utilising a very rare resource • Active and passive recreation precincts • Trail bike management • Education and tourism
Climate change	2	<ul style="list-style-type: none"> • Impact of climate change on biodiversity
Community involvement	1	<ul style="list-style-type: none"> • Revegetation

Question: What sorts of land uses and activities do you think should be available in the Park? (Burswood, Ellen Brook and Floreat workshops)

Almost half of the respondents listed passive and active recreation as an activity that should be available in the proposed Gnangara Park (26 respondents). Examples of recreational activities suggested by respondents included nature observation areas, walking/hiking (e.g. extension of Bibblumun track to Yanchep), orienteering, picnic areas, camping, adventure recreation (e.g. eco-adventure park for children), dog exercise area, horse riding, shooting range, aero modelling and motorised sports.

There were suggestions to create something similar to Whiteman Park and have an environmental education centre similar to Herdsman Lake. Most respondents indicated a preference towards passive/low impact recreation over active/high impact recreation. Respondents felt that active recreational activities would need to be appropriately managed e.g. restricted trail bike/motor sports areas with dieback management and education.

Conservation/Bushland reserves for biodiversity protection were also a popular land use for respondents (12 respondents).

Other land uses and activities suggested by respondents included;

- Wildflower and seed production
- Horticulture and organic farming
- Sustainable forestry
- Sand mining
- Water supply protection
- Set urban growth limits
- Multiple managed use so as not to impact on water quality and biodiversity, or other human uses
- Should have Regional or National Park status controlled by DEC
- Industrial work opportunities
- Airfield

3.4 WETLANDS

Question: Should any wetlands, even those with relatively low social and ecological values, be allowed to dry and adapt to the drying climate and declining water levels? Please provide reasons. (Burswood, Floreat and Yanchep workshops)

Most respondents were supportive in principle of allowing wetlands to dry and adapt due to naturally occurring seasonal cycles. However, many respondents indicated that they were not supportive of wetlands drying due to unnatural/human influences such as over abstraction and climate change.

Majority of respondents were in favour of allowing natural drying cycles but also wanted to conserve and protect wetlands with high biodiversity and social values.

Many respondents indicated that allowing wetlands to dry would cause water quality problems, such as acidification and heavy metal contamination, due to Acid Sulphate Soils.

Respondents concerns and additional comments are listed below;

- Introduce recycled water in wetlands and harvest stormwater run-off
- Use advice from specialists and modelling information to choose wetlands that should receive water level maintenance
- If preservation of the lowest value wetlands is to the detriment of drinking water provision then it should not be supported
- Should not maintain levels artificially. Should enforce groundwater conservation measures, such as restricting bores in the local area around wetland
- Consider relocation of species from wetlands allowed to dry out

Question: Do you support using treated wastewater to raise groundwater levels so as to retain high value wetlands? (Burswood, Floreat and Yanchep workshops)

Respondents were generally supportive of using treated wastewater to raise groundwater levels so as to retain high value wetlands. However most respondents indicated that prior to implementing such a strategy more research is required to understand aquifer processes, quality of treated wastewater and effect it will have on wetland biology. Most respondents indicated that treated wastewater should not be pumped directly into wetlands but should be injected into the superficial aquifer close to the wetland to allow filtration through the soil. Many respondents questioned what constitutes a 'high value' wetland and how they would be identified.

Respondents concerns and additional comments are listed below;

- Concerned about health issues of using treated wastewater
- Need to advise interested community of long term effects and discuss what level of treatment is appropriate
- Concerns regarding heavy metal accumulation
- Support wetlands by increasing recharge in urban areas
- Need to prioritise wetlands as too expensive/not feasible for all
- Urban wetlands should be supplemented with treated wastewater, but not stormwater runoff (which is not treated) due to accumulation of pollutants
- This option should be used to re-establish natural levels, not to fill wetlands during summer for aesthetic views

3.5 BANKSIA BURNING

Question: It has been proposed to conduct more frequent controlled burns in Banksia woodland to increase groundwater recharge and manage biodiversity values. What do you think are the positive and/or negative impacts of this proposed action? (Burswood, Ellen Brook and Floreat workshops)

Analysis of responses showed that although respondents acknowledged that controlled burning may increase groundwater recharge, most respondents believed that this option would have more negative than positive impacts. A summary of these responses is included in Table 6.

Loss of biodiversity (*10 respondents*), smoke causing airborne pollution and respiratory problems (*6 respondents*), increased water use by vigorous regrowth (*5 respondents*) and weed encroachment/invasion (*4 respondents*) were the main negative impacts identified.

Respondents did acknowledge the positive impacts of this option, including increased recharge (*7 respondents*) and less wildfires (*2 respondents*). However, most respondents cautioned that more research is required to understand how often these burns would be required and to understand the impacts on flora and fauna communities.

Some general comments in regards to this issue included;

- Controlled burns should be used to maximise biodiversity values, not for water recharge
- Consider the use of fungi to breakdown leaf litter and build up soil as an alternative to burning
- Preference to use water more efficiently before having to do controlled burning

Table 6. Summary of respondents perceived positive and negative impacts to Banksia burning as a management option to increase recharge

Positive Impacts	No. booklets that identified this impact	Negative Impacts	No. booklets that identified this impact
More recharge	7	Loss of biodiversity - Inappropriate fire regimes have a huge adverse impact on biodiversity in particular fauna and habitat	10
Less wildfires	2	Smoke – airborne pollution and respiratory problems	6
More like native management	1	May cause higher draw on water during active regrowth phase. Old growth Banksia may use less water than vigorous younger systems	5
Relief for fire-fighters	1	Weed encroachment/invasion	4
Seeders that need heat, smoke to regenerate	1	Changes vegetation type (favours resprouters over seeders)	2
		Takes 12 years for bird life to return	2
		Burning causes less rain – Trees attract rain, more burning, less vegetation, less rain. More burning, more ash in atmosphere, lower ground temp, less evaporation, less rain	1
		Damages soil crust which maintains soil biota to sustain natural revegetation	1
		Increase fire risk from opportunistic species which are often highly flammable e.g. veldt grass, Watsonia etc.	1
		Takes a long time to seed	1
		Dieback problems	1
		Conservation Council are against burns	1
		Impact on decomposition/nutrient cycles	1

3.6 WATER USE EFFICIENCY

(Burswood and Floreat workshops)

Respondents were asked if ‘we’ (as a community) were doing enough to efficiently use and reuse water. Although this question was only asked at these two forums, some respondents from other forums felt strongly about the issue and included comments on water use efficiency in their response to other questions.

Most respondents felt that the community, Government, industry and public utilities were not doing enough to efficiently use and reuse water supplies and that we rely too heavily on ‘traditional’ sources (i.e. groundwater and surface water). Table 4 lists the sectors and the overall response to whether that sector was doing enough to efficiently use and reuse water. Respondents also chose to provide suggestions to improve water use efficiency in each sector, which are listed in Table 4.

Table 4. Perceived efficiency of major water use sectors and suggestions to improve efficiencies

Sector	Are we doing enough?	Comments and suggestions
Household scheme water	No (all respondents)	<ul style="list-style-type: none"> • Promote grey water reuse • Decrease volume coming out of tap • Incentives and government rebates • Re-evaluate water pricing • Allow households to have enough water to grow own fruit/veg gardens • Behaviour change programs • Water efficient design for new developments and housing • Retrofit existing households • Need volume restrictions for sprinklers, as well as day restrictions • Work out average consumption per person per day • Pumping credit for recharge volume from roof and pavers per household • Read water meters more frequently and report back to users • Recycled water is virtually non-existent in the urban area, compare with the country which has 60 recycling schemes
Domestic bore water	No (all respondents)	<ul style="list-style-type: none"> • Too many domestic bores, no control on use • Should be regulated and charges should be levied • Private bores were encouraged in the past • New legislation will restrict bores
Public open space	Mixed views	<ul style="list-style-type: none"> • Need water efficiency plans by 2009 • Council and public use should demonstrate best practice methods of water conservation • Need to reduce amount of lawn in public open space
Horticulture	Mixed views	<ul style="list-style-type: none"> • Visually the horticulture industry appears to be inefficient, but some are making the technical shift to be efficient e.g. Water wise on the farm • Move to efficient use is slow • Over pumping/irrigating (especially overhead irrigation) • Protect prime agricultural land but make them more water efficient • Promote hydroponics

Sector	Are we doing enough?	Comments and suggestions
Industry	No (all respondents)	<ul style="list-style-type: none"> • Industries should be required to prepare water budgets for their operations • Profit issues – it is often cheaper to use new water, rather than recycle and reuse water • Should regulate by charging differential rates for various volumes of use • Control chemicals and toxins • Shared cost between State, federal and local govt. to treat water and reticulate public space • Pilot projects to work out affordable water use efficiency options • Health issue re grey water/ health department too strict

Question: There is a perception among some sectors of the community that local government may not be adopting water efficient technologies quickly enough. What are the barriers preventing local government from adopting water efficient technologies? What technologies would you adopt to supplement government effort? (Floreat workshop only)

Respondents identified the following barriers preventing local government from adopting water efficient technologies;

- Cost - Government budget constraints. There has been a significant investment in current systems and it would be difficult to justify to ratepayers the cost of changing irrigation infrastructure
- Rate payers – limited data to determine if they are willing to pay for efficiency. There is a general lack of awareness and understanding of the need to improve efficiencies. There is public perception to landscaping that gardens need to be green and lakes require water
- Regulation - equity issues about regulation as private bores are not metered. Regulation verses cooperation argument
- Incentives – recommended to encourage efficiency. The current price of water (free) is no incentive to change
- Public health concerns - Health Department’s concerns are viewed as a barrier for reuse / recycling
- Capacity – of Council staff and Councillors. There is a need for change management
- Governance - inadequate leadership from State government, although water conservation plans are starting to address this

A couple of respondents indicated that they would adopt the use of water wise plants, grey water recycling/reuse, best practice irrigation technologies and practices, community education programs and rainwater tanks to supplement government effort. The majority of respondents did not address this part of the question.

Question: Where technologies have been adopted, has this information been communicated to the community? (Floreat workshop only)

Participant's responses to this question were varied, most likely due to which local government areas individuals had been involved. A few respondents commented that Council's ability to communicate their water efficient practices varied across local governments.

Some respondents commented that Councils communicated quite well and gave specific examples including Cottesloe and new areas in the Northern suburbs (i.e. Butler and Brighton). Subiaco and City of Swan were also listed as adopting and communicating water efficient technologies to their communities.

Others suggested that Local Government's do not communicate information well to residents and there is a need for them to lead by example and publicise all water conservation initiatives.

3.7 WATER PRICING

Question: Would you be willing to pay more for your water bill if it meant reducing the amount of water taken for drinking water supply from Gngangara? (Burswood workshop only)

All but two responses indicated there would be a willingness to pay more for water if it meant reducing the amount taken for drinking water supply from the Gngangara groundwater system. Participant's additional comments and suggestions are listed below.

- Pricing will influence behaviour
- There may be better ways of achieving a reduction – by rewarding those who use less water by a rate reduction.
- We should be moving towards alternative sources to supplement existing supply
- Need to encourage conservation and reuse
- Would pay more if the water was used efficiently
- As long as the water remains in the system and is not allocated to other users

Question: Is the price paid for scheme (household) water too little, about right or too much? (Burswood and Floreat workshops)

Respondents all agreed that the price paid for scheme (household) water is too little and that it is not priced according to its value, especially in such a dry country. Respondents offered suggestions to modify the price of water, suggesting that it should be increased each year for a number of years or that pricing authorities should change the basic charge rate for water and rebate households when they do not use their set allocation.

One respondent suggested pricing should be used as a tool to engender behaviour change and suggested that the escalation in petrol prices has resulted in reduced vehicle usage.

3.8 PINE PLANTATIONS

Question: Thinking about the pine plantations, what are some of the things you like about them and would like to retain? What things do you dislike about the pines? (Ellen Brook and Yanchep workshops)

Several respondents indicated that they liked the forestry/timber industry and recreational values of the pine plantations. The pine plantations were considered by some to be important for local timber production which provides local employment and timber resources.

Respondents used the pine plantation areas for recreational activities such as dog walking, orienteering, trail bikes/off road vehicles, horses, shooting ranges and aero modelling.

A few respondents commented that they did not like anything about the pines.

Common dislikes about the pines included their high water use and low biodiversity values.

Table 5 provides a summary of likes and dislikes of the pine plantations and the number of respondents that identified them.

Table 5. Respondents likes and dislikes to pine plantations on the Gngangara groundwater system

Likes	No. booklets that identified this like	Dislikes	No. booklets that identified this dislike
Forestry – local timber production, local employment, not harvesting native timber, don't have to import timber, lower energy footprint than steel	8	High water use	3
Recreation – dog walking, orienteering, trail bikes/off road vehicles, horses, shooting ranges, aero modelling	6	Low biodiversity	2
Birds - food source for Carnaby's Cockatoo	4	Stops regrowth of native species	2
Landscape, visual amenity	3	Low landscape amenity	2
Saved the area for future land use	3	Motor sports	1
Wind buffer	1	Carbon footprint	1
Shady	1		
Heritage values	1		

Question: Where the pines are removed, what sorts of land uses or landscapes do you feel would be suitable replacements and would contribute to improved long-term groundwater management? (Ellen Brook and Yanchep workshops)

The majority of respondents felt that rehabilitation and revegetation with local endemic species and the creation of ecological corridors and linkages would be the most suitable replacement for the pines (*20 respondents*).

Several respondents indicated that recreation areas in the form of parks and public open space would be a suitable land use where the pines are removed (*7 respondents*). Urban development was also listed by several respondents, with two respondents suggesting that it is better to develop on ex-pine plantation than clear natural bushland areas. Another stated that urban areas should be designed around conservation areas and corridors so there is minimum fragmentation (*7 respondents*).

Other suggestions by respondents included grazed grasslands for goats and horses (*4 respondents*), alternative commercial tree species (*4 respondents*) and a mixed use between bush, urban, tourism and recreation (*6 respondents*).

Some additional comments and suggestions provided by individual respondents are listed below;

- Wildflowers
- Wetlands
- Alternative land for people buying good swan valley land for horses – but would need to be well managed on sand
- Keep some pines along Gngangara Rd for aesthetics
- Low density forest e.g. Banksia woodland – hard to put Banksia back due to herbicide use
- Large trees to replace shade, evidence of them existing historically
- Revegetation with native species that will allow multiuse of areas and sustainable practices for harvesting of timber
- Landscaped parks with local native species
- People didn't buy at Ellen Brook because of pines
- Grazed grassland provides maximum recharge
- Ensure there is a staged removal plan to reduce the eyesore when pines are removed (i.e. Current eyesore in Wanneroo)

Question: Would you support replanting some areas with other commercial species for the local timber industry? What species and landscapes (e.g. plantations, woodlands, open belts etc.) would be best suited if this was an option? (Ellen Brook and Yanchep workshops)

All respondents (except two) stated that they would support replanting some areas with other commercial species for the local timber industry. Participant's suggestions and comments are listed below.

- Marri
- Jarrah
- She oak
- Dieback resistant species
- Local WA species only, for local fauna.
- Fibre crops e.g. hemp
- Sandalwood, quandong, eucalyptus, melaleucas (oil)
- Tree mixtures or mini plantations of different varieties rather than a monoculture
- Landscape change should be linked to local employment options
- As long as total clear felling is not used and ecological linkages are retained

3.9 HORTICULTURE

Question: How important is it to you that the horticulture industry is retained in the northern suburbs? (Burswood workshop only)

The respondents felt that it was important that the horticulture industry is retained in the northern suburbs (*13 respondents*). Four respondents indicated that the horticulture industry was not important or should be moved further north.

Respondents concerns and additional comments are listed below;

- Reduce food miles – need to consider transport emissions and cost
- Water use efficiency
- Local produce is more desirable than exported goods
- Horticulture pressured by urban sprawl and complaints. Most will sell
Inevitable that horticulture will move to outer edge of city
- What are the social costs of alternative options
- No large scale industrial
- Need to minimise impact by pesticides/groundwater pollution
- Encourage growing your own at home
- Protect areas like the Swan Valley for the production of local food
- Good for our children to know where our food comes from and how it is grown

Question: What sort of horticulture crops would you like to see being grown in the northern suburbs and why? (Burswood workshop only)

The types of horticulture crops respondents would like to see being grown in the northern suburbs include;

- Fruit and vegetables - grown and eaten in season. For example - lettuce/salad leafs, leafy greens, strawberries, tomatoes, root vegetables, peas, fruit trees
- Those suitable to the area and conditions (e.g. soil type, climate)
- Those that can be sustained with minimal/sustainable water and chemical usage
- Crops that are normally imported so as to minimise energy dependence and be self sufficient
- Flowers
- Shallow-rooted crops in preference to high water using deep-rooted crops.
- Organically produced crops

Question: Groundwater in the Swan Groundwater Area (including the Swan Valley) is heavily used, which limits the expansion of some industries. What could be done to improve water availability and water use efficiency in this area? (Ellen Brook workshop only)

Respondents suggested the following to improve water availability in the Swan Groundwater Area;

- Promote the use of rainwater tanks
- Develop systems that reuse and recycle stormwater, brackish water and wastewater
- Increase groundwater recharge i.e. through collective sumps
- Increase use of deeper aquifers
- Import water from other regions
- Desalination
- Accelerate pine removal

Respondents suggested the following to improve water use efficiency in the Swan Groundwater Area;

- Support and promote irrigation best practice – micro and drip irrigation, soil moisture monitoring/management
- Provide incentives to landowners for improving water efficiency
- Continue the Water Wise on the Farm program and other training programs
- Regulation
- Appropriately price water

Respondents concerns and additional comments are listed below;

- Concerns regarding treated wastewater for horticulture/viticulture – due to concentrated nutrients, heavy metals and other contaminants
- Expansion of industry should not be supported as there is no capacity
- Table grape industry is struggling to break even. May need support to improve efficiency
- Water Wise on the farm no longer funded. It gave dollar for dollar for efficiency gains in infrastructure.

Question: How important is it to you that the horticulture industry is retained in the Swan Valley and surrounding areas? (Ellen Brook workshop only)

Almost all respondents at the Ellen Brook workshop agreed that the horticulture industry in the Swan Valley be retained for the reasons listed below.

- Tourism
- Cultural values
- Suitability of soils in the Swan Valley
- Reduce food miles
- Provides local employment
- Swan Valley Planning Act (land use restrictions)

Only two respondents indicated that horticulture in the Swan Valley was not as important to them. One participant indicated that biodiversity was more important and the other stated that they grow their own fruit and vegetables, but understood that other people relied on horticulture for food supply, tourism, employment and local economy.

3.10 URBANISATION

Question: What are your thoughts regarding urbanisation and how it will affect you? (Yanchep workshop only)

The two questions regarding urbanisation were asked only at the Yanchep forum. One table did not respond to this question, therefore there were limited responses obtained. Those who commented acknowledged the need for urbanisation but felt that there was a need to increase housing density. There were suggestions to develop satellite nodes to limit the urban footprint and shift towards more sustainable living. Some respondents commented on the need for Australians to live within our means and our available resources and especially water supplies.

Question: Do you believe urbanisation could provide a solution to falling groundwater levels? (Yanchep workshop only)

Those who commented on this question acknowledged that urbanisation will increase recharge but most were concerned about the quality of this recharge water and its impacts on biodiversity values. It was seen by those who commented as a less preferred option and it was suggested there are other more suitable alternatives that could be explored and utilised in preference.

3.11 ADDITIONAL COMMENTS

Question: Do you have any additional thoughts or comments you would like to share that could contribute to improved management of the Gnamangara groundwater system? (Ellen Brook, Floreat and Yanchep workshops)

Most respondents chose not to respond to this question, which was the last question in all booklets (with the exception of Burswood). Some responses reiterated those made to other questions, mostly in regards to water pricing, reiterating that they felt it was an undervalued resource.

A few other comments indicated their desire for an effective and strategic governance model beyond completion of the Gnamangara Sustainability Strategy and for a greater geographical area than Gnamangara.

There were a number of respondents suggesting that the Ord river pipeline down the coast needs to be reconsidered. Many of these respondents were also calling for greater water use efficiency and sustainable triple bottom line.

One table booklet highlighted the need for carbon emissions to be a key consideration when determining suitable options.

4. INTERPRETATION OF WORKSHOP RESULTS

This section provides a brief interpretation and summary of the workshop results for the key areas considered.

Social values

Natural areas were considered to have important social, environmental and cultural values and were rated highly by respondents. Economic and social values of agricultural and viticultural areas were also highly rated, acknowledging the importance of maintaining a rural lifestyle near the city and the need to reduce 'food miles' for fresh produce.

There was a strong belief that it is important to retain natural areas for future generations as they provide opportunities for physical activity close to high density living and educational opportunities for future generations. There was strong support for these natural areas to be offered adequate long term protection from urbanisation and human influences.

Public water supply

Respondents acknowledged the need to continue using the Gnamangara groundwater system for public water supply but many were well informed and eager to utilise alternative water sources to supplement this source. It was acknowledged that more research is required for some technologies and information regarding the advantages and disadvantages of each option should be provided to the community. Respondents seemed to be aware of the energy demands of desalination and cautioned over relying too heavily on this option, which has been brought to light with the recent energy crisis experienced in Western Australia.

Biodiversity (Gnangara Park, wetlands and Banksia burning)

Retention of biodiversity values featured highly among responses to questions, and respondents were well informed of the threats to biodiversity.

Although it was acknowledged that biodiversity assets are threatened in some areas by falling groundwater levels caused by a reliance on the Gnangara groundwater system, it was also appreciated that a certain level of protection from urbanisation is offered by the Gnangara groundwater system.

There was support for the development of an integrated management plan for the proposed Gnangara Park. Respondents felt that the plan needs to address natural area management, in particular bushland fragmentation and ecological corridors.

It was viewed that the proposed park has opportunities to provide a variety of uses including recreation, conservation, horticulture, forestry (mostly alternatives to pines) and water supply protection. Many respondents were keen to see a similar model to Whiteman Park with a focus on conservation.

Respondents acknowledged the natural drying patterns of the shallow wetlands on the Swan Coastal Plain but most were not content to see these wetlands adversely impacted due to human influences, in particular falling groundwater levels, acid sulfate soils and heavy metal contamination.

There was general support for using treated wastewater to retain levels in priority wetlands, through localised superficial aquifer recharge. However, there were concerns regarding the potential environmental and health risks which, it was felt, should be addressed by further research.

Banksia burning was not seen as a preferable option by respondents to increase groundwater recharge. It was felt that the negative impacts outweighed any benefits and that other options, including water use efficiencies, should be utilised in preference.

Water use efficiency

Respondents felt that most sectors of the community were not doing enough to improve water use efficiency and reduce water use, with strong views about wasteful household and industrial use. There were mixed views about the efficiency of horticulturalists and local government, with suggestions that water use from these sectors is quite visual and may contribute to perceptions about wasteful usage.

Value of water

Questions regarding the value of water were directly asked at two forums, but the topic was raised through responses in all forums. There was a strong belief that the price of water is too low and as such, the community do not value its real worth. It was suggested that to change people's behaviours the price of water needs to increase, although there were a variety of suggestions as to how this increase should be introduced and administered.

Pine plantations

Although it was acknowledged that the pines need to be harvested due to the risks posed by European House Borer, many respondents valued the pines, particularly for their employment opportunities and local timber resources. However, some of the same respondents acknowledged the high water use of the pines and their low biodiversity values.

There was strong support to replace the pines with local endemic species, some of which should be retained as conservation areas and others for passive recreation. There was a mixture of other uses suggested including urbanisation, grassland and alternative commercial tree crops (mostly Australian species).

Horticulture

There was strong support to retain the horticulture industry in the North West metropolitan corridor and within the Swan Valley. Respondents saw value in keeping the industry close to Perth to reduce food miles and carbon emissions and to retain employment opportunities. The Swan Valley had additional social and economic values identified including tourism, cultural values and the need to retain the soils in the Valley for horticulture.

Some respondents felt it was inevitable that urbanisation would consume horticultural areas close to Perth, particularly around Wanneroo. The Swan Valley Planning Act was seen as offering protection from urban encroachment in the Swan Valley.

The horticulture industry was seen as trying to adopt water use efficiencies but felt that many were experiencing financial hardship and needed incentives and support from government through the continued funding of programs such as Water Wise on the Farm.

Urbanisation

Urbanisation was seen as a necessity but an area that requires improvement. Most responses focused on zoning densities and sustainable living rather than urban influences on groundwater levels. However, a few respondents acknowledged that urbanisation would increase recharge to groundwater but were aware it would likely be of poor quality. Alternative water supply options were considered to be a preferable approach to increasing groundwater levels.