

Appendix 1

Australian and New Zealand Environment and Conservation Council (ANZECC) 2000 Guidelines for Recreational Waters



Australian and New Zealand Environment and Conservation Council (ANZECC) 2000 Guidelines for Recreational Waters

Indicator	Primary Contact Recreation (PCR)	Secondary Contact Recreation (SCR)
Faecal Coliforms ¹	Median value not exceeding 150 CFU/100mL with 4 out of 5 samples <600 CFU/100mL	Median value not exceeding 1000 CFU/100mL with 4 out of 5 samples <4000 CFU/100mL
Enterococci ¹	Median value not exceeding 35 CFU/100mL (maximum number in any one sample: 60 – 100 CFU/100mL) or geometric mean of <33 CFU/100mL	Median value not exceeding 230 CFU/100mL (maximum number in any one sample: 450 – 700 CFU/100mL)
Algae	<15,000 cells/mL total blue-green algae and biovolume < 2mm ³ /L or biovolume not determined and blue green algae <15,000 cells/mL	<15,000 cells/mL total blue-green algae and biovolume < 2mm ³ /L or biovolume not determined and blue green algae <15,000 cells/mL
pH	5.0 - 9.0	N/A
Temperature	15°C - 35°C	N/A
Turbidity	Upland rivers: <25 NTU Lowland rivers: <50 NTU Freshwater lakes: <20 NTU Estuaries: <10 NTU	N/A
Nuisance organisms	Excessive amounts of nuisance organisms such aquatic weed (<i>Salvinia molesta</i>)	Excessive amounts of nuisance organisms such aquatic weed (<i>Salvinia molesta</i>)

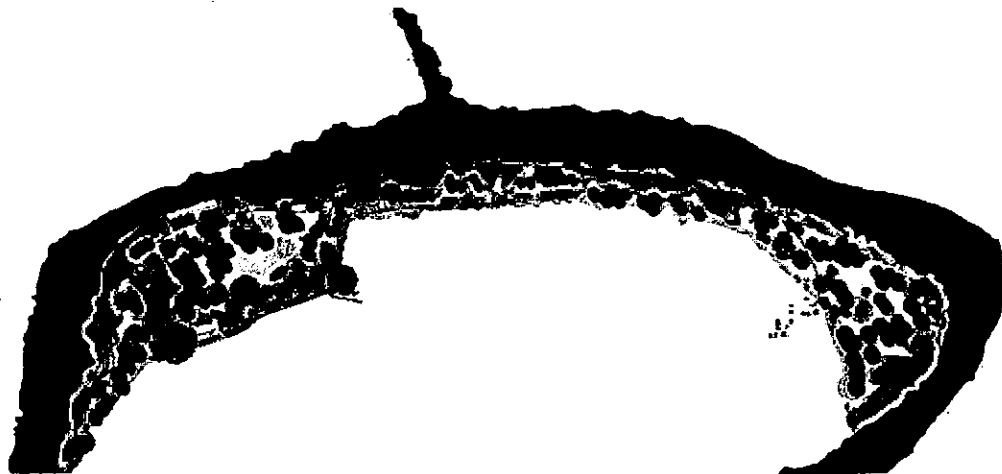
¹ Minimum of 5 samples taken at regular intervals not exceeding one month.

Primary Contact Recreation (PCR) = direct water contact with a high potential for ingestion - including activities such as swimming, diving and water skiing

Secondary Contact Recreation (SCR) = some direct contact but where ingestion is unlikely - including activities such as wading, fishing and boating

Appendix 2

Schweikert Historic Flood Records, Crosslands Area, 1887-1946



BEROWRA CREEK FLOODS.

The following are the heights of the most destructive floods but many more have been just over the banks one to two feet.

It also depends on whether the floods rush down at high or low tide, it also depends on spring or neap tides. If the volume of water comes down stream at low water when it is spring tides, or full moon, then it's only one to three feet over banks, if it is a low neap tide then they are much deeper over the bank, as the spring tide has a very low mean water level, whereas the neap tide has a higher mean low water level.

YEAR	HEIGHT	WEIGHT.
1887	10ft. 6in.	
1889	4ft. 10in.	
1893	14ft. 10in.	
1895	21ft. 2in.	stayed up three weeks.
1899	9ft. 0in.	
1905	7ft. 4in.	
1906	5ft. 9in.	
1910	4ft. 6in.	
1914	11ft. 2in.	
1918	11ft. 0in.	
1921	5ft. 6in.	
1927	11ft. 1in.	receded to banker at mid-day. Rose again 8p.m.
1927	7ft. 10in.	stayed up between 2 & 5ft two days.
1930	8ft. 9in.	
1932	7ft. 10in.	
1936	10ft. 2in.	
1937	8ft. 0in.	
1939	10ft. 6in.	
1942	15ft. 1in.	27th March stayed up nine days
1942	7ft. 8in.	16th May
1942	6ft. 3in.	4th November
1945	9ft. 3in.	18th April
1945	4ft. 10in.	26th May.
1946	7ft. 2in.	

There have been more since the above dates and heights but it is fortunate most have been bankers at low tide. It seems since the valley at Hornsby has been worked differently and there has been some damming of water courses it has made flooding slightly different, but the whole thing depends on the weather.

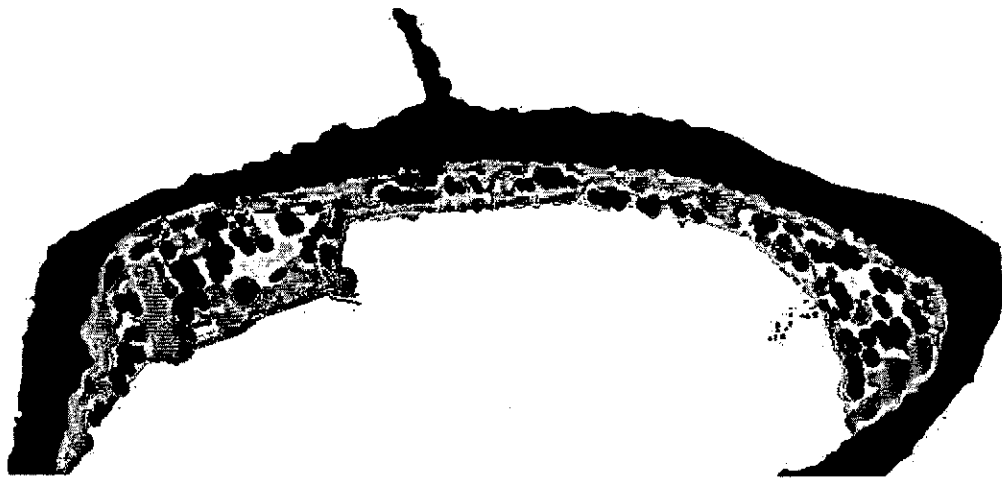
The water is discoloured more frequent since development drainage has been diverted into natural water courses.

These records were taken from diaries, I know it is not for me to say, but any improvements to the area should be kept up on the hill side as floods take everything before it.

Heather M. Schweikert. *

Appendix 3

Focus Group Membership and Meeting Attendance



Focus Group Membership, and Meeting Attendance

Bob Salt (Deputy Chair, NPWS Sydney North Region Advisory Committee) – Attended Meetings 1 and 3

John Hunt (Hornsby Conservation Society) – Attended Meetings 1 and 3

David Booth (Berowra Creek Estuary Management Committee) – Attended Meetings 1 and 2

David Tribe (NPWS Sydney North Region Advisory Committee) – Unable to attend any meetings

Peter Quirke (Benowie District Scouts) – Attended Meetings 1, 2 and 3

John Ashton (Crosslands Convention Centre) – Attended Meetings 2 and 3

Peter Corrigan (Great North Walk Co-Ordinator - Department of Lands, Soil Service Division) – Attended Meeting 1

Ian Robertson (Southbound Adventures, commercial operator) – Unable to attend any meetings (but met out-of-session with a representative of the Consultant Project Team)

Rob deJong (Community Representative) – Attended Meetings 1, 2 and 3

Julie Cowie (Community Representative) – Unable to attend any meetings

Appendix 4

**Focus Group Minutes
Meeting 1
12 April 2005**



Park Masterplan – Crosslands Reserve

FOCUS GROUP – MEETING 1

MINUTES

-
- Venue:** Function Room 3 (ground floor), Hornsby Council Chambers Building,
296 Pacific Highway Hornsby
- Attendance:** Bob Salt (Deputy Chair, NPWS Sydney North Region Advisory Committee)
Peter Corrigan (Great North Walk Co-Ordinator, Department of Lands, Soil
Service Division)
Peter Quirke (Benowie District Scouts)
David Booth – Berowra Creek Estuary Management Committee
John Hunt (Hornsby Conservation Society)
Rob deJong (Community Representative)
- Kurt Henkel (Landscape Coordinator, Parks and Landscape, Hornsby
Shire Council)
Julia Morton (Parks Assets Officer, Hornsby Shire Council)
- Alan Ginns (Gondwana Consulting)
- Apologies:** Julie Cowie (Community Representative)
John Ashton (Crosslands Convention Centre)
Ian Robertson (Southbound Adventures)
David Tribe (NPWS Sydney North Region Advisory Committee)
- Agenda:** See Attachment 1
- Open:** 6.15 pm

Comments/contributions by Focus Group Members identified in bold italics.

- Welcome by Kurt Henkel, introduction of Alan Ginns from Gondwana Consulting.
- Alan Ginns introduces consultant project team – Gondwana Consulting (visitor use planners), Phillips Marler (landscape architects), and supporting specialists.
- *Focus Groups members introductions, backgrounds and interests associations with Crosslands Reserve.*

- Kurt Henkel outlined the background/origin of the CR recreation/masterplanning exercise, existing planning documents and situation of split land ownership and management between HSC and NPWS, but unified management, CR presentation and facilities due for improvement. CR identified as an important "district park" in wider Hornsby Shire context, with works funding identified. Task to start from the big picture and review the whole recreation workings of CR and from that prepare a realistic masterplan for park improvements. Exercise does not necessarily mean major changes in the nature of CR.
- Kurt Henkel distributed "Project Outline and Role of the Focus Group" information sheet (Attachment 2).
- Kurt Henkel outlined broad membership of Focus Group to include user groups, interests groups and general community. Focus Group to provide a forum for working with the community, to identify issues and test management ideas/directions, provide a reality check before going out to exhibition in the wider community. Focus Group discussions are not final decisions and are open for discussion with others who members think may have an interest in the area. Focus Group minutes will go to Steering Committee for consideration and subsequent direction of consultant team in preparing recreation/masterplan for HSC approval for public exhibition. Focus Group is an advisory forum, venue for rigorous debate if required, and conflicting views will be accurately reported to Steering Committee and Council.
- Julia Morton briefly explained differing management objectives/approaches between HSC and NPWS, especially in relation to dogs, and day-to-day management MOU between the two agencies. *Dog signage seen to be inadequate and confusing.*
- Alan Ginns and Kurt Henkel clarified land tenure situation at CR and scope of recreation/masterplan exercise as being limited to the developed/landscaped areas of CR. Crosslands Convention Centre land is not part of the recreation/masterplan exercise. Issue of small strips of foreshore land along each bank of Berowra Creek that appear to be part of creek tenure parcel (riparian corridor), but eastern strip may still be addressed/impacted by recreation/masterplan exercise – Kurt Henkel to clarify with HSC surveys/property section.
- Kurt Henkel briefly described HSC Generic Plan of Management for Council reserves, dates from 1996 but being progressively updated.
- Kurt Henkel explained that the bushland areas of CR were not part of the recreation/masterplan exercise due to far lower levels of recreation use, access and facilities and no intention to develop these natural areas.
- Alan Ginns introduced as discussion facilitator, aim of tonight is to promote discussion and input from Members as to - what they value about CR, how they use or don't use the area at present, who uses CR and for what activities, perceived usage issues, perceived management issues and challenges, and desired future directions. Discussion will be structured along the lines of the "Pre-plan Submission Form" that Members received prior to meeting. This is the introductory scene-setting meeting to understand where people are coming from and why interested in CR - following Focus Group meetings, three possibly four meetings, will provide further opportunities for input, discussion and refinement.
- Alan Ginns provided scene-setting/background comments regarding split tenures, MOU between HSC and NPWS and joint management with day-to-day management by HSC

(cleaning, maintenance, booking system, enforcement). Split tenure means different plans of management apply to parts of CR.

- Alan Ginns gave a brief overview of the Berowra Valley Regional Park Draft Plan of Management, yet to be signed off by DEC Minister. Distributed "Berowra Valley Regional Park - Draft Plan of Management, 2003" information sheet (Attachment 3) and highlighted relevant management guidelines applying to CR. HSC limited visitor satisfaction survey undertaken in 2002, although very small, indicated high levels of visitor satisfaction.
- *Some concern about existing fire pits, and possibility of upgrading/additional pits, with a perceived high fire risk bushland site.*
- Alan Ginns gave a brief overview of the Hornsby Shire Council Parks and Reserve's Generic Plan of Management, covering all parks and reserves in the Shire, 1996 document being progressively replaced by district-based plans. Distributed "Hornsby Shire Council Parks and Reserve's Generic Plan of Management, 1996" information sheet (Attachment 4). Provides general guidelines/directions to the management of CR. Outcomes of this recreation/masterplan exercise for CR can be reflected in relevant district Plan of Management when prepared.
- Alan Ginns gave a brief overview of the Berowra Creek Estuary Management Plan which extends well beyond CR - but still has some specific management references for the site and especially recreation use, access and developments/facilities. Distributed "Berowra Creek Estuary Management Study and Management Plan, 2002" information sheet (Attachment 5).
- Discussion of how constrained this recreation/masterplan exercise should be by existing plans.
- Alan Ginns introduced importance of addressing CR in a regional context. Distributed "Regional Context" information sheet (Attachment 6). CR is distinctive among the four regional level parks identified by HSC (Fagan Park, Lillian Fraser Gardens and Lisgar Gardens) due to its sense of remoteness, natural setting/context and limited levels of development. In terms of setting and experience is perhaps most comparable, at a regional scale, with Bobbin Head in Ku-ring-gai Chase National Park but not as "busy" and CR offers camping whereas Bobbin Head is day-use only.
- Discussion of where CR visitors come from, according to HSC booking records, but only a limited/skewed sample.
- Discussion of biodiversity values of CR. *Landscaped areas seen as modified and of limited biodiversity value, but of some interest/significance due to presence of tree species flushed down creek from upland vegetation communities. Landscaped areas were probably originally a marshy river flat. Some loss of individual mangroves observed along foreshore by Berowra Creek Estuary Management Study, mangroves seen as sensitive/important vegetation zone.*
- Alan Ginns briefly discussed relevant findings of the HSC "Strategic Leisure Plan 2000" which identified needs, at the whole-of-Shire scale, for safe easy walking tracks and safe cycleways especially aimed at providing for the elderly/aging and disabled communities.
- Kurt Henkel explained that the project budget for the first stage of the recreation/masterplan's implementation was up to \$600,000, based on available Section

94 developer contributions of \$400,00 and further possible funding from other sources including grants.

- Focus Group Members then participated in a hands-on exercise to elaborate their views on CR. A summary of Members' comments/suggestions/input from this exercise is attached as a separate document.
- *Hornsby District Scouts have been using CR since 1963, principally the southern end. Easter is major event/use time, with camps of up to 250-300 Scouts, but numbers have declined in recent times. This Easter camp was 100+ Scouts. Headquarters set up Thursday evening, Scouts arrive Good Friday morning, and all pulled out by Easter Sunday evening. Purpose is mainly to teach hygiene and bush camping skills, good novice/beginners camping place, incorporates fun activities. A lot of use made of river in the past, including swimming, but this has declined due to water quality concerns and upstream STP. Camp Windeyere (?), on opposite bank of Berowra Creek (outside CR), used by another Scout district. The CR camp is part of the Scouting tradition in Hornsby District, possibly even pre 1960s, even used to hike down in past or ride bikes part-way down bushtracks when road access was poor or row up-river in boats for larger camps. Other uses are - "Yellowcord" camps overnight up to 25 Scouts, canoe courses over a weekend but no camping, and Patrol Leaders course one night over a weekend. All prefer to use the southern end. Venturers and "Greencord" hikers on GNW, including a lot of out-of-District use from elsewhere in Sydney, with overnight backpack camp at CR. Locked top-gate has been great assistance to camp security and safety of campers (both Scouts and general public). Very strict on vehicle access to grassed areas maximum of 5 at any one time, and one permanently accessible for first-aid/safety. Others park in parking lot, mainly southern end and bank closest to southern camp, recent Easter site photos show the southern carpark as unusually busy/crowded due to Scout camp and fine weather. Camp Windeyere users still access site via CR. CR is a good place for canoe training because power boats mostly "can't get past the flat" which is continuing to silt-up, and no problems to-date with jet skis. Council fee increases, to \$4 per head per night, may also account for reduced numbers this year. CR appeals because of ease of setting up campsite, flat open country (usually don't camp under trees) good for heavy-weight camp which helps build social skills, large open grass area in south used for camp-sports days which are very popular with parent participation, allowed to have a campfire (bring their own timber and closely supervised), traditional site with inter-generational use, strong canoeing activity base and history. Adjoining bush not actively used. Very few problems/conflicts with other users groups, occasional bushwalkers camping next to Scout campfires but usually move later.*
- *North end of picnic areas is generally seen as the more attractive/appealing site for most users.*
- *People tend "to work it out" (re their use of the reserve/lawns) and distance themselves from or give space to larger groups such as Scouts. "It will logically sort itself out".*
- *Need orientation information for walkers arriving on GNW so they don't stop beside first toilet block/site encountered. Dusk GNW arrival tends to camp in first sites encountered.*
- *Southern end near toilet block is "terrible for sandflies", avoided by Scouts and people-in-the-know.*

- *Informal campsites or resting places - with limited facilities - plentiful on the GNW, including each side of CR.*
- *Berowra Valley Regional Park Draft Plan of Management proposes 3 major campsites in the Park – CR, Tunks Ridge, Stringybark Ridge – with minor site on ridge between Berowra Valley and Muogamarra.*
- *Need orientation signposting at entrance to carpark/developed area to inform direct users, may also need information at top entry.*
- *Some locals “stumble across” CR and don’t know much about it. Appealing as it has no major development, is surrounded by bushland, a peaceful spot during the week and still reasonably quiet on most weekends with quiet spots that can still be found, it’s easy to get away from groups or be amongst groups as well as see people enjoying nature, generally has a “nice appeal” and is used by people who care about it.*
- *Place is comfortable even during busy times.*
- *Not promoted in local papers, seems to be known mainly by word of mouth, so users tend to be more appreciative.*
- *CR is “rare” as an undeveloped park in close proximity to an urban area.*
- *Julia Morton advised that the management of CR costs HSC money, the area is not a profit-making proposition, but is seen more as a major open space asset for the Shire.*
- *One of the few, perhaps the only, vehicle accessible bushland camping destinations in northern Sydney. One of only two vehicle access points on Berowra Creek, the only one in the upper catchment.*
- *Informality and relaxed nature of CR, and lack of a heavy-handed management presence, seen as valuable part of appeal. But close management needed if/when major events get out-of-hand – such as “Trail Walker”.*
- *Site security and night gate closure an important part of the site’s appeal, especially for families and first-timers.*
- *CR had a history of “hoon” activity, burnouts and car dumping/burning – a lot of the low-lying area in the north-east corner of the site is a legacy of earlier “wheelies” and bogging stolen cars. Very rarely have vehicle use/abuse problems during the day.*
- *Surrounding bush seen more a backdrop, “stage” or setting for recreation use of the developed areas – “part of the scene”. People more exposed to bushland due to elongated nature of the site, bush one side and mangroves the other, seen as providing attractive setting as well as allowing to “hide” more visitors (as opposed to other reserve shapes). Interest in bushland was greater when trees were named and regeneration/plantings taking place, also of interest for many GNW users.*
- *Unsealed road deters the “uncommitted” visitor and helps keep cars with boat trailers in limited numbers. Seen as an important part of CR’s character and experience, and good management tool.*
- *CR access is one of the few unsealed roads left close to Sydney.*

- *Shallow safe tidal waterway, one of the few places offering this in a natural setting in northern Sydney, and so very appealing to families. Access to shallow relatively safe water, a good place to take kids for water activity until water quality declined. Can walk across the creek at most tides.*
- *Julia Morton advised CR used as an access point for groups being boated across the creek to the Crossland Convention Centre, mainly during the week. Can have up to four busses at any one time serving the Centre.*
- *Bus and vehicle conflict on access road an occasional concern, but limited due to weekday bias.*
- *University and TAFE use CR for teaching and research activities, both group and individual. Attracted by accessibility for getting groups and equipment onto site, and no charge for day use.*
- *Surprising amount of wildlife still in/around the picnic areas – especially at the northern end.*
- *Limited perceived use by ethnic groups/migrants – deterred by unsealed road and perception of “dangerous” bush.*
- *Mix of day use and camping has worked historically, everyone has been “getting on”.*
- *CR is an important vehicular access point for work/maintenance crews on the GNW, a great central point on the GNW. Need vehicle access right to trackheads. Also access point for search and rescue and other emergencies. CR is on GNW map and is actively promoted to GNW users, especially as an overnight stop for a weekend/two-day trip on the GNW. Walkers use GNW in both directions. Option of preparing a separate Benowie Section map of GNW, with CR highlighted. Marketing targeted to walkers. “Couldn’t recommend this place quick enough”. People vehicle camping at CR can head off in both directions along GNW to experience the bush and “have a bit of a walk”. Use boat ramp for GNW flat-bottom punt (5m long and 2.5m wide and carries over 1 cubic metre), very important for access and track maintenance/upgrade works. Only use the existing ramp 3-4 times per year, OK as is but muddy and boggy.*
- *CR a great place for first-time campers, inexperienced and young families. Water, toilets and all the facilities needed to make it an easy experience, and in a bush setting with enough to do and experience.*
- *Scout and school use has been a means of promoting CR in the past, return use after an organised/group visit.*
- *A lot of use by keen fishermen in the past, now only the more dedicated users or long term/traditional users tend to use the area. Fish all along the bank and from mangroves/bush at each foreshore end. Also social, fun and family fishing associated with some picnic users.*
- *“Tinnie” launching from boat ramp by dedicated long-term users, fishermen, who have “been doing it for donkey’s years”.*

- *Perception that the northern loop was put in “for kids to ride bikes”. Danger to bike riders, especially children, from vehicles backing-out in carpark despite the area being a low-speed environment due to aggressive speed bumps.*
- *Carpark “needs to be improved a lot”, the great width down the centre could be used for more parking or something else. Cars pushing in under trees along carpark margins in search of shade, soil compaction, low-mowing around trees cutting surface roots, and Round-Up use in hard to mow areas all contributing to tree health decline.*
- *Plant shade trees that aren’t as tall and prone to dropping limbs as large Eucalypts are.*
- *Historic and Aboriginal connections of CR poorly recognised at present, something should be done to improve this, especially Mr Crossland’s role in early Hornsby history.*
- *School use is significant, as well as some use by sporting and social clubs. School groups more likely to “get into problems” in the bush due to group sizes, “active” kids, and inexperienced teachers.*
- *Flood markers on rear steps at Scout Hall at Camp Windeyere. The “big flood” in 1988 swept across the entire southern lawn area, all flooded up to 8-9 feet, and took away the temporary toilets that HSC provided at the base of the access road for the scheduled Scout Camp.*
- *Wrap-up by Alan Ginns and outline of items for next focus Group meeting – discussion of constraints and opportunities, management issues, the site’s desired role and character, and future management directions. Next meeting, 6.00pm 3 rd May 2005.*
- *Alan Ginns happy to receive comments and discuss ideas/issues/input out-of-session by whatever means of communications convenient.*

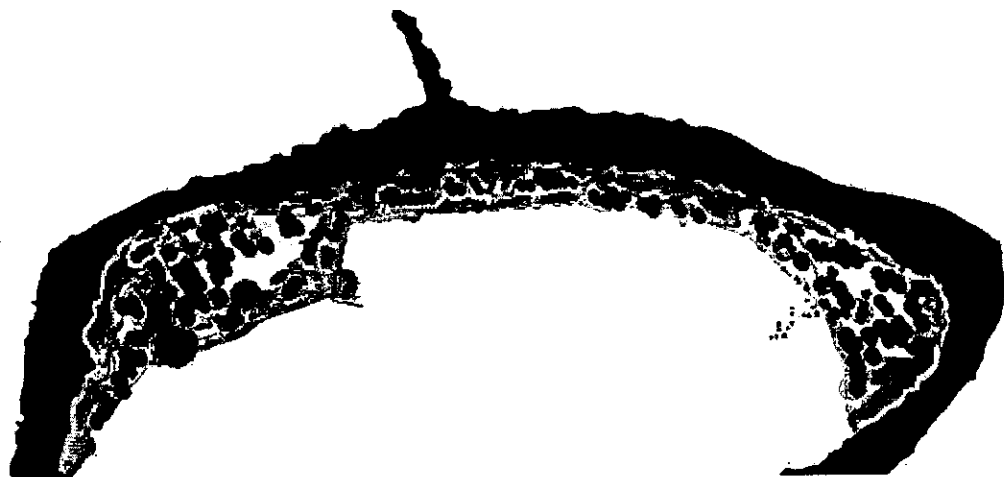
Close: 8.40 pm

Appendix 5

Focus Group Meeting 1

12 April 2005

“Exercise” Comments and Input



Park Masterplan – Crosslands Reserve

FOCUS GROUP – MEETING 1

“EXERCISE” COMMENTS & INPUTS

Participants: Bob Salt (Deputy Chair, NPWS Sydney North Region Advisory Committee)
Peter Corrigan (Great North Walk Co-Ordinator, Department of Lands, Soil Service Division)
Peter Quirke (Benowie District Scouts)
David Booth – Berowra Creek Estuary Management Committee
John Hunt (Hornsby Conservation Society)
Rob deJong (Community Representative)

Responses/comments/contributions of Focus Group Members to selected values, uses, management issues and future directions areas.

All responses/comments/contributions recorded verbatim. (*Text*) inserted for explanation/clarification.

1. Access Road

Part of the experience (*as an unsealed road*), keeps away the uncommitted, discourages boats on trailers.

Is run-off an issue ?

Would sealing the road increase visitors ? And if not will it impact bushland and run-off ?

Needs realignment and better maintenance, but does traffic volume justify sealing ?

2. Unsealed Access Road and Carpark Capacity Acting to Limit Visitor Numbers

No, but discourage boats with trailers.

Not sure.

No, but produce other problems.

3. Car Park

The carpark is usually full on Sunday only.

Keep it concentrated and well managed.

Reduce roadway areas, increase parking bays.

Agreed (*usually empty and a waste of recreation space*), needs redesign.

Keep parking central.

Keep car access limited, easier to manage/maintain, safer.

Agree (*excess capacity, unattractive, and remote from ends of park*), but needs a better design, cars under trees are a major compaction.

(Bottom of access road and entry to carpark can get congested and potentially dangerous, needs to be more safely and efficiently designed)

Agree

Agree, but how ?

No standing signs.

More no standing in areas.

Never seen this congestion – but I'm only there during the week.

This only happens during Easter when Scouts use area and on Sunday when visitors use area.

(Vehicle and pedestrian-cyclists conflict and hazards in carpark on busy days)

Cyclepath needed next to carpark, separated by poles.

Not (*a problem*) if speed is kept down.

Carpark area has a large surface area – could be divided into sections and provide cycle access around park.

Yes, this is a concern.

Yes.

4. Standard and Character of Park/Picnic Facilities and Capacity/Types/Levels of Visitor Use

About right as is.

Keep as is – nice and simple.

As is.

Don't know.

No more development:

Keep its current status, avoid promotions.

Needs improvement, not promotion. Fees may be necessary in future.

No fees.

No fees. Picnic - yes, Camping - yes. Motor boat access – no.

(Better and more sustainable toilets)

Environmentally friendly loos.

Yes.

Yes, portables (*toilets*) show capacity problems.

We (*Scouts*) supply (*portable toilets*) for Easter camp. Electrical maintenance should be carried out.

(Unsuitably old wood-burning BBQs, gas or electric BBQs as an alternative)

Yes.

Remove (*old damaged BBQs*).

Don't provide any fires (even gas).

(Provision/adequacy of shade)

Plenty of shade areas.

Yes *(there is enough)*.

Overuse produces compaction and loss of herbs and shrubs.

5. Balancing Camping and Day Uses

Maintain both.

Needs much better management, danger from big trees.

Good with both.

Camping needs permit (fee).

A suitable balance needs to be achieved, but who decides what is the balance ?

(Separation of campers and picnickers and more formal/structured site management)

No.

Let them follow the convention of polite interaction.

Keep mixed, by separating can create conflicts - us/them.

6. Management of Camping

(Campers taking over picnic facilities, undesirable)

Yes *(should be controlled)*, picnic facility for short term use.

Yes, this should not be allowed.

Agree, picnic areas should be shared.

(Providing vehicle access for campers closer to campsites)

No, it's part of the experience.

No, it's not a caravan park.

No.

(Camping under/around trees, and tree safety issues)

Most trees have been removed that were dangerous. This can be maintained.

Tall shady trees caused death a couple of years ago. These need to be managed correctly.

Not good to camp around, recent camping death.

Manage trees, camp areas need shade, prevent camping under tall trees with dead limbs.

Zone people out of these areas by not mowing and planting shrubs.

(Campers' portables showers and washing lines)

Only used in 3 or 4 day camps.

Campers should wash, preferably in a properly engineered facility.
Set washing areas, with filter zones.
Should not be allowed, proper facilities needed.
Not seen this, only at peak times ?

7. **Open Campfires/Firepits – Part of the Experience Versus Risks and Management Issues**

Good part of park, where managed well.
The latter (*a fire hazard and management headache*).
Part of the experience.
Camp fires are an important part of Scouting and campfires are controlled by leaders.
Fire hazard when not controlled.

8. **Large Group Use and Special Events/Bookings**

Large camps are a part of a Scout's training and are only held on a few weekends a year.
Periodic, quarterly ?
No (*not fair or acceptable*) needs to be limited.
Limit size of events so as not to exclude public.
Should be weekdays only, maximum 30% of days, one end of park only.

9. **Cycling versus Picnic and Walking**

There is room for both.
Bikes are great, should be allowed.
Not in my experience (*cyclist conflicts/intrusion/hazards*).
The circular track at the north end was supposed to cater for kids, but no conflicts problems observed.

10. **Upgrading of Boat Ramp or Provision of Special Canoe Launching Facilities**

Never and issue for me.
Yes, safer access, but to a level that does not invite jet skis.
Yes, could reduce run-off and bank erosion.
Could be improved, but not a major problem for canoes.

11. **Compatibility of Canoes and Motorised Boats on Berowra Creek**

Yes (*compatible*), but high powered boats a problem.
Motor boats conflict with swimming by children.
Scouts use canoes and boats to cross creek to camp.
Motor boating difficult at low tide - but can Council etc control boating movement ?
GNW maintenance crews use Crosslands to access creek for maintenance purposes.

12. **Swimming**

Yes swim – at own risk.

Have had to remove trees further in where these are being used as “swings” into creek, dangerous”.

Yes (*swimming*), only road accessible place with shallow tidal water.

Risky.

Fix the sewer outlet upstream.

13. Ball Games and “Rowdy” Uses

Plenty of space for both (*ball games and picnicking/quiet relaxing*).

Leave the ball games in (excl grade rugby).

Ball games, organised sport, a problem.

14. Dogs - Permissibility and Management

Dogs are not allowed near cooking or play facilities. There are too many big dogs off leads mid-week.

Dogs are permitted in parts (*of the reserve*).

No strong views.

GNW made a fiscal contribution to this (*southern boardwalk*).

15. Use of Adjoining Bushland

Lots, Scouts, bushwalkers.

Some.

Agree (*lots*), surprising number.

Almost everyone I’ve seen at the park (I’m there on a regular basis) go for “strolls” from both end of the park.

16. Perception of GNW Users, Welcome Facilities or Unwelcome/Developed Intrusion

It is also a strategic entry/exit for walkers.

Provides a break.

Don’t U bet – most bushwalkers are conservation/environment minded. Think this statement (*Crosslands provides facilities for bushwalkers*) is incorrect.

17. Encourage Educational and School Use

Yes.

Yes, but no development.

18. Information Signage, Better Visitor Information and Clearer Park Identity

Maybe (*needs improvement*).

Yes (needs improvement), needs to be resolved by bodies concerned.

Yes, signs need to be consistent throughout.

19. Interpretation Signs and Which Stories to Tell

People could be more informed of historical significance, but this is not why people visit the area.

Provide plenty of these (*interpretation signs*), people use them if they wish.

Needs more info on history.

20. Southern Extensive Lawn/Open Area

More shade trees – but keeping ball and playing areas large enough.

(*Retain it*) The area is used by large camp users.

Maybe (*Could be better used*).

Could be better (*Used*).

(*Exposed unshaded and very open play eEquipment*)

Safer than in trees, near road or water.

Shade cloth ?

21. Northern Picnic Area Layout/Attraction/Use

(*A great picnic spot, attractive and obviously popular. Why change it, it's working fine ?*)

Agree.

Agree, but could be some improvements.

Yeah, why change ? If it's not broke, why fix ?

22. Filling and Leveling of North-east Low-lying Area to improve Appeal/Usability

No, it is a natural area.

No, it's a natural wet area subject to tidal influence as is many other areas in Crosslands.

Yes.

Yes, but will need a lot of maintenance. This is a legacy of car burnouts.

23. Providing Additional Creek Views/Vistas Through Mangroves

No

No

No less creek views, more protected areas along creek.

Definitely not.

No.

24. Management Challenges of Very Peaked Usage – Warm Weekends and Holidays

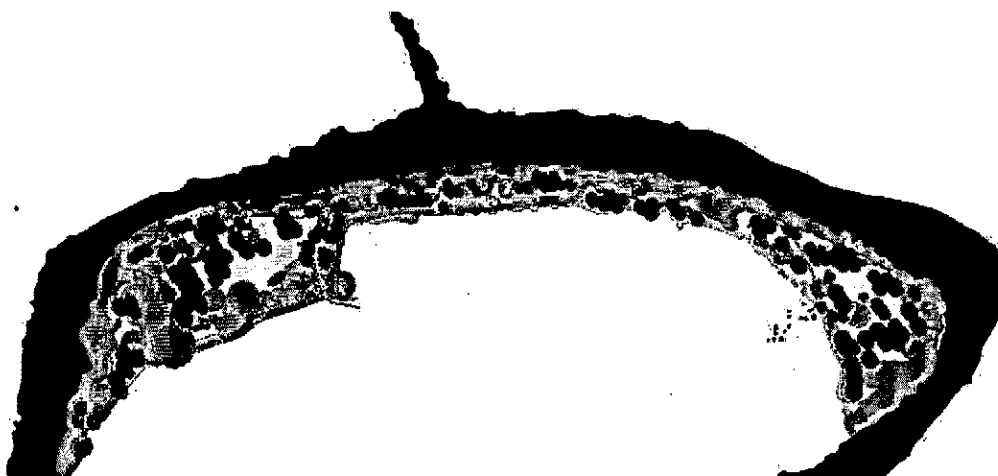
So.

Agree, but busy times are also important socially.

Needs to be dealt with.

Appendix 6

Focus Group Minutes
Meeting 2
3 May 2005



Park Masterplan – Crosslands Reserve

FOCUS GROUP – MEETING 2

Tuesday 3 May 2005

MINUTES

Venue: Council Chambers (first floor), Hornsby Council Chambers Building,
296 Pacific Highway Hornsby

Attendance: Peter Quirke (Benowie District Scouts)
John Ashton (Crosslands Convention Centre)
David Booth (Berowra Creek Estuary Management Committee) (from
6.40 pm)
Rob deJong (Community Representative) (from 6.40 pm)

Kurt Henkel (Landscape Coordinator, Parks and Landscape, Hornsby
Shire Council)

Julia Morton (Parks Assets Officer, Hornsby Shire Council)

Alan Ginns (Gondwana Consulting)

Julie Marler (Phillips Marler)

David Phillips (Phillips Marler)

Apologies: Julie Cowie (Community Representative)
Bob Salt (Deputy Chair, NPWS Sydney North Region Advisory Committee)
Peter Corrigan (Great North Walk Co-Ordinator, Department of Lands, Soil
Service Division)
John Hunt (Hornsby Conservation Society)
Ian Robertson (Southbound Adventures)
David Tribe (NPWS Sydney North Region Advisory Committee)

Agenda: See Attachment 1

Open: 6.15 pm

Comments/contributions by Focus Group Members identified in bold italics.

- Welcome by Kurt Henkel, background to the recreation/masterplan process for new members, introduction of Alan Ginns from Gondwana Consulting and Julie Marler and David Phillips from Phillips Marler. Brief outline of tonight's session. Apologies.
- Alan Ginns briefly summarised last Focus Group Meeting which concentrated on a discussion of the values and uses of CR as well as touching on management issues and

directions. This Meeting more about management issues and future directions, as informed by constraints and opportunities analysis of the site and possible development options. From Meeting 1 the special character/identify of CR was strongly recognised by Members and reinforced by regional context/analysis. CR special as an unsealed access destination, bushland setting, shallow safe waterway, family orientation, harmony of existing uses/users, feeling of user safety, and sense of informality and lack of an overt or heavy-handed management presence or regimentation. However facilities seen as tired and in need of renewal, overly dominant carpark, little on-site interpretation and poor orientation. Overall feeling of Meeting 1 was that the recreation positioning of CR was "about right" as it is – the character and experience offered by CR was to be largely retained, but the site's presentation and level of facilities could be upgraded.

- *Only minor changes required to draft minutes from Meeting 1. Comments to be provided out of session to Alan Ginns.*
- *Water quality at CR perceived to have "improved a lot over the years". Not a lot of obvious effluent floating in the creek, barnacles growing on CCC boat again, only a bit of floating rubbish floating around at times. Upstream STP seems to have improved its operation. After rain in the 80s and 90s the creek was "unswimmable", Scouts changed their water activities entirely in the 90s in response to water quality issues, not often the case now. Alan Ginns advised that water quality monitoring shows the water in Berowra Creek at CR creek to be unsuitable for primary contact, that is swimming, on over two-thirds of days, and unsuitable for secondary contact, boating fishing etc, on one-third of days. Fish are back in the creek at present, even tailor. Fishermen consider that water quality has improved in recent times.*
- *Some of the CCC outdoor education groups camp in CR at times, mainly in the southern area, use the Great North Walk a lot, Southbound Adventures one of the CCC major users use CR frequently. Overall CCC use CR and perceive similar values for the area as most other users. CR provides the only viable large group access to CCC for bus groups.*
- Alan Ginns distributed a summary of the "Management Issues" as identified by Members via the completed pre-planning submission sheets (Attachment 2). Issues grouped by themes – appropriate management of the natural environment, access to the river and protection of bushland, appropriate development, sustainable visitor use, compatible activities, interpretation, facility maintenance, access road, and parking. Management of dogs and fire pits where other issues raised at Meeting 1.
- Alan Ginns briefly discussed road engineer's report on access road, indicating only one recorded accident over the last 8 years (in 1998) but not elaborated.
- *Observations from CCC side of creek area that the carpark is only occasionally full on warm Sundays. Julia Morton advised that Anzac Day was very busy with vehicles starting to park parallel on the roadside at the bottom of the access road and double-stacking in the centre of the carpark, but this was a definite peak usage event. Alan Ginns counted 141 vehicles in carpark at 1pm on Easter Sunday, but still capacity along south-east edge of main carpark.*
- Julia Morton advised that CR is a declared alcohol free zone but this was enforced at the Ranger's discretion especially for younger/"party" groups. *Bonfires and beer with underage party groups still a problem observed from CCC side of creek. CCC staff have had to manage and call Police on occasions. Vehicles dragging/skidding around carpark still occurs, especially late Friday afternoons before "lock-up", vehicles*

skidding on grass verges at south-east end of carpark and using speed humps as launching ramps. Management responses/options constrained by lack of a permanent on-site management presence. Julia Morton advised that all camping groups must have at least one person over 18 years old, and that RFS advises HSC on CR closure on Total Fire Ban days (CR no longer automatically closed during Total Fire Bans) and HSC Rangers erect temporary signage as needed.

- Julie Marler presented a poster display of the outcomes of the site analysis and opportunities-constraints assessment (Attachments 3 and 4) and briefly discussed the key points focusing on the Southern, Central and Northern areas of CR (identified for site planning purposes) as well as 9 discrete locations presenting specific opportunities/constraints, physical planning issues, and possible development/management options – entry area, central parking area, CCC pick-up point, boat launching area, southern camping/day use area, possible southern camping area service access, northern day use and restricted camping area, riverine edge, and possible riverside interpretive walk with Great North Walk (refer Attachment 4).
- *Support for removing carparking from the CR entry experience, along western extension of access road and start of carpark access (Attachments 3 and 4), to offer an improved arrival/open space experience with less visual dominance of parked cars. Along with improved orientation and information signage. Support for possible parking and drop-off bay for buses (2 bus capacity) at base of access road, to limit bus access to the heart of CR and reduce width requirements of the central parking area. Pathway connection from proposed bus bay to CCC pick up point and creekside walk. Some concern about visibility of buses detracting from the arrival experience, with possible need for a screening “landscape blister”. Greater walking distance from proposed bus bay to CCC pick-up point on creekside not seen to be a problem, even for groups staying several nights. Larger buses servicing CCC via CR are usually school group drop-off and pick-up which happen during the week when CR is quieter (larger buses with school groups can’t access CCC via their western access road).*
- *Existing western arm of carpark (at southern head of wetland area) is inundated after even moderate rain under “normal non-drought conditions”. Also far north-east corner of southern picnic area - the corner area with tree-planting south of the existing roadside mound - is flooded after moderate to heavy rain by local run-off from the eastern hill and drainage from the picnic area, which is exacerbated by the mound acting as a dam. Flooding issues will need to be addressed in the design of the bus bay and pathway (and possible camping area service access), with possible infilling and minor engineering works.*
- *Support for rationalisation of carpark and reduction in hardstand area – to return some existing sealed area to open space along creekside, to better link northern and southern usage areas, and for greater control and more efficient organisation of vehicle parking to achieve comparable capacity to present, as well as restricting vehicles to sealed area rather than off-seal under adjacent trees.*
- *Support for removal of existing sealed track through southern landscaped area, to reduce vehicle intrusion and separation of the lawn/landscaped area, and provision of an alternative vehicle access along the base of the eastern hill, accessing past the bus bay. Could be short route with option for later extension further southwards, winding through community planting area. Managed as a temporary drop-off/unloading and pick-up/loading facility for booked campers and large groups under a locked gate and keyed-access system, with alternative (either more accessible or more tightly regulated) management regimes also possible as/if required over time. Will also provide service*

vehicle access for southern toilet block maintenance. Camping area service access would also serve as a fire control line between bushland and the southern landscaped area.

- Julie Marler gave a brief summary of the arborist's report into tree safety within CR and key management recommendations.
- *Support for maintaining the southern landscaped area as CR's main camping precinct, especially for "heavy" vehicle accessed booked camping and group events, but without the regimentation of designated campsites. Julie Marler explained that persistent camping around the base of trees is causing soil compaction and tree health concerns. Option of rotating visitor use around different groups of trees using temporary fencing, mulching and signage – as done at the Royal Botanic Gardens – to "rest" trees and tree groups from continuing camping/usage pressures was generally supported. Support for removing camping and visitor use from around higher risk trees more permanently using similar control/management measures. Larger organised/accountable groups, such as Scouts, still to be permitted vehicle access onto grass areas for special events under strict controls.*
- *Support for maintaining the southern landscaped area as the site's largest open lawned area to cater for more traditional, but informal, urban park activities ("somewhere to kick a ball around", "fly a kite", or "park your car and have a game of cricket or have the bikes in the back"). General support for retaining the overall "trees and lawn" character of all CR's developed/landscaped areas – with tree mulching but minimising shrub/understorey plantings and "clutter". Opportunity for more cultural/landscape plantings of appropriate tree groupings/types supported, could be used to remodel southern open-lawn area following relocation of sealed access track out of this area.*
- *Agreement that the existing playground should be relocated further towards the east and visually linked with existing tree groups along eastern edge of southern landscaped area. Some form of playground facility still seen as desirable, but perhaps more appropriate materials and more adventurous. Alan Ginns commented on level of observed use of CR during the week by mothers and pre-schoolers. Relocated play area will require pathway access for prams and young families, and walking distance from relocated parking area will need to be acceptable/comfortable. Relocation of playground from existing site will also allow for reconfiguration, and cultural plantings, of main southern open space.*
- *Support for sensitive upgrading of existing boat/canoe launching ramp to "remake" eroded banks and improve presentation/functionality of the site, including lockable bollards to limit use to "carry-launching" only and prevent use by visitor's boat trailers (while still providing for authorised trailer use). "Carry only" boat launching supported and not seen to be a problem. CCC staff observe little use of the area by trailer launched tinnies" Wider carparking bays may be provided adjacent to the boat ramp, to give extra space for canoe unloading. No special parking bays to be provided for boat trailers, or trailers generally, with trailers to be unhitched and left in car parking bays (especially during peak periods). Concern that trailer parking limitations/requirements be advised to visitors at top of access road. Restricting vehicle access to boat ramp supported to prevent vehicle entry to Berowra Creek. CCC staff have seen 2WD vehicles bogged on the central sandbar off the boat ramp in the middle of the creek.*
- Alan Ginns reminded members to be conscious of the possibility of incremental changes to the character and presentation of CR that may result from the cumulative effects of

many small minor facility upgrades and additional regimentation. *However not seen to be a concern at the level of improvement/development discussed so far.*

- *Strong support for a formed pathway along the creekside linking each end of the site, providing an interpretive experience, and joining the north and south trackheads on the Great North Walk. Pathway seen as a shared walking and cycling route, although track surface yet to be finalized but a different character/appearance to the existing road-style paths and moving back towards footpath presentation.*
- *Support for additional park furniture/picnic facilities in new greenspace established between carpark and creekside.*
- *Support for boardwalk/jetty access through mangroves at two selected sites, accessed off the proposed creekside pathway, to provide an on-the-water experience and possible additional interpretive opportunities (focused on the estuary where appropriate) (refer Attachment 3). Preference to use existing openings or disturbed areas in mangroves.*
- *Julie Marler described possible interpretive themes, and their location, across the site (refer Attachment 3). CCC has photographs of WWII "boat incident" that may be of interpretive value. HSC in the process of preparing extra interpretive signs for along the existing northern boardwalk.*
- *Discussion of allowing restricted walk-in/carry-in camping at far end of northern landscaped area – principally for walkers on the Great North Walk as well as light vehicle campers prepared to carry their equipment the extra distance from carpark. General support for "light" camping in a designated zone in the northern landscaped area, potentially the north-east low-lying area following appropriate filling/mounding, but with no provision for visitor vehicle access (even for equipment drop-off/pick-up) or large group camping.*
- *Julie Marler outlined toilet upgrading and relocation options. Southern toilet is appropriately located, but northern toilet is far too obvious/dominant and disrupts the landscaped space. Northern waste absorption mound is also poorly sited, taking up recreation space and breaking up the landscaped area. Toilet systems, and suitable options, challenged by peaks in use and flood-labile nature of the site. Suggested option of upgrading treatment system to be more water efficient, and reduce water demands, while installing additional in-line storage tanks to increase the capacity of each system and provide a buffer for peak period use and possible pump failure. Suggestion to refurbish and expand the existing southern toilet block and upgrade fittings/fittings to best current standards. Northern toilet-block needs to be demolished and relocated, possibly to a site nearer the Great North Walk trackhead, but still using the existing absorption mound (refer Attachment 3). *General support for initial toilet recommendations.**
- *Agreement that barbecues, park furniture (seating, benches, bins) and picnic shelters all need upgrading. Support for more centralised shared barbecue facilities, preferably electric dual units. Julie Marler canvassed the option of a large group picnic shelter catering for 30-60 users in a pavilion style structure. Concern regarding attracting large groups to such a facility and changing the CR character/experience, preference for one or two slightly larger picnic shelters (catering for up to two family groups, approximately 10 people) but no central large group shelter. Desire to limit large structures and built elements on the site, to "only put back what is there now" (in terms of size and character).*

- *Agreed that the provision of showers was not appropriate or warranted due to unmanageable water supply pressures and waste water disposal issues, as well as changing the character of the CR camping experience. Discussion of need for washing basins for camping/cooking equipment – but cleaning, management and oil/waste water disposal issues agreed as to problematic and not worth pursuing.*
- *Support for erosion control and “soft” formalisation measures at the two beach/water access points in the north and south of CR – to define water access areas while controlling bank erosion/impacts. Support for temporary fencing and possible landscaping (using *Lomandra spp* etc) of other informal water access points to allow recovery of mangroves.*
- *Discussion of proposed mangrove platforms, generally supported but should not be not excessive or dominant, two sites only seen as desirable and some preference for locating towards the central zone. Floating pontoon would be worth considering, compared with a fixed pile structure, but tidal range and access gradients would limit use by disabled/less agile visitors.*
- *One proposed jetty may be the CCC pick-up point for river crossings, if it can be suitable designed. However CCC at present uses two sites on the east bank, the southern carpark site (with rough concrete ramp and step) which is only accessible at high tide and is difficult to use at lower tides (due to currents over the sandbar) and a more southerly break in the mangroves which is useable at all tides. CCC would be happy to use the southern site at all times if it were upgraded/formalized, extra walking distance from proposed bus bay is not seen as an issue.*
- Alan Ginns summarised the planning/management directions as embodied in the preceding masterplan presentation and discussions as striking the balance between site protection, development, an informal family-friendly character, and necessary management inputs and regimentation.
- *Concept of a designated picnic area that visitors could book was discussed, seen as a desirable income generator for HSC but management demands may be prohibitive despite possibility of user self-regulation.*
- Alan Ginns distributed a summary of the “Preferred Future or ‘Vision’ for Crosslands Reserve 2010” as identified by Members via the completed pre-planning submission sheets (Attachment 5). Expressed directions to keep CR as a low-key, nature based and sustainable destination are consistent with all discussions to-date. CR described in terms of the key “role and character” parameters – degree of modification (modified landscaped site within a natural setting), access (unsealed 2WD), standard and number of facilities (better presentation, but of the same type and standard of facilities as on-site now), usage and crowding (limited by carpark capacity, but desire for “elbow room” for all visitors without perception of over-crowding), and intensity of management (use regulated but not a high degree of regimentation and overt management presence). ***Strong support for role and character as defined in discussions to-date.*** Alan Ginns to prepare a draft role and character statement for comment/consideration by the Focus Group out-of-session.
- Discussion of levels of existing use of access road being under the threshold for cost-effective sealing (of approximately 1,000 vehicles per day) even at peak use periods. Some thought to sealing the access road by HSC engineers/maintenance section due to continuing maintenance costs. ***Strong support for retention of access road as unsealed 2WD route.***

- Kurt Henkel raised the possibility of not requiring the next Focus Group Meeting, originally scheduled for 10 May. Alan Ginns explained that the extra meeting was a precaution in case members views regarding the planning and management of CR were vastly divergent requiring further discussion. *Agreed that the planned 10 May focus Group Meeting was not required.*
- Kurt Henkel invited comments on Attachments 3 and 4 out-of-session.
- Next meeting, 6.00pm 7th June 2005.

Close: 8.20 pm

Appendix 7

**Focus Group Minutes
Meeting 3
7 June 2005**



Park Masterplan – Crosslands Reserve

FOCUS GROUP – MEETING 3

Tuesday 7 June 2005

MINUTES

Venue: Council Chambers (first floor), Hornsby Council Chambers Building,
296 Pacific Highway Hornsby

Attendance: Bob Salt (Deputy Chair, NPWS Sydney North Region Advisory Committee)
Peter Quirke (Benowie District Scouts)
John Ashton (Crosslands Convention Centre)
Rob deJong (Community Representative)
John Hunt (Hornsby Conservation Society) (from 7.30pm)

Kurt Henkel (Landscape Coordinator, Parks and Landscape, Hornsby
Shire Council)

Julia Morton (Parks Assets Officer, Hornsby Shire Council)

Polly Thompson (Environmental Scientist Bushland Team, Hornsby Shire
Council) (until 8pm)

Peter Coad (Acting Estuary Manager, Hornsby Shire Council)

Alan Ginns (Gondwana Consulting)

Julie Marler (Phillips Marler)

David Phillips (Phillips Marler)

Apologies: David Booth (Berowra Creek Estuary Management Committee)
Julie Cowie (Community Representative)
Peter Corrigan (Great North Walk Co-Ordinator, Department of Lands, Soil
Service Division)
Ian Robertson (Southbound Adventures)
David Tribe (NPWS Sydney North Region Advisory Committee)

Agenda: Open agenda

Open: 6.30 pm

Comments/contributions by Focus Group Members identified in bold italics.

- Welcome by Kurt Henkel, introduction of Alan Ginns from Gondwana Consulting and Julie Marler and David Phillips from Phillips Marler. Outline of tonight's session with presentation of masterplan drawings, masterplan report and recreation plan report. Copies of masterplan to take away and review. Opportunity to talk through the

masterplan proposals assisted by a presentation by JM and DP, and get a feel for what is proposed for the site, building on what has been discussed at previous meetings.

- Apologies.
- Alan Ginns tabled the draft recreation plan, explained two part report at present – draft recreation plan and draft masterplan, but to be combined into a single final report. Only new item in the draft recreation plan that has not been previously canvassed is the role and character statement for the site, an attempt to sum up the place and its desired future “in a nutshell”. Presentation of role and character statement as set out in draft recreation plan. Potential for considerably greater visitor numbers/pressures, especially if the access road was to be sealed, the site is at present at the very low end of the development and usage spectrum. Review of project objectives as a benchmark against which to assess the role and character statement and masterplan directions.
- Julie Marler presented the draft masterplan drawings – discussing site opportunities and constraints. Ten key masterplan elements or zones – entry area improvements, new riverside interpretation walk, removal or existing vehicular/service tracks, reorganization and refurbishment of central carpark, reorganisation of canoe/boat launching area, riverbank improvement works, visitor amenity structures, mounding, tree planting, and interpretation. Discussed each set of proposals in turn – as per summary masterplan diagram (Attachment 1).
- Bus parking entry area reconfigured from previous proposals due to traffic engineering, safety, and bus reversing requirements.
- Possible new walking track linking lower entry area and main reserve entry/Somerville Road at Hornsby Heights.
- Reconfiguration of central parking area will “win back” open space for riverside walk and extra picnic/usage areas. Three options for resurfacing carpark possible, depending on available budget.
- Riverside walk will also provide cycling opportunities, approximately 1 kilometre from end to end along creekbank, exact surfacing material yet to be determined but will be suitable for cycling.
- *Problems of unknown or non-booked buses that arrive “on spec” as one off visits, occasional day outings (such as nursing/retirement homes), or touring from locations beyond Sydney.* Option of limiting the site to a small bus/mini-bus only destination. *Crosslands Field Studies and Convention Centre can manage bus drop-off and pick-up to work with limited on-site bus parking, buses very rarely on site for any great length of time.* AG advised of an out-of-session meeting with Ian Robinson from Southbound Adventures who advised that he could similarly manage his bus traffic to suit the proposed limited on-site bus parking proposed (on a 2-in 2-out basis). *Capacity of bus turning area at end of Somerville Road sealed section may become an issue, turning area used by local commuter service.*
- *Orientation sign proposed for bottom of access road/carpark entry should be very basic welcome and vehicle orientation signage only – as people unlikely/unsafe to stop to take in much information. More detailed orientation and regulatory/behavioural signs more appropriate at one, or possibly two, locations within the carpark “where people get out and gather”.*

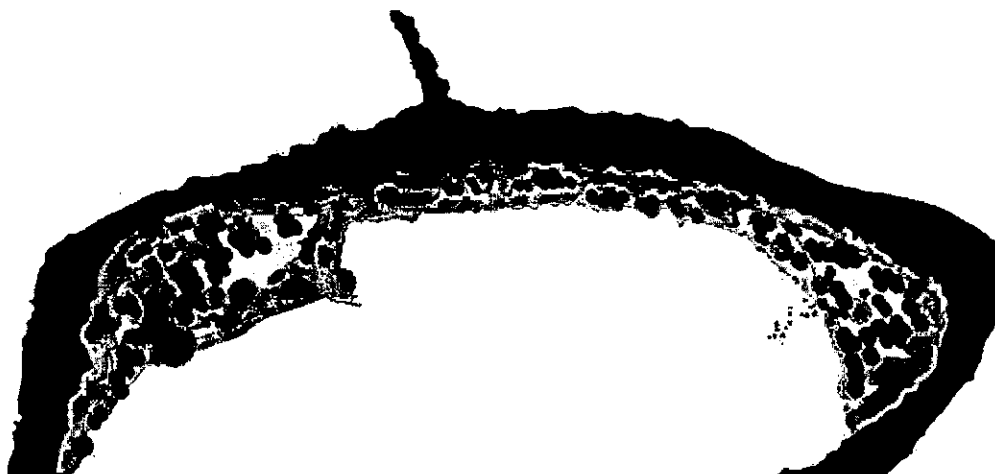
- *Sandfly and mosquito problems may limit the utility/attractiveness of the proposed mangrove viewing platforms.*
- *Detailing of mangrove viewing decks will need to be vandal resistant. However similar facilities at Brooklyn not excessively vandalized.*
- *Southern pontoon will also serve as an embarkation/disembarkation point for Convention Centre but not solely for their use. May need to consider a floating pontoon, in part, to allow for use at all tides.*
- *Edge seating only should go on mangrove platforms rather than a central picnic table, to discourage monopolisation and “exclusive” picnic sites. Safety railing requirements will need to balance BCA requirements and use for boat loading/unloading, may need safety equipment on platforms. Deep “swimming” hole off proposed site of southern platform.*
- *Group reiterated desire that the reserve should continue to be managed, and enforced, as a “no dogs” venue.*
- *Foxes heard on site recently from Convention Centre side.*
- *KH explained that the option of limiting the site to a small bus/mini-bus only destination may be required in future due to the narrow nature of access road and space/maneuvering limitations in the carpark area, this may adversely impact Crosslands Field Studies and Convention Centre. JA from Crosslands Field Studies and Convention Centre advised that their bus use will not increase from 2-3 buses at any one time, as that is the limit of their present accommodation capacity.*
- *Requirement for an apron beside the canoe/boat ramp area, where users can wash-down their canoe before loading onto car or pack/prepare canoe prior to paddling away. Service apron of open timbers, possibly sleepers, would be good. Rubber matting or stabilisation mesh required on ramp base to avoid mud and increase utility and ease of use, not concrete as it damages canoe bottoms.*
- *No showers and no campers’ washing facilities proposals raised by AG. Both restrictions supported.*
- *Support for retaining firepits as part of the novice camping experience, but will need redesign and relocated, 3 on-site now but preferably only 1 firepit per end camping zone to avoid monopolisation. Can use firepits as “honeypots” to define camping areas.*
- *Upgrade wood-burning bbqs to electric. Electricity upgraded recently by NPWS to accommodate electric bbqs.*
- *Water supply line is a continuing problem and needs to be upgraded as a priority, breaking down weekly. Water quality poor (rusty) due to pipe age/corrosion and breaks. Convention Centre gets priority in water supply then the two toilets blocks, recreation areas have run out of water in the past especially when the Convention Centre has a large function/demand. Water supply limits toilet provision/capacity. Consider directional drilling with big bore plastic line, also potential for shared trench for all services.*

- David Phillips presented the Preliminary Costs Plan. Large cost items are reorganization/resealing of the carpark, toilet block refurbishment/reconstruction, and creekside pathway. First draft cost estimates only, staging costs yet to be considered and design fees and construction contingencies added. KH advised that staging works yet to be addressed in detail, but preference for initial works aimed at improving the image of the park.
- *Water supply should be a high priority. Support for “getting the basics right”. Wood bbqs being removed at present, and so should take the opportunity to replace with electric units. The area should remain a functioning/serviceable picnic area at all times through upgrade – approach of “incremental beautification”. Link works with anticipated demand. Works aimed at environmental protection should receive a high priority. Basic orientation signage should receive a high priority.*
- Extra funding may be needed for licencing requirements associated with in-creek works. But need to clarify tenure of Berowra Creek bed and waters.
- Timing of signature works versus basic facilities and additional recreation opportunities. Bollards and creekside pathway will be signature works and may warrant priority, but toilet capacity may be a more pressing issue – especially for the southern toilet block. Water and sewage, do the major infrastructure items first to support subsequent amenity works.
- *Central carpark may require an additional toilet block in the longer term, especially if use of the area by elderly/disabled/larger groups increases.* But beyond the timetable of this masterplan.
- *Creekside pathway should meander rather than being a straight and less interesting route more liable to become bike racetrack.* Closeness of trees to side of path will also slow people down. Pathway will not be used by service vehicles, service staff need to be trained and monitored to take alternative routes across the lawn areas and be “respectful” of the site. Avoid breaking up the site with dedicated service access routes.
- *Concern that sealed sewage tanks may “pop-up” out of the ground as water levels rise, and that long term sewerage pumping station may be an option.*
- *Mobile phone coverage in the recreation areas has improved recently, possibly due to an extra/new tower at Berowra.*
- KH outlined the programme from here to finalise the masterplan.- Invited written comments, to be received preferably within a week or a little more. Advised that there are likely to be changes to the drafts as tabled tonight before they are reported to Council – aiming for the July or August meetings – and interested people can view the agenda items on the HSC website where the recreation plan and masterplan will be attached to the Council papers. Intention is that Council adopt the draft for exhibition, which is then placed on public display for wider comment/review.

Close: 8.10 pm

Appendix 8

Pre-planning Submission Form – Blank Example





Crosslands Reserve

Recreation Plan and Park Masterplan

Help Plan Crosslands Reserve

Hornsby Shire Council in consultation with the NSW Department of Environment and Conservation is preparing a Recreation Plan and Park Masterplan for Crosslands Reserve, at Hornsby Heights. The Masterplan will provide direction for the future use, development and management of this important reserve which includes lands owned by Council and the NSW Department of Environment and Conservation.

To assist Council, and ensure that the community's views are central to the planning process, interested people or groups are invited to briefly contribute their ideas, views or suggestions early in the Masterplan's development. Everyone is welcome to contribute – frequent reserve users, occasional visitors, schools and clubs, neighbours, non-users, and any other interested individuals or groups.

The Draft Masterplan will comply with the requirements of the Berowra Valley Regional Park draft Plan of Management, and will be formally exhibited for public comment and review once prepared. However if you wish to participate early in the planning process please take the opportunity to complete this simple form and return it to Council as shown. Your contributions will be considered in the draft masterplan's preparation, however issues or management directions will not be individually identified as coming from specific people or groups.

For more information contact Kurt Henkel, Landscape Co-ordinator at Council on 9847 6887.

Please return this form when you attend the initial Focus Group meeting at 6pm on Tuesday 12th April 2005. Alternatively you may post it to Council, PO Box 1630, Hornsby NSW 1585, preferably prior to Wednesday 13th May 2005. Your contributions will be identified. Attention: Kurt Henkel, Submitter for Crosslands Reserve Masterplan, Hornsby Shire Council, PO Box 1630, HORNSBY, NSW, 1585.

1. What do you value about Crosslands Reserve, or what is it about this area that is especially important for you?

2. Do you use the area at the moment ? And if so - how frequently, for what sort of activities or uses, and how long do you usually spend in the reserve ?

3. What do you consider to be the main issues that need to be addressed in the area's future management ? (Please list in your order of importance/concern.)

(1)

(2)

(3)

(4)

4. What management directions or guidelines do you suggest the draft masterplan should take or include to address these issues ?

(1)

(2)

(3)

(4)

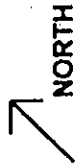
5. Briefly describe your preferred future for Crosslands Reserve - that is, what you would like the area to be like in say 5 years time.

6. Please feel free to add any other comments or suggestions you may have about the planning or future use, development and management of Crosslands Reserve (please add extra pages if you need to).

Thank you for your interest and involvement.
Please bring this completed form to the initial Focus Group Meeting on Tuesday 12 April, or return it to Council as described on page 1.

Please indicate if you would like to be notified of the Draft Masterplan's public exhibition or other opportunities to be involved in the planning for this area.

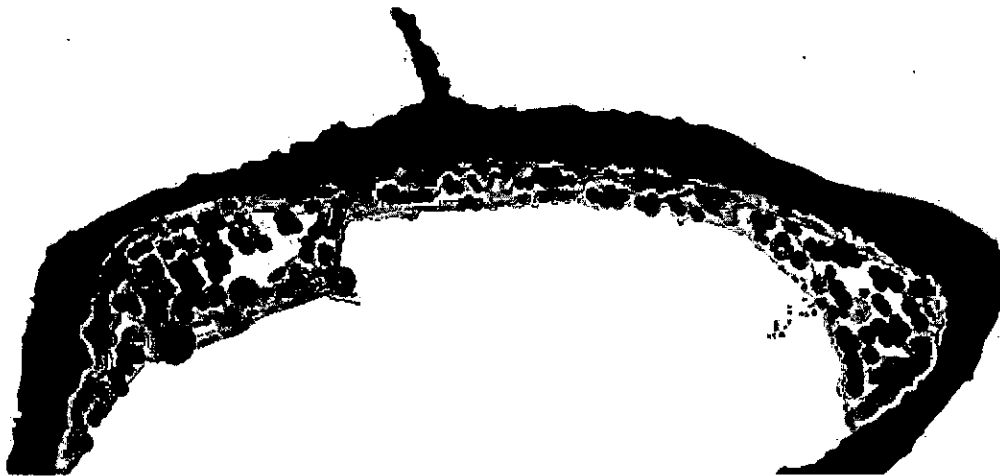
Name:
Address:
.....
.....



Crosslands Reserve Site Plan NTS
Project - Proposed Master Plan for Crosslands Reserve, Hornsby Shire Council

Appendix 9

Access Road Report,
Ray Dowsett Traffic and Transport Planning
Pty Ltd, June 2005



**'CROSSLANDS RESERVE',
SOMERVILLE ROAD,
HORNSBY HEIGHTS**

**PRELIMINARY ASSESSMENT
OF ACCESS ARRANGEMENTS**

2 June 2005

PROJECT NO. 5017

PREPARED BY

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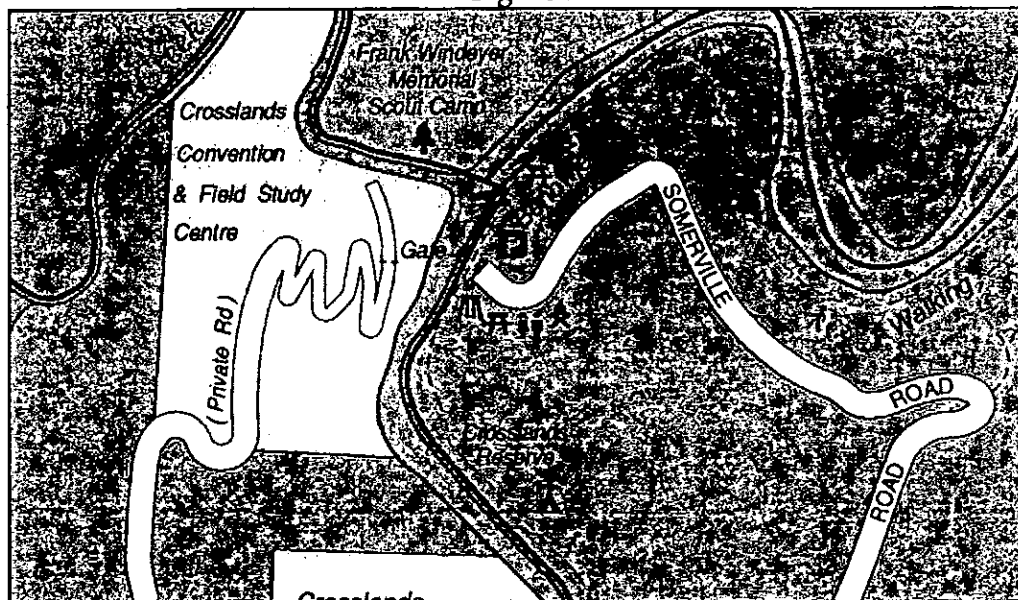
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1. INTRODUCTION

This report has been prepared under instruction from Hornsby Shire Council to provide a preliminary assessment of the access road to 'Crosslands Reserve', Hornsby Heights in conjunction with the preparation of a Recreation and Master Plan for the reserve which is located on Berowra Creek, Hornsby Heights (Figure 1).

CROSSLANDS RESERVE, HORNSBY HEIGHTS

Figure 1



The format of this report has been structured to provide an overview of the access road, which is an extension of Somerville Road, from the point of access at the entry gate into Berowra Regional Park to the Crosslands Reserve car parking area having regard to issues such as road width, pavement condition, alignment, signposting and safety.

Crosslands Reserve is partly within Berowra Valley Regional Park under the control of the National Parks and Wildlife Service and partly on Council land with each agency jointly managing the area. Vehicle access to the reserve is controlled by a gate at the southern extremity of the park which is open between 8.00am and 5.30pm (autumn) daily. The reserve is a popular venue, mainly on weekends and during holiday periods, for picnicking, camping and canoeing. Chartered buses also access the area for picnicking and use of the Crosslands Convention and Field Study Centre located on the northern side of Berowra Creek.

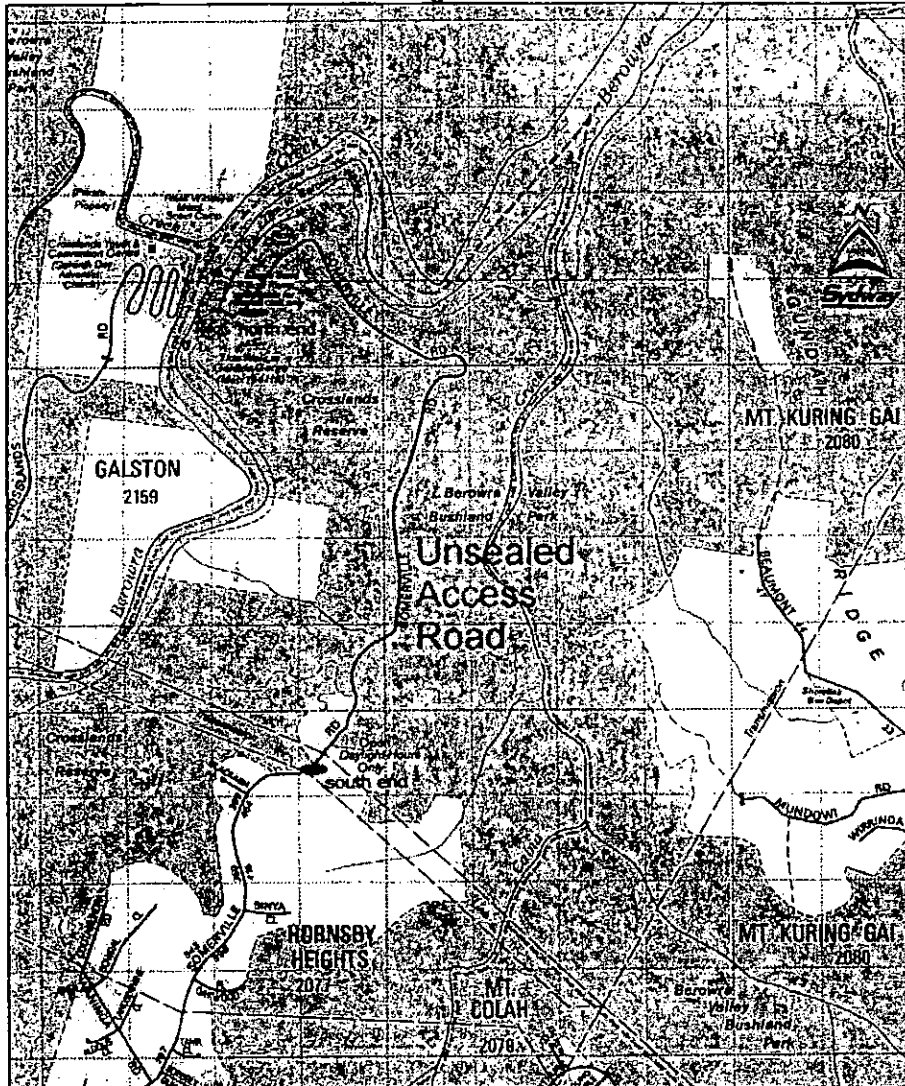
A draft Road Safety Audit Report (Existing Road Stage) was conducted for Somerville Road within Berowra Valley Regional Park by the Works Division of Hornsby Shire Council in July 2002. The draft report, which it is understood was never formally adopted by Council, has been referenced in the preparation of this assessment. A copy of the draft Audit Report is appended for information.

2. EXISTING ROAD AND TRAFFIC CONDITIONS

Vehicle access to Crosslands Reserve is provided via a northerly extension of Somerville Road (Figure 2).

SOMERVILLE ROAD ACCESS

Figure 2



Somerville Road, between the access gate and the reserve, is 2.5km long constructed on a generally curving alignment and increasing downgrade northerly to Crosslands Reserve. Traffic counts were carried out as part of the 2002 Road Safety Audit from 21 July to 27 July 2002 inside the entrance gate, the survey results indicated traffic flows along Somerville Road inside the park as tabulated overleaf:-

SOMERVILLE ROAD TRAFFIC FLOWS

TRAFFIC MOVEMENT	AVERAGE DAILY FLOW WEEKDAY	DAILY FLOW	
		SATURDAY	SUNDAY
Somerville Rd. two way flow	70	264	448

The survey data also recorded 85th% vehicle speeds of 35km/h and 36km/h for north and southbound traffic respectively.

It was estimated that approximately 500-700 vehicles visited the reserve on Easter Sunday 2005, considered a peak use day.

The site was inspected on 14 April 2005 during fine weather and dry conditions. Overall, the road surface was considered to be in reasonable condition except for relatively small areas of 'corrugations' on the steeper gravel sections which resulted in a less comfortable ride and minor loss of tyre grip during acceleration and/or heavier braking.

The road is approximately 5.0m wide, provides for two way traffic flow with some narrower sections, has a predominately unsealed surface of recycled asphalt profiling with short sections of sealed bitumen on some of the steeper grades and dense tree/foilage growth abutting the carriageway over the majority of its length (Photograph 1).

Council's Northern Maintenance Engineer has advised that maintenance is generally carried out on a yearly basis or more frequently if required, predominately involving grading, clearing of table drains and overgrown vegetation. It was further advised that consideration is being given to the allocation of funds in a future program to fully seal the road as it is becoming uneconomical to continue with the current maintenance program. It is understood during periods of heavy rain significant amounts of loose road surface material washes off the carriageway into the table drains and pits adding to the maintenance costs.

Somerville Road from Galston Road to the Berowra Valley Regional Park entrance gate is designated a Roads and Traffic Authority Regional Cycle Route and from the park entrance to Berowra Creek a Recreational Cycle Route in Council's Bike Plan. It is understood small numbers of pedestrian's i.e. recreational walkers and the like also use the road.

TYPICAL SECTION OF SOMERVILLE ROAD

Photograph 1



Road surface drainage predominately consists of table drains with limited formal drainage works (Photograph 2).

TYPICAL DRAINAGE FACILITIES

Photograph 2



Advisory signposting is generally limited to the area of the gate at the southern entry to the park for entering motorists and at the northern end of the access road for motorists exiting the area with some additional intermediate signs provided as shown in Photographs 3, 4, 5, 6 & 7 below and on the following pages.

WARNING SIGNS AT PARK ENTRY

Photograph 3



WARNING SIGNS AT RESERVE EXIT

Photograph 4



Photograph 5



INTERMEDIATE WARNING SIGNS

Photograph 6



Photograph 7



Lengths of timber post and weldmesh 'catch' fence have been provided on sections of the road where there is a substantial fall away from the carriageway as shown in Photographs 8 & 9 below and overleaf. Generally, these 'catch' fences are in reasonable condition.

TYPICAL SECTIONS OF WELDMESH FENCING

Photograph 8



Photograph 9



Limited use has been made of white frangible posts as road alignment markers to delineate the carriageway and assist motorists to negotiate the road, particular along sections of table drain, at culverts and through the tighter curves.

3. ACCIDENT DATA

A summary of Roads and Traffic Authority accident data for the section of Somerville Road from the southern entry gate to Crosslands Reserve for the 8 year period 1996 to 2003 is shown in the following table:

SOMERVILLE ROAD ACCESS ACCIDENT DATA

Year	Accidents	Fatal Accidents	No. Killed	Injury Accidents	No. Injuries
1996	0	0	0	0	0
1997	0	0	0	0	0
1998	1	0	0	0	0
1999	0	0	0	0	0
2000	0	0	0	0	0
2001	0	0	0	0	0
2002	0	0	0	0	0
2003	0	0	0	0	0
TOTALS	1	0	0	0	0

The accident circumstances for the 8 year reporting period appear to be very satisfactory with one (1) recorded incident and nil (0) injuries.

Accordingly, based on the above data it can be concluded there are no significant safety related issues in respect to the section of Somerville Road passing through the Berowra Valley Regional Park.

4. SUMMATION AND RECOMMENDED IMPROVEMENTS

There is limited scope to provide major improvements to the access road i.e. widening or re-alignment without undertaking substantial road reconstruction which would be cost prohibitive and difficult to justify. It is not possible to accurately predict a traffic volume threshold at which the road would require significant upgrading. As indicated earlier, for economic reasons, Council is considering future funding to fully seal the road. Increased use by heavier vehicles i.e. charter buses would add to the frequency for maintenance on the road surface.

While there is no apparent evidence to suggest buses are having any significant difficulties in accessing Crosslands Reserve it is accepted that when a bus opposes a car on a narrower section of the road one vehicle may have to give way. It is understood that this situation does occur on infrequent occasions. Any increase in bus activity along the road would create the potential for this situation to arise more frequently and could give rise to consideration of imposing restrictions on access to the reserve by vehicles of a determined length i.e. vehicles exceeding 7.0m in length. This restriction would permit vehicles such as the 21 seater Toyota 'Coaster' minibus (6.99m long, 2.025m wide) to access to the reserve.

By way of comparison the Oxford Falls Road/Morgan Road route between Wakehurst Parkway and Forest Way in the Warringah LGA had, until recently, an unsealed road surface over the majority of its length. This route has been used as a 'by-pass' for many years, albeit an unattractive one, between Wakehurst Parkway at Oxford Falls and Forest Way at Belrose. Pressure to fully seal the road had been resisted by Council in the knowledge it would become more attractive resulting in an increase in traffic volume, speed and accidents leading to requests for the introduction of traffic slowing measures. As a guide it is considered that when the traffic volume reached 500-600 vehicles per day (900 per day in 1998) Council was 'pressured' into complete sealing of the road over its entire length. There is now additional pressure for Council to introduce traffic calming devices along the route.

As noted earlier the maximum recorded traffic volume on the subject section of Somerville Road was in the order of 450 vehicles on a Sunday in 2002, with an 'estimated' maximum of 500-700 vehicles per day over Easter 2005. It is important to note week day volumes are significantly lower i.e. approximately 70 vehicles per day.

Caution should be exercised in drawing direct comparisons between Somerville Road and the Oxford Falls Road/Morgan Road route as there are differing circumstances i.e. road function and status, 24 hour accessibility etc.

Any significant upgrading of the road/road surface i.e. full length sealing would result in an undesirable increase in vehicle travel speeds with a possible increase in accidents requiring consideration to the introduction of traffic slowing measures.

Increase use of the reserve by buses may require future consideration to restricting large vehicle access to the reserve i.e. vehicles in excess of 7.0m in length. It is also understood that as longer term proposal a separate walking track is under consideration to segregate pedestrians and vehicles.

Accordingly, a number of improvements are recommended below to provide immediate and longer term safety benefits to users of Crosslands Reserve.

Recommended Actions:-

- Continue with the current yearly program of maintenance of the road surface and table drains with particular attention given after periods of inclement weather. The maintenance period may need to be reviewed in light of any increase in traffic volume.
- Replace damaged 'Next 3 km' [W8-17-1 '3'] warning sign prior to the entry gate to the park.
- Provide 'Slippery' [W5-20] and 'When Wet' [W8-7] warning signs at the entry gate to the park for entering vehicles.
- Provide 'Bicycle' [W6-7] and 'Pedestrian' [W6-1] warning signs at the entry gate to the park and at the exit from Crosslands Reserve.
- Relocate the 'Reduce Speed' warning sign 60m south of the curve and install 'Curve Left' sign [W1-3 (L)] sign approximately 30m in advance of the 'Reduce Speed' sign (this action was also recommended in the Road Safety Audit Report).
- Provide additional white frangible alignment posts along edge of the carriageway to delineate table drains and through each curve.
- Replace timber post weldmesh 'catch' fence with steel guardrail. The priority for this work will increase in conjunction with increases in traffic volume along Somerville Road emanating from improvements to Crosslands Reserve and/or the road surface.
- Any decision to fully seal the road and construct appropriate table drains should give consideration to include funding to provide traffic slowing measures and up grade the chain wire safety barriers.
- Future consideration be given to restricting large vehicle access to the reserve i.e. vehicles in excess of 7.0m in length and provision of a walking track to segregate pedestrians and vehicular traffic.

Appendix 10

**Draft Road Safety Audit Report,
Works Division,
Hornsby Shire Council,
July 2002**



ROAD SAFETY AUDIT REPORT

EXISTING ROAD STAGE

**Somerville Road
within Berowra Valley Regional Park**

Hornsby Heights

July 2002

AUDIT TEAM

**John Jenkins (Team Leader)
Peta Smith**

for

HORNSBY SHIRE COUNCIL

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1. INTRODUCTION

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APPENDIX 1 Traffic Count Information

APPENDIX 2 Road Safety Audit Findings and Recommendations

1. INTRODUCTION

1.1 Auditors and Audit Process

This report results from a site inspection of Somerville Road carried out by the Works Division of Hornsby Council.

The audit was carried out by:

John Jenkins, BE, FAITPM (Audit team leader)
Traffic Consultant
Peta Smith, BE
Assistant Traffic Engineer

The audit has been carried out following the procedures set out in Austroads Road Safety Audit guidelines, 1994. The audit covers physical features of the road which may affect road user safety and it has sought to identify potential safety hazards. However, the auditors point out that no guarantee is made that every deficiency has been identified. Further, if all the recommendations in this report were to be followed, this would not guarantee that the road is "safe"; rather, adoption of the recommendations should improve the level of safety of the facility.

1.2 Audit Route

The Road Safety Audit was carried out on that section of Somerville Road within the Berowra Valley Regional Park.

The road surface is unsealed. Periodic maintenance is undertaken using appropriate materials. Recycled asphalt profilings are currently being used. While this may give the appearance of a sealed pavement in certain locations it is stressed that this is not the case.

The road was audited during the day in fine weather. No night audits were carried out as this section of Somerville Road is locked at the gate at the park entrance during the night.

1.3 Crash History

A review of RTA crash data for the period January 1996 to June 2001 did not show any recorded crashes in the subject section of Somerville Road.

1.4 Cycle Route

Somerville Road from Galston Road to the park entrance is designated an RTA Regional Cycle Route in the Hornsby Bike Plan. From the park entrance to Berowra Creek, Somerville Road is a recreational bike route.

2. TRAFFIC COUNT

A traffic count was undertaken on Somerville Road from 21 July 2002 to 27 July 2002. The location of the count was just after the entrance gate to the park.

The 85th percentile speeds were 35km/h northbound and 36km/h southbound. An average of 35 vehicles access Crosslands Reserve during weekdays (70 vehicle movements). On Saturdays 132 vehicles accessed the park and 224 vehicles accessed the park on Sunday (264 and 448 vehicle movements respectively).

The number of vehicles utilising the car park at Crosslands Reserve has been determined using the traffic count. During the week, the maximum average usage is 11 vehicles between midday and 1pm. On Saturdays the usage is approximately 50 vehicles between 2pm and 4pm. On Sundays the maximum usage is 130 vehicles between 1pm and 3pm. Appendix 1 shows the vehicle movement north and southbound and the accumulated vehicles parked within the car park at Crosslands Reserve.

3. ROAD SAFETY AUDIT

The road safety audit was carried out using Austroads Road Safety Audit Checklists, Stage 5 Existing Roads.

The audit findings together with the audit recommendations are given in Appendix 2. All chainages given are in kilometres measured from the gate at the entrance to the park.

4. CONCLUDING STATEMENT

We have inspected the audit route as described in Section 1.2 of this report. The audit has been carried out for the sole purpose of identifying any features of the route which could be altered or removed to improve safety. The identified issues have been noted in this report. The accompanying recommendations are put forward for consideration by the Project Manager for implementation.

(Signed)

John Jenkins (Team Leader),
Traffic Consultant

(Signed)

Peta Smith,
Assistant Traffic Engineer

.....

draft

APPENDIX 1
Traffic Count Information

The traffic count information is attached below and calculates the accumulation of vehicles utilising the car park in Crosslands Reserve

Somerville Road Traffic Count Results

Hours	Monday		Accum		Tuesday		Accum		Wednesday		Accum		Thursday		Accum		Friday		Accum		5 Day			4 day Accumu
	Nth	Sth			Nth	Sth			Nth	Sth			Nth	Sth			Nth	Sth			Total	Ave	Ave Accum	
00 - 01			0				0					0				0					0	0	0	0
01 - 02			0				0					0				0					0	0	0	0
02 - 03			0				0					0				0					0	0	0	0
03 - 04			0				0					0				0					0	0	0	0
04 - 05			0				0					0				0					0	0	0	0
05 - 06			0				0					0				0					0	0	0	0
06 - 07			0				0					0				0					0	0	0	0
07 - 08			0				0	1				1				0					0	1	0	0
08 - 09			0	2	1		1	2	2			1	1	1		0					0	9	2	0
09 - 10	2		2	3	2		2	1	2			0	2	1		1	4	2			2	19	4	1
10 - 11	15	3	14	9	2		9	2	1			1	3	1		3	4	2			4	42	8	6
11 - 12	12	3	23	9	3		15		1			0	2	2		3	4	4			4	40	8	9
12 - 01	12	4	31	1	5		11	2				2	4	2		5	2	1			5	33	7	11
01 - 02	6	20	17	2	2		11	1	3			0	4	4		5	6	3			8	51	10	8
02 - 03	6	8	15	3	6		8	2	2			0	3	5		3	4	5			7	44	9	7
03 - 04	7	19	3	3	5		6	3	3			0	2	4		1	5	5			7	56	11	3
04 - 05	2	5	0	2	3		5	1	1			0	3	2		2	4	6			5	29	6	2

05 - 06			0	1	2	4	1		1		2	0	2	4	3	12	2	2	2
06 - 07			0			4		1	0	2	2	0		2	1	7	1	1	1
07 - 08	1	1	0	1	1	4	1	1	0			0	1	1	1	8	2	1	1
08 - 09			0			4			0			0			1	0	0	1	1
09 - 10			0			4			0			0			1	0	0	1	1
10 - 11			0			4			0			0			1	0	0	1	1
11 - 12			0			4			0			0			1	0	0	1	1
TOTAL	63	63		36	32		17	17		26	26		36	35			70		

APPENDIX 2
Road Safety Audit Findings and Recommendations

AUDIT FINDINGS (Stage 5 Existing Roads)	AUDIT RECOMMENDATIONS
5.1 General Topics	
5.1.1 Chainage ¹ 2.19. Railway line gate posts are installed on both sides of the road. There is provision for a gate rail to be placed across the road. It is located around a corner on a downgrade on an unsealed road. There is no provision for vehicles to turn around. One post is within the table drain.	Remove gate posts
5.1.2 Ch 2.29. Dead branches protruding into carriageway	Remove vegetation
5.1.3 Ch 2.24-2.38. Undergrowth growing through chain wire safety fence obscures view of reflectors on posts	Trim / cut back growth
5.2 Alignment and Cross Section	
5.2.1 Sight distance is adequate for speed of vehicles currently using unsealed road. If road is sealed speeds will increase.	If road is sealed traffic calming devices will be required
5.2.2 Ch 0.45-0.50. Drain on (LHS) of road full. Water could sheet across road.	Clean drain
5.2.3 Ch 0.57. Culvert partially blocked/blocked	Clear debris from culvert
5.2.4 Ch 1.16. Culvert on RHS not trafficable	Make culvert trafficable
5.2.5 Ch 1.32. "Gravel Road Drive Slowly" on LHS	Trim foliage and install additional sign on RHS of road.
5.2.6 Ch 1.34. Power pole on road side of barrier fence	Relocate pole behind barrier fence or relocate barrier fence to road side of power pole
5.2.7 Ch 1.38. Culvert on LHS not trafficable	Make culvert trafficable
5.2.8 Ch 1.48. Culvert on LHS not trafficable	Make culvert trafficable
5.2.9 Ch 1.72. Culvert on LHS not trafficable	Make culvert trafficable
5.2.10 Ch 1.82. Culvert on LHS not trafficable	Make culvert trafficable
5.2.11 Ch 1.90. Culvert on LHS not trafficable	Make culvert trafficable
5.2.12 Ch 1.96. Culvert on LHS not trafficable	Make culvert trafficable
5.2.13 Ch 1.96. Culvert partially blocked/blocked	Clear debris from culvert
5.2.14 Ch 2.04. Culvert on LHS not trafficable	Make culvert trafficable
5.2.15 Ch 2.10. Culvert on LHS not trafficable	Make culvert trafficable
5.2.16 Ch 2.16. Culvert on LHS not trafficable	Make culvert trafficable
5.2.17 Ch 2.16. Culvert partially blocked/blocked	Clear debris from culvert
5.2.18 Ch 2.22. Culvert on LHS not trafficable	Make culvert trafficable
5.2.19 Ch 2.23. Culvert partially blocked/blocked	Clear debris from culvert
5.2.20 Ch 2.31. Culvert on LHS not trafficable	Make culvert trafficable
5.2.21 Ch 2.37. Culvert on LHS not trafficable	Make culvert trafficable
5.3 Intersections – Not Applicable	
5.4 Auxiliary Lanes and Turn Lanes – Not Applicable	
5.5 Non-Motorised Traffic	
5.5.1 The road forms part of Council's recreational bike route.	No recommendations for cyclists are made
5.6 Signs and Lighting	
5.6.1 Ch 2.07. "Reduce Speed" sign, G9-9, at apex of curve	Relocate "Reduce Speed" sign to 60-80m in advance of curve and add W1-3(L) 30m in advance of "Reduce Speed" sign
5.7 Traffic Signals – Not Applicable	
5.8 Physical Objects	

5.8.1 Ch 0.05-0.06. Access control to bush at side of road with horizontal rails.	Install alternative control device
5.8.2 Ch 0.24-0.32. Chain wire safety fence on LHS	Replace chain wire safety fence with approved crash barrier
5.8.3 Ch 0.33-0.38. Chain wire safety fence on RHS	Replace chain wire safety fence with approved crash barrier
5.8.4 Ch 0.45-0.54. Chain wire safety fence on RHS	Replace chain wire safety fence with approved crash barrier
5.8.5 Ch 1.16-1.30. Chain wire safety fence on LHS	Replace chain wire safety fence with approved crash barrier
5.8.6 Ch 1.13-2.39. Chain wire safety fence on RHS	Replace chain wire safety fence with approved crash barrier
5.8.7 Ch 1.95. Rotten post in chain wire fence on RHS	Replace post
5.9 Delineation	
5.9.1 Ch 0.57. Culvert on LHS not delineated	Delineate culvert
5.9.2 Ch 0.57. Drainage channel not delineated on approach to culvert on LHS	Delineate drainage channel
5.9.3 Ch 0.57. Culvert on RHS not delineated	Delineate culvert
5.9.4 Ch 0.58. Tree close to carriageway on RHS	Delineate tree
5.9.5 Ch 0.60. Tree close to carriageway on RHS	Delineate tree
5.9.6 Ch 0.63. Culvert on LHS not delineated	Delineate culvert
5.9.7 Ch 0.63. Culvert on RHS delineation fallen out	Reinstate culvert delineation
5.9.8 Ch 0.68. Tree close to carriageway on RHS	Delineate tree
5.9.9 Ch 0.82. Tree close to carriageway on RHS	Delineate tree
5.9.10 Ch 1.28. Culvert on RHS not delineated	Delineate culvert
5.9.11 Ch 1.57. No delineation on outside of curve in road	Install delineation around curve
5.9.12 Ch 1.66-1.67. Non trafficable drain to culvert	Install delineation along drain
5.9.13 Ch 1.72. Drain on LHS not delineated	Delineate drain
5.9.14 Ch 1.80-1.82. No delineation to drain on LHS to culvert	Delineate drain
5.9.15 Ch 2.35. No delineation on power pole	Delineate power pole
5.9.16 Ch 2.40. No delineation on right hand bend at bottom of hill	Delineate bend
5.10 Pavement	
5.10.1. Pavement is currently undergoing maintenance	

1 Chainages commence at gate to Berowra Valley Regional Park and are measured in kilometres

Appendix 11

Tree Hazard Assessment



Arborist's Report

Tree Hazard Assessment for Crosslands Reserve Masterplan



Crosslands Reserve
Hornsby Heights

by
Tony Lydon BSc
TLC Tree Solutions

April 2005

1. Introduction

This report contains observations and recommendations intended to assist in the management of trees located within Crosslands Reserve, Hornsby Heights.

The author has been asked to inspect trees within the main open space area of the reserve, and to provide arboricultural information to be used in the development of a masterplan for the reserve. Of particular concern are any trees that may be identified as hazardous, since their removal or retention may impact on any proposed future site use, or masterplan site layout, including areas of proposed concentrated public use.

The author visited the site in April 2005.

2. Scope of the Report

The information provided in this report is intended for masterplanning purposes. Whilst general advice regarding tree maintenance or protection measures has been provided for various trees or groups of trees, comments and recommendations made do not substitute for normal tree maintenance procedures or the preparation of a tree pruning schedule. To illustrate this point, deadwood has been identified in several trees but has not been recorded in all instances where it occurs, particularly if the deadwood is considered minor. Removal of deadwood is considered a normal part of tree maintenance in areas where falling limbs could be considered potentially hazardous.

A copy of the site survey plan, as provided to the author by Phillips Marler, has been used to number and locate trees or groups of trees for the purposes of this report. A copy of the relevant section of this plan is reproduced in Appendix Two.

3. Method of Assessment

The method of assessment applied to all trees is based on a visual inspection from ground level. Assessments are based on the principles developed and published by the International Society of Arboriculture (ISA). A copy of the ISA Hazard Evaluation Form (2nd Edition) (Matheny and Clark 1994) is attached at Appendix One.

While not all parameters are relevant to the trees assessed, this comprehensive standard form indicates the nature and extent of observations made to form an opinion as to likely failure potential.

Comments provided are also based on the principles of a Visual Tree Assessment (VTA) methodology (Mattheck C and Breloer H 1995). VTA focuses on external visual indicators of likely internal wood structure to predict overall structural qualities in assessed trees.

In addition, assessments have drawn on the personal experience of the arborist in factors such as knowledge of each tree species' expected characteristics and performance in the local area, as well as comparisons with other similar aged trees of the same species nearby.

Trees of similar characteristics or landscape quality have been assessed and numbered by general group features rather than as individual trees. Comments, such as "stem inclusion", which are relevant to such groups may refer to individual or all trees within a group.

Trees in bushland areas around the site or mangroves growing along the riverfront have not been assessed.

A Significance Rating has been applied and is discussed in Section 6.

Where further detailed examination of a tree is recommended, for example, where the assessor believes further monitoring may be necessary or an aerial inspection is required to verify an observation, this has been noted in the tabulated data. Trees have not been climbed and root systems not excavated.

4. Explanation of Risk Assessment Parameters and Hazard Rating.

Risk assessment for the trees surveyed is based upon a Hazard Rating. For the tabulated data forming part of this report the rating provided is on a scale of 2 – 8.

Two of the three factors that make up a standard Hazard Rating have been directly assessed. Since the factor of Target Rating or Exposure will be affected by future masterplanning outcomes this factor has not been incorporated in to the tabulated Hazard Ratings provided. The three factors are explained as follows :

4.1 Factor One - Probability

Probability is also defined as “Failure Potential” This factor identifies the most likely failure scenario based on an observed structural defect. The rating is based on a prediction of failure within an inspection period. For the purposes of this exercise the inspection period (time elapsed between inspections) is one year. A shorter inspection period would have the effect of reducing the rating and consequently the risk score.

The arboricultural interpretation of the rating system is as follows.

Almost Certain - Most likely and expected result

Score 4 – Severe; defects are very severe (e.g. advanced decay evidenced by fungal fruiting bodies, cavity encompassing more than 50% of the trunk). Root plate lifting.

Quite Possible - 1 in 10 chance

Score 3 – High; numerous and/or significant defects present (e.g. cavity encompassing 30-50% of the circumference of the trunk, major bark inclusions). Previous failure - torn stubs. Unsecured hanging branches.

Unusual but possible - 1 in 100 chance

Score 2 – Medium; defects are present and obvious (e.g. cavity encompassing 10-25% of the circumference of the trunk). Large deadwood > 1 year old. Hanging branches wedged firmly.

Remotely Possible - 1 in 1000 chance

Score 1 – Low; visible defects are minor (e.g. dieback of twigs or small limbs, small wounds with good wound-wood development).

4.2 Factor Two - Possible Consequences

This factor rates the size of the part most likely to fail. Generally the larger the part that fails, the greater the potential for injury or damage.

Size of Part categories have been derived from the ISA Hazard Assessment Form and, along with an interpretation of the most likely consequences, score as follows.

Score 4 - Part most likely to fail larger than 75cm in diameter - Very Serious (Fatality)

Score 3 - Part most likely to fail 45 – 75cm in diameter - Serious (Serious Injury)

Score 2 - Part most likely to fail 15 – 45cm in diameter - Important (Casualty Treatment)

Score 1 - Part most likely to fail less than 15cm in diameter- Noticeable (First Aid Treatment)

For the purposes of this assessment orientation, perceived wood density, falling height, overall length of part and likely impact with other limbs may allow modification of a score, rather than place an absolute reliance on the estimated diameter size of each part.

4.3 Factor Three – Exposure

In a tree management context, exposure is based on location within the reserve area and is related to public use, fixed targets, pedestrian or access routes.

As previously noted no Target Rating or Exposure factor has been added to the Hazard Rating scores provided in the tabulated data. Target Ratings will be dependant on future site use and masterplan design. The data provided does not require a Target Rating since the addition of up to 4 additional score points would not change the relative assessments made by the author.

Should the site managers or master planners wish to incorporate additional information regarding Exposure (Target Rating) in order create a Hazard Rating scored out of 12 in line with normal ISA assessment parameters, the following scores (with their associated interpretation) might be added to the scores provided by this report.

Score 4 - Constant - Many times daily / fixed target

Score 3 - Once daily - Frequent

Score 2 - Once a week - Intermittent

Score 1 - Once a month - Occasional

5. Summary Table of Observations Made

See Glossary (Appendix Three) for definition of arboricultural terms used.
Data highlighted to facilitate interpretation as follows:

Orange = Tree has hazard rating score of 5 or above. (Highlighted for Hazard Abatement consideration)

Black = Tree recommended for removal

Tree No.	Name	Rating		Notes and Recommendations
		Hazard	Significance	
1	<i>Casuarina glauca</i> Swamp Oak	3	4	12+ trees. Minor root damage by mowing. Appear stable. Type G pruning.
2	<i>Casuarina glauca</i> Swamp Oak	3	4	Basal stem injury appears stable.
3	<i>Casuarina glauca</i> Swamp Oak	3	3	3 Swamp Oak trees amongst Mangroves. Minor basal injury. Conflicting limbs. Type G pruning.
4	<i>Casuarina glauca</i> Swamp Oak	3	2	11 young trees in "grove". Minor stem inclusion. Formative pruning (SORCLE prune).
				Minor stem inclusion. Formative pruning (SORCLE prune).
6	<i>Casuarina glauca</i> Swamp Oak	2	2	23 young trees
8	<i>Angophora floribunda</i> Rough-barked Apple	2	5	Tree in Good condition.
9	<i>Angophora floribunda</i> Rough-barked Apple	2	5	Tree in Good condition.
10	<i>Angophora floribunda</i> Rough-barked Apple	3	3	Basal swelling. Suppressed by adjacent trees. Monitor.
11	<i>Angophora floribunda</i> Rough-barked Apple	2	3	
12	<i>Angophora floribunda</i> Rough-barked Apple	4	4	Leaning tree.

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Tree No.	Name	Rating		Notes and Recommendations
		Hazard	Significance	
13	<i>Angophora floribunda</i> Rough-barked Apple	3	3	Small tree. Lean with major 'guy' root.
14	<i>Angophora floribunda</i> Rough-barked Apple	2	3	Minor dieback of lower limbs. Mistletoe.
	<i>Angophora floribunda</i> Rough-barked Apple			2 trees - 10 trees from multiple stumps. Stem disease. Suckers to be removed. Remove limbs from trees to be removed.
16	<i>Angophora floribunda</i> Rough-barked Apple	3	4	10 trees located within mulched and planted area.
	<i>Angophora floribunda</i> Rough-barked Apple			Multiple trees in area. SORCLE prune or remove.
18	<i>Angophora floribunda</i> Rough-barked Apple	4	3	Included upper limb. SORCLE prune or remove.
19	<i>Angophora floribunda</i> Rough-barked Apple	3	3	Basal stem injury. Callous and wound wood appears sound.
20	<i>Angophora floribunda</i> Rough-barked Apple	3	3	Stem canker.
21	<i>Angophora floribunda</i> Rough-barked Apple	2	3	Minor borer attack to lower trunk.
22	<i>Angophora floribunda</i> Rough-barked Apple	3	3	Minor lower trunk bulge. Wound wood from previous "axe" injuries good. Root damage by mowers.
	<i>Angophora floribunda</i> Rough-barked Apple			Multiple trees in area. SORCLE prune or remove. Remove limbs from trees to be removed.
24	<i>Angophora floribunda</i> Rough-barked Apple	3	4	Basal flare / buttress roots. Appears sound.
25	<i>Eucalyptus pilularis</i> Blackbutt	4	7	Possible termite nest in base of trunk. Monitor.
26	<i>Eucalyptus paniculata</i> Grey Ironbark	4	6	Modified crown shape, previously lost limbs. Good health and vigour. Remove fig from fork.

Tree No.	Name	Rating		Notes and Recommendations
		Hazard	Significance	
27	<i>Eucalyptus pilularis</i> Blackbutt	4	6	Cockatoo damage to upper fork.
28	<i>Eucalyptus pilularis</i> Blackbutt	3	5	Minor deadwood.
29	<i>Eucalyptus pilularis</i> Blackbutt	4	5	Suppressed form.
[REDACTED]				
32	<i>Eucalyptus pilularis</i> Blackbutt	2	5	
33	<i>Eucalyptus pilularis</i> Blackbutt	2	7	
34	<i>Eucalyptus pilularis</i> Blackbutt	2	3	Minor deadwood. Lower stem bulge.
35	<i>Angophora floribunda</i> Rough-barked Apple	3	3	Chino flow due to pest attack. Health and vigour appear good.
36	<i>Angophora floribunda</i> Rough-barked Apple	2	3	
37	<i>Eucalyptus pilularis</i> Blackbutt	4	4	Basal stem injury. Callous wood appears sound. Sweep in mid trunk.
38	<i>Casuarina glauca</i> Swamp Oak and <i>Angophora floribunda</i> Rough-barked Apple	4	4	Group of 6 trees. Basal stem injury and inclusions. Target radius 8m.
39	<i>Angophora floribunda</i> Rough-barked Apple	4	4	Apparent stem inclusion. SORCLE prune.
40	<i>Eucalyptus saligna</i> Sydney Blue Gum	4	8	Mature specimen.

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Tree No.	Name	Rating		Notes and Recommendations
		Hazard	Significance	
41	<i>Eucalyptus pilularis</i> Blackbutt	3	4	Root buttress may indicate internal stem damage but appears structurally sound. Minor deadwood.
42	<i>Angophora floribunda</i> Rough-barked Apple	3	3	Lower trunk curve. Appears stable.
43	<i>Angophora floribunda</i> Rough-barked Apple	2	2	Crossing limbs. Type G pruning.
44	<i>Eucalyptus pilularis</i> Blackbutt	2	8	Minor deadwood.
45	<i>Eucalyptus pilularis</i> Blackbutt	3	8	Lower limb loss and cockatoo damage.
46	<i>Eucalyptus pilularis</i> Blackbutt	3	7	Prune cockatoo damaged limbs.
47	<i>Angophora floribunda</i> Rough-barked Apple, <i>Casuarina glauca</i> Swamp Oak and <i>Eucalyptus pilularis</i> Blackbutt	4	5	14 trees in fair health. Exhibit signs of decline including deadwood and basal stem injuries. Monitor and prune / remove if required.
48	<i>Angophora floribunda</i> Rough-barked Apple	3	5	3 trees. Minor limb inclusion. Reduction prune.
49	<i>Eucalyptus pilularis</i> Blackbutt	4	8	Deadwood.
50	<i>Syncarpia glomulifera</i> Turpentine	2	6	2 leaders.
[REDACTED]				
53	<i>Casuarina glauca</i> Swamp Oak	3	3	Included stem.
54	<i>Casuarina glauca</i> Swamp Oak	3	3	Host to Fig. Future decline likely. Monitor for die back due to strangulation.
55	<i>Syncarpia glomulifera</i> Turpentine	3	5	2 leaders. Basal stem injury.

Tree No.	Name	Rating		Notes and Recommendations
		Hazard	Significance	
56	<i>Eucalyptus pilularis</i> Blackbutt	3	6	
58	<i>Eucalyptus pilularis</i> Blackbutt and <i>Angophora floribunda</i> Rough-barked Apple	2	3	
59	<i>Eucalyptus pilularis</i> Blackbutt	3	6	Deadwood
60	<i>Banksia integrifolia</i> Coast Banksia	4	4	Previous limb loss. Lean.
61	<i>Angophora floribunda</i> Rough-barked Apple	3	3	Lower trunk bulge. Multiple branch injury (Pest attack or possible canker).
62	<i>Angophora floribunda</i> Rough-barked Apple	2	4	Roots undermined.
63	<i>Angophora floribunda</i> Rough-barked Apple	3	3	Stem bulge and poor health. Remove when further declined or dead.
64	<i>Banksia integrifolia</i> Coast Banksia	3	4	Previously lost second leader.
65	<i>Acacia sp</i> Wattle	4	3	Decline. Inclusion and die-back. Remove.
66	<i>Syncarpia glomulifera</i> Turpentine	4	8	Potential inclusion of major limb. Basal injury. Health and vigour excellent. Target radius 20m.
67	<i>Eucalyptus pilularis</i> Blackbutt	4	6	2 trees. Deadwood and lopped suckers.
69	<i>Casuarina glauca</i> Swamp Oak	4	3	Approximately 100 trees around car parking area. Basal injuries and included leaders common. SORCLE prune or remove affected trees.

6. Discussion

Three Trees (numbers 7, 31 and 57) have been recommended for removal. Each of these trees has a Hazard Rating of 6 or 7.

A further 8 trees have scored 5 or higher out of eight and are therefore highlighted for further consideration or hazard abatement. These trees are numbered 5, 15, 17, 23, 30, 51, 52, and 68. Whilst these trees may also have scored 6 on the Hazard Rating scale (ie tree 23) their significance and opportunity for hazard mitigation means that they have not been recommended for immediate removal.

The nature of suitable abatement works to minimise risk relative to all trees varies with specific circumstances and has been indicated in the Notes and Recommendations column of the assessment table. For example recommended works for tree 17 would be either SORCLE pruning or removal. Tree 51 may best be managed by normal tree maintenance as well as ensuring a low target rating within a 15m radius Target Zone. Tree 68 appears to require no work in addition to normal maintenance since any likely failure will be towards the adjacent river.

Because the Hazard Rating scheme applied reflects equally on large or small, valued or less valued trees the author has elected to provide a secondary Significance Rating to facilitate further planning.

The Significance Rating offers a comparison with reference to the author's additional subjective valuation based on such factors as;

- Tree size
- Visual impact
- Specific amenity (shade/screening etc)
- Location within site / perceived landscape qualities
- Likely habitat value
- Species

The Significance rating may help determine the relative merits of trees of equal Hazard Rating such as trees 18 (hazard 4, significance 3) and 25 (hazard 4, significance 7). In this comparison tree 25 would be afforded greater consideration than tree 18 in planning for any further infrastructure or facilities.

Since the Significance Rating applied is wholly subjective, alternative interpretations of each tree's significance or value may be equally valid and may be used to amend or revise the priorities or suggestions made.

7. Further Notes on Application of Hazard Assessments

This report is a tool, for use by the owner or managers of the trees described, to assist in formulating priorities for masterplanning purposes.

It provides expert advice on trees that have the potential to become hazardous, and makes tree care or management recommendations on the basis of arboricultural information.

Its conclusions or recommendations do not stand alone, but should be used in conjunction with other information such as aesthetic or ecological concerns, expected exposure to visitors or members of the public, available maintenance budget, tolerance to risk, and long term management intent.

A general hazard assessment, such as has been carried out for these trees, does not provide a quantifiable point for specific action. By their intrinsic nature as organic systems no living tree can ever stop growing. Similarly, no risk of tree failure is ever likely to be presented as zero and must be considered against ongoing benefits and likely consequences.

Periodic re-inspection of trees, particularly after environmental changes such as a period of drought, or any physical change such as storm damage to trees, is vital to ensure information on which decisions are based is as current as possible.

The following quote illustrates the point that the hazard assessment process is not infallible in producing a clear definition of works required

"hazard ratings cannot strictly define a numerical line for action, between either removal and retention or treatment and no treatment. This must be an administrative decision, one made by owner and manager..... Some level of risk will always be present when people live among trees. The decision of how much risk is tolerable remains with the owner and manager."

Matheny and Clarke (1994)

Even with priorities established that might translate into immediate work orders, or dictate localised site usage, foundation work such as formative pruning of new plantings, maintaining high quality tree care practices, and improving growing conditions (including mulching) for established trees must be considered concurrently.

8. Care of Older Trees

Older trees are often correctly perceived as more valuable than younger trees for a variety of reasons. They generally offer greater amenity, habitat, landscape features, better returns on maintenance costs, and particularly in the case of Crosslands Reserve contribute to a "sense of place".

If measures discussed in the following section on General Tree Care and Recommendations are not able to be implemented then a cycle of avoidable tree decline and hazard formation will continue.

It is apparent that from this time forward decline in many older trees will accelerate and maintenance work will need to be carried out more frequently than has been the case in the past.

Amongst the reasons for this is that as trees mature and senesce they must dedicate a greater proportion of their energy to dealing with disease and injury and less to healthy new growth.

In other words they must work harder just to exist. Each injury or setback has a compound effect and leads to the tree having less available resources to deal with the next injury or setback. Trees generally cope by shutting down or sealing off sections of damaged or

decayed wood and concentrating growth in healthy areas of tissue. (This is partly how cavities are formed in older trees).

Once an older tree has suffered an adverse impact it is far more difficult to reverse the process. This is often termed a "spiral of decline". In a natural setting such decline is a necessary part of a tree's life stage and complements environmental requirements for habitat, ecological niches, and forest succession.

In a reserve setting, the financial and spatial costs required to safely manage declining trees may not be considered appropriate or desirable. In that case a plan of management may focus on providing sufficient resources for high quality and staged replacement planting.

9. General Tree Care and Recommendations

The following notes provide comments on general tree care and specific considerations that may be appropriate for the site.

- **Minimise general disturbance to trees root zones**

Infrastructure design and any subsequent works need to be sympathetic to retained trees. Changes in soil level, addition of turfed or paved areas, excavation for pipes, or general cultivation of the soil should be avoided unless specifically designed with regard to existing site trees. It is recognised that turfed areas are part of the character of the reserve, but it should be equally acknowledged that turf competes with trees for moisture and may be particularly harmful to remnant native trees.

Minor disturbances to roots may not lead to the immediate death of a tree but will cause physiological stress. This in turn leaves the trees susceptible to further attack by pest and diseases. Any unnecessary damage to their root systems will have a negative affect on the future health, vigour, life expectancy and safety of the trees.

- **Application of mulch**

A 75 - 100 mm layer of composted leaf mulch applied within the tree protection zones will assist in stabilising soil moisture and surface temperature conditions for both existing and newly planted trees. Appropriate application of leaf mulch is also beneficial for trees in the long term. Among other benefits it provides enhanced conditions for beneficial soil organisms, reduces compaction of surface soil layers, and acts as a slow release source of nutrients.

Mulch can be aesthetically appealing in both new and established planting areas and certainly reduces the incidence of damage by mowers or excessive application of poison.

- **New Plantings / Maintenance of Amenity and Character.**

It has been noted that several of the older trees are in a state of ongoing decline. Replacement plantings have been carried out over time with varying degrees of success. Unless properly carried out new plantings are likely to become a liability in the future. Poor stock selection and outdated planting technique will certainly reduce the success of future plantings and may lead directly to future hazard formation.

It is important that a sufficiently long-term view of replanting be taken to maintain character and amenity as older trees are lost to disease or general decline and need to be replaced. Individual feature trees of high quality or advanced stock may be considered in conjunction with areas of group plantings.

- **Pruning of trees**

Pruning work will be part of an ongoing maintenance program for many trees. Where such work is required all work should be carried out by a trade qualified arborist working to the Australian Standard for Pruning Amenity Trees AS 4373 - 1996

Removal of foliage should be kept to a minimum. Whilst pruning is often necessary to maintain safety it should be recognised that over-pruning can lead to stress and tree decline. General pruning of previously cut stubs, crossing branches, and removal of dead wood could be carried out at the same time as hazard reduction pruning. Location of final cuts may be determined by qualified persons in accordance with the principles of natural target pruning.

The importance of formative pruning in long term tree health should not be underestimated.

- **Habitat / Environmental Management**

Management of habitat is a broad and complex subject that often requires specialist knowledge and skills. On a practical level the most significant aspect of habitat management is to recognise that not all trees potentially weakened by decay cavities or nesting hollows should be removed. Fauna studies will indicate which hollows are in use by protected species. Tools and techniques to assess the safety of cavities exist and should be employed by specialist Consulting Arborists where required on a case by case basis.

Normal risk management assessments may be made, but levels of acceptable risk may be greater under special circumstances and actions and outcomes may be weighted to the additional environmental benefits gained.

- **Signage / Public Education**

The most useful signs are those that both educate and inform. Any signs obviously need to fit the ambience of the Reserve but even warning signs can be designed in a low-key format.

Signs and discrete low fencing might be required to explain retention of a particular tree and request that members of the public do not linger in a target area.

If any part of this report is not clear to the reader, or if further information is required, please contact the author at the office of TLC Tree Solutions or on (0412) 292 777.

Yours faithfully,

Tony Lydon BSc (Hons)

Consulting Arborist
Life Member National Arborists Association Australia
Founding Member International Society of Arboriculture Australia Chapter

Appendix One – ISA Tree Hazard Evaluation Form (part A)



A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas **TREE HAZARD EVALUATION FORM** 2nd Edition

Site/Address: _____
 Map/Location: _____
 Owner: public _____ private _____ unknown _____ other _____
 Date: _____ Inspector: _____
 Date of last inspection: _____

HAZARD RATING:						
Failure Potential	+	Size of part	+	Target Rating	=	Hazard Rating
_____		_____		_____		_____
_____ Immediate action needed						
_____ Needs further inspection						
_____ Dead tree						

TREE CHARACTERISTICS

Tree #: _____ Species: _____
 DBH: _____ # of trunks: _____ Height: _____ Spread: _____
 Form: generally symmetric minor asymmetry major asymmetry stump sprout stag-headed
 Crown class: dominant co-dominant intermediate suppressed
 Live crown ratio: _____ % Age class: young semi-mature mature over-mature/serescent
 Pruning history: crown cleaned excessively thinned topped crown raised pollarded crown reduced flush cuts cabled/braced
 none multiple pruning events Approx. dates: _____
 Special Value: specimen heritage/historic wildlife unusual street tree screen shade indigenous protected by gov. agency

TREE HEALTH

Foliage color: normal chlorotic necrotic Epicormics? Y N Growth obstructions:
 stakes wire/ties signs cables
 Foliage density: normal sparse Leaf size: normal small
 curbs/pavement guards
 Annual shoot growth: excellent average poor Twig Dieback? Y N
 other _____
 Woundwood development: excellent average poor none
 Vigor class: excellent average fair poor
 Major pests/diseases: _____

SITE CONDITIONS

Site Character: residence commercial industrial park open space natural woodland/forest
 Landscape type: parkway raised bed container mound lawn shrub border wind break
 Irrigation: none adequate inadequate excessive trunk wetted
 Recent site disturbance? Y N construction soil disturbance grade change line clearing site clearing
 % dripline paved: 0% 10-25% 25-50% 50-75% 75-100% Pavement lifted? Y N
 % dripline w/ fill soil: 0% 10-25% 25-50% 50-75% 75-100%
 % dripline grade lowered: 0% 10-25% 25-50% 50-75% 75-100%
 Soil problems: drainage shallow compacted droughty saline alkaline acidic small volume disease center history of fall
 clay expansive slope aspect: _____
 Obstructions: lights signage line-of-sight view overhead lines underground utilities traffic adjacent veg. _____
 Exposure to wind: single tree below canopy above canopy recently exposed windward, canopy edge area prone to windthrow
 Prevailing wind direction: _____ Occurrence of snow/ice storms: never seldom regularly

TARGET

Use Under Tree: building parking traffic pedestrian recreation landscape hardscape small features utility lines
 Can target be moved? Y N Can use be restricted? Y N
 Occupancy: occasional use intermittent use frequent use constant use

The International Society of Arboriculture assumes no responsibility for conclusions or recommendations derived from use of this form.

Appendix One – ISA Tree Hazard Evaluation Form (part B)

TREE DEFECTS

ROOT DEFECTS:

Suspect root rot: Y N Mushroom/cank/bracket present: Y N ID: _____

Exposed roots: severe moderate low Undersided: severe moderate low

Root pruned: _____ distance from trunk Root area affected: _____% Buttress wounded: Y N When: _____

Restricted root area: severe moderate low Potential for root failure: severe moderate low

LEAN: _____ deg. from vertical natural unnatural self-corrected Soil heaving: Y N

Decay in plane of lean: Y N Roots broken Y N Soil cracking: Y N

Compounding factors: _____ Lean severity: severe moderate low

CROWN DEFECTS: Indicate presence of individual defects and rate their severity (S = severe, m = moderate, l = low)

DEFECT	ROOT CROWN	TRUNK	SCAFFOLDS	BRANCHES
Poor taper				
Bow, sweep				
Codominants/forks				
Multiple attachments				
Included bark				
Excessive end weight				
Cracks/splints				
Hangers				
Girdling				
Wounds/seam				
Decay				
Cavity				
Conks/mushrooms/bracket				
Bleeding/sap flow				
Loose/cracked bark				
Nesting hole/bee hive				
Deadwood/stubs				
Borers/termites/ants				
Cankers/galls/burls				
Previous failure				

HAZARD RATING

Tree part most likely to fail: _____

Inspection period: _____ annual _____ biannual _____ other _____

Failure Potential + Size of Part + Target Rating = Hazard Rating

_____ + _____ + _____ = _____

Failure potential: 1 - low; 2 - medium; 3 - high; 4 - severe

Size of part: 1 - <6" (15 cm); 2 - 6-18" (15-45 cm);

3 - 18-30" (45-75 cm); 4 - >30" (75 cm)

Target rating: 1 - occasional use; 2 intermittent use;

3 - frequent use; 4 - constant use

HAZARD ABATEMENT

Prune: remove defective part reduce end weight crown clean thin raise canopy crown reduce restructure shape

Cable/Brace: _____ Inspect further: root crown decay aerial monitor

Remove tree: Y N Replace? Y N Move target: Y N Other: _____

Effect on adjacent trees: none evaluate

Notification: owner manager governing agency Date: _____

COMMENTS

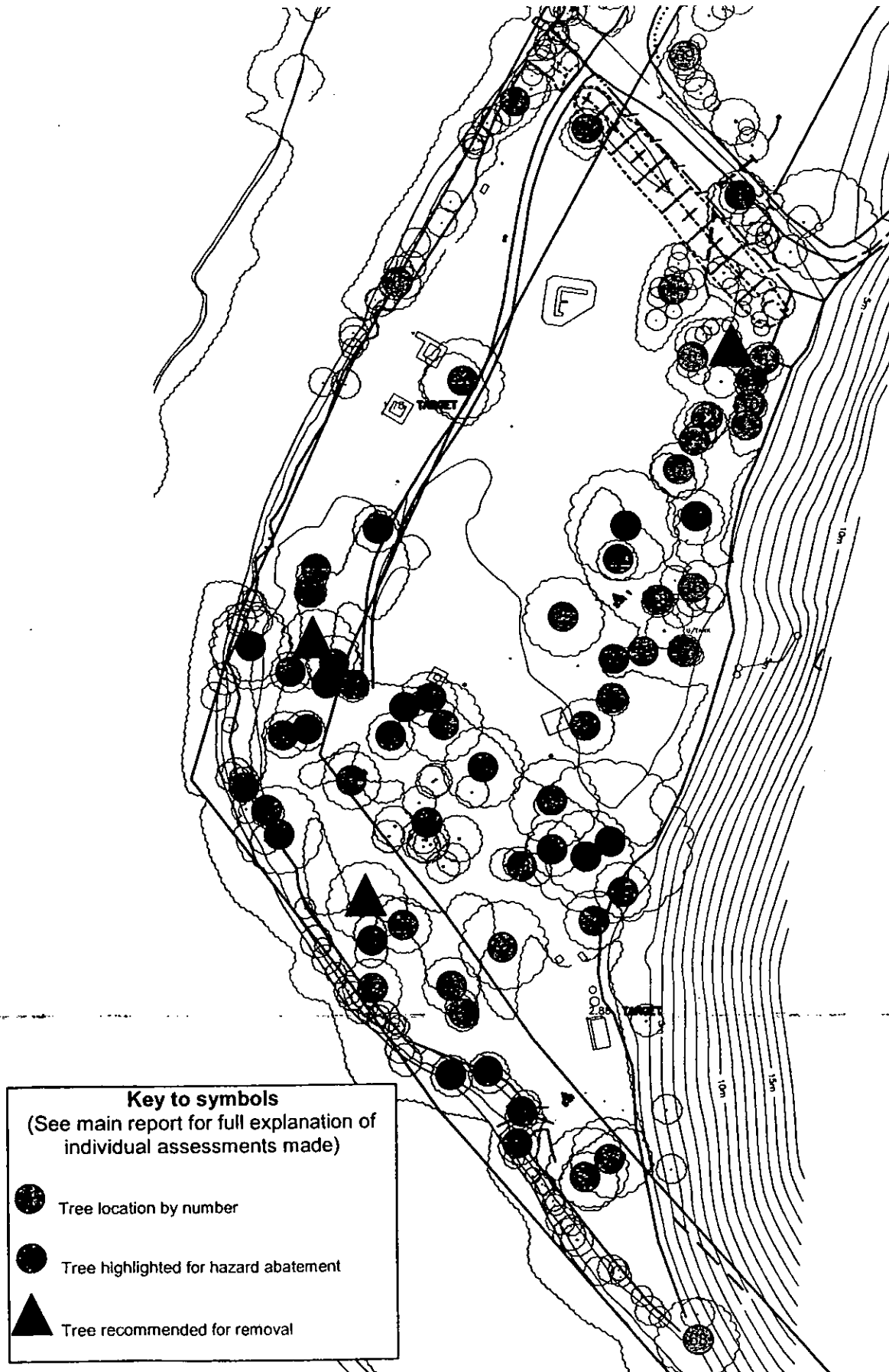
Appendix Two - Selected References

- Clark R (1996) NATSPEC Purchasing Landscape Trees. Construction Information Systems. Sydney.
- Gilman E (2002). An Illustrated Guide to Pruning. Delmar. Albany. USA
- Harris et al (1999). Arboriculture Integrated Management of landscape Trees, Shrubs and Vines. (Third Edition) Prentice Hall. New Jersey. USA
- Lonsdale D 1999. Principles of Tree Hazard Assessment and Management. Dept of Environment Planning and the Regions. London.
- Mattheck C and Breloer H 1995. The Body Language of Trees – A handbook for failure analysis (Research for Amenity Trees 4) HMSO, London.
- Matheny N and Clarke J 1994. A photographic guide to the Evaluation of Hazard Trees in Urban Areas. International Society of Arboriculture. Illinois. USA.
- Perry, T. Professor 1994. Size, Design, and Management of Tree Planting Sites. The Landscape Below Ground I - Proceedings of International Workshop on Tree Root Development in Urban Soils. International Society of Arboriculture. Illinois. USA.
- Schwarze F (1999). Fungal Strategies of Wood Decay in Trees. Springer. Berlin.
- Shigo A. 1991 Modern Arboriculture. Shigo and Trees, Associates. Durham. USA.
- Shigo A 1988. A New Tree Biology. Facts, Photos and Philosophies on Trees and their problems and proper care. Shigo and Trees Associates. Durham. USA.
- Simpson J (2000). Proceedings of the 3rd NAAA Tree Management Seminar and Workshop. 'Fungi for the Arborist' Sydney. NSW
- Standards Australia (1996) AS4373 – 1996 Australian Standard Pruning of Amenity Trees

Appendix Three – Glossary of Terms.

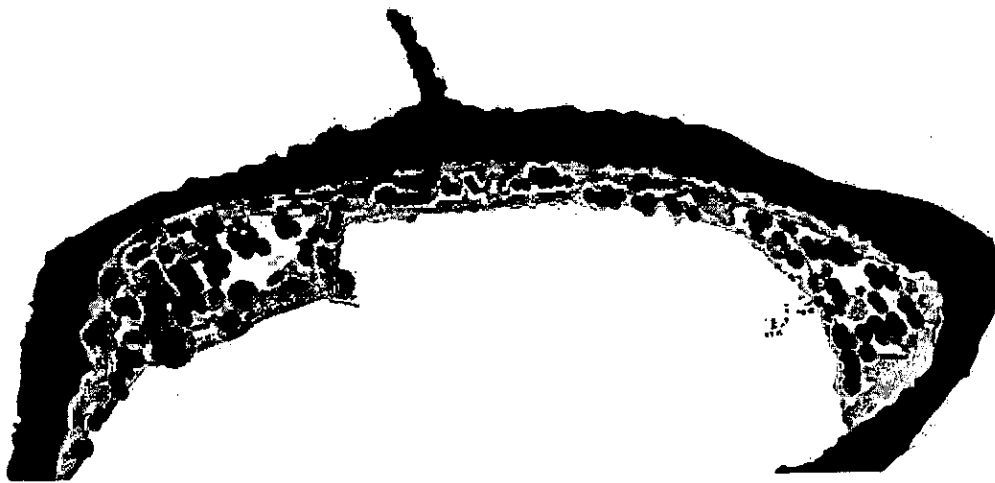
AS 4373	The Australian Standard for Pruning of Amenity Trees (1996).
Borer	Refers to bark or cambium-eating pest. Normally larval stage of Longicorn beetle.
Cambium	Layer of soft tissue between outer protective bark and inner structural wood. Important for trees growth and protection.
Canker	Localised dead area or necrotic lesion. May be caused by animal injury, pathogenic fungi or other organisms. May lead to decay and loss of wood strength.
Cockatoo Damage	Injury to cambium (bark) caused by cockatoos or other birds. May be a feeding or other behaviour. May cause cankers and structural weakness over time.
Die back	Process during which terminal ends of limbs may be deprived of sufficient moisture or may be subject to decline due to stress and reallocation of a trees internal resources.
Inclusion / Included Leader	Structural feature where compressed bark is wedged between growing stems. Most often assessed as a defect.
Remedial Prune	Pruning of damaged limbs in order to extend the useful life of tree. (Also know as Type H by AS 4373 - The Australian Standard for Pruning of Amenity Trees).
SORCLE	Suppression or Reduction of Competing Leaders. - Method of pruning used to minimise risk of branch or stem inclusion.
Target Radius	Radial distance from the base of the tree within which the potential hazard identified applies. Further specific assessment may modify the assumed symmetrical shape of the target area.
Type G Pruning	General Pruning as specified by AS 4373 - The Australian Standard for Pruning of Amenity Trees.
VTA	Visual Tree-Assessment: A method of tree assessment that emphasizes examination and interpretation of mechanical and other external signs. Also known as the "body language" of trees.

Appendix Four – Tree Locations



Appendix 12

Historical References



Crossland's.

BEROWRA CREEK.

The Children's Paradise.

At the present time, when there is so much talk about swimming baths, our Civic Fathers could do worse than give consideration to what might be considered suitable pleasure resorts within the Shire.

After a pleasant holiday at Crossland's, on Berowra Creek, writer is fully convinced that a finer pleasure resort would be hard to find anywhere in the State. It is situated right at Hornsby's back door, and it only needs the sympathetic consideration of the Hornsby Shire Council in making it more easily accessible to make it a popular family resort and children's paradise.

The surroundings are the most beautiful imaginable. Walled in by precipitous mountains, densely timbered, the creek winds its way from Dusthole Bay for miles over sandy flats, covered with golden sand, which at high tide are negotiable by boats of fairly heavy draught, and which at low tide are just beautiful clean sand beds through which a silvery channel winds its way back to the main body of water, to be again augmented when the tide turns to send the crystal waters again up into the mountains as if on a ceaseless cleansing of the golden sands, where children's footprints have been impressed in delightful frolicking during its temporary absence.

The most ideal spot on the river is Crossland's, where acres of turf-covered banks slope down to the water's edge, and where during all holiday seasons dozens of white canvas tents nestle snugly amongst the willows, and the women with the banks. Here the Hornsby Shire has a 20-acre reserve, which is at present accessible only by a neglected and ill-defined track down from the back of Fred Kaye's. Vehicles can only proceed as far as the top of the hill overlooking the flats. From thence down to the water's edge is a quarter of an hour's journey. The distance this way is 8 miles. The Council could do much worse than expend money on this route to make it more easily accessible. At present holiday makers from Hornsby proceeding by this track have to leave their conveyances and horses at the top of the hill and risk the consequences. Mr. Turnidge, of Hornsby, did this last week, and when he returned he found that the horse had somehow or other broken one of its legs and had to be destroyed.

There is another route via Galston, one of the most beautiful routes in the Shire, which is eleven miles. As it is only four miles from Galston it is largely patronised by Galstonites and residents of the Hills District. About eighteen months ago a largely signed petition was presented to Council by Cr. Moore on behalf of A and B Riding ratepayers, asking for this road to be placed in better condition. Since then a couple of turns have been widened, but little else seems to have been done. This route is negotiable by cars. Mr. H. W. Bray, of Hornsby, holding the record for the heaviest load thereby—but few care to risk the journey owing to the sharpness of the turning stones which cause the wheels to skid, and the clayey nature of several patches—soil which has been placed on the road. A maximum expenditure of £200 would make this road into a motor road, and with a little publicity would make this particular part of Berowra Creek the Manly of the Shire.

As showing the popularity of the place we extract from hundreds of recent signatures in a visitors book kept by Mr. J. B. Crossland, the following names, together with comments on the place—

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T. H. Wicks, Glenorie, road wants wider heads on hills; W. Hogarty, Glenorie—Beuda too narrow; A. Hopkins, Dural—Turns too sharp; E. Carr, Galston—simply grand; H. M. Osmond, Sutherland, Wabroonga—delightful holiday resort; Mr. G. Thorington, Sydney—Nature invites woody ones to come back; E. W. Byles, Bascett—could not be better; M. McAllister, Marrickville—an ideal holiday resort; T. S. Tyler, Bascett—Good-o, only better; Eric Newland, Galston—turns too sharp; E. Drownick and party, Burwood—best time of our lives; Mr. and Mrs. Hattshaw, Manly—The day of our life; W. H. Carson, Hornsby—Exquisite wild grassland; H. A. Hawkins, Castle Hills—The best place on earth; T. W. Ward, Paddington—Could not stay too long—will always do hub; E. Bellamy, Penzance Hills—Had a glorious week; W. B. Wrench, Kenthurst—stayed 3 days and got plenty fish; F. O. Eggleston, Newtown—Taxi 471; W. Powell, Coogee—Private hire car 32208; C. F. Mullins, Coogee—walking home; Mr. E. Amies, Coogee, footsore and weary; J.

HORNSBY SHIRE HERITAGE STUDY Prepared by Perumal Murphy Wu Pty Ltd for Hornsby Shire Council and the NSW Department of Planning	Reference No L279
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Present Name Crosslands Reserve	Date Inspected 20.4.93 Survey By WA
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Location: Berowra Creek via Sommerville Road, Hornsby Heights Town/Suburb HORNSBY HEIGHTS Postcode 2077. Locality Real Description	Category Sub Category
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Present Owner: Town/Suburb Postcode	Site Area Existing Zoning
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Evaluation Criteria: Historic Rare <input type="checkbox"/> Associative <input type="checkbox"/> Representative <input type="checkbox"/> Aesthetic Rare <input type="checkbox"/> Associative <input type="checkbox"/> Representative <input checked="" type="checkbox"/> R Social Rare <input type="checkbox"/> Associative <input type="checkbox"/> Representative <input type="checkbox"/> Scientific Rare <input type="checkbox"/> Associative <input type="checkbox"/> Representative <input checked="" type="checkbox"/> R Other Rare <input type="checkbox"/> Associative <input type="checkbox"/> Representative <input type="checkbox"/>	Date
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Significance: A large section of Berowra Valley Bushland Park with wide cross-section of topography and tree associations and particularly large creek flats beside Berowra Creek, of regional significance. Of regional significance.

Location Plan



Physical Characteristics:

Description: Large bushland reserve on and above Berowra Creek and part of Berowra Valley Bushland Park. Extensive ridgetop scrub/heathland with many wildflower species. Valley sides on rugged sandstone country provides many views up creek and typical tree associations such as Grey Gum, Red Bloodwood, Scribbly Gums and Smooth Bark Angophora. And at bottom of valley sides Sydney Peppermint, Smooth Bark and Rough Bark Angophora and Forest Sheoak.

Along the valley floodland zonation of species as evident. Here taller Blue Gum and Blackbutt to 28m and lower Rough Bark Angophora exist on the slightly higher plain then swamp Casuarina and Phragmites Reed give way to mangroves on the tidal zone.

The lowland floodplain is grassed and well maintained for public recreation with good signage, barrier controls, playground equipment and amenities.

Waters of Berowra Creek suffer from heavy pollution in very wet weather.

Recommendation: The concrete pipes in the playground area introduce a strong man-made element with engineering overtones and should either be screen by ludicrous indigenous planting or replaced with a less man-made element.

Historical Period:

	Built	Used
Pre 1800	<input type="checkbox"/>	<input type="checkbox"/>
1800 - 1825	<input type="checkbox"/>	<input type="checkbox"/>
1826 - 1850	<input type="checkbox"/>	<input type="checkbox"/>
1851 - 1875	<input type="checkbox"/>	<input type="checkbox"/>
1876 - 1900	<input type="checkbox"/>	<input type="checkbox"/>
1901 - 1925	<input type="checkbox"/>	<input type="checkbox"/>
1926 - 1950	<input type="checkbox"/>	<input type="checkbox"/>
1951 - 1975	<input type="checkbox"/>	<input type="checkbox"/>
Post 1975	<input type="checkbox"/>	<input type="checkbox"/>

Heritage Listings:

<input type="checkbox"/>	Register of the National Estate (AHC) - Registered
<input type="checkbox"/>	Register of the National Estate of Aust (AHC) - Interim
<input type="checkbox"/>	Register of the National Trust (NSW)
<input type="checkbox"/>	Register of Significant Twentieth Cent. Architecture (RALA)
<input type="checkbox"/>	Department of Public Works Heritage and Cons. Register
<input type="checkbox"/>	Heritage Council Register - Permanent Cons. Order
<input type="checkbox"/>	Heritage Council Register - Interim Cons. Order
<input type="checkbox"/>	Heritage Council Register - Section 130 Order
<input type="checkbox"/>	Heritage Council Register - Nomination
<input type="checkbox"/>	NSW Govt Dept Heritage Register (S.170 Heritage Act)
<input type="checkbox"/>	NP&WS Historic Sites Register
<input type="checkbox"/>	NP&WS Aboriginal Sites Register (Contact Sites)
<input type="checkbox"/>	Institution of Engineers (NSW) Heritage Register
<input type="checkbox"/>	Existing Heritage Study
<input type="checkbox"/>	Regional Environmental Plan Heritage Schedule
<input type="checkbox"/>	Local Environmental Plan Heritage Schedule
<input type="checkbox"/>	Other

Historical Themes:

SHIP

Local

Sources