

Office of the Commissioner for Sustainability and the Environment

Investigation into the state of Lake Burley Griffin and catchment:

Economic impact of water quality issues Report

Ian Lawrence 4th December 2011



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The assistance provided by a number of Lake User organisations, who responded to the 'Economic Assessment Survey' Form, and provided written submissions on the impacts of Lake closures on the viability of their programs, is also acknowledged.

1. Background:

On the 27th May, the Minister for the Environment and Sustainable Development, Mr Simon Corbell MLA, directed the Commissioner for Sustainability and the Environment to undertake an ‘Investigation into the state of the water courses and catchment for Lake Burley Griffin’.

At its meeting of 28th July 2010, the Reference Group appointed to assist the Commissioner for Sustainability and the Environment in undertaking the Investigation, identified the need for an assessment of the annual economic value of the Lake, and the economic impact of Lake water quality issues on the Lake economic value.

This Report has been prepared in response to an Engagement by the Office of the Commissioner for Sustainability and the Environment, to produce a Paper on the economic impact of Lake water quality issues on the ACT economy.

2. Scope of Lake related values yielding economic benefits

Lake Burley Griffin was conceived by Walter Burley Griffin as one of the major axes of the Canberra Plan, underpinning the symbolic role of the National area. Constructed in 1960 to 63, today, the Lake is seen by the Canberra community as a key city recreational and activity venue, providing water based and related recreational opportunities, and attractive foreshore areas for walking, cycling and picnicking.

Unfortunately, in recent years, a number of triathlon, rowing and sailing events have been hampered through water quality and safety issues such as blue-green algae levels, faecal contamination and flood related debris. This has required, for example, the cancellation of triathlon swim legs which has negatively affected competitor numbers (particularly from interstate) and diminished Canberra’s reputation as a triathlon event host.

In view of the potential for these perceptions to adversely impact on Canberra’s economy, the Reference Group considered that an economic assessment was an important part of the wider assessment of social, environmental and economic costs to Canberra of Lake water quality issues.

This assessment is not intended as a Benefit/Cost analysis, but rather an identification of the economic benefits flowing to the Canberra community as a result of activities based on or associated with the Lake values and amenity, and the impact on these benefits as a result of actual or perceived water quality issues and Lake closures.

Section 1.2.2 of the *National Capital Plan* states that the Lake Burley Griffin and Foreshores are intended to provide a range of recreational, educational and symbolic experiences of the National Capital. Section 5.2 of the *Lake Burley Griffin Management Plan*, designates the Lake water uses, as:

- Primary contact (swimming) recreation;
- Secondary contact (boating) recreation;
- Passive (walking, cycling, picnicking) recreation;
- Fishing;
- Water supply,
- Drainage and flood management.

Lake Burley Griffin remains a key component of the visitor experience offered in the ACT. It is central to the design and layout of the national capital and is also a hub for a broad range of recreational and social activities including sailing, rowing, kayaking, dragon-boating, water-skiing, swimming, fishing, triathlon, walking, cycling and picnics/BBQ's.

A number of businesses situated around the lake's edge, including hire companies (bicycles, paddle boats, segways etc.), cruise operators and restaurants/cafe's/kiosks service both local and tourism markets throughout the year – enhancing the enjoyment of the Lake and its surrounds.

Lake Burley Griffin plays an important role as both a venue and iconic backdrop for a number of key tourism events during the year. Australian Capital Tourism, through its Events Assistance Program (EAP), has funded a number of these events – including:

- The Foreshore Summer Music Festival;
- The 2011 Australian Dragon Boat Racing Championships;
- The Canberra City Half Ironman Triathlon; and
- The Capital Summer Sports Festival (incorporating the Canberra Capital Triathlon)

Other events, including those held in and around the Canberra Festival celebrations (e.g. Enlighten, the Balloon Spectacular, and Skyfire), the Canberra Carp Out, sailing regattas and Australia Day Celebrations are also synonymously linked with activity both on the Lake and adjacent to the Lake foreshore.

From a marketing perspective, Lake Burley Griffin is regularly used as a key promotional tool for the destination. Views of the Lake from key city lookouts, the Captain Cook Memorial Jet, and spectacular images across the water to our national institutions are unique and in many cases instantly recognisable as 'Canberra'.

Australian Capital Tourism's flagship consumer publication – the *2011 Holiday Planner* magazine (refer to link below) – clearly highlights Lake Burley Griffin's importance and

relevance to our tourism marketing effort given its regular use in imagery and editorial content.
<http://www.visitcanberra.com.au/hp2011/index.html>

3. Basis for assessing economic benefits

The following material outlines the scope of activities included in the economic assessment. In addition, it flags a number of activities which are significant economically, but given their indirect link to the Lake and its water quality, or the absence of a pricing signal upon which to make an economic assessment, are more difficult to substantiate a benefit deriving from the Lake, and have not been included in the assessment.

Direct economic benefits include:

- Charges for the abstraction of water supply;
- Club membership fees, race entry fees, services (storage of boats/equipment, hire of boats/equipment), hire of amenities, sale of food & beverages;
- Paddle boat, canoe hire payments;
- Lake cruise tickets & charter payments;
- Cycle hire.

Indirect economic benefits:

- Accommodation, meals, other tourist entry fees, by Interstate/overseas visitors/participants in Lake related functions (National Rowing Events, National Sailing Regattas, Triathlon Events, Water Skiing Events);
- Enhanced sales value of properties having Lake frontage or Lake view;
- Enhanced property valuations – rates;
- Local purchase of sporting equipment – boats, sails, oars, fuel, fishing gear, clothing, etc;
- Enhanced patronage of Clubs, restaurants around the Lake;
- Water pollution control – removal of Phosphorus – protection of Murrumbidgee River;
- Flood protection of significant administrative, education and cultural assets within the 1 in 500 yr flood zone.

The Lake also provides a number of important environmental services, including:

- Water pollution control – protection of the Murrumbidgee River;
- Water supply;
- Drainage and flood management.

As many of these benefits do not involve a payment for enjoyment of the Lake and its foreshores (public good), their ‘economic’ value cannot be directly measured. However, there are a substantial range of activities, uses and services that do generate income.

ACT Tourism has provided survey data indicating the average length of stay of interstate and international visitors to Canberra. This data has been used in estimating the 'flow-on' economic benefits accruing to the wider Canberra community from the interstate and international visitors drawn to Canberra by the Lake based sporting events. This estimate has been included in the assessment of economic values attributable to the Lake.

In response to an 'Economic impact of Lake Burley Griffin water quality issues' Survey form, Lake users have provided information on:

- Club membership & annual fees;
- Sporting event participant numbers and entry fees;
- Training program fees;
- Fees for storage of boats, trailers & equipment;
- Hire of boats, equipment, buildings;
- Hire of bicycles;
- Lake cruise tickets & value;
- Lake cruise charter charges;
- Sale of food and beverages.

Where information has not been provided by some user groups, Web site information on their fee structures, membership, and national events has been utilized in compiling a profile and economic benefit accruing to the economic value of the Lake.

Lake users have also provided estimates of interstate visitors/participants in sports events.

The National Capital Authority and Environment ACT have provided information on the annual volume of water abstracted under licence from the Lake, for irrigation purposes.

As noted above, the Lake provides a number of environmental services. The Lake intercepts an average of 11 tonnes of Total Phosphorus each year (compared to LMWQCC interception of 90 tonnes of TP/yr), making a significant contribution to the protection of the Murrumbidgee River. It is difficult to place an economic value on this contribution. Standard economic evaluation practice would be to apply the cost of removal of an equivalent weight of phosphorus at Lower Molonglo Water Quality Control Centre. As P removal at LMWQCC is integrated into the overall treatment process, it is difficult to separate the P removal cost. At this stage, an estimate of the economic value of this environmental service has not been included in the economic assessment.

The annual benefit yielded by flood protection is also difficult to estimate. In most cases, institutions having facilities within the floodplain carry their own flood damage risk. Typical scales of flood risk insurance rates versus risk could be applied to these assets, but this is a major

analysis, beyond the scope of this economic assessment. However, in view of the magnitude of the assets held within a number of these institutions, this economic benefit is significant. As this economic component is not affected by water quality, its omission does not invalidate the assessment of the cost of Lake closure as a result of water quality degradation.

Similarly, the enhancement of the values of properties adjacent to or having views of the Lake, are significant. Enhancement of values as a result of waterway frontages, are typically of the order of 50 to 70%, while enhancement of values as a result of views across waterways, are typically of the order of 20 to 30%. In view of the scale of residential and commercial development of buildings in Kingston, and in Civic currently, these benefits are significant. While the enhanced sale value is a one-off economic return, the higher valuation for property rating purposes, yields an annual return. However, this analysis is beyond the scope of this economic assessment.

The value of water supply from the Lake, however, can be assessed. In this case, water is abstracted under licence. The value of this water has been based on 40% of the current value of the bulk water supply tariff (ACT Independent Competition & Regulatory Commission), and data on annual abstraction levels provided by the NCA and the ACT EPA.

4. Impact of water quality issues/Lake closures on economic value

A number of national and local sporting events have been cancelled over recent years, as a result of Lake closures or Health warnings. The cancellations or loss of participants as a result of Lake closures, has resulted in a significant loss to sporting organizations and the wider Canberra community.

Lake users have provided information on the number of events cancelled and their recent curtailment of event programs in the light of uncertainty (and hence participation) regarding the availability of the Lake on the programmed date.

The AIS questions the appropriateness of location of its National Rowing Centre of Excellence in Canberra, if reliable access to the Lake cannot be assured into the future. The Centre is a major investor in facilities, staff, athlete training programs, and national events.

Reliability was perhaps the key concern across all of the submissions – the concern regarding the ability to program events with a reasonable level of certainty that conditions on the day would permit the running of events, free of last minute constraints or program changes. The establishment of clear protocols on risk assessment and the determination of the location and use category related constraints are cited as important factors in building confidence regarding the reliability of the Lake as a sporting venue into the future.

A number of submissions also stressed that in the event of loss of access to the Lake for water sport activities, there would be a cost penalty to local sports people – the travel/accommodation costs incurred by Canberra residents, in travelling to alternative venues outside of the ACT.

Lake water quality also impacts on the suitability of water for irrigation (concern regarding irrigation spray generated aerosols containing bacteria/viruses). In this case, there is a loss in payment for Lake water, and an additional cost incurred by Lake water users, in having to purchase more expensive town mains water.

5. Assessment findings

The assessment estimated the annual economic value attributable to the Lake, at \$23,260,300. A summary of the economic benefits is provided in Table 1. Summary of Economic Assessment.

Major components of this economic value comprise the membership and income generated by national and international rowing regattas, and in particular, the investment made by AIS in the National Rowing Centre Excellence Program, based on Lake Burley Griffin, and the value of water abstracted from the Lake for irrigation water supply. The value added to restaurants adjacent to the Lake shore, as a result of enhanced patronage, is another significant economic benefit.

The impact of poor Lake water quality, leading to Lake closure, impacts at a range of levels on Lake User Groups. In some instance (primary contact sport), it results in cancellation of swimming related events, and ultimately, the transfer of these national events to more reliable locations elsewhere. This not only results in an economic loss as a result of termination of these events, but has impacts on membership within sporting clubs in Canberra.

Secondary contact sports such as rowing and sailing are also at risk. In this case, significant investment in equipment and venues, are also at risk.

The assessment estimated that in the event of continued deterioration in the quality and reliability of the Lake as a sport venue, the annual economic cost to Canberra would be \$25,513,500. This amount includes not only the loss in economic value accruing to Canberra as a result of termination of the Lake related activities, but additional costs incurred by organizations in terms of devaluation of equipment and facilities, and costs incurred in travelling to venues outside of the ACT.

Table 1. Summary of Economic Assessment

User category	Annual economic value	Added value	Total annual value	Annual loss of Lake closure
Water abstraction	\$2,453,340	0	\$2,453,340	\$6,146,540
Boat cruises & charter	\$1,422,000	\$1,032,000	\$2,454,000	\$1,652,000
Bicycle & boat hire	\$709,800	0	\$709,800	\$630,000
Restaurants added value	0	\$4,260,600	\$4,260,600	\$2,130,300
Sailing	\$655,000	\$240,000	\$895,000	\$1,026,000
Triathlons, marathons	\$610,000	\$1,120,000	\$1,730,000	\$1,852,000
Rowing	\$6,366,563	\$3,600,000	\$9,966,563	\$11,239,876
Dragon boats	\$148,000	\$200,000	\$348,000	\$377,600
Water skiing	\$40,000	\$80,000	\$120,000	\$128,000
Canoeing & kayaking	\$66,000	\$192,000	\$258,000	\$271,200
Model boats	\$600		\$600	\$720
Sea Scouts	\$19,900		\$19,900	\$23,880
Fishing	\$29,500	\$15,000	\$44,500	\$35,400
Total value	\$12,520,700	\$10,739,600	\$23,260,300	\$25,513,500

Notes:

Annual economic value: Income from membership, event entry fees, hire of equipment, hire of storage space, hire of facilities, sale of food & beverage.

Annual added value: Additional expenditure made by interstate & international participants in Club events, on accommodation, food & beverage, & patronage of other facilities.

Total annual value: Annual Club/Organisation value + Annual added value

Annual cost of closure: Annual income lost and expenses incurred as a result of loss of access to Lake, plus cost of disposal of equipment, plus cost to Canberra members for travel to facilities outside of Canberra, plus loss of 'annual added value'.

6. Marginal costing of the range of Lake water quality management objectives

In order to assess the Cost/Benefits of a range of Lake water quality management measures, and to provide an assessment of the economic impact of deteriorating water quality, an assessment of the progressive or marginal costs of several Lake water quality deterioration increments was undertaken.

The issue for Lake users is 'certainty' in respect to their ability to stage national, international and local Club events. Several submissions noted the impact of Lake closures on their loss of Club membership and participation in Lake events, as a result of dissatisfaction of members following cancellation of activities. Members tend to move to other outdoor activities free of this uncertainty. Several submissions also noted the economic impacts of late cancellation of events, in terms of lost income and additional costs incurred in arranging alternative venues.

From a marginal costing or sensitivity analysis perspective, the problem is that firstly, Lake closures are absolute - there is little gradation of impacts on activities - all activities involving contact or potential contact with the Lake's water are effectively closed down. Secondly, the events (toxins associated with BG algal blooms and/or elevated faecal bacteria levels) have a duration of 3 to 6 weeks - a significant part of the summer season.

It appeared that the most appropriate parameter to measure the economic impact of deteriorating water quality increments, is the number of closures per year.

Table 2: Risk of Lake closure during the summer season (20 weeks)

Number of closures/yr	Average closure period/closure	Probable percentage of summer period closure
0.5	4 weeks	10%
1.0	4 weeks	20%
2.0	4 weeks	40%
3.0	4 weeks	60%

Based on the submissions to the Commissioners Office, it was concluded that a probability of closure greater than 10% would be unacceptable in respect to international and national events, while a 20% probability would be unacceptable to local Club events.

From the perspective of organised sport and recreational activities, there appears to be just three water quality scenarios:

- a low probability (<10%) of closure, with some marginal loss in economic value of the Lake;
- an intermediate probability of closure (10% to 30%), with significant loss of national & international activities, and some decline in local activities;
- a high probability of closure (>30%), with major economic loss of income resulting from the substantial loss of Lake based recreational activities and services.

Table 3. Marginal costs of Lake closure scenarios

Annual frequency of closure	Period of summer closed	Annual cost to the ACT community
< 0.5	<10%	\$400,000
0.5 to 1.5	10% to 30%	\$16,000,000
>1.5	>30%	\$19,000,000

As noted above, the major issue for sport and recreational organizations and their members, is uncertainty. The establishment of clear and agreed protocols for assessing the risks associated

with Lake use, relevant to specific activities, and including user participation in risk management, would significantly reduce the past level of perceived uncertainty, both in respect to the user groups and the regulatory/management agencies.

The development of predictive tools for progressive upgrading of the risk assessment, approaching the timing of national and international events, would provide another means for reducing this uncertainty.

These approaches would provide additional layers in respect to the ‘closure scenarios’ and associated estimates of annual cost to the community.

7. Recommendations

The assessment of the economic value of the Lake to the ACT community has been identified by the Reference Group as a key element in the consideration of the state of the water courses and catchments for Lake Burley Griffin, and its implications for the ACT community.

This Paper has demonstrated the substantial economic and social benefits of the Lake’s sport, recreational, water and landscape values to the ACT community, and the serious potential for loss of these benefits as a result of decline in water quality of the Lake.

In view of the limited scope of information accessible for this analysis, and the emerging significance of the economic element to the investigation, it is recommended that a more detailed and rigorous economic assessment be commissioned, as necessary to guiding decisions on management of this valuable asset into the future.

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Appendix A. List of Submissions to Economic Impact of Lake Burley Griffin water quality issues

ACT Capital Tourism

ACT EPA: Water abstraction data

Australian Institute of Sport

AROC Sport

Canberra Model Yacht Club

Capital Region Fishing Alliance

Canberra Yacht Club

Burley Griffin Canoe Club

Lake Burley Griffin Sea Scouts

National Capital Authority: Water abstraction data

Rowing Australian Capital Territory

Turner Residents Association Inc

Wetspot Watersports