# Healthy Waterways Plan for Lake Tuggeranong

A plan to restore the health of the lake

ACT Government

ACT Healthy Waterways

## Acknowledgment of Country

The City and Environment Directorate acknowledges the Ngunnawal people as traditional custodians of the ACT and recognise any other people or families with connection to the lands of the ACT and region.

We respect the Aboriginal and Torres Strait Islander people, particularly our Aboriginal and Torres Strait Islander staff, and their continuing culture and contribution they make to the Canberra region and the life of our city.

### Privacy



Telephone: 13 22 81
GPO Box 158, Canberra City 2601
This publication should be cited as:

ACT Government 2026. Healthy Waterways Plan for Lake Tuggeranong: A plan to restore the health of the lake. Report by the ACT Healthy Waterways Program, ACT Government, Canberra.

### Accessibility

If you are deaf, or have a hearing or speech impairment, and need the telephone typewriter (TTY) service, please phone 13 36 77 and ask for 13 22 81.

For speak and listen users, please phone 1300 555 727.

For more information on these services, contact us through the National Relay Service: www.accesshub.gov.au.

If English is not your first language and you require a translating and interpreting service, please telephone Access Canberra on 13 22 81.

## Contributors

Dr Ralph Ogden

Katie Miller

# Table of Contents

# Executive summary

Lake Tuggeranong experiences frequent blue-green algal blooms that significantly reduce recreational use, create public health risks and diminish local amenity. This plan provides a clear, evidence-based pathway to restore Lake Tuggeranong's health over the coming decade. While algal blooms cannot be eliminated entirely, the combined actions set out in this plan will significantly reduce lake closures, improve amenity and create a more liveable and resilient Tuggeranong.

Scientific assessments show that excessive amounts of phosphorus entering the lake, primarily via stormwater from the surrounding urban catchment, is the primary driver of algal growth. Based on current modelling, to shift the lake to a healthier, more resilient condition, phosphorus inflows need to be reduced by approximately 700 kilograms (kg) per year. Achieving this target would prevent algal blooms in 3 out of 4 years, on average, and ensure that any blooms that do occur are shorter and more manageable.

To meet the pollution reduction target and deliver visible improvement in lake health, the ACT Government (the government) proposes to initially progress a suite of 7 management options.

1. **Expand street sweeping**, including sweeping behind verge mowers, to remove organic material before it enters stormwater.
2. **Construct additional water quality assets**, such as wetlands, to filter pollutants from stormwater.
3. **Improve residents' gardening practices**, with a focus on managing leaf and grass litter and reducing excessive fertiliser use.
4. **Improve maintenance of existing water quality assets**, ensuring they operate at maximum effectiveness.
5. **Strengthen research and monitoring**, including real time sensors and evaluation of options for managing lake sediments.
6. **Trial anti algal technologies** to rapidly respond when blooms do arise.
7. **Appoint First Nations rangers** to support cultural connection and contribute to on ground catchment management.

The initial focus will be on shifting how leaf and grass litter and fertilisers are managed by government, residents and businesses. Implementation of management options will need to be staged, both for practical reasons and to verify their effectiveness before they are applied more widely across the catchment.

Ongoing research and development will aim to expand the management options available to government to reduce pollution and to refine existing options to maximise their effectiveness and cost-effectiveness. The mix of management options deployed to solve the problem will be reviewed periodically. The program may adopt new and potentially more effective options for mitigating phosphorus pollution or treating algal blooms that emerge from research and development, trials or First Nations co-management.

# Introduction

Lake Tuggeranong currently experiences frequent blue-green algal blooms and periods of elevated faecal bacteria levels. In the past decade the lake has been closed for an average of 3 months a year during the warmer months due to the blue-green algal blooms.

This plan focuses on addressing the problem of algal blooms in the lake. Algal blooms present health risks to people, pets and wildlife and contribute to a large proportion of lake closures. Severe blooms have significant visual and odour impact on the community. Future plans will tackle the management of faecal bacteria levels.

This plan supplements the report on Options for restoring Lake Tuggeranong (the Options Report, ACT Government, 2025a) and should not be considered in isolation. This plan draws on the information contained in the Options Report and public feedback to the report to present the government's plan to tackle the problem of algal blooms in Lake Tuggeranong.

## Aims

This plan outlines catchment and lake management strategies that aim, within 10 years, to:

- prevent lake closures due to algal blooms in 3 out of 4 years, on average
- ensure that when algal blooms do arise, they are short-lived and managed safely.

## Vision

The 10-year vision is by 2035, Lake Tuggeranong is more consistently free of blue-green algal blooms and, when they do occur, they are short-lived so the Tuggeranong community can enjoy the lake most of the year.

# Background

## Overview of Lake Tuggeranong and its catchment

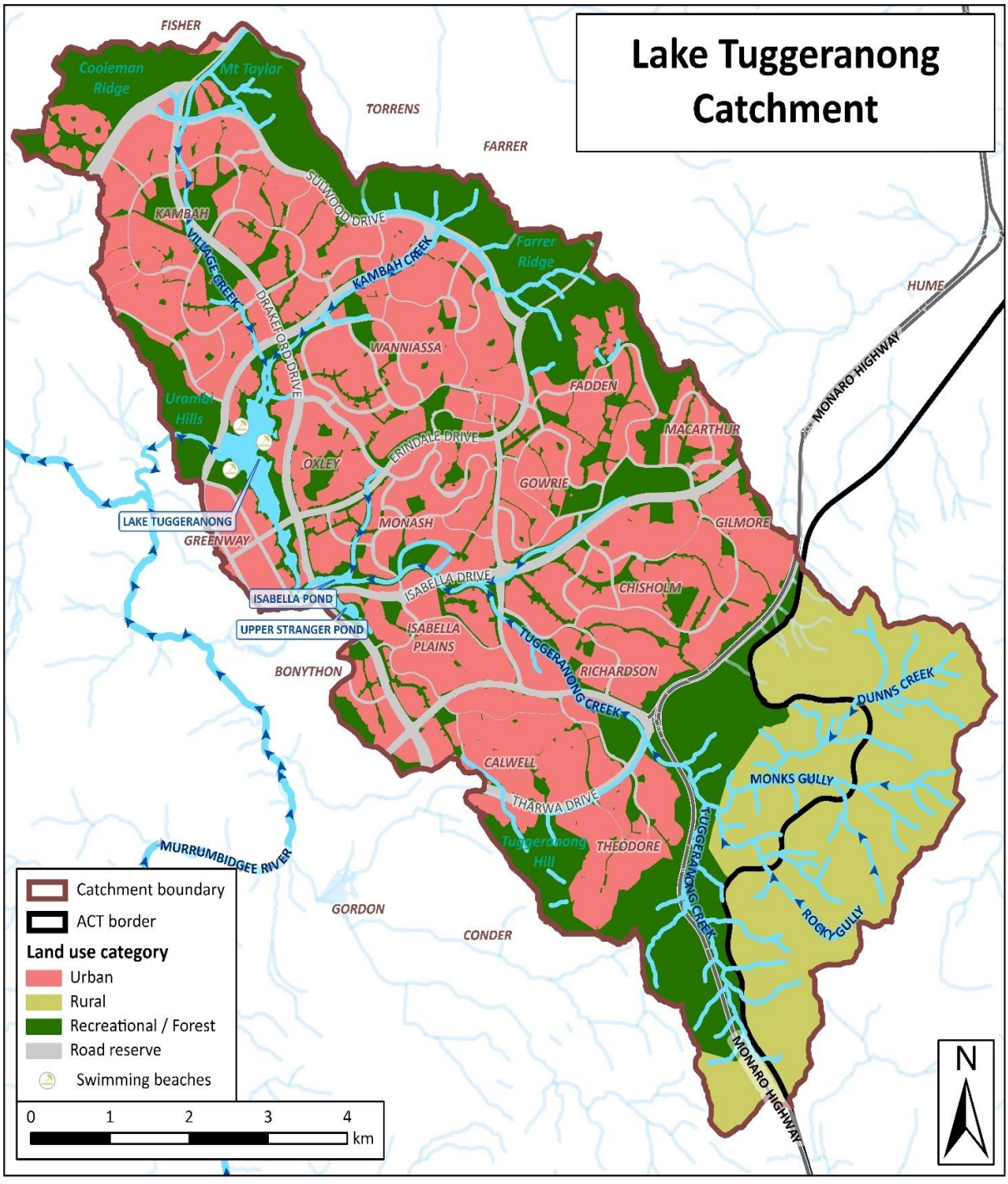
There is a rich history of Aboriginal use of the Tuggeranong valley and its waterways, with evidence of the Ngunnawal people occupying the valley for more than 20,000 years. The name 'Tuggeranong' comes from a Ngunnawal word for 'cold place' or 'cold plains'.

Sheep and cattle stations were established in Tuggeranong in the early 1800s. Suburban development started in the 1970s, with around 50% of the water catchment now urbanised. Lake Tuggeranong was built in 1987 as a focal point for the growing town centre and to protect the downstream Murrumbidgee River from the water quality effects of urban development. Around the same time, a stormwater system was built to manage flood risk by converting natural creek lines such as Tuggeranong Creek into concrete channels.

Three major tributaries deliver inflows to Lake Tuggeranong, as do several minor drains (Figure 1, below): Kambah and Village creeks in the north drain a fully urban area; and Tuggeranong Creek in the south drains urban and rural areas. Tuggeranong Creek runs through a series of settling ponds to improve water quality—Isabella Pond then Lake Tuggeranong wetlands—before discharging into Lake Tuggeranong.

Lake Tuggeranong has an area of 57 hectares, an average depth of 2.9 metres, a maximum depth of 12.2 metres and a volume of 1,790 megalitres at normal water levels. Inflows range between 3,000 and 18,000 megalitres per year, with an average of 9,000 megalitres per year. The lake experiences summer mean minimum and maximum temperatures of 13.6 to 28.1°C and winter mean minimum and maximum temperatures of 0.7 to 14.4°C. Persistent temperature stratification of the water column (i.e. a stable warm layer of water at the lake surface) commences in November or December and extends into March.

***Figure 1:*** *Lake Tuggeranong catchment, showing its tributaries. The lake discharges into a short section of Tuggeranong Creek via an outflow channel and weir at the west corner of the lake. This creek then flows into the Murrumbidgee River.*



## The problem

The Options Report established that, in common with other inland lakes in Australia and around the world, elevated levels of phosphorus in Lake Tuggeranong are driving blue-green algal blooms. Other factors like climate and the morphology or shape of the lake also contribute to algal blooms but are beyond the control of water managers.

Phosphorus is generated from many diffuse sources across the urban catchment of Tuggeranong such as leaves, grass clippings, fertiliser products (including composts and manures), soil and sewage. Roughly half is in a dissolved form that is readily taken up by algae. There is currently far more phosphorus entering the lake from its catchment than is released to the water column from lake-bottom sediments.

Lake Tuggeranong has experienced elevated plant nutrient levels (e.g. phosphorus, nitrogen) for more than 10 years, which has contributed to frequent blue-green algal blooms. The blooms smell unpleasant, are unsightly and require the government to close Lake Tuggeranong to activities such as swimming and water sports due to health risks (ACT Health 2014; NHMRC 2026). The blooms pose risks to people, pets and local wildlife that come in contact with lake water. They may also pose health risks to residents of suburbs surrounding the lake who are exposed to aerosolised lake water on windy days.

Residents' proximity to 'blue' spaces correlates with increased physical activity, lower obesity and improved mental health and wellbeing (Smith et al. 2011, Britton et al 2020), but algal blooms limit the potential for Lake Tuggeranong to provide these wellbeing benefits.

Furthermore, given waterbodies reduce local urban heat island effects (Tapsuwan et al. 2024), fewer days of lake closures and smelly, unsightly algal blooms will enable greater use of Lake Tuggeranong and its surrounding parklands, which are cool refuges on extreme heat days, helping to lower risk of heat stress.

Constructing more raingardens and other wetlands will fulfil two purposes. Their primary purpose is to help prevent the pollution that drives algal blooms. Their secondary purpose is to provide wellbeing for residents through their strong amenity, recreation and cooling benefits.

## Community values

Tuggeranong residents have consistently expressed they want healthier waterways and a healthier Lake Tuggeranong, as exemplified below:

- 'Increase servicing for lakes, ponds and wetlands and the stormwater system' was the top recommendation of a Better Suburbs forum of Canberra citizens about the 14 service areas the ACT Government provides residents (ACT Government 2018).
- 'Better maintenance and improvement to the water quality of Lake Tuggeranong' was a strong theme during consultation for the Tuggeranong District Strategy (Communication Link 2023).
- Tuggeranong residents are willing to pay up to $280/pp/per year to greatly improve the amenity of Lake Tuggeranong (Natural Capital Economics 2023).
- 'All participants were consistent about the environmental challenges in the Tuggeranong area. All identified Lake Tuggeranong as poor quality, with lots of rubbish and a bad smell from the blue-green algae.' (Tuggeranong Community Council 2024 youth forum).
- 'All students noted how awful Lake Tuggeranong is, highlighted by comments like "`it's gross", "I wouldn't swim in it", "it stinks".' (Tuggeranong Community Council 2023 youth forum).

# Options Report and solutions

## Target for preventing pollution

Research presented in the Options Report shows that stormwater flowing off the Tuggeranong catchment before the Healthy Waterways program started, delivered an average of 1,656 kg phosphorus per year to the lake.

The seven constructed wetlands built in Stage 1 of Healthy Waterways have reduced this supply by about 214 kg a year (to 1,442 kg). The effects of the five extra assets built in Tuggeranong in Stage 2 of Healthy Waterways have not yet been modelled.

The modelling also shows that curbing the supply of phosphorus to the lake by a further 50%, around an additional 700 kg a year (the most that can practically be achieved), can significantly reduce blue-green algal blooms. Once this target is achieved, the lake will no longer be primed for algal growth in an average of three out of four years; any algal blooms that do arise can be prevented or will be less severe and quickly cleared through in-lake actions.

For most of the year, and in most years, the lake should be available for contact-based activities.

## Management options to reach the target

It's possible to remove phosphorus from the system, or to treat algae directly, at 3 stages during the 'journey of the stormwater' (Figure 2).

The Options Report examined a subset of 10 management options and variants of options in detail (Table 1). These were not the only options available to solve the problem but were chosen because their costs and effectiveness could be well characterised based on local trials or the scientific literature.

How effective these options would be depends on their level of implementation, correlating to level of investment. For example, for street sweeping, the lowest investment level reflects a frequency of once a month, and the highest investment level reflects weekly sweeping. Analyses of the benefit (or effectiveness) of investment in the different levels of implementation of each of the management options (Figure 3) clearly show that the most effective options for reducing phosphorus pollution are an increased frequency of street sweeping and building extra water quality assets.

However, no single option was found to be a 'silver bullet' or perfect solution with the potential to reach the phosphorus mitigation target on its own.

***Figure 2:*** *Conceptual model showing where targeted interventions can address algal bloom problems.*

**There are 3 points in the 'journey of stormwater' where phosphorus may be removed or algae treated directly.**

**1. At the sources of phosphorus pollution,** by preventing nutrient pollution from occurring in the first place

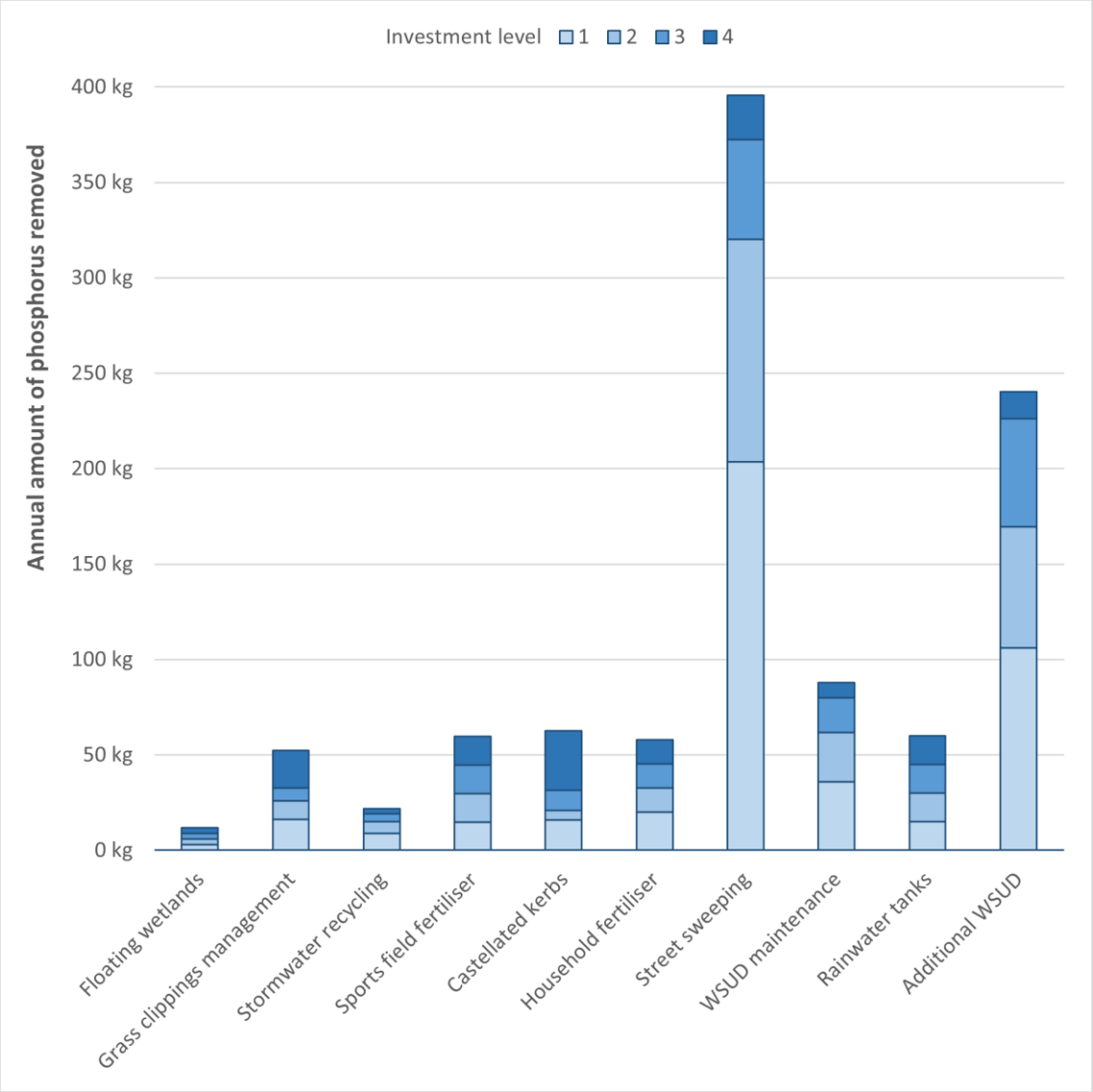
**2. Within the stormwater system,** by slowing the flow of water and allowing it to be filtered naturally by wetlands and/or to seep slowly back into the landscape where it is naturally cleansed.

**3. In the lake,** using anti-algal technologies that either compete with algae or treat the algae once it grows to bloom proportions.

***Table 1. Options considered by Booksmythe et al. (2024) to reduce phosphorus pollution of stormwater.***

| Option | Description |
|---|---|
| Street sweeping | Increase the amount of street sweeping in the catchment to remove more organic material from the roads, preventing it from leaching phosphorus into the stormwater drains.<br>The investment level reflects sweeping frequencies of 12 to 48 sweeps per year. Other ways to optimise street sweeping regimes have yet to be evaluated. |
| Fertiliser management | Identify and target the relatively small number of households that use excessive amounts of fertiliser to help them use either low-phosphorus fertiliser or no fertiliser at all.<br>The investment level reflects the reach of the program. |
| Open space mowing | Reduce the amount of grass clippings from municipal mowing that end up on the road, preventing clippings from leaching phosphorus into the stormwater drains.<br>The investment level reflects different management approaches, from having designated street sweeping trucks following mowers to towing electric blowers behind mowers to divert clippings from the road. |
| Rainwater tanks | Capture stormwater from roofs for reuse on residential blocks. This may help remove some phosphorus in the system as well as reduce urban runoff.<br>The investment level reflects the number of houses that would have a tank installed. |
| Stormwater recycling | Divert and filter stormwater to storage tanks at sports fields for use in irrigating the fields.<br>The implementation level reflects the number of sports field sites at which water managers install this infrastructure. |
| Castellated kerbs | Retrofit road kerbs to 'castellate' them; that is, have more outlets in the kerb so some stormwater can be diverted to open green space where it filters into the ground.<br>The investment level reflects the number of outlets installed (water managers are limited by availability of suitable places in the Tuggeranong catchment; that is, areas adjacent to green space). |
| New water quality infrastructure—sports fields | Build swales around sports fields to potentially capture phosphorus leaching out from fertiliser. Sports field managers currently appear to be fertilising optimally, and the leaching may be more a legacy issue.<br>The investment level reflects the number of sports field sites at which water managers install this infrastructure. |
| New water quality infrastructure | Construct more wetlands in the catchment to filter out phosphorus in the stormwater.<br>The investment level reflects the number of wetlands constructed, ranging from the two most effective builds to the ten most effective builds. |
| Maintenance of existing water quality infrastructure | Ensure maintenance of existing water sensitive urban design infrastructure in the catchment (such as dredging out built-up sediment and harvesting plants) to maximise the lake's performance and capture the largest amount of nutrients possible.<br>The investment level reflects the number of assets maintained. |
| Floating wetlands | Install more floating wetlands on Lake Tuggeranong to draw phosphorus out of the lake water.<br>The investment level reflects the number and size of wetlands installed. |

***Figure 3:*** *Benefit (or effectiveness) of different levels of investment in ten phosphorus pollution mitigation options. Each stacked histogram represents the incremental benefit of 4 levels of investment in each option (source: ACT Government 2025a).*




When pollution mitigation options are implemented concurrently, some options partially offset the beneficial effects of others. For example, having a dedicated street sweeper follow mowers of road verges would diminish some of the effect of street sweeping suburbs 36–48 times a year.

Dey et al. (2024) used the catchment water quality model to model this interactive effect and found that it reduces the total phosphorus removed by approximately 30%. However, the Options Report concludes that the 700 kg/year pollution reduction target can still be met by adopting multiple management options, refining existing measures to improve their effectiveness and developing new options to help managers achieve the target.

Water managers will need to implement multiple management options to achieve the pollution mitigation target for phosphorus. Notably, the Options Report stresses that focusing on pollution mitigation options that prevent stormwater getting polluted in the first place is the priority to substantially reduce the frequency of blue-green algal blooms.

## Community feedback on options

In late 2025, the government sought community feedback on the Options Report (discussed further below) and an associated summary through its YourSay Conversations website and associated community engagement.

The government received 443 items of feedback. Community concerns centred around the presence of pollution, the smell of the lake, the impact of poor lake health on the health of people and pets, and on lake closures that prevent the community using or accessing the lake. The listening report from this community engagement (ACT Government 2025b) is available via a link below or at Options to restore Lake Tuggeranong | YourSay ACT.

The engagement found community support for the government to take action to improve the health of Lake Tuggeranong through 4 priorities:

- Better public-space leaf management by government
- Strong support for household action
- Greater awareness and education for the public
- Community programs to support action.

# Plan to reduce pollution and algal blooms

## Options to implement

Drawing from the above management options and community feedback, the government will implement the following in Tuggeranong.

1. Expand street sweeping (including having sweepers follow behind verge mowers).
2. Build several more water quality assets.
3. Improve residents' garden practices (comprising both fertiliser use by residents and residents' management of leaves and grass).
4. Improve arrangements to maintain water quality assets.
5. Strengthen research and monitoring.
6. Trial anti-algal technology.
7. Appoint First Nations rangers.

### 1. Expand street sweeping

Street sweeping is by far the most effective and cost-effective mitigation measure, decreasing phosphorus by 200–400 kg per year, depending on the frequency of sweeps (Figure 3). Optimising the program for frequency of sweeps, seasonality and targeting of streets with more trees will increase its benefits.

This option will include a sub-program to sweep up grass clippings from government mowing of road verges to prevent them from entering drains.

### 2. Build several more water quality assets

Constructing more water quality assets will decrease phosphorus by 100–200 kg per year depending on the scale of the wetlands and other water quality assets already in the system. This is the second biggest impact of any management option examined (Figure 3) but is not as cost effective as street sweeping.

### 3. Improve residents' gardening practices

This option combines 2 presented above: residents' use of fertiliser and their management of leaf and grass litter. The cost-effectiveness of improved fertiliser management is understood. In contrast, the benefits, and therefore its cost-effectiveness, of residents' management of leaves and grass cannot yet be quantified for comparison with other options (ACT Government 2025a). However, implementation of the option is justified since, even with enhanced street sweeping arrangements, leaves will accumulate on road verges in between sweeps. This matters because leaves lose 50–90% of their phosphorus content in the first wetting event (i.e. first storm) and 90–100% after the second storm wetting (Ubrihien et al. 2025). If it rains in between sweeps, much of the phosphorus contained in the leaves will already have been washed into the stormwater system and ultimately transported to the lake.

Also, even as the street sweeping program is optimised, for example by reducing sweeping in streets with fewer trees to improve cost-efficiency, those streets will still accumulate some leaf litter. Improving residents' gardening practices will reduce the resulting impacts on stormwater quality.

To support better management of leaf and grass litter by residents, educational activities will build awareness that fallen leaves on pavements are polluting litter that, like rubbish, should be recycled or otherwise properly disposed of by residents. Mechanisms like leaf bags, extra green bins, and/or community disposal points will help residents adopt new practices. Options to facilitate community leadership and stewardship will build momentum for changed gardening practices.

The focus on fertilisers is fundamentally different. The vast majority of residents use little or no fertiliser, while a minority apply fertilisers greatly in excess of what is required for plant growth (ACT Government 2025a). Heavy use of fertilisers may exceed the capacity of plants and soils to take up the nutrients. This creates a heightened risk that the fertilisers leach into stormwater. The fertiliser program will focus on transitioning heavy fertiliser users to lower, more responsible users of fertilisers, saving them money and effort in the process.

### 4. Improve maintenance of water quality assets

This option will increase the focus on the operation and maintenance of the 12 ponds, raingardens, wetlands and other water quality assets built across Tuggeranong through the Healthy Waterways program so they function at close to 100% of potential capacity at all times.

This program will include maintenance and upgrades to gross pollutant traps so the wetlands and other water quality assets in the catchment and the lake itself are protected from excessive organic inputs.

### 5. Strengthen research and monitoring

Ongoing research and development are critical to expanding the management options available to government and to refining existing options to maximise their effectiveness and minimise their costs.

Currently, the highest research priorities are to:

- investigate the fate of fertilisers applied to residents' blocks so the importance of preventing that pollution source can be better understood
- determine whether sewer cross-connections with stormwater, or tree roots penetrating wastewater pipes, are a significant cause of elevated phosphorus in stormwater.

Refinement of the 7 management options is also a priority and will occur both via the monitoring and evaluation activities described above and from some applied research.

Water quality monitoring is vital, but current methods are generally labour intensive so very expensive and not very timely. Water samples must be taken, processed, sent for analysis, analysed and reported, which can take days or weeks. The government is coinvesting with other jurisdictions in the research and development of sensors for water quality that will be less expensive to deploy and will be able to provide real-time data on levels of phosphorus, blue-green algae and algal toxins within Lake Tuggeranong.

Over time, as the level of pollution entering the lake from the catchment drops, the pollutants stored within lake sediments will become of greater concern. In the coming years there will be a need for research into ways to manage the flux of nutrients between the sediments and water column of the lake. Some of the approaches and products for reducing phosphorus levels in stormwater before it enters Lake Tuggeranong also offer promise for managing phosphorus released from lake sediments.

### 6. Trial anti-algal technologies

Algal blooms probably cannot be prevented entirely, and the analyses carried out in the Options Report suggest the best that can practically be achieved is to avoid algal blooms in an average of 3 out of 4 years.

With less pollution entering the lake, it is possible that the duration and intensity of blooms that do arise will be less and their impacts can be managed through short lake closures. The government may also consider ways to treat algal blooms as they arise in the years when conditions permit their

formation. These may range from products that draw phosphorus out of the stormwater, to those that compete with harmful blue-green algae (e.g. diatoms or harmless species of bacteria), or are toxic to blue-green algae but not to beneficial biota.

Anti-algal technologies will be trialled in the Tuggeranong context, to understand potential effectiveness and provide confidence that it can be used without having adverse unintended ecological impacts.

### 7. Appoint First Nations rangers

An outcome aspiration in the ACT Water Strategy 2025-2045 is that "Traditional custodians and the ACT Government work in partnership to support healthy catchments and waterbodies". This option, to appoint First Nations rangers, supports this aspiration. The benefits of this have not been quantified in dollar terms but are consistent with commitments made by the ACT Government in the National Agreement on Closing the Gap and the ACT Aboriginal and Torres Strait Islander Agreement 2019–2028.

The responsibilities of First Nations rangers will be co-designed throughout the life of the plan. This approach will enhance the wellbeing of local First Nations residents by supporting their connection to Country and waterways within urban areas.

## Excluded management options

Several management options will not be implemented at this time due to low cost-effectiveness (ACT Government 2025a):

- Sports field fertiliser management
- Installing floating wetlands
- Stormwater recycling for irrigation
- Household rainwater tanks.

Some of these measures may prove to be effective pollution-mitigation options in the future, once alternative approaches are explored.

## Staging of implementation

A key finding in the Options Report is the need to prevent stormwater from getting polluted in the first place.

Removing pollutants once they are in stormwater is difficult as most pollutants move quickly from impervious surfaces to the lake. This fast movement leaves little opportunity for green spaces or constructed wetlands to capture and treat the water before it reaches the lake. This is exacerbated during heavy rain when high flows are generated. Removing pollutants once they are in the stormwater system is also expensive.

Preventing stormwater pollution will require a significant shift in how leaf and grass litter—and fertilisers—are managed by government, residents and business. Changes to practices can take time, so pollution prevention should be an early focus of the waterway management program.

Implementation of the 7 options described above will need to be staged, both for practical reasons and to confirm the efficacy of management options before they are widely applied. For example, expanding the street sweeping program from 2 sweeps a year to, possibly, 12 sweeps will require significant logistical planning. Staged implementation will be a useful way to ensure the expansion is done in a safe and cost-effective manner.

Expanding the sweeping program in some Tuggeranong sub-catchments before others will allow for monitoring of water quality to test whether the predicted improvements are occurring before further investment is made to expand the program across most, or all, of Tuggeranong.

## Monitoring impacts of actions

Four elements of this management program will be monitored.

1. **Effectiveness of individual management options.** The performance of all management options that are implemented, including in trials, will be monitored to enable their evaluation. This approach is consistent with previous practice, which enabled the quantification of the costs and benefits of the 10 options for mitigating pollution and preventing algal blooms, as detailed in the Options Report.
2. **Progress on mitigating phosphorus pollution**. The amount of phosphorus entering the lake will be monitored to estimate how effective the interventions are. Flow gauges and autosamplers have already been installed in major tributaries of the lake, enabling continuous measurement of both flow and phosphorus concentrations. These data will allow comparison between the observed phosphorus inputs and:
    - the expected incremental improvement in water quality from the investments in this plan (predicted through water quality modelling)
    - the phosphorus mitigation target of 700 kg per year.
3. **Progress on solving the problem of lake closures from algal blooms.** The frequency and intensity of algal blooms will be monitored through records of lake closures. The Environment Protection Agency collects data on the number of days the lake is closed due to blue-green algae; this will be used as an overall indicator of program performance. If the program is effective, the incidence and duration of algal blooms should drop over time. It is important to note, however, that:
    - there will be significant year-to-year variation in pollution levels related to climate
    - impacts on lake closures are expected mainly in the later stages of the investment as the collective effect of actions to reduce pollution approaches the target of mitigating 700 kg of phosphorus per year.
4. **First Nations engagement**. The effectiveness of the First Nations Ranger program will be assessed by consulting with local elders from Ngunnawal families and other First Nations families with connections to the ACT.

## Reviewing and refining the approach

To succeed, the program to restore the health of Lake Tuggeranong will require ongoing collaboration between government, residents and businesses. It will employ an adaptive management process. Evaluations of individual management options will be used to refine their implementation, with the dual objectives of decreasing their cost and increasing their effectiveness.

The mix of management options deployed to solve the problem will be regularly reviewed. New and potentially more effective ways to reduce phosphorus pollution or treat algal blooms may emerge from research and development, trials or First Nations engagement and may be adopted as a part of the program, subject to approval by the project governance body. The new options may replace existing ones that are less cost-effective.

Stakeholder engagement will influence the mix of management options over time. The community's understanding and experience of the catchment and the implementation of the options is important

in decision making; for example, if an option needs to be dropped if it has unintended negative consequences.

The effort and cost of some options will be relatively steady and recurring over time, for example street sweeping. The effort required for other options will vary over time, for example:

- the construction of water quality assets has large up-front effort, followed by lower ongoing costs for operation and maintenance
- programs to improve residents' gardening practices are characterised by high up-front effort as the programs are rolled out and supported by residents, followed by less effort as campaigns are refreshed or the messages in the program are periodically reinforced.

To ensure that lessons learned from the first 4years of implementation are incorporated, the plan will be formally reviewed in 2030 and government approval sought for any changed approaches to implementation or investment.

# Conclusion

The Healthy Waterways Plan for Lake Tuggeranong sets out a clear and achievable pathway to significantly reduce the frequency and severity of blue-green algal blooms.

Algal blooms can be prevented in 3 out of 4 years, on average, through a targeted combination of pollution-prevention options, improved maintenance of water quality assets, community behaviour change activities, First Nations partnership and ongoing research and monitoring. Together, they are expected to reduce phosphorus inflows by up to 700 kg per year.

While algal blooms cannot be eliminated entirely, the coordinated actions in this plan will mean any blooms that do occur are shorter, less intense and manageable through short-term responses or emerging treatment technologies.

Achieving long-term improvement will require sustained effort, adaptive management and collaboration between government, residents, businesses and First Nations partners. As pollution entering the lake decreases and monitoring data is used to refine actions, Lake Tuggeranong will increasingly become a healthier, more reliable recreational and environmental asset for the Tuggeranong community.

Overall, this plan provides a robust, decade-long program designed to restore the health and amenity of Lake Tuggeranong and deliver lasting benefits for the community and the environment.

# References


ACT Government (2018) Have your say on city services for better suburbs statement 2030.

ACT Health (2014) ACT Guidelines for Recreational Water Quality.

ACT Government (2025a) Options for restoring Lake Tuggeranong.

ACT Government (2025b) Listening Report – Restoring Lake Tuggeranong Community Consultation

Booksmythe, I, Dey S, Stewart J, Kahn AT, Starrs, D (2024). Lake Tuggeranong Catchment Management Options Assessment: Technical report supporting the Lake Tuggeranong Healthy Waterways Plan. Report to the ACT Healthy Waterways Program. ACT Government.

Britton et al (2020) Blue care: a systematic review of blue space interventions for health and wellbeing

Communication Link (2023) Planning System Review and Reform Project Listening Report.

Communication Link (2026) Restoring Lake Tuggeranong: Community Consultation Report. Report to the ACT Healthy Waterways Program, ACT Government, February 2026.

Dey, S, Stewart, J, Kahn, A, Booksmyth, I & Starrs, D (2024). Lake Tuggeranong Catchment Model Technical Report: Configuration and Calibration of the Water Quantity and Quality Model. Report to the Healthy Waterways Program, Environment, Planning and Sustainable Development Directorate, ACT Government.

Natural Capital Economics (2023) Economic values of ACT Urban Lakes. [Navigate to Water Research/Research priorities/Social values and behaviours]

NHMRC (2026) Australian Recreational Water Quality Guidelines: Public consultation draft. January 2026. National Health and Medical Research Council.

Smith et al (2021) Urban blue spaces and human health: a systematic review and meta-analysis of quantitative studies.

Tapsuwan, S, Ingleton, G & Capon, T (2024). Measuring the cooling benefits of living infrastructure in urban Canberra: a report of findings. Canberra.

Tuggeranong Community Council 2023 and 2024 youth engagement forums

Ubrihien, R., Lekammudiyanse, M. U., Gettongsong, T., Wei, M., Maguire, A., Fluke, M., O'Connell, J., Tschierschke, A., Cross, Y., Buckingham, W., Pournajaf, N. and Dyer, F. (2025). Lake Tuggeranong and Catchment Research: Leaf and Grass Contribution.


ACT
Government


ACT Healthy
Waterways