Lake Hood update

HPPOA AGM
7 August 2025

Ashburton
DISTRICT COUNCIL

3 Topics

1. Update on operations of the lake over past 12 months
2. Health warnings and lake closure
3. Hydrodynamic model with water quality/cyanobacteria study and trials (Prof Susie Wood)

Past 12 months

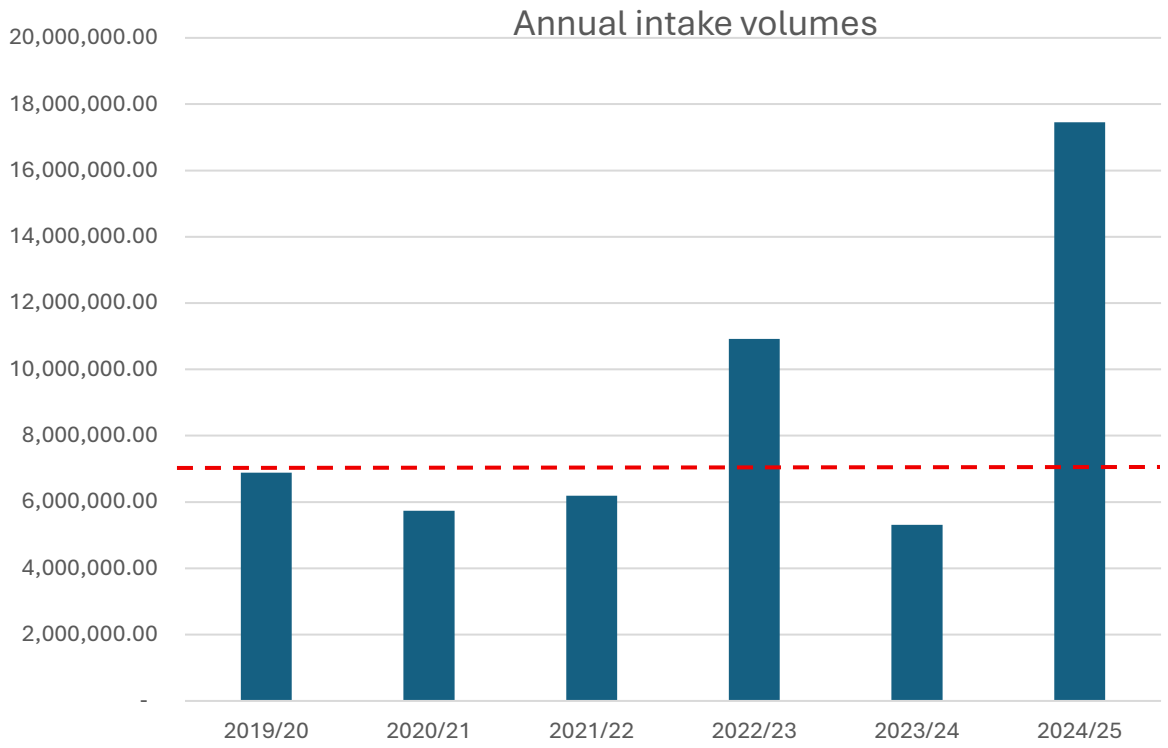
1. Weed harvester from November 2024 - March 2025. Removed **1,100 tonnes of weed**
2. Extra channel constructed with concrete diversion structure. Diverted approx. **80% water to NW canals**. Extra channel constructed at end of water-ski area. Weed harvester used to assist with water flow
3. Cooler weather, good river flows and additional water from RDR. Easterly winds big assist. Used bore water when flows reduced and temperatures increased.

Water flow restrictions:

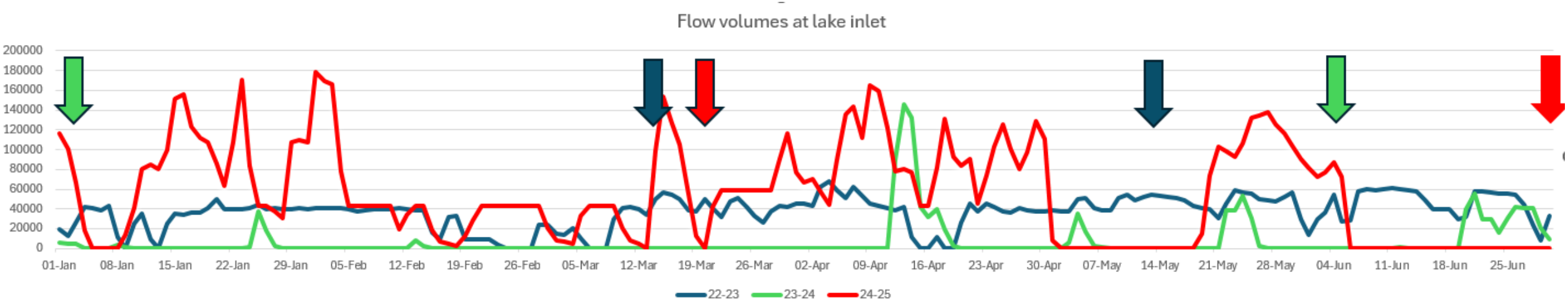
- Take is based on river flow at Ashburton SH1 bridge (24hr delay)
  - Below 6 m^3/s = no water take
  - 6 m^3/s - 8.5 m^3/s = 0 - 100 l/s (stepped reduction as river drops)
  - 8.5m^3/s - 15m^3/s = 500 l/s take
  - Above 15m^3/s = 2.5 m^3/s take

- Condition of intake structure
- Dirty water
- Weir level (consenting issues)


Monthly water volume at river intake
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
-
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
20-21
21-22
22-23
23-24
24-25



	Annual Intake Volumes	
2019/20	6,884,246.00	m3
2020/21	5,736,296.80	m3
2021/22	6,193,373.40	m3
2022/23	10,923,034.00	m3
2023/24	5,315,642.30	m3
2024/25	17,458,743.50	m3

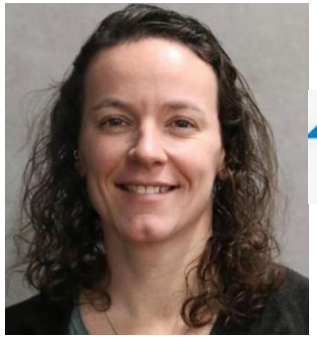


Health warnings

16 March-15 May 2023 (91 days)
5 January-7 June 2024 (153 days)
20 March-4 July 2025 (106days)

- Council engaged Tonkin & Taylor to assist with future planning for the lake (August 2024-December 2024)
- Meeting with Environment Canterbury regarding non-consumptive take – further work required on improving quality of water discharged before application can be lodged
- All Lake Hood consents expiring in 2031 – need to start preparing for new consents

- Cyanobacteria appeared in March/April
- Need to engage scientists and qualified experts to provide advice on water quality and cyanobacteria, to assist with water quality management



- **Professor Susie Wood** – world expert on toxic cyanobacteria who has been involved with developing recreational and drinking water guidelines for cyanobacteria in New Zealand.
- **Dr Aidan Jabbari** – Earth Sciences New Zealand (previously NIWA). Lake ecological modeller
- **Stephanie Koviessen** – Team Leader Water quality, Environment Canterbury

Water sampling process and Health warnings

- *MfE New Zealand Guidelines for Cyanobacteria in Recreational Freshwaters*
  - Updated 2025
  - Creates alert level framework

- Health NZ/ECan: *Canterbury Recreational Water Monitoring and Response Protocol for Planktonic Cyanobacteria*
  - Updated prior to each summer
  - ECan monitor contact recreation sites across Canterbury weekly
  - Health NZ issue public health warnings based on alert level framework
  - Council obligated to follow health warning & install signage
  - Ongoing discussions with ECan/Health NZ to review for Lake Hood

- Council has purchased a Cyanofluor handheld device

Aerial imagery

January 2024

Map of testing locations

Health New Zealand
Te Whatu Ora

Health Protection
Te Mana Ora | Community and Public Health
National Public Health Service, Te Waipounamu

Figure 1. Alert Level Framework for planktonic cyanobacteria in recreational freshwaters

Extract from Aotearoa New Zealand guidelines for cyanobacteria in recreational freshwaters 2024

Alert level	Action
Surveillance Level (green mode) **Situation 1:** The cell concentration for toxin-producing cyanobacteria observed in Aotearoa (Cuspidothrix issatschenkoi, Raphidiopsis raciborskii, Microcystis spp and Nodularia spumigena)[a] are **< 500 cells/mL**, or **Situation 2:** The biovolume equivalent for the combined total of all cyanobacteria is **< 0.5 mm³/L.**	Undertake weekly or fortnightly visual inspections[b] and sampling of water bodies where cyanobacteria are known to proliferate between spring and autumn.
Alert Level (amber mode) **Situation 1:** The cell concentration for toxin-producing cyanobacteria observed in Aotearoa is;[a,c] Cuspidothrix issatschenkoi **500 to < 100,000 cells/mL** Raphidiopsis raciborskii **500 to < 5,000 cells/mL** Microcystis spp **500 to < 30,000 cells/mL** Nodularia spumigena **500 to < 10,000 cells/mL**, or **Situation 2: 0.5 to < 10 mm3/L** total biovolume of all cyanobacteria.[d]	Increase sampling frequency to at least weekly.[e] If possible, multiple sites should be inspected and sampled. If potentially toxic cyanobacterial taxa (see table A5.1) are present at levels ≥ 0.5 mm³/L, then consider testing samples for toxin-production genes[f] or cyanotoxins.[g] Notify public health staff. Consider erecting information signs.[h]
Action Level (red mode) **Situation 1:** Cell concentration thresholds for toxin-producing cyanobacteria observed in Aotearoa);[a,c] Cuspidothrix issatschenkoi **≥ 100,000 cells/mL** Raphidiopsis raciborskii **≥ 5,000 cells/mL**[i] Microcystis spp **≥ 30,000 cells/mL** Nodularia spumigena **≥ 10,000 cells/mL**, or **Situation 2: ≥ 10 mm³/L** total biovolume of all cyanobacteria,[d] or Situation 3: Cyanobacterial scums consistently present,[j] or Situation 4: Cyanotoxin concentration thresholds;[g] Anatoxins **≥ 60 µg/L** Cylindrospermopsins **≥ 6 µg/L** Microcystins / Nodularins **≥ 24 µg/L** Saxitoxins **≥ 30 µg/L.**	Continue monitoring as for Alert Level (amber mode).[e] Notify the public of a potential risk to human health (see section 5.5 for more information). Samples should be tested for toxin-production genes[f] or cyanotoxins[g] to continue growing our knowledge on toxin-producing cyanobacteria in Aotearoa.

The above list in ACTION mode is not an exhaustive list of all cyanobacteria species. The species listed are currently known to produce toxins. Other species may be able to produce toxins, but this is not yet proven. High level exposure to many cyanobacteria (even those that are not currently known to produce cyanotoxins) can cause respiratory irritations, skin rashes, and stomach discomfort, therefore toxin producing status is only one factor when interpreting results in ACTION mode. For more information refer to 'Section 2 Framework' in the Aotearoa New Zealand Guidelines for Cyanobacteria in Recreational Freshwaters 2024.
Please refer to the footnotes below 'Decision Chart 1' in the Aotearoa New Zealand Guidelines for Cyanobacteria in Recreational Freshwaters 2024 regarding the detailed rationale for ALERT and ACTION 'Situations', including further details on species specific information.

The Priority for ACTION has been discussed with ECan, and it is most likely that ACTION mode will be recommended based on either 'Situation 2' and/or 'Situation 3'.

Sample date	Location	Total cyano biovolume mm3/L	Notes
05/12/2024	Torbay Ave boat ramp	0.008	
09/01/2025	Bayliss Beach	0.5	
23/01/2025	Ski lane	6	Caution advisory on LAWA
30/01/2025	Ski lane	5	Caution advisory on LAWA
5/02/2025	Ski lane	3	Caution advisory on LAWA
14/02/2325	Ski lane	0.1	Caution advisory on LAWA
19/02/2025	Main Swimming Beach	2	Caution advisory on LAWA
27/02/2025	Lake Hood Canal, Lake Hood Drive Bridge	8	Caution advisory on LAWA
11/03/2025	Lake Hood Canal, Lake Hood Drive Bridge	7	Caution advisory on LAWA
20/03/2025	Lake Hood Canal, Lake Hood Drive Bridge	40	Warning issued on visuals (scum) before the lab results came through.
28/03/2025	Lake Hood at Torbay Ave boat ramp	60	Red based upon total biovolume and visuals. *Microcystis* present.
02/04/2025	Lake Hood Canal, Lake Hood Drive Bridge	3	Warning remains.
08/04/2025	Lake Hood Canal, Lake Hood Drive Bridge	5	Warning remains.
14/04/2025	Lake Hood Canal, Lake Hood Drive Bridge	4	Warning remains.
22/04/2025	Lake Hood at Torbay Ave boat ramp	50	Warning remains.
29/04/2025	Lake Hood at Torbay Ave boat ramp	40	Warning remains.
06/05/2025	Lake Hood at Torbay Ave boat ramp	2	Warning remains.
16/05/2025	Main Swimming Beach	4	Warning remains.
21/05/2025	Main Swimming Beach	1	Warning remains.
28/05/2025	Ski Lane	0.06	Warning remains.
06/06/2025	Main Swimming Beach	2	Warning remains.
13/06/2025	Main Swimming Beach	0.5	Warning remains.
19/06/2025	Lake Hood Road	0.006	Warning remains
26/06/2025	Main Swimming Beach	0.4	Health warning lifted

ADC Lake Closure

Timeline of 2025 events leading up to closure:

- 20 March: Health warning issued due to red alert level
- 25 March & 1 April: Public notification of ‘chemical poisoning in the environment’ of two people (swimmer and jet-skier)
- 2 April: Test results received - presence of microcystis (known toxic algae)
- 3 April: Consultation with Health NZ, Water Ski NZ, ECan
  - Concern over safety of visitors and stress on health services over Easter
- 3 April: Lake closed
- 15-20 April: Scheduled water-ski Nationals

ADC Lake Closure

Once closed:

- Thought we could re-open when health warning back to green (felt logical at the time)
- Green took much longer to achieve
- Ongoing closure became untenable
- 19 June 2025: Council re-opened Lake
- 4 July 2025: Health warning lifted, results back to Green
- 31 July 2025: Commenced review of closure process

Communication

- Council website
- Email newsletter
- HPPOA meetings