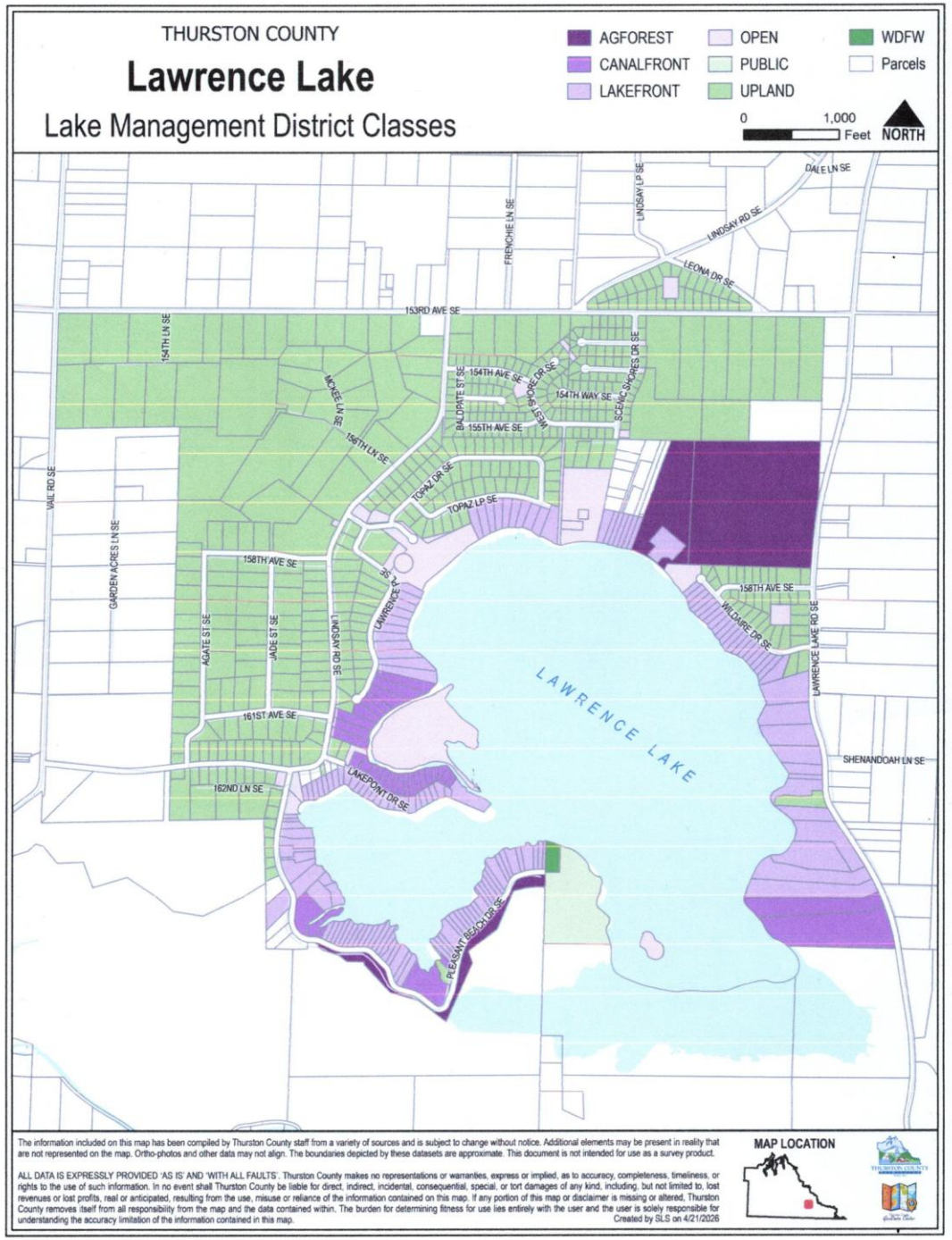
Lake Lawrence
Lake Management District
In Person Meeting
14 May 2026
6:30-8:30 p.m.

2027
Lake Lawrence LMD Boundary Map



AGENDA for 14 May 2026 LMD Meeting

- **Call to Order**
  - Introductions
  - Approval of Agenda
- Approval of 19 March 2026 Meeting Minutes
- **Public Communications**
- **Recuring/Continued Business: -** Janice
  - 2026 Budget as of May 2026
  - Work Orders/Purchases/Invoices
- **Old Business:**
- Lake Water Level & Floating Island Issue update – Frank
- Senate Bill S-3518.1 update – Barry
- Cyanobacteria Mgmt. Plan (CMP) update – Barry
- LMD Renewal 2027 Subcommittee Update – Barry/Janice
- Continuing Discussion of “SHALLOW WATER SIGNS” & Public Boat Launch Sign - update - Barry
- 2026 LMD Invasive/Nuisance Aquatic Weed/FWL/YFI Treatment Plan update – Barry
- 2026 Yellow Flag Iris Treatment Plan update – Barry
- 2026 Fragrant Water Lily Treatment Plan update/Recommendation – Barry
- 2026 Meetings & Survey Dates
- GRANT Funding update – Kim Farnes
- **New Business:**
- 16 April & 12 May 2026 Survey Results
- **Other Business:**
- Animals of Lake Lawrence
- **Good of the Order**
- **Adjourn**

Call to Order

- Introductions/Roll Call/Attendance
- Approval of 14 May 2026 Agenda
  - MOTION:
- Approval of 19 March 2026 Meeting Minutes
  - MOTION:

Public Communications

- Please mute yourself until you are recognized to speak.
- Please Choose the “raise your hand” option to address the committee. You will be promoted to a panelist when it is your turn to speak and be seen. To be seen, please turn on your camera. If you are dialing in, press *9 to “raise your hand.” Make sure you also choose *6 to unmute yourself.
- After you have made your comments please mute yourself.

Recurring/Continued Business

- Budget – Janice Leitzke
  - 2026 Budget as of end of May 2026
  - Work Orders/Purchases/Invoices (next slide)

Lake Lawrence Management District

Financial Report

	2026 Budget	2026 Actuals thru 5/14/2026	2026 Variance	2026 Actual Notes
REVENUE				
Penalties - Operating Assessment		74	74	Through 3/31/2026
Investment Earnings		4,033	4,033	Through 3/31/2026
Other Interest - Operating Assess.			-	Through 3/31/2026
Operating Assessment Charges	118,000	7,433	(110,567)	Through 3/31/2026
Algae Grant	25,000	35,084	10,084	$5,933 owed from Grant
Yellow Flag Iris Grant			-	
TOTAL REVENUE	**143,000**	**46,625**	**(96,375)**	
EXPENSES				
Administrative Rate at 5%	**5,900**	**561**	**5,339**	Through 3/31/2026
Nuisance Weed Program	80,000	31,025	48,975	Treat 34 acres @ $72k CLP4, $136.74 APAM permit, 1st treatment $30.888K
Algae Mitigation	210,000		210,000	
Cyanobacteria Mgmt Plan (CMP)	60,000	25,634	34,366	Herrera Contract of $93,287 ends 6/2026
Yellow Flag Iris	1,500		1,500	Treat in May
Lily Treatment	3,500		3,500	Will check in June/July if need treatment in Aug/Sept
Nutrient Testing	15,000		15,000	
Prof Svcs - Advertising	1,100	(144)	1,244	$144 reimbursement from 2023 to be corrected in 2026
Total Professional Services	**371,100**	**56,516**	**314,584**	
Supplies	125	1,046	(921)	Shallow water signs $1,046
Annual Meeting and Picnic	500		500	
Small Tools & Minor Equip	300		300	
Communications (Mailers)	1,290	272	1,018	$272 Treatment notice
Operating Leases/Rentals (LLCC)	60		60	
Website & admin technology	400		400	
Misc.	5,000	1,610	3,390	Renewal Expenses: $317 + $164 for public hearing ads, $1,073 for ballot mailing, stamps $55.52
Total Supplies & Operating Expenses	**7,675**	**2,928**	**4,747**	
TOTAL EXPENSES	**384,675**	**60,005**	**324,670**	
NET (Revenue-Expenses)	***(241,675)***	***(13,380)***	***228,295***	
Beginning Fund Balance		428,717		Awaiting confirmation from Thurston County
Ending Fund Balance		**415,337**		

Lake Lawrence Management District
Details of Financial Report

Expense Detail 05/12/26

Date	Amount	Account	Payee	Notes
Prior Year	$ (143.52)	Advertising	Correction for 2024	50% RFP ad in Dec 2023 s/b coded to Long Lake
11/13/2025	$ 210.35	CMP C-01	Herrera #60640R	Sept 27-Oct 31 2025, to be booked in 2026
11/13/2025	$ 2,869.13	CMP C-02	Herrera #60640R	Sept 27-Oct 31 2025, to be booked in 2026
11/13/2025	$ 107.14	CMP C-03	Herrera #60640R	Sept 27-Oct 31 2025, to be booked in 2026
11/13/2025	$ 320.70	CMP D-03	Herrera #60640R	Sept 27-Oct 31 2025, to be booked in 2026
12/5/2025	$ 55.52	Renewal expense	Barry Halverson	2 books of stamps and 4 certified Letters
1/5/2026	$ 317.20	Public Hearing-Renewal	CR Publishing #307914	AD#136069 for Jan 8 and 15th
2/13/2026	$ 6,091.33	CMP C-02	Herrera #61460	Jan 1-30 2026
2/13/2026	$ 191.99	CMP D-03	Herrera #61460	Jan 1-30 2026
3/4/2026	$ 1,072.82	Mailing ballots	Nisqually Print, #NPNP3080	Postage $305.55, Labor $126, Envelopes $393.82, Paper $156.17, Tax 91.28
3/1/2026	$ 136.74	Permits	Dept of Ecology	APAM Fee $136.74 (1/4 of $500 permit+16.96 Processing fee for 2026
3/20/2026	$ 4,930.30	CMP C-01	Herrera #61780	Jan 31,-Feb 27, 2026
3/20/2026	$ 250.92	CMP D-03	Herrera #61780	Jan 31,-Feb 27, 2026
3/31/2026	$ 560.81	TC Admin Overhead	Thurston County	Q1 2026
4/14/2026	$ 271.99	Chemical treatment notice	Nisqually Print, #NPNP3491	165 - stamps $128.70, handouts 89.10, Labor 42, tax 12.19
4/16/2026	$ 11,564.63	CMP C-02	Herrera #62017	Feb 28-Mar 27, 2026
4/16/2026	$ 117.85	CMP C-03	Herrera #62017	Feb 28-Mar 27, 2026
4/16/2026	$ 368.77	CMP D-03	Herrera #62017	Feb 28-Mar 27, 2026
4/30/2026	$ (1,388.42)	Pending credit	Invoice #62017 to be adjusted	Herrera will reissue invoice w/in budget
4/22/2026	$ 1,046.00	Supplies	Barry Halvorson	Concrete Mix $36.69, 3 shallow sater Signs $49.24, 6 mill 4x8 signs $961.07
4/20/2026	$ 164.45	Renewal	Nisqually News, #137016	Notice of Public Hearing
5/6/2026	$ 30,888.31	Aquatic Vegetation	AquaTechnex #21130	SonarONE
	$ 60,005.01	**Total Expenses per LLMD Financial report**		
	$ 46,397.38	Less items submitted but not confirmed by Thurston County		
	$ 13,607.63	**Total Expenses confirmed per Thurston County Q1**		

Work Orders/Invoices

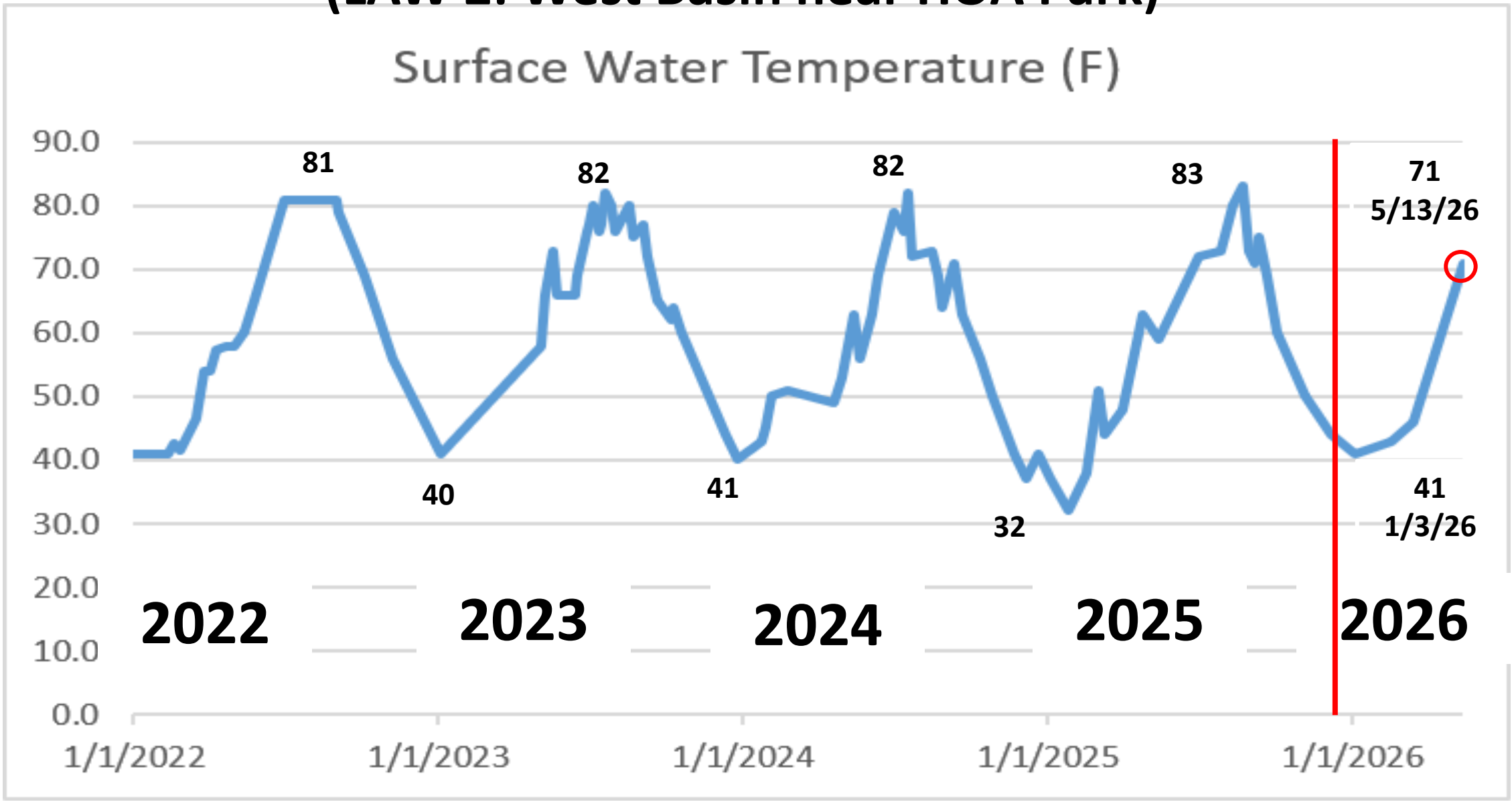
1. Notice of LMD Establishment published in Local Paper within 10 days of Ordinance creating LMD – Notice published by BoCC Clerk of the Board. Estimated cost is $320.00. Actual cost was $ _____
2. Notice of Public Hearing for Roll of Rates & Charges – Notice published by BoCC Clerk of the Commission. Est. Cost is $320.00. Actual cost was $164.45
3. Special Assessment Public Hearing Notification – **Quote = $1,000**. Send out 16 April 2026. Cost was $748.74.
4. Treatment Notification Card – **Quote $500**. Mailed 31 March 2026 cost was $271.99.
5. Weed Treatment – **Quote $71,308+/-** 34 Acres. Send WO to contractor March 15. Treatment Mid-April, Mid–May, and Mid-June 2026. 1st Treatment 30 April 2026 cost was $30,888.31
6. YFI Treatment - **$1,500**. 12-13 or 19-20 May 2026. Same cost as last year.

Items 1-6 are updates from February 2026 meeting.

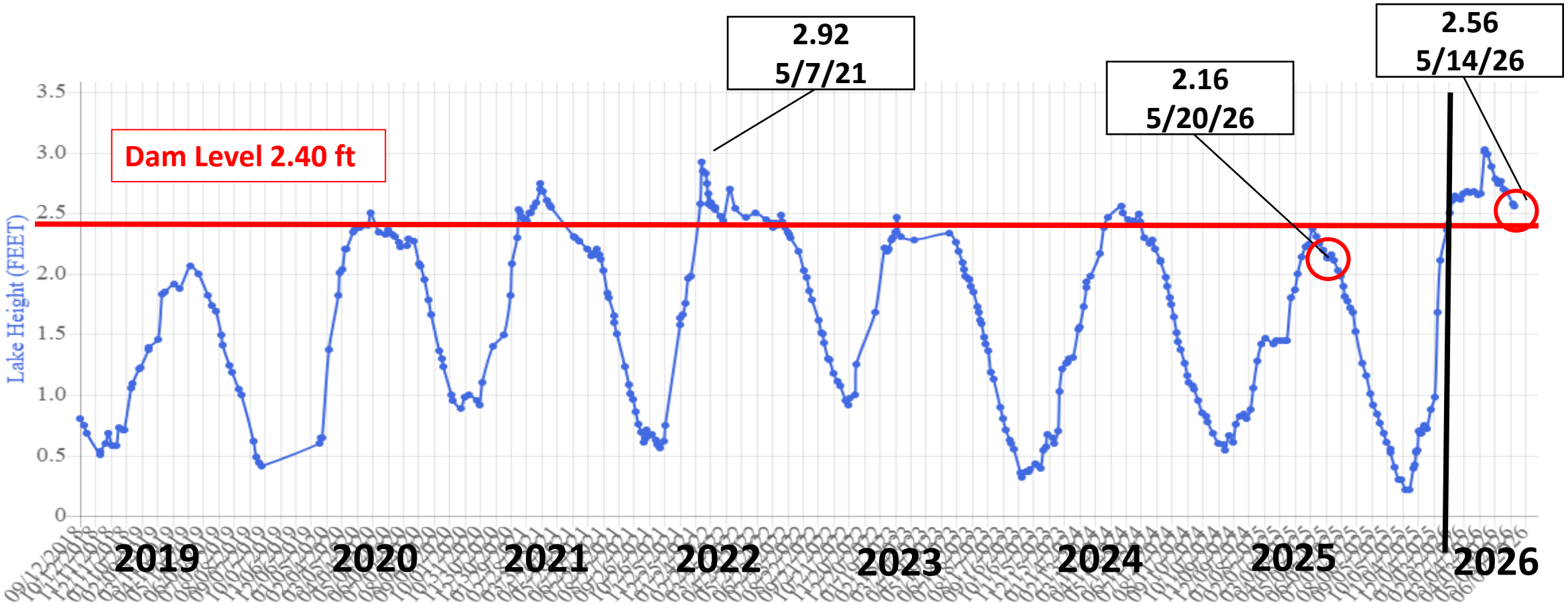
No new items to approve.

OLD BUSINESS

Lawrence Lake Surface Water Temperatures
(LAW 2: West Basin near HOA Park)

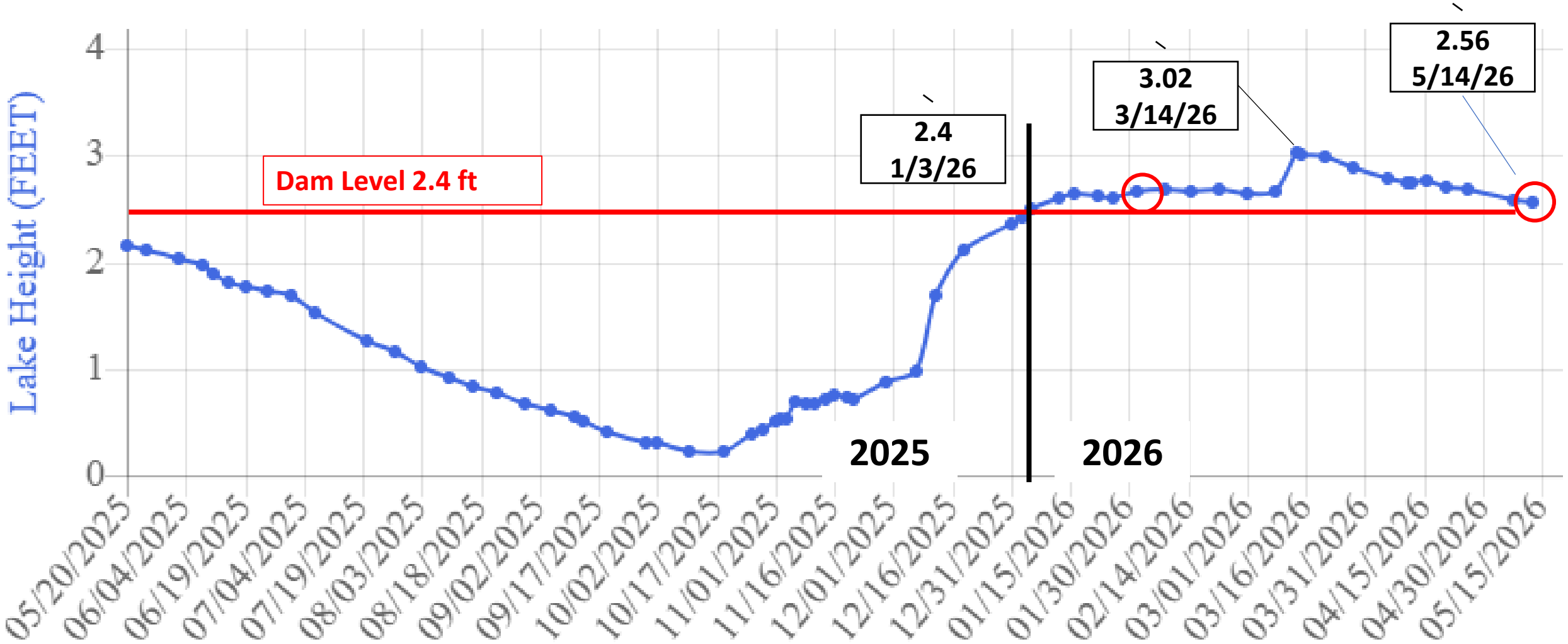


Lawrence Lake Water Surface Level
ref: https://liquidearthlake.website/gauge/scaleddetailsall/47



○ Lake levels on ~ 5/14/xx

Lawrence Lake Water Surface Level LAW 2
ref: https://liquidearthlake.website/gauge/scaleddetailsoney/47



Floating Island Issue

History retained for continuity.

Updated 5/13/26

Floating Mat Issue

Mat sighted May 2026. Location: northern shore of East Basin (~ 2’ x 2’)

Floating Mat Issue

Mat sighted September 2025. Location: western shore of West Basin (~ 8’ W x 60’ L x 5’ deep)

Floating Mat Issue: status

- 2022-2023 Numerous communications LMD/T-County/WA DNR/WA FW
- Oct 23 Site survey by boat: LMD/FW/DNR
- Dec 23 DRAFT Presentation vetted through Lawrence Lake LMD Steering Committee
- Dec 23 Presentation sent to State Representative Abbarno's Office
- 26 January 2024 Presentation to Rep Abbarno, FW/DNR
- April 24 Lawrence Lake's State Voting District change: Reps Wilcox, Barkis; Sen McCune
- 4 April 24 New floating mat discovered, towed and secured in protected cove
- 13 May 24 LMD Floating Mat Presentation to Rep Wilcox
  - Staff directed to contact State DNR leadership for follow-up action
- 1 July 24 Follow up action: Presentation to WA State Agencies:
  - Presentation Major Point: State Constitution: DNR has Jurisdictional Authority for lake bottom beyond High Water Mark
  - Attended: Departments of Ecology, Fish and Wildlife representatives
  - Did not attend: DNR, Hilary Franz – Commissioner of Public Lands (elected official)
- 3 Sep 24 ECY/DNR/FW meeting with Rep Wilcox staff
  - *Lake Lawrence eutrophication is a "natural process"*
  - "*Human influence might be a beneficial premise for a study*"
  - *Sediment removal is LMD responsibility*

Floating Mat Issue: status/update

- 28 Oct 24 LMD presented the Floating Island Issue to Army Corp of Engineers (ACE) federal regulatory representative Alexandra Hammond, Seattle District Office
  - Summary: *ACE is at the tail end of any process or planning for dredging etc but can assist with any required federal permits including EPA*

Current Status: May 2025

- Floating Island issue remains a safety issue for Lawrence Lake
  - New reported incident September 2025 "mudberg" lodged on western side of Western Basin (picture)
    - Mudberg disintegrated on its own
  - New floating mat May 2026 north shore of East Basin
- Presentations to Representatives Orcutt, Abarno negated by redistricting (20>2) Apr 2024
- Presentation to Representative Wilcox negated by Nov 2024 election/retirement
- State ECY/DNR/FW representatives assume no responsibility for the Floating Island Issue
- Federal ACE will only assist with federal "tail end" permitting (e.g., EPA)

Proposed actions for Steering Committee consideration

1. Tour Representative Marshall and ACE representative Hammond
2. Incorporate current Cyanobacteria lake study (contractor) findings/recommendations into presentation
3. Steering Cmte letter To: Commissioner of Public Lands, cc: BoCC, State Representatives: Barkis, Marshall

Senate Bill S-3518.1 Update

- 30 May DFW sent us a letter outlining their concerns
- 4 June sent email to WA LMDs to update their contact information
- 6 June sent DFW ltr and other info to WA State LMDs for their input by 14 Jun
- 14 June sent email to WA State LMDs with 2 dates for virtual mtg 19 & 20 Jun
- 19 & 20 June met virtually with WA State LMDs
- 24 June sent email with ltr to DFW addressing their concerns
- 30 Aug WALPA sent email – would like to be involved and support revision of RCW 36.61. Want to work with LMDs on changes. Waiting for date/time to set up mtg to discuss.
- 2 Sep sent email to DFW asking for a response – Responded that they will have an answer by mid-September.
- 18 Oct 2024 rec'd letter from DFW reiterating their position that the bill must include a change to the RCW regarding restructuring of public entity assessment fees in paragraph 36.61.160.
- 4 Nov 24 – Email to our legislative sponsors of the bill and WDFW representatives letting them know where the LMDs stood, asking for their input on the LMD Assessment Table and discontinuing any effort to pursue this legislation this coming session until we have had time to further discuss the bill with all City/County LMD managers and other stake holders.
- 21 Nov 24 – Email to all LMD Leadership, WALPA, and LMD City/County managers requesting their review/discussion of proposed changes to RCW 36.61 and WDFW's concerns.
- 16 Jan 25 – Virtual meeting with LMDs, WALPA and City/County LMD Representatives to discuss bill, identify any changes desired, confirm support for bill and existing changes and identify next steps. WALPA agreed to moderate discussion with DFW – Clark to reach out to them. WALPA agreed to reach out to all city/county LMD representatives to get them involved (ongoing).

Senate Bill S-3518.1 Update (Continued)

- 2 Apr 26 – Rec'd email from WALPA - DRAFT Bill perspective paper/review sent to all parties (City/Counties; DFW; LMDs) with 5 May suspense. WALPA to coordinate actions with city/counties and DFW. Barry to coordinate with LMDs.
- 3 Apr 26 – Barry sent email/information to all State LMDs with recommended changes to perspective paper.
- 5 May 26 – Rec'd responses from LMDs and forwarded to WALPA.

Cyanobacteria Management Plan (CMP) Timeline

- G • Nov 2023 - Grant request submitted
- G • Jan 2024 - Grant approved by Ecology – funding not until July 2024
- G • Feb 8, 2024 – RFP submitted for contractor to do plan.
- G • 8 Mar 2024 – BoCC approved RFPs Clerk of the Board issued Public Notice
- G • Apr/May 2024 – Bids received and evaluated
- G • May/June 2024 – Contract issued (June 18th)
- G • June/July 2024 – Contractor begins study – EH held virtual kickoff meeting with contractors 12 July
- G • 25 July 2024 – Mtg #1 2hr Public Mtg to discuss project objectives & monitoring plan
- G • July 2024 – SC receives 1st Draft of Quality Assurance Project Plan (QAPP) for review (we have 2 wks)
  - 6 Sep 2024 – Rec'd 1st Draft of QAPP for review - Reviewed same day.
  - 9 Oct 2024 – Rec'd Final Draft of QAPP for review – Signature copy going out 11 Oct.
- G • August 2024 – Ecology reviews QAPP – 6 Sep – 8 Oct 24?
- G • Aug/Sep 2024 – Final review of QAPP – 9 Oct 24

G = Green = Completed On Time

Y = Yellow = Late – Program Jeopardized

R = Red = Mission Fail

Cyanobacteria Management Plan (CMP) Timeline (continued)

- G 25 Sep 24 – Lake Sediment Sampling (Completed)
- G Oct 24-Oct 25 – LMD responsibility. Weekly water level monitoring/reporting (On track)
- G 5 May 2025 – Mtg #2 1 hr. w/SC to discuss monitoring update.
- G May 2025 – Rec'd $8,982.83 in Grant Funding. Additional funding expected Oct 25.
- G 11 Dec 2025 – Mtg #3 2 hrs. w/SC to discuss Phosphorus Budget & Mgmt. Alternatives.
- G 16 Apr 2026 – Mtg #4 2 hrs. Public Mtg to go review/discuss DRAFT CMP.
- 11 Jun 2026 – MTG #5 2 hrs. w/SC to discuss final CMP.
- Jun/Jul (Changed from April) 2026 – RFP issued for contractor to implement plan
- Aug/Sep (Changed from May) 2026 – Contractor identified
- Mar/Apr 2027 (Changed from Jun-Oct 2026) – Plan/contract/treatment executed.

G = Green = Completed On Time

Y = Yellow = Late – Program Jeopardized

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Cyanobacteria Management Plan (CMP) Timeline (continued)

- 16 Apr 2026 – Mtg #4 2 hrs. Public Mtg to go review/discuss DRAFT CMP.
  - Presentation posted to website and YouTube Channel
  - Emailed link information to everyone on LMD contact list.
  - 5 May 2026 - Suspense for review/comment on DRAFT CMP
    - All SC Board Members notified.
    - April 2026 Barry and Janice provided Comments.
- 14 May 2026 LMD Meeting
  - Motion to approve CMP DRAFT Plan with changes as submitted Yes_____ No_____

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What are we attempting to control/Improve?

- Toxic Algae Blooms - prevent
  - Total Phosphorus “P”
  - PHOSPHORUS SEQUESTRATION METHODS & COSTS Total “P” estimated at 6,717 – 7,709 lbs.
- Improved Dissolved Oxygen Levels at deeper depths.

NOTE: Lake management should focus on achieving the appropriate ecological balance between algae and plants, since too much of either can be problematic.

What's feasible & what isn't

Table 1 Cyanobacteria Management Feasibility Screening for Lake Lawrence.

Method	Effectiveness	Cost	Impact Risk	Feasibility	Suitability
Watershed (External Nutrient Loading Control) Methods					
Septic System Management	Low	High	Low	Moderate	Yes, but not expected to meaningfully improve lake water quality
Stormwater Management	Low	Moderate	Low	Moderate	Yes, but not expected to meaningfully improve lake water quality
Stream Phosphorus Inactivation	Low-Moderate	Moderate	Moderate	Low	No, there is no major surface phosphorus loading source.
Waterfowl Management	Low-Moderate	Moderate	Low	Moderate	Yes
Shoreline Management	Low-Moderate	Moderate	Low	Moderate	Yes
Lake Physical Methods					
Lake Mixing	Low	Moderate	Low	Moderate	No – uncertain effectiveness
Sonication	Low	Moderate	Low-Moderate	Low	No – uncertain effectiveness
Lake dilution	Moderate	High	Low	Low	No – high cost
Hypolimnetic Oxygenation/ Aeration	High	Moderate-High	Low- -Would Benefit Fish	Moderate	Yes
Ozone/ Microbubbles/ Nanobubbles	Low	Moderate	Low	Low	No – not effective, experimental
Hypolimnetic Withdrawal	Low	Moderate	High	Low	No – insufficient inflow, downstream impacts
Dredging	Low-Moderate	Very High	Moderate	Low	No – high cost/benefit
Shading (Dyes)	Moderate	Moderate	High	Low	No – not feasible
Lake Chemical Methods					
Algaecide treatment	Moderate	Low-Moderate	Low-Moderate	Moderate	No –not a long-term solution
Chemical Phosphorus Inactivation ("lake reset" or multiple lower doses)	High	Moderate-High	Low-Moderate	High	Yes – effectiveness will depend on timing of treatment and the product used.
Alum	High	Moderate	Low-Moderate	High	Yes
Lanthanum	High	Moderate-High	Low	High	Yes
ZVI	Uncertain	Low	Low	High	Maybe – could be explored as an experimental treatment. Uncertain effectiveness and longevity
Proprietary Chemicals	Uncertain	High	Unknown	Moderate	No – higher cost and requires experiment permit
Calcium	Low	Moderate	Low	High	No – uncertain effectiveness
Lake Biological Methods					
Carp removal	Low	Moderate-High	Low-Moderate	Low	No – high cost/ benefit
Biomanipulation (Zooplankton planting; Piscivore stocking)	Low	Low-Moderate	Low-Moderate	Low	No – not feasible, low effectiveness
Aquatic Weed Harvesting	Low-Moderate	Moderate	Low	Moderate	No – high cost/benefit
Macrophyte plantings	Low	Moderate	Low	Low	No – high cost/benefit
Barley Straw	Low	Low	Low-Moderate	Low	No – uncertain benefit

Waterfowl/Shoreline/OST

ALUM/Lanthanum/Iron(ZVI)

Table 3. Pros and Cons of Chemical Phosphorus Inactivation for Approaches A and B

Approach A: Lake Reset		Approach B: Annual Lower Dose	
Pros	Cons	Pros	Cons
● Long-term improvement given low external loading **● Single contactor procurement process** **● Single year of permit-required monitoring**	● High upfront cost ● Potential large investment in ineffective treatment for relative un-tested chemicals (or in lakes with high external loads). ● Permit requires monitoring before and after each treatment.	● Lower cost per treatment ● Lake clarifying products (alum, Eutrosorb WC) will provide immediate improvements in water quality. ● Ability to change products based on cost/effectiveness. ● For alum, lower doses are not likely to require a buffer, which is more costly and more challenging to apply.	● For alum (without buffer), increased possibility of pH issues. ● Potentially higher overall long-term cost. ● Permit requires monitoring before and after each treatment. ● Annual costs to increased material and mobilization costs. ● May require repeated contractor bids ● Repeated "mobilization" and monitoring costs.

We simply cannot afford a total reset

Leaves us with only a partial dose option

In Lake Management Techniques (Cont)

(DRAFT Herrera CMP Study 2026)

Hypolimnetic Oxygenation and Aeration

- Hypolimnetic oxygenation or aeration techniques are implemented to combat hypolimnetic anoxia by maintaining or increasing DO levels in the hypolimnion while preserving thermal stratification.

Long Term, Mechanical (no chemicals),
Expensive Option - $2.7 Million

How? Legislative Appropriation of funds
and/or Lawrence Lake Association (501C3)

Hypolimnetic Oxygenation System (Mechanical System) Update (Info provided during work session with Clarity Resources Group 22 January 2026 – Video posted)

- **Oxygenation System** (info provided by Sandy Williamson, Spanaway Lake & Herrera Inc.)
  - Currently being studied by Pierce County for use in Spanaway Lake.
  - Air injection system pumped into deepest parts of lake to pump oxygen into lake.
  - Multiple basins/deep areas may require multiple pumping stations.
  - Requires land to install generators, tubes from generators into water at deepest points.
  - 24/7 electricity to run system. ~ $25,000 a year.
  - Frequent maintenance. Requires maintenance contract.
- Cost – Very expensive, but exact costs dependent on lake. Costs are "forever costs". Initial costs about $2.7 Million.

POSSIBLE LOCATIONS OF OST SYSTEM

- West Lake Location: James & Ruth Boyle Property
- Will also discuss location at LLCC Small Park on northwest end of West Lake.

East Lake Location: Wildaire HOA Property Have discussed with them – Willing to do this. 25 Feb Mtg with HOA Board to discuss further. I will be attending to answer HOA Board questions. Will attend their 6 June Annual Meeting.

Concerns

- **Risk of shock** – GFCI breakers on all 3-Phase pumps. A 3-phase Ground Fault Circuit Interrupter (GFCI) prevents electric shock in water by constantly monitoring the current balance among all three phases. If a leakage current occurs (e.g., electricity traveling through water to ground), it detects a tiny imbalance – typically 20 mA or less – and cuts power within 1/40th of a second.
- **Noise** –
  - The Compressor has a noise rating of 67 dba.
  - The Generator has a noise rating of 72 dba.
  - For comparison, a 3 Hp exhaust fan has a noise rating of 80-90 dba.
  - Further noise dampening by insulating the exhaust hood and creating a 90-degree turn.
- **How do we ensure it does not sink into bottom of lake?**

OST Meetings & Updates

- 4 Mar 26 – Met with Brianne Blackburn, Pierce County Water Resources LMD Program Manager and Program Lead for the OST System they are planning on deploying in Spanaway Lake. They are at 90% design.
  - They decided to do a 200-foot setback for the building to preempt problems with A SEPA and Conditional Use Permit Process. They are digging a ditch from the bldg. to the water and burying the cables for the system.
  - DNR is requiring a lease agreement for the part of the system that enters the water (that they own).
  - No Issues with WDFW.
  - No issues with Army Corps of Engineers (Only required a letter) Approved within 24 hrs.
  - They are bldg. a concrete block maintenance bldg. , concrete floor, metal insulated roof, Roll-Up Garage Door on one end with a wide steel door on the other. Small electric heater inside. Exterior lights, Warning System for malfunctions.
  - She will notify me when they start construction so I can visit and take YOUTUBE Videos throughout the process. Commented that their entire department was following our Phosphorus Briefings on our YOUTUBE Channel.
  - They have identified no issues with noise, electricity, etc.

FULL RESET COST COMPARISON

			RECOMMENDED FULL RESET OF ALL 7,250 LBS. OF "P"													
PRODUCT	DISTRIBUTOR	CONTRACTOR	Cost per lb. of "P" Unbuffered & Buffered	Amt of "P" In lake 7,250 lbs. X lb. Buffered & Unbuffered = Total Reset	Cost Per Lb./Gal Buffered & Unbuffered	Total Product Cost for total reset	Time to Apply Product	App Cost per lb. / Gal	Total App Cost	Shipping / Handling Costs	Total Treatment Costs	Analytes Required to be tested w/new APAM Mar 26	Testing Costs - figured by Herrera	Can Product be applied over yrs?	Total Cost Product + App + Shipping + Testing	APAM Approved
ALUM	None-Commodity	AquaTechnex			$1.80 / Gal		?	Included in Product Cost		$0.60 /Gal shipping		DO/pH/Temp/ Conductivity/% Saturation/Hardness (as CaC03)/Total Alkalinity (mg/L)/ Dissolved Oxygen Cargon (mg/L)/ Total Aluminum (ug/L) / Sulfate (mg/L)	$18,000	Yes - See below		Yes
ALUM	None-Commodity	Soliitude Lake Mgmt	$195 per lb.Buffered : 1 lb. "P"	$195 per lb of "P" x 7,250 = $1.41 million		$1.41 million	96 hrs	Included in Product Cost				DO/pH/Temp/ Conductivity/% Saturation/Hardness (as CaC03)/Total Alkalinity (mg/L)/ Dissolved Oxygen Cargon (mg/L)/ Total Aluminum (ug/L) / Sulfate (mg/L)	$18,000	Yes - See below	$1.42[illegible] million	
EutroSORB G	EutroPHIX / SePro		50 lbs. : 1 lb. "P"	362,500 lbs.	$3.60	$1.31 million	4-6 Work Days	$1.16 lb.	$420,500	None	$1,721 million	pH/DO/Conductivity/% DO Saturation.		Yes - See below		Yes
EutroSORB SI Wet	EutroPHIX / SePro		2.5 Gal : 1 lb. "P"	18,125 Gals	$72 /Gal	$1,31 million	2-4 Work Days	$18 / Gal	$326,250	None	$1,627 million			Yes - See below		Yes
EutroSORB SI Dry			10 lbs. : 1 lb. "P"	72,500 lbs.	$18 / lb.	$1,31 million	2-4 Work Days	$3 / lb.	$217,500	None	$1,518 million			Yes - See below		
Sedox MAX	OASE		33.3 lbs. : 1 lb "P"	241,425 lbs.Product	$4 lb. Bulk or $6.57 lb. MSRP	$966 k assume bulk	Contractor Dependent - assume high end of $3 per lb.= $724,275				$1,692 million	Experimental Use Plan - Will require extensive testing. OASE will assume most testing costs through experimental phase		Yes - See below		No
ZVI	hepure		30 lb. : 1 lb "P"	217,500 lbs	$2.75 lb.	$598,125	64-80 hrs.	$1,993.75 per acre	$164,000	$48k shipping / 12 k handling	$822,125			Yes - See below		

OLD NUMBERS

Average Cost: $1,594 million

Lowest Cost at $823 k

PARTIAL RESET (20%) COST COMPARISON

PRODUCT	DISTRIBUTOR	CONTRACTOR	Lbs. : Lbs. "P" or per acre of lake	Amt of "P" In lake 7,250 lbs. = Total Reset	Cost Per Lb./Gal	Total Product Cost for total reset	Time to Apply Product	App Cost per lb. / Gal	Total App Cost	Shipping / Handling Costs	Total Treatment Costs	Analytes Required to be tested w/new APAM Mar 26	Testing Costs - figured by Herrera	Can Product be applied over yrs?	Total Cost Product + App + Shipping + Testing		APAM Approved
		RECOMMENDED PARTIAL TREATMENT - Cost depends on how much "P" you want to sequester. Let's assume we want to sequester 20% of the "P". 20% of 7,250 lbs = 1450 lbs															
ALUM	None-Commodity	AquaTechnex		50-80 Gals per acre	$1.80 / Gal	$36 k low end to $57.6 k high end	20 hrs	Included in Product Cost		$0.60 /Gal shipping		See Above - Same requirement regardless of dose applied	$18,000				Yes
ALUM	None-Commodity	Soliitude Lake Mgmt	$195 per lb.Buffered : 1 lb. "P"		$195 lb. Buffered	$282,750	20 hrs	Included in Product Cost				See Above - Same requirement regardless of dose applied	$18,000		$300,750		
EutroSORB G	EutroPHIX / SePro		50 lbs. : 1 lb. "P"	72,500 lbs.	$3.60	$261,000	1-2 Days	$1.16 lb.	$84,100	None	$345,100	pH/DO/Conductivity/% DO Saturation.					Yes
EutroSORB SI Wet	EutroPHIX / SePro		2.5 Gal : 1 lb. "P"	3,625 Gals	$72 /Gal	$261,000	1-2 Days	$18 / Gal	$26,100	None	$287,100						Yes
EutroSORB SI Dry			10 lbs. : 1 lb. "P"	14,500 lbs	$18 / lb.	$261,000	1-2 Days	$3 / lb.	$43,500	None	$304,500						
Sedox MAX	OASE		33.3 lbs. : 1 lb "P"	48,285 lbs.	$4 lb. Bulk or $6.37 lb. MSRP	Using Bulk: $193,140	Contractor Dependent - assume high end of $3 per lb.= $144,855				$337,995	Experimental Use Plan - Will require extensive testing. OASE will assume most testing costs through experimental phase					No
ZVI	hepure - 20% of "P"		30 lbs. : 1 lb. "P"	43,500 lbs.	$2.75	$119,625	1-2 days	$136.45 per acre x 300 acres	$40,935	$15k Ship & Handling	$160,560	DO/pH	One Time $12,000 for test set				
ZVI	hepure - contractor recommended initial dose		166 lbs per Acre	50,000 lbs.	$2.75 lb.	$137,500	16-20 hrs.	"	$40,935	$15 k Ship & Handling	$193,435	DO/pH	One Time $12,000 for test set		$205,435		Yes
		MECHANICAL SOLUTION															
			How many OST Systems are required?	How many pumps at each station?	Cost for all stations & Pumps	Cost for Equip Install?	Time to Install System	Cost for two equipment bldgs w/power?	Annual Electrical & Maint Cost	Shipping / Handling Costs	Initial Install Costs	Analytes Required to be tested w/new APAM Mar 26	Testing Costs - figured by Herrera	Can Product be applied over yrs?	Total Cost Product + App + Shipping + Testing	How can it be applied over yrs?	APAM Approved
OST	Clarity Resources Group	Clarity Resources Group	Two Generator/Compressor Stations. One in each basin.	4 for East Basin & 2 for West Basin	$1.5 to $2 million	Included	2 wks by Clarity Staff	Power: $85K from Scenic Shores does not include trenching (1000 ft); $100k from Wildaire- Trenching not req. Bldg Const ?	$60k	$10 k	$1.7 million to 2.2 million	$0 app to uplink test equip to phone ~$30 per month	$0 app to uplink test equip to phone ~$30 per month	No - Can install 1 system vs. 2	$1.7 to 2.2 million	Do only East Basin initially at $1.2 million; if it works do West Basin	Yes

OLD NUMBERS

Average Cost: $315 k

Lowest Cost at $160 - 190 k

Total Cost $2.2 m
1 Sys $1.5 m

THIS IS THE REVISED COST ESTIMATES AS OF 2 PM 14 MAY 2026

Approach	Phosphorous Inactivation Product	Application Dose	Materials Cost	Mobilization	Sales Tax (9.25%)	Contingency (10%)	Treatment Cost	Monitoring	Contractor Oversight and Reporting	Cost / Treatment	10-Year Cost
Approach A: Lake Reset Sediment P: 2111 kg Water Column P: 97 kg	Buffered Alum	42,308 kg Al (Alum: 96,154 gallons; Aluminate: 52,885 gallons)	$520,626	$145,775	$61,642	$72,804	**$800,847**	$18,000	$30,000	**$848,847**	
	Eutrosorb G	105,526 kg	$870,589	$243,765	$103,078	$121,743	**$1,339,175**	$18,000	$30,000	**$1,387,175**	
	Eutrosorb SI	48,684 PDUs	$998,027	$279,447	$118,166	$139,564	**$1,535,205**	$18,000	$30,000	**$1,583,205**	
	PhosLock	211,052 kg	$768,229	$215,104	$90,958	$107,429	**$1,181,720**	$18,000	$30,000	**$1,229,720**	
	ZVI	97,148 kg	$180,901	$50,652	$21,419	$25,297	**$278,269**	$14,000	$30,000	**$322,269**	
	OASE SeDox	105,526 kg	$1,176,614	$329,452	$139,311	$164,538	**$1,809,915**	$18,500	$30,000	**$1,858,415**	
	Eutrosorb WC	48,684 PDUs	$1,217,106	$340,790	$144,105	$170,200	**$1,872,201**	$18,500	$30,000	**$1,920,701**	
Approach B: Repeated 25% Dose Sediment P: 528 kg Water Column P: 97 kg	Unbuffered Alum	10,650 kg Al (Alum: 48,409 gallons; Aluminate: 0 gallons)	$86,652	$24,263	$10,260	$12,117	**$133,292**	$18,000	$11,000	**$162,292**	**$809,586**
	Eutrosorb G	26,381 kg	$217,647	$60,941	$25,769	$30,436	**$334,794**	$18,000	$11,000	**$363,794**	**$1,814,772**
	Eutrosorb SI	12,171 PDUs	$249,507	$69,862	$29,542	$34,891	**$383,801**	$18,000	$11,000	**$412,801**	**$2,059,244**
	PhosLock	52,763 kg	$192,057	$53,776	$22,740	$26,857	**$295,430**	$18,000	$11,000	**$324,430**	**$1,618,408**
	ZVI	16,575 kg	$30,865	$16,000	$4,335	$5,120	**$56,320**	$14,000	$11,000	**$81,320**	**$405,660**
	OASE SeDox	26,381 kg	$294,154	$82,363	$34,828	$41,134	**$452,479**	$18,500	$11,000	**$481,979**	**$2,404,334**
	Eutrosorb WC	12,171 PDUs	$304,276	$85,197	$36,026	$42,550	**$468,050**	$18,500	$11,000	**$497,550**	**$2,482,012**

Average total reset costs are $1.47 M vs. old numbers of $1.584 M not including ZVI

No guarantee it would be unbuffered

Average total 25% costs are $374k vs. old numbers of $315k not including ZVI

TESTING EQUIPMENT/COSTS
If we do this testing it will save us approximately $7,500 per phosphorus application.

Would need this equipment by December 2026 to start testing January 2027. Some equipment requires lengthy lead times to obtain so would need to place order in June/July 2026.

YSI xylem 1700/1725 Brannum Lane, Yellow Springs, OH 45387-1107 Email: ysi.info@xylem.com Phone: 1-877-726-0975				Fondriest Environmental, Inc., Website: www.fondriest.com/ysi-exo1 ; phone: 888-426-2151					
Part #	**Test Equipment**	**Cost**		**Part #**	**Test Equipment**	**Cost**			
626870-2	ProDSS Handheld with GPS	$2,982		599960	EXO handheld display	$3,300			
626910	ProDSS 4-Port Cable w/ shallow sensor 10 meter length	$3,700		599501-01	EX01 multi-paramenter quality sonde with 4 sensor ports, 10 m depth sensor	$5,900			
626900	ODO with pre-installed sensor cap	$1,269		599100-01	EXO optical dissolved oxygen sensor	$2,300.00			
626902	Conductivity and temperature	$893.10		599870	EXO conductivity & temperature sensor	$1,150			
626903	pH with pre-installed sensor module	$570		577601	EXO guarded pH sensor	$785			
				577611	EXO guarded pH/ORP sensor	$895	(what does the ORP do?)		
626905	Nitrate with pre-installed sensor module	$772		599710	EXO guarded ISE nitrate sensor	$995	(is this the same thing?)		
626210	Total Algae, PC (Chlorophyll + phycocyanin	$4,046		599102-01	EXO freshwater total algae sensor (chlorophyll + phycocyanin)	$3,995			
626946	Large, hard-sided carrying case	$521		599020-01	Case	$680			
TOTAL:		**$14,753**				**$20,000**			
	Calibration Requirements								
060907	Conductivity calibrator , 1000 umhos/cm (8ea, pint)	$184							
603824	2 pints each of 4, 7, and 10 pH buffers	$107							
003885	1 mg/L nitrate standard (500 mL)	$112							
003887	100 mg/L nitrate standard (500 mL)	$120							
TOTAL:		**$523**							
	Other Testing Equipment								
	Wildco Instruments Wildlive Supply Company 86475 Gene Lasserne Blvd, Yulee, FL 32097 Website: www.wildco.com Phone: 800-799-8301				Eijkelkamp North America Website: www.royaleijkelkamp.com				
UX-05486-00	Wildco 1510-C20 Kemmerer Water Sampler, 3 to 600' depth, Acrylic, 1.2L	**$778**			Kemmerer water sampler, set	**$873.50**			
	AMAZON.COM								
BUWUSMU	7.87 Inch Plastic Secchi Disk Set - With black and white quadrants, steel cone, holding line, and 30 meter tape measure for clarity measurements	**$26.99**							
TOTALS:		**$16,080.99 + TAX**			**OR**	**$21,423.49 + TAX**			

Low End = **$17,000** High End = **$22,000**

WHAT ARE OUR OPTIONS

FACTS

1. Shallow, 320-acre eutrophic lake – Max depth 25’ – Avg depth 12’
2. Two basins with shallow channel between them
3. Recurring cyanobacteria blooms – mostly microcystin
4. Season low dissolved oxygen conditions in Hypolimnion – below 2 and 5 mg/L
5. Total phosphorus load – 7,250 lbs. or 547 mg/kg-DW (East Basin) and 147 mg/kg-DW (West Basin) (Pg 33 CMP)
6. Initially we want to target 20-25% of total “P” or 1450-1812 lbs. for sequestration with additional applications as funds allow

ASSUMPTIONS

1. Given average pH of Lake – ALUM may be required as buffering agent depending on how much is used.

CRITERIA/WEIGHTING

- **Water Quality & Lake Response =**
  - Dissolved Oxygen (DO) Impact **WEIGHT = 5**
    - Negative (Score -1) – Likely to reduce DO or increase oxygen demand
    - Neutral (Score 0) – No impact
    - Positive (Score +1) – Improves or stabilizes DO conditions
  - pH Compatibility **WEIGHT = 5**
    - Negative (Score -1) – Risk of harmful pH change or limited application window
    - Neutral (Score 0) – Minimal or manageable pH impact
    - Positive (Score +1) – No pH impact
  - Phosphorus Removal from water column **WEIGHT = 2**
    - Negative (Score -1) – No meaningful removal
    - Neutral (Score 0) – Partial or short-term removal
    - Positive (Score +1) – Consistent, effective removal
  - Phosphorus Sequestration – Sediment **WEIGHT = 4**
    - Negative (Score -1) – Does not bind phosphorus in sediment
    - Neutral (Score 0) – Finds phosphorus but may release under certain conditions
    - Positive (Score +1) – Strong, long-term binding based on field use
  - Longevity of Effect **WEIGHT = 3**
    - Negative (Score -1) – Weeks to months
    - Neutral (Score 0) – 1-3 years
    - Positive (Score +1) – 4 or more years

CRITERIA/WEIGHTING (cont.)

- **Cyanobacteria Considerations =**
  - Expected Cyanobacteria Reduction **WEIGHT = 4**
    - Negative (Score -1) – No demonstrated bloom reduction
    - Neutral (Score 0) – Indirect or inconsistent reduction
    - Positive (Score +1) – Demonstrated reduction in bloom frequency or severity
  - Risk or Short-Term Bloom Situation **WEIGHT = 2**
    - Negative (Score -1) – Documented Risk
    - Neutral (Score 0) – Possible under certain conditions
    - Positive (Score +1) – No known risk
- **Implementation & Flexibility =**
  - Incremental/Phased Application Potential **WEIGHT = 3**
    - Negative (Score -1) – One-time or limited application
    - Neutral (Score 0) – Some flexibility
    - Positive (Score +1) – Easily applied incrementally with cumulative benefit
  - Sensitive to Lake Conditions **WEIGHT = 3**
    - Negative (Score -1) – Highly sensitive to temperature, mixing, or low DO
    - Neutral (Score 0) – Moderately sensitive
    - Positive (Score +1) – Performs reliably across conditions

CRITERIA/WEIGHTING (cont.)

- **Monitoring & Regulatory =**
  - Water Testing Requirements **WEIGHT = 3**
    - Negative (Score -1) – Recurring testing of 4 or more laboratory analytes during and after treatment
    - Neutral (Score 0) – Required testing of 1-3 analytes during and after treatment
    - Positive (Score +1) – Required monitoring of field analytes only (Temp, pH, DO)
  - Regulatory Approval Status (WA State) **WEIGHT = 4**
    - Negative (Score -1) – Not approved/experimental use plan required
    - Neutral (Score 0) – Conditional or limited approval
    - Positive (Score +1) – Fully approved for intended use
- **Ecological & Human Safety =**
  - Aquatic Life & Habitat Safety **WEIGHT = 5**
    - Negative (Score -1) – Known or likely harm – potential negative consequences if product not used correctly
    - Neutral (Score 0) – Some risk under specific conditions – as seen at other lakes
    - Positive (Score +1) – No known harm based on field use
  - Human, Pet, & Wildlife Safety **WEIGHT = 5**
    - Negative (Score -1) – Known or likely harm – potential negative consequences if product not used correctly
    - Neutral (Score 0) – Some risk under specific exposure scenarios
    - Positive (Score +1) – No known risk

OPTIONS	WEIGHT	ALUM	EUTROSORB G &SI	Sedox MAX	Zero Valent Iron	OST
CRITERIA						
WATER QUALITY & LAKE RESPONSE						
DO Impact	5	0	0	0	-5	5
pH Compatibility	5	-5	0	0	0	0
"P" Removal From Water Column	2	2	0	0	2	0
"P" Sequestration - Sediment	4	4	4	4	4	4
Longevity of Effect	3	0	0	0	0	4
CYANOBACTERIA CONSIDERATIONS						
Expected Cyanobacteria Reduction	4	4	4	4	4	4
Risk or Short-Term Bloom Stimulation	2	-2	-2	-2	-2	2
IMPLEMENTATION & FLEXIBILITY						
Incremental/Phased Application Potential	3	3	3	3	3	0
Sensitivity to Lake Conditions	3	-3	0	0	-3	3
MONITORING & REGULATORY						
Water Testing Requirements	3	-3	-3	-3	0	3
Regulatory Approval Status (WA State)	4	4	4	-4	4	4
ECOLOGICAL & HUMAN SAFETY						
Aquatic Life & Habitat Safety	5	-5	0	0	5	5
Human, Pet, & Wildlife Safety	5	-5	0	0	5	5
TOTALS:		-2	10	2	13	39

WHERE ARE WE?

- Cyanobacteria Management Plan (CMP) completed – IAW State Law this study is required before any harmful algae bloom (HAB) treatment can occur
- Conclusions:
  - Some nutrient indicators have improved relative to the early 1990's, water clarity has declined and seasonal algal biomass remains elevated. Poor water quality driven by the long-term accumulation of phosphorus (Pg vii CMP).
  - Primary source of phosphorus is internal release (81% annually and 97% during the summer (Pg viii CMP) .
  - Phosphorus is the primary limiting nutrient to algae growth, though nitrogen may also limit growth during the summer (Pg 18 CMP).
  - Historical contributions of sediment phosphorus are from diverted Deschutes River sediment (Pg viii CMP & Pg 10 CMP). In the early 1900's, Lake Lawrence served as a reservoir for the Tumwater Power Plant, for which the lake outlet was dammed, and a channel was constructed to divert a portion of the Deschutes River flow into the lake, raising water level by around 18 feet. With this diversion of water also came excess river sediment, containing erosion from newly logged forests, which settled to the lake bottom. Due in part to the dam at the lake's outlet, there is decreased export of nutrients from the lake, and more nutrients are therefore retained within the lake's sediments, which may be recycled for use next season. (Pg ix CMP)
  - Groundwater phosphorus loading is negligible (2%) input (Onsite Septic) (Pg viii & Pg25 CMP) .
  - Lake is eutrophic (KCM 1991 Study and Pg 22 2026 CMP Herrera)
    - High levels of microcystin, a liver toxin exceeding state guidelines in 2010, 2011, 2013, and every year since 2017 (2017-2025) (Pg viii CMP) .
    - Harmful Algae Blooms (HABs) exceeded state guidelines on average 28 days a year over the past 10 years
    - Most severe HAB occurred in 2024 and closed lake for recreational activity for 147 days (Backup Slide)

WHAT'S NEXT?

- Action required - Harmful Algae Blooms (HABs) will get worse and last longer if we do nothing (Pg 30 CMP).
- Establish algae management objectives (Pg x & Pg 21 CMP) :
  - From 2027-2031 (5-year period), there is no more than 1 year with two or more events with cyanotoxins exceeding state guidelines resulting in a public health advisory of Warning or Danger
  - Within this same period there is no more than 1 year with a public health advisory lasting 3 weeks or longer.
  - Average summer values of chlorophyll a, total phosphorus, and Secchi depth do not exceed the lowest end of the eutrophic scale (i.e., values occur in the mesotrophic range). Average summer (June through September) chlorophyll-a concentration does not exceed 7.2 micrograms per liter (ug/L) at 1 meter depth, total phosphorus does not exceed 24 ug/L at 1 meter depth, and Secchi depth is not less than 2.0 meters.
- Summer 2025 algal productivity was 100 ug/L for chlorophyll-a concentrations and Secchi depths commonly reduced to 1-2 meters. WA State sets 20 ug/L as an action level for lakes in this area (Pg 22 CMP) .

WHAT'S NEXT? (Continued)

- Implement Sediment Phosphorus Inactivation Strategies (Pg x-xv CMP).
  - It is estimated that reducing 80% of the phosphorus released from lake sediments is required to meet water quality objectives and sufficiently control algae growth.
  - This will require either a full lake reset or partial lake reset over time to achieve cumulative impact.
    - Full Reset – immediate phosphorus sequestration expected
    - Partial Reset over time – Gradual reduction in HABs and water quality
      - Timeline dependent on quantity/type of mitigation and based on financial ability) 10-20 yrs
- Continue water quality monitoring and algae surveillance (Pg xii CMP)

WHAT'S NEXT? (Continued)

- Implement Watershed Source Control Activities (Pg xiii CMP) Even though this study and previous studies have shown total annual phosphorus load to the lake from these sources are low (less than 20%) it does have an impact and could help prevent future HABs when in-lake phosphorus loads are reduced.
  - Shoreline improvements and program management
    - Lawns/landscaping (fertilizer/pesticides); native plants; pet waste; etc.
  - Waterfowl management – fecal matter
    - Reduce "do not feed" signs, educating community, shoreline plantings, removal
  - Encourage routine septic system inspections/maintenance

HOW DO WE ACCOMPLISH AN 80% REDUCTION? CMP Recommendations

- ALUM (Pg xi CMP)
  - Total Reset – $1.4 M
  - Partial Reset, requires additional treatments periodically - 20% Dose - $300 k
  - High testing cost ($18k+)
- Lanthanum (Pg xi CMP)
  - Total Reset - $1.7 M
  - Partial Reset, requires additional treatments periodically - 20% Dose - $345 k
  - Moderate to high testing cost ($14-16k+)
- Iron (ZVI) (Pg xii CMP)
  - Total Reset - $827 k
  - Partial Reset, may require additional treatments periodically - 20% Dose - $190k
  - Low testing cost (12k+)
- Oxygen Saturation Technology (OST) (Pg xii CMP)
  - Two systems $2.7 M (one in each basin)
  - One system (Large Basin First) $1.5 M
  - No testing cost
  - Requires regular maintenance & electrical cost of ~$85k a year

Some of these costs' numbers changed as a result of the updated table, we received at 2 p.m. today (Slide 34)

Courses of Action Considered by SC

1. Use tried and true chemical (Lanthanum) – adds product to water and lakebed that is not naturally occurring in water or sediment
2. Use natural mineral (Iron – ZVI) – already present in all lakes, but a higher percentage of Iron to phosphorus ratio is required to sequester the high phosphorus content in the lake sediment
3. Use Oxygen Saturation Technology (OST) – Mechanical Method – no chemicals
4. Use a natural mineral (Iron – ZVI) to mitigate near term Harmful Algae Blooms (HABs) and work to secure funding for OST over next 5 years
5. If COA 4 does not prove successful (either through sequestering blooms using ZVI or securing funding) move to COA 1

How To Proceed?

- LMD has funding for partial doses of ALUM/Lanthanum/ZVI over next 5 years
  - First application Feb/Mar 2027 ($300k)
- Secure OST funding through:
  - Ecology Grants – LMD submits for these
  - State Legislative Appropriation – Will BoCC support LMD initiative to petition State Legislature for $2.7 M appropriation over a three-year period? – CMP has already shown this to be a viable option
    - Year One ($500k) Study & Design
    - Year Two ($500k) Construction of infrastructure
    - Year Three ($1.7m) Purchase and installation of equipment
  - Lake Association (501C3) – Donations from large corporate donors – need lead (cannot be SC member)

LMD RENEWAL 2027

HOW DO WE GET THERE?
12 STEPS TO LMD FORMATION (IAW RCW 36.61 & Thurston County Lake Management District SOP)

STEP 1 – Draft Petition (RCW 36.61.030 sub para 1)

- G • 20 Mar 2025 – SC decisions on renewal of LMD.
- G • 4 Mar 2025 – DRAFT petition/resolution of renewal completed.
- G • 4 Mar 2025 – DRAFT petition sent to County for approval - Approved by EH 5 Mar 25.

STEP 2 – Petition Complete & Sent to Property Owners (RCW 36.61.030 sub para 1)

- G • 1 May 2025 – Sent petition to all property owners for signature (**RCW requires 20%** by acreage of assessed properties). We have **592** acres of assessed parcels. Require signatures of parcel (assessed) owners owning at least **119** acres of property within LMD to move forward.

STEP 3 – Gather Petition Signatures (RCW 36.61.030 sub para 1)

- G • 17 June 2025, received petitions for **225.60 acres (38.1% of the 592 acres of the LMD)**.
- G • 17 July 2025 SC approves petition list and DRAFT Resolution of intent.

STEP 4 – Petition Sent to and Received by County (RCW 36.61.030 sub para 1)

- G • 24 July 2025 Petition and DRAFT Resolution of Intent delivered to EH.

G = Green = Completed On Time

Y = Yellow = Late – Program Jeopardized

R = Red = Mission Fail

HOW DO WE GET THERE?
12 STEPS TO LMD FORMATION (IAW RCW 36.61 & Thurston County Lake Management District SOP) (cont.)

STEP 5 – BoCC approves Resolution of Intent to Establish LMD #26 & Sets public hearing. (RCW 36.61.030 sub para 4)

- 25 Sep 20252 EH emailed BoCC requesting approval of timeline for LMD Renewal.
- 4 Nov 2025 – BoCC Issues Resolution of Intention to form Lake Lawrence LMD No. 26 & calls for public hearing.
- 2 Dec 2025 – Notice of public hearing sent via Certified Letter to State Partners (DNR, OFM, WDFW/Ecology
- 3 Dec 2025 – Notice of public hearing sent via USPA First Class mail to all LMD Members
- 1 and 8 Jan 2026 – Notice of public hearing published in Nisqually Valley News.
- 12 Jan 2026 – Notice of public hearing emailed to LMD members and state partners.

STEP 6 – Public Hearing to determine Public Interest & Financial Feasibility (RCW 36.61.040 and 050)

- 20 Jan 2026 – BoCC holds public hearing.

STEP 7 – 3 Feb 2026 BoCC approves/disapproves of LMD Renewal. If approved adopts Resolution of Findings & Determinations for vote of property owners. (RCW 36.61.070)

STEP 8 – 17 Feb 2026 Ballots mailed to property owners for vote. (RCW 36.61.080 - 100)

- 11 March 2026 – All ballots must arrive NLT 5:00 p.m. Ballots arriving after that will not be counted.
- 12 March 2026 – Ballots counted – residents invited – Atrium Rochester Room #255 at 10:30 am.
  - Majority of votes NO – LMD will dissolve 31 December 2026
  - Majority of votes YES – LMD will renew 1 January 2027

G = Green = Completed On Time

Y = Yellow = Late – Program Jeopardized

R = Red = Mission Fail

HOW DO WE GET THERE?
12 STEPS TO LMD FORMATION (IAW RCW 36.61 & Thurston County Lake Management District SOP) (cont.)

G **STEP 9 – 31 March 2026 BoCC adopts ordinance #16621 creating LMD if majority votes YES. (RCW 36.61.100)**

G **STEP 10 – 9 or 10 April 2026 Notice of LMD Establishment published in Local Paper within 10 days of adoption (RCW 36.61.100).**

9 & 16 April 2026 **Notice of Public Hearing for Rolls & Rates published in NVN.**

13 April 2026 Notice of Objection Public hearing sent to property owners at least 20 days in advance of public hearing (RCW 36.61.140).

Y **STEP 11 – 28 April 2026 then 5 May 2026, now 19 May 2026 Public Hearing on Roll of Rates & Charges. (RCW 36.61.140)**

Y **STEP 12 – 28 April 2026 then 5 May 2026 now 19 May 2026 BoCC Approves/Disapproves/Amends the Resolution Confirming the Roll of assessment for Lake Lawrence No. 26. (RCW 36.61.130)**

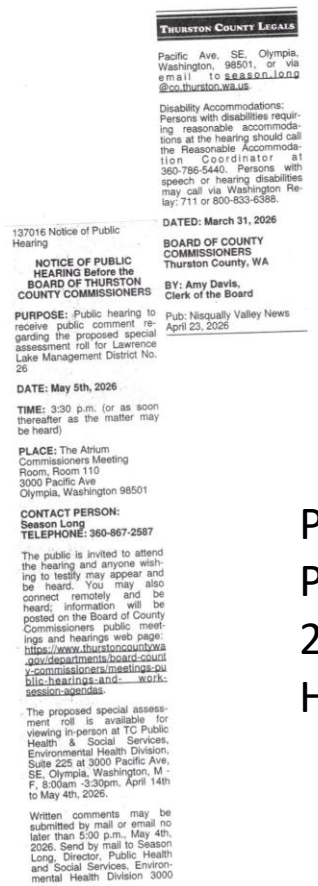
- Within 30 days of approving the Resolution Confirming the Roll of Assessment the county legislative authority will file the resolution and pertaining documents with the County Treasurer (RCW 36.61.220)
- January 2027 – Lake Lawrence LMD No. 26 operational.

G **G = Green = Completed On Time**

Y **Y = Yellow = Late – Program Jeopardized**

R **R = Red = Mission Fail**

2nd Public Hearing Notice



137016 Notice of Public Hearing

NOTICE OF PUBLIC HEARING Before the BOARD OF THURSTON COUNTY COMMISSIONERS

PURPOSE: Public hearing to receive public comment regarding the proposed special assessment roll for Lawrence Lake Management District No. 26

DATE: May 5th, 2026

TIME: 3:30 p.m. (or as soon thereafter as the matter may be heard)

PLACE: The Atrium Commissioners Meeting Room, Room 110 3000 Pacific Ave Olympia, Washington 98501

CONTACT PERSON: **Season Long** **TELEPHONE: 360-867-2587**

The public is invited to attend the hearing and anyone wishing to testify may appear and be heard. You may also connect remotely and be heard; information will be posted on the Board of County Commissioners public meetings and hearings web page: https://www.thurstoncountywa.gov/departments/board-county-commissioners/meetings-public-hearings-and-work-session-agendas.

The proposed special assessment roll is available for viewing in-person at TC Public Health & Social Services, Environmental Health Division, Suite 225 at 3000 Pacific Ave, SE, Olympia, Washington, M - F, 8:00am -3:30pm, April 14th to May 4th, 2026.

Written comments may be submitted by mail or email no later than 5:00 p.m., May 4th, 2026. Send by mail to Season Long, Director, Public Health and Social Services, Environmental Health Division 3000 Pacific Ave, SE, Olympia, Washington, 98501, or via email to season.long@co.thurston.wa.us.

Disability Accommodations: Persons with disabilities requiring reasonable accommodations at the hearing should call the Reasonable Accommodation Coordinator at 360-786-5440. Persons with speech or hearing disabilities may call via Washington Relay: 711 or 800-833-6388.

DATED: March 31, 2026

BOARD OF COUNTY COMMISSIONERS Thurston County, WA

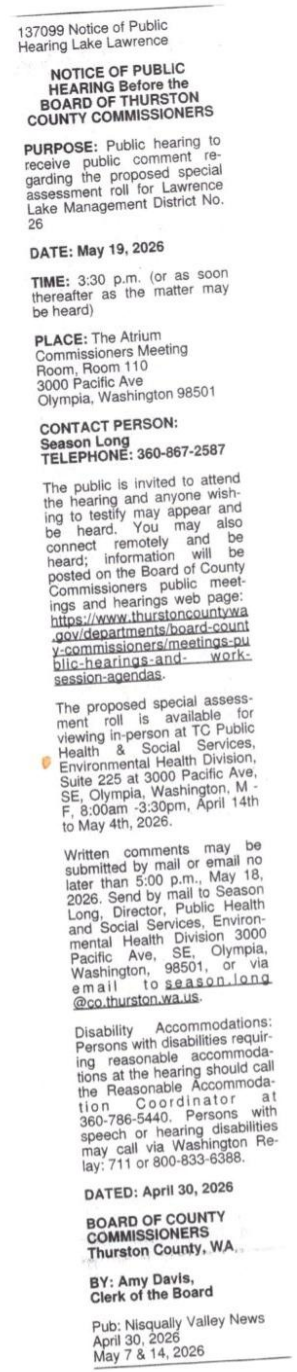
BY: Amy Davis, Clerk of the Board

Pub: Nisqually Valley News April 23, 2026

THURSTON COUNTY LEGALS

Public Hearing Notice
Published in NVN
23 Apr 26 shows Public Hearing as 5 May.

Public Hearing Notice
Published in NVN
30 Apr 26 shows Public Hearing as 19 May.



137099 Notice of Public Hearing Lake Lawrence

NOTICE OF PUBLIC HEARING Before the BOARD OF THURSTON COUNTY COMMISSIONERS

PURPOSE: Public hearing to receive public comment regarding the proposed special assessment roll for Lawrence Lake Management District No. 26

DATE: May 19, 2026

TIME: 3:30 p.m. (or as soon thereafter as the matter may be heard)

PLACE: The Atrium Commissioners Meeting Room, Room 110 3000 Pacific Ave Olympia, Washington 98501

CONTACT PERSON: **Season Long** **TELEPHONE: 360-867-2587**

The public is invited to attend the hearing and anyone wishing to testify may appear and be heard. You may also connect remotely and be heard; information will be posted on the Board of County Commissioners public meetings and hearings web page: https://www.thurstoncountywa.gov/departments/board-county-commissioners/meetings-public-hearings-and-work-session-agendas.

The proposed special assessment roll is available for viewing in-person at TC Public Health & Social Services, Environmental Health Division, Suite 225 at 3000 Pacific Ave, SE, Olympia, Washington, M - F, 8:00am -3:30pm, April 14th to May 4th, 2026.

Written comments may be submitted by mail or email no later than 5:00 p.m., May 18, 2026. Send by mail to Season Long, Director, Public Health and Social Services, Environmental Health Division 3000 Pacific Ave, SE, Olympia, Washington, 98501, or via email to season.long@co.thurston.wa.us.

Disability Accommodations: Persons with disabilities requiring reasonable accommodations at the hearing should call the Reasonable Accommodation Coordinator at 360-786-5440. Persons with speech or hearing disabilities may call via Washington Relay: 711 or 800-833-6388.

DATED: April 30, 2026

BOARD OF COUNTY COMMISSIONERS Thurston County, WA

BY: Amy Davis, Clerk of the Board

Pub: Nisqually Valley News April 30, 2026 May 7 & 14, 2026

26 March 2026 LMD Update

LETTERS TO THE EDITOR

LETTERS POLICY: *Submit letters to the editor typed or legibly handwritten. Generally, letters should be 350 words or fewer. Deadline is noon Tuesday. Include name, address and a daytime telephone number for verification purposes. No unsigned letters will be published. The editor reserves the right to edit letters for clarity, grammar and length. Mail letters to the Nisqually Valley News, P.O. Box 597, Yelm, WA 98597 or e-mail to yelmnews@yelmonline.com*

Update on Lake Lawrence Lake Management District Renewal

On March 12, 2026, 90% of Lake Lawrence residents voted to approve the renewal of the Lake Lawrence Lake Management District (LMD).

This renewal expands the district's focus from just invasive, noxious and invasive weed control to funding treatment of ever-increasing harmful algae blooms that endanger pets, wildlife and humans that interact with the waterbody.

Renewing the LMD ensures we can continue to protect water quality, reduce algae blooms and keep Lake Lawrence safe and usable for everyone.

Community involvement has guided this process and remains essential. To learn more or follow updates, visit: www.lakelawrencelakemanagementdistrict.com

Thank you for supporting the care of one of our area's most valued natural resources.

Barry Halverson, Yelm
Co-Chair, Lake Lawrence Lake Management District

2026 Toxic Algae Report

4 Feb 2026 – Wildaire Community Park – reported to EH

2 Mar 2026 – Wildaire Community Park – Reported to EH

Test Taken at WDFW Boat Launch – Below threshold

5 Apr 2026 – Lake Point Dr & Wildaire Community Park – Reported to EH

Testing showed only 0.8 ug/L well below warning requirement.

20 Apr 2026 – Wildaire Community Park – Reported to EH

21 Apr 26 - Test Taken at Wildaire Park. Tests showed toxic algae below state guidelines.

5 April 2026 – Wildaire Community Park

2026 Toxic Algae Report (cont.)

28 Apr 2026 – WDFW Boat Launch –Reported to EH

5 May 2026 – Samples taken by EH – Results 1.8 ug/L

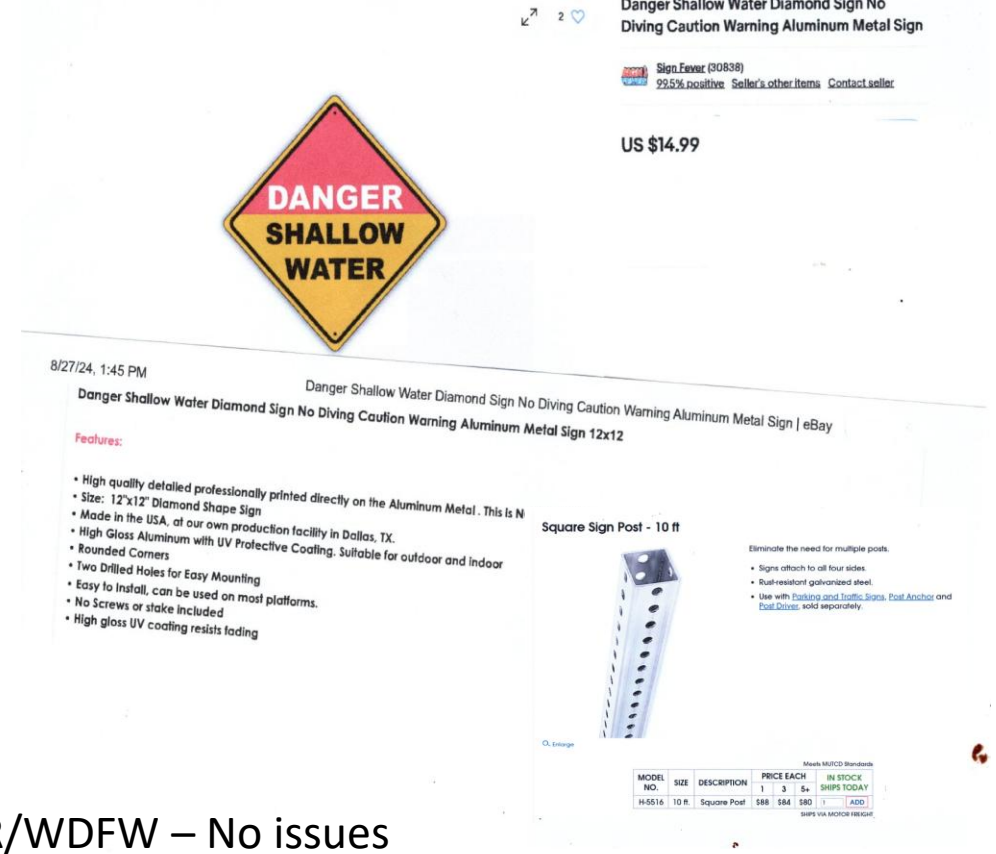
12 May 2026 – Samples taken by EH from West Lake Lawrence near LLCC Little Park – Results 45.9 ug/L

24-Jun-25	West/East		WARNING Level Imposed											X		45.9
8-Jul-25	West/East		WARNING Level lifted after 2 consecutive weeks of results below 8 ug/L													
22-Jul-25	East	N/A	50	52	8.2		0.61	22.9		16.5	7.8	6.7	110	136		
22-Jul-25	West	N/A	26	57	8.5		0.2	23.1		16	7.8	6.7	110	165		
21-Aug-25	East	47	59	53	9.2		0.27	22.6		20.7	7.9	6.4	111	124		
21-Aug-25	West	53	56	55	9.7		9.5	22.7		20.2	8.1	6.4	113	172		
22-Sep-25	East	49	66	55	8.6		7.9	20.6		20.1	7.8	7.8	112	113		
22-Sep-25	West	54	76	55	8.8		8.4	20.6		19.5	7.8	7.9	114	114		
21-Oct-25	East	N/A	70	66	10.4		7.9	13.6		13.4	9	7.7	111	113		
21-Oct-25	West	N/A	66	64	10.8		10.3	13.3		12.7	7.9	7.8	112	113		
21-Oct-25	West/East		WARNING Level Imposed											X		10.9
4-Nov-25	West/East		WARNING Level lifted after 2 consecutive weeks of results below											X		7.5
14-May-25	West/East		WARNING Level Imposed Microcystin: 45.9 ug/L											X		45.9

Pet Waste Stations Lake Lawrence

Installed at County Park
6 April 2026 by Barry, Curt and Jim

Installed at Topaz & Topaz and Lawrence Place
May 2026 by Tim



Recommendation:

April 2025 install 3 signs on steel stakes 100-150’ apart across the southern end of Lake Lawrence to warn boaters of extreme shallow water dangers.

Cost:

Signs – 3 x $20 = $60

10’ Square Sign Post – 3 x $84ea. +tax & Shipping = $100 ea.

Tamper Proof Bolts – 10 x $14+tax (Home Depot)

Tamper Proof Nuts – 10 x $12+tax (Home Depot)

80 lb Concrete – 3 x $6 + tax (Home Deport_

TOTAL: $404+tax +/- 10% APPROVE AT 17 OCT 24 LMD MTG

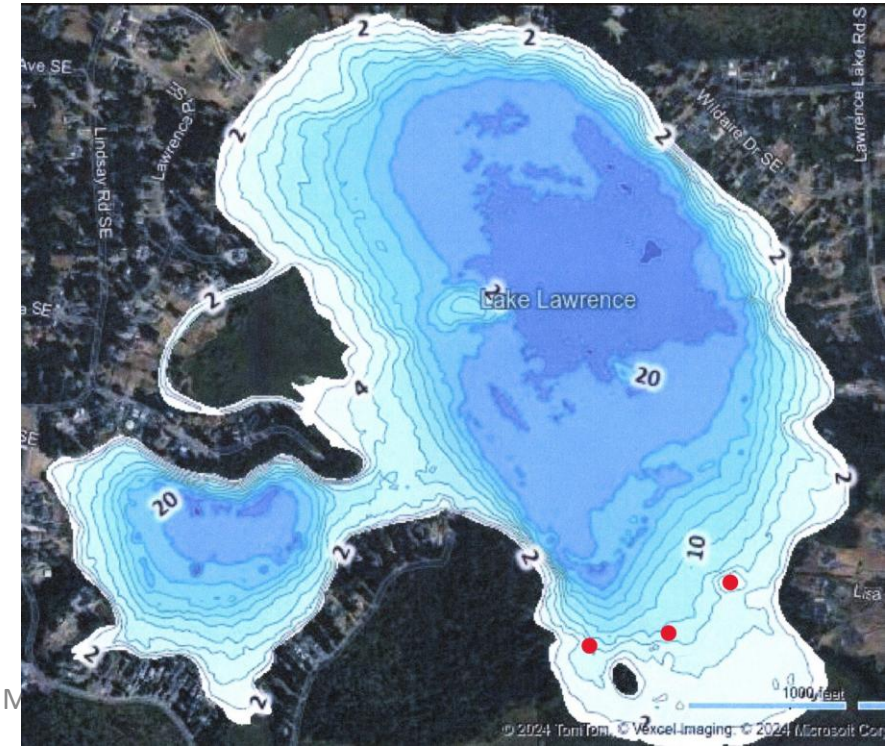
DNR/WDFW – No issues

County EH – ?

County Sheriff – Deputy Cady, Boating Enforcement Officer – No legal issues as long as lake organization board approves.

We have three 10’x3” Galvanized Posts – Will try to drive into lake bottom May 2026 – need help!

If we can get these posts in place, we will purchase the signs.



SHALLOW WATER SIGNS

- On 18 April 2026 Barry, Frank, Jim, & Carl installed three 10’x25” galvanized pipes at the south end of the lake to install Shallow Water Signs.
- On 9 May 2026 Barry, Frank, Jim, Curt, and Tim installed the signs on the posts.
- Galvanized Pipe donated by American Lake Veterans Golf Course.
- Hardware donated by Barry.
- Signs purchased by LMD – Cost $49.24.

Welcome to **Lake Lawrence**

Watch your speed! Be safe, legal, & courteous!

Speed Limits

5 MPH
NO-WAKE areas
45 MPH
SKI areas – Must remain at least 200 ft from shorelines, boat launches or swim areas

Over 5 MPH
In Ski Areas Only 11 a.m. to Sunset or 8 p.m. (whichever occurs first)

Speeds over 5 MPH must Travel Counterclockwise

One US Coast Guard approved PFD per person

You may **NOT** operate a boat under the influence

You Must Be:

16 to operate a boat over 5 MPH or a personal watercraft

12 to operate a boat with motor

Clean ALL weeds off your boat & trailer before and after Launching to prevent transfer of invasive weeds.

PACK IT IN
PACK IT OUT

Safety Signs

No Wake Zone

Hazards

Direction Of Travel

FIRES ARE PROHIBITED

PLEASE CALL SHERIFF WHEN FIRES ARE PRESENT 360.704.2740
THURSTON COUNTY PARK CODE 10.76.190

Thurston County Code (TCC) 16.04 and Revised Code of Washington (RCW) 79A.68
For more information call the Thurston County Sheriff's Office Marine Services Unit: (360) 786-5500
Provided by the Lake Lawrence Lake Management District of Thurston County

BOAT LAUNCH SAFETY SIGN

On 18 April 2026 Barry, Frank, Jim, & Carl installed the signposts for the Boat Launch Safety Sign at the DFW Boat Launch.

On 20 April 2026 Barry and Curt installed the sign frame for the Boat Launch Safety Sign at the DFW Boat Launch.

On 21 April 2026 Barry and Curt installed the sign for the Boat Launch Safety Sign at the DFW Boat Launch.

- Posts & Sign frame material donated by LLCC HOA.
- Concrete, hardware & Sign purchased by LMD
- Paint & some hardware donated by Barry

SIGN AUTHORIZATION/REVIEW

- Thurston County Sheriff's Office – Marine Services Unit, SGT Nault – Reviewed signage Feb 24, 2026. Information updated. Approved.
- Thurston County Parks – Ed Marson – Parks Mgr. – Approved.
- WDFW – Chad Buck – No problem with signage. May require cultural resource review permit. Chad Buck, Land Agent, Costal Region, WDF Chad.buck@dfw.wa.gov . WDFW working Cultural Resource Review Permit. May take some time. But does not see a problem.
  - Rec'd WDFW Permit Approval 8 April 2026.
  - Purchased sign and installation completed 21 April 2026.

2026 LMD Invasive/Nuisance Aquatic Weed Treatment Plan

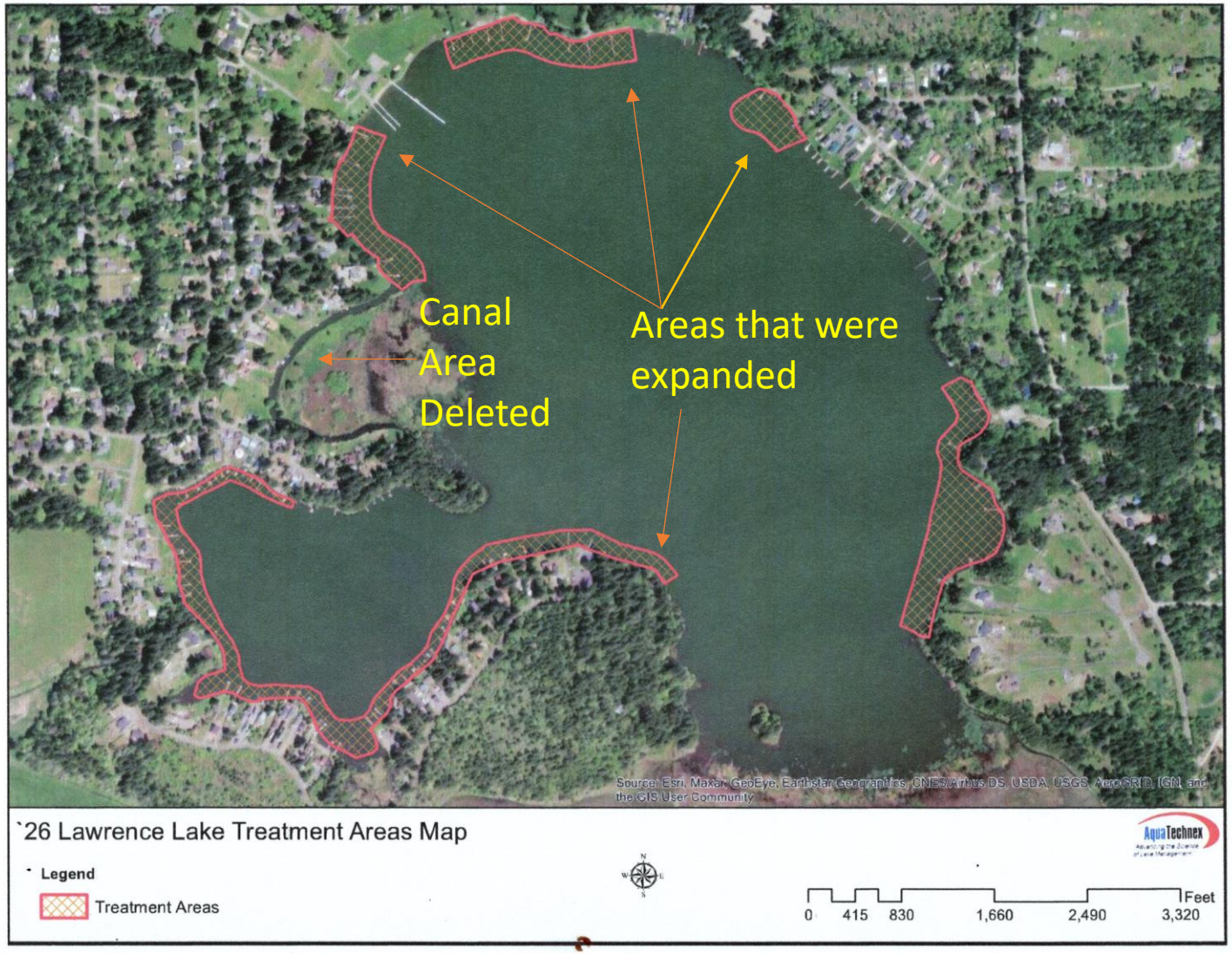
- G • July 2025 – LMD budget $80,000 for 2026 for Invasive/Nuisance Aquatic Weed Control.
- G • 19 August 2025 – Survey Committee & ARS conduct end of year survey to assess type of weeds and density.
- G • October 2025 – Virtual meeting with contractor to discuss 2026 treatment plan – Met with contractor 2 Oct 25. Contractor working on est. for 2026 treatment for weeds and Algae Treatment.
- G • Prior to Feb 2026 - Contractor to provide cost/application recommendations for Spring 2026 treatment of Curly Pondweed. Total area to be treated = ~34 acres. Cost est. = $71,308 includes additional 3 acres.
- G • 31 March 2026 - APAM Notice mailed to lake front residents 10 days prior to any treatment. APAM Notice Cost $271.99. Will be Mailed 31 March 2026/
- G • April – August 2026 - Survey Committee – monthly lake surveys.
- G • Mid-April/May/June (a few weeks earlier than last year) – Treatment of invasive/nuisance aquatic weeds using Sonar One. Recommended by contractor.
  - First Treatment 30 April.

G = Green = Completed On Time

Y = Yellow = Late – Program Jeopardized

R = Red = Mission Fail

2026 CURLY PONDWEED TREATMENT MAP



Sonar One 2026
34 Acres
3 applications – three-four weeks apart
First Treatment: Mid April 2026 30 April
Second Treatment: Mid of May 2026
Third Treatment: Mid June 2026
Cost: ~$71,308 or $2097.29 per acre ($65 per acre more than 2025)

Previous Treatments:
2021 – Sonar One – 25 Acres
2022 – Aquathol K – 33.5 Acres
2023 – No treatment
2024 – Galleon SC – 26 Acres
2025 – Sonar One – 31 Acres red outlined areas
2026 – Sonar One – 34 Acres (Blue = add areas)

2026 LMD Yellow Flag Iris Treatment Plan

- G • Oct 2025 – County Noxious Weed confirms treatment ($1,500 cost to LMD & $2,000 cost to County via Grant Funds)
- Jan/Mar – Send out and Receive permission letters for treatment:
  - G • Jan 2, 2026 – Sent out first email to capture permission letters from 24 private parcels
  - G • Jan 26, 2026 – Sent out second email.
  - G • Feb 16, 2026 – Sent out third email.
  - G • Feb 23-27, 2026 – Sent permission letters to PW Noxious Weed
- G • 31 March 2026 – Send out treatment notification cards.
- Y • 12-13 or 19-20 May 2026 NOW 26-27 May – PW Noxious Weed treats YFI. Email from Mike Murphy, Noxious Weed Mgr.
- Cost to LMD $1,500 Approved at 19 Feb 2026 Mtg

G **G = Green = Completed On Time**

Y **Y = Yellow = Late – Program Jeopardized**

R **R = Red = Mission Fail**

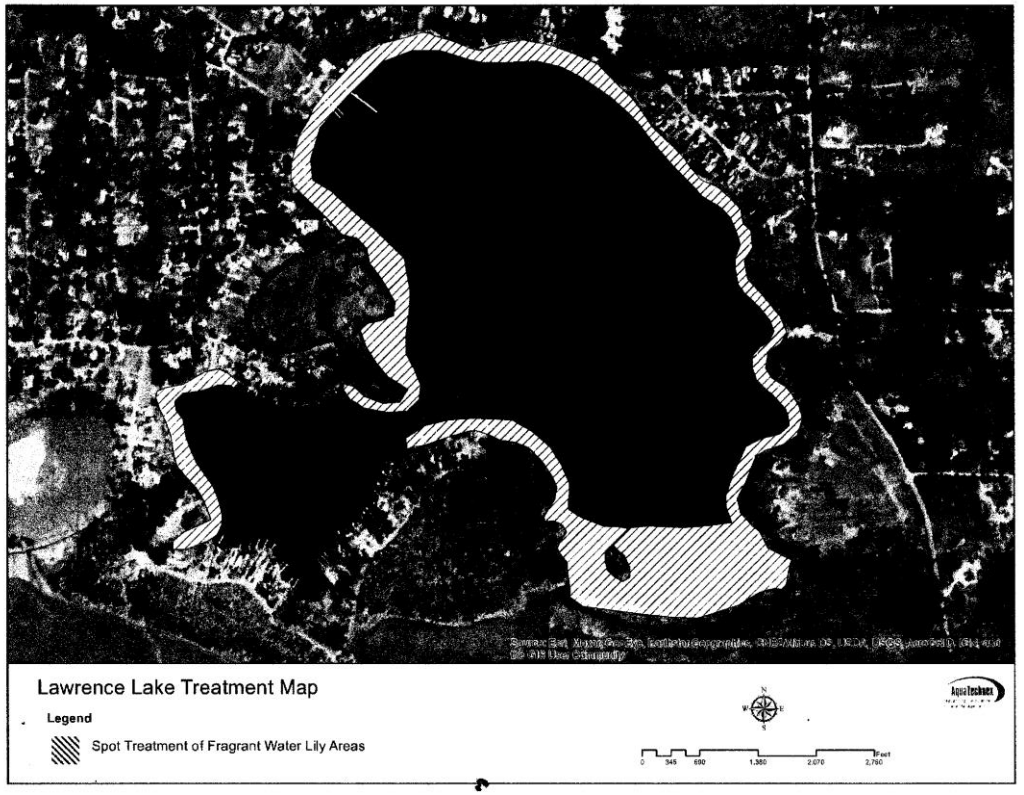
2026 LMD Fragrant Water Lily Treatment Plan

- 15 Jul – 15 Aug – Treatment of Fragrant Water Lily, if required (to be determined in June or July 2026 following lake survey).

2024 Treatment –
2.5 Acres

2025 Treated
Approx 3 Acres

Treatment Costs:
Jul 19 - $1,540
Jul 20 - $1,517
Jul 22 - $2,373
Sep 24 - $2,500
Aug 25 –$1,875



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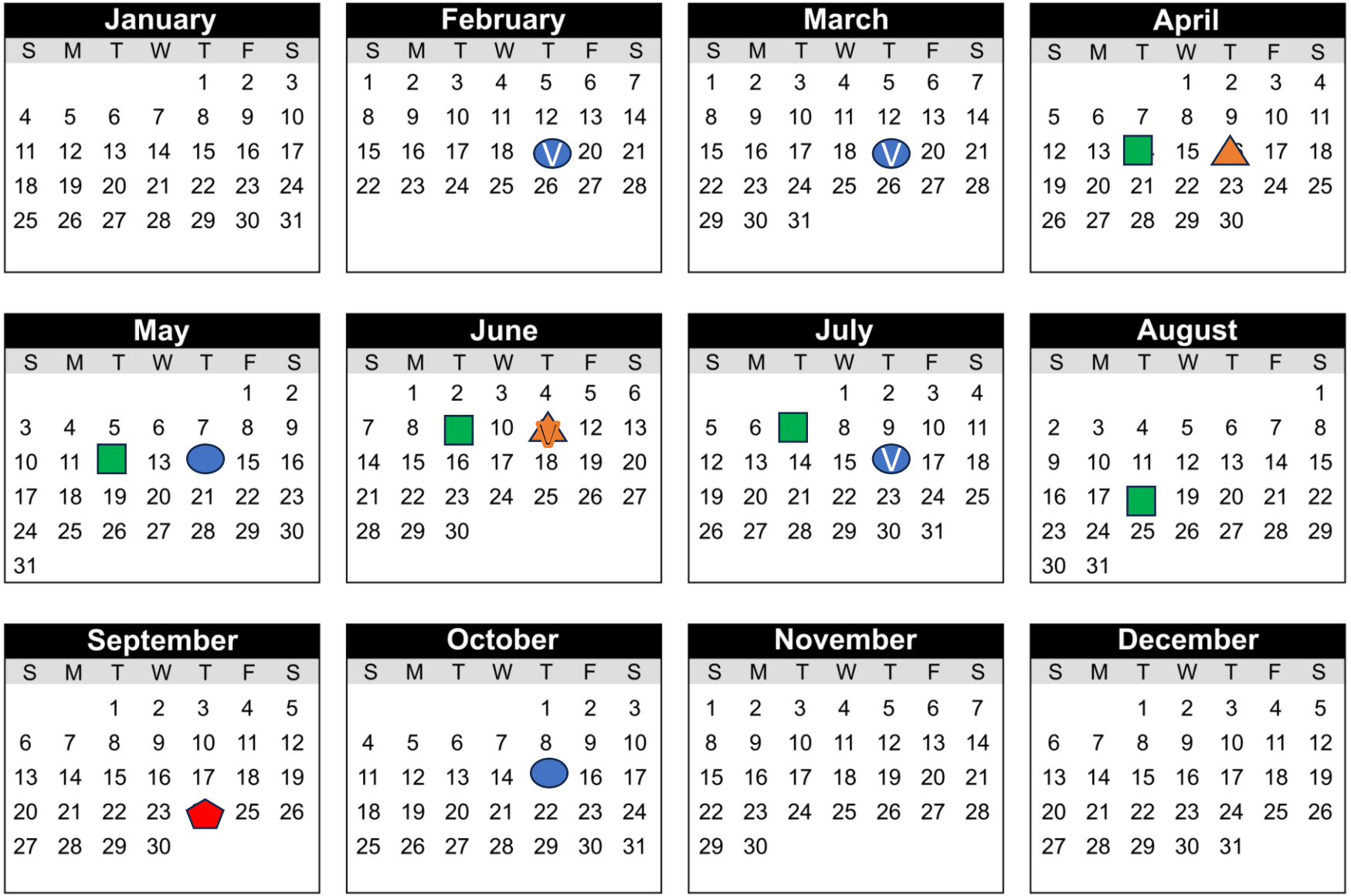
2026


January
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LEGEND
LMD MTGS
CMP MTGS
SURVEYS
ANNUAL MTG
V VIRTUAL

2026 SC Meeting Schedule (6:30-8:30 p.m.):

- Thursday 19 February (Virtual)
- Thursday 19 Mar (Virtual)
- Thursday 14 May (In Person)
- Thursday 16 July (Virtual)
- Thursday 15 Oct (In Person)

2026 CMP Meeting Schedule:

- Mtg#4 – Thursday 16 Apr 2026 2 hours Virtual w/All LMD 6:30-8:30 p.m.
- Mtg#5 – Thursday 11 Jun 2026 2 hours virtual w/SC 6:30-8:30 p.m.

2026 Survey Schedule – 9 a.m. (3 hours):

- Tuesday 14 Apr
- Tuesday 12 May
- Tuesday 9 June
- Tuesday 7 July
- Tuesday 18 August

Annual Meeting – 6:30-8:30 p.m.

- Thursday 24 September

FUNDING FOR LAKE LAWRENCE

Registered for HAB grant webinar - 3/26 -

Registered for SAW - Secure Access Website

Continue working on grant application due Nov 2026

Other Funding Ideas

Non Profit - Individuals and businesses can donate.

Need their own structure - Board of Directors - Bank Acct - Meetings

Letter of Interest Drafted - Vote on distributing?

501c4

Non Profit - Not Tax Deductible Donations (Pattison Lake Association)

501c3

Non Profit - Tax Deductible Donations i.e: Friends of Lake Lawrence

GRANT FUNDING UPDATE

- Kim Farnes
- Objective – to obtain one grant a year beginning in 2027.
- Grant Opportunities:
  - 1 Oct 2026 - $50,000 Grant for Freshwater Algae Control Grant Program for Fiscal Year 2028. Fund Manager: Joseph Teresi, Aquatic Invasive & Algae Control Grants Manager, Dept of Ecology, joseph.teresi@ecy.wa.gov
    - Cyanobacteria control and management
  - Storm Water Drainage & Erosion Control (LLCC HOA Park/Wildaire HOA Park & Drainage)
  - Habitat Restoration Goat Island/County Park/HOA Parks
  - Water quality monitoring equipment (Secchi Disk/Kemmerer Gauge/Water Quality Sonde w/4 Probes & 50FT Cable – same one as used by Thurston County Environmental Health) – John Haberline john.haberline@co.Thurston.wa.us
  - Water quality testing equipment
  - Locating and capturing phosphorus output at lake vents (springs) to determine actual amount of "P" coming into lake through these springs.
  - Federal Grants EPA Grants under Clean Water Act – to fund OST Costs

September 24, 2026, Annual Meeting

- Guest Speaker: Kevin Hansen, Thurston County Hydrologist
- Talking Points:
  - Hydrology of Lake Lawrence and surrounding area
  - Aquifers in and around area and how they impact our lake
  - Soil composition around Lake Lawrence and how that impacts septic system flow into the lake
  - Test results from local wells/public wells/water systems, what those tests show (Phosphates, etc.) in the water that may impact water quality at the lake
  - Recycle time for lake water

NEW BUSINESS

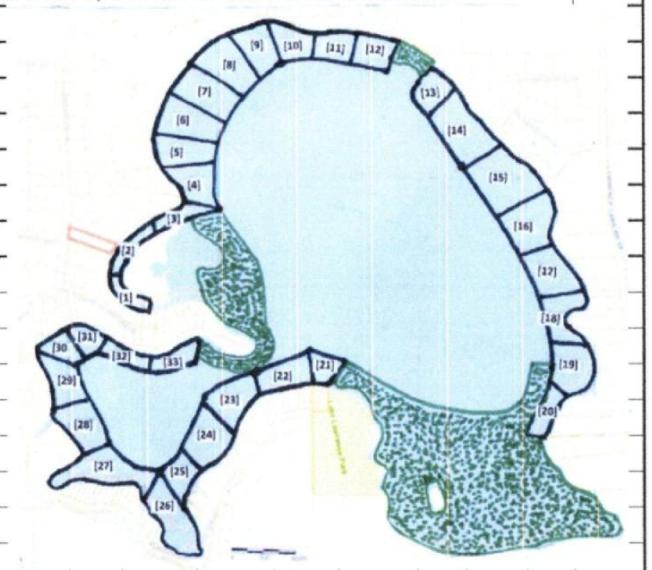
16 April 2026 - SURVEY RESULTS

LAKE LAWRENCE SURVEY SHEET

DATE:	16-Apr-26						COLLECTOR(S):	Barry, Frank, Janice, & Jim									
		Air Temp: 32-52	Water Surface Temp:		52 degrees		Weather: Partly Cloudy										
AVAS	Rake Pull	Geographic Location	Lat/Long	Depth (ft)	Water-Nymph	Nitella	Common Elodea	Narrow-Leaf	Curly	Big Leaf	Floating Leaf	Tape Grass	Coontail	Sago	Eel Grass	FWL	YFI
		A summary of the survey is provided below. Detailed survey results by AVAS are shown on subsequent pages.															

RATINGS:		
	1	Few plants in only 1 or a few locations - used to record the fact that a plant or specific species was found.
	2	Few plants, but with a wide patchy distribution. Small number of plants on rake head.
	3	Plants growing in large patches, codominant with other plants. More plants than 2, but fewer than a full rake head.
	4	Plants in nearly monospecific patches, dominate. Full rake head.
	5	Thick growth covering area. Plants falling off rake head.

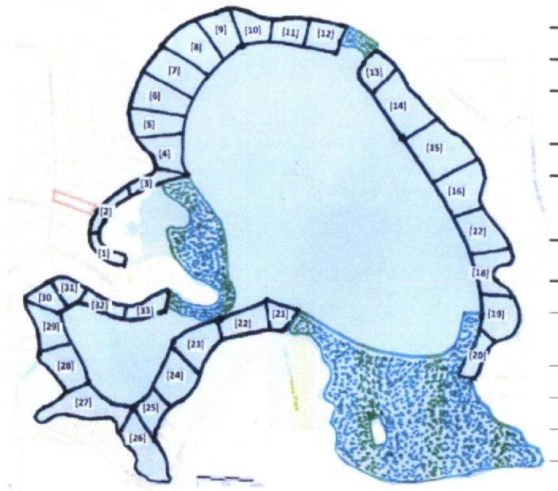
NOTES:		
1		59 Geese Counted - mostly on south end of lake in marsh area
2		YFI - A few private parcels around lake. Most in areas that will be treated this year.
3		Narrow-Leaf Pondweed Levels 1 and 2, AVAS Areas: 1, 6, 1-25, 27-31
4		Big Leaf Pondweed Level 1 AVAS Areas: 22 & 33
5		Tape Grass Level 1 AVAS Areas: 16, 22, & 28
6		Curly Pondweed - None identified in any area including conservations areas



12 May 2026 - SURVEY RESULTS

LAKE LAWRENCE SURVEY SHEET

DATE:	12 May 2026						**COLLECTOR(S):**	Barry, Frank, Jim, Ken, Terry & Janice										
	Air Temp: 55-70	**Water Surface Temp:**		**71**			**Weather:**	Slightly overcast to sunny										
AVAS	**Rake Pull**	**Geographic Location**	**Lat/Long**	**Depth (ft)**	**Water-Nymph**	**Nitella**	**Common Elodea**	**Narrow-Leaf**	**Curly**	**Big Leaf**	**Floating Leaf**	**Tape Grass**	**Coontail**	**Sago**	**Eel Grass**	**FWL**	**YFI**	**Geese A/G**
		A summary of the survey is provided below. Detailed survey results by AVAS are shown on subsequent pages.																
RATINGS:																		
	1	Few plants in only 1 or a few locations - used to record the fact that a plant or specific species was found.																
	2	Few plants, but with a wide patchy distribution. Small number of plants on rake head.																
	3	Plants growing in large patches, codominant with other plants. More plants than 2, but fewer than a full rake head.																
	4	Plants in nearly monospecific patches, dominate. Full rake head.																
	5	Thick growth covering area. Plants falling off rake head.																
NOTES:		**Water clarity was excellent. Bottom could be seen down to 9-10 feet. Great to see the bottom of the lake almost throughout the entire lake.**																
1	16 Adult and 15 Juvenile Geese																	
2	YFI - Many parcels around the lake that are not scheduled for treatment have active YFI. Homeowners of these parcels are responsible for ensuring the YFI stems/seed pods are cut off and/or the plant is removed.																	
3	Narrow Leaf Pondweed levels 1-4 in AVAS areas 1-7,11, 14-25, 27-28																	
4	Big Leaf Pondweed levels 1-3 AVAS areas 18, 21-22, 32-33																	
5	Tape Grass Levels 2 AVAS areas 4 & 17 - Tape Grass is just starting to emerge so we expect much more in the coming months.																	
6	Curly Pondweed levels 1-3 in AVAS areas 18 and all conservation areas																	
7	Nitella levels 1-2 in AVAS areas 2-4, 6, 8-9, 11, 15-16, 21-24, 27-32																	
8	Common Elodea 1-2 in AVAS area 33																	

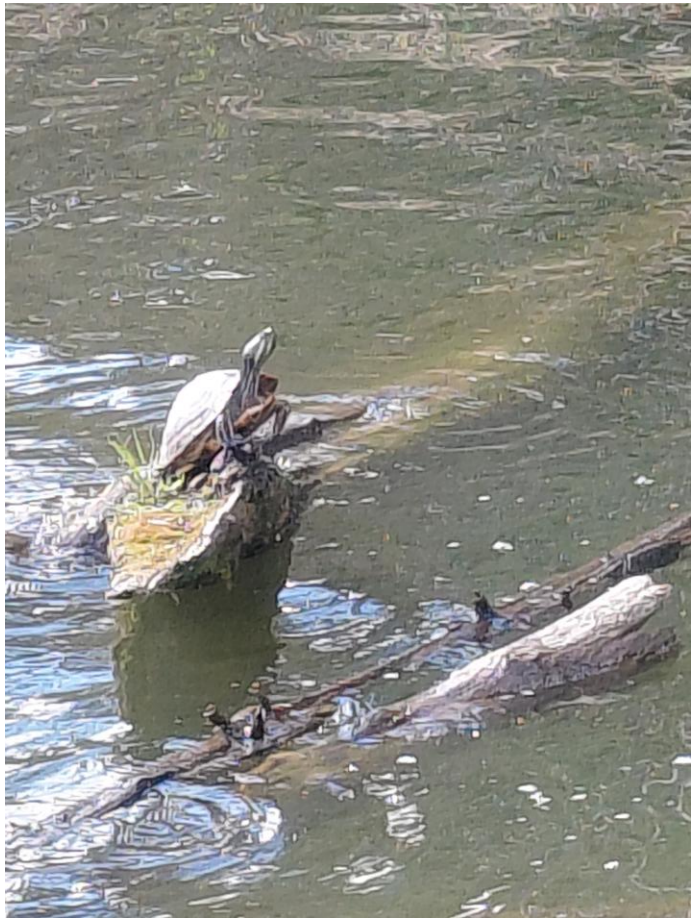


Other Business

- Good of the Order
  - HOA ANNUAL MEETINGS:
    - Scenic Shores - April 11 11a.m.-1 p.m. Moose Lodge, Yelm, WA
    - Wildaire – 6 June 2026, 9 a.m., Wildaire Community Park
    - LLCC – 20 June 2026, 11 a.m., LLCC Lower Lodge
  - 1 June 2026, 11:30-12:30 Meeting with Commissioner Grant

Animals of Lake Lawrence

Coot Rescue



Painted Turtle

REMOVAL OF HAZARDS

On 18 April 2026 Barry, Frank, Jim, & Carl located a large floating log in the Shoreline for Disposal on their burn pile.

Other Business

- Seminars/Webinars 23 & 25 March 2026
  - 23 March 2026 10 a.m. to 1 p.m. – U.S. EPA HAB Seminar - https://www.epa.gov/system/files/documents/2026-02/epa-cyanosymposium-2026-announcement_2-12-2026_v2.pdf
    - Animal Health Effects of Cyanotoxins
  - 25 March 2026 10 a.m. to 1 p.m. – U.S. EPA HAB Seminar – Same link as above.
    - Economic consequences of Cyanotoxin health risks
- WA State Pre-Season Freshwater HAB Readiness Workshop 15 Apr 26
  - WA Drought Declaration for 2026
  - Expect a warmer summer with higher and more severe incidents of HABs
  - 1 Dog Death reported in WA State in 2025 (Spanaway Lake) due to HAB Bloom

BACKUP SLIDES

In Lake Management Techniques

(DRAFT Herrera CMP Study 2026)

It is important to recognize that any lake management technique aimed at controlling algae, if successful, is likely to impact aquatic macrophyte populations. The clearer water means more sunlight for plant growth. Since most plants obtain their nutrients from the sediments rather than the water, lake nutrient reduction techniques typically do not impact them. Although phosphorus inactivation methods reduce nutrient availability in sediments where most aquatic macrophytes obtain nutrients, macrophyte roots typically penetrate below the inactivation zone (upper 10 centimeters) and are not affected by inactivation treatments. **Lake management should focus on achieving the appropriate ecological balance between algae and plants, since too much of either can be problematic.**

In Lake Management Techniques (Cont)

(DRAFT Herrera CMP Study 2026)

ALUM –

- Applications of aluminum sulfate (alum), in a sufficient dose to inactivate all mobile sediment phosphorus, have been shown to be effective for at least 10 years in lakes with low watershed inputs (Cooke et al. 2005).
- When alum is added to water, it consumes alkalinity, which can result in lowering pH. When pH lowers, more aluminum becomes dissolved, which lowers its effectiveness and also poses toxicity to fish in the lake. Low pH (<6) can directly harm lake biota, as well as increasing solubility of other toxic metals. To counteract negative ecological outcomes, particularly for larger treatments in soft water lakes (such as those in western Washington), a buffering agent is added during treatment to mitigate a significant pH drop.
- Multiple small alum doses typically cost more than a whole lake alum dose, due to higher mobilization costs. However, costs can be similar if an expensive buffer (sodium aluminate) is not needed to neutralize small alum doses but is needed for large alum doses. Multiple small alum doses are more appropriate for lakes with high external loading, which would reduce the longevity of a whole lake alum dose. Multiple small alum doses are sometimes preferred over a large long-term dose for financial reasons or to reduce potential impacts of aluminum toxicity to aquatic organisms. **Multiple small alum doses can be used to strip phosphorus from the water column and to inactivate sediment phosphorus**.

In Lake Management Techniques (Cont)

(DRAFT Herrera CMP Study 2026)

ALUM –

- ***Advantages***
  - Instantaneous water column phosphorus control
  - Long-term, stable sediment phosphorus control
  - Floc rapidly settled to bottom
  - Promotion of water clarity
  - Cost-effective and widely successful
- ***Disadvantages***
  - Potential impacts of aluminum toxicity to aquatic organisms (however, extensive use of a buffer and monitoring in our region has minimized this risk)
  - Sediment phosphorus monitoring required for accurate dosage calculations
  - Limited effectiveness when watershed load is dominant – not the case with Lake Lawrence

In Lake Management Techniques (Cont)

(DRAFT Herrera CMP Study 2026)

ALUM –

- ***Suitability for Lake Lawrence***
- Alum treatment would be a suitable management method to inactivate available phosphorus in Lake Lawrence given the strong influence of internal phosphorus loading on seasonal water quality conditions. Alum is comparable in cost to lanthanum-modified clay but typically has greater longevity because it is applied at rates with a higher phosphorus binding capacity than lanthanum. The long-term effectiveness of alum treatments in other Washington lakes with similar internal loading characteristics demonstrates its potential applicability. **Given Lake Lawrence's documented history of internal phosphorus release and recurring harmful algal blooms, alum treatment could provide meaningful reduction in phosphorus availability and bloom intensity if external inputs remain relatively small.**
- **Lake Lawrence is a soft water lake and would therefore require a buffering agent for a large alum dose. For smaller doses, a buffering agent would likely not be required; however, confirmation is needed** to ensure that a lower alum dose (<2 mg Al / L) would not result in substantial and ecologically damaging decreases in pH.
- ***Planning Level Costs***
- Testing Costs - $18k+ Regardless of full or partial treatment
- $1.41 M for full Reset or $315K for Partial Reset Treatment 20-25%
- Partial Reset will require additional treatments over several years to reach management goals.

In Lake Management Techniques (Cont)

(DRAFT Herrera CMP Study 2026)

- **Lanthanum Treatment**
  - Lanthanum (La^{3+}) has a strong affinity for phosphate (PO_4^{3-}), such that it chemically inactivates phosphate through precipitation and forms a mineral of extremely low solubility. Therefore, similar to alum, it forms a stable, long-lasting bond with phosphate. Lanthanum is available for application in lakes as lanthanum-modified bentonite (LMB), which is applied as a slurry using either Phoslock or EutroSORB® G
  - Unlike alum, however, lanthanum is not a coagulant and therefore **does not trap and remove particles in the water column**. Rather, lanthanum works mainly in the sediment to bind phosphate that would normally be released to the water through decomposition or changes in sediment chemistry
  - **Lanthanum concentrations immediately following application may exceed estimated toxicity thresholds**, particularly for zooplankton, and little study has been done for impacts on benthic organisms (Copetti et al. 2016).

In Lake Management Techniques (Cont)

(DRAFT Herrera CMP Study 2026)

Lanthanum Treatment

- ***Advantages***
  - Provides stable and long-term inactivation of phosphorus in the water column and/or sediment
  - Remains effective and non-toxic under a wide range of pH and oxygen conditions
- ***Disadvantages***
  - Temporarily increases turbidity from clay
  - Requires monitoring for accurate dosage calculations
  - Has fewer case studies to evaluate effectiveness and duration of treatments compared to alum
  - Has limited effectiveness when watershed load is dominant – not applicable in our case

In Lake Management Techniques (Cont)

(DRAFT Herrera CMP Study 2026)

Lanthanum Treatment

- ***Suitability for Lake Lawrence***
  - Lanthanum treatment would be a suitable management method to reduce available phosphorus in Lake Lawrence, particularly for controlling internal phosphorus loading from lake sediments. Phoslock®, EutroSORB® G, EutroSORB® SI are currently permitted for use in Washington and are best used for sediment inactivation lasting one to several years. These products may also be applied in smaller doses to strip phosphate from the water column, though additional product is typically required to inactivate phosphorus released from recent sediments over a 1-year period.
- ***Planning Level Costs***
  - Testing Costs $16k+
  - $1.7m total reset or $315k for partial reset treatment
  - Partial reset requires additional treatments annually or frequency based on conditions

In Lake Management Techniques (Cont)

(DRAFT Herrera CMP Study 2026)

- **Iron Application**
  - Iron (Fe) amendments are used to reduce internal phosphorus (P) loading by increasing the capacity of sediments (and, in some cases, the water column) to bind phosphate. Iron can be applied as iron salts (e.g., ferric chloride, ferrous chloride, ferric/ferrous sulfate) or as iron-bearing solids (including iron oxyhydroxides and zero-valent iron [ZVI]). **Following application, phosphate can be removed from the water column through adsorption and co-precipitation with iron (oxyhydr)oxides and subsequently retained in surface sediments**, where iron can function as a dynamic P "trap" under appropriate geochemical conditions. Under anoxic, low sulfur conditions, phosphorus can be retained in association with ferrous iron as vivianite, which can act as a longer-term P sink. These processes are highly sensitive to sulfur cycling and redox dynamics.
  - A synthesis of iron-addition restoration studies in shallow lakes found that most evaluated applications increased P retention, and field studies commonly reported reduced water column chlorophyll responses without observed toxic effects, while emphasizing that outcomes depend strongly on lake-specific conditions (Bakker et al. 2016). Across systems, iron addition was most successful when external P loading was low and when sediment organic matter, sulfate, and sediment disturbance by fish/crayfish were also relatively low.
  - Field evidence indicates that sulfate reduction can divert added iron away from phosphate binding by promoting Fe-sulfide formation, reducing the iron available for P retention. In a comparative field study of two urban lakes (Heinrich et al. 2022), added iron was preserved in sediments in both systems, but phosphorus retention improved in one lake while sulfur was retained by excess iron in the other; the authors attributed the contrast to differing sulfate reduction rates and concluded that planning for iron amendments should explicitly consider the competing process of iron sulfide formation and may require additional iron to account for it.
  - ZVI is a form of iron typically used in soil and groundwater remediation efforts to bind chemical contaminants by transferring an electron to a contaminant compound. Contaminants in groundwater that have been inactivated by ZVI include petroleum hydrocarbons, pesticides, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and nitrates. These results support ZVI's capacity to bind phosphate under controlled conditions, but translating engineered-system performance to open-water lake settings requires site-specific testing and monitoring.

In Lake Management Techniques (Cont)

(DRAFT Herrera CMP Study 2026)

Iron (ZVI) Treatment

- ***Advantages***
  - Can enhance retention of dissolved phosphate and reduce internal P loading when lake chemistry supports durable Fe–P retention pathways.
  - Potential for formation of redox-stable Fe(II)–P minerals (e.g., vivianite) under favorable (low sulfur) conditions.
  - Not expected to have environmental impacts at anticipated dosage
- ***Disadvantages***
  - Phosphorus bound to iron in lakes and reservoirs can be resuspended due to dissolution in anoxic conditions
  - Effectiveness can be reduced where sulfate reduction drives Fe-sulfide formation, diverting iron from phosphate binding.
  - In organic matter-rich, frequently mixed, and intermittently anoxic systems, iron addition can yield only short-term improvements and may be followed by intensified seasonal P release
  - Limited effectiveness when watershed load is dominant. Not applicable in our case.

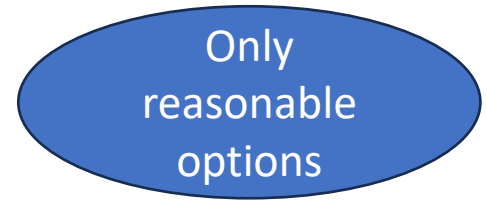
In Lake Management Techniques (Cont)

(DRAFT Herrera CMP Study 2026)

Iron (ZVI) Treatment

- ***Suitability for Lake Lawrence***
  - Iron/ZVI is not rejected for Lake Lawrence but, at this time, is best suited for pilot-scale testing. The lake develops low-oxygen/anoxic conditions at the sediment–water interface during summer, which is a critical constraint for iron-based sequestration strategies. In such settings, the long-term success of iron (including ZVI) depends on whether the system favors durable Fe–P retention (including vivianite formation) without substantial diversion of iron into sulfide phases. Given these uncertainties, iron/**ZVI is best characterized as an experimental or pilot-scale option for Lake Lawrence unless additional site-specific sediment and sediment-water-interface chemistry and bench/pilot testing indicate favorable sulfur and organic matter controls and a practical pathway to sustain iron-mediated P retention.**
- ***Planning Level Costs***
  - $12k+ Testing Costs – fewer tests required.
  - $875k for full reset or $190-225k partial reset treatment.
  - Partial reset may require additional treatments over time to reach management goals.

Table 4. Assumptions for Dose and Material Cost Estimates for Phosphorus Inactivation Chemicals.			
Approach	Cost per Unit	Approach A: "Lake Reset" Ratio	Approach B: Annual Lower Dose Ratio
Alum	Alum: $1.80/gal; Buffer: $6.60/gal	Sediment: 20 Al : 1 P (by mass) Water: 1 Al : 1 P (by mass) Buffer Needed ($246/kg P)	2 Al: 1 P (by mass) No buffer needed ($16/kg P)
Lanthanum (EutroSorb G; 10% La)	$8.25/kg	50 product : 1 P or 5 La : 1 P (by mass) ($412/kg P)	5 product : 1 P or 0.5 La : 1 P (by mass) ($41/kg P)
Lanthanum (EutroSorb SI; 10% La)	$20.50/dose units (sold per 10 dose units)	22 dose units: 1 kg P ($450/kg P)	2.2 dose units: 1 kg P ($45/kg P)
Lanthanum (Phoslock; 5% La)	$3.64/kg	100 product : 1 P or 5 La : 1 P (by mass) ($364/kg P)	10 product: 1 P or 0.5 La : 1 P (by mass) ($36/kg P)
Iron (ZVI)	$1.21/kg	44 Fe: 1 P (by mass) ($53/kg P)	4.4 Fe: 1 P (by mass) ($5/kg P)
Proprietary Blend – Calcium (OASE SeDox Max)	$11.15/kg	50 product : 1 P (by mass) ($558/kg P)	5 product : 1 P (by mass) ($56/kg P)
Proprietary Blend – EutroSORB WC	$25.00/dose units (sold per 10 dose units)	22 dose units : 1 kg P ($550/kg P)	2.2 dose units : 1 kg P ($55/kg P)



Note that the costs in these table reflect material cost estimates as of October 2025 and do not reflect mobilization/application costs, sales tax, permitting or monitoring fees, or inflation.

In Lake Management Techniques (Cont)

(DRAFT Herrera CMP Study 2026)

Hypolimnetic Oxygenation and Aeration

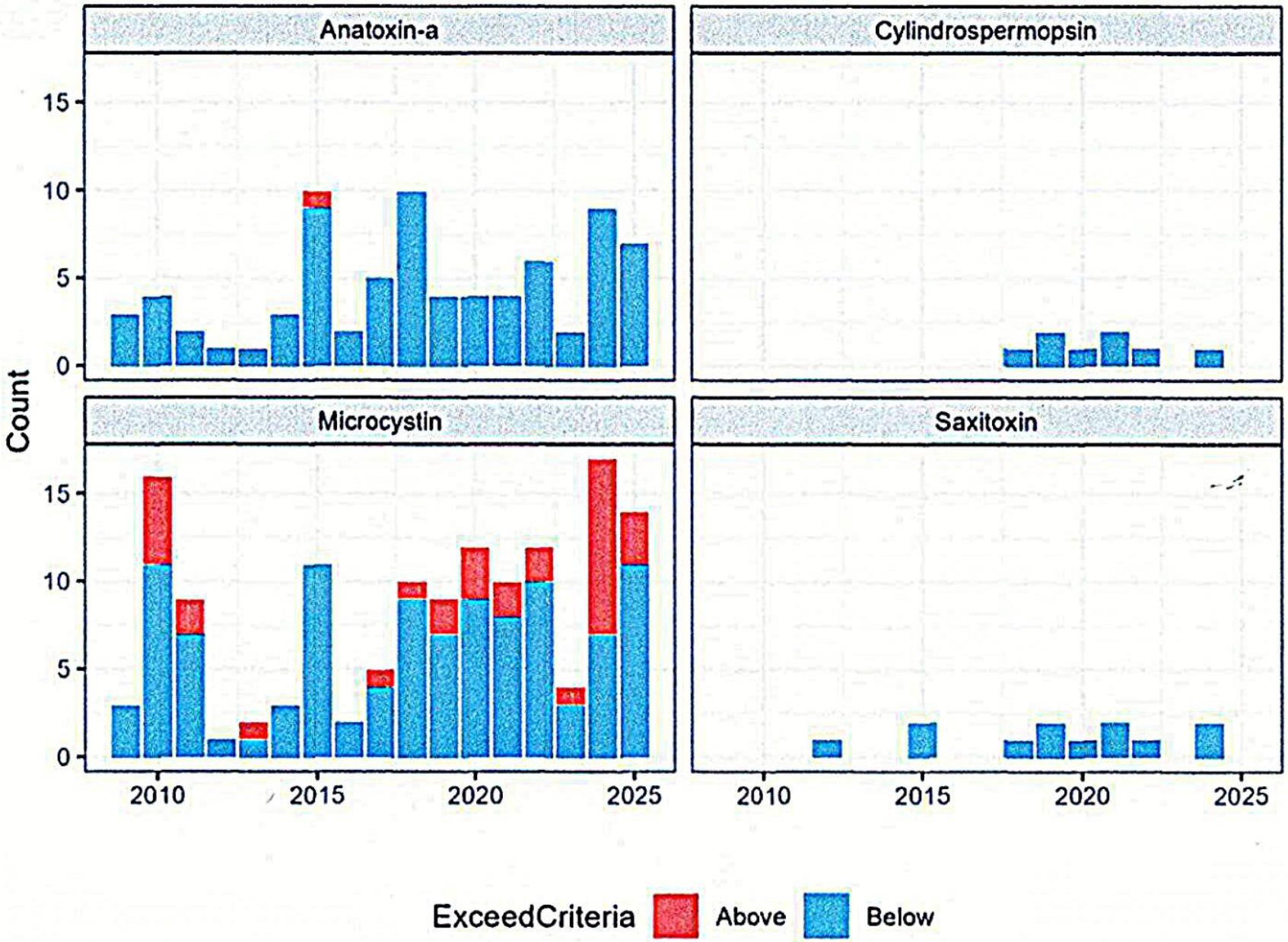
- **Advantages**
  - Reduces phosphorus release from anoxic sediments
  - Increases deep water oxygen, improves fish habitat and aquatic life uses
  - Degrades organic matter and cyanotoxins faster by using aerobic microbes
  - Is a non-chemical alternative
  - In addition to these advantages, new oxygen saturation technology (OST) pumping oxygenated water to and from hypolimnion is very promising for small lakes and is cheaper than traditional oxygenation systems.
- **Disadvantages**
  - May potentially resuspend sediment layer nutrients/ions in the water column
  - Causes sedimentation of organic matter
  - Requires installation and operational cost (electricity/regular maintenance) ~$85k a year
  - May require continuous operation
  - Can be ineffective when external nutrients are not controlled

In Lake Management Techniques (Cont)

(DRAFT Herrera CMP Study 2026)

Hypolimnetic Oxygenation and Aeration

- **Suitability for Lake Lawrence**
  - Hypolimnetic oxygenation is a suitable management technique for Lake Lawrence. The lake maintains seasonal stratification despite its relatively shallow depth (~6 m), allowing hypolimnetic anoxia to develop and drive internal phosphorus loading. Because external nutrient inputs are minimal, addressing internal loading is critical for improving water quality. Oxygenation directly targets this mechanism by maintaining oxic conditions at the sediment–water interface, thereby limiting phosphorus release. As a result, it has strong potential to reduce nutrient availability in the water column and mitigate cyanobacteria blooms. Given the lake's size and depth, OST may be particularly well suited, as it can efficiently deliver oxygen to the hypolimnion without disrupting stratification.
  - While effective, this approach requires significant upfront investment for design, permitting, and construction. HOS systems also require continuous power and maintenance, and may require one-time or ongoing treatments of supplemental iron to the lake to sustain phosphorus binding. Land may need to be acquired for placement and construction of the onshore facility, plus addition of a three-phase electrical supply to sufficiently power the facility and device.
- **Planning Level Costs**
  - Planning level costs for implementation of an HOS device in Lake Lawrence are based on the ongoing installation of an OST device in Spanaway Lake since the lake size is similar to Lake Lawrence (hypolimnetic volumes of ~ 2,500 and 2,700 acre-feet, respectively). Installing an HOS device in Lake Lawrence is expected to cost approximately $220,000 to design and $2.2 million to construct (including taxes and contingency costs). We recommend two manufacturer maintenance visits per year: one pre-season in April and one mid-season in August. This maintenance plan and annual operation costs are estimated at approximately $22,000 per year. Altogether, HOS in Lake Lawrence will cost approximately $2.6 million over 10 years, not including permitting costs to be completed by the contractor and Thurston County. Replacement parts range up to $1,800 and emergency repairs outside of warranty service are billed at $250 per hour; these incidental costs are not included in the above estimate.



Year	Days with Warning or Danger
2010	59
2011	35
2012	0
2013	16
2014	0
2015	35
2016	0
2017	13
2018	13
2019	19
2020	35
2021	29
2022	19
2023	13
2024	**147** (includes blooms going through Feb 2025)
2025	28