



LakeFront

Quarterly Newsletter of the Whitefish Lake Institute

Fall 2021

Septic Leachate Issue Progresses

A key component to healthy communities, dating back to Roman society, is the treatment of household wastewater. Nationwide, septic systems serve 1 in 6 households. Because of the more rural setting in Montana, roughly one half of the households have a septic system. Septic systems can offer an effective on-site wastewater treatment solution, but like all infrastructure, they have a finite life expectancy.

Typically, septic systems last for 25 to 30 years when the structure is apt to fail, or the drainfield soils lose their capacity to treat effluent. When this happens, human pathogens and nutrients such as phosphorus and nitrogen, may leak into surface water or groundwater putting human health and aquatic life at risk.

Suspected septic leachate contamination in Whitefish Lake was reported in a study conducted by the Flathead Lake Biological Station in the mid-1980s. In 2012, the Whitefish Lake Institute (WLI) published a study that confirmed the presence of septic contaminants at several shoreline locations. The issue has existed for over 30 years, and as more septic systems age and fail, our clean drinking water is at risk.

In response to this ongoing threat to water quality, the Flathead Basin Commission (FBC) recently undertook an effort using a Geographic Information Systems (GIS) model to assess the density and age of Flathead County septic systems using the septic permit database. The model overlays physical risk factors such as depth to groundwater, soil suitability, *(continued on Page 2...)*



What Makes Whitefish Great? The Lake!

During the 8th annual Great Fish Challenge, Whitefish residents gave to causes that matter to our community. A total of 139 donors contributed \$62,600 to the Whitefish Lake Institute. The Whitefish Community Foundation matched these donations with \$11,200. Twenty of the donors that gave to WLI were first time supporters.

Keeping the lake clean and preserving its quiet, scenic beauty is important to residents. Thank you to everyone who supported WLI during this fundraising event.

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Founded in 2005

Mission Statement

The Whitefish Lake Institute is committed to science, education, and aquatic resource initiatives to protect and improve Whitefish Lake and Whitefish area water resources today, while providing a collective community vision for tomorrow.

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LakeFront is published quarterly by the
Whitefish Lake Institute

Cover Photo:
*Whitefish Lake, looking toward
Whitefish Mountain Resort*

(*Septic leachate, continued from Page 1...*) slope, and distance to surface water.

Preliminary data from the FBC model shows that half of the permitted septic systems in the basin are older than 30 years. The model effort is currently working on an estimate of even older non-permitted systems predating **permit requirements that began in 1978. The model's preliminary data corroborates the areas of concern on Whitefish Lake identified by WLI in 2012.**

While water quality monitoring identifies the presence of septic leachate in waterbodies, it does not identify the source of the contaminants. To solve this question, WLI and FBC are partnering with Cornell University to conduct a Synthetic DNA study in 2022. Synthetic DNA tracers are benign and have a unique signature that will allow the research team to pinpoint contamination sources in the upland area.

WLI is also participating on a team funded by a National Science Foundation Smart & Connected Communities grant to explore solutions to the septic issue. The group will host a septic leachate summit in May 2022 to be held at the Flathead Lake Biological Station. Experts from across the nation will be invited to share information and develop solution strategies.

The solution strategies are complex. Traditional engineering solutions include replacement of the septic field (if there is space on the property), upgrading to a Level II system, neighborhood or communal systems, or connection to municipal waste services. Underlying the engineered solution is the complex interplay of personal perception and opinion, cost, jurisdictions, and inconvenience.

The science is clear. This issue has not gone away and will only get worse. We as a community need to define our stewardship legacy. Will we take the steps to tackle this complex issue, or will we kick the can down the road for future generations to address?

Septic System Health—What Can You Do?

- Pump your tank regularly. Regular pumping prevents solids from clogging the drainfield. The tank should be pumped every 3 to 5 years depending on use.
- Conserve water. Use water-saving fixtures and conserve water in the kitchen, bath, and laundry to reduce the amount of wastewater the soil must absorb.
- Repair or replace leaky fixtures. Leaky fixtures add excess water to the drainfield; fixing them promptly will reduce the amount of water the soil must absorb.
- Maintain proper cover and landscape over the drainfield. Make sure the drainfield is covered with grass to prevent soil erosion. A crowned drainfield and surface swales will prevent excess surface water from entering the trench. Make certain that downspouts, patios, walkways, and driveways do not divert water on to the drainfield or septic tank.
- Limit what goes into the septic tank. Things like diapers, coffee grounds, cigarette butts, kitty litter, hygiene products, cooking oil, and grease do not decompose may end up blocking the drainpipes. Solvents, cleaning fluids, paint, motor oil, gasoline, or other chemical substances kill the beneficial bacteria in the tank and soil.
- Do not drive or build over any part of your septic system.
- Have the septic pumper inspect the system components at the time of pump out. Check for signs of problems that can be corrected before a failure occurs.
- Monitor your system. If you notice standing water around your septic tank or leach field, **if you notice an awful smell in any of these areas, it's time to get your tank pumped.**

What's that in the lake?—FAQs

What is the yellow–green dust on the lake?

The yellow or greenish dust on the lake is pine tree pollen. It often accumulates near shorelines from wind action. Eventually, the pollen becomes waterlogged and sinks.

What is the black streak attached to my dock or buoy?

These black streaks appear to be periphytic, or attached ciliates. Ciliates are protozoans that are characterized by the presence of hair-like organelles called cilia. Most likely, periphytic ciliates are part of a biofilm that can develop on hard substrates and may also contain algae, bacteria and fungi.

What are the white streaks in the lake?

These “windrows” are Langmuir circulation cells. They develop when wind blows steadily over the water surface. That surface energy creates counter-rotating vortices in the very upper strata of the lake. White foam congregates where the counter-rotating vortices converge.

What is the white foam or “soap suds” along the shore?

Foam is created when the surface tension of water is reduced and air is introduced. Various natural organic surfactants from biological activity can reduce surface tension. If the suds smell earthy, it's a natural occurrence. If the suds smell like perfume, it's a indicator of human pollutants.

I see what looks like green paint or grass clippings.

This could be a “Harmful Algal Bloom” (HAB). Cyanobacteria or “blue-green algae” are ubiquitous in all lakes. The right environmental conditions are needed for a bloom to occur; usually calm and hot weather where there are plenty of nutrients. It's unknown how and why cyanobacteria can produce cyanotoxins. If ingested, cyanotoxins can cause skin irritation and intestinal distress to humans. In extreme cases, death can occur to livestock that ingests larger quantities. If you suspect a HAB, give the WLI office a call or report the suspected HAB to Montana DEQ at www.hab.mt.gov, or 1-888-849-2938.

I see what looks like green cotton candy in shallow waters.

This is filamentous algae. It is common in some lakes and may not indicate a water quality problem. These clouds may appear after heavy run-off in the spring or following a long, hot spell in the summer. Localized concentrations may indicate a pollution source nearby.

Call the WLI office if you observe any “Unidentified Floating Objects.”

A Closer Look—WLI's Science Advisory Committee (SAC)

Since its founding in 2005, WLI has continuously worked to enhance data collection, scientific research, and the communication of research results on Whitefish Lake and its tributaries. As part of this effort, the Science Advisory Committee (SAC) made up of local scientists, educators, and natural resource professionals provide scientific and technical guidance. **Guidance focuses on WLI's efforts to conduct research that results in valuable data for resource management decision makers in the Whitefish Lake Watershed.** The SAC meets quarterly to work with staff to cultivate and foster water quality related projects and to review science program methodologies, study results and reports. This group also provides input and reviews annual recommendations for WLI's scholarship programs and community awards.

Currently, the SAC is comprised of seven local professionals including: Sam Bourret, a fisheries biologist with Fish, Wildlife & Parks (FWP); Paul McKenzie, the Lands and Resource Manager at F.H. Stoltze Land & Lumber Co; Ryan Richardson, a fluvial geomorphologist with River Design Group; John Wachsmuth, a retired FWP biologist; Eric Sawtelle a Whitefish High School science teacher, and our two newest members: Erin Sexton, a research scientist at the Flathead Lake Biological Station and Melissa Brickl, a project hydrologist with Water and Environmental Technologies.

NMLN Wraps Up Season

This summer, Science and Education Director Cynthia Ingelfinger and WLI summer intern Molly Schmit were fortunate to work with many terrific volunteers on 41 lakes all over northwest Montana as part of the Northwest Montana Lakes Network (NMLN). This program is a long-term partnership between Montana Fish, Wildlife & Parks, WLI, and citizen scientists. The objectives of the program are to collect baseline data, determine water quality trends, and, most importantly, inform and educate the public regarding water quality issues, aquatic invasive species and aquatic ecology. This summer, nearly fifty volunteers spent more than 600 hours in the field collecting water data and searching for aquatic invasive species.

The program website (nmln.info) includes detailed information about all 41 lakes including a short report for each lake. The hard work of dedicated volunteers over the last ten years has produced a wealth of information about water quality of the lakes in our region. If you would like to volunteer to monitor a lake, contact Cynthia at the WLI office 862-4327.

Fall Photos



A black bear balances on a log in the Averill's Viking Creek Wetland Preserve. The Preserve is 28.82 acres and is owned and managed by WLI. The Battin Nature Conservancy Easement borders the Preserve's northern and eastern boundary.



A cow elk bedded down directly in front of one of our cameras. We had many photos of elk in the Preserve, and the area appears to be an important refuge and rearing area for a herd that travels to and from Big Mountain.



A bobcat was caught sneaking through the Averill's Viking Creek Wetland Preserve. The area has proven to be rich in biodiversity. Notice the houndstoungue in the foreground. WLI has a weed management program to control infestations.



WLI's Science Advisory Committee recently met at the Whitefish High School Center for Sustainability and Entrepreneurship to discuss the future direction of WLI's scientific monitoring of the Whitefish Lake watershed.



2021 summer intern Molly Schmit from The University of Montana spent the summer assisting in water quality data collection on 41 lakes in northwest Montana.



Whitefish watercraft inspectors Natalie and Kaitlyn, along with Meghan, a MSU undergrad student, spent a day observing and assisting in WLI's long-term monitoring effort on Whitefish Lake.

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