



LAKES ERIE AND CAMPBELL

Lake Management District No. 3

The following information has been provided by Skagit County Public Works Department and the Lake Management District No. 3 (LMD 3) Advisory Committee to the residents of the Lake Erie & Campbell Lake LMD with the intent of increasing public awareness and involvement related to lake management issues.

Milfoil, Algae, Flooding, Beavers, Geese, ... Oh My!

There are several complex issues impacting Lake Campbell these days, including aquatic weeds, algal blooms, high lake levels, and problematic wildlife (ie beavers, and geese). Both Lakes Erie and Campbell are shallow eutrophic (nutrient rich) lakes and are conducive to excessive aquatic plant growth and algal blooms which makes them challenging to manage. There are no easy fixes. Treating one issue tends to make the other issue worse. Controlling algae would improve water clarity which could increase aquatic weed growth. While controlling aquatic weeds with herbicides could increase the cyclic effect of internal phosphorous loading which could trigger algal blooms. It is important to acknowledge that these lakes will never experience the same pristine conditions that deep water lakes do. The purpose of this newsletter is to inform property owners of the issues and the steps that are being taken to address them.

Lake Management District No. 3 Program Overview

There are four LMDs in Skagit County administered by the Public Works Department. LMD 3 has been in place since 2001 after lakefront property owners voted to finance the management of invasive and nuisance aquatic plants in Lakes Erie and Campbell. It is one of four LMDs in Skagit County. LMD3 was recently re-established in 2020 for a new 10 year term. Lakes Erie and Campbell were combined into one LMD

because they are hydrologically connected, and invasive aquatic plants can easily get transported from one lake to the other. LMD 3 annual special assessments are limited to just managing the aquatic weeds and program administration for both lakes. There is not enough funding to address the algae or any of the other issues impacting the lakes unless the annual special assessment rates are increased.

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LMD 3 Aquatic Plant Control Program

Controlling noxious aquatic plant species is top priority for both lakes (ie Milfoil, lilies, purple loosestrife, and yellow flag iris). Milfoil can spread quickly and is very difficult to completely eradicate. It can easily be spread by fragmentation from boats, fishing equipment, wildlife, waterfowl, and water movement. It can also remain undetected beneath the lily pads.



Nuisance native weeds are also treated as needed and as funding allows. Native plants have become problematic on Lake Erie but are not currently prevalent on Campbell.

The [Integrated Aquatic Plant Management Plan](#) (IAPMP) for Lakes Erie and Campbell was developed with community input as a guideline for controlling the aquatic weeds. The IAPMP examines different alternatives and costs for managing the aquatic plant growth while maintaining a healthy ecological balance using the most affordable and effective solutions.

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Aquatic Weed Control Program

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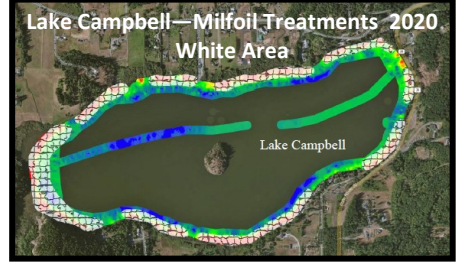
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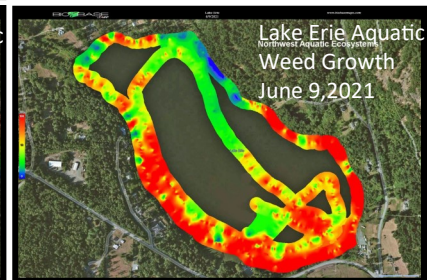
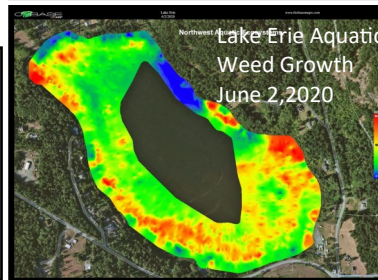
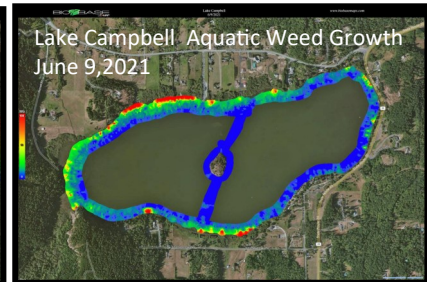
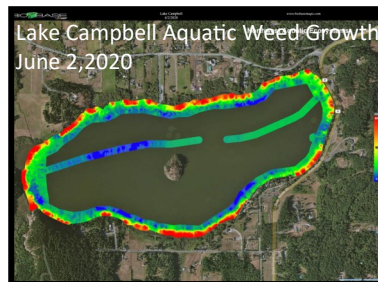
- **Michael & Zeffy Feist**
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The LMD3 aquatic weed control program is administered by Skagit County Public Works with input and guidance from the LMD3 Advisory Committee. The spring aquatic vegetation surveys help determine the treatment plan for both lakes. Reports can be found here: <https://www.skagitcounty.net/Departments/PublicWorksSurfaceWaterManagement/erielake.htm>

- **2019:** Only 6 Milfoil plants were observed on Lake Campbell and treated in 2019. No Milfoil observed on Lake Erie.
- **2020:** Milfoil had spread across most of Lake Campbell's shoreline in 2020. Over 81 acres of Milfoil were treated. New patches of Milfoil were observed and treated within the northwest corner of Lake Erie.
- **2021:** Milfoil was significantly reduced on Lake Campbell in 2021. However, there was an unexpected late season growth of Milfoil which could not be treated because the budget had already been expended on Lake Erie to treat the problematic native aquatic weeds.
- **2022:** The conditions at Lake Campbell were very poor during the spring 2022 survey. The water clarity was terrible, and the Milfoil had already surfaced. The contractor said this was the first time he has seen the Milfoil surface this early in the Season on Lake Campbell. Milfoil and lily treatments took place at Lake Campbell on July 7, 2022. Unlike Lake Campbell, Lake Erie appeared to be in really great shape this year! During the spring survey, the lake had filamentous algae growing on the bottom, but the Milfoil was very sparse and the water quality was great. From a weed perspective this was the best Lake Erie has looked in many years. Milfoil, lilies, and nuisance native aquatic plant treatments took place at Lake Erie on July 6, 2022.



Aquatic weed densities fluctuate from year to year. Sonar technology is used to map the weed densities to identify the most problematic areas to treat.



Blue=0% weed growth
Green= 20% weed growth
Yellow= 50% weed growth
Red= 100% weed growth

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Want to Improve Water Quality?

Reduce Nutrient Inputs Into the Lake:

- Inspect & maintain septic systems or better yet, switch to sewer.
- Do not feed water-fowl
- Reduce or eliminate the use of fertilizers and pesticides
- Only use phosphorus free, slow release organic fertilizers
- Properly dispose of pet waste
- Wash vehicles at a commercial car wash
- Reduce lawns (lawns attract geese)
- Plant native shrubs and vegetation along shoreline

[For more information:](http://www.ecy.wa.gov/programs/wq/plants/algae/lake)
www.ecy.wa.gov/programs/wq/plants/algae/lake

For questions or to report algal blooms or septic maintenance/ inspections in Skagit County, contact **Samantha Russell:** srussell@co.skagit.wa.us at the Skagit County Health Dept.



Algal Blooms

Algal blooms are not something new to Lakes Erie and Campbell. It's been an ongoing problem in both lakes since the 1970s. They are both **shallow eutrophic (nutrient rich) lakes** and are naturally conducive to excessive aquatic plant growth and algal blooms.

What Causes Algal Blooms?

Excess nutrients, primarily phosphorus, is the key ingredient that can trigger algal blooms. Nutrients can come from a variety of sources such as, fertilizers, failing septic systems, agriculture, forestry, animal waste, sediment, and decaying plant material. Other important factors include sunlight, temperature, and stagnant water.

Algal blooms are most common in the late summer and early fall, but can occur just about any time of the year if the conditions are just right. It is very common for blooms to occur right after there are big changes in temperature causing mixing of nutrients from the lake bottom into the water column. They also often occur after a period of heavy rain washing additional phosphorus into the lake, followed by sun and warmer temps.

Algal blooms also tend to increase when there are fewer aquatic plants or when aquatic plants are controlled with herbicides. When aquatic plants are present, phosphorus is removed from the soil by plant uptake. When plants decompose, nutrients are released back into the water column and lake bottom.

Algal blooms are typically short-lived and only last a few weeks. But sometimes they can last several months. This year the algal bloom at Lake Campbell lasted over four months!

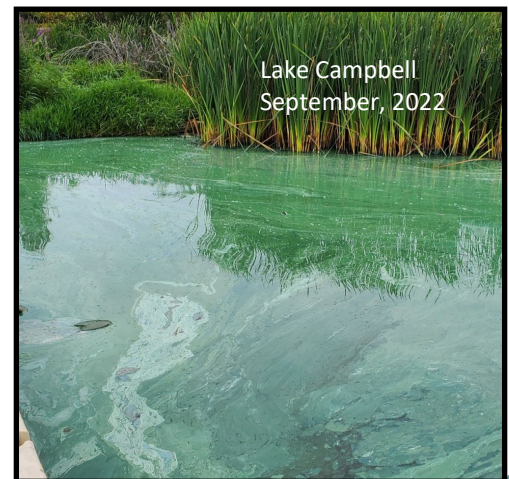
Are Algal Blooms Cause for Concern?

There are many different species of algae. Most algae are not harmful but can sometimes create undesirable water quality conditions.

Blue-green algae are actually cyanobacteria that have similar qualities to algae. Blue-green algae can sometimes produce harmful toxins. It's always a good idea to avoid areas with visible scum and keep pets out of the water, because conditions can change from day to day. Toxic algal blooms can be harmful to humans, pets, and other animals and can sometimes cause fish kills, depending on the level of toxins present.

Blue green algal blooms often look like spilled green paint floating on the water. Swirls of blue and white will occur as the blue-green algae starts to decay.

After the bloom dies, the microbes that decompose the dead algae use up more of the oxygen, generating a "dead zone" which can cause fish die-offs.



Algal Blooms Continued...

Lake Erie Water Quality

Fortunately for Lake Erie, the water quality appeared to be pretty good this year. The last time Lake Erie had a significant algal bloom was 2018, but the toxin levels were well below the State recreational guidelines. 2015 was the only time in the last 12 years the algal bloom toxin levels exceeded the recreational guidelines.

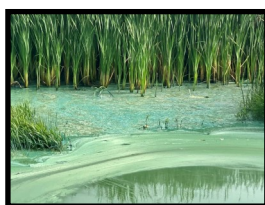
Lake Campbell Water Quality

Algal blooms have occurred almost every year at Lake Campbell since 2012 and exceeded the state recreational guidelines for toxins twice, in 2021 and 2022. This year was particularly bad because the algal bloom has lasted over five months so far!! The algal bloom consisted of two different types of algae, filamentous algae and blue-green algae.

Filamentous algae is a stringy slimy green algae that grows along the lake bottom or attached to structures in the water (like rocks or other aquatic plants) and often floats to the surface forming large slimy mats.



Blue-green algae (also called cyanobacteria) are a type of bacteria that can form blooms that look like green scum or swirls of spilled paint on the surface of water and often smells musty. Blue-green algae can become toxic. Although not all algal blooms are toxic, a good rule of thumb is “when in doubt, stay out”. A bloom that tests non-toxic one day can turn toxic the next day.



Algae Testing: The County Health Department tested the algal bloom several times throughout the summer at the public boat launch. The County Health Department can only collect samples on public property not private property. However, residents can collect their own samples and send it to the State Laboratory for testing, but only if pre-approved by the Washington Dept of Ecology because there is a cap on the number of samples that can be tested. For test results or more information: <https://www.nwtoxicalgae.org/ReportBloom.aspx>



Most of the samples tested in 2022 were well below levels of concern. However, the sample tested on August 25, 2022 exceeded the recreational guidelines for microcystin toxins. Yellow Warning signs were placed at the public boat launch owned by the Washington Department of Fish and Wildlife (WDFW).

What Caused the Fish Die-Off?

There were several reports of dead fish at Lake Campbell in late September, which could have been due to the toxic algal bloom, the depleted oxygen after the algae decayed, or some kind of virus or bacteria in the water.



Why Was the Water Quality So Bad This Year?

Without doing a water quality study, it is hard to say for certain why the water quality was so bad this year. However, it is likely that the levels of phosphorus were exacerbated by the **record rainfall** in the winter and spring, **extremely high lake levels**, **erosion**, **lake stagnation**, the large population of **Canada geese**, and possibly **overstocking fish**.

Lake Restoration Actions

Lake Campbell Lake Levels: *(Drainage Utility Funding)*

- ⇒ The carp screen was relocated to an area where it has remained clear of debris.
- ⇒ Removed the beaver dam at the outlet within the county right of way multiple times over the summer.
- ⇒ Notched the beaver dam in the outlet channel outside the right of way on private property multiple times over the course of a few weeks.
- ⇒ Obtained another permit to remove the dam with an excavator. Our crews plan to return and remove the dam one more time before the rainy season returns.
- ⇒ Assisting landowners in obtaining a permit to notch the beaver dam in the future.
- ⇒ Retained Watershed Science and Engineering firm to investigate the outlet channel to identify factors that are restricting flow and impacting lake levels. According to the [Technical Memorandum](#), Lake Campbell water levels are impacted by multiple factors, not just beaver dams. The downstream channel reach between Lake Campbell and Buttram



Lake Restoration Actions Continued...

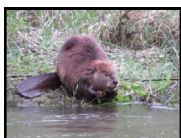
Lake is a significant factor impacting lake levels because it is relatively flat and heavily clogged with dense vegetation.

- ⇒ Water level loggers were placed in the outlet channel to collect one year's worth of water level data to develop a simple hydraulic model to evaluate the potential effects of a simplistic outlet channel restoration project. Results will be provided in another Technical Memorandum that will be made available to the public.
- ⇒ Technical Memos, Plans and Studies can be found here: <https://www.skagitcounty.net/Departments/PublicWorksNaturalResourcesManagement/plans.htm>

Problematic Wildlife:

Although the beaver and geese have become problematic for Lake Campbell residents, the County does not have the authority to manage wildlife. For technical advice and assistance in dealing with problematic wildlife, contact:

- ⇒ **WA Department of Fish and Wildlife:** TeamMillCreek@dfw.wa.gov, (425) 775-1311; or
- ⇒ **US Department of Agriculture:** Brook Zscheile (brook.zscheile@usda.gov) (360) 328-8691



Water Quality Study/ Algae Treatments:

- ⇒ In 1983, a **Water Quality Analysis and Restoration Plan for Erie and Campbell Lakes** was completed by Entranco Engineers. The study evaluated several different restoration options and identified aluminum sulfate as the best solution for reducing phosphorus and improving water quality.
- ⇒ 1985- Aluminum sulfate was applied to both lakes with good results that lasted over 10 years.
- ⇒ Over the last 20 years there has been an increase in phosphorus loading and the frequency, severity, and duration of algae blooms in both Lakes Erie and Campbell. This year was particularly bad for Lake Campbell.
- ⇒ 2022– There was not enough funding available to treat Lake Campbell this year. The County is currently looking into treatment options, costs, grants, and other sources of funding for lake restoration in the near future. There is no easy fix, and all of the treatment options are expensive.
 - **Long Term Treatments:** Aluminum sulfate, Phoslock, and EutroPHIX provide longer-term results by removing phosphorus, the underlying cause of algal blooms. Treatments are applied prior to a bloom and typically last an estimated 10 years depending on dosage. A study is required to determine proper dosage. Treatment

Costs range \$412k to \$4.4million

- **Short-Term Treatments:** Algaecides are applied during an actual bloom. Results last no more than one season. Treatment costs range from \$300/acre to \$800/acre. The contractor recommends treating an area of no less than 50 acres to get the best results which would cost around \$15k–\$40k. To treat Lake Campbell, the entire lake would cost around \$110,100—\$293,600, and for Lake Erie it would cost around \$33,900- \$90,400.
- Other treatment options that can also be considered and evaluated in the Lake Restoration Plan include, but not limited to: Nanobubble Technology, MPC Buoys, Iron, Calcite, Floating Wetlands, Mechanical Dredging, Aerators, etc.

Next Steps?

Lake restoration projects can only be successfully implemented if we take the time to develop a good solid plan, anticipate projected costs, secure adequate funding, and work within the regulatory framework.

STEP 1: Secure Funding for the Study and Lake Restoration Plan (Oct 17, 2022—Dec 1, 2022):

The County will apply for the Department of Ecology's (DOE) Freshwater Algae Control Grant Program which offers small grants up to \$50,000 to do a **study** and develop a **Lake Restoration Plan for Lakes Erie and Campbell**. The Study and Lake Restoration Plan will examine issues impacting the lakes, evaluate different treatment options and costs and identify the best solution for restoring the lakes. The study will also be used to calculate appropriate dosage for chemical treatments. The grant requires a 25% match. The County will look for ways to meet the 25% match requirement and reduce costs such as recruiting volunteers to help with sampling. The grant application process opens **October 17, 2022—December 1, 2022**. Funding will be available for the study and Plan in January, 2023. Results will be shared with landowners.

STEP 2: Secure Funding to Implement Treatments Identified in the Plan (Oct 17, 2023—Dec 1, 2023):

After the study and Lake Restoration Plan are complete, the County will apply for DOE's Freshwater Algae Control Grant Program to **implement the recommended treatments identified in the Plan**. The \$50,000 grant will most likely not be enough to cover the costs of treatments. Additional funding would need to be secured. At this point, it is uncertain where the rest of the funding would come from. The most likely source would be to increase special assessments which would require a vote. We will continue to explore other multiple funding sources. If we are unable to secure adequate funding, we cannot move forward with treatments.

Who is Responsible for What?

We all have an important role to play in keeping our waters clean, safe, and manageable. Protecting, restoring, and maintaining the lakes are expensive and will take time to develop a good plan and secure funding and work within the regulatory framework of appropriate public agencies. Funding, staffing, and regulations are huge limiting factor for public agencies in regards to what they are able to do for lake water quality.

Skagit County Public Works, Natural Resources Division



<https://www.skagitcounty.net/Departments/PublicWorksNaturalResourcesManagement/main.htm>

- Drainage Utility District Drainage Concerns (<https://www.skagitcounty.net/Departments/PublicWorksSurfaceWaterManagement/drainageutility.htm>)
 - ⇒ Contact: CJ Jones, cjones@co.skagit.wa.us or (360) 416-1448
- LMD3 Aquatic Weed Control <https://www.skagitcounty.net/Departments/PublicWorksSurfaceWaterManagement/erielake.htm>
 - ⇒ Contact: Tracy Alker, tracya@co.skagit.wa.us or (360) 416-1462

Skagit County Health Department, Environmental Health Division



<https://www.skagitcounty.net/Departments/HealthEnvironmental/recreation.htm>

- Local Toxic Algae Testing/Signage at Public Access
 - ⇒ Contact: Samantha Russell, srussell@co.skagit.wa.us or (360) 416-1566

Washington State Department of Ecology



- Maintains the Washington State Toxic Algae Testing program and database: <https://www.nwtoxicalgae.org/Default.aspx>
- Offers grants for Algae Management Plans and Algae Control and low interest rate loans for water quality improvement projects (<https://ecology.wa.gov/Water-Shorelines/Water-quality/Freshwater/Freshwater-algae-control>)
 - ⇒ Toxic Algae Program Contact: Lizbeth Seebacher, lizbeth.seebacher@ecy.wa.gov or (360) 407-6938
- Lake Water Quality Monitoring (<https://ecology.wa.gov/Research-Data/Monitoring-assessment/Lake-water-quality>)
 - ⇒ Lake Water Quality Monitoring & Protection Contact: William Hobbs, william.hobbs@ecy.wa.gov or (360) 995-3369
- Permitting and Regulatory Agency for aquatic plant management (<https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Aquatic-pesticide-permits/Aquatic-plant-algae-management>).
 - ⇒ Aquatic Plant Management Permits Contact: Shawn Ultican, shawn.ultican@ecy.wa.gov or (360) 870-3492
- Provides Technical Assistance for Aquatic Weed Identification and Control (<https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Aquatic-weed-control-technical-assistance>).
 - ⇒ Aquatic Weed identification Contact: Wes Glisson, wes.glisson@ecy.wa.gov or (360) 407-6194

Washington State Department of Fish and Wildlife



- Owns and maintains the public boat launch and is charged LMD3 special assessments for aquatic weed management
- Permitting and regulatory agency for fishing, hunting, trapping, and beaver dam removal
- Provides technical expertise to landowners for dealing with nuisance wildlife (<https://wdfw.wa.gov/species-habitats/living/nuisance-wildlife>)
 - ⇒ Regional Contact: TeamMillCreek@dfw.wa.gov, (425) 775-1311
 - ⇒ Canada Geese Contact: Tucker Seitz, tucker.seitz@dfw.wa.gov
- Pilot Beaver Relocation Program. Seeking volunteer participants to become permitted beaver relocators (<https://wdfw.wa.gov/species-habitats/living/nuisance-wildlife/beaver-relocation>)
 - ⇒ Contact BeaverRelocationPermit@dfw.wa.gov
- Provides technical expertise regarding beaver deceivers/pond levelers.
 - ⇒ Contact: Marcus Reaves, Marcus.Reaves@dfw.wa.gov or (360) 688-6247
- Can assist landowners with hiring a certified Wildlife Control Operator or becoming one: <https://wdfw.wa.gov/species-habitats/living/nuisance-wildlife/wildlife-control-operators>

US Department of Agriculture Wildlife Services Program



https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/SA_Program_Overview

https://www.aphis.usda.gov/wildlife_damage/ws_state_info/info_notebook/2015/pdf/Washington.pdf

- Provides technical assistance, equipment, and materials that enable people to resolve wildlife conflicts on their own. Also provides onsite wildlife management assistance to landowners when the issues are too complex to resolve on their own
 - ⇒ Contact: Brook Zscheile (brook.zscheile@usda.gov) (360) 328-8691

Samish Indian Nation



- Owns and maintains waterfront property on Lake Campbell and has a representative on the LMD3 Advisory Committee
- Monitors Lake Campbell water quality and its associated inflows and outflows since 2006
 - ⇒ Contact: Dept of Natural Resources (360) 293-6404