

The Beaver Lake Monitor



A publication of the Beaver Lake Management District Advisory Board
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The Beaver Lake Management District Renewal: *Eyes on the Future*

Citizens living near Beaver Lake have long been concerned advocates for the lake, which is considered sensitive due to the amount of phosphorus it receives from the watershed.

Beaver Lake was designated for special protection through increased control of water runoff

from development activity and specific measures to ensure protection were included in the 1998 King County Surface Water Design Manual, which was adopted by the city of Sammamish when it incorporated.

In 1995 property owners voted to tax themselves annually for five

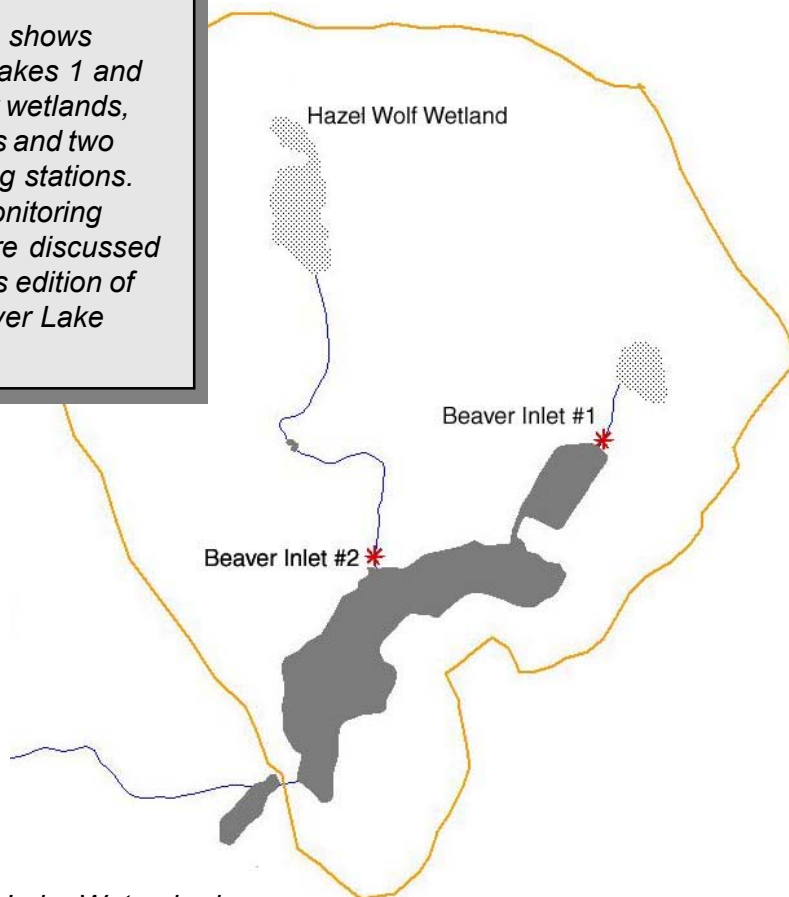
years in a tightly controlled local improvement district, called a Lake Management District (LMD).

This created funding to monitor the water quality of runoff and to educate residents within the watershed about the effects of both good and bad environmental practices in every day life. The final task of the district was to produce an update of the 1993 Lake Management Plan, which was completed in December 2000.

In 2001, property owners in the watershed and the Sammamish City Council approved a second LMD, by majority vote. In August 2002 the LMD Advisory Board was formed to direct LMD activities. The Board began by selecting a group to do the work approved

(Continued on p. 4)

This map shows Beaver Lakes 1 and 2, nearby wetlands, tributaries and two monitoring stations. Some monitoring results are discussed inside this edition of The Beaver Lake Monitor.



The Beaver Lake Watershed

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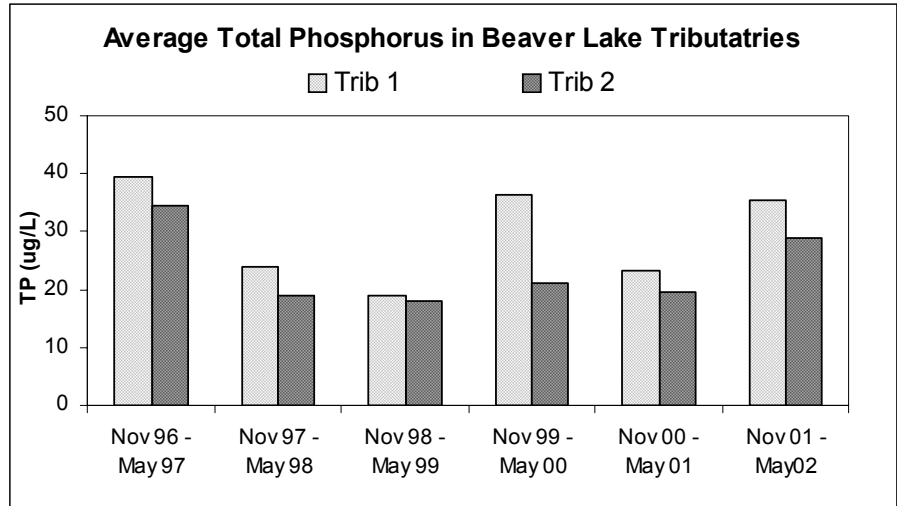
Phosphorus in Beaver Lake

15 P 30.9738 Phosphorus	Symbol	P
	Name	Phosphorus
	Atomic Number	15
	Relative Atomic Mass	30.9738

Phosphorus is a nutrient common to lakes around the world, and Beaver Lake is no exception. Phosphorus naturally enters lakes with leaves, wood, and attached to sediment, as well as dissolved in the water.

However, increased development in a watershed can result in higher phosphorus concentrations in lake water. Every day human activities near lakes can contribute substantially to phosphorus in the water, as well. Yet, there are many easy ways to minimize phosphorus impacts (*see article opposite page*).

Algae growth in most King County lakes is limited by the amount of available phosphorus. So even small additions to the overall



phosphorus “budget” can trigger algae blooms that can detract from our enjoyment of a lake.

To monitor phosphorus concentrations in Beaver Lake, the Lake Management District Advisory Board (*see cover story*) has contracted with the King County Department of Natural Resources

and Parks to collect samples from the tributaries leading into little Beaver and big Beaver lakes.

The chart above shows the average phosphorus concentrations in micrograms per liter from November through May for the last five years. Samples were collected from each of the tributaries entering Beaver Lakes 1 and 2 from the north, as well as from the seasonal inflow entering Beaver Lake 2 slightly north of Beaver Lake Park. All three sample sites are just upstream of the culverts under Beaver Lake Drive. Preliminary analysis yields no significant trends and the range of variation from year to year is well within normal.

For more information, contact King County Department of Natural Resources and Parks Lake Stewardship Program staff: Sally Abella at 206-296-8382 or sally.abella@metrokc.gov or Michael Murphy at 206-296-8008 or michael-wlr.murphy@metrokc.gov.



King County Lake Stewardship Program staff member Michael Murphy collects water samples and takes temperature, dissolved oxygen, pH and conductivity measurements from the tributary to Beaver Lake 1.

Tips for Reducing Phosphorus

Phosphorus (P) is a common element found in all things on Earth including animals, plants, soils, and air. All organisms need phosphorus and, in freshwater environments such as lakes, it plays a vital role in plant growth.

However, too much phosphorus can cause excessive algae blooms which can reduce water clarity, turn the lake green and deplete oxygen levels.

As a lakeside resident you have an impact on water quality. By using products around the house that have less phosphorus or changing the way you use them, you can make improvements.

Following are some tips on an easy way that you can reduce phosphorus.

Go to a car wash

Soaps and detergents used to wash cars at home can contain a lot of phosphorus. And when you wash your car on the street, all the chemicals, dirt, and nutrients can get rinsed directly into the lake. At a car wash, soaps and chemicals drain into our sewer system. So by using a car wash, the chemicals and

nutrients in the water will be treated before being returned to our waters. If you can't get to a car wash, park your car over grass when you wash it. That way you'll get the benefits of watering the grass as well as letting it filter water runoff before it drains into the lake.

Use low phosphorus or organic fertilizer

Regular fertilizer can be unnecessarily high in several nutrients, including phosphorus. Your grass doesn't require that much phosphorus to thrive. Switch to an organic or low phosphorus fertilizer that will feed your lawn as well as drastically cut back the amount of phosphorus your garden potentially contributes to the lake.

Plant a buffer between your yard and the water

If you live on the lake or have a stream running through your property, plant a strip of native wetland vegetation between your yard and the water. This small patch of plants filters water runoff that could otherwise carry harmful nutrients into the lake or stream.



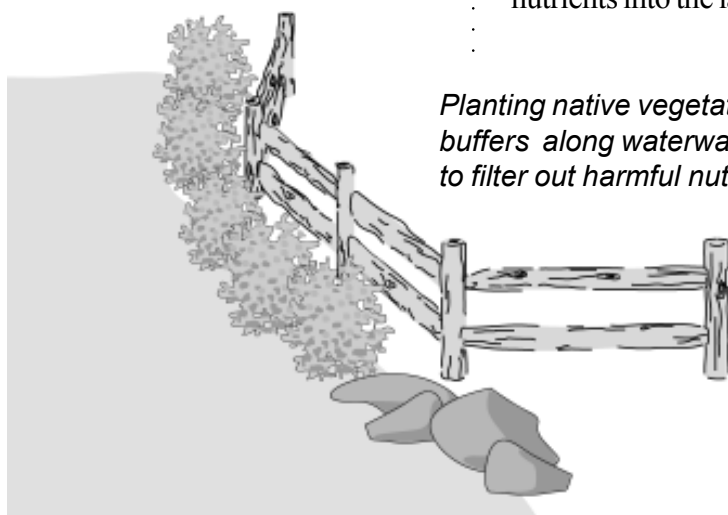
Using a car wash allows harmful chemicals and nutrients to drain into the sewer system, where it can first be treated, instead of directly into your lake or stream.

Reduce goose poop through landscaping

Goose waste can contribute high amounts of phosphorus to water. Geese are drawn to long stretches of unbroken lawn that reach down to the shoreline. So by planting that same vegetative buffer along your shoreline to soak up excess nutrients, you will also create an area less attractive for geese to hang out.

Pick up pet waste

Pick up after your pets, especially along the shoreline. Their poop is just as full of nutrients as that produced by the geese.



Planting native vegetation buffers along waterways helps to filter out harmful nutrients.



For more information about native plants or shrinking your lawn, call Greg Rabourn with King County at 206-296-1923 or go online to: <http://dnr.metrokc.gov/topics/yard-and-garden/>

LMD Renewal *(Continued from cover)*

under the LMD. Current board members include Bob White, Ray Petit and Sheldon Fisher, all of whom will serve for the remainder of the second LMD through 2006. The Board meets four times a year to discuss LMD work and to review suggestions for further activities.

The Lake Stewardship Program, a part of the King County Department of Natural Resources and Parks, Water and Land Resources Division, was chosen to continue monitoring the inlet creeks over the next three years, followed by a comprehensive lake assessment in 2006. This work is supported by an inter-local governmental agreement between the city and the county.

Meanwhile, volunteer monitors working with the Lake Stewardship Program staff in a county-funded project will monitor lake conditions during each summer to assess phosphorus – known to act as a

nutrient for algae – and will also measure temperature, water transparency, chlorophyll and nitrogen. Volunteers will also alert county staff if algal blooms occur and the species will be identified and recorded.

“Volunteers will monitor lake conditions from 2003 through 2005.”

The Beaver Lake Monitor newsletter will be produced and distributed by County staff biannually to keep the community informed. Newsletter content is suggested and supervised by the LMD Advisory Board.

Technical advice and support will also be provided to update the Beaver Lake Handbook, which is a Beaver Lake Community Club publication that details the recent history and environment of the Beaver Lake watershed. Further support will be given on the LMD

Web site, which is available through links on the Beaver Lake Community Club (www.beaverlake.org/LMD) and city of Sammamish Web sites.

If you have questions, comments or suggestions please contact Evan Maxim, City of Sammamish, at 425-836-7932 or Sally Abella, King County Department of Natural Resources and Parks, at sally.abella@metrokc.gov or 206-296-8232.



The south shore of Beaver Lake

Beaver Lake Management District Development Activity*

Current Building Permits:

There are 111 single-family, building permit applications in the general Beaver Lake Management District area.

Current Land Use Projects:

1. Two Lot Short Plat: 25210 SE 28TH ST- 1.65 acres/two lots.
2. Beaver Lake Estates Division 2: SE 26th ST, SE 23rd PL, and SE 22nd ST; 29 lots.
3. Beaver Lake Estates Division 3: E Beaver Lake DR SE & 263RD PL SE (approx.); 51 lots.
4. Laurels Division 3: 242 AV SE and SE 20th ST; 36 lots.
5. Norris Estates Division 2: 248th AV SE (approx.) and SE 27TH ST; 105 lots.
6. Trossachs Division 12: Trossachs BLVD SE; 79 lots.

*Information, as of July 2003, furnished by the City of Sammamish. Project boundaries extend as far as: west: 239TH AV SE; east: far side of Trossachs; north: Section 36 (Soaring Eagle); and south: Issaquah-Beaver Lake RD.

The Beaver Lake Creeks: Trends in pH and Alkalinity

King County staff have sampled the streams entering Beaver Lakes 1 and 2 since 1997 (*see map on front page*), looking for trends or changes in the water quality. Stream monitoring gives clues about potential impacts from changes in land use. If no changes are seen, that information can moderate concerns about development causing future problems in the lakes.

The Lake Management District tracks water flow, temperature, dissolved oxygen, pH, alkalinity, total phosphorus, turbidity, suspended solids, and water color. These elements provide information about the health of the streams and the origins of the water.

Increases over time

Both pH – a measure of water acidity – and alkalinity have increased in both streams over time. Higher pH values mean less acidity, with a pH of 7 considered neutral.

The pH chart shows that since 1997 both streams have increased pH in winter, meaning that both streams have become less acidic.

Since low pH is related to the bog origins of both streams, this could signal changes either in the bogs themselves or else in the landscape between the bogs and Beaver Lake. Increases occurred each year until 2003, when values dropped for both streams.

A similar pattern was seen for alkalinity, which measures the buffering capacity of the water (i.e., how hard it is). Bogs generally produce very soft water, so increases in the alkalinity measure suggest that more carbonates or other buffering agents are entering the streams. This could be related to soil disturbance or to new concrete being added on land within the watershed.

What might it mean for the lakes if these trends continue upward?

If these trends continue, the worst case would be that it signals some deterioration in the wetlands. If that were true, nutrients released by the decomposing bog mats could enter the lakes and cause increases in algal growth, even



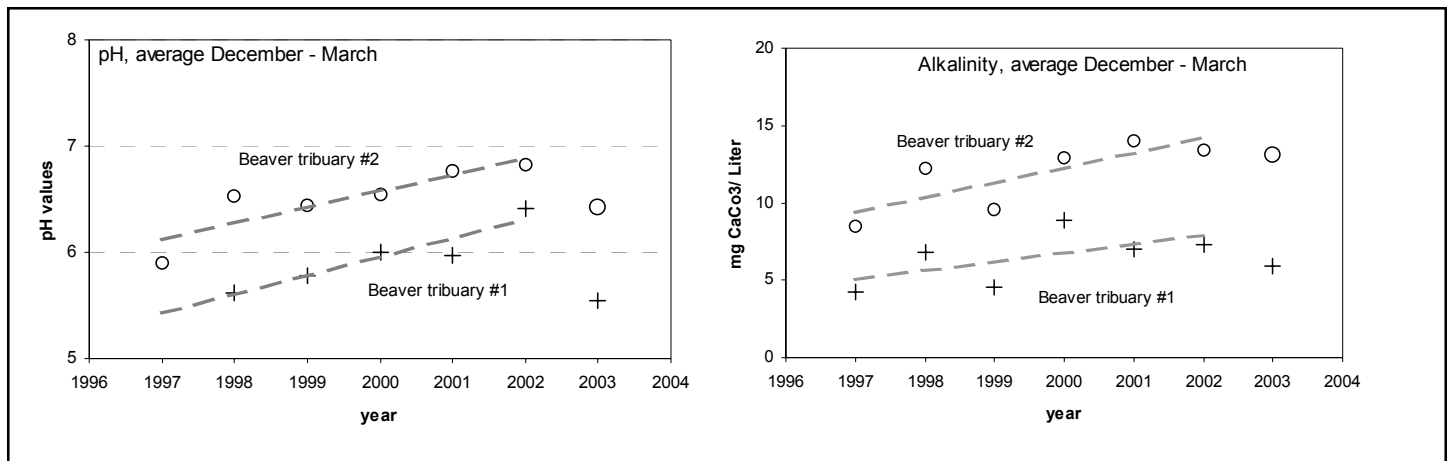
The west shore of Beaver Lake

nuisance blooms. However, this possibility has not been shown by the total phosphorus data so far and is merely a speculation.

If the only changes over time are the higher pH and alkalinity, not accompanied by increased phosphorus or nitrogen concentrations, resulting environmental changes are likely to be less drastic and may even be undetectable.

Additional sampling upstream could be done to see if the higher pH and alkalinity values are from water coming directly out of the wetlands themselves or from water entering the streams below the wetland outlets.

In any case, the LMD monitoring will continue to watch these two water characteristics very closely in the future.





King County

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Beaver Lake Monitor

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www.beaverlake.org (under development)



King County



At this beautiful time of year, we bring you a new edition of The Beaver Lake Monitor. In this issue you'll find information about the renewal of the Lake Management District, reports on Beaver Lake water quality and its creeks, as well as easy tips you can follow to help reduce the amount of phosphorus in Beaver Lake. Enjoy the rest of your summer!