



Lake Steward

The newsletter of the SWM Lake Stewardship program Vol. 4, No. 2 Spring 1997

Going native on your lake....

And we don't mean skinny dipping!

What are the benefits?

Preserving or reestablishing a buffer of native plants along the lake shoreline is one of the best ways to protect a lake from nearby land uses. Shoreline plants filter sediment and chemicals in stormwater runoff from shoreline properties. Vegetation protects the shoreline from erosion by buffering wave action and lake level changes. A native plant buffer between the open water and uplands also provides food and habitat for fish, wildlife, and many aquatic insects.

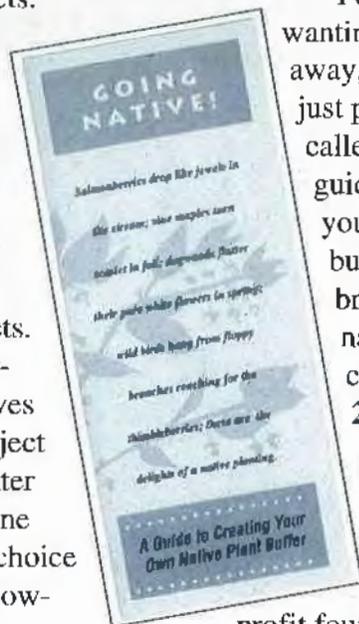


Native plant buffers filter stormwater runoff and provide habitat.

Are natives difficult?

Restoring or establishing a native plant buffer is not much different than most home landscaping projects. The primary difference is the objectives of the planting project (to protect lake water quality and shoreline structure) and the choice of plant material (low-maintenance native plants).

There are lots of written resources as well as technical experts available to assist you in your project if you decide going native is for you.



How to get started?

For gardening enthusiasts wanting to get started right away, King County WLR has just published a brochure called "Going Native". This guide will help you create your own native plant buffer. For copies of this brochure as well as other native plant information, call **Cindy Young** at **296-8065**.

Native plant projects

King County, the Pomegranate Center (a community based non-profit foundation) and the cities of Bellevue and Issaquah are currently working with shoreline residents along Lake Sammamish. The project is intended to reestablish native plant buffers along 10 shoreline properties. A similar

project was conducted at four Beaver Lake properties in 1995.

Lake Sammamish shoreline property owners have participated in a series of workshops with (continued on page 6.)

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Lake monitors report

Heavy winter rains kept lake levels high

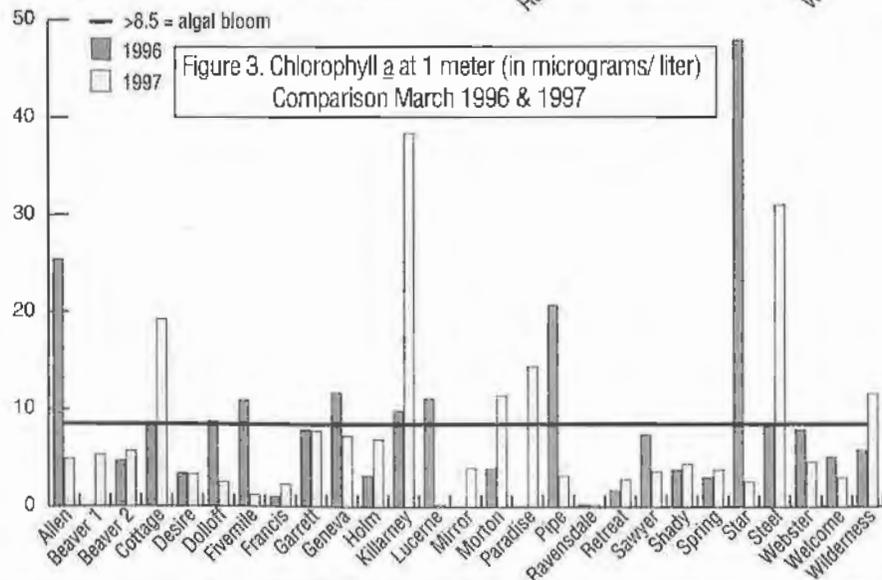
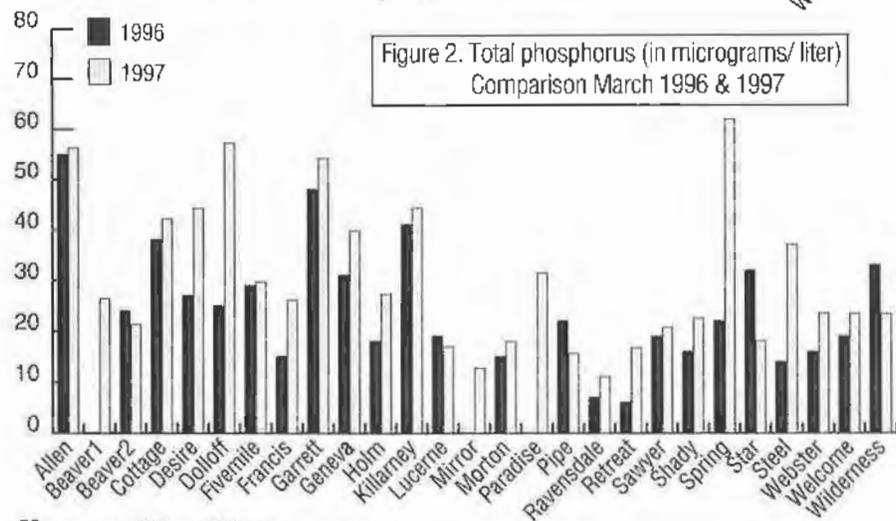
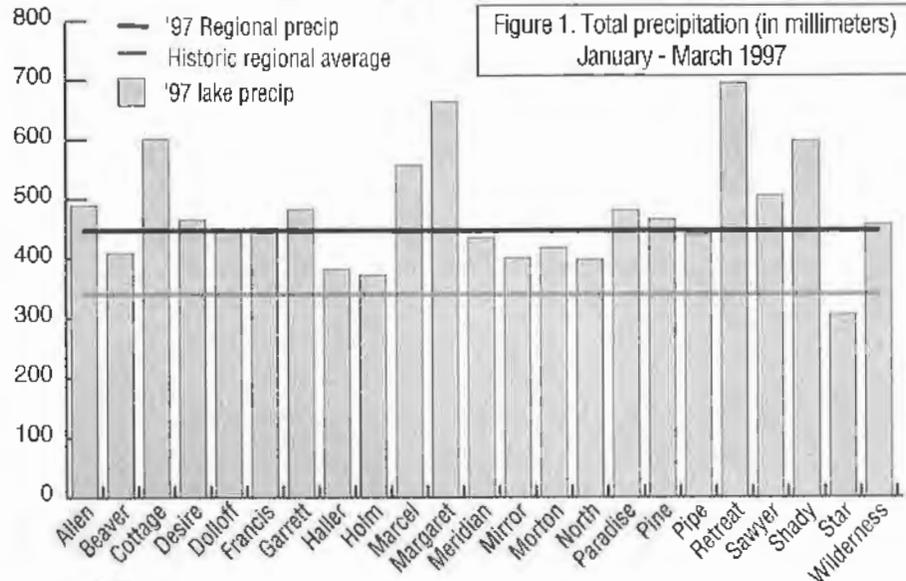
This winter's above average rainfall left most lake levels elevated around the County. Rainfall totals were higher than the historic regional average value of 340 mm (13.39 in.) for 21 of the 22 lakes. Precipitation levels from our reporting lakes ranged from a low of 306 mm at Star Lake to a high of 664 mm at Lake Margaret (Figure 1). The actual regional rainfall for this period was 447 mm (17.60 in.) which is 131 percent above average for the three month period.

Since lake levels were already elevated, less dramatic increases were observed during the winter quarter for most of the lakes. Only five lakes (Allen, Cottage, Garrett, Haller, and Margaret) reported lake level increase of 50 cm or more for the winter. Last quarter, 19 of 22 lakes had an increase of 50 cm or greater.

Successful March Sampling

Twenty-seven lakes participated in the March 9th & 10th Level II water quality sampling event. Figure 2 compares March 1997 total phosphorus concentrations with those taken at the same time last year. Most lakes had higher total phosphorus concentrations in March 1997 than the previous year. Beaver 2, Lucerne, Pipe, and Wilderness were the only exceptions with lower concentrations observed in 1997.

Higher lake phosphorus values this spring likely reflect increased nutrient loading caused by
(continued on page 4.)



Staff Changes

Say a big hello to Susan!

With the monitoring season in full swing, you'll soon get the chance to meet **Sue Kaufman-Una**, who joined the program in February as our **Sr. Water Quality Specialist**. In addition to supporting the Lake Stewardship Program, Sue is working on projects at Lakes Sawyer, Cottage, Twelve

and Killarney.

Sue is no stranger to King County – she has worked for the Water and Land Resources Division (formerly Surface Water Management) for five years in river and stream water quality and watershed management. Previously, she worked as a limnologist in New England. Sue is excited about working with the many dedicated lake volunteers and is happy to be part of such a strong program. 🐸



Susan is happy to be on board!

See you later alligator

And he's off!

For the last five years, **Steve Majerick** has supported the lake monitoring program. He loved helping volunteers and serving as the program techno-wizard, but he couldn't pass up a new opportunity with the City of Steilacoom. We will miss his resourcefulness and good humor!

Good luck Steve! 🐸

Another addition

Jessica joins lakes program

Jessica Anderson joins the Lake Monitoring Program this month. She will help Wendy Cooke make smooth sailing of the rest of the sampling season.

Level II monitors are likely to run into Jessica making the rounds, picking up samples. Be sure to say hello to Jessica if you have the chance! 🐸

What a workshop!

Monitoring workshop spawns comment

We received fourteen evaluations from the volunteers that attended our March Lake Monitor Workshop. Comments were very favorable while offering ideas to improve future workshops.

Most everyone found it reassuring to review monitoring techniques, and said that the summation of volunteers' data is interesting and useful.

To improve future workshops many folks suggested we manage individual questions better to ensure that time spent in the

workshop is the most beneficial to everyone.

Other comments included:

- 🐸 "Forget the bagels and bring on the donuts!"
- 🐸 "More frequent or longer workshops could teach more."
- 🐸 "A laboratory tour would be interesting to many." (we will look into this for a future date)

Volunteers passed on topic ideas for future workshops:

- noxious weed identification and control,
- algae identification,

- lake clarity (measurement and reasons for fluctuations),
- watershed surveys, mapping and monitoring,
- community awareness techniques, and
- wetland wildlife and management.

We send a big **THANK YOU** to those that took the time to respond to our survey. If you have any **additional** ideas that might improve our workshops, please call **Wendy Cooke at 296-1949**. 🐸

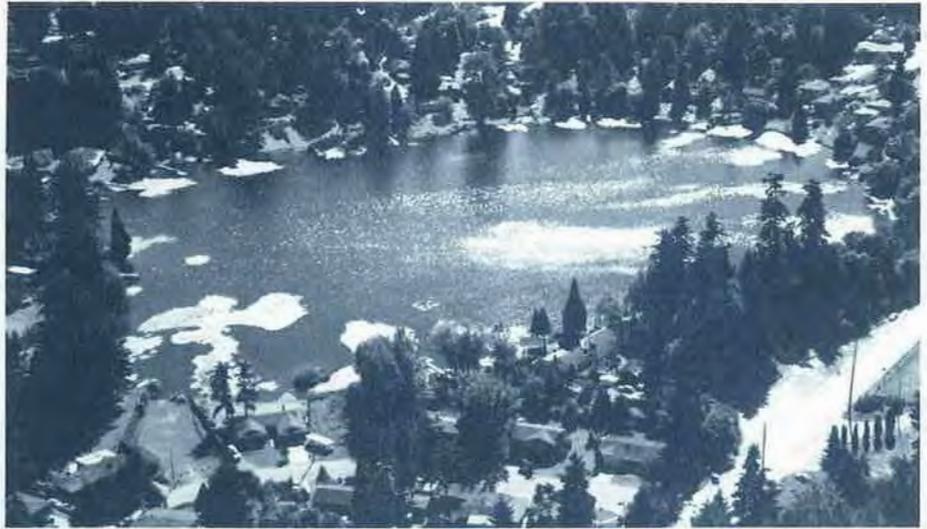
Report from the shoreline

Reflections of a Mirror Lake monitor

Mirror Lake is a privately owned 19 acre lake in urban Federal Way. It is relatively shallow, averaging 12 feet, with a maximum depth of 24 feet. Having no continuously running inlet or outlet during the dry season it is effectively a seepage lake during the summer months. In the rainy season an outlet develops at the south end of the lake leading to Fisher's Pond, about 7 blocks away.

During periods of heavy rainfall, such as January and February of the last two years, Fisher's Pond rises to the level of Mirror Lake and together they act as the receiving body for a much larger drainage area than that of Mirror Lake alone. As a result, the normal rise in lake level per inch of rain increases from a factor of 1.5 to about 4. This has resulted in dramatic lake level increases during the heaviest rains, flooding yards and homes around the lake.

Lake residents formed an association in 1989 focused on protecting water quality and improving communication among lake residents. The Mirror Lake Resident's Association (MLRA) made its first organized effort assessing the effects of a proposed nearby major retail development on the quality of Mirror Lake waters. After a successful 2 year challenge by the MLRA and others, the project was relocated and the 11 acre parcel was rezoned from business to residential.



Mirror Lake is a residential lake in an urban watershed.

Since that time, the MLRA has focused on a number of activities to preserve and improve water quality. The association provides input to the city on such matters as parks, road improvements, nearby development and the periodic high-water problems. During the last two years the MLRA has implemented an aquatic plant control program to reduce the range of water lilies, which were encroaching on recreation areas.

Mirror Lake monitoring of basic physical parameters began with King County's Volunteer Monitor Program in the 1994/5 water year. In May of 1996, the city of Federal Way began sponsoring biweekly dissolved oxygen testing. This year, biweekly water sampling has begun through the support of King County.

(Thanks to Bob Roper, Mirror Lake resident and monitor, for contributing this article.) 🐾

Rain leaves lake levels...

(continued from page 2.)

heavy rainfall. When the rain stops and as lake temperatures increase, we may see higher algal (chlorophyll *a*) levels during the spring and summer monitoring period:

Figure 3 compares chlorophyll *a* concentrations for March 1996 and 1997 sampling periods. There was no identifiable trend

in chlorophyll *a* concentration among lakes from 1996 to 1997. Cottage, Killarney, Morton, Steel, and Wilderness had substantially higher chlorophyll *a* values this spring, reflective of bloom conditions. Paradise had chlorophyll *a* values above bloom conditions. The remaining lakes had low chlorophyll *a* concentrations indicating good water quality thus far. 🐾

Phosphorus loads expose water quality

Loadings and budgets

Phosphorus plays a key role in influencing plant growth. In turn, the rate of plant growth drives the need for lake management. Management strategies often focus on reducing the total amount of phosphorus entering or present in a lake. Lake managers identify the total amount of phosphorus entering a lake over time (mass per unit time) to determine the annual or seasonal loading.

A phosphorus budget can be developed to compare sources of phosphorus. It is like a financial budget in that all income (inflow) and expenses (outflow) are determined. All the sources of phosphorus entering and leaving the lake are identified. The budget also looks at the phosphorus stored in the lake sediments and

plant materials. Understanding where all the phosphorus is coming from and where it goes allows lake managers to determine the most cost effective way to reduce phosphorus inputs.

A case study

The graph below shows the current and future phosphorus loadings for Lake Sawyer. Sources include three tributaries: Rock Creek, Ravensdale Creek and the subbasin surrounding Lake Sawyer. Other sources include nearshore septic systems, groundwater and precipitation, sediment release and aquatic plant decay.

The current phosphorus loading rate for Lake Sawyer is very similar to other rural lakes with large wetland components, such as Beaver Lake. With the current

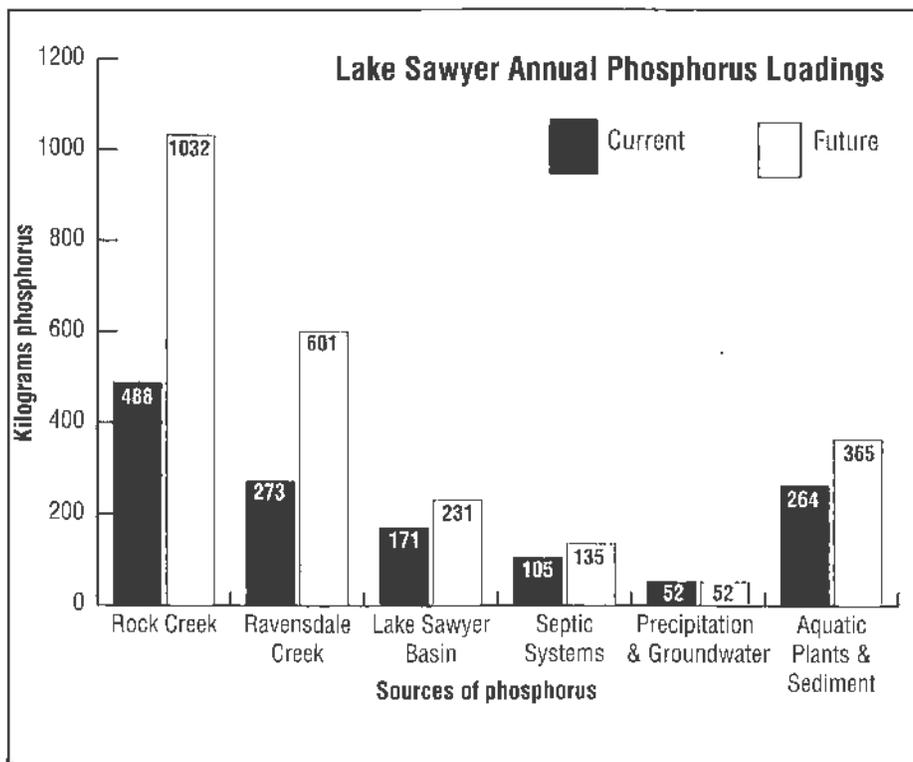
phosphorus budget, the lake is moderately productive (mesotrophic).

The "future budget" was calculated using a mathematical model representing the watershed with maximum development allowed under current zoning regulations. Based on this modeled scenario, the lake will become more productive (eutrophic).

Where will it come from?

In the future, the total phosphorus loading is expected to increase from 1318 kg/year to 2414 kg/year, almost doubling. Lake Sawyer's increased productivity may cause more algal blooms. The increase in phosphorus to the lake will be directly related to the changes in the landscape. Shifting from a rural watershed with some residential and urban development to a more urbanized watershed with more impervious surface and less timberland will result in significantly more phosphorus entering the lake unless there is more stormwater treatment. How additional phosphorus is managed can make a big difference to the lake water quality.

So, what can a resident do to keep phosphorus from entering a lake? On a large scale, you can monitor the development in your watershed and encourage retention of forest and open space. Clustering houses and retaining some undeveloped tracts is one landuse management technique used in King County. On-site
(continued on page 6.)



Natives ...

(continued from page 1.)

landscaping experts to design an alternative landscape plan for their property. In exchange, these property owners will transform their yards into models of shoreline restoration. A landscaping handbook being developed as part of this project will be available in December 1997.

In a related project, WLRD is developing a video on "Lakeside Best Management Practices". The video will be completed this fall and will describe beneficial landscaping methods.

For more information on lake restoration and how to get involved, please call **Sharon Walton** at **296-8382**. 🐸



Phosphorus loads ...

(continued from page 5.)

stormwater quality ponds can also reduce phosphorus discharges before they reach the lake. When development does occur, the use of erosion control techniques can protect sensitive areas.

On your own property you

can reduce impervious surfaces, maintain a shoreline buffer of native plants, use less fertilizer and have your septic system pumped regularly. These may seem like small steps but cumulatively, they are significant actions toward maintaining a healthy lake. 🐸

Upcoming events:

Learn to be lake friendly

Come learn how to be a good neighbor to your small lake! This fun and functional workshop will be held **June 14, 1997** at the **Beaver Lake Middle School**. Call **Polly Freeman** at **296-8359** for more information. 🐸



King County
Department of Natural Resources

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