

Lake Steward

The newsletter of the WLR Lake Stewardship program Vol. 6, No. 3 Summer 1999



The King County Department of Development and Environmental Services

Demistifying the development dilemma

The Department of Development and Environmental Services (DDES) is charged with implementing King County's development and environmental regulations. These regulations cover all aspects of land use and land

development in the unincorporated areas of King County. Regulations concerning shoreline development are of particular interest to lake residents. Usually any type of construction activity within the shoreline setback or within the waterside of the ordinary high water mark will require at least a shoreline exemption.

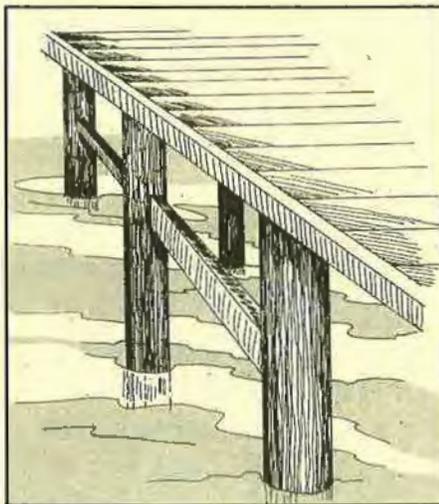
Building or Replacing Docks

On King County lakes, pier and dock construction requires either a shoreline exemption or substantial development permit. If the market value of the construction is less than \$10,000, only a shoreline exemption is required when the resulting construction is 80 feet in length or less, does not

exceed 13 feet in depth, and is 600 square feet or less in surface area. If the proposed construction is greater than \$10,000 or does not meet the above criteria, a shoreline substantial development permit must be obtained. Generally, a shoreline exemption takes about 30-40 days for DDES to review while a shoreline substantial development permit may take up to 120 days for DDES to review.

Building Bulkheads

Establishing a bulkhead or adding riprap to a shoreline area is normally permitted only when necessary to protect existing legally established structures and public improvements or to pre-
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The Lake-Friendly Landscaping workshop

Frolicking in native foilage

Thirty two eager landscapers attended the "Landscaping the Lake-Friendly Way" workshop, held on May 22nd and learned about the use of native plants in landscape design. Besides the Lake Stewardship Team, three additional County experts were on hand to share their knowledge — **Linda Hansen**, Landscape Architect and Basin Steward; **Cindy Young**, Manager of the Native Plant Salvage Operation; and **Mary Robson**, King County

Horticultural Agent. Participants divided into small groups which rotated between the experts. Topics covered included plant choices for specific yard needs, putting together a site plan and solutions to basic garden problems.

Native plants were showcased and their merits and planting requirements were discussed. The grand finale of the workshop was the ever popular plant raffle where we sent participants home with a native plant of their choosing.

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Nitrogen cycling: a year-round sport

Nitrogen is a nutrient. Nutrients are foods, or elements needed for growth and nourishment. Nitrogen is an important component of proteins and nucleic acids, and ranks third after carbon and oxygen in quantity required by organisms (including you) to sustain life.

Bacteria pedals the cycle

Through the nitrogen cycle (Figure 1), nitrogen is bound and unbound to other elements as it is absorbed, eaten, excreted, and

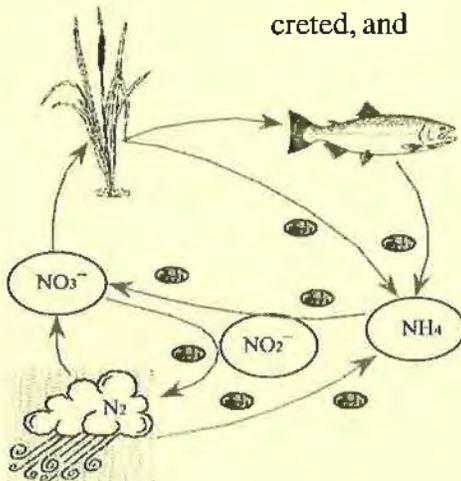
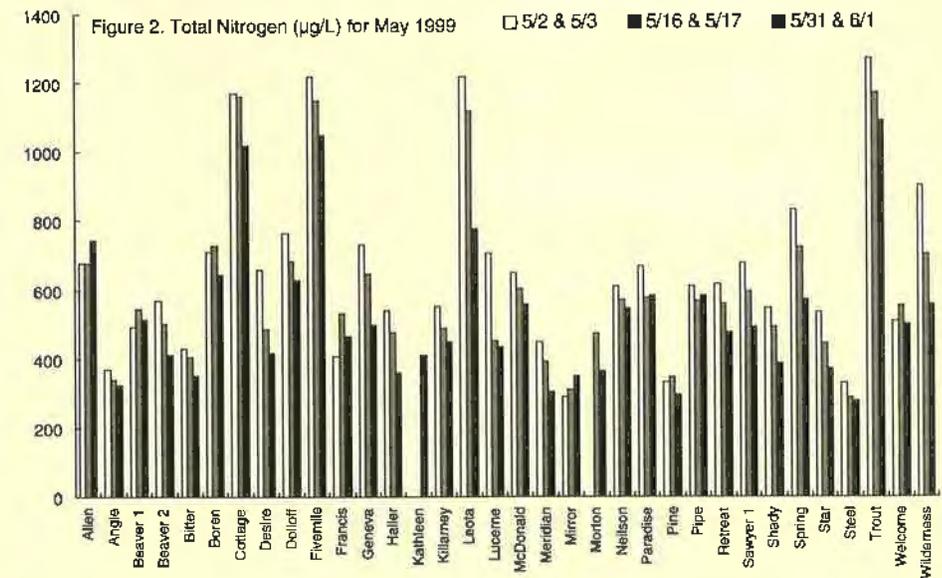


Figure 1. Nitrogen cycle decomposed. The cycle starts with nitrogen in the atmosphere (N_2) where the energy of lightning mixes it with water molecules which eventually become rain. Through direct rainfall, surface runoff, and ground water, nitrogen enters lakes as nitrate (NO_3^-).

Nitrogen may also be absorbed directly from the atmosphere by special nitrogen "fixing" bacteria and algae that convert it to ammonia (NH_4). Ammonia is converted by other bacteria to nitrite (NO_2^-) and then nitrate (NO_3^-), the form utilized by plants. Animals eat the



plants and excrete ammonia in their waste products. When the plants and animals die, bacteria break down (decompose) the tissue, also producing ammonia. The ammonia is then converted by other bacteria back to nitrite and nitrate, closing the cycle. In fact, bacteria are the major movers of the nitrogen cycle.

Cycling in water

Special conditions in lakes can affect the nitrogen cycle. Different forms of nitrogen may dominate at different depths within a lake because of oxygen availability, temperature conditions, and algal activity.

In water with low oxygen levels, some bacteria actually reverse the nitrogen cycle by converting nitrate to nitrite and then atmospheric nitrogen. Algae may absorb large quantities of nitrogen from the surface waters of a lake. Also, ammonia levels can be higher in lakes associated with wetlands

because their tannins and humic acids inhibit the break down of ammonia in the cycle.

Cycling in King County

Either nitrogen or phosphorus may "limit" lake productivity, depending on which is in shorter supply. In Pacific Northwest lakes, phosphorus is usually the limiting nutrient, but in general, higher nitrogen concentrations are also associated with more productive lakes. For May 1999, nitrogen concentrations are compared for some King County lakes (Figure 2). Lakes with good water quality and low productivity like Angle, Geneva, Lucerne, Pine, Pipe, Star and Steel tended to have lower nitrogen concentrations than lakes like Allen, Cottage, Dolloff, Fivemile, Leota, Spring, Trout, and Wilderness which have medium to high productivity. Many of the higher productivity lakes are linked

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Lakeside development...

(continued from page 1.)

serve important agricultural lands as determined by DDES. Bulkheading is not usually permitted on the water side of the ordinary high water mark.

Establishing Setbacks

A setback is the distance required from the closest part of a structure to the ordinary high water mark. Building setbacks vary with the type of environment as defined by the shoreline management act. For urban or rural environments, the setback is 20 feet. For conservancy environments, the setback is 50 feet and for natural environments, the setback is 100 feet. Be aware, setback greater than those established under the shoreline management act may be required under the sensitive areas provisions of the King County Code (KCC21A.24).

Accessory structures, such as cabanas, gazebos, or detached decks may be permitted within the required setback area subject to various limitations. As a property owner, you will need to consult with DDES to identify the specific

setback requirements and shoreline development limitations associated with your specific parcel.

Removing Vegetation or Adding Sand or Gravel

A clearing and grading permit is required when clearing, filling, or excavating vegetation or other material within a sensitive area like a shoreline area, steep slope, wetland, lake, or stream. For more information about shoreline development and associated permits, you can call DDES at (206) 296-6640.

Getting More Information

DDES also has numerous customer service bulletins to address frequently asked questions. Topics of interest to lake residents include clearing and grading; shoreline erosion control; residential building on or near waterfront; and water problems.

Copies of these bulletins can be obtained by calling **Paula Adams** at (206) 296-6682 or printed directly from the world wide web at www.metrokc.gov/ddes/bulletin.htm#alpha.

Nitrogen cycle...

(continued from page 2.)

to wetlands which may contribute to the higher nitrogen levels.

Keeping your balance

Too many nitrogen oxides in the atmosphere can contribute to acid rain, high levels of ammonia are toxic to aquatic life (especially salmonids) and high concentrations of nitrate can cause algae and aquatic plant problems. So how do you help keep the nitrogen cycle

balanced? Pet and livestock wastes have a high nitrogen content, so dispose of them properly before they leach into surface runoff or ground water. Check to make sure your septic tank is functioning properly; wastewater is also very high in nitrogen. Limit your use of fertilizers; try using compost or mulch instead. Finally, use native plants to help prevent erosion of topsoil and lake and stream banks.

Workshop...

(continued from page 1.)

If you were unable to attend the workshop, it is not too late to learn about lake-friendly landscaping. The experts can meet with lake groups or conduct follow up sessions. Also, you can contact a neighbor below about lake-friendly landscaping. If you don't see your lake represented here and would like assistance, contact **Debra Bouchard** at (206) 296-1989.

Angle Lake - Ed Montry (206) 878-7737

Bitter Lake - Danae Hollowed (206) 363-5499

Cottage Lake - Carol Fauconnier (425) 827-6958

Lake Dolloff - Jeff & Debbie Horne (253) 839-4651

Lake Geneva - Laura Stiles & Bruce Harpham (253) 874-9792

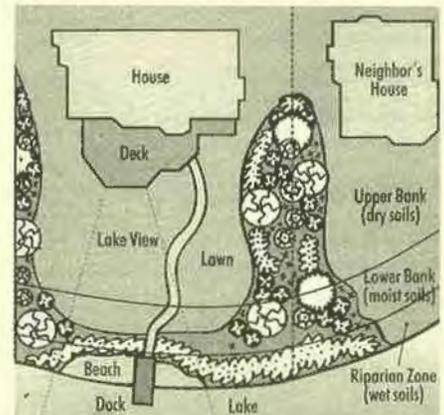
Lake Killarney - Mike Ficker (253) 835-0298

Morton Lake - Dick Balash (253) 631-7437

Lake Retreat - Janice Hammerstrom (425) 432-5300

Shady Lake - Liz Willetts (425) 228-9095

A lake-friendly landscape plan.



Report from the shoreline

Scenic splendor at Spring Lake

Spring Lake is a sixty-seven acre lake located between Renton and Maple Valley, in a cluster of lakes including Desire, Shady, Shadow and Peterson. Spring Lake is different than the rest because about a quarter of the shoreline is wetland. Also, a large portion of the Spring Lake watershed is in King County

Open Space, protecting it from future development.

Even with these vast natural resources, Spring Lake has some challenges ahead. Residents completed a noxious weed survey of the lake in the summer of '98 and were dismayed at the extent of Eurasian watermilfoil throughout the lake.

Earlier surveys had also shown developing areas of purple loosestrife along the shore. Some of those purple loosestrife infested areas are decreasing as cutting and other measures are being adopted.

Also, data collection has shown that the lake levels responds very quickly to rainfall events. This reflects the loss of tree cover and lawn installation around the lake.

Even with these challenges, many critters choose Spring Lake as their home. Douglas squirrels are still common and exotics, such as English sparrows, still relatively rare. Lake residents often enjoy sightings of eagles, otters and turtles.

Since I own a large wooded lot, I decided to participate in the **Backyard Wildlife Sanctuary Program**. In order to qualify, you need to provide food, water, cover, and nesting places for birds and other wildlife. Native plants are always a welcome addition as well. Rewards include a newsletter with information about planting for wildlife, reports on wildlife sightings and a sign to place in your yard. To receive a packet of resources and an application for your yard, mail a \$5.00 check with your name and address to: **Department of Fish and Wildlife, attn: Backyard Sanctuary, 16018 Mill Creek Blvd, Mill Creek, WA, 98012**. This is a great way for individual homeowners to positively impact their lake!

Thanks to Caren Adams, Spring Lake Monitor, for this article.

Lounging by the lakeside at lush Spring Lake.



Adding another ally...

Meet the latest addition to the Lake Stewardship Program ... **Debra Bouchard**. Debra joined the team in February filling a vacancy created by Susan Kaufman.

Debra is working on the lake monitoring annual report and will be working with local residents on specific projects at Cottage Lake, Lake Sawyer, and Lake Twelve. Prior to joining King County, Debra worked as an environmental consultant completing lake assessments and



developing management plans. In her spare time, Debra enjoys playing at the beach with her husband and two boys. Debra is excited about working with so many dedicated and enthusiastic citizens on our many King County lakes.

Sweeping the lakes for fecal bacteria

Fecal coliform bacteria is routinely sampled in water as an indicator of a potential human health risk. Elevated counts of fecal coliform bacteria always occur when sewage is present in water. However, the presence of fecal coliform bacteria does not necessarily indicate humans are the source of the fecal matter. Many other mammals and birds can also contribute this type of bacteria to water.

To more accurately identify the source of the sewage, tests for the presence of specific bacteria, such as *Escherichia coli* or *Pseudomonas aeruginosa*, have been used. Another technique uses the genetic material RNA (ribonucleic acid) from bacteria which provides information on the animal contributing the bacteria. A recent study using RNA identified domestic cats as the major contributor of fecal coliform bacteria in Piper's Creek in Seattle's Carkeek Park (1993).

Fecal Sweep 1998

In August 1998, the Lake Stewardship Program sampled 27 Microscopic view of small rod-shaped fecal bacteria.



small lakes in one big "sweep" to evaluate fecal coliform concentrations at public access points. The results of this sampling are shown in Table 1. In addition to the Stewardship Program monitoring event, the swimming beach areas of Five Mile, Pine, and Wilderness lakes were sampled routinely by the King County in 1998. To find out the results of sampling these three lakes, check out the following web page: <http://splash.metrokc.gov/wlr/waterres/lakes/3lakes.htm>

To Swim or Not To Swim..

There is no standard protocol among local health departments for closure of swimming beaches. But, a measurement over 200 fecal coliform is considered high by most health officials.

In June 1998, King County closed Pine Lake's swimming beach because of high fecal coliform bacteria levels. Samples collected in June had counts of 440, 980, and 110 cfu/100 ml. Pine Lake was reopened in July after bacteria levels dropped to acceptable levels. Waterfowl fecal matter was believed to be the primary source of the high counts based on shoreline survey results and the numerous waterfowl present at the park.

King County will continue to routinely sample Five Mile, Pine, and Wilderness lakes. These three are the only lakes within unincorporated King County which have designated swimming beaches. There are plans to repeat the Lake

Lake name	Fecal coliform CFU/100 ml
Angle	380
Beaver 2	5
Bitter	110
Boren	12
Cottage	7
Desire	4
Dolloff	20
Echo	600
Five Mile	64
Garrett	60
Geneva	15
Haller	29
Killarney	300
Meridian	20
Morton	34
Neilson	23
North	20
Pine	58
Sawyer	3
Shadow	70
Shady	10
Spring	38
Star	200
Steel	180
Trout	260
Twelve	3
Wilderness	18

Stewardship Program Fecal Sweep in August 1999.

Beaches on Lake Washington and Lake Sammamish are sampled routinely for fecal coliform bacteria. Information about which beaches are routinely monitored for fecal bacteria can be found at our website <http://splash.metrokc.gov/wlr/waterres/lakes/bacteria.htm>. If a beach is closed due to high bacterial counts, there will be signs marking the area. 🐾

What's your sign?

Are you worried about weeds spreading to or from your lake? Interested in informing your neighbors or other lake users about the problem with noxious weeds?

To address problems with Eurasian watermilfoil, purple loosestrife, hydrilla, or weeds in general, the Lake Stewardship program is offering lake residents assistance with sign placement at local boat launches or public parks. These signs are a great way to spread the word about lake protection. Contact **Sharon Walton** at (206) 296-8382 for more information. ♻️

Upcoming events:

Lake Critters Workshop

Saturday, September 18

Ever wonder what is the stuff floating in your lake? Or how to identify that little fish near your dock? Attend this workshop for info on all sorts of critters in your lake. Call **Debra Bouchard** at (206) 296-1989 for details.

Waterworks Grants

Up to \$50,000 per project is available for projects that benefit lakes. Requests for less than \$5,000 can be made anytime.

Call **Ken Pritchard** at (206) 296-8265 or email him at: ken.pritchard@metrokc.gov

Watershed journey: from shore to mountains!

Learn more about watersheds by attending any of the seminars below. For more information, call **Polly Freeman** at (206) 296-8359.

September 15th:

Beyond the beach: the nearshore environment (Seattle Aquarium)

September 29th:

Floods and floodplains (Mt. Si Senior Center, North Bend)

October 13th:

Challenges of restoration (Issaquah's Village Theater)

November 3rd:

Salmon today and tomorrow (Carco Theater, Renton)



KING COUNTY

Department of Natural Resources

Water and Land Resources Division

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