

# Volunteer Newsletter

For Present and Past Volunteers



WINTER 2019

## IN THIS ISSUE

- 2018 IN-REVIEW
- LAKE SERENE: AN URBAN GEM
- SUMMER INVERTEBRATE FINDINGS
- FRESHWATER SPONGES
- NATIONAL LAKE LEVEL PROJECT

## Service Awards

### 10 YEARS

JIM AND CHERIE POYNER, LAKE HOWARD

### 15 YEARS

MARK FUSSELL, LAKE SERENE

### 25 YEARS

STEVEN AND NANCY DEAN, LAKE MARTHA

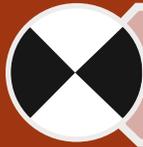
## 2018 Monitoring Stats



376  
Secchi  
Readings



184  
DO/Temp  
Profiles



262  
Phosphorus  
Samples



54 Volunteers  
32 Lakes



48 Returning  
Volunteers

## 2018 - A Great Year of Monitoring

Thank you for another great year of monitoring! The work could simply not be done without your valuable time and effort. Your commitment to monitoring is essential to tracking lake health.

Fifty-four volunteers spent over 1017 hours to monitor the health of 32 lakes. To all of the longtime volunteers, we especially want to thank you as your experience ensures such high quality data. We are also excited to welcome 6 new volunteers in 2018: Anthony Bourke (Blackmans), Bryce Land (Bryant), Camille Van Vurst (Crystal), Janessa Anderson (Lost), and Kim Cook (Lost). We were also happy to welcome back Chris Sandys (Ketchum) for the year. Lastly, we would like to recognize Tyler Feldman's (Roesiger S.) hard work this summer helping us with data management before heading into his senior year of high school.

We had a very successful year collecting temperature and dissolved oxygen profiles on 19 lakes. We rotate the available oxygen meters between different lakes each year. We're looking forward to exploring the long-term results of this data at this year's workshop.

In 2018, nine lakes were tested for potentially toxic blue-green algae. Of those lakes, Armstrong, Blackmans, Cassidy, Chain, Howard, Shoecraft, and Wagner had toxins detected, but only Wagner had toxin levels that exceeded the Washington State

guidelines for microcystin (a liver toxin). More information about toxic algae can be found at [www.nwtoxicalgae.org](http://www.nwtoxicalgae.org).

As some of you remember, we changed the lab where we send water samples in August 2017. After analyzing a year and a half of data, it became clear that the lab was not meeting data quality objectives. Data collected during this period are being analyzed for usability. Your reliable data has been pivotal in working with the lab to make sure that they can provide quality analysis for years to come. We are so grateful for all of your hard work during this time of transition.

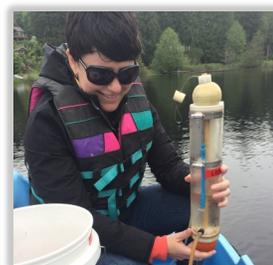
As you head into another year of monitoring, be assured that we are putting your data to good use. Lake residents are always thrilled to see the reports on their lakes. In addition, your data has contributed to the following projects:

- Research project on Martha South by students from UW Bothell
- Freshwater toxic algae grant that was awarded from the Department of Ecology, which will help us develop an algae control plan for Lake Loma and Sunday Lake over the next two years
- WDFW temperature and dissolved oxygen analysis for fish stocking efforts

Thank you again and we look forward to another great monitoring season in 2019! Please join us for the **2019 volunteer workshop on Sat., May 4th from 9:30—1:30.**



Bryce Land at Bryant



Kim Cook at Lost



Chris Sandys at Ketchum

# Lake Serene: An Urban Gem—by Mark Fussell



One of Mark's beautiful photos



Labor Day Float-a-Palooza Fun



Mark enjoying the snow



Dock reflections at Serene

I think that I shall never see, a poem as lovely as a... lake. Apologies of sorts to Joyce Kilmer, but a lake is life and of course it calls to us. Lake Serene called to my Grandfather in 1955 when he bought the property I now own, and I still listen to the lake. Originally the area around Lake Serene was wholly owned by the lumber company Pope and Talbot; there is still a house on the lake that once served as a bunkhouse for the lumber workers. In the 50s and 60s, the lake was a rustic playground for those who fled the Seattle area. My childhood at Grampa and Gramma's place was always spent on its shores or its waters. Later, when they passed on, my family moved there and it was my daily oasis.

Despite the fact that it is one of the most urbanized lake in Snohomish County, it has much to give and much to tell, if you keep still and listen on its own terms. The eagles, osprey, mud hens, and mallards certainly do. The lake has always been my playground, and whether I realized it or not, a teacher. As a child I observed the migration of tadpoles around the lake and learned not to fear either large geese or large crawdads. I met my friends and girlfriends on the lake, it just seemed more natural than being stuck indoors around grownups. And houses were smaller then, and the most sophisticated technology was the furnace and a single, tiny TV.

Quite by accident, I became a lake monitor when the original monitor moved and appointed me to the job. Much like how I was appointed to be on the Lake Serene Community Association. In absentia of course. But that's how most of my career moves have started. Without any real plan, being involved with the lake led me to be a leader and advocate for the lake and community. And mostly because I just care about where I live, and I see that people can make a difference if they get involved.

My son and I spent years doing the water sampling from a canoe and while he sometimes grumbled, I know he really enjoyed just hanging out on the water and enjoying the stillness of it all. We created a relationship with the lake and its creatures. And we learned some science in the real world laboratory instead of surfing the internet and forgetting what we read. These days Sonja Voice and her hubby Aaron and I share a raft and do the monitoring as a team and have a great time out there with all the gear and a picnic basket. The other boaters must wonder why we are loaded with all the stuff and still manage to have fun in the middle of the lake.

Now more than ever, our lakes need us, and people will pay attention if they have a relationship with them. If all people want is a view, they are missing the real magic of natural beauty and the science that explains it. But of course, you all know that! Spread the word.

## 2018 Invertebrate Assessment Findings

Thank you to all of you who helped conduct the 2018 Invertebrate/Mollusk Survey. All together, we surveyed 27 lakes for invertebrate species, and are happy to report that no lakes had highly invasive zebra mussels or New Zealand mud snails! The assessment will add to our understanding of native and invasive species in the County, and allow us to track changes over time. The results of the assessment were sent to WDFW and are being used in their invasive species tracking efforts. We hope to conduct this survey every 5 years, though you can note seeing these critters at any time on your data sheet. Please let us know if you have any feedback from this last year. These species were found at the following number of lakes in 2018:



# Freshwater Sponges Native to Washington

When people think of sponges they normally think of tropical beaches and the Bahamas, but we have these amazing species right here in the Pacific Northwest!

Evolutionarily speaking, freshwater sponges are immobile creatures that never developed true tissues like muscles, nerves, and skin. While sponges are considered the simplest of all animals, there are many basic facts of their biology that we still don't know. Only recent advances in microscopes and genetic analysis have made it possible to reliably identify one species of sponge from another. To date, 200 species have been identified worldwide and 32 in North America.

The most common native freshwater sponge in our area is *Spongilla lacustris*. This species lives in freshwater lakes, attaching itself to the bottom of logs or rocks. Their greenish color comes from symbiotic algae that live on the outside of the sponge. They can also be white in areas lacking sunlight. Freshwater sponges have specialized cells that are connected by living tissues and held rigid by needlelike silica structures called spicules. These spicules are the reason sponges have an uneven and rough surface. Spicules are also why they will spring back to their original shape just like our kitchen sponges! Their body shape ranges from globular to finger-like, depending on the life cycle stage and environmental conditions. County staff have observed sponges as big as 10-feet tall attached to logs.

Freshwater sponges are filter-feeders, filtering water that enters through an inlet in the sponge's body called the ostium. They consume organic particles and plankton from the water, as well as symbiotic algae that are reliant on the sponge itself. Water exits

the sponge through tiny water-exit holes. Looking from the other side of the food chain, these sponges provide food for other aquatic invertebrates like caddis flies and mayflies.

Winter hibernation is a very interesting time for sponges. Only one type of sponge cell survives in the winter. This special cell type is surrounded by a shell called a gemmulae. The gemmulae shell allows high internal pressure to develop, preventing the cells from rupturing in low temperatures. After hibernation, the cells inside the gemmulae leave to start a new animal. Another way sponges reproduce asexually is by forming buds (baby sponges) on the outer layer of the sponge. These buds drift away and form a new colony. Sponges can also reproduce sexually by producing both sperm and eggs to give birth to live larvae that are free swimming. These larvae then swim around and eventually attach to a solid surface such as a twig and develop into an adult sponge.

In Snohomish County, sponges have been seen at Lake Martha (N) and Lake Serene. If you think you have found a sponge at your lake, send a picture to [lakes@snoco.org](mailto:lakes@snoco.org).

Thank you to Tyler (below) for helping us write this article



Freshwater sponge at Martha N

## National Lake Level Project Comes to Washington

Lake Observations by Citizen Scientists & Satellites (LOCSS) is an effort to better understand how the volume of water in lakes is changing over time. This NASA-funded project is a collaboration between UNC-Chapel Hill, University of Washington, and Tennessee Technological University.

LOCSS depends on a network of volunteer citizen scientists, just like you! Volunteers and visitors to boat launches report lake height by reading the staff plate and texting in the measurement. LOCSS also uses satellite images to determine the lake surface area. By knowing the changes in both lake height and surface area, researchers can understand how the volume of water in a given lake is changing over time.

LOCSS recently completed the prototype phase of this project, focusing on large, natural lakes in Eastern North Carolina. They received additional funding to expand the project to new lakes, including several in Washington State. In Snohomish County, Bosworth, Roesiger, Cassidy, Martha N, Flowing and Echo were chosen based on satellite paths and outlet criteria. Staff plates were installed in September 2018.

There are tens of millions of lakes in the world, but probably only a few thousand of them are monitored. This project presents an opportunity to harness the power of volunteers to gather data that a single research team would be unable to obtain. Learn more about how you can get involved and look at the lake level data at [www.locss.org](http://www.locss.org).



# Mark Your Calendar for the 2019 Volunteer Workshop!

Please join us for our annual volunteer training workshop on **Saturday, May 4th from 9:30-1:30!** Meet fellow volunteers and learn more about lakes. Events include:

- ◆ Monitoring method review
- ◆ Looking at your data
- ◆ Special projects around the County
- ◆ Awards and recognition
- ◆ Lunch and snacks
- ◆ Photo contest



**2018 Winner - Evening Reflections**  
**Edith & Jerry Bruns at Little Martha**

## Enter the 2019 Photo Contest

A new year brings a new opportunity to win the lake photo contest! Submit your best shot of lake scenery, wildlife, or recreation. We will vote for the best at the workshop and place it in next year's newsletter! Send your photos to [lakes@snoco.org](mailto:lakes@snoco.org) with your name, title, and lake.



**2018 Winner - Blood Moon**  
**Connie & Brian Moulaison at Sunday**

Title VI/ADA: Interpreter and translation services for non-English speakers and accommodations for persons with disabilities are available upon request. Call 425-388-3204. For questions regarding Public Works' Title VI Program, contact our Title VI Coordinator via email at [spw-titlevi@snoco.org](mailto:spw-titlevi@snoco.org), or phone 425-388-6660. Hearing/speech impaired call 711.

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WINTER 2018

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- 2017 IN-REVIEW
- VOLUNTEER SPOTLIGHT
- STEVENS AERATOR REMOVAL
- LAKEWISE GRANT UPDATE



## 2017 - Another Year of Monitoring Success

Thank you for another great year of monitoring! The work could simply not be done without your valuable time and effort. Your commitment to monitoring is essential to tracking lake health.

Fifty-four volunteers made 360 trips to monitor the health of 32 lakes. To all of the longtime volunteers, we especially want to thank you as your experience ensures such high quality data. We are also excited to welcome 9 new volunteers who joined us in 2017: Paul Clement (Beecher, photo left), Larry & Monica Hall (Bosworth), Fred Vander Werff (Cochran), Cathy & Russell Kindler (Loma), Connie & Brian Moulaison (Sunday), and Kimberly Myhre (Martha N). We would also like to welcome back David Spencer (Blackmans) and Chuck Lucus (Shoecraft).

We had a very successful year collecting temperature and dissolved oxygen profiles on 18 lakes. We have 14 oxygen meters available for volunteers to use. If you are interested in collecting profiles for your lake in 2018, please let us know!

In 2017, seven lakes were tested for potentially toxic blue-green algae. Of those lakes Lake Howard, Lake Crabapple, and Blackmans Lake had toxins but only Blackmans had levels that exceeded the Washington State guidelines for microcystin (a liver toxin). More information about toxic algae can be found at [www.nwtoxicalgae.org](http://www.nwtoxicalgae.org).

Last August the lakes program switched the lab where we take your water samples. We are very grateful to have such a strong group of volunteers that have been consistent throughout this transition.

We are still working out some data issues, which is not uncommon when changing labs. This has led to delays in processing the data, and therefore we will not be updating the State of the Lakes Reports this year. However, we will be completing report cards for each lake! Report cards are 2-page summaries of the health of each lake designed to be readable for the public. They were first introduced at the workshop in 2014 and we will be presenting a few templates this year and finalizing the design based on your feedback. Reports for all lakes should be available in Fall 2018.

As you head into another year of monitoring, be assured that we are putting your data to good use. Lake residents are always thrilled to see the reports on their lakes. In addition, we rely on your data to prioritize, plan, and take actions to protect and restore lakes. Your data has also helped the greater scientific community through inclusion in several scientific publications, including last year's article on the [Effectiveness of Alum in a Hypereutrophic Lake \[Ketchum\] with Substantial External Loading](#) (May, 2017).

Thank you again and we look forward to another great monitoring season in 2018!

## 2017 Monitoring Stats



54 Volunteers  
32 Lakes



360  
Secchi  
Readings



204  
DO/Temp  
Profiles



43  
Returning  
Volunteers



7.3  
Average years volun-  
teers stick around



Mark Your  
Calendar!

2018 Volunteer  
Workshop  
9:30-1:30

April  
21

# The joys of lake monitoring are not lost on Lost Lake

By Chris Gray & Cordelia Scheuermann

What do lake monitors, bald eagles, largemouth bass and algae have in common? They are all opportunistic about enjoying a beautiful day on the water!

In our four years of serving as lake monitors for Lost Lake, we have multiplied our joys by observing more and more nature up close and personal than you ever can by observing a lake through a plate glass window! Our lake may be small but it sure beats staring at mole hills in your backyard or counting the growing number of cars on a city road any day!

We've learned about largemouth bass big enough to snatch frogs and turtles off of lily pads (indigenous ones, of course!), bald eagles who seem to get a kick out of watching catch and release fisherman make it easy for them to snatch a stunned trout snack right out of the water, beavers who create piles of debris that look like a selective tsunami came through, and stringy green algae that can make anyone say "ewwww!!"

We have also learned about the fun noises the frogs make on a warm summer night when the windows are open (we heard them for the first time just two nights before this article was written), the happy shouts of children jumping into the lake, and geese, ducks and dogs walking on the ice in the dead of winter. Who can forget the beauty of the lake and its surrounding shoreline on Christmas Day this year with our 4 inches of beautiful, pristine snow?

Why do we make time to go out there every other week? Because it's too easy to take a lake for granted and there is no more positive way to get to know your neighbors than to be seen regularly as someone who puts their efforts where their stated convictions are when it comes to caring for our shared environment! We learned how to use the paddle boat, learned to "drive" it, and always have fun visiting neighbors as we circumnavigated the lake after doing our "work." It happens again and again that someone will come down to the lakeshore to ask us how the lake is doing or to find out how to improve the health of their shoreline.

We learned about the LakeWise Certification program and became the first two certified on Lost Lake. We advertised it through our NextDoor web program and had Surface Water staff attend our Float Your Boat neighborhood picnic one summer to talk personally with neighbors about the program. We also advertised the classes on NextDoor which boosted attendance. Now we have the most certified properties of all the lakes and there are a number of additional neighbors who are working towards it.

When Chris' cat, Tootsie Toe White, jumps in the paddle boat with us, we are sure to have an extra measure of joy as we try to figure out the actual disappearing point of that spinning Secchi disk or agree on the color of the water. There is one thing we never disagree on and that is the recreational suitability of our lake. It couldn't be better and the way we will keep it that way is by raising the public profile on how to take care of it today and into the future!



Bald eagle at Lost Lake (Photo: Julia Borgen)



Chris & Tootsie Toe White getting ready to monitor!



Native watershield at Lost Lake



Chris & Cordelia, always smiling while monitoring!

## Age of the Aerator Comes to an End

Lake Stevens is the County's largest natural lake and most popular lake destination. The lake health started to decline in the 70's from high phosphorus and bacteria levels and widespread algae blooms.

In the early 90's lake residents, the County and City developed a restoration plan featuring a hypolimnetic aeration system. It works by aerating the lake bottom in the summer months preventing phosphorus release from the lake sediments.

When constructed in 1994, it was the world's largest lake aeration system and

cost \$1 million. Comprised of four separate diffusers, it required over 50 tons of concrete anchors to hold the system in place. Our Lake Ki volunteer (Ken Miller) was actually a County engineer working on the project!

The aeration system effectively controlled phosphorus in the lake, which dramatically improved the lake health. Unfortunately, the cost of annual maintenance and its reduced effectiveness led to its decommissioning in 2012. The City and County have switched over to small annual alum treat-

ments which have proven to be as equally effective and easier to manage.

This last fall, the City of Lake Stevens removed the aeration system. We were lucky enough to see one of the four aerators being towed to the boat launch.



# LakeWise Grant Wrap – Up

It's a wrap! A two-year LakeWise grant project was successfully completed in 2017. Much has been accomplished and we wanted to share some of the highlights with you.

## First, some history

One of the primary goals of the volunteer lake monitoring program is to track changes in lake health. Over the past two decades, your data has shown that many lakes have alarming trends of increasing phosphorus. This is an early warning sign of deteriorating lake health. The culprit at most of our lakes is simply the increase in people living near lakes. Each house may only contribute a little pollution from things like pet waste, fertilizers, and septic systems. Over time these small amounts add up to big problems like lower clarity, stressed fish and wildlife, and toxic algae blooms.

To help reverse these trends, we launched the LakeWise outreach program. LakeWise aims to empower lake area residents to reduce pollution on their property. The LakeWise Clear Choices checklist has the most important actions to reduce pollution in lawn and yard care and septic system care. Landowners completing all actions are recognized with an attractive yard sign. Shoreline property owners can also earn a Healthy shore certification by replacing shoreline lawn with shrubs, perennials and trees that better filter pollution while still preserving lake access and views.

## LakeWise Grant Project

LakeWise was successfully piloted in 2012 & 2013 at Lake Howard, with limited participation from other lakes. It wasn't until the County won a grant in 2015 that the program could expand to the 11 target lakes\* that your data showed were the most at risk from pollution.



Specifically, the grant funded:

- 1) 12 septic system care workshops
- 2) Incentives for septic care maintenance
- 3) Community engagement through mailers and community events
- 4) Development of guides on shoreline restoration and runoff solutions
- 5) Planting of up to 40 shoreline properties
- 6) Evaluation of program effectiveness

\*Crabapple, Echo, Flowing, Howard, Ketchum, Ki, Loma, Lost, Panther, Shoecraft & Sunday

## LakeWise Outcomes to Date

About 15% of the 2,200 target lake property owners participating in LakeWise. Participation included attending a workshop or having a site visit. Across the county:

- **497 households** attended a septic system and/or natural lawn care workshop
- **182 households** had a LakeWise site visit and completed some LakeWise actions
- **69 properties** were LakeWise certified by completing all 9 LakeWise actions
- **2,271 feet of shoreline** was restored with 1.2 acres of plantings on 35 properties
- **260 lbs of phosphorus pollution and 1,657 lbs of nitrogen** will be kept out of our lakes annually

While the grant has concluded, LakeWise will continue to be implemented throughout the County. Look for lawn and septic care workshops coming to your area in 2018. We will also focus on one or two lakes each year to specifically engage the community with a tailored outreach approach. The County's Savvy Septic program will also continue to offer rebates for septic system care ([savvyseptic.org](http://savvyseptic.org)). The shoreline planting guide is now available at [www.lakewise.org](http://www.lakewise.org) and the runoff solutions guide is still in development.

If you haven't already, sign up for a LakeWise site visit today by emailing us at [lakes@snoco.org](mailto:lakes@snoco.org)!

## And the LakeWise Survey Says . . .

As part of evaluating the effectiveness of the LakeWise program, we conducted a landowner survey. The survey was sent to all property owners within the target watersheds (11 lakes). The survey results will be used to shape the program's future. Some key findings include:



Ruggs Lake volunteers  
Chuck & Annette VanBelle

- **50%** of all lake area residents recognize the LakeWise logo
- **94%** of residents rated site visits as very useful (79%) or useful
- **50%** of workshop attendees (lawn or septic) reported sharing information, reaching an additional **1,250 individuals!**
- **90%** of lawn workshop attendees took action to reduce pollution
- **73-75%** of all lake area residents reported having a septic inspection within the last 3 years
- **95%** of respondents who have had a LakeWise site visit put their dog's waste in the trash



Panther Lake volunteers -  
Kurt Gibbons (Vivian Gibbons not pictured)



# Join us for the Volunteer Workshop on April 21st, 9:30 AM to 1:30 PM

Please join us for our annual volunteer training workshop! Meet fellow volunteers, brush up on monitoring procedures & learn new things about lakes. Events include:

- ◆ Monitoring method review
- ◆ Look at your data
- ◆ Special projects around the County
- ◆ Awards and recognition
- ◆ Lunch and snacks
- ◆ Photo contest



## Calling All Photographers

**2017 Winner**

***Snowfall***

***by Jim Berentsen***

***Storm Lake***



**2017 Winner**

***Flood Night***

***by Mark Fussell***

***Lake Serene***



A new year brings a new opportunity to win the lake photo contest! Submit your best shot of lake scenery, wildlife, or recreation. We will vote for the best at the workshop. Send your photos to [lakes@snoco.org](mailto:lakes@snoco.org) with your name, title, and lake.

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**Public Works**  
**Surface Water Management**  
3000 Rockefeller Ave., M/S 607  
Everett, WA 98201-4046



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WINTER 2017

## IN THIS ISSUE

- 2016 MONITORING SUMMARY
- SWANS RETURN TO SNOCo LAKES
- VOLUNTEER STORY SPOTLIGHT
- NATIONAL LAKES ASSESSMENT
- BOGS AROUND THE COUNTY

## 2016 Monitoring Statistics



53 Volunteers  
34 Lakes



326  
Secchi  
Readings



173  
DO/Temp  
Profiles



507  
Phosphorus  
Samples



178  
Chlorophyll  
Samples



161  
Nitrogen Samples



53  
Toxic Algae  
Samples

## 2016 - Here's to a Great Monitoring Season

Thank you for another fantastic year of monitoring! Fifty-three volunteers made about 354 trips to monitor the health of 34 lakes in 2016. The work could simply not be done without your valuable time and effort. Your commitment to monitoring is essential to tracking lake health. We especially want to thank our longtime volunteers whose experience ensures such high quality data.

We are excited to welcome two new volunteers who joined us for the 2016 monitoring season: Mandy Schoen at Lake Cassidy and Andy Stevermer at Nina Lake.

We had a very successful year collecting temperature and dissolved oxygen profiles on 18 lakes! We have 12 oxygen meters available for volunteers to use. If you are interested in collecting profiles for your lake in 2017, please let us know!

In 2016, nine lakes were tested for potentially toxic blue-green algae. Of those lakes, three had toxic blooms that exceed-

ed the Washington State guidelines for microcystin (a liver toxin). More information about toxic algae can be found at [www.nwtoxicalgae.org](http://www.nwtoxicalgae.org).

All of your data have been entered and are available at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info). We have begun to analyze the data and updated lake reports will be available on our website in the coming months.

We would also like to recognize your commitment to high quality data. Because of this, data from the volunteer monitoring program has contributed to three recent publications in scientific journals:

- ◆ [Education and notification approaches for harmful algal blooms, Washington State, USA](#) (Oct 2016)
- ◆ [Dominant factors associated with microcystins in nine mid-latitude, maritime lakes](#) (April 2015)
- ◆ Effectiveness of Alum in a Hyper-eutrophic Lake [Ketchum] with Substantial External Loading (April, 2017)



Solveig Whittle, Rita Aguilar, & Ozzie Pearce - Crystal Lake



Jim Berentsen  
Storm Lake



Chris Grey  
Lost Lake



Mark Your Calendar!  
2017 Volunteer Workshop  
9:30-1:30

MAY  
06

# Winter Wonders Return to the County's Lakes

Each November, residents of Snohomish County witness flocks of graceful, snow-white swans descending upon lakes and open fields. Lake volunteers have recently spotted swans at Sunday, Beecher, and Crystal Lake. Today you see the two native swans which are both protected: the large Trumpeter Swan (*Cygnus buccinators*) and the slightly smaller Tundra Swan (*Cygnus columbianus*).

Seeing trumpeter swans is a special treat. Prized for feathers that made some of the best ink quill pens, trumpeters were nearly hunted to extinction by the early 1900's. In 1932, fewer than 100 birds were known to exist south of the Canadian border.

Habitat preservation and hunting regulations saved the swans from extinction. In 2007, it was estimated that almost 4,000 swans from central Alaska winter in Skagit County alone. Jim Collins at Sunday Lake counted more than 930 in one night, reporting by Thanksgiving

that "the entire Lake was stuffed with them; mornings looking like a huge floating marshmallow scene."

Today, tundra and trumpeter swans can be seen mingling together in shallow lakes, slow-moving rivers, coastal estuaries, and agricultural fields. However, when Trumpeter Swans first reappeared in Washington, they inhabited fresh water while the Tundra Swans inhabited salt water environments. It's not clear why this habitat separation is no longer the case.

Lead poisoning is still a threat to swans as ingesting only 3-4 lead shot can be fatal. Poisoned swans must be removed as scavengers preying on them can also be poisoned. The County's Animal Control Services can remove poison swans—call 425-388-3440 .

We'd love to know if you've spotted these white-winged wonders on your lake. Let us know and send some pics to [lakes@snoco.org](mailto:lakes@snoco.org)!

## Trumpeter Swan

(*Cygnus buccinators*)

- Identified by the black bill with no coloration.
- Bob their heads and necks with vocalizations to communicate.
- Largest of the North American native waterfowl with wingspans of up to eight feet.
- Trumpeter Swans migrate from British Columbia and Alaska. Flocks fly low in a V-formation.
- Adults eat stems, leaves, and roots of aquatic plants and upland grasses during the winter.
- Incubation lasts 32-37 days and youth first fly at 4 months.

Photo: Trumpeter Swan, Lee Barnes, Seattle Audubon Society



Photo: Tundra Swan, Tom Grey, Seattle Audubon Society



## Tundra Swans

(*Cygnus columbianus*)

- Identified by yellow patch in front of eyes (although not always present).
- Will only nod their head up or down—do not bob like trumpeters.
- Also known as the Whistling Swan, their scientific name is derived from the Columbia River.
- Migrate long distances in family groups from Arctic tundra nesting sites to winter grounds in the Northern Contiguous U.S.
- Adults historically ate invertebrates and submerged vegetation but now also rely on leftovers in ag fields.
- Incubation lasts 29-32 and youth first fly at 2-3 months.

Range of Trumpeter Swans in Washington

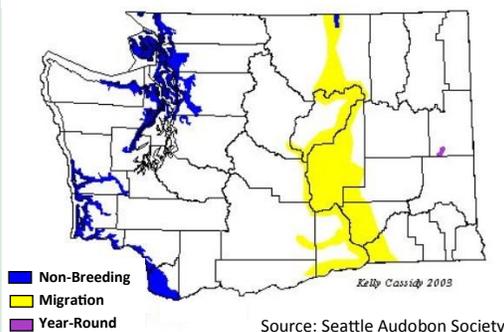
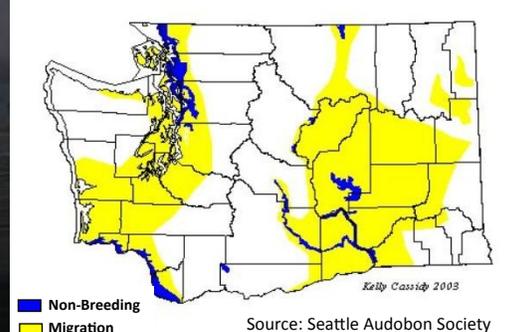


Photo: Trumpeter Swan on Sunday Lake, Gerald Plowman

Range of Tundra Swans in Washington



# EPA's National Lakes Assessment - How Healthy Are Our Lakes?

## What is the National Lakes Assessment?

The National Lakes Assessment (NLA) is a massive sampling effort led by the EPA to better understand the health of our nation's lakes. Slated to be conducted every 5 years, there have been two so far in 2007 and 2012 with another planned this year.

The 2012 results were recently published and we are starting to get answers to big questions including:

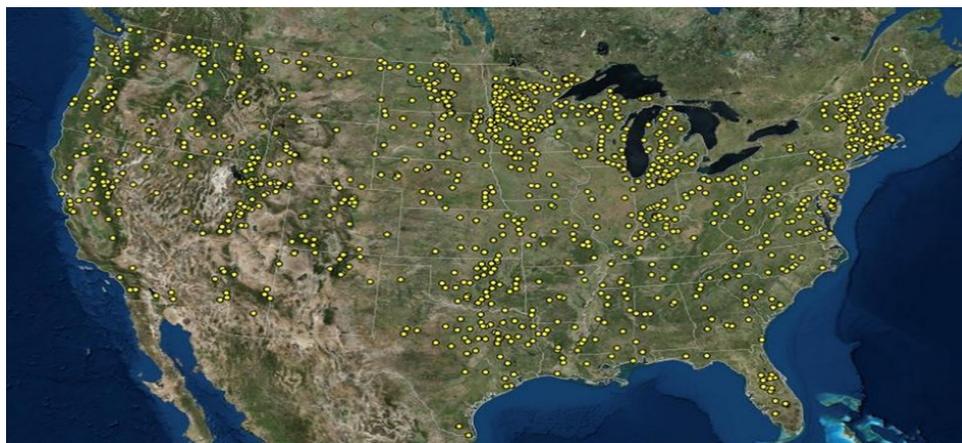
- What is the biological, chemical, physical and recreational condition of lakes?
- How much are lakes degraded? And is it widespread or localized (regional)?
- Are lake conditions getting better, worse, or staying the same over time?
- Which environmental stressors are most associated with lake degradation?

## What lakes were included?

Lakes are selected randomly to represent their ecological region – with similar climate, ecology, and plant and animal communities. The NLA includes natural or man-made lakes, ponds, and reservoirs across the lower 48 states that are:

- greater than 2.47 acres
- at least 3.3 feet deep
- a minimum quarter acre of open water
- a minimum retention time of 1 week

We are in the Western Mountain region and had two lakes sampled - Lake Armstrong (2007) and Martha S (2012).



During the spring and summer of 2012, 89 crews sampled 1,089 lakes across the country.

## What did they sample?

Parameters were selected to tell the story of the physical, biological, and chemical health and the recreational suitability. The survey includes all of the parameters you sample plus assessing habitat quality, biological health (zooplankton and macroinvertebrates), and toxins (mercury and atrazine).

## What did they find?

- **Nutrient pollution**—In total, 45,000 lakes have high levels of phosphorus or nitrogen in the United States.
  - 40% had excess phosphorus.
  - 35% had excess nitrogen.
  - Lakes with high phosphorus were 2.2 times more likely to be have impaired benthic life.
- **Biological conditions** - 57% of lakes have poor to moderately degraded communities of benthic or bottom critters (e.g. snails and aquatic insects) and 48% for zooplankton.

- **Lake shoreline habitat** - 57% of lakes have poor to moderate habitat complexity and 51% have poor to moderate riparian cover. Impaired lakes were 1.6 times more likely to have degraded benthic life.
- **Microcystin** - 39% of lakes have detectable levels of this liver toxin which is produced by blue-green algae but were rarely at levels of concern.
- **Mercury** - 26% of lakes are most disturbed for sediment mercury and 40% for a toxic version methylmercury. Mercury can build up in fish and shellfish, affecting people and animals.
- **Atrazine** - 30% of lakes had detectable levels of atrazine and 70% had none. A common agricultural herbicide, it is found in about 75% of streams in the US.

*Compared to other ecoregions, our ecoregion had less lakes in the most disturbed condition, including the phosphorus and lakeshore disturbance parameters.*

## How Are Lakes Changing? 2007 vs 2012



### Phosphorus

*18.2% fewer lakes with low-phosphorus conditions.*  
A key nutrient in lakes, the data shows that phosphorus has increased in lakes that were previously low in phosphorus.



### Nitrogen

*No change in lakes with most disturbed conditions.*  
While many lakes had high levels, the nitrogen levels overall were not increasing or decreasing.



### Cyanobacteria

*8.3% more lakes in the most disturbed condition.*  
Cyanobacteria cells are an indicator of risk for exposure to algal toxins and are increasing across the country.



### Microcystin (an algal toxin)

*9.5% increase in the detection of microcystin.*  
While more lakes had detections, there was no change in the number of most disturbed lakes.



### Biological Community

*No change for benthic macroinvertebrates.*  
Zooplankton changes couldn't be assessed.



### Lake Shoreline Habitat

*No changes were seen for 3 of 5 habitat metrics.*  
More lakes had decreased habitat complexity, but fewer lakes were impacted by lake drawdowns, which is good for habitat.

# A Quagmire of Cool Bog Facts



*Sphagnum moss with carnivorous sundews (on log) and bladderworts (in water) at Lake Riley*



*Sundew with sticky insect traps growing over bog cranberry - Little Lake*



*Close-up of bladderwort which has tiny zooplankton traps*



*Bog bean at Little Martha Lake*



*Tom Blum leading fellow lake volunteers on a tour of Little Lake bog*

While you might regularly hear comments such as “being bogged down with work” or “stuck in a legal quagmire,” you may never have stopped to think about where these terms came from. All of these terms, plus a whole lot more (fens, mires, morass, muskegs), refer to a special type of wetland that is primarily composed of peat and often dominated by sphagnum moss. Bogs are rare and fascinating ecosystems that we can find right in our backyard in the Puget Sound Region. Here is just a sample of interesting bog info:

**Bogs grow slowly** A defining bog characteristic is the buildup of peat - soil made of dead plant matter. Peat forms when plants grow faster than they decompose. Our climate, with cooler temperatures and lots of rain, is good for peat buildup. To be an official bog, there must be at least 16 inches of peat. Washington bogs accumulate about one inch of peat every 40 years. They range in depth from a few feet to over 50—meaning some bogs in our area started growing after the last glacial retreat about 10,000 years ago!

**Bogs are malnourished** Another hallmark of bogs is the presence of sphagnum moss. This clever plant doesn't just beat out its competition, it actually changes the rules of the game. Sphagnum releases hydrogen ions to better obtain nutrients. This causes the local pH to drop as low as 3.5, compared to our lakes that range from pH 6 to 8. The low pH makes nutrients less available for other plants. The tough conditions favor “ericaceous” plants such as Labrador tea, bog laurel, and bog cranberry. They rely on mycorrhizal fungi to assist with nutrient extraction. Other plants, such as sweet gale, grow special nodes that can fix nitrogen. Of course bogs are also known for their cadre of carnivorous plants such as sundews and bladderworts (see photos) that derive nutrients from tiny invertebrates.

**Bogs form around lakes** While bogs can be found in a variety of environments, in this area many form around lakes and ponds. Decaying vegetation mats slowly cover or fill in lakes over time. You may have heard of a quaking bog - where a lake is mostly covered in floating vegetation. It can be fun to walk on, but dangerous if you fall through!

**Bogs are rare** Studies from the 1920's to the 1950s by a local bog pioneer, George Riggs, showed that there were at least 24 peatland areas in Snohomish County. Since that time, some of these have been disrupted through mining (such as Chase Lake) or development. However, some intact bogs are associated with lakes we monitor. Crystal Lake has not only Hooven bog in its headwaters, but the Little Lake bog area as well. This special ecosystem is privately owned and protected by the Crystal Lake community. Lake Cassidy and Little Martha Lake (located north of Lake Stevens) are adjacent to a large bog ecosystem, part of which is owned by County parks. Lake Ketchum and Lake Riley also have identified bogs in their watersheds. While not on the official inventory, Lake Loma used to be called Cranberry Lake and was likely a peatland before being developed. We've also noticed bog rosemary and other common bog plants near undeveloped portions of Lake Armstrong and the Three Lakes area. Chain Lake also has large floating mats of vegetation, which is one of the earlier stages of bog formation.

**Bogs are important but at risk** Bogs are like giant sponges that absorb and clean water. This helps to prevent downstream flooding and provide cool clean water that support salmon and trout. Bogs and other peatlands are also considered the most efficient carbon sink on the planet. If preserved, they can help prevent climate change, but if destroyed they can contribute to its acceleration. Small changes in the hydrology or chemistry of bogs, the encroachment of invasive plants, or too much foot traffic can disrupt these delicate ecosystems. They are also at risk for commercial uses such as peat mining and cranberry farming and natural risks like peatland fires which can burn for decades. What takes thousands of years to form can be destroyed in a matter of days.

## A Story from the Archives by Patricia Cassidy

Written by Patricia Cassidy a former volunteer who monitored Panther Lake with Wayne Gilbert from the mid 90's to 2001

"It was a cool cloudy summer day when Wayne and I set out in his tiny aluminum boat to do our lake monitoring. It was about 10 am and the lake was very quite. I didn't even realize that there was someone else on the lake until he putted past us.

He was a scruffy looking character who appeared to have not gotten very much sleep. As he motored by us, Wayne asked him if he'd had any luck fishing. The guy mumbled something back in return, all I could make out was that he had snagged his fishing pole then lost it while trying to pry it loose. He said he was lucky because he had brought another pole with him.

About 15 minutes had passed when I glanced around and noticed our fishing buddy standing in his little boat leaning over the side, apparently relieving himself in the lake. Well I guess he leaned a little too much and lost his balance. He didn't completely fall out of his boat, but just enough to soak himself and fill his boat with about 90% water. By the time he got himself seated again there was only about 5" of visible boat. He then had to fumble to get his oars which kind of tipped the boat allowing it to continue to fill the water. Leaving a trail of empty beer cans, his life preserver, and misc. other things floating on the surface he managed to row himself around this big tree that was laying in the lake.

Needless to say Wayne and I were laughing so hard just watching this idiot, we forgot we should probably row over to help him. By the time we got there he had lost total control of his sinking ship and fallen in again, this time all the way out of his boat. We watched as his boat battery, fishing pole, tackle box, and knife sunk to the bottom of the lake.

Mr. fisherman would still not give up, he was trying to get back in his boat which was now only visible by the tip sticking out of the water. We suggested that he try and get some water out before attempting to get back into his boat. We tried to help retrieve what was left floating around, while keeping an eye on our buddy to make sure he wasn't going to drown. We both had a very hard time trying to keep a straight face.

Finally he was able to get himself in the boat and row back to shore hopefully a lot more sober than when he arrived. What amazed me was that during this whole ordeal this guy had a cigarette hanging out of his mouth that never seemed to get wet. He smoked that darn thing all the way down to the butt. And who said lake monitoring wasn't exciting!

By the way Wayne and his brother later went diving and retrieved all the items that had sunk to the bottom. He is now the proud owner of a new motor battery, fishing pole, and tackle box. We doubt that Mr. fisherman recalls which lake he had been fishing on."

## Hooven Bog - A Newly Protected Snohomish County Treasure

In 2015, Snohomish County purchased 37.25 acres to preserve Hooven Bog and the surrounding forest. Hooven Bog is one of very few well-preserved peat bogs remaining in Snohomish County. It is considered a wetland of statewide importance for its unique and regionally rare aquatic plant communities. It is technically a bog/poor fen community.

A threat of homes being developed within 100 feet of the bog triggered a group of concerned citizens, the Bear Creek Headwaters group, to take action and advocate for the bog's protection. Eventually they partnered with then Executive John Lovick's team. The County worked with the community to ultimately purchase the bog with a unanimous vote of the County Council.

The latest purchase adds to a greater 4-mile long wildlife corridor with 1,700 acres of natural lands that includes County parks and conservation areas, the Crystal Lake community, and DNR lands. Now that the bog is protected, efforts are

focused on restoring the area by removing part of a road and controlling invasive species. Because of its fragile ecosystem, Hooven Bog is not currently open to the public for recrea-



*Hooven Bog - photo from Bear Creek Headwaters*

# Join us for the Volunteer Workshop on May 6th, 9:30 AM to 1:30 PM

Please join us for our annual volunteer training workshop! Meet fellow volunteers, brush up on current monitoring procedures, and learn a few new things about lakes. Activities include:

- ◆ Monitoring method review
- ◆ Awards and recognition
- ◆ Look at your data
- ◆ Lunch and snacks
- ◆ Special projects around the County
- ◆ Photo contest



## Introducing New Staff Member Katie Ruthenberg

As an intern, Katie started working with the lakes group in May 2016. She has recently moved into her full-time Water Quality Analyst position with the lakes group. Katie grew up in Michigan, the “Great Lakes State,” and has loved being around lakes ever since. She moved out to Washington to attend the University of Puget Sound, where she earned a Bachelors degree in Geology. Previously, Katie has gained experience in lake monitoring by studying heavy metals in lake sediment in Pierce County. She has also gained field experience through mapping geologic units in Death Valley National Park. You should be hearing from Katie soon as we gear up for the monitoring season.



2016 Winner

*Reflections*

*Photo by Solveig Whittle*

*Crystal Lake*



## Calling All Photographers

2016 Winner

*Fall Foliage*

*Photo by Gina Lorenz*

*Blackmans Lake*



A new year brings a new opportunity to win the lake photo contest. Submit your best shot of lake scenery, wildlife, or recreation and you could be the next winner. Winners will be chosen at the workshop.

To enter please send your photos to:

[lakes@snoco.org](mailto:lakes@snoco.org)

Please include the photographer's name, photo title and lake name.

# Volunteer Newsletter



WINTER 2016

## IN THIS ISSUE

- 2015 Monitoring Summary
- Have You Seen Me?
- Volunteer Spotlight
- Parameter Spotlight
- Shoreline Restoration Program

## 2015 Monitoring Statistics

	<b>63 Volunteers</b> <b>36 Lakes</b>
	<b>360 Secchi Readings</b>
	<b>193 DO/Temp Profiles</b>
	<b>416 Phosphorus Samples</b>
	<b>197 Chlorophyll Samples</b>
	<b>173 Nitrogen Samples</b>
	<b>27 Toxic Algae Samples</b>

## 2015 – A Fantastic Year for Monitoring

Thank you for another remarkable year of monitoring! Nearly 740 hours were spent monitoring the health of 36 lakes in 2015. We sound like a broken record, but we are so appreciative of your efforts. Your commitment to monitoring allows us to track the health of Snohomish County lakes. We especially want to thank all of our longtime volunteers whose experience ensures such high quality data. We also would like to welcome our new volunteers:

- ◆ Rick & Candi Nicholas, Lake Armstrong
- ◆ Lowell & Gina Lorenz, Blackmans Lake
- ◆ Ozzie Pearce, Crystal Lake
- ◆ Bruce Bjorklund, Nina Lake
- ◆ Trevor Tregellas, Nina Lake
- ◆ Jim Berentsen, Storm Lake

We had a very successful year collecting temperature and dissolved oxygen profiles on 13 lakes! These profiles allow us to track

critical changes in temperature and oxygen during the summer months. We have thirteen dissolved oxygen meters available for volunteers to use in 2016. If you are interested in collecting profiles for your lake, please let us know!

In 2015, nine lakes were tested for potentially toxic blue-green algae. Of those lakes, four had toxic blooms that exceeded the Washington State guidelines for microcystin (a liver toxin). More information about toxic algae can be found at [www.nwtoxicalgae.org](http://www.nwtoxicalgae.org).

All of your data have been entered and are available at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info). We have begun to analyze the data and your 2015 lake reports will be available on our website in the coming months.

Thank you again, and we look forward to another great monitoring season in 2016.



Bill Garber at Echo



Candi Nicholas at Armstrong



Jane Kelly at Crystal

Mark Your Calendar!  
2016 Volunteer Workshop  
9:30-1:30



## Have You Seen Me? Chinese Mystery Snail



- Up to 2.5 inches (most adults >1.5 inches)
- 6-7 whorls on shell (count the little ones too)
- Color ranges from olive green to brown to reddish brown

### Distribution of Mystery Snail



Source:  
USGS



## What makes this snail so mysterious?

Have you been out on the lake and noticed large snails on the lake bottom? If so, you are probably seeing the Chinese Mystery Snail, a large freshwater snail native to Asia. Volunteers have seen these invaders in many area lakes including Crabapple, Panther and Serene.

Chinese Mystery Snails (*Cipangopaludina chinensis*) can be easily identified by their relatively large shell. The shells have six to seven whorls (complete 360° spiral), can reach 2.5 inches in height and are olive green, greenish brown, brown or reddish brown in color. This snail is also called the “trap door snail” because it can seal the opening of the shell shut for protection from predators or drying out. The Mystery Snail lives in rivers, streams, and lakes with slow-moving freshwater. They prefer lakes with soft, muddy or silty bottoms.

These snails gain their mystery from their reproductive cycle. In the fall, the females begin migrating to deeper water for the winter. Then in spring, they give birth to young, fully developed snails that suddenly and mysteriously appear—hence their name. Females live up to 5 years, while males live up to 4 years. After reproducing in their 4<sup>th</sup> or 5<sup>th</sup> year, they die and their shells wash up on shore.

Mystery Snails are native to Asia where they are a common food item. Several reports indicate that this species of snail was initially imported to the San Francisco Asian food markets in the late 1800’s. Over time the snails moved from the Chinese food markets into the aquarium trade. Mystery Snails were most likely introduced into our waters from hobby aquariums emptied into local ponds and lakes. The Mystery Snail was first documented in the Pacific Northwest 50 years ago, but very little is known about their impacts on native snails or on lake ecosystems.

While Mystery Snails may be eaten in some parts of Asia (some interesting recipes are available online), eating these snails is not recommended as they are known to harbor parasites, like flukes and schistosomes (the parasite group responsible for swimmer’s itch in our area).

If you see a Chinese mystery snail in your lake, let us know or report it to the Department of Fish and Wildlife’s invasive species program using their online form at <http://wdfw.wa.gov/ais/reporting/>.

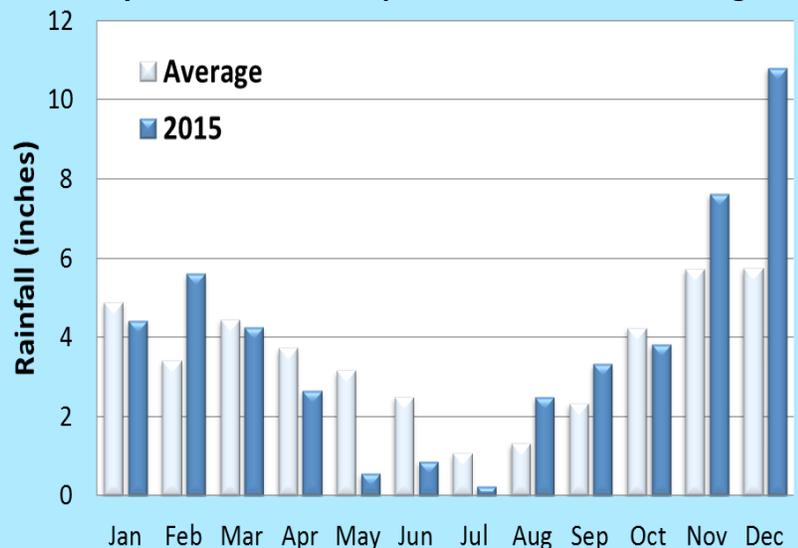
## Rainfall fun facts - How wet has it really been this winter?

Does it seem like your yard is abnormally wet or that your lake is higher than normal? While we were in a drought for the first half of 2015, we’ve had a years worth of rainfall since October. Here are a few facts to ponder:

- There were 175 days of rain in 2015.
- Near Lake Stevens it rained a total of 46.71”. The historical annual average is 42.48”.
- December had 10.81” of rain compared to the historical average of 5.52”

\* The rainfall data is from Snohomish County’s Sunnyside @ Soper Hill gage available at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info).

Monthly 2015 Rainfall Compared to the Annual Average



## Lake Roesiger, Our Lake - by Kristine Feldman

The stresses of city life are beginning to fall away, if only momentarily as the car winds along Woods Creek Road. I glance over at Emma who's looking out the window inquisitively at all the landmarks—familiar and soothing to me, but new and exciting to her. We pass the alpaca farm, the roadside barn with fresh-laid eggs for sale, the cedars, firs and bare deciduous trees waiting for spring's arrival. Emma is our three-month old golden retriever, and we're driving up to Lake Roesiger together on this beautiful February morning to introduce her to "our lake". I can't wait. I don't think she can either from the looks of it.

I wasn't always a "lake" person. Growing up, my sister and I spent most of our summers with our grandparents at the beachfront cabin they built on Whidbey Island. We spent our days crabbing, fishing, exploring tide pools, building driftwood forts, and running along quiet roads with stunning views of the Cascades and Puget Sound. It was idyllic. I cherish those memories holding them close to my heart. Those early experiences instilled in me a love for the outdoors and especially for marine ecosystems, which eventually led me to graduate school at the University of Washington where I studied interactions among burrowing shrimp, Dungeness crabs, and oyster culture in Grays Harbor and Willapa Bay.

In the midst of graduate school, my husband and I decided to grow our family. First came our two golden retrievers, Jessie and Sophie, and later our sons, Ben and Tyler. Life was busy. Leonard and I longed for a little place to get away with our family and create with them what I'd been fortunate enough to have as a child on Whidbey. After months of looking at saltwater properties, a colleague of Leonard's offered to let us use his place on South Lake Roesiger. Seasonal cabins with outhouses to large full-time residences populated the shoreline. Tall majestic trees interspersed among many of the structures and views of undeveloped forested hillsides made me feel like I was far away from the bustle and stress of Seattle. We enjoyed that crisp fall weekend canoeing with our boys, watching our dogs retrieve their tennis balls from the water, warming up by a cozy fire, and enjoying the beautiful serene views of the lake. For the first time, I could imagine myself enjoying all that a lake such as this had to offer.

In 2005, we purchased our cabin on South Lake Roesiger. Lake Roesiger is named after Richard Roesiger, a German immigrant who settled on a piece of land close to its shores in 1887. The lake consists of two deep-water basins (often referred to as north lake and south lake) joined by

a shallow-water mid-section. The north and south basins are open to waterskiing and other fast motor-boating activities during the summer. Throughout much of the year, fishers cast their lines into the water from boats or docks, hoping to feel the tug of kokanee, bass or perch on the other end. Humans aren't the only fishers on the lake though. More than once, I've been fortunate to witness a bald eagle swoop down from above to pluck its unsuspecting prey out of the water.

Lake Roesiger has been the perfect retreat for our family. Our boys, now 16 and 15, have grown up here, spending much of their summers, like I did, outdoors. So many wonderful memories...swimming, waterskiing, tubing, canoeing, 4<sup>th</sup> of July fireworks and boat parades, biking or running around the lake, trips to the Lake Roesiger store for ice cream, and hikes through Lake Roesiger County Park with our dogs. Our dogs have loved it just as much, spending more time up here wet than dry. When they weren't retrieving balls or sticks, they stretched out under our fir tree scanning the lake and dozing in the warm sun.

Six years ago, I became the south lake's volunteer monitor, taking over for Elsie Sorgenfrei who was one of the "original" lake volunteers. I admire her dedicated stewardship and am grateful for the opportunity to give back in some small way to the lake that has given so much to me. On many of my monitoring outings over the years, my younger son Tyler has accompanied me, showing a growing interest in science and data collection. Our golden retriever Lucy often begged to go as well (Jessie and Sophie having passed on since I started monitoring). Lucy usually relaxed in the bow of the boat, but every so often I'd find her happily chewing on what she thought was a stick but in fact was my pencil for recording data! (Luckily I always brought extras.) Sadly, Lucy passed away suddenly last summer from an inoperable cancer. My son Ben took our last picture of her just a few days before she died, at the bow of the canoe, protectively watching over Tyler and me as we swam in Lake Roesiger. We miss her terribly, but are happy that her final days were spent with us celebrating the 4<sup>th</sup> of July up at the lake.

"We're here, Emma!" She leaps out of the car. Her nose is to the ground, smelling what I can only imagine. She stops to peer around the side of the house and then she's off—bounding towards the water. I follow behind excitedly, ready to experience the lake through her senses. I think I might have a new monitoring buddy by my side this year. I better pack extra pencils!



*Kristine and Tyler*



*Emma!*



*Leonard and Lucy*



*Kristine Busy Monitoring*



*Tyler and Lucy*

# Parameter Spotlight – Surface Temperature

*Can your data show if Climate Change is affecting Snohomish County Lakes?*

A new study funded by the National Science Foundation (NSF) found that lakes around the world are rapidly warming - even faster than the oceans and the atmosphere. Scientists examined 25 years of thermal imaging data from 235 lakes around the world and found they are warming an average of 0.6°F per decade. Comparatively, oceans are warming at 0.22°F per decade. Northern lakes, like those in Snohomish County, are warming even faster—1.3°F per decade. However, the patterns can vary significantly from lake to lake.

What harm could warming lake water cause? Since water temperature drives many of the ecological processes in lakes, there's the potential for a lot of harm, including: the health of cold-water fish, like trout and salmon, will decline; the communities of algae and microscopic animals will change; and new invasive species may thrive. The NSF study predicts that algae blooms in lakes will increase by 20% over the next century, and more blooms will be toxic.

So, does the volunteer monitoring data show a similar warming pattern in Snohomish County lakes? We put over two

decades of your data to use by analyzing the information to detect changes in surface water temperatures.

The results? The evidence for warming lakes in Snohomish County is not overwhelming. But, 9 of our lakes (25%) show statistically significant trends toward warmer water from the 1990s through 2015. (The data are from July – September, the same period examined in the NSF study). Ten other lakes have evidence of warmer water, but the trends are not significant.

In contrast, 2 of our lakes have significant trends toward cooler temperatures and 3 lakes show some evidence of cooler water. About 12 lakes have no evidence one way or the other. In general, the lakes with warming water are fairly shallow, so temperatures may be more easily affected.

Another interesting result of our analysis is that the cycles of warmer/drier summers and cooler/wetter summers that affect this region are clearly evident in the data patterns. The first graph below shows the yearly July-Sept surface temperature averages of all monitored lakes in the County. The up/down pattern every few years is apparent, as well as a slow, overall rise in temperature of about 1°F in two and a half decades. The second graph shows just the 9 lakes with significant warming trends. The same pattern is there, but the warming is stronger—about 3°F. This works out to about 1.2°F increase per decade, remarkably close to the trend in northern lakes around the world. So, your data are similar to data from other scientists around the world. Only time will tell what the effects may be on the long-term lake health.

### CHANGES IN OUR LAKES

**Warming**



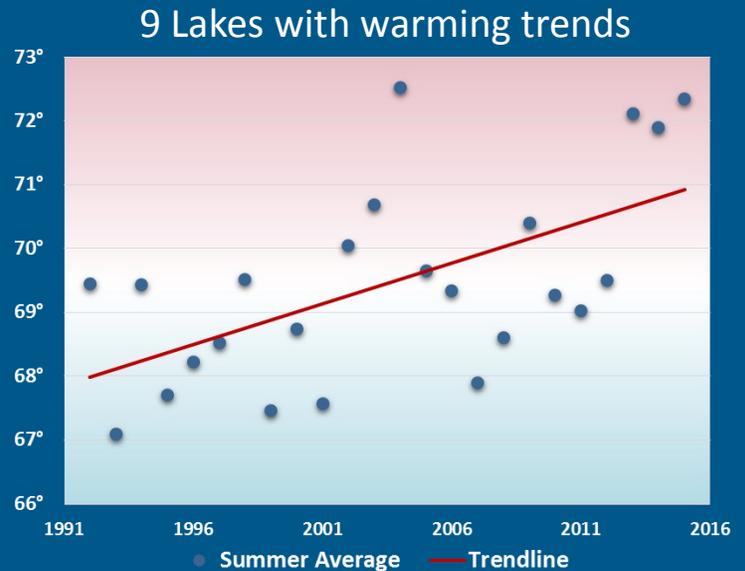
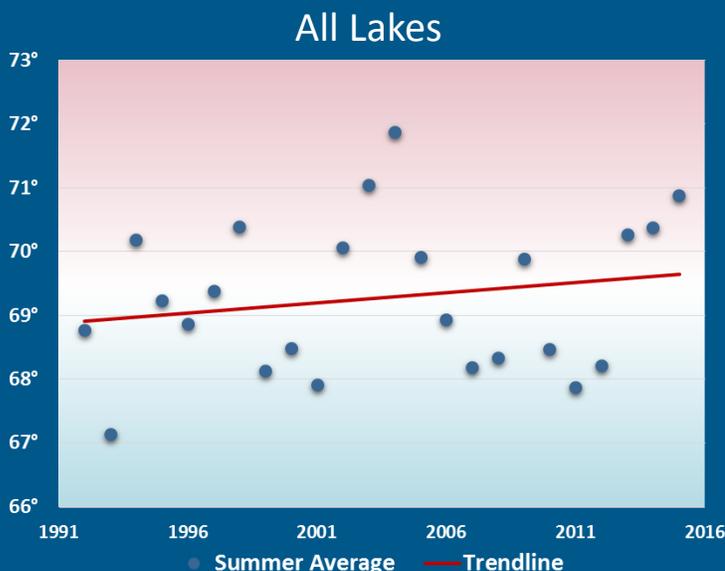
- Cassidy
- Chain
- Kayak
- Loma
- Serene
- Stickney
- Storm
- Wagner

**Cooling**



- Crabapple
- Roesiger N

## Average Snohomish County Summer Lake Temperatures 1992 - 2015



# Shorelines Come Alive With New LakeWise Program

Shorelines across Snohomish County are receiving healthy-lake makeovers thanks to the LakeWise shoreline landscaping program. Participating landowners agree to replace some of their lawns with more deeply rooted perennials, shrubs and trees. In exchange, the landowners receive free, professionally-designed shoreline landscaping designs that are created to protect water quality while maintaining lake views. Landowners also receive free planting installation and/or free native plants.

Plants with deep roots act like sponges, trapping and filtering polluted runoff before it reaches the lake. In fact, natural shorelines can trap and filter out nine times more phosphorus pollution than turf grass. Having a variety of plants along the shoreline also provides excellent homes for frogs, turtles, aquatic insects and other wildlife.

In the first year, 18 landowners have signed up, including two fellow volunteer lake monitors - Kurt Gibbons on Panther Lake and Cordelia Scheuermann on Lost Lake. Sunday Lake is leading the pack with 7 properties, which will restore 15% of the lawns around the entire shoreline!

The shoreline program is being funded largely through a grant from the United States Environmental Protection Agency and the State Department of Ecology. One of the reasons we were able to obtain the grant is we used your data to show that several of our lakes have rapidly increasing phosphorus pollution. The program is targeted at the most threatened lakes. Landowners at these 11 lakes can receive free full shoreline landscaping through 2016. Landowners at other lakes are eligible to receive some free native plants as part of our shoreline landscaping program.

If you are interested in the program, you can find out more at [www.lakewise.org](http://www.lakewise.org) or just give us a call. Please spread the word as this is a great opportunity!



## A LakeWise Shoreline Makeover



## NEW - Shoreline Resources Online

### Shoreline Plant List

Created to help find the perfect plants for shorelines, the new native and ornamental plant guide includes plant descriptions, pictures, and preferred sun and soil conditions. It is organized by plant height to help you keep those views.

### Shoreline Planting Designs

For landowners who aren't sure where to start, we created planting templates for a variety of site conditions and preferences, such as full sun, pollinators and wildlife, and planting under trees.

SCIENTIFIC NAME COMMON NAME	ZONE			CLIM E	WETLAND	EXPOSURE			MATURE SIZE		TIME OF BLOOM	PLANT CHARACTERISTICS
	1	2	3			Full Sun	Partial Shade	Shade	Height	Width		
Aquilgia flavescens Western columbine	2	3		D					12" - 16"	12" - 16"	May to June	Orange-red and yellow flowers with black stamens and dark blue-purple centers, will tolerate, but not tolerate of occasional flooding.
Arctostaphylos uva-ursi Kinnikinnick, Bearberry	2	3		E					6" - 12"	24" - 30" spreading	April to May	Low growing, evergreen groundcover; dark evergreen leaves, bell-shaped pink flowers both open white, great for erosion control.
Artemisia maritima Sea Thrift												Tall, low growing dense clumps of silver leaves.
Aruncus dioicus (A. sylvestris) Giant Ragwort												
Asarum canadense Wild ginger												
Allyrium filifolium Lily fern												
Blechnum spicatum Deer fern												



# Join us for the volunteer workshop on April 30th 9:30 am to 1:30 pm

Please join us for our annual volunteer training workshop held at the Snohomish County campus in Everett! Meet fellow volunteers, brush up on current monitoring procedures, and learn a few new things about lakes. Activities include:

- ◆ Monitoring method review
- ◆ Awards and recognition
- ◆ Look at your data
- ◆ Lunch and snacks
- ◆ Special projects around the County
- ◆ Photo contest



## 2015 Winner



*Tickled Pink*  
Photo by Gina Lorenz  
Blackmans Lake

## Calling All Photographers

A new year brings a new opportunity to win the lake photo contest. Submit your best shot of lake scenery, wildlife, or recreation and you could be the next winner. Winners will be chosen at the workshop.

To enter please send your photos to:

[lakes@snoco.org](mailto:lakes@snoco.org)

Please include the photographer's name, photo title and lake name.

## 2015 Winner



*Snowy Day*  
Photo by Kevin Jones  
Lake Loma



**Snohomish County**

**Public Works**

*Surface Water Management*

3000 Rockefeller Avenue, MS-607

Everett WA 98201-4046

# Volunteer Newsletter

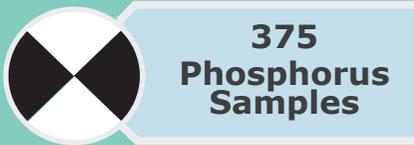


WINTER 2015

## IN THIS ISSUE

- 2014 Monitoring Review
- Putting Your Data to Work
- Parameter Spotlight
- Volunteer Spotlight
- Good News for Ketchum

## 2014 Monitoring Statistics



## 2014 - An Amazing Monitoring Season

Thank you for another awesome year of monitoring! With the help of 59 volunteers, we made 379 trips to monitor the health of 37 lakes. This work could not be done without all of your valuable time and effort. We especially want to thank our long-term volunteers ensures such high quality data.

We also would like to welcome volunteers who joined us in 2014:

- David Spencer, Blackmans Lake
- John Dietz, Lake Goodwin
- Marissa Wright, Lake Kayak
- Ken and Carla Miller, Lake Ki
- Chris Gray, Lost Lake
- Cordelia Scheuermann, Lost Lake
- Travis, Ryan, Sidney, and Sawyer Keay, Martha Lake (South)
- Chris Berg, Lake Riley
- Aaron and Sonja Voice, Lake Serene
- Brad Anderson, Lake Shoecraft

We had a very successful year collecting temperature and dissolved oxygen profiles on twelve lakes! We have twelve dissolved

oxygen meters available for volunteers use. If you are interested in collecting profiles of your lake, please let us know!

In 2014, six lakes were tested for potentially toxic blue-green algae. Of those, Lake Ketchum had toxic blooms that exceeded the Washington State guidelines for microcystin (a liver toxin). More information about toxic algae can be found at [www.nwtoxicalgae.org](http://www.nwtoxicalgae.org).

We also started collecting additional nutrient data with nitrogen samples, as well as recreational observation data.

All of your data have been entered and are available at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info). We have begun to analyze the data and your updated lake reports will be available on our website in the coming months.

Thank you again and we look forward to another great monitoring season in 2015. Your commitment to lake monitoring is essential to tracking long term changes in water quality.



Chris and Cordelia  
Lost Lake Volunteers



Sonja and Aaron  
Lake Serene Volunteers



Ken and Carla  
Lake Ki Volunteers

**Mark Your Calendar!**  
**2015 Volunteer Workshop 9:30-1:00**

**APRIL**  
**18**

## Volunteers

### LakeWise Certified!



C. Scheurman on Lost Lake



Cartmills on Lake Crabapple



VanBelles on Ruggs Lake



Keays on Martha Lake



C. Gray on Lost Lake



# Putting Your Data to Work for Lake Protection

## Volunteer Monitoring Drives Creation of Lakewise Program

One of the primary goals of our volunteer lake monitoring program is to track changes in lake health so we can find and address problems early and prevent costly lake restoration. Over the past several years, your data shows alarming trends of increasing phosphorus and algae at many lakes, which are early warning signs of deteriorating lake health.

By looking at changes in each lake area more closely, it became clear that in most cases the likely culprit in an increase in developed properties near lakes. Each individual house may only contribute a small amount of pollution from sources like pet and animal wastes, lawn and garden fertilizers, eroding soils and failing septic systems. However, over time these small amounts wash into the lake and can add up to big problems, such as decreased water clarity, stressed fish and wildlife, and potentially toxic algae blooms.

To slow these disturbing trends, many individuals need to make small changes on their properties to decrease phosphorus inputs. Thus was born the County's LakeWise program. LakeWise is a voluntary program that encourages lake area residents to make small changes on their property identified in the "Clear Choices Checklist" and who are then recognized with a LakeWise certification. The program was successfully piloted in 2012 at Lake Howard. But we knew that we would need additional funding to roll out the program to other lake areas and provide incentives to increase participation.

## Volunteer Data Used to Prioritize Lakes and Obtain Grant Funding

Finding funding sources for outreach and education programs is difficult. However, last September, the Washington State Department of Ecology (Ecology) and the United States Environmental Protection Agency (EPA) announced a Nutrient Reduction grant opportunity through the National Estuary Program (NEP). Puget Sound is a large estuary that is being dramatically affected by nutrient pollution (i.e. nitrogen and phosphorus) that is flowing in from the rivers, lakes and streams throughout the region. We quickly realized that this might be an ideal

fit to help fund work to reduce nutrients in our lakes.

The grant requires that we work on waterbodies that are listed as impaired on Ecology's list for nutrient pollution, or have problems with nutrient pollution. The State had already used volunteer monitoring data to list several county lakes as impaired. Your data were also used to identify the lakes that have trends towards increasing phosphorus that would benefit from the LakeWise program. With 20 years of phosphorus data and 13 years of chlorophyll a data we were able to make a compelling case for reducing nutrients at these lakes and were successfully awarded a \$295,000 grant for 2015 and 2016.

## Volunteer Data Used to Evaluate LakeWise Effectiveness

The final piece that your volunteer data helped to fulfill in obtaining the grant is providing a mechanism to measure the effectiveness of the grant project. The entire goal of LakeWise and the grant project is to reduce nutrients flowing into lakes which leads to lower in-lake phosphorus concentrations. However, there is a delayed environmental response to changes like these, and it would be virtually impossible to detect changes in the two short years of the grant. Our long-standing monitoring program increased our chances to obtain funding and helps ensure that LakeWise is an effective, long-term approach to lake pollution problem.

## LakeWise Grant Highlights

Your data has helped us to fund the following LakeWise activities:

- ⊗ 4 LakeWise community events
- ⊗ 8 septic system care workshops
- ⊗ 350 septic system care rebates (\$100 each)
- ⊗ 40 shoreline restoration planting projects
- ⊗ 40 driveway pipe/downspout disconnection rebates (\$200 each)

The LakeWise program and workshops are available to all County residents. However, the additional incentives will only be available to residents of the 11 target lakes: Crabapple, Echo, Flowing, Howard, Ki, Ketchum, Loma, Lost, Panther, Shoecraft and Sunday.

**Attend a FREE Natural Lawn Care Workshop!**  
**March 24 in Snohomish or March 26 in Stanwood**  
**REGISTER TODAY! Visit [www.lakewise.org](http://www.lakewise.org)**

## Good News For Lake Ketchum!

For decades, Lake Ketchum has been the most polluted lake in Snohomish County. Extremely high levels of phosphorus caused dense, blue-green algae blooms throughout the summer. Frequently, these blooms were toxic. Swimming and most other uses of the lake were severely affected.

But, a new day is dawning at Lake Ketchum. The first phases of a lake clean-up plan have been implemented.

In May 2014, Snohomish County Surface Water Management (SWM) performed a large scale alum treatment in the lake. Alum takes phosphorus out of the water column and inactivates phosphorus in the lake sediments. The contractor applied 13,500 gallons of alum (aluminum sulfate) and 7,500 gallons of sodium aluminate (a buffer to prevent pH changes). Unfortunately, because of a dense algae bloom and poor mixing of the two chemicals, the treatment was suspended when some fish started to die. Nevertheless, phosphorus concentrations were reduced 88% during the summer and fall of 2014. In the summer of 2013, phosphorus had averaged 289  $\mu\text{g/L}$  at 1 meter and 1,427  $\mu\text{g/L}$  at the bottom. During the summer of 2014, the averages dropped to 35  $\mu\text{g/L}$

and 162  $\mu\text{g/L}$ , respectively.

During the first week of March 2015, SWM performed another large alum treatment at Lake Ketchum. This time, the treatment of 13,000 gallons of alum and 8,100 gallons of buffer, went smoothly. Fish scientists from the State Department of Fish and Wildlife were on site, and did not detect any impacts to fish from the treatment.

We are hoping for more significant improvements following the recent treatment. The phosphorus levels will still be higher than at many other lakes in the County, but there should be fewer and less severe algae blooms.

The alum treatments cost \$142,000 plus another \$50,000 in monitoring and consultant costs. Property owners around the lake, a State grant, a SWM grant, and general SWM fees each paid about 25% of the total costs.

Small alum treatments are planned every spring into the future. And, residents will need to work hard to control pollution from their properties. But, things are looking up at Lake Ketchum.



*Big Trucks...Small Space*

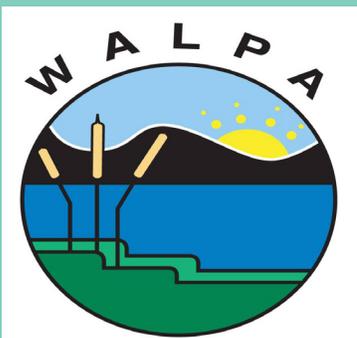


*Loading Chemicals on Barge*



*Alum in the Water*

## Washington State Lake Protection Association Conference Scholarship



The Washington State Lake Protection Association (WALPA) is a non-profit organization formed in 1986 by a group of volunteers concerned for the future of lakes in this state.

WALPA has grown to more than 200 members that include lakeside residents, lake associations, recreationists, scientists, educators, legislators, and local and state agencies. Through WALPA, separate entities with diverse interests speak with a united voice.

WALPA is excited to announce a new scholarship that will provide a lake association representative funds for registration and accommodation at the annual conference. The conference will be held in Walla Walla, WA October 26-28, 2015. The lake association scholarship is intended to allow members of a lake association to send a representative to the annual conference to learn from our presenters and sponsors, and network with WALPA members, to take information back to their association. The recipient will be expected to give a short

presentation at the conference business lunch on the lake association and its goals and to write a short article for Waterline after the conference summarizing their experience. If you are interested, please find more information about WALPA and the conference scholarship at [www.walpa.org](http://www.walpa.org).

## Lake Beecher - My Kind of Wild! -by Jenifer Poole

I moved into a little 1932 cottage on Lake Beecher in June of 2007. Although the house had recently been remodeled, the property was in quite a wild state (and much to my chagrin, so was the septic system). The acre of land going from the edge of the yard down over a 20 ft embankment to the Lake was a garden of invasives so tall and thick you could not see over or through it. There were no steps down to the water, and the dock had boards that were completely rotted out. The house next door had been empty and abandoned for over 2 years. I did not realize how vastly outnumbered I was by rodents, until the first time I mowed the “lawn” and herds of rats and mice fled shrieking in terror ahead of my mower.

I got the lake monitoring request that first summer, but had to turn it down because I didn't have a boat, or so I thought. The following spring, the two young men building my new potting shed took a break, and while wading through a sea of reed canary grass layers by the shore tripped over a dinghy hidden beneath. They left that day with an extra \$20 each!

There's no point in living on a lake if you never go out on it, and so two years later, I happily accepted the volunteer request to have one more reason to hop into my “ringy dinghy” and be Huck Finn out on the water. One of the main things I've appreciated about the Lakes program and the training you get, is that you don't just learn how to take water samples and read Secchi disks, you learn a different way of “seeing” the lake you live on.

I now had my own “panel of experts” to call on for plant and animal identification. Instead of mindlessly recoiling in horror at the thought of going swimming in Lake Beecher, I now fully understand why I don't want to take a dip in that mid-summer pond scum, oozing so warm, green, and bubbly through my fingertips as I fill the algae sample jar. Now I have a perfectly good reason to spend two hours on the Audubon.org website wearing headphones listening to water and marsh bird calls. Why? The Pied Billed Grebe.

When I see or hear things on the lake I don't understand, instead of just kicking back on my chaise lounge with another martini, I want to get to the bottom of it. I've gone from taking pretty photos of cats and the occasional live

mink Bentley dragged into the house, to turning my laundry room into CSI: Lake Beecher. Measuring and laying out dead specimens of various wildlife I've come across and snapping their final close-up. My photo morgue contains weasels, moles, bugs, flying squirrels, a variety of mice & rats, and beavers that ventured away from the lake never to return.

I have a love-hate relationship with beavers, who outnumber the human lake dwellers here 2:1. One day I'm Annie Oakley in bedroom slippers, toting a gun loaded with expletives chasing them off the property with their mouths stuffed full of my newly planted shrubbery, making me spend two days putting up beaver-proof fencing. Other days, I am thanking them for chewing down 80% of the Nootka Rose bushes overnight that I was about to spend all day pruning! It's all about perspective.

Lake Beecher has more than just wildlife to watch. There were those young, two-legged types in a 16 ft'er motoring by at dusk wearing camo hauling a flock of floating decoys headed for “No Man's Land” up the canal, outside of duck hunting season. It's not that I really noticed them that much, not in a Gladys Kravits binocular wielding way. It's when I heard the ear splitting reverb of gun shots that I suddenly had total-recall. The next day, while paddling up the canal looking for bodies, but finding only submerged bryozoans the size of my boat, did I get the full picture. There they were, cleverly hidden twin duck blinds, facing each other on opposite sides of the canal. Okay, not exactly twins. One was more upscale. It had a fancy lounge chair toilet!

Autumn to spring Lake Beecher is a lake and a river becoming a moving mural, when Evans Creek rushes in from the south and the Snohomish River from the north, and from the comfort of our cozy windows, we watch Rod Pruitt's runaway dock scurry from one end of the lake to the other, each time beaching itself somewhere new.

Whatever the season, there's always something going on. Others can go for a month long angst workout on the PCT. All I need to be a Girl Gone Wild, is some nearby water and wilderness with no cell phone in sight.



Jenifer Poole



Mink on Beaver Dam



Bladderwort



Trumpeter Swans in Flight



Lake Beecher

photos by Jenifer Poole

# Parameter Spotlight- Water Clarity

## What is Water Clarity?

Water clarity is the clearness or transparency of the water. This is one of the most noticeable traits of a lake. In Snohomish County, lakes with a wide range of water clarity occur naturally. Many factors can affect water clarity, including algae and aquatic plants, suspended sediments from streams or stormwater runoff, tannins that come from surrounding wetlands and forested areas, the time of year and even the weather.

One of the oldest, easiest and cheapest ways to measure water clarity is with the Secchi disk. The Secchi disk was invented in 1865 by Angelo Secchi, a scientific advisor to the Pope. Secchi disks of various sizes can be used, but customarily it is an 8-inch diameter disc with alternating black and white quadrants. A rope or chain is attached through the center of the Secchi disk and is marked in feet or meters. The disk is lowered into the water to find the depth at which the disk vanished from the observer's sight.

## How Do We Use Your Data?

Snohomish County staff and lake volunteers have been collecting water clarity data since 1992 at 42 lakes. Water clarity can be used to help assess a lake's trophic state, as well as, determining long term changes. Trophic status is a useful means of classifying lakes and describing lake processes in terms of the productivity of the system. Aquatic scientists often choose to use Secchi depth measurements as an indirect way of measuring biological productivity and its associated trophic state because of the strong relationship between water clarity (Secchi depth measurements) and chlorophyll concentrations. The trophic categories often used for algae are;

- ⊗ Oligotrophic - Secchi > 4 meters
- ⊗ Mesotrophic - Secchi 2 - 4 meters
- ⊗ Eutrophic - Secchi < 2 meters

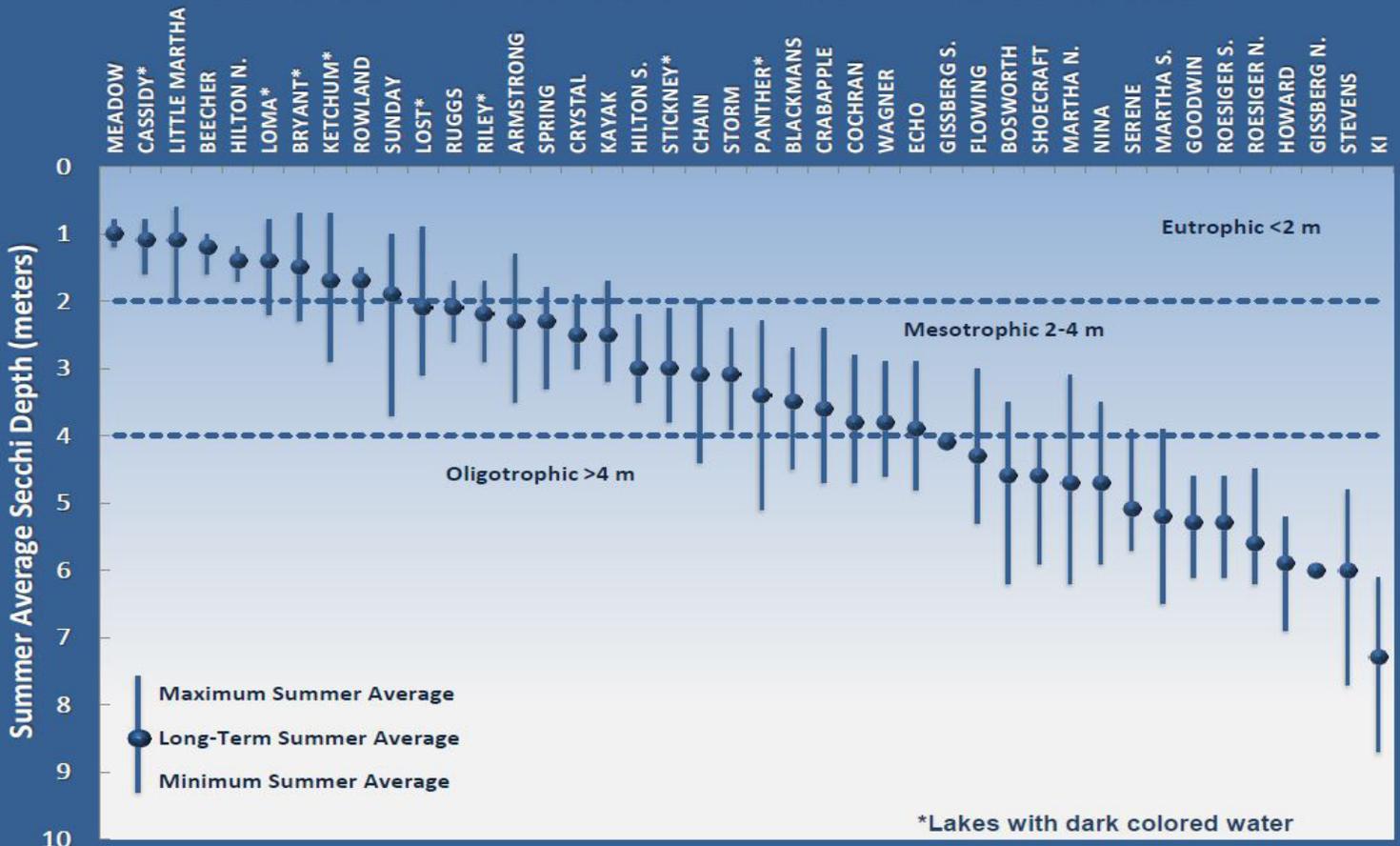


*Secchi disk near the water surface at Lake Ketchum*



*Gordon Hayslip measuring the Secchi at Lake Crabapple*

## SUMMER WATER CLARITY AVERAGES 1990-2014



\*Lakes with dark colored water

# Join us for the Volunteer Workshop on April 18th 9:30 am to 1:00 pm

Please join us for our annual volunteer training workshop - meet fellow volunteers, brush up on monitoring procedures, and learn a few new things about lakes.

Activities include:

- ☒ Monitoring method review
- ☒ Awards & recognition
- ☒ Look at your data
- ☒ Lunch and snacks
- ☒ Guest Speakers (TBD)
- ☒ Photo contest



## 2014 Winner



### **Baby Birds**

*Photo by Bill & Henri Wilson,  
Lake Roesiger (South)*

## Calling All Photographers

A new year brings a new opportunity to win the lake photo contest. Submit your best shot of lake scenery, wildlife, or recreation, and you could be the next winner. Winners will be chosen at the workshop.

To enter send your photos to:

[jennifer.oden@snoco.org](mailto:jennifer.oden@snoco.org)

Please include the photographer's name, photo title, and lake name.

## 2014 Winner



### **Sunrise**

*Photo by Mark Fussell,  
Lake Serene*



**Snohomish County**

Public Works

Surface Water Management

3000 Rockefeller Avenue, MS-607

Everett WA 98201-4046

## 2013 MONITORING STATISTICS



**54 Volunteers  
at 27 Lakes**



**324 Secchi  
Readings**



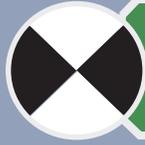
**333 Total  
Phosphorus  
Samples**



**150 Chlorophyll  
Samples**



**99 Temp/DO  
Profiles**



**46 Toxic  
Algae Samples**



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*Sunrise on Flowing Lake*

*Photo by Pete Gilderoy*

## 2013 - A Successful Monitoring Season

Thank you for another fantastic year of monitoring! In 2013, 54 volunteers made 334 trips to monitor the health of 27 lakes. We would like to welcome our new volunteers from 2013: Bob Murray (Armstrong), Bill Garber (Echo), Kevin Jones (Loma), Nino Panganiban (Nina), and Brian Funk (Wagner). We also want to thank our longtime volunteers whose experience is invaluable. This work could not be done without all of your time and effort, and we are truly grateful for all you did in 2013.

We had a very successful year collecting temperature and dissolved oxygen profiles on eleven lakes! We have a few new dissolved oxygen meters, and are hoping to collect data on more lakes in 2014. If you are interested in collecting oxygen data for your lake this year, please let us know.

In 2013, ten lakes were also tested for potentially toxic blue-green algae. Of those lakes, Cassidy, Howard, Ketchum, and Stevens had toxic blooms. More information about toxic algae can be found at [www.nwtoxicalgae.org](http://www.nwtoxicalgae.org).

All of your data have been entered and are available at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info). We have just now begun to analyze the data, and the updated lake reports will be available on Snohomish County's NEW website in the coming months.

Thank you again, and we look forward to another great monitoring season in 2014. Your commitment to lake monitoring is critical to tracking long term changes to better protect and improve your lakes.

## Ketchum Restoration Efforts Are Underway

There is excitement in the Lake Ketchum community this winter. Plans are being finalized to conduct a large-scale alum treatment in the lake this spring. The alum treatment will be a major step toward restoring water quality in the most polluted lake in Snohomish County. The disappointing summers with nearly continuous toxic algae blooms may be coming to an end.

The algae problems in Lake Ketchum are the result of extremely high phosphorus levels. Phosphorus concentrations average 270 µg/L in the lake. Phosphorus in nearly every other Snohomish County lake averages less than 50 µg/L.

The largest source of pollution (73%) is the release of phosphorus from the lake bottom sediments. Of course, all of that phosphorus originally came from the watershed, mainly from a single dairy farm near the lake. But now this huge reservoir of



Kristine Feldman monitoring  
Lake Roesiger

### Mark Your Calendar!

**APRIL**

**12**

**Volunteer  
Workshop  
9:30 - 1:00**



Algae Scum at Lake Ketchum



Sign posted by local resident



Secchi disk in an algae bloom



Toxic algae warning sign

## Ketchum Restoration (continued)

phosphorus just recycles year after year, leading to the algae blooms.

The alum treatment, which is estimated to cost about \$190,000, was recommended in the 2012 Ketchum Algae Control Plan. A portion of the analysis used to develop the plan was based on years of volunteer monitoring data.

Alum (aluminum sulfate) is a liquid chemical that will permanently bind phosphorus molecules and prevent them from feeding algae. Alum is a safe chemical widely used for lake restoration and for purifying drinking water. The large-scale treatment is expected to control 85% of the phosphorus in the lake bottom. Much smaller alum treatments are planned for

future years to help bind up the remaining phosphorus in the sediments and to strip out the new phosphorus that flows into the lake.

The Lake Ketchum project is possible because of the persistence of the local community and help from SWM staff. Funding is coming from a Department of Ecology grant, SWM funds, and from people who live around the lake. The average homeowner is contributing about \$300 per year, plus a one-time contribution of about \$400 from earlier assessments. That's a major commitment. But, the property owners are looking forward to enjoying a healthier, more beautiful lake.

## LakeWise - A Year in Review

It has been over a year since we launched the County's new outreach program - LakeWise. LakeWise was created specifically to help reverse the declining water quality trends that your monitoring results are showing at some lakes. Although anyone living near a lake can participate in the LakeWise program (including all of you), we have been piloting the project at Lake Howard (south of Stanwood) since late 2012. After a year of working closely with the Lake Howard community, we are looking back to try and evaluate the program so we can improve it and expand to a new area in late 2014.

We have some preliminary results we are excited to share with you, but first, here is a bit of history on LakeWise. As you all know - phosphorus is a key parameter used to track lake health. Even small amounts of phosphorus can lead to big problems like excessive algae (including toxic algae blooms), reduced water clarity, and stress on fish. For most of our lakes, phosphorus pollution is not coming from one large source, but is coming in small amounts from homes around the lake from septic systems, pet and animal wastes, lawn fertilizers and eroding soils (soils in this area are rich in phosphorus). Most people don't even realize that they are contributing to the problem.

The LakeWise program goal is to encourage lake residents to take simple actions

on their property to prevent phosphorus pollution. Landowners that make the "Clear Choices" on their property can become "LakeWise Certified" and are awarded an attractive sign to display. Clear choices include actions such as not using phosphorus fertilizers and attending a septic system care workshop. Shoreline landowners can also earn an extra "Healthy Shore" certification by protecting or restoring non-lawn vegetation along their shoreline.

Lake Howard has proven to be a great place to launch LakeWise. The community involvement (including our volunteers) has been essential to getting the word out about the program.

*(Continued on Page 3)*



The first LakeWise sign awarded to Rich Roberts at Lake Ki

## LakeWise (continued)

One in four of the 108 households around Lake Howard have participated in the program by attending a LakeWise workshop and/or having a certification site visit. Of the 17 properties that have had certification visits, three have already been certified – two of which have also received the Healthy Shore recognition.

Around 60 additional households from eight other lake watersheds have also attended LakeWise workshops (Ki, Goodwin, Shoecraft, Loma, Ketchum, Rowland,

Sunday and Martha North) and 13 have had site visits including our first certified property at Lake Ki (see photo).

We are now in the process of evaluating the program to figure out what is and is not working. Once we make improvements, we will expand to the next focus area which will be the three lakes of Panther, Flowing, and Storm (located east of Snohomish). We chose these lakes based on the water quality trends and their close proximity to each other.

In the next few months, we'll start looking for interested community members at these lakes to help shape the program for their community.

If you would like to see if your property qualifies to be LakeWise certified, let us know and we'll sign you up for a site visit. You can see the Clear Choice checklist and find out more info at [www.lakewise.org](http://www.lakewise.org).



## Eurasian Watermilfoil Update

Eurasian watermilfoil is the most problematic invasive aquatic plant in Snohomish County lakes. It can form thick mats and interfere with boating and swimming. It spreads easily by small fragments, so an infestation in one lake can pose a threat to all nearby lakes.

Since the mid 1990s, SWM has worked to eradicate and control Eurasian watermilfoil in our lakes. The main control methods have been diver surveys and handpulling, with herbicide treatments in certain problem lakes.

These methods have worked well most years. But, by 2012, Eurasian watermilfoil was out of control in portions of Lake Shoecraft and Lake Goodwin.

During the summer of 2013, SWM hired a contractor to treat 25 acres in these two lakes

with the herbicide triclopyr. This herbicide is often used to target milfoil with minimal effects to the lake.

By the end of the summer, the milfoil in the treatment areas was looking quite dead. But, we'll have to wait until the 2014 surveys to confirm the success of the treatment.

Controlling invasive aquatic plants is expensive. The cost of the herbicide treatment was \$29,000. Funding came from special fees paid by shoreline landowners at these two lakes. Preventing the spread of invasive plants and catching new infestations early is a much cheaper option. Volunteer monitors can help spot new plants at an early stage before they become expensive problems.



Jen Oden is geared up for a pre-treatment survey



Eurasian watermilfoil during treatment



Herbicide application underway



Eurasian watermilfoil post-treatment



FIND US ON FACEBOOK!

Snohomish County Lake Monitoring finally has a presence on Facebook. Post Pictures and Videos and Stay Connected. Go to [www.facebook.com/snohomishcountylakes](http://www.facebook.com/snohomishcountylakes) and "like" us

# Volunteer Spotlight on Deb Kocher-Thank You for 20 Years!

## Scenes from Lake Crabapple

Photos by Deb Kocher



A family of otters on the Kocher dock



An afternoon sail on Lake Crabapple



A bullfrog (an invasive frog) rests on a lily pad



A family of ducklings head to shore

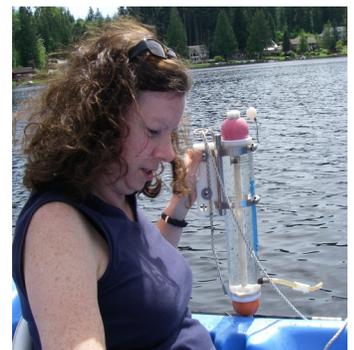
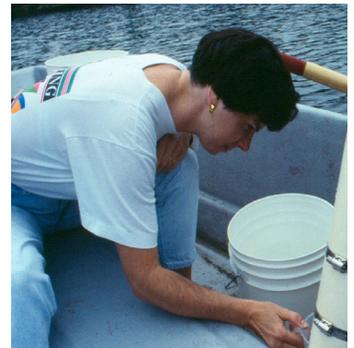
**This year we are celebrating Deb Kocher. She has been volunteering for twenty years! We asked Deb to say something, in her own words, about her history with Lake Crabapple and love for her lake....**

On my first visit to Lake Crabapple, I was welcomed by a family of otters playing on the shoreline of what would become our home. That was 1987 and I can't imagine a better place to live. Lake Crabapple is a 37 acre lake nestled between Lake Loma and Lake Goodwin in Marysville. Camp Kiloqua, a Campfire summer camp, sits on one end of the lake and the Crabapple Acre Association on the other end. It is motor free and very quiet. I began doing water quality monitoring quite by accident. After witnessing a disaster on the lake, I went to the County to learn more. That visit led me to Gene Williams who quickly recruited me for the task of monitoring. I wanted to learn and I wanted to make a difference and hopefully, prevent another such disaster.

It wasn't long when neighbors and visitors began asking questions. Knowing that people care and that I can provide answers to some of those questions is satisfying. Seeing that the data you collect is being compared with other lakes in the county, state and national level is rewarding. Knowing that experts are analyzing the data, watching for anomalies and may be able to respond to problems that arise a little quicker is a great benefit for those who use the lake and those who depend on the lake for their survival. Knowing that the data can be used to help design County building codes that will reduce degradation is hopeful.

In the twenty-seven years of living on the lake, I have seen many changes. Sadly, these changes are not for the good. In the Spring, the substrate used to be covered with hundreds of tad poles. Today I cannot say I have seen any in the past several years. Though this lake has never had a large duck population, I always looked forward to the clusters of baby mallard families every year. We still see the families but rarely see one baby grow up to be an adult. The frogs used to be deafening as they looked for their mates but now are seldom heard. Tree frogs still seem to be managing. But even the bull frogs have become few and far between. The lake now experiences several brown algae blooms every year starting in the Spring through Summer. In the first years of living here, this never happened, at least it was not noticeable. Even the number of duck species dropping by for seasonal visits has dropped. Conversations with some of the old timers, who are no longer with us, revealed a lot of changes as well. They got to see and experience things that I never have.

I am happy to say that after a long absence of the otters, due to a 216 acre housing development, the otters have finally returned (see photo). A family visited just a few weeks ago. It was a National Geographic moment as the babies and parents were rolling and sliding in the lawn. It is a great place to live!



Deb monitoring Crabapple in 1994 and more recently.

## Introducing the Newest Burghdoff Addition!

As many of you already know, my husband Mike and I welcomed a new addition to our family last March. William is a very happy baby and his sisters (Hazel & Colette) are mostly thrilled to have him as well. For much of last year, I was working a part time schedule. I am now back full time and am excited to catch up with many of you who I missed seeing last year during the site visits. – Marisa



# The Invasion of New Zealand Mud Snails

## What are New Zealand mudsnails?

New Zealand mud snails (NZMS) are tiny aquatic snails that are found in freshwater and brackish environments. These invasive snails can adapt to diverse climates and environmental conditions and are easily transported to new areas by people, pets, wildlife, and equipment. NZMS are considered a high invasive threat because they can dominate river and lakebed habitat by multiplying very quickly and achieving densities of more than 100,000 per square meter.

There is not enough information to predict just how large a problem they will be in the Puget Sound region, but we do know that once they are present in a stream or lake, it is impossible to get rid of them without seriously harming native species present.

## Are they in Washington State?

NZMS are here. They are present in King County, and they were recently found in the mouth of the Snohomish River estuary. The map below was taken from the United States Geological Survey website (USGS.gov) and shows where mudsnails

have been identified in most of Washington.

## What does a New Zealand mud snail look like?

NZMS are very small animals; adults are about the size of a grain of rice. Many of our native mudsnails are also very small, so it is best to try to identify species with at least the use of a hand lens.

Key characteristics of NZMS are:

- elongated shells with 5-6 whorls
- shell opening is on right
- color ranges: gray to dark brown
- shell opening has a protective cover

## What should I do if I have found a New Zealand mudsnail?

- Take photos and note the location
- Report to Fish & Wildlife
  - Call 1-888-WDFW-AIS OR
  - Go Online:  
[wdfw.wa.gov/ais/reporting/](http://wdfw.wa.gov/ais/reporting/)
- Let Us Know!



*Mudsnails on a fingernail*

*photo by Paul Chin of the San Francisco Chronicle*



*New Zealand mudsnail*

*photo by Dan Gustafson from U.S. Fish and Wildlife*

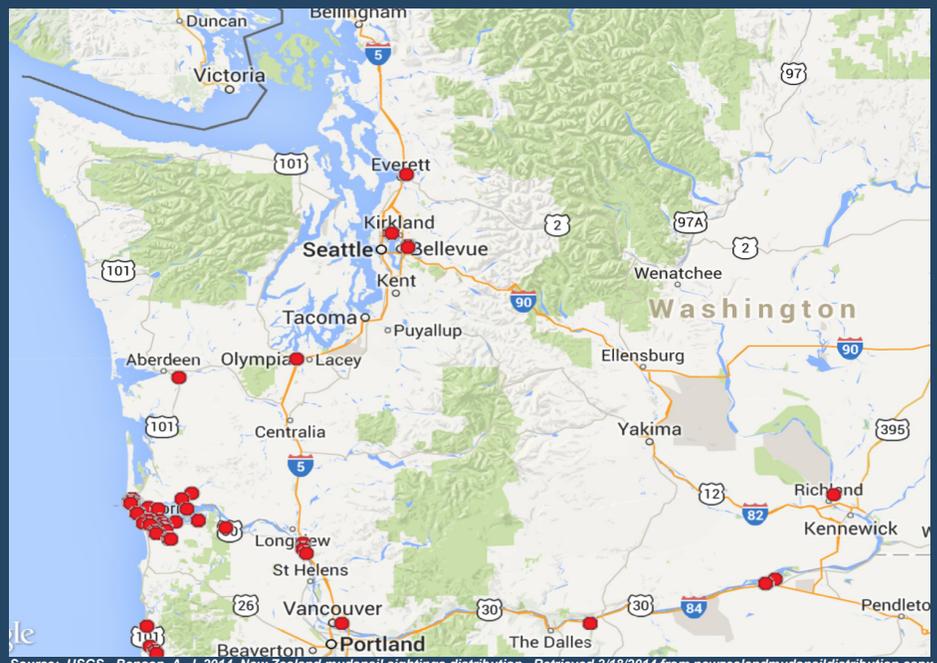
## You Can Help Slow the Spread of Mudsnails - Clean Your Gear

### After Going to a Lake or Stream:

- Remove all plants, algae, or mud from shoes, waders, life vests, boat hulls, trailers, and other gear using a stiff-bristled brush.
- If you can't clean up your gear on site, place gear in a plastic bag and allow to dry out at home before you enter another body of water.
- Allow everything to dry in low humidity for at least 24 hours before entering another body of water.



### Current Mudsnail Distribution (USGS)



Source: USGS - Benson, A. J. 2014. New Zealand mudsnail sightings distribution. Retrieved 2/18/2014 from [newzealandmudsnaildistribution.aspx](http://newzealandmudsnaildistribution.aspx)

# Join us for the Volunteer Workshop on April 12th 9:30 am to 1:00 pm

Please join us for our annual volunteer training workshop - meet fellow volunteers, brush up on monitoring, and learn a few new things about lakes. Our guest speaker, Peggy Campbell, is a Watershed Steward and a plant expert for Snohomish County. She will talk about what happens during LakeWise landowner site visits, including some of the most common lake landowner problems and solutions. Other activities include:

- ⊗ Review monitoring methods
- ⊗ Awards & recognition
- ⊗ A look at your data
- ⊗ Lunch and snacks
- ⊗ Guest Speaker Peggy Campbell
- ⊗ Photo contest



## 2013 Winner



***Sunrise on Lake Cochran***  
Photo by Dana Jordan

## Calling All Photographers

A new year brings a new opportunity to win the lake photo contest. Submit your best shot of lake scenery, wildlife, or recreation, and you could be the next winner. Winners will be chosen at the workshop.

To enter send your shot to [jennifer.oden@snoco.org](mailto:jennifer.oden@snoco.org) with the photographer's name, photo title, and lake name.

## 2013 Winner



***Mallards on Ruggs Lake***  
Photo by Chuck & Annette Van Belle



**Snohomish County**

Public Works

Surface Water Management

3000 Rockefeller Avenue, MS-607

Everett WA 98201-4046

## 2012 MONITORING STATISTICS



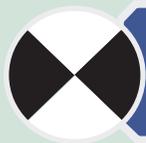
**47 Volunteers  
at 28 Lakes**



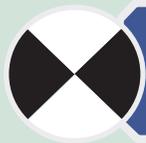
**394 Secchi  
Readings**



**261 Total  
Phosphorus  
Samples**



**170 Chlorophyll  
Samples**



**144 Temp/DO  
Profiles**



**165 Toxic  
Algae Samples**



### IN THIS ISSUE

- Year End Wrap-Up PG.1
- LakeWise PG. 1
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- Lake Water Levels PG.2
- Volunteer Spotlights PG.3
- New Staff Member PG.5

### Lilypads on Lake Serene

Photo by Mark Fussell

2012 Photo Contest Winner

## 2012 - A Fantastic Monitoring Season

Thank you for another great year of monitoring! Your commitment to lake monitoring is critical to tracking long term changes in water quality. The work could simply not be done without your time and effort. We especially want to thank our longtime volunteers whose experience ensures such high quality data. We also would like to welcome our first-year volunteers: Ben MacDicken (Chain Lake), Joan Onchen (Crystal Lake), Sue Styrlund (Crystal Lake), Kevin Jones (Lake Loma), Edith Bruns (Little Martha Lake), Chuck Lucas (Lake Shoecraft), and William Rodland (Lake Shoecraft).

In 2012, forty-seven volunteers made over 300 trips to monitor the health of their

lakes. More temperature and dissolved oxygen profiles were collected that ever before! We are hoping to beat this record again in 2013, so if you are interested in collecting profiles, please let us know.

In addition, we have also seen the highest rate of Secchi depth readings ever. Eight lakes had 100% completion for Secchi readings in 2012.

All of your data have been entered and are available at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info). We have just now begun to analyze the data and your updated lake reports will be available on the website in the coming months.

Thank you again, and we look forward to another great monitoring season in 2013.

## LakeWise Outreach Program Launched

In 2012, we kicked off our new lake outreach program called: LakeWise - "Clear Choices for Health Lakes."

### A Little History

Your monitoring data have shown alarming trends towards declining water quality at several lakes in the County. The primary problem is phosphorus pollution, which causes excessive algae, toxic algae blooms, reduced water clarity, and stress on fish and wildlife.

For most lakes, the pollution is not coming from one large source, but is coming in small amounts from all of the properties near lakes. The major phosphorus sources include lawn fertilizers, septic systems,

eroding soils, and pet and animal waste. In many cases, the problem could be addressed if everyone living near lakes made small changes on their property.

However - this is easier said than done. Many people do not realize they are part of the problem, and even if they do, re-



Henrie and Billie Wilson taking water samples on Lake Roesiger

### Mark Your Calendar!



**Volunteer  
Workshop  
9:30 - 1:00**

## Varieties of Bryozoan found in Snohomish County Lakes



## What Is a Bryozoan?

If you've ever seen a light brown, gelatinous blob in your lake, you may have been looking at a bryozoan. Bryozoans form colonies, like coral, that consist of thousands of microscopic animals called "zooids" spread around the surface of a hard, jelly-like mass. There are several species of freshwater bryozoans found in Snohomish County lakes.

Bryozoans usually grow around a submerged branch or plant stem or a portion of your dock. They can be long and thin or shaped like a ball, depending on the surface to which they are attached. Bryo-

zoans have tiny tentacles that filter food particles from the water.

Don't worry if you find bryozoans in your lake. They are commonly found in unpolluted and silt-free lakes. They do not grow in bogs or acidic waters. Bryozoans thrive in warm water. The colonies start out small in the spring, but may grow to more than a foot in diameter in the summer. Some years there are lots of bryozoans and others they are difficult to find.

So, when you see a bryozoan, don't be freaked. Enjoy the amazing diversity of life in our lakes.

## Fall Rain Makes For High Lake Water Levels

Did the water level in your lake get high this winter? If so, you're not alone. The County received reports about flooding at Blackmans, Loma, Martha (North), Roesiger, Serene, Stevens, and Storm lakes. And, we know that many other lakes experienced high water in December and early January, but we just did not get any calls.

The main reason that lake levels have been high is that we've had lots of rainfall. Yes, it always rains in the fall and winter; but the table shows that the amounts we received this fall were much greater than other recent years. Only 2006 comes close.

Also, the outlet streams or pipes at many lakes are very flat, so water cannot flow out as fast as it flows in. Only a few lakes have outlet structures that can be lowered to let water out before the rains begin. Some outlet streams are also filling with sedi-

Precipitation in Inches <i>in South Everett</i>				
	OCT	NOV	DEC	TOTAL
2004	3.19	3.99	5.85	13.03
2005	3.48	5.74	6.87	16.09
2006	2.77	11.01	7.99	21.77
2007	3.23	3.57	10.02	16.82
2008	2.18	6.20	4.08	12.46
2009	6.29	8.50	2.77	17.56
2010	2.85	4.06	7.07	13.98
2011	2.60	6.90	1.29	10.79
2012	5.77	8.48	9.60	23.85

ment and vegetation which impedes the water flow. Beavers may also cause problems at some lakes. The County is working with citizens at Lake Serene to identify actions that can reduce the level of flooding there. Data that you collect on the water levels in your lake, especially during winter, are a big help in tracking lake flooding problems.

### WINTER LAKE LEVEL REMINDER!

We encourage all of our volunteers to take weekly lake level readings throughout the winter if possible. Lake levels are one of the most common concerns of lake residents. High levels can threaten yards and structures, and low levels can affect lake access. If you are interested in tracking lake levels this winter, forms are also available at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info) under "resources for current volunteers". You can also just keep a log in a notebook.

# Volunteer Spotlight on Nancy Dean-Thank You for 20 Years!

This year we are celebrating Nancy Dean. She has been monitoring Lake Martha since 1993 with the support of her husband, Steve Dean. We asked Nancy to say something, in her own words, about her life on Lake Martha.



*What motivated you to start and continue lake monitoring?*

Many years ago, I'm told 20, Joan Evans was the monitor for Lake Martha. When she decided to retire, I decided it would be a good way to contribute to the community and keep an eye on the lake. I continue because the continuity is a good thing and it gives me the impetus to get out on the lake and kayak on a regularly.

*Is there anything you would like to share about Lake Martha in particular?*

Lake Martha is a lovely, quiet lake where people can swim, sailboard, kayak and float around on lounges. Years ago the motor boats would race down the lake (8 mph) creating wakes that would wash the shores, rock the docks, and swamp swimmers. The lake is very narrow and long, so it didn't take much to impact the shorelines. We, the residents, decided it would be nice to be able to swim or paddle around without worrying about getting run over, so we wrote a petition to the County Council. A neighbor, Charlie Nelson, took it upon himself to personally talk all shoreline owners (then 70 homes) to make the petition successful.

*Do you have a good anecdote or monitoring story?*

I don't have a personal story, but last year Steve took over the monitoring briefly due to my illness and did the annual visit with Marisa. When they returned they related how they couldn't understand why paddling was so difficult after the monitoring. It turns out they forgot to haul anchor and went a fair distance before they realized why.

*How long have you lived at Lake Martha? What changes have you seen?*

We moved to Lake Martha around 1987. Since then we have seen several very large homes and new bulkheads built. The 80 acre forest adjacent to Lake Martha has been logged and reforested with mostly alder and cottonwood. Two years ago the neighbors who built in the forest logged most of their 6 acres taking out most of their old growth trees. The same thing has happened across the lake with several of the newer large homes. When the larger logging operations happened, the runoff increased dramatically. On the positive side, 2 or 3 of the residents have stopped clearing their beaches and the shoreline has a more natural buffer to help sop up the runoff and stop erosion by waves.

*Why did you decide to transform your lawn to a more naturally vegetated shoreline and how did you go about it?*

When we moved our property was mostly yard that took two hours to mow. The previous owner had cut all but 2 trees and bulldozed off the top soil. Only sparse grass, weeds, and the slugs that loved them remained. Starting at the cabin and working toward the lake, I began to convert a swath of lawn to a flower/shrub bed each year. I was ultimately seeking a mountain meadow effect. At some point I realized that letting the lake edge grow would accomplish several things; I could stop sloggging through wet grass while mowing, it would reduce shoreline erosion, it would provide habitat, and it would discourage the large flocks of geese from foraging and leaving their calling cards. At the lake edge we basically stopped mowing and most things came up naturally. Each year we remove alder to keep the area from turning into a forest, and pull a few blackberries, but that is all the maintenance it requires. Mowing the small lawn area by the lake and the driveway only takes 20 minutes. At about the same time, other neighbors started shoving the logs off their shorelines so they could mow more. Steve and I also started lassoing the logs others were removing from their shoreline and anchoring them to ours. It gave a sitting place for herons, otters and ducks, as well as providing shade for the small fish. We have even had the pleasure of seeing a turtle sunbathing there. We also added some rock terraces and most recently a deck amidst the plantings where we can sit in the sun late in the day and watch all the birds perch in the willows along the lake. I now have my mountain meadow with a natural shoreline!



*The Dean's Shoreline in 1990*



*The Dean's Shoreline in 2008*

# Volunteer Spotlight on Don Foltz-Thank You for 20 Years!

This year we are celebrating Don Foltz. He has been monitoring Lake Cochran since 1993, recently with the support of Dana Jorden. We asked Don to say something, in his own words, about his life with regards to lakes - including Lake Cochran.

## *The Lakes and Me*

My enjoyment and fascination with lakes in general has reached a final niche with Lake Cochran. First, my friendship with Lake Cochran dwellers, Reverend Forrest Tibbits and his wife Marleah, led to my frequent use of the lake for swimming and then as a lake monitor some 20 years ago. After a serious accident, being hit by a car while on my bike, I was forced into retirement from work and also had to stop training for the triathlon by running and riding my bike to the lake.

My earliest recall of lake pleasures was as a young boy during World War II at lakes in Wisconsin. My family would rent a cottage in the summer where I learned the dog paddle, and I recall spending many hours feverishly fishing with hook line and sinker for pan fish with my many cousins. We also spent hours in an old sluggish row boat looking for turtles amongst lily pad covered nooks of the lake, and sneaking up on their protruding heads and snatching their beautiful colored shelled bodies for keeping and observing before eventually releasing them to be replaced by others for temporary keeping and much fun.

Time passed and my family took up farming and summer lake joys came to an end except for a frequent hike on a day off to a beautiful nearby lake in the Kettle Moraine State Park near West Bend, Wisconsin. The lake (Mauthe Lake by name) had a beautiful beach and a raft off shore where I fished from. The lake was circumferenced by a wonderful forest trail that I loved to hike at first, and then gradually started running the whole way just for fun. Being in a state forest park led me to enrolling in a forestry college. I had earned a letter in track and captained the cross-country team while in high school. After high school, running became the tail that wagged the dog, so to speak, and I changed from attending a forestry college and transferred to a college to run under a nationally acclaimed coach.

After college and a stint in the Army, I got my first job as a coach at a large high school in Milwaukee, Wisconsin until I became enamored with the words of the famous Indian chief in the northwest. Chief Seattle preached that the earth is for us to borrow and to pass on to future generations while maintaining "the web of life". So on to Sultan WA, where I was the high school counselor and coached track and cross-country plus got involved in a myriad of "feel good" at-boy activities including; Snohomish County recycling & Master Composter, Adopt-a-Stream, trying to save the "lungs of Monroe" it's beautiful forested golf course, stopped the county from spraying road sides for weed control, turned the Sultan School District into the best recycling district in the state, and by helping elect the likes of Peter Hurley, Dave Somers and Hans Dunschee.

After retirement, becoming a lake monitor was a natural, allowing for me to at least swim for fitness and to help maintain the lakes purity where cottages still pipe their drinking water out of the lake, motor boats are not allowed and I still can plant salmon smelt into the lake as part of my job as a Fish & Wildlife Cooperator with the state. Lake Cochran, is a tributary of one of my allotted fish planting sites, namely Woods Creek. A wonderful "marriage" is the lake and me.

-Don Foltz



Don Foltz in 1993



Don Foltz and Dana Jorden in 2009



Don Foltz in 2011



Don Foltz and Dana Jorden in 2012

## Introducing New Staff Member Jen Oden



After 16 years of the Snohomish County Lakes Management Program existing as a team of two...we are now a group of three. Jen Oden started working with us in January 2013. Jen has a Bachelors degree in Environmental Science from Oregon State University and has been working in water quality since 2001. She began working for the County in 2007 as part of the water quality group, working on stream and stormwater monitoring. Previously, Jen

worked as a research assistant at the College of Earth, Ocean and Atmospheric Science at OSU looking at long term nutrient trends along the Oregon coast. She also worked as an analyst in an environmental testing laboratory analyzing water and sediment samples. Jen lives in Marysville with her husband, Shane, and 3 year old son, Derek. You should be hearing from Jen soon as we gear up for monitoring in 2013.

## LakeWise continued

search has shown that knowledge alone is not usually enough for people to make long-lasting changes. Barriers to change include lack of knowledge, time, and costs. For people to take the next step, these barriers must be reduced and/or incentives provided to help them along. The new LakeWise program is based on your feedback and research into addressing these barriers and providing motivation to help people take steps to protect water quality.

### The Program

We are piloting the LakeWise program at Lake Howard to test the effectiveness of various elements. There is strong community involvement there, with many interested community members (including the volunteer monitors) who have been very engaged in shaping the program, including hosting an ice cream social to launch the program and promoting it door-to-door. As the program expands, we will work closely with other lake communities.

A key element of LakeWise is a list of "Clear Choices" that will protect the lake. Citizens who implement the Clear Choices can have their properties recognized as "LakeWise Certified". Free site visits from a professional helps citizens identify the actions that work for their property. The "Clear Choices" checklist is divided into three main areas – lawns and yards, septic systems, and shorelines (for those living on a lake shore). If a property owner satisfies the checklist for lawns and yards and septic systems, the owner receives an attractive "LakeWise Certified" sign that can be displayed on their property. Landowners

who meet the shoreline checklist will also receive a "Healthy Lakeshore" sign. The purpose of the certification is to recognize their accomplishment, and to promote the program to the community. Positive peer pressure can be an effective motivator for people to make changes.

Another element of LakeWise is offering frequent workshops on septic system and natural lawn care. The workshops (required for certification) provide lots of helpful information. We are seeking additional incentives for attendance (such as discounts on a septic system inspection).

A final element of the program is to improve lake shorelines. Many shorelines have been converted to lawn. However, lawn allows up to nine times as much phosphorus pollution into the lake as taller grasses, shrubs, and trees would allow. We are hoping to partner with a few landowners to create demonstration shoreline revegetation projects that are attractive while not impacting views or lake access.

We'll be sharing more information about LakeWise at the workshop and if interested you can be among the first to be LakeWise Certified.



Sign for properties that become LakeWise certified



Volunteers Jim and Cherie Poyner present their data to neighbors



Lake Howard Ice Cream Social



Septic System Care Workshop

## Join us for the Volunteer Workshop on May 4th

Please join us for our annual volunteer training workshop - meet fellow volunteers, brush up on monitoring, and learn a few new things about lakes. Other workshop activities include:

- ⊗ Review monitoring methods
- ⊗ Awards & recognition
- ⊗ A look at your data
- ⊗ Lunch and snacks
- ⊗ Guest Speaker (TBA)
- ⊗ Photo contest



2012 Winner



Wakeboarding on Lake Tye

Photo by Dana Jorden

## Calling All Photographers

A new year brings a new opportunity to win the lake photo contest. Submit your best shot of lake scenery, wildlife, or recreation and you could be the next winner. Winners will be chosen at the workshop.

To enter send your shot to [jennifer.oden@snoco.org](mailto:jennifer.oden@snoco.org) with the photographer's name, photo title, and lake name.

2012 Winner



Ducklings on Ruggs Lake

Photo by Chuck & Annette Van Belle



**Snohomish County**

Public Works

Surface Water Management

3000 Rockefeller Avenue, MS-607

Everett WA 98201-4046

## IN THIS ISSUE

- Year End Wrap-Up PG.1
- Lake Outreach Pilot Project PG. 1
- Toxic Alge 2011 PG. 2
- Volunteer Spotlight PG. 4
- Stevens Milfoil A Threat PG. 5

*Lake Roesiger*



Billie Garber  
Echo Lake



Kristine Feldman  
Lake Roesiger - South



Billie & Henri Wilson  
Lake Roesiger - North



Ed Gordon  
Martha S.



## 2011 - Another Year of Monitoring Success

What a great year for volunteer lake monitoring - 51 volunteers at 30 lakes made over 265 lake monitoring trips! In addition to our routine monitoring, volunteers collected more dissolved oxygen and temperature profiles than ever before. This information could simply not be collected without your help. We especially want to thank our long-time volunteers whose experience ensures such high caliber of data. We also want to welcome our first-year volunteers: Billie and Henri Wilson (Roesiger N); Kristine Feldman (Roesiger S.); and Debbie and Paul Specht (Sunday).

You may have thought on one of your monitoring trips "Am I really making a difference?" Well, we would like to respond with a resounding YES! With 20 years of

water clarity data, 16 of nutrient data, and 10 years of chlorophyll a data - Snohomish County has one of the longest running lake water quality data sets in the state. Having a long-term, consistent data set is the only way to find out how water quality is faring at our lakes and to respond to problems that are found. We highlight two of our projects in this newsletter that would not have been possible without volunteer data. Starting in April, you will also find an annual report on the information you collected at our website ([www.lakes.surfacewater.info](http://www.lakes.surfacewater.info)). This information is ultimately for you and fellow citizens. Let us know if we can help you put it to good use. Thank you again for the great work and we look forward to the 2012 season!

## Lakes Outreach Pilot Project Takes Shape

If you have been able to attend a recent workshop, many of you may know that with the data you collected we have found that several lakes are showing signs of declining water quality. Phosphorus levels, in particular, continue to slowly creep up in even our healthier lakes. Unfortunately, in most of these lakes there isn't just one source of pollution, like a farm or a commercial area that could be easily addressed. Instead very small amounts of pollution come from the homes around the lakeshore and in the watershed and are carried into the lake by rain running off the ground.

The most common sources are things like pet waste, eroding soils, lawn fertilizers, and poorly maintained septic systems. Many people don't realize they are part of the problem or that they can take a *(continued on page 5)*

*Mark Your Calendar*

• **May** •  
**12**

**Volunteer  
Workshop  
9:30 - 1:00**

## Toxic Algae 2011-Slow Start but Strong Finish

Your monitoring results show that 2011 was the worst year for toxic algae since volunteers began monitoring in 2005. If you are unfamiliar with the term toxic algae – it refers to toxins sometimes produced by a group of algae known as cyanobacteria or blue-green algae. These algae are a natural component of lakes, but under certain conditions (usually during blooms) they can produce toxins, posing a health risk to people or pets who recreate in affected waters. The blooms often form scum that looks like green or blue paint floating on the water. The two most common toxins are anatoxin-a (a neurotoxin) and microcystin (a liver toxin).

Ten lakes in the county have been sampled regularly for algal toxins for the last three years (see adjoining story for more info). In addition, since 2005 you all have been taking algae samples that we screen for potentially toxic algae species each time you sample. Volunteers and citizens can also report blooms that we can sample and test. Initially 2011 appeared to be a quiet year for algal toxins, as only one lake experienced problems through the end of August. However, by the end of the year, toxins had been found at 11 lakes. Six of the lakes suffered from algal blooms with toxin levels exceeding the State of Washington's recreational standards (See table to right). Lakes Ketchum and Cassidy, which have a history of toxic blooms, suffered the most frequent and highest levels of

the toxin microcystin, with Cassidy reaching an astonishing 18,800 parts per billion (over 3000 times higher than the standard). This was the first time dangerous toxin levels had been found at four of the lakes including: Armstrong, Howards, Stevens, and Sunday. The bloom at Lake Stevens was of particular concern given the high recreational usage of the lake. Fortunately, the bloom occurred the week before Christmas when exposure risks were relatively low. To warn lake users, signs were posted at public access sites at all of the lakes with dangerous levels. Mailers were also sent to lakefront residents who might not use public access sites.

The apparent high levels of toxic algae in 2011 may have been caused by several factors. First, algal blooms are caused by high levels of nutrients. Therefore, lakes that have higher nutrients are more productive and more susceptible to algal blooms. Many of you on lakes without nutrient problems will not have to worry about this type of bloom unless conditions change. However, even in lakes that are susceptible to blooms, the frequency of blooms and the frequency of toxin production cannot be easily predicted. Annual variations in weather, such as temperature and cloud cover, likely play a significant role. There may also be genetic differences in strains of algae that determine when blooms are toxic. The monitoring will help to shed more light on these differences.



Heavy algae scum



Sample for analysis



Shoreline accumulation



Public access sign

## Lake Protection Bill Passes in 2011

Starting in 2013, lakes around the state will be have greater protection from phosphorus pollution from lawn fertilizers. Thanks to the efforts of lake residents advocates from around the state and the Washington State Lake Protection Association (WALPA) , the Washington legislature passed a ban on the sale of fertilizers containing phosphorus for turf grass. Phosphorus-rich lawn fertilizers are one of the primary contributors to high nutrient levels in lakes leading to poorer water quality and nuisance algal blooms. If you love your lawn – don't worry. In this region, phosphorus is not needed for a healthy green lawn because local soils are typically rich in this nutrient. In addition the ban does not apply to flower and vegetable gardens or for the first year of establishing a lawn. This type of ban has already occurred in several states. Washington helped to tip the scales so that even Scotts has decided to convert its lawn fertilizers to phosphorus-free nationwide by 2013. To find out more information visit [www.leg.wa.gov](http://www.leg.wa.gov) or WALPA's website at [www.walpa.org](http://www.walpa.org).

## Volunteers Complete Toxic Algae Study

The 2011 monitoring season also marked the end of a special toxic algae monitoring project that volunteers at ten lakes have been working on for 3 years. The goal of the project is to better understand how common blooms of blue-green algae are and how frequently toxins are associated with the blooms. Although some limited monitoring will be done in 2012, for most lakes the monitoring has been completed. The results from the ten lakes in Snohomish County will be added to data from 20 other lakes in Pierce and King County. The project, funded by the U.S. Centers for Disease Control (CDC), is a regional collaboration with Pierce and King Counties, as well as the Washington Departments of Health and Ecology and Seattle University. The project is leading the way nationally to better understand the severity of the

health threat toxic algal blooms pose to the public and wildlife, as well to identify the most important environmental factors leading to blooms. After data analysis in 2012 and 2013, findings will be presented at national conferences and published in scientific journals to ensure the information reaches researchers, public health officials, and lake managers working on toxic algae issues.

This has been a unique scientific study in that volunteers played such an instrumental role in data collection. The study could not have been done without the help of volunteers. In 2011, volunteers included Herb Hainey (Lake Armstrong/Bryant), Julie Callebert (Blackmans Lake), Nancy Dean (Martha N.), the Collins family and Beth Allen (Lake Stevens).

## 2011 Toxic Algae Results

Lake	Maximum Microcystin (ppb)	Maximum Anatoxin a (ppb)	# of Weeks Toxins Detected	# of Weeks Above Standards*
Armstrong	32.8	NA	11	0
Blackmans	0.1	0.35	8	0
Cassidy	18,400	0.73	13	10
Chain	NA	0.03	3	0
Howard	56	NA	9	2
Ketchum	555	0.03	20	9
Loma	0.1	0.06	3	0
Lost	NA	0.33	1	0
Martha N	0.1	0.04	5	0
Stevens	29	NA	9	1
Sunday	67.6	0.03	9	4

\*Washington State Recreational Standard for Microcystin = 6 ppb  
Washington State Recreational Standard for Anatoxin a = 1 ppb

## Thank You Toxic Algae Volunteers!



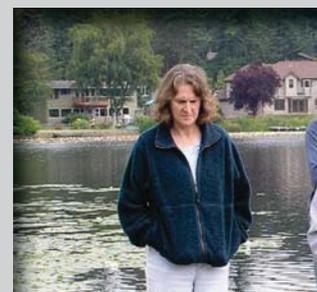
Nancy Dean - Martha N



Julie Callebert - Blackmans



Herb Hainey - Armstrong



Beth Allen - Stevens



Missy (pictured), Jack, Erick, & McRae Collins - Stevens

## Volunteer Spotlight - Chuck VanBelle

### Scenes from Ruggs Lake



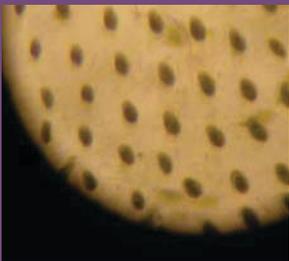
*Lillies are widespread on Ruggs lake*



*Nostoc - an algae with a gelatinous mass*



*Many large trees remain despite urban setting*



*A close-up of a algae sample from Chuck*

For this year's volunteer spotlight we turn to Chuck VanBelle who has been a volunteer with his wife Annette at Ruggs lake since 2004.

### **Tell us about growing up on Ruggs Lake.**

My Aunt Wilburena (Tootsie) Bartholomew purchased land on Rugg's Lake about the time I was born in 1949. When I started fishing with my Dad on the lake, the number of houses on the shore could be counted on one hand.



In 1962, my family built a house nearby, and I was able to put our 8' wood dinghy on my back, hike to the lake, drop it in the water, and fish until dark. Mom would come to my Aunt's lot to pick me up for dinner. The wet dinghy would barely fit in the back of our Rambler station wagon.

We would fish and swim from a float in the middle of the lake. A bare gold hook just in the water would bring up crappie and sunfish, a worm near the bottom perch, eggs could entice a 24" Rainbow or Cutthroat Trout, a spoon near the lilies or logs could fetch bass as large as 5 lbs and brown bullheads would protect their young right up at the shores by taking the school into her mouth.

In 1980 my Aunt and her husband George "Bart" Bartholomew built a home on the edge of Rugg's Lake. They lived here until she passed on and Bart could not manage alone. We were able to purchase this house in 1996.

### **What are the changes you have seen at the lake?**

In many ways Rugg's Lake was the same now as it was in 1962; and markedly different in others. More homes line the lake's shoreline. Most lots still retain the towering fir, hemlock and cedar. Few lawns come to the shoreline. Many homes still have a buffer of willow, cattail, rushes, spiraea, salal, sedge, and native grasses. Beaver and otter are still present. All manner of fowl continue to make the lake home. The lake is smaller than it was in 1962, most noticeable when the lilies are in bloom in the shallows. The outflow is filling with sediment from the annual decay of aquatic plants. Trout are in less abundant and bass are seldom as large. Bullheads are almost non-existent and rarely do we see crappie or perch.

### **Why did you decide to volunteer at Ruggs Lake?**

Returning to Rugg's Lake, I wanted to see what could be done to help preserve this resource. My wish was to restore the lake to the way it was when I enjoyed it as a child more than a half century ago. My grandchildren and their children should be able to appreciate it as others have.

### **What keeps you motivated to continue as a volunteer?**

Documenting the changes is essential to identifying degradation of the lake and applying resources to reverse those trends. For example, when construction on the Bothell- Everett Highway caused silting in Rugg's Lake, a sediment pond at the inflow from Silver Lake Creek was formed to reduce that effect.

One of the most important benefits of being a volunteer is being able to compare and learn from solutions other volunteers have found at their lakes. With SWM we have a forum to discuss, identify and resolve issues with a credible voice to government and with our neighbors. We have learned to use the correct fertilizers and insecticides, monitor our septic systems, properly dispose of pet waste, control run-off by buffering into planted areas and swales, identify and control invasive plants, and many other things that contribute to a viable future for our watershed.

Being a part of the process of protecting the environment is an honor and a commitment. The measure of progress moves glacially slow, while the price of failure can be lightning fast. I am thankful have a part in working towards a brighter future for Rugg's Lake.

## Outreach Pilot Project (cont. from page 1)

few small steps to make a difference in their lake.

Although we have always considered outreach on lake protection a high priority, our strategy has relied on the belief that, if we let people know about the problem, they will change some of their behaviors that contribute pollution. However, for the majority of people, just knowing about a problem is not enough to make changes. Therefore, we decided that we needed a different approach to outreach that focuses on addressing the barriers people have to making changes, as well as providing incentives or motivation for people to make those changes. Last year we received approval to start working on such a project with one of our communication specialists, Peggy Campbell. Lake Howard was chosen as the pilot lake because it has historically had good water quality, but in recent years has developed trends in three different parameters showing declining water quality. In 2011, the lake also began having toxic algae blooms. To start the project, we conducted a survey of

lake residents at Lake Howard and Lake Ki to better understand current perceptions of water quality and sources of pollution, as well as their willingness to change behaviors. We also researched similar outreach projects throughout the country to find out what the best strategies are and find out what types of programs to avoid. We are now putting this information together to help select the best program strategies as well as program branding. We will be sharing our findings and recommendations at the upcoming workshop. Although the project will be kicking off at Howard this summer, the goal is to eventually expand the project countywide, especially to lakes with declining water quality trends.



## Help Name the Lake Outreach Project

Feeling creative?

We are looking for a catchy name and logo for the new outreach project and need your help. If you have any ideas of a two or three word name or good images for a logo - please email your idea by March 31st. We will award the best idea for name or logo at the workshop on May 12th.

Here are a few example signs and images from lake groups and water quality campaigns to help you start thinking:



## Area Lakes Threatened by Stevens Milfoil

Lake Stevens is the largest natural lake in Snohomish County, covering 1013 acres. The size and beauty of the lake make it the most popular destination in the county for recreation – especially for motorized boats. Unfortunately, the popularity of the lake puts it at high risk for invasions by non-native aquatic plants and animals that are carried in on boats and trailers. Between 2005 and 2009, Eurasian watermilfoil invaded Lake Stevens and expanded into a large-scale infestation. The infestation at Stevens presents a significant threat to all local lakes because all it takes is a small fragment (1-2 inches) to start a new infestation. Milfoil spreads rapidly, crowding out native plants and forming dense mats at the surface. These plant mats can entangle swimmers, motors, paddles, and

fishing gear (see photo).

Fortunately, the City of Lake Stevens in conjunction with the County has begun an aggressive control effort at Lake Stevens. The work began this past summer with a large-scale herbicide treatment. It was an initial success, with most of the milfoil dying back. However, spot treatments or hand-pulling will be needed annually to ensure the plant does not return to pre-treatment levels. Part of the eradication plan is to educate boat users about the dangers of spreading milfoil. The bold signs created for Lake Stevens will be coming to several other lakes with existing milfoil problems (Serene, Goodwin, Shoecraft, and Roesiger), as well as to Flowing Lake which is at high risk for infestation from motorized boats.



# Join us for the Volunteer Workshop May 12th, 2012

Please join us for our annual volunteer training workshop - meet fellow volunteers, brush up on monitoring, and learn a few new things about lakes. We are pleased to welcome State Fish & Wildlife biologist, Justine Spinelli. He will discuss local fish and the stocking program as well as answer your questions. Other workshop activities include:

- ⊗ A look at your data
- ⊗ Review of monitoring methods
- ⊗ Awards & recognition
- ⊗ Lake outreach pilot project
- ⊗ Lake Ketchum restoration
- ⊗ Lunch and snacks



2011 Winner



Sunset Glow - Serene

Photo by Mark Fussell

## Calling All Photographers

A new year brings a new opportunity to win the lake photo contest. Submit your best shot of lake scenery, wildlife, or recreation and you could be the next winner. Winners will be chosen at the workshop. To enter send your shot to [marisa.burghdoff@snoco.org](mailto:marisa.burghdoff@snoco.org) with the photographer's name, photo title, and lake name.

2011 Winner



Damsel Formation - Beecher

Photo by Jenifer Poole



**Snohomish County**

Public Works

Surface Water Management

3000 Rockefeller Avenue, MS-607

Everett WA 98201-4046

## 2010 MONITORING STATISTICS



**47 Volunteers  
at 34 Lakes**



**272 Secchi  
Readings**



**271 Total  
Phosphorus  
Samples**



**122 Chlorophyll  
Samples**



**107 Temp/DO  
Profiles**



**224 Toxic  
Algae Samples**



### IN THIS ISSUE

- Year End Wrap-Up PG.1
- Volunteers Identify Invaders PG. 1
- Field Trip for Volunteers PG. 3
- Volunteer Spotlight PG. 3
- Toxic Algae 2010 PG.4

### Mink on Lake Beecher Edge

Photo by Jenifer Poole

## 2010 - Here's to a Great Monitoring Season

For the second year in a row, you have helped break all previous records for data collected by volunteers for the Snohomish County Lake Management Program. With water color sampling and the continued algae monitoring, more water quality samples were collected in 2010 than ever before (see the numbers to the left). In addition, we have seen the highest rate of secchi depth collection and temperature/dissolved oxygen profiles in our program's history. Thank you for all of your hard work and dedication for such a productive year!

All of your data have been entered and are available at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info). We have just now begun to analyze the data

and your updated lake reports will be available on the website in the coming months.

As most of you know, we collected some extra samples for water color this year. The idea was to determine if any changes had occurred in water color since data were last collected for most lakes in 1994 and 1995. Initially, it appears that most lakes are actually slightly darker in color than in the past. Of the 25 lakes with historic data, 8 lakes appeared to be significantly darker, 14 were slightly darker and only one (Panther) was slightly lighter. We will be continuing water color monitoring for one more year to see if this is in fact a change or if there is just higher than expected annual variation.

## Volunteers Find Aquatic Invaders First

Water quality monitoring is just a part of being a lake volunteer. The observations you make throughout the year help to identify problems and changes at lakes. Just in the past year we have had extremely helpful reports on algal blooms, lake level issues, water quality violations, and wildlife sightings (even bears!). This past year was also notable as three new invasive aquatic plants were identified in Snohomish County – two of which were spotted by volunteers. Billie Garber at Echo Lake made one of the first observations of Australian water-clover (*Marsilea mutica*) in the state. Although the water-clover has been problematic in the southeast, it is very new to the northwest. This plant may be cute, but it is apparent-

ly an aggressive invader that spreads rapidly through rhizomes. In just a few short months, a large patch was established by the boat launch. Thanks to Billie's efforts, the plant will likely be added (cont. on pg. 2)



Herb Hainey - Armstrong & Bryant



Jenifer Poole - Lake Beecher

## Aquatic Invaders (cont. from pg 1)

### Australian Water-Clover



to the state quarantine list, so that the sale of this plant will be banned to prevent future invasions. As for Echo Lake, control in the next year will hopefully be feasible before the plant becomes problematic for the lake.

The second new plant is Bur Arrowhead (*Sagittaria rigida*), found by Jenifer Poole on Lake Beecher. There are a few native species of arrowhead (also known as duck potato or wapato) found in many WA lakes. Thanks to Jenifer's excellent photos of the plant, it was easily identified as the bur arrowhead which is only native to the Midwest and Eastern United States. We are not sure how long ago the plant was introduced, but it has become well-established at Lake Beecher and neighboring oxbow

lakes. Given the widespread local distribution of the plant, control is not likely feasible at this location. However, the State will also be recommending adding this plant to the quarantine list.

Finally, a small patch of the non-native plant, Pickerelweed (*Pontederia cordata*) was found at Lake Ketchum. Jenifer Parsons, the State aquatic plant specialist, identified the plant during a routine survey. Pickerelweed is common in the eastern half of the US, but only a few plants have been identified in Washington. It is an attractive plant with bright purple flowers and would likely have been introduced as an ornamental plant. It is not yet known whether this plant will spread easily and become an invader. We'll be keeping an eye out for its progress in the coming year.

### Bur Arrowhead



## Eurasian Watermilfoil Grows Rapidly in 2010

From all across the county, we received reports of dense of aquatic plants in 2010. The highly invasive Eurasian watermilfoil was no exception, making efforts to control this plant particularly difficult. Eurasian watermilfoil (or milfoil) is a non-native, invasive aquatic plant. Left untreated, milfoil spreads rapidly, crowding out native plants and forming dense mats at the surface. Plant mats can entangle motors, paddles, swimmers, and fishing gear.

Lake Stevens, in particular, suffered the effects of the robust growth this year. Milfoil has become very problematic in this lake in the last two years. The severity of the problem there is not only impeding recreation on the lake, but poses a threat to all neighboring lakes as it only takes a small fragment to spread to a new lake and establish a population. The City of Lake Ste-

vens has been working on a control plan that should be implemented in 2011.

Residents at Nina Lake know first hand about the ease of milfoil spread. At this private lake it appears that the plant was newly introduced from one of their own resident's boats. The citizens have taken the initiative to plan a herbicide treatment to prevent further spread of the plant.

The heavy milfoil growth also made long-term ongoing treatment difficult at Lakes Goodwin, Shoecraft, Roesiger, and Serene. The milfoil populations at these lakes have been kept under control in recent years by annual hand-picking by divers. With so many large plants in 2010, picking was hard, and the threat for spreading is greater. Only next summer will we be able to determine if our efforts this year were enough to keep widespread growth from returning.

### Pickerelweed



### Eurasian Watermilfoil



## Update on Lake Protection Bill

You may remember from last year that the Washington State Lake Protection Association (WALPA) was working on passing a bill that would ban the application of phosphorus-containing fertilizers for residential turf in Washington. The bill relates to lakes because lawn fertilizer is one of the primary contributors to high nutrient levels in lakes that decreases water quality and creates nuisance algal blooms. In addition, phosphorus is not typically needed for healthy lawns in this region as the soils are already rich in this nutrient. Last year, the bill passed in the Senate, but did not make it through the House before the session ended. The bills (HB 1489 & SB 5149) have been introduced again in 2011 and now propose a ban on sale of lawn fertilizer. For more information visit the state legislature at [www.leg.wa.gov](http://www.leg.wa.gov) or WALPA's website at [www.walpa.org](http://www.walpa.org).

# Field Trip - A Time to Learn About Other Lakes

In July about a dozen volunteers participated in our first ever volunteer field trip. The first stop was Lake Serene where we were hosted by Mark Fussell. Mark shared details about his planned lake-front restoration project. He also gave some insight into the benefits of starting a lake association and how it worked for his community. Lake Serene, with its plant life, was also the perfect setting for volunteers to see a host of aquatic plants that we had collected from around the county. Volunteers were able to get a close up look at plants such as the carnivorous bladderwort and the dreaded Eurasian watermilfoil.

Crystal Lake was our next destination where we were hosted by Solveig Whittle, Tom Blum, and Shirley Post. We were

delightfully surprised by a gourmet lunch that was served in Crystal Lake's beautiful club house. Solveig and Tom talked about their unique Crystal Lake Community. The Community actually owns a significant portion of undeveloped land in the lake watershed that they actively manage for forestry. Their association also has a water quality committee that has worked to do extra monitoring to determine if new watershed development is impacting the lake quality. Following the presentation, we were treated to two tour options. Half of the group took a walking tour around the perimeter of the lake. The other half took to canoes to explore the unique bog habitat north of the lake. Overall, thanks to everyone who attended and especially to our hosts!

## Mark Your Calendars

- April 23** Annual Volunteer Workshop
- May 7** First week of lake monitoring
- June 13** First water quality sample pick-up date



## Volunteer Spotlight Nick Martinoli

For this year's volunteer spotlight, we thought we would introduce you to Nick Martinoli, our youngest volunteer. Nick is a highschool sophomore and already has 3 years of volunteering under his belt! Here is what he had to say about his monitoring experience and Lake Wagner.



*Why did you decide to get involved in the water quality monitoring?*

Well it was really two part, first was because I am in the Boy Scouts and I love being outdoors and I want to help protect the wildlife, and the second part is because I live on Lake Wagner (the lake that I monitor) and during the summer I don't want to be swimming in a lake that is gross.

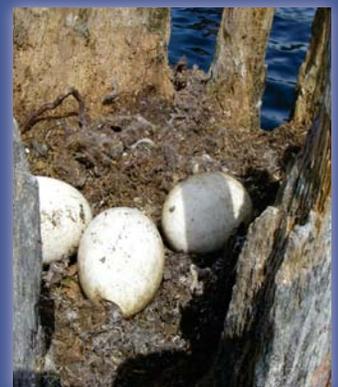
*Would you like to share something about Lake Wagner?*

Lake Wagner is a very interesting place. It has abundant plants and wildlife. During the summer we have bald eagles

and ospreys and during the winter we have trumpeter swans. It has a rich history of being a logging lake where loggers dumped logs to await shipping. Across the lake from my house, there is an old house where logs were milled. Next to the house is a row of pilings that used to be the place that served as the platform for a train to dump logs into the lake. I have even heard that there is a locomotive on the bottom of the lake that fell there when a board rotted away.

*What types of activities are available on the lake?*

There are many fun things to do here. My family is the only family on the lake that owns a sandy beach so I love to play in the sand and my sister likes to sunbath. We also go swimming, snorkeling, fishing and canoeing. We have frequently had my Boy Scout troop over to practice for the canoeing and swimming merit badge. So in summary, we love to enjoy the sun (whenever we get it Ha-ha) by spending time on our lake.



Goose eggs Nick found in old railroad piling on Lake Wagner

# Toxic Algae Update - 2010

Volunteers have now been helping to identify blooms of potentially toxic algae in Snohomish County for five years. This past year was also the second of three years that volunteers will be doing intensive toxic algae monitoring at ten lakes with a high risk for toxic algae. The extra monitoring is part of a larger project funded by the U.S. Centers for Disease Control (CDC). The project is in partnership with King and Pierce Counties as well as the Department of Health, Department of Ecology, and Seattle University.

If you are unfamiliar with the term toxic algae – it refers to toxins sometimes produced by a type of algae known as cyanobacteria or blue green algae. These algae are a natural component of lakes but under certain conditions (usually during blooms) they can produce toxins posing a health risk to people or pets who recreate in affected waters. The two most common toxins of concern are anatoxin-a (a neurotoxin) and microcystin (a liver toxin). In 2010, seven lakes had visible surface scum of cyanobacteria

including: Beecher, Blackmans, Cassidy, Howard, Ketchum, Stevens, and Sunday. All of these lakes were also found to be toxic during the summer with the exception of Lake Beecher, which was not tested. Lake Armstrong and Martha N. also had low toxin levels, but without visible surface scum. In most cases, the toxin levels were well below or close to the recreational standards set by the State Department of Health (6 parts per billion for microcystin and 1 part per billion for anatoxin-a). However, Lake Cassidy and Lake Ketchum each had several weeks where the toxin microcystin was present at potentially dangerous levels. Thanks to the extra monitoring, the lakes were posted and notices sent to citizens to warn them of the potential risk.

Next year will be the final year of the comprehensive study. When complete, we should gain a better understanding of the toxic algae problem in this region and better understand why blooms and toxin production occur.

## Winter Lake Levels Reminder

We encourage all of our volunteers to take weekly lake level readings throughout the winter if possible. Lake levels are one of the most common concerns of lake residents. High levels can threaten yards and structures and

low levels can affect lake access. If you are interested in tracking lake levels this winter, forms are also available at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info) under “resources for current volunteers”. You can also just keep a log in a notebook.

## 2010 Toxic Algae Results

Lake	Microcystin* (Parts per billion)	Anatoxin-a** (Parts per billion)
Armstrong	0.165	NA
Blackmans	2.77	0.042
Cassidy	732	0.175
Howard	>6	NA
Ketchum	24.8	NA
Martha N.	0.050	NA
Stevens	2.51	0.027
Sunday	NA	0.021

\*Washington State Recreational Standard = 6 ppb  
 \*\*Washington State Recreational Standard = 1 ppb



## Introducing our newest addition

As many of you know, I have been absent for the last three months following the the birth of my daughter. Her name is Colette Amy and she was born on Sept. 28. Everything went very well. She is an extremely happy baby, and I really enjoyed my time off getting to know her and spending time with her sister Hazel. I am back at work now, and I just wanted to say a quick thank for all of the warm wishes - *Marisa*



2010 Winner



Lake Beecher Birds in Fog

Photo by Jenifer Poole

## Calling All Photographers

A new year brings a new opportunity to win the lake photo contest. Submit your best shot of lake scenery, wildlife, or recreation and you could be the next winner. Winners will be chosen at the workshop. To enter send your shot to [marisa.burghdoff@snoco.org](mailto:marisa.burghdoff@snoco.org) with the photographer's name, photo title, and lake name.

2010 Winner



Ice Bubbles on Lake Serene

photo by Mark Fussell



Mark Thompson – Lake Goodwin - with homemade lake level gauge

## Winter Lake Level Readings Yield Interesting Results

As many of you are aware, this past year was quite a year for lake level fluctuations. We went from a wet snowy winter to a hot dry summer. A wide range of lake level shifts were seen across the County. Nina Lake changed over 1.4 feet and Crystal Lake changed 1.9 feet. In the seven lakes area we found Lake Goodwin changed 2.1 feet and Lake Loma at least 2 feet. However, the biggest changes were seen at Sunday Lake and where levels were estimated to have changed 5 feet!

We encourage all of our volunteers to take weekly lake level readings throughout the

winter if possible. Lake levels are one of the most common concerns of lake residents – as high levels can threaten yards and structures and low levels can affect lake access. In addition, the changes in lake level throughout the year are important to understanding the hydrologic cycle of your lake.

If you are interested in tracking lake levels this winter, please call or email us to obtain a form. Forms are also available at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info) by clicking on “resources for current volunteers”.

## Snohomish County Volunteer Lake Monitors Update

Winter 2010

### Included in this Issue:

- 2009 Monitoring Results
- Your Data Put to Use
- Toxic Algae Monitoring
- Volunteer Spotlight
- Proposed Fertilizer Legislation
- Winter Lake Levels

## 2010 Lake Photo Contest – Calling All Photographers

You now have had one more year to take that great photo of your lake. Maybe you have a great scenic picture, a shot of someone enjoying the lake, or maybe a wildlife picture. If so – you may win the 2010 lake photo contest. To enter send your photo by mail or email to Marisa Burghdoff ([marisa.burghdoff@snoco.org](mailto:marisa.burghdoff@snoco.org)) and be sure to include the following:

- Photographer’s name,
- Lake
- Photo title

Entries can be submitted anytime before the 2010 volunteer training day.



2009 Photo Contest Co-Winner Mark Fussell- Lake Serene Rainbow

# Snohomish County Volunteer Lake Monitors Update Winter 2010

## A Record Year of Data Collection – THANK YOU!!



Nick Martinoli – Wagner



Lisa Mallant - Kayak

Thanks to all of your help, 2009 was a record breaking year for lake monitoring in Snohomish County. Fifty-five volunteers at 34 lakes made over 300 trips to monitor the health of their lakes. We have never had this many volunteers or collected as many water quality and algae samples as we have in 2009. Your commitment to lake monitoring is critical to tracking long term changes in water quality. The work could simply not be done without your time and effort.

We are working to make the new information available to you and interested citizens. All of your data can be seen through our online database. Your updated annual reports are in progress and should be available on the website ([www.lakes.surfacewater.info](http://www.lakes.surfacewater.info)) in February.

## Your Data Put to Work

After a summer of many hours of volunteer monitoring you probably cannot help but question the value of your efforts. Here are our best answers to some of your common questions.

### WHY COLLECT DATA?

Monitoring sets a baseline condition for our lakes so that we can detect long-term changes in water quality. Lakes, in particular, reach a tipping point at which negative water quality trends are difficult to reverse. Early detection of problems can allow for more immediate actions to reverse trends before it is too late, and costly restoration is needed. In the future data may also be important for detecting broader variables such as climate change.

With 18 years of water clarity data, 14 of nutrient data, and 8 of chlorophyll *a* data – Snohomish County has one of the longest running data sets in the state. Although many lakes are showing no significant changes in water quality, we are beginning to detect worsening conditions in some lakes.

### WHO USES THE INFORMATION?

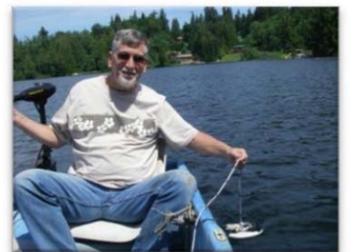
Lakefront citizens are the most frequent end users of your data. We respond to many calls from citizens and give presentations on the water quality of lakes each year with your data. We also estimate about 1,500 visitors each year access the lake web pages that contain your data. Knowing the state of the water quality is usually the first step to taking actions to protect it.

The Department of Ecology also uses your data to decide which lakes should be on a list of “impaired waterbodies” as required by the Clean Water Act. The State then must undertake a study to determine the causes of the problems. The listing also makes the lake more likely to receive funding for restoration or protection actions.

### HOW DOES MONITORING HELP MY LAKE?

Information alone does not necessarily lead to actions to improve water quality. (Continued on page 3)

## 2009 Volunteer Data Collection Statistics



Jim Poyner – Howard



Marv Woolman - Bosworth



Cherie Poyner - Howard



Chuck VanBelle - Ruggs



Dennis Nicholson - Slickney

## Volunteers Critical for Toxic Algae Monitoring 2009

In 2009, volunteers began work on a new toxic algae monitoring program funded by the U.S. Centers for Disease Control (CDC). The project is in partnership with King and Pierce Counties as well as the Department of Health, Department of Ecology, and Seattle University. The grant is large in scope, but our role is to monitor for toxic algae blooms at ten lakes in Snohomish County. The ten lakes are considered high risk for having algal blooms that may be toxic.

For those of you new to the term toxic algae – it refers to a type of algae known as cyanobacteria or blue green algae that may produce toxins. Blue green algae are small photosynthetic bacteria and are a natural component of lakes. In certain conditions they can reproduce rapidly or bloom. Some types of algae produce toxins during blooms. The toxins present a health risk to people or pets who recreate in affected waters.

With the help of three existing volunteers and five new volunteers, we were able to collect bi-weekly water samples from June-October. This was in addition to the standard algae screening samples that everyone collects. Each of the samples was analyzed for two potential toxins, anatoxin-a (a neurotoxin) and microcystin (a liver toxin).

Initial analysis of the 2009 data yielded some interesting results. Four of the 10 lakes (Armstrong, Chain, Lost and Stevens) did not experience major blooms with heavy algal scums. Very low levels of toxin were, however, detected at Armstrong and Lost on one occasion each. Significant algal scums of blue-green algae were found at the remaining 6 target lakes which include: Blackmans, Ketchum, Sunday, Martha N, Loma and Cassidy. Cassidy and Loma did have persistent high toxin levels which exceeded the recreational standards set (Continued on page 3)

## Volunteer Spotlight: Elsie Sorgenfrie

We thought you might like to know a little bit about some of your fellow volunteers. We couldn't think of a better choice to start with than Elsie Sorgenfrie, who has been monitoring for twenty years! Elsie graciously agreed to answer a few questions for us.

### Why did you decide to start water quality monitoring?

My involvement with local Lake Roesiger issues of logging, land use, water conservation/domestic water and lake/fish protection proposals made water monitoring a necessity to understand and evaluate possible lake protection strategies including hypolimnetic aeration techniques. Also, I was retired and had the time to enjoy monitoring and getting to know the lake from the top-down technically.

### What motivates you to continue monitoring?

I have continued monitoring to add accurate, scientific information of Lake Roesiger over time for both the public record and a demonstration of local lake care action. Not to mention my curiosity about what may happen next year and the next and the next

### Is there about Lake Roesiger you would like to share?

Lake Roesiger, like other rural lakes, continues to be vulnerable to dense watershed development. One



Elsie (in middle) with long-time monitoring partners Bob & Joanne Miller

unique feature of Lake Roesiger is the special water quality protections that have been put into place for the PUD district 3. These include septic system grading, scheduled septic tank pumping, and installation of low-flow plumbing fixtures.

### Do you have a good anecdote or monitoring story?

Boats used for monitoring at Lake Roesiger have been paddled, rowed, motored, and towed, but the most unusual paddling power came from two clip boards!



Karen Thompson - Goodwin



Howard Lucus - Ki



Steve Wilson - Ki



Jim Collins - Sunday



Judy & Bud Perry - Sunday

## Your Data Put To Work (cont. from page 1)

However, your data has helped to identify which County lakes are already impaired or are at highest risk for future water quality problems. With this in mind, we applied for a grant with the Department of Ecology to fund lake protection and restoration actions at 10 target lakes in the County. Three of the lakes (Ketchum, Sunday, and Loma) are already classified as impaired. The remaining seven lakes (Flowing, Howard, Ki, Lost, Panther, Shoecraft, and Wagner) are exhibiting one or more trends towards declining water quality. The goal of the project

would be to reduce the inflow of phosphorus into the lakes which is primarily from fertilizers, pet wastes, failing septic systems, erosion, and stormwater runoff. If we obtain the grant, the funds will go towards developing and implementing a social-marketing based outreach campaign to encourage residents to implement lake-friendly behaviors. A special focus of the grant will provide incentives to landowners to restore or protect lake riparian buffers. We won't find out if we receive the grant until late spring or early summer, but we will keep you posted.

## Toxic Algae 2009 (cont. from page 2)

by the State Department of Health. Lake Cassidy, in fact had microcystin levels that were over 1,000 times higher than the standard. Blackmans, Martha N, and Ketchum each had 1 or more sample with very low microcystin levels. Sunday Lake had no toxins detected even though there were persistent bloom conditions. This is surprising because in 2008, the presence of an algal scum was nearly always accompanied by high toxin levels.

This is only the first of three years of data collection. After more years of results, we should gain a better understanding of the toxic algae problem in this region. We may also better understand why blooms and toxin production occur.



Blue-Green Algal Bloom

The project is likely the most comprehensive ongoing freshwater algal toxin monitoring study in the country. It is already receiving attention both regionally and nationwide. This valuable work could not be done without the dedication of our volunteers!

## Bill Proposes a Ban on Phosphorus Containing Fertilizers

The Washington State Lake Protection Association is again working to pass a bill that will ban the application of phosphorus-containing fertilizers for residential turf. Typically in this region, phosphorus is not needed for healthy lawns as the soils are rich in this nutrient. The proposed bill does allow exemptions for landowners who are in the first year of establishing a lawn or when tests show low phosphorus levels. A reduction in phosphorus entering lakes from phosphorus fertilizers could help protect

water quality. Phosphorus is the limiting nutrient in freshwater meaning it is critical for plant and algae growth. Excessive levels of phosphorus can lead to nuisance algal blooms and other water quality problems. For more information on the bill you can visit [www.leg.wa.gov](http://www.leg.wa.gov). For more information on lake-friendly lawn care visit our website at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info).

# VOLUNTEER LAKE MONITORING

## WINTER 2009 Update



Kerry Mauer: Nina Lake

### Thank you for a great year!

Thanks to all of your efforts, we had another successful season of lake monitoring! Fifty two volunteers contributed to collecting data on 32 lakes throughout the County. Your commitment to lake monitoring is critical to tracking long term changes in water quality. Most of your data are already available for viewing on the County's water quality database at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info). In the coming months, you will also find updated reports on the health of your lake.

## Focus on Toxic Algae

### What are Toxic Algae?

Most of you have probably heard of blue green algae, also known as cyanobacteria. If you haven't, blue green algae are small photosynthetic bacteria that are a natural component of lakes. In certain conditions, blue green algae can reproduce rapidly and create an algae bloom. Depending on the type of blue green algae and the bloom conditions, the algae may also produce toxins. In high concentrations, the toxins can make the water dangerous to humans and pets.

### Toxic algae in Snohomish County

With your help we are working to better understand the frequency and duration of toxic algae blooms in Snohomish County. All of the algae screening samples that you collect are screened to determine if a toxin-producing species is present. If found in high concentrations, we will collect a water sample, and conduct a toxin test. If high

levels of toxin are found, will work with the health district to post public access sites and notify lake residents. This year toxic blooms were found in



Lake Ketchum - toxic algae bloom

Lake Cassidy, and Blackmans Lake. Blooms with toxin-producing species were also found at Beecher and Crystal Lakes, but were dissipated before samples could be collected.

Snohomish County has also received two grants to further study toxic algae in the county. The first is a Department of Ecology grant and is focused on three lakes with a history of toxic algae blooms – Ketchum, Cassidy, and Loma. This year we conducted algae monitoring in these three lakes from July through Oct. In the coming year, we will continue monitoring as well as start an outreach campaign to raise awareness of toxic algae blooms and provide (continued on back)



## Introducing Hazel Burghdoff. . .

As you may have heard from Gene – I abruptly left work back at the end of August as I was put on bed-rest for the remainder of my pregnancy. Everything ended up going extremely well, and a healthy Hazel Anne was born on September 29. She is wonderful and I am really enjoying being a mom. I am now back at work and starting to get into the swing of things for 2009. Thanks for all of your best wishes - Marisa

## Website Improvements on the way



Don Folz and Dana Jordan:  
Lake Cochran

If you haven't been to our website yet – now is a great time to visit [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info). Last year we added several new features including individual lake pages, lake aerial photos, and bathymetric maps. This year we plan to have several new pages on how to improve lake quality such as “lawncare for lakes” and “caring for septic systems”. We will also have new and updated information on toxic algae, aquatic plants, invasive plant control, and much more. Be sure to check out the site in February.

## Focus on Toxic Algae Cont.

information on reducing nutrients that cause blooms. We will hopefully be able to use the information and outreach materials for other lakes that may experience algae blooms in the future. We are just starting to compile data for the first year, but it was quite a year as Lake Ketchum experienced a toxic bloom starting in early July and lasting through Oct.

The second grant we will be working on in 2009-2010 is from the U.S. Center for Disease Control (CDC). It is in partnership with King and Pierce Counties as well as the Department of Health, Department of Ecology, and Seattle University. The grant is large in scope and includes providing data to the CDC on blooms and effects, monitoring for toxic algae blooms, developing recreational standards for blooms, and developing public outreach strategies related to health effects of toxic blooms.

The portion of the grant that we will be working on is to better understand the prevalence and risk of harmful algal blooms in the Puget Sound region. Ten lakes from Snohomish County were chosen for the study

based on their history of algae blooms and recreational importance. We will likely be seeking help from existing volunteers or finding new volunteers at the following lakes for help in collecting these data.

- **ARMSTRONG**
- **BLACKMANS**
- **CASSIDY**
- **CHAIN**
- **KETCHUM**
- **LOMA**
- **LOST**
- **MARTHA N.**
- **STEVENS**
- **SUNDAY**

## Winter Lake Levels

As you enjoy your lake over the winter, you will continue to notice changes in lake levels. Observing lake level variations throughout the year is an important part of understanding the hydrologic cycle of your lake and watershed. This information also helps us better respond to calls from residents about very high or low water levels. If you are able, we strongly encourage you to take a lake level reading once a week year-round and after storm events. Forms for tracking lake level are available at [www.lakes.surfacewater.info](http://www.lakes.surfacewater.info) – just click on “resources for current volunteers”.



Herb Hainey: Lake  
Armstrong & Bryant

## 2<sup>nd</sup> Annual Photo Contest

You've now had a year to take your best lake photo for our second annual photo contest. Just send your photo by email or mail with the photographer's name, Lake, and photo title to Marisa Burghdoff ([Marisa.Burghdoff@snoco.org](mailto:Marisa.Burghdoff@snoco.org)). Entries can be submitted anytime before the 2009 volunteer training day in May when the winners will be announced and awards presented.



Pam and Scott Seiber:  
Lake Ki

# Snohomish County Lake News

March 2000

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## Calling All Lake Friends

It's time again to recruit volunteers to help monitor the condition of Snohomish County lakes. Snohomish County lake staff will be making phone calls in the next few weeks to confirm returning monitors. We are looking for new volunteers at several Snohomish County lakes.

Please call **Heidi Reynolds** at (425) **388-3464, x-4640**, if you live on or have direct access to one of the following lakes and would like to help us track its health: **Sunday, Riley, Ki, Echo, Blackman, and Lost**. At **Lake Cochran**, we are looking for a back-up monitor.

All volunteer lake monitors regularly record lake level and from May to October, make biweekly boat trips to measure water clarity and temperature. In addition, some monitors measure dissolved oxygen and collect water samples monthly from June through September. ➔

## Spring 2000 Workshop

Already it's almost spring and the Annual Workshop for volunteer lake monitors is drawing near. We hope to have a great turnout with many returning monitors as well as some new faces. We will present last summer's data, hear from some volunteers who

attended the WALPA conference (see pg.2) and share some pizza.



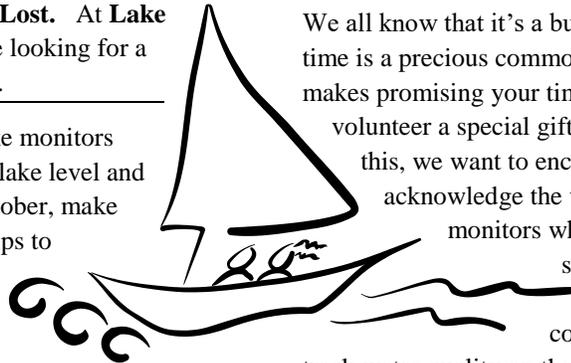
We have tentatively scheduled the workshop for either **Saturday, May 6<sup>th</sup> or 13<sup>th</sup>**, and we are looking for a venue. If you are a returning monitor, interested in hosting this year's event please call **Heidi Reynolds or Gene Williams** at (425) **388-3464**. ➔

## Dedicated Volunteers do it Their Way

We all know that it's a busy world, and time is a precious commodity. That makes promising your time as a volunteer a special gift. In view of this, we want to encourage and acknowledge the volunteer lake monitors who make a substantial time commitment to track water quality on their lakes. They help us understand not only their own lake, but also how lakes are faring throughout the region.

### *Why People Volunteer*

**Showing concern.** Lakeside residents who band together show a history of involvement in their lake. By collecting data, they document trends and potential problems. This documentation – and a track record of involvement – may be beneficial when applying for grants to fund stewardship activities that restore or protect lake water quality.



**Staying in tune.** Many volunteers were paddling ‘round their lakes on a regular basis long before they joined the monitoring program. They enjoy observing wildlife and like to keep tabs on changing conditions. For some volunteers, keeping a regular record of these outings adds to their enjoyment and understanding of their lake.

**Continuing education.** The monitoring program trains volunteers in the how’s and why’s of data collection and provides lots of resources on lake issues. Volunteers can then share what they learn with family, friends, and neighbors. Sharing one-to-one is a great way to educate each other about our environment and encourage stewardship.

**Volunteering can be its own reward.** Sometimes the results of our efforts are not directly observable or measurable,



but we do them anyway because they make us feel good. **Volunteering is an affair of the heart!**

**Whatever your reasons, we rely on and sincerely thank our volunteers!**

## Toxic Algae

The toxic algae blooms at Lake Sammamish in 1997 and at Seattle’s Green Lake in 1999 were reported in the news. Many of you may be wondering whether something similar could happen at your lake.

The bloom at Green Lake consisted primarily of the cyanobacteria called *Anabaena*. *Microcystis*, another cyanobacteria, caused the bloom at Lake Sammamish.

### Cyanobacteria Defined

Cyanobacteria, also known as blue-green algae, are closely related to bacteria. These organisms are similar in

size to algae, and like algae, photosynthesize light, converting it to cellular energy and food. Additionally, cyanobacteria have a special pigment that gives them their characteristic blue-green coloration.

### Blooming Algae

Algal blooms occur when favorable temperature, light, and nutrient conditions allow rapid population growth in a short period of time. Most blooms die back within a week or two, but overlapping blooms of different species may appear as one “continuous” bloom. Favorable conditions for blue-green algal blooms include water temperatures between 72-80°F, long hours of sunlight, and excess phosphorus and nitrogen in the water. These conditions typically occur in nutrient-rich lakes during the late summer or fall.

### Testing for Toxicity

*Anabaena*, *Aphanizomenon*, or *Microcystis* (fondly referred to as “Annie,” “Fannie,” and “Mike”) are the most common blue-greens. These species can produce liver or

neurological toxins that affect animals. These toxins can remain in the water a few days to a week after a bloom disappears.

Testing for toxicity typically involves injecting crushed algal cells into a mouse and observing the mouse for signs of poisoning. Signs of liver toxins include jaundice, shock, abdominal pain, severe thirst, and sometimes death while signs of neurological toxins include staggering, paralysis, and involuntary muscle movement.

Both types of toxins have been known to kill fish, waterfowl, or animals. No confirmed human deaths from contact with a toxic bloom have been reported, but skin irritation and gastroenteritis

## Learn More about Lakes

### 2000 WALPA Conference

The Washington Lake Protection Association (WALPA) is holding its annual conference April 13 –15 at the SeaTac Doubletree Hotel. General conference topics include toxic algae, aquatic plants, water quality, and watershed analysis. On April 15<sup>th</sup>, the morning session will concentrate on topics of special interest to lake associations.

WALPA is a nonprofit, all volunteer organization working with lake users and government agencies to achieve effective lake management.



### Conference Scholarships

Snohomish County is offering 8 scholarships, which will cover the cost of one-day registration fees for the conference. These will be offered on a first-come first-served basis to any interested lake monitors. Please call Heidi Reynolds or Gene Williams at (425) 388-3464 for more information.

## Questions? Contact:

Any questions about the Snohomish County Lake Program, please call Gene Williams at (425) 388-3463, x-4563 or Heidi Reynolds x-4640.

Persons with disabilities may receive this information in alternative forms by calling (425) 388-3464. TTY/TDD users may reach all phone numbers by calling the Washington Relay Center at 1-800-833-6388.

have occurred in connection with toxic bloom conditions.

The mere presence of a cyanobacteria does not mean toxic conditions are present: a toxicity test must be completed to make this determination. Because of the expense, toxicity testing is usually limited to lakes where other signs of toxicity have been observed. Presently, scientists are working to better understand the environmental conditions that cause the algae to produce toxins.

**Spotting Blooms**

Blue-green algae blooms can look like green, blue-green, or brown-green paint spilled across the surface of the water. Often they can be blown by the wind and will accumulate along a leeward shoreline. If you suspect a blue-green bloom is toxic, stay out of the water, keep animals and livestock from drinking the water, and contact the **Lake Program Staff at (425) 388-3464.**

**New for Summer 2000**

*Field Visits*

Gene and Heidi will be meeting with each volunteer in the field sometime this summer. We will be contacting monitors individually to make arrangements to accompany you on one of your regular monitoring days.

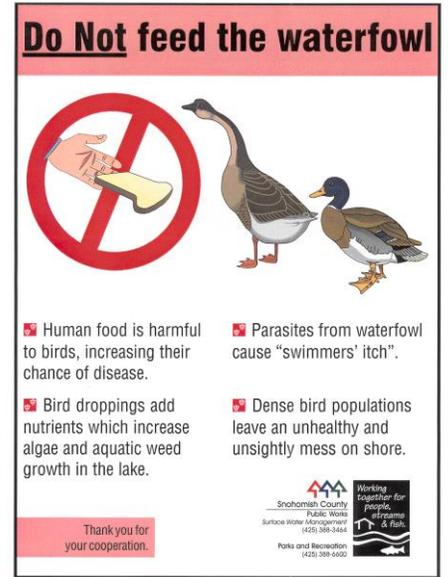


**Heidi Reynolds and Nan McGuire at Lake Beecher.**

We want to do this for several reasons. First, there are quite a few lakes that we have not been to for a year or more. Second, it will be an important quality check on the volunteer data and equipment. For example, we can test the thermometer accuracy against the Hydrolab, we can compare secchi measurements between individuals, and measure dissolved oxygen using the Hydrolab and LaMotte kits. We can replace or repair any faulty equipment, and answer any questions.

*Waterfowl Signs*

Snohomish County Surface Water Management and the Parks Department have combined efforts to design and install educational signs at all lake front county parks and public boat launches. The new signs (shown at right) are meant to discourage people from feeding ducks and geese by informing them about the water quality problems and potential health risks associated with nuisance waterfowl.



**Milfoil Projects**

Snohomish County is working with area residents to combat EWM, at three Snohomish County lakes: Shoecraft, Goodwin, and Roesiger. At both Lake Roesiger and Lake Goodwin, divers have been hand-pulling and placing bottom barriers, to eradicate milfoil. These ongoing efforts will continue this summer.

*Continued on following page.*

**Milfoil in Snohomish County**

To date, Snohomish County does not have many problems with exotic aquatic plants, but there are ongoing efforts to eradicate Eurasian watermilfoil (EWM) at several lakes in the county. Eurasian watermilfoil is a non-native, invasive plant that grows to the surface and can form mats, which tangle fishing lines and motors. EWM can quickly crowd out other native plants and will grow in new locations where no plants previously existed. It is important for volunteers and lake residents to watch for milfoil and other exotic plants. Early detection of pioneer colonies makes eradication efforts simpler and less expensive.

Some of the information contained in these articles was taken from the Lake Steward, the newsletter of the King County Water and Land Resources Lake Steward Program.

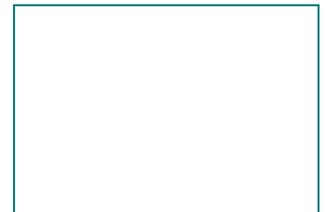
February 2000

Lake Shoecraft's EWM problem is more severe and requires stronger measures. Milfoil control work begins there early this summer. The densest areas will be separated from the rest of the lake behind temporary fabric barriers and will be treated with herbicide. The rest of the milfoil will be controlled with hand-pulling and bottom barriers as in Lake Goodwin and Lake Roesiger. 🐟



**Milfoil at Lake Shoecraft.**

Snohomish County  
Surface Water Management  
2731 Wetmore Ave., Suite 300  
Everett, WA 98201-3581



ADDRESS CORRECTION REQUESTED

