

Stream Team News

FREE

OLYMPIA • LACEY • TUMWATER • THURSTON COUNTY

EDUCATE • PROTECT • RESTORE



Inside...

Bald Eagle Kayak Tour | 2
Lichens—New Opportunity | 3
LID Series: Green Roofs | 4–5
Salamanders, Newts & Frogs...Oh My! | 6
Holiday Tree Planting | 6
Featured Waterbody: Lake Lois | 7
Year in Review | 8–9

Featured Creature: Nutria | 10
Beyond Landscaping | 11
AmeriCorps | 11
Rain Garden Design & Construction | 11
Barriers to Fish Passage Identified | 12
Winter Twig Identification | 12

Bees | 13
Stormwater Stewards | 13
Naturescaping for Water & Wildlife | 13
Kids' Corner | 14
Calendar of Events | 15
Holiday Trees for Restoration | 16

WINTER EDITION

Dec 2014–Jan–Feb 2015

KAYAK TOUR

- Saturday, Dec. 13
- 8:45 a.m. – noon
- Mud Bay
- \$25

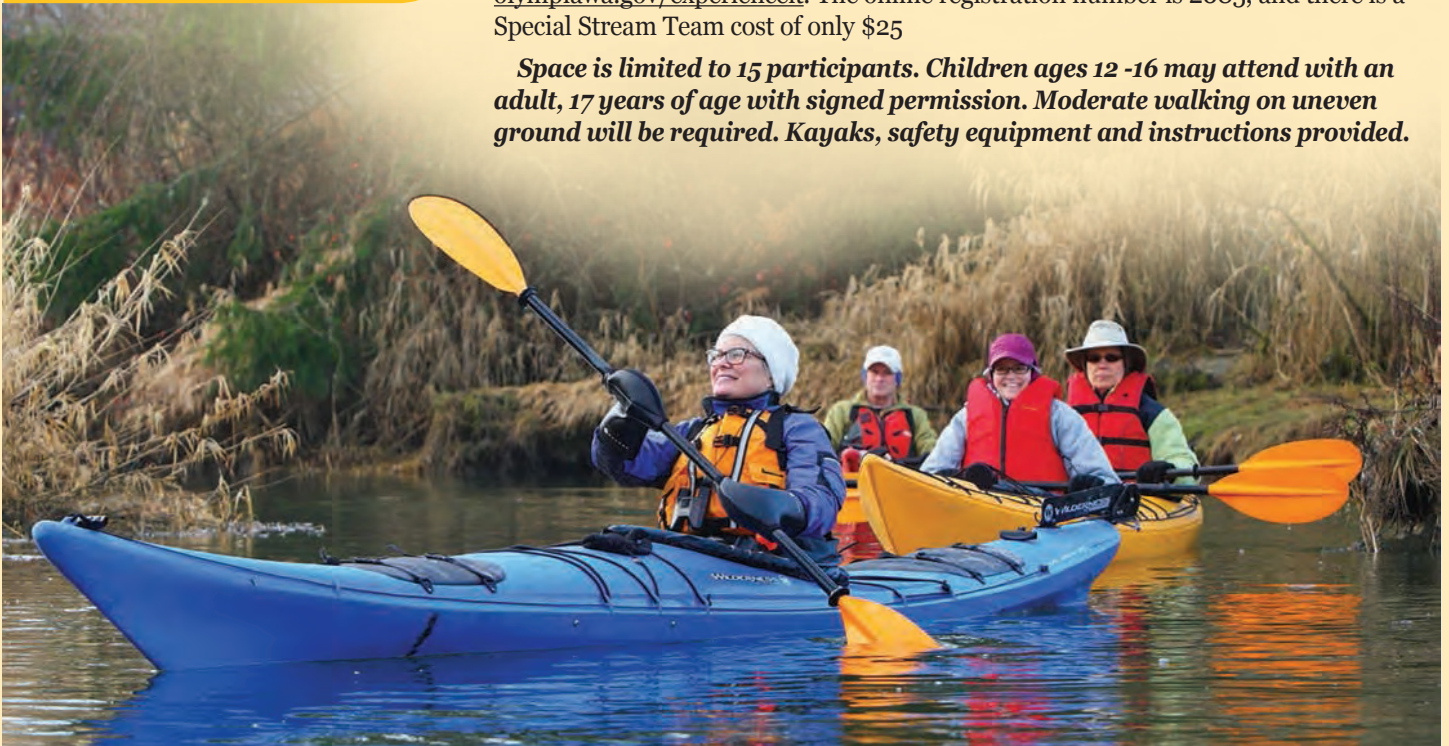


4th Annual Bald Eagle Kayak Tour in Mud Bay

The chum salmon have finished spawning and the bald eagles are back on the feeding grounds. Join Stream Team and City of Olympia's Parks, Arts, and Recreation Department and explore Mud Bay at Allison Springs. We will leisurely paddle Mud Bay into the mouth of McLane Creek to see the eagles.

To register, call City of Olympia Parks, Arts, and Recreation 360-753-8380 or visit olympiawa.gov/experienceit. The online registration number is 2085, and there is a Special Stream Team cost of only \$25

Space is limited to 15 participants. Children ages 12 -16 may attend with an adult, 17 years of age with signed permission. Moderate walking on uneven ground will be required. Kayaks, safety equipment and instructions provided.



ON THE COVER: Stream Team volunteers conduct amphibian egg mass monitoring, winter 2014.

STREAM TEAM MISSION

To protect and enhance the water resources and associated habitats and wildlife in Thurston County through citizen action and education.

Stream Team is funded and jointly managed by the stormwater utilities of the Cities of Lacey, Olympia and Tumwater and Thurston County. Stream Team programs meet the requirements for the National Pollutant Discharge Elimination System (NPDES) permit for stormwater.

SPECIAL NEEDS?

Citizens requiring special accommodations can call one of the coordinators listed at least one week prior to an event to make special arrangements.

FIND US ON FACEBOOK:

 [ThurstonStreamTeam](https://www.facebook.com/ThurstonStreamTeam)

STREAM TEAM INQUIRIES

360-438-2672 or streamteam@ci.lacey.wa.us

IN LACEY:

City of Lacey Water Resources Program
420 College St SE, Lacey, WA 98503

Attn: Kim Benedict

Tel: 360-438-2687
TDD: 1-800-833-6388
kbenedic@ci.lacey.wa.us

IN OLYMPIA:

City of Olympia Water Resources Program
P.O. Box 1967, Olympia, WA 98507-1967

Attn: Patricia Pyle

Tel: 360-570-5841
ppyle@ci.olympia.wa.us

IN TUMWATER:

City of Tumwater Water Resources Program
555 Israel Road SW, Tumwater, WA 98501

Attn: Debbie Smith

Tel: 360-754-4148 TDD: 1-800-833-6388
dmsmith@ci.tumwater.wa.us

IN THURSTON COUNTY:

Thurston County Water Resources Program
929 Lakeridge Dr. SW, Olympia, WA 98502

Attn: Chris Maun or Ann Marie Pearce

Tel: 360-754-3355 EXT 6377
TDD: 360-754-2933
maunc@co.thurston.wa.us
pearcea@co.thurston.wa.us

NEWSLETTER CONTRIBUTORS: Chris Maun, Patricia Pyle, Debbie Smith, Michelle Stevie, Cynthia Taylor, Kim Benedict, Michele Burton Photographer, Claire Skelly and April Roe.

DESIGN & LAYOUT: Azure Summers Graphic Design, design@azuresgd.com

NEW STREAM TEAM OPPORTUNITY



DID YOU KNOW:

Some lichen species found in outlying forests no longer occur in Olympia due to changes in air quality?

LICHENS LECTURE, FIELD TRIP & BIO-BLITZ ••

- Saturday, Feb. 21
- 9 a.m. – 5 p.m.
- Priest Point Park Rose Garden, 2600 East Bay Drive NE, Olympia



A Day in the Life of *Lichens*

Stream Team is teaming up
with Northwest Lichenologists
for a Lichen *Bio-Blitz*

Come play with us for the day to learn about lichens in the Pacific Northwest, their importance and about the stressors affecting their survival.

Special guests Dr. Lalita Calabria and Scot Loring will share their fascination with lichens, the importance of these unique symbiotic organisms and their relationship to the health of our environment. They will join Greg Eide and other members of Northwest Lichenologists to take us on a tour of discovery in our local parks.

Dr. Lalita Calabria has a PhD in plant biology and teaches at The Evergreen State College. Her areas of expertise include botany, mycology, phytochemistry, bryophyte and lichen taxonomy and ecology.

Scot Loring has worked as a lichenologist/botanist throughout the PNW since 1994, conducting various research, inventory, rare species survey and monitoring projects. For much of that time, he has been a consultant for various entities including the U.S. Forest Service, U.S. Bureau of Land Management and multiple universities. He has discovered many species new to science, including two new genera.

The day will start with an intro talk on what lichens are, how to collect them for identification, their ecology and lichen conservation. For the separate field portion, we will break into smaller teams led by the experts who will oversee lichen identification and their collection, while providing a hands-on education of the specimens that are found. We will then break, and those wishing to continue can join us at The Evergreen State College (TESC) lab to further our identification skills. The end result will be a species list compiled of the lichens found and identified. Collected specimens may be added to TESC collections to be used as further teaching aids.

To register for this workshop or bio-blitz, visit www.streamteam.info and click on "Register". For questions, contact Michelle Stevie at mstevie@ci.olympia.wa.us

What is a lichen Bio-Blitz?

It's a day where teams led by field experts collect as much information as possible on the different lichen species for a selected location.

- ✓ Add to the knowledge of the local lichen flora by expanding the number of known species
- ✓ May include discoveries of rare or previously undescribed species
- ✓ Increase the interest and awareness of lichens in our environment and where we live
- ✓ Train people in lichen identification
- ✓ Can provide information for future land management decisions
- ✓ FUN!

Low Impact Development Series

If you are looking for a way to retrofit or build your home according to the latest environmentally friendly methods, try using live plants! In Germany, it is estimated that green roofs already comprise 12% of flat roofs. In Copenhagen, Denmark it is mandatory that all flat roofs under a 30° pitch be vegetated. Now, in the eco-friendly atmosphere of the Pacific Northwest, this trend has caught on. With the new low impact development regulations to help control stormwater on the horizon and with the encouragement of public utilities, green roofs are increasing in popularity and frequency throughout the Pacific Northwest.

Also known as eco-roofs, vegetated roofs and living roofs, green roofs capture both the literal and buzzword meanings of the word green. Vegetation is installed over several underlayments as the top part of the roof surface to create an aesthetically pleasing living medium. Green roofs can be installed on roof pitches ranging from 5° to 40°. Vegetated roofs treat pollution in stormwater and also store a significant amount of water, further preventing polluted stormwater runoff from entering our waterways and combined sewer systems.

Low Impact Development
Series will feature
"Living Walls"
in the next
Stream Team News!

Green Roofs: Beauty and Functionality for the Environment



CREDIT: SOLTERRA SYSTEMS

Some of the many ecological benefits of green roofs include:

Energy use reduction

During an 80° F summer day, a black roof can reach 180° F as opposed to a plant-covered roof which only reaches 85°. During the winter, a green roof will retain 15-30% more heat than a conventional roof. This insulation translates into lower cooling and heating costs!

(Lui & Baskaran 2003, National Research Council of Canada)

Urban heat island reduction

The more green roofs in an urban area, the lower the ambient temperature of the city.

Greenhouse effect mitigation

Green roofs radiate less energy than black roofs into the atmosphere. A University of California at Berkeley lab study found that switching to "cool" or "white" roofs alone would be the equivalent of removing 300 cars from the roads for 20 years.

Air quality improvement and carbon sequestration

Photosynthesis removes carbon from the atmosphere and stores it as biomass.

Added habitat

Native vegetation attracts butterflies, birds and bees.

Sound proofing

Outside noise can be reduced from between 40-50 decibels depending on the type of green roof. (Peck et al. 1999)

Less waste

According to research, a green roof will lengthen roof life by up to 20 years. (Miller, C. 1998)

Stormwater treatment

Green roofs reduce the amount of stormwater runoff and also delay the time at which runoff occurs, resulting in decreased stress on stormwater and combined sewer systems at peak flow periods.



Interested in seeing some green roofs in person? Here is a partial list of green roofs that you can visit:

Olympia:

**The Evergreen State College:
Seminar II Bldg**
2700 Evergreen Pkwy NW, 98505
Type: Extensive | Year: 2004

Woodland Trail Restroom
1600 Eastside Street SE, 98501
Type: Extensive | Year: 2007

Olympia City Hall
601 4th Ave E, 98501
Type: Extensive | Year: 2011

Tacoma:

Troy's Green Roof (Drive by only)
3108 South 9th St., 98405
Type: Extensive | Year: 2004

Seattle:

Seattle Justice Center
600 5th Ave., 98104
Type: Extensive | Year: 2002

Russell Investments Center
1301 Second Avenue, 18th Floor, 98101
Type: Intensive | Year: 2006

Portland:

Hawthorne Hostel
3031 SE Hawthorne Blvd., 97214
Type: Extensive | Year: 2002

Multnomah County Multnomah Bldg
501 SE Hawthorne Blvd., 97214
Type: Extensive | Year: 2003

**Oregon Health & Science University
(OHSU) Center for Health & Healing**
3303 SW Bond Ave., 97239
Type: Extensive & Intensive
Year: 2006

Green roofs can be designed and engineered in two ways. The initial investment pays off in terms of reduced energy costs and the increased longevity of the roof:

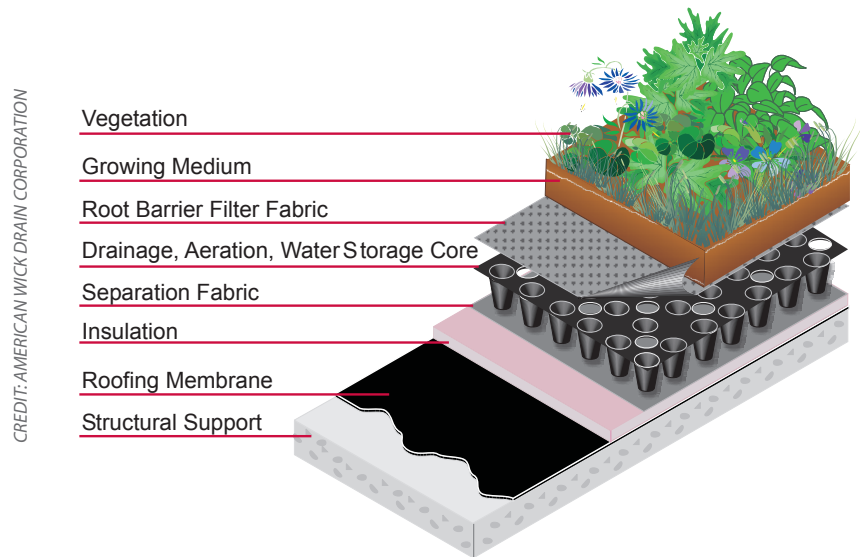
Intensive

These roofs require a flat surface and are well suited to public or private businesses that want to encourage roof-top gardening and/or a park-like setting. A deep substrate of 8-24 inches of soil is able to accommodate lawns, edible crops, small trees and shrubs. This high load (35-120 lbs. per square foot) requires additional structural support to increase load-bearing capacity. Because of their increased weight and the possible need to add an irrigation system, these roofs have a higher capital cost. They also have higher maintenance requirements. Cost of installing an intensive green roof begins at \$25 a square foot.

Extensive

These roofs generally weigh 10-50 lbs. per square foot and are within the load bearing capacity of a typical roof. They are suitable for home or business owners who want a self-sustaining roof that requires low to no-maintenance. The planting substrate is shallow, containing four to six inches of engineered soil mix and best accommodates low-growing, fire resistant, drought-tolerate vegetation such as local wildflower mixes, sedums, herbs, mosses and grasses, typically on a 5-20° pitch. Extensive roofs are only accessible for maintenance activities. It costs approximately \$10-24 per square foot to install an extensive green roof with root repellant/waterproof membranes and other key underlayments.

Components of a green roof will vary depending on the type and size of installation as well as the manufacturer. A waterproofing membrane is critical if the system is going to succeed in the long-term. However, several layers of other protective materials are often included to achieve waterproofing and to convey water away from the roof deck. The following diagram illustrates the possible components:



Resources for further reading and information on the green roof industry:

<http://tinyurl.com/7q8k9ff> (Great photos of European green roofs)
<http://tinyurl.com/kpegg3s> (A contractor's YouTube page)
<http://tinyurl.com/ojn79eq> (Article on the largest green roof in Portland for stormwater treatment)
www.greenroofs.org (Promotes the green roof industry through education and advocacy)
www.lid-stormwater.net/ (Information on low impact development)
www.greenroofs.com/ (A treasure trove of information on the industry)
www.ecobuilding.org/ (Local resources for low impact development)
www.solterrasystems.com/green-roofs/ (Seattle company with links to green roof photos)
<http://tinyurl.com/m8t8qk9> (Facts from the EPA)



Salamanders, Newts & Frogs... *Oh My!*

It's January, and it feels like a good time to curl up in front of the fire with a hot beverage...OR you could be out with other adventurous individuals hunting for frog and salamander eggs!

Are you curious by nature (and about nature!) and interested in learning about local Pacific Northwest species of amphibians? Join Stream Team and herpetologist, Dr. Marc Hayes for a fun, informative workshop. The workshop will explore the ecology, habitat requirements and unique characteristics for each species. We will address how to identify different life stages of PNW amphibians with an emphasis on egg mass identification.

For those of you with a spirit for adventure, join our Stream Team amphibian survey crew this winter to survey wetlands for amphibian egg masses.

■ Saturday, Feb. 7

LIFE HISTORY TALK

■ 9:30 – 11 a.m.

■ LOTT WET Science Center,
500 Adams St NE, Olympia

FIELD TRAINING

■ 11:30 a.m. – 2 p.m.

■ Hansen Elementary,
1919 Road Sixty-Five,
Olympia



INTERESTED IN ASSISTING WITH ROAD SURVEYS?

Stream Team is partnering with Washington Department of Fish and Wildlife to look for areas where amphibians are migrating across roads. Do you know of areas where frogs are seen crossing the road during these dark wet nights?

If you are interested in this project contact Michelle Stevie at mstevie@ci.olympia.wa.us.

To register for this workshop or field training, visit www.streamteam.info and click on "register." For questions, contact Michelle Stevie at mstevie@ci.olympia.wa.us

TREE PLANTING

■ Saturday, Jan. 10

■ 10 a.m. – 1 p.m.

■ Woodland Creek
Community Park



Help Stream Team Plant Holiday Trees!

Our annual Holiday Tree Program will continue this winter. (Find out how to purchase a tree for your home on pg. 16.) Stream Team will be at Woodland Creek Community Park planting the native, live trees that have been returned after the holidays in order to revegetate the riparian buffer around Woodland Creek. As you plant new trees, you will be able to see first-hand the success of trees planted in previous years through the Holiday Tree Program.

Having native trees planted along streams helps provide shade for salmon and stabilize the shoreline to prevent erosion. These trees will improve ecosystem health for years to come, so start off the New Year by getting outside and helping our community!

To Register for this event, visit www.streamteam.info and click on "Register." For more information, contact Claire Skelly at 360-438-2672 or americorps@ci.lacey.wa.us

2014 AMPHIBIAN SURVEY DATA

Pond	Long toed Salamander	Northwestern Salamander	Red Legged Frog	Chorus (tree) Frog	Oregon Spotted Frog	Rough Skinned Newt
Hansen Pond	55	0	18	114	0	NA
12 th Ave NE	0	3	19	1	0	NA
9605 Tilley Rd Storm Pond	0	0	0	2	0	NA
Cooper Crest A	2	12	34	114	0	NA
Cooper Crest B	3	23	24	5	0	NA
2736 South Bay Road	24	1	73	581	0	NA
Overhulse Parkway Pond	53	45	157	1	0	NA
66 th Ave Wetlands	NA	NA	NA	NA	70*	NA
Champion Drive Road Mortality Survey	2	0	16 dead 3 live	72 dead 2 live	0	323 dead 2 live

*Genetic samples sent for confirmation

Featured Waterbody

Lake Lois



Lake Lois

Every day, 20,000 motorists drive over Lake Lois - located along Carpenter Road between Pacific Avenue and Martin Way - yet few people seem to be aware of this small waterbody, which is part of an urban oasis in the middle of Lacey.

Appearing at times, especially the late summer, to be more of a pond/wetland complex than a true lake, Lake Lois is a two part complex bisected by Carpenter Road where the lake waters flow through a beautiful stone arch under a Carpenter Road bridge. To the east of Carpenter Road is the Lake Lois Habitat Preserve featuring the larger portion of the lake and a wooded, rustic nature trail. To the west of Carpenter Road is Lake Lois Park, featuring mowed lawn, park benches, picnic tables and mulched walking trails in more of a city park setting.

Lake Lois is the fourth and final lake in a chain of lakes consisting of Hicks Lake, Pattison Lake, Long Lake and finally, Lake Lois in the headwaters of Woodland Creek, the largest creek flowing into Henderson Inlet. Woodland Creek emerges from Long Lake and flows about one mile through Woodland Creek Community Park and travels under Pacific Avenue where it enters Lake Lois behind the Safeway store. Here one can find steps to the nature trail and an information kiosk, courtesy of several Boy

Scout Eagle Projects and the Lacey Rotary Club. The Lake Lois Habitat Preserve is also accessible off Lake Lois Road on the east side of the Preserve. At this location, people can stroll along the margins of the lake through mature second growth forest and observe western pond turtles sunning themselves, mallards, bufflehead, goldeneye and other waterfowl, as well as a variety of songbirds. An ADA accessible viewing platform is located on the south side of the lake.

Like the other lakes in the chain, Lake Lois also featured lakeside destination resorts and camp grounds during the 1920s. During this era, the Lake featured a wood bridge that allowed horse drawn carts and early automobiles to cross at its narrowest point. Fishermen caught large chum salmon in Woodland Creek and the lake. Later, the bridge was replaced with fill and a 48 inch culvert as the Lacey area and the resulting traffic grew.

In 1993, the City of Lacey obtained what would become the Lake Lois Habitat Preserve and Park with funds provided by a State Department of Natural Resources ALEA (Aquatic Lands Enhancement Account) grant. Funds for this account are derived in part from revenue generated by the leasing of DNR managed tidelands for shellfish aquaculture including oysters and mussels.

In 2011, Lacey in conjunction with Thurston County, completely rebuilt Carpenter Road through the Lake Lois area and widened the road from two to four lanes. At that time, the old failing culvert was replaced by a bridge with a new bottomless culvert, allowing for much easier fish passage through the lake and upstream points in Woodland Creek. During this same construction project, stormwater treatment facilities were installed allowing polluted runoff from Pacific Avenue to receive treatment before flowing into Lake Lois and eventually Henderson Inlet.

Today, Lake Lois features a beautiful stone bridge that incorporates this fish-friendly arching culvert. The bridge is popular with local fishermen who seek to catch its bluegill, yellow perch, largemouth bass and rainbow trout. People can picnic next to attractive stormwater treatment facilities that help keep Woodland Creek clean, benefiting the health of Henderson Inlet and its shellfish resources some five miles downstream. Lake Lois and its Habitat Preserve, along with the adjacent wooded parts of the Saint Martin's University campus provide an intact tract of woods and waters within the busy limits of the City of Lacey. The next time you drive down Carpenter Road in Lacey, stop and enjoy this small, oft ignored gem.



2014





YEAR IN REVIEW



Featured Creature

Nutria (*Myocastor coypus*)



Nutria in Capitol Lake.

Nutria: Threat to Native Wetlands

Nutria (*Myocastor coypus*) are large, semi aquatic rodents native to southern South America. Nutria have invaded many parts the United States and Canada causing millions of dollars in damage to valuable wetland habitat and resources. During the 1930s nutria were introduced throughout North America primarily for the fur industry. Between the years 1930-1950, there were 600 nutria farms in Washington and Oregon. They have also been used to control unwanted aquatic vegetation. As with many exotic species farms, once prices collapsed and farming became uneconomical, the rodents were released. Nutria, like other invasive species are very adaptable and highly prolific. They quickly established themselves throughout North America.

Nutria are voracious consumers of aquatic plants and roots consuming approximately 25% of their body weight daily. They also wreak havoc on agricultural fields and gardens eating only 10% of what they harvest.

Nutria belong to the taxonomic order of Rodentia or rodents, which are characterized by a single pair of continuous growing front teeth that must be kept short by gnawing. Nutria are smaller than beavers but larger than muskrats and most closely related to porcupines (they are not rats!). Their bodies are 17-25 inches with a long 10-16 inch sparsely haired tail. Their average weight is 12 pounds. The nutria's front legs are very efficient for digging and burrowing, causing considerable wetland damage.

Nutria are voracious consumers of aquatic plants and roots consuming approximately 25% of their body weight daily. They also wreak havoc on agricultural fields and gardens eating only 10% of what they harvest. Nutria often use aquatic vegetation to build feeding platforms which they construct in shallow water. Besides feeding, platforms are

used for grooming, resting and birthing.

Nutria are prolific breeders. They have as many as three litters per year with an average of five young per litter, but they may have as many as 13 young in one litter. Young are born fully furred, and within a week they are eating wetland vegetation. In 1938, 20 individual nutria were introduced into Louisiana and within 20 years, the nutria population exceeded 20 million animals! By 1962, nutria had replaced the native muskrat as the leading furbearer in Louisiana (Marshdog.com).

Control measures and preventing damage: Nutria are not climbers so when designed correctly, fences and other barriers can be effective in excluding them. Nutria are diggers so all barriers need to be buried at least one foot into the ground to be effective. Water level manipulations can also be used to

force nutria to more desirable areas. Eradication of nutria is through trapping and lethal control. In Washington State nutria are classified as a Prohibited Aquatic Animal Species (WAC 220-12-090). Due to their classification, all live trapped animals should be euthanized and not returned to the "wild". For more information on living with wildlife visit wdfw.wa.gov/living/nutria.html

Creative Consumerism: In response to the invasive species issue, there is a world-wide trend of utilizing and/or consuming invasive species. The prominent group Invasive.org and the popular book by Jackson Landers *Eating Aliens* are two references worth checking out. As a way to save local wetlands, companies such as *Righteous Fur* sells fashionable clothing made of nutria fur and *Marsh Dog* produces a popular, all natural dog treats made from nutria.

BEYOND LANDSCAPING PART 1.....

- Thursday, Feb. 26
- 6 – 9:15 p.m.
- Tumwater Fire Hall

PART 2.....

- Saturday, Mar. 14
- 10 a.m. – 2:30 p.m.
- Thurston County
Courthouse, Room 152



Beyond Landscaping

Part 1: Marine & Riparian Revegetation

If you live along a stream, lake or Puget Sound, this workshop is for you! Living next to water requires unique landscaping methods and approaches. Attend this workshop to learn how to improve the habitat, stability and beauty of your shoreline. While this workshop is tailored especially for shoreline property owners, it is useful to anyone planning to restore large sections of their property. Topics include managing invasive species, choosing the right plants for revegetation, erosion and waterfowl control, tree care, view maintenance and how to make an affordable action and planting plan.

Part 2: Landscape Plans

During the optional Part 2 of this class, a limited number of participants will meet with experts to review and discuss their revegetation plans. Following the plan review, the class will travel to a field site for a hands-on session on slope planting techniques. Part 2 will include how to plant fascines and live stakes on a steep slope-site, as well as other practices to minimize impact and maximize stability. Please register separately for this class.

To register for one or both parts of this workshop, or for additional information, visit www.streamteam.info and click on “Register.”



monitoring and revegetation projects with Stream Team’s hard working volunteers.

The City of Lacey is excited to welcome a new AmeriCorps volunteer for the 2014-2015 program year. Claire Wayne Skelly was born and raised in Albuquerque, New Mexico but moved northwest in 2009 to pursue a degree in Environmental Science/ Marine Ecology at Western Washington University. Since graduating, she has worked in environmental education and interpretation in Florida and Colorado. She is excited to be back in Washington and to learn more about community outreach and environmental restoration with her time at the City of Lacey. In her free time, she enjoys running, biking and spending time near the ocean. She looks forward to meeting all the wonderful Stream Team volunteers!

AmeriCorps

April Roe is excited to return for her second AmeriCorps term with Thurston County. She is a Pennsylvania native and graduated from The Pennsylvania State University with a bachelor’s degree in Environmental Resource Management. This past year she enjoyed learning about Puget Sound and watching all the unique wildlife in the county. She is looking forward to another fun year of salmon stewarding, stream bug



Rain Garden Design & Construction

WORKSHOP.....

- Thursday, Jan. 15
- Tumwater Fire Hall

LECTURE.....

- 6 – 8:15 p.m.

HANDS-ON.....

- 8:15 – 9 p.m.
- Optional



Do your part to help protect streams and Puget Sound while also keeping stormwater drainage away from your home. Stream Team and WSU Extension’s Native Plant Salvage will co-sponsor a free workshop which will provide all the details needed to build one or more rain gardens in your yard. Rain gardens are a low-maintenance, attractive feature that will also provide habitat for birds and butterflies.

Each participant will receive detailed information about designing and building a rain garden, as well as a full-color rain garden poster and a copy of WSU’s “Rain Garden Handbook for Western Washington Homeowners”.

This workshop is free, but registration is required as space is limited. Visit www.streamteam.info and click on “Register.” For further information, contact Native Plant Salvage at 360-867-2167 or nativeplantsalvage@gmail.com

Barriers to *Fish Passage* Identified

The Washington State Department of Transportation (WSDOT) and the Washington Department of Fish and Wildlife (WDFW) have identified approximately 2,000 barriers to fish passage within Washington State's highway system, approximately 30 of which are in Thurston County.

Most of these fish barriers consist of cross-highway culverts that are too small, or otherwise inadequate to allow fish to migrate upstream or downstream, restricting their habitat. Examples of highway-related fish barriers in Thurston County include the Moxlie Creek and Indian Creek crossings on I-5 near the Plum St. interchange, and various culverts under SR 8 near Summit Lake Rd. that convey Kennedy Creek and its tributaries toward Totten Inlet.

WSDOT and WDFW have been working for years to prioritize fish barriers for replacement. This prioritization of fish barriers takes into account the potential increase in fish habitat as well as the cost of removing the barrier and replacing it with a suitable culvert or bridge. Generally, fish barriers are replaced with much larger culverts, or with bridges, so that stream channels can pass below highways in a more natural state. This work has played an important role in the overall programming and design of WSDOT highway construction projects. As of 2013, a total of 285 fish passage projects have been completed statewide, improving access to over 970 miles of fish habitat.

Recently, 21 northwest Washington tribes asked the U.S. District Court to find that the State of Washington has a treaty-based duty to preserve fish runs. They sought to compel the state to repair or replace culverts that impede salmon migration. The court ruled in favor of the tribes and declared that the right of

state-owned culverts that block habitat for salmon and steelhead by 2030.

WSDOT has about 1,000 fish barriers that apply to this injunction. To be in compliance with the injunction, WSDOT estimates it will need to correct an average of 30 to 40 fish barriers per year, beginning in 2015 and continuing



Culvert under a highway blocking fish passage.

CREDIT: GABE TAYLOR

taking fish, secured to the tribes in the Stevens Treaties, imposes a duty upon the state to refrain from building or operating culverts under state-maintained roads that hinder fish passage and thereby reduce the number of fish that would otherwise be available for tribal harvest. The court further declared that the State of Washington currently owns and operates culverts that violate this duty. A federal court injunction, issued March 2013, requires the state to significantly increase its effort to remove

through 2030. In the 2013-2015 biennium, approximately \$36 million will be spent on stand-alone fish passage projects. In addition to this, other larger highway projects will remove fish barriers that are within their boundaries. For more information, please visit WSDOT's fish passage website at www.wsdot.wa.gov/Projects/FishPassage/default.htm

*Thanks to contributing writer:
Gabriel L. Taylor, L.E.G., Engineering
Geologist, WSDOT*

OUTDOOR WORKSHOP

- Sunday, Jan. 25
- 10 a.m. – 12:30 p.m.
OR 1 – 3:30 p.m.
- West-Olympia
- \$5



Winter Twig Identification Field Classes

Add a new dimension to your winter walks in the woods. In this outdoor workshop, local plant experts teach the secrets to identifying deciduous trees and shrubs without their leaves. Choose either a morning session or an afternoon session on Sunday, January 25.

The Native Plant Salvage Foundation is offering these walking workshops that take place on a west Olympia nature trail for \$5. Small groups of learners will be matched with knowledgeable instructors to learn the keys to identifying over 25 native plants. The skill is useful for gardeners and anyone who enjoys spending time outdoors, even during winter months. Participants receive a free handout and an opportunity to purchase a detailed winter twig identification book.

For more information, contact Native Plant Salvage Project at 360-867-2167 or www.nativeplantsalvage.org.

Free Consultations with Stormwater Stewards

Looking for ideas for dealing with stormwater runoff on your property? Stormwater Stewards can help. Stormwater Stewards is a program offered by Thurston County Water Resources, the Cities of Olympia, Lacey and Tumwater and WSU Extension.

Highly trained and capable Stormwater Stewards are ready to help you learn how to reduce stormwater runoff from your home and landscape. They can make recommendations on:

- Drainage improvements
- Techniques to infiltrate stormwater
- Water friendly landscape techniques
- Healthier plants and lawns
- Designing and constructing rain gardens
- Green roofs and living walls
- Permeable pavements...and more.

For more information and to schedule a Stormwater Stewards consultation, contact 360-867-2167 or stormwater.stewards@gmail.com

If you are interested in becoming a trained 2015 Stormwater Stewards volunteer please visit: www.nativeplantsalvage.org/program-areas/stormwater-stewards/

BEES.....

- Saturday, Jan. 24
- 10 a.m. – noon
- LOTT WET Science Center,
500 Adams St NE, Olympia



BeeTalk & Bee House Workshop

See what all the buzz is about! Join Stream Team and special guest speakers Laurie Pyne, president of the Olympia Beekeepers Association, and Glen Buschmann for a fun, fact filled bee talk and bee house building workshop!

Laurie Pyne, an avid gardener and bee keeper, is an advocate for honeybee conservation and protection. Laurie will talk about honey bee conservation and how to get started with your own hive.

Glen Buschmann has expertise in habitat and housing needs of animals including 20 years of experience with Mason bees. Glen will teach us about our local bees and lead us in building a simple bee house made from a carton and newspaper rolls!

To register for this workshop, visit www.streamteam.info and click on "Register." For questions, contact Michelle Stevie at mstevie@ci.olympia.wa.us



Naturescaping for Water & Wildlife Workshop

Part 1: Introduction

Winter is the perfect time to make a landscaping plan. Learn how to turn your yard into a lovely year-round landscape that attracts birds, butterflies and amphibians, while using less water.

During this workshop you will learn:

- Planting for four-season interest
- Landscaping for tricky areas including slopes
- Easy ways to minimize lawn area
- Water-wise ideas for your landscape
- How simple landscape changes can save you time and money

Part 2: Landscape Plans

Thurs., Mar. 5 • 6 – 9 p.m.

In this optional class participants will receive a planting plan consultation with local landscape design professionals. Bring your draft landscape plan and receive feedback from several local experts who can answer specific questions about your plant choices and placement. Work on and/or revise your plan during this session. Prior participation in the Naturescaping Part 1 is required.

Limited spots available. Register early! To register for Part 1 or both Parts 1 and 2 of this workshop, or for additional information, visit www.streamteam.info and click on "Register."

- LOTT WET Science Center,
500 Adams St NE, Olympia

PART 1.....

- Thursday, Feb. 5
- 6 – 9 p.m.

PART 2.....

- Thursday, Mar. 5
- 6 – 9 p.m.



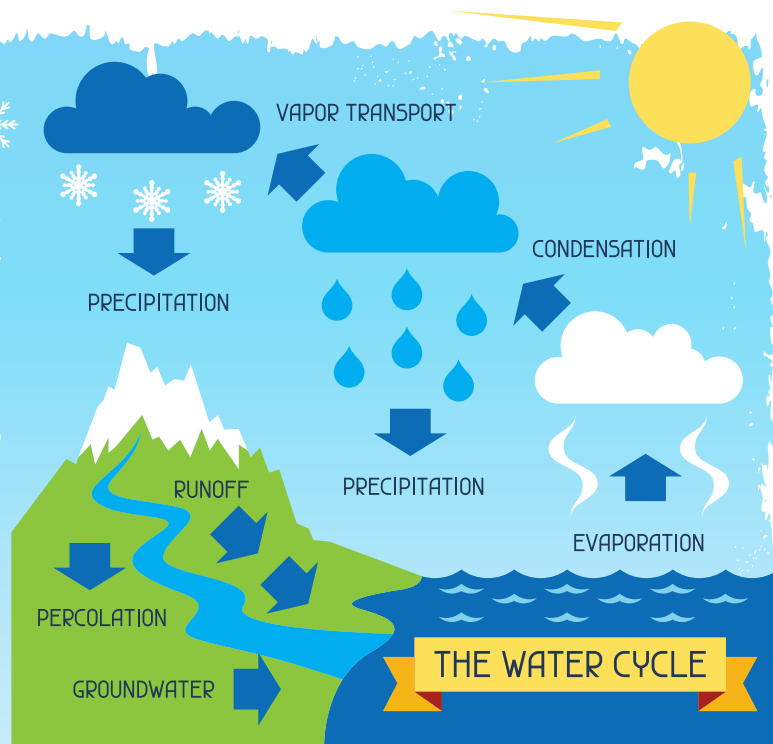
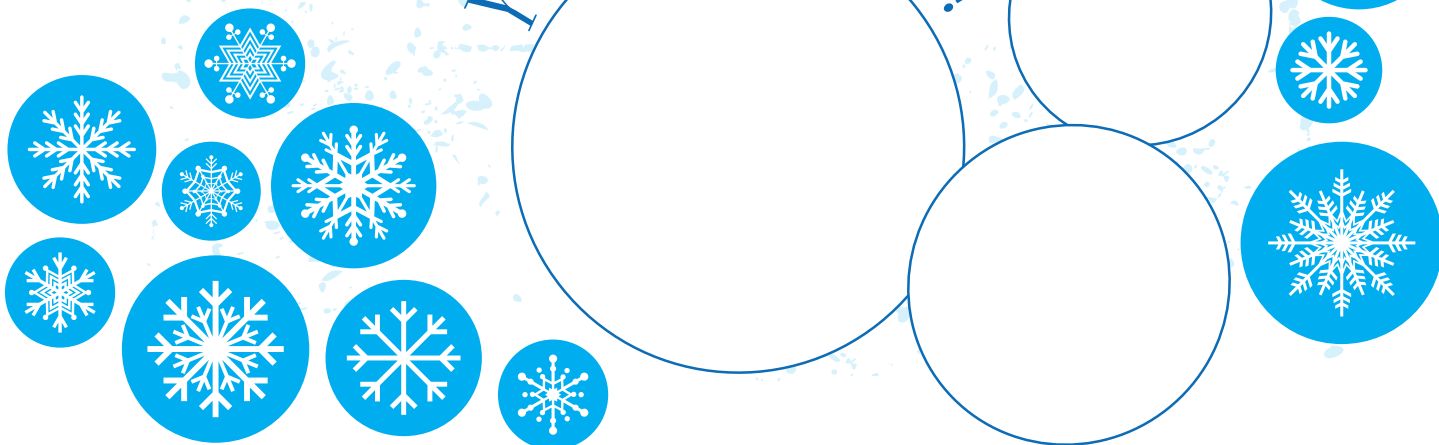
Kids' CORNER

Celebrate SNOW

Did You know?

The formation of a snowflake, or ice crystal, is determined by air temperature and humidity. An ice crystal is formed when a water droplet freezes onto a particle, like dust or pollen, in the sky on a very cold day. As the ice crystal falls more water vapor is collected from the sky and new crystals are formed, creating six identical looking arms of a snowflake. But, no two snowflakes are exactly alike! That is because snowflakes vary in the paths they take to fall from the sky and encounter different atmospheric conditions along the way. Some snowflake "arms" have needles, some are lacy. **Here are some of the shapes a snowflake may take:**

DRAW
Your own Snowflakes!



Snow is an important part of the water cycle. When it snows in the mountains a snowpack is created that acts like a reservoir of fresh water during the spring and summer months. As the snow melts some of this fresh cold water flows into our streams and rivers. Fish, insects and other aquatic species are dependant on this cold water for survival. Humans, too, are dependant because snow also gradually seeps, or infiltrates, through rocks and soil to become groundwater, our main source of water for drinking and irrigation.



Stream Team *Events*

For additional events, event details, or to register, please visit our website and click on "Calendar" or "Register": www.streamteam.info

For maps and directions to any of these events, go to: streamteam.info/getinvolved/directions/

DECEMBER

4th Annual Bald Eagle Kayak Tour

Sat., Dec. 13 • 8:45 a.m. – Noon
Mud Bay at Allison Springs
\$25. See page 2 for details.

To register, call City of Olympia Parks, Arts, and Recreation 360.753.8380 or visit olympiawa.gov/experienceit online: Registration # 2085

Citizen Monitoring Opportunity: Forage Fish Surveys

Sun., Dec. 14 • 1 p.m.

Survey various beaches located within City of Olympia / Thurston County. (Surveys are tide dependent so survey times will be variable.) Trained and untrained volunteers welcome! Carpooling available.

Register online at, www.streamteam.info and click on "Register." For more information contact Michelle Stevie at mstevie@ci.olympia.wa.us

JANUARY

Citizen Monitoring Opportunity: Forage Fish Surveys

Sat., Jan. 3 • 9 a.m.

Survey various beaches located within City of Olympia / Thurston County. (Surveys are tide dependent so survey times will be variable.) Trained and untrained volunteers welcome! Carpooling available.

Register online at, www.streamteam.info and click on "Register." For more information contact Michelle Stevie at mstevie@ci.olympia.wa.us

Holiday Tree Planting

Sat., Jan. 10 • 10 a.m. – 1 p.m.

Woodland Creek Community Park

See page 6 for details.

Rain Garden Design & Construction Workshop

Thurs., Jan. 15 • 6 – 9 p.m.

Tumwater Fire Station

See page 11 for details.

Bee Talk and Bee House Workshop

Sat., Jan. 24 • 10 a.m. – Noon

LOTT WET Science Center

See page 13 for details. Families welcome!

COMMUNITY EVENT

Winter Twig Identification Workshops

Sun., Jan. 25

10 a.m. – 12:30 p.m. OR 1 – 3:30 p.m.

\$25. See page 10 for details.

Register online at www.nativeplantsalvage.org

FEBRUARY

Naturescaping for Water & Wildlife Workshop

Thurs., Feb. 5 • 6 – 9 p.m.

LOTT WET Science Center

See page 13 for details.

Amphibians of the Pacific Northwest Workshop

Sat., Feb. 7 • 9:30 a.m. – 2 p.m.

LOTT WET Science Center

See page 6 for details.

Register separately for talk and or field Training.

Citizen Monitoring Opportunity: Forage Fish Surveys

Sat., Feb. 14 • 8 a.m.

Survey various beaches located within City of Olympia / Thurston County. (Surveys are tide dependent so survey times will be variable.) Trained and untrained volunteers welcome! Carpooling available.

Register online at, www.streamteam.info and click on "Register." For more information contact Michelle Stevie at mstevie@ci.olympia.wa.us

Lichen Bio-Blitz!

Sat., Feb. 21 • 9 a.m. – 5 p.m.

Priest Point Park Rose Garden

See page 3 for details.

Beyond Landscaping: Part 1

Thurs., Feb. 26 • 6 – 9:15 p.m.

Tumwater Fire Hall

See page 11 for details.

HOW TO REGISTER FOR EVENTS



Visit: www.streamteam.info and click on "Register"



Select the event for which you plan to register



Click on the register button near the bottom of the "Event Detail"



Follow the instructions to either log in as an existing volunteer or create a new secure profile

EARN YOUR FREE "P.S. I LOVE YOU" BAG

by participating in four types of Stream Team events:

Macro, Amphibian or Forage Fish Monitoring • Salmon or Sound Stewarding Tree Planting or Maintenance • Educational Workshop

Earn your own tote bag and show everyone that Puget Sound is in your heart! Look for the "P.S. I Love You" stamp next to the events in our calendar for qualifying events.





Stream Team

EDUCATE • PROTECT • RESTORE
Olympia • Lacey • Tumwater • Thurston County

929 Lakeridge Dr SW
Olympia, WA 98502
www.streamteam.info

Holiday Trees for Restoration

This holiday season, you can enjoy the beauty and fragrance of a live potted tree in your home! After the holiday, return the tree to Stream Team to be planted at a stream restoration project.

How does it work? 1

Purchase a live potted tree from Puget Sound Plants for the holiday season (discounted price). **Trees must be ordered ahead and picked up by Monday December 22. After the holidays, drop the tree off at a designated location by January 5, 2015.**

Trees will be kept in a nursery and cared for until they are planted by Stream Team volunteers later this winter. Replanting trees next to streams provides shade that keeps streams cool for salmon and other species of fish and wildlife. You can also help plant the trees. Information about the event scheduled to plant these special trees can be found on pg. 6.

Want to participate?

Call Puget Sound Plants at 866-816-5080, Monday–Friday, 8 a.m. – 4:30 p.m., to place your tree order. Mention that your tree purchase is with the Stream Team Holiday Tree Program. Arrange the pickup day and time when placing your order. *Puget Sound Plants is not open on weekends.*

Cost (includes pot):

- 3-4 foot young (Charlie Brown style) Douglas-fir: \$15
- 4-5 foot Douglas fir: \$30
- 5-6 foot Douglas fir: \$38

Note: Trees weigh between 60-115 pounds. Care instructions will be included.

Pick Up 2

Puget Sound Plants is located at 3147 46th Ave NE, near South Bay and Shincke Roads. Please pick up the tree at the prearranged time and day.

This limited offer ends soon.

Please place orders starting Dec. 1 and pick up your tree by Dec. 22.



Returning Your Tree 3

After the holidays, you can plant your tree (instructions included) or you can choose between these locations to drop off your tree. Trees must be moved outdoors as soon as possible and no later than January 4.

- Lacey City Hall, 420 College St SE
Assisted drop off:
Jan. 5 • 4-6:30 p.m.
- City of Olympia Nursery, 830 Union Ave SE, alley access behind Chevron
Assisted drop off:
Dec. 30 & Jan. 5 • 7-9:30 a.m.
- Woodland Creek Community Park, 6729 Pacific Ave SE
Drop off: Jan. 10 • 10 a.m.–Noon
Planting: Jan. 10 • 10 a.m.–1 p.m.

Tree planting open to everyone!

Sat., Jan. 10 • 10 a.m. – 1 p.m. (Drop off until Noon) • Woodland Creek Community Park

Drop off your tree, or stay and help plant it! Staff and volunteers will be available to help unload your tree. To register for the tree planting, or for additional information, visit www.streamteam.info and click on “Register”.