Stream Team News

FREE

OLYMPIA • LACEY • TUMWATER • THURSTON COUNTY

EDUCATE • PROTECT • RESTORE

SPRING EDITION
March–April–May 2015

Inside...

Stormwater Stewards

Help Protect Water Quality

Would you like to be part of a team of trained volunteers who are actively helping to reduce stormwater runoff pollution one property at a time? Join the Stormwater Steward Team!

Stormwater Stewards learn how to help other community members build rain gardens, install permeable pavers, create sustainable landscaping plans and adopt Green Stormwater Infrastructure techniques. Stormwater Stewards receive thorough in-class training and practice installations in May and June, then they continue into a practicum period and become certified Stormwater Stewards. Trained Stormwater Stewards conduct site assessments and make recommendations to homeowners. No prior experience is necessary; you just need a passion for learning and a willingness to dive into the field to make on-the-ground changes happen!

Learn to provide recommendations concerning:

- Drainage improvements
- Rain gardens
- Pervious pavements
- Waterwise, pesticide-free landscapes
- Privacy buffers
- Safer walkways
- Wildlife habitat
- Aesthetic enhancements
- Healthier lawns

The Stormwater Stewards Program is jointly managed by Thurston County Water Resources and WSU Native Plant Salvage, with additional support from the Cities of Lacey, Olympia and Tumwater.

If you are interested in helping to make this important work happen, please email stormwater.stewards@gmail.com or call 360-867-2167 to receive the 2015 recruitment packet. Applications are due by April 24, and trainings begin in early May for eight consecutive Thursday evenings, plus additional field days on some Saturdays.

If you are interested in requesting a Stormwater Stewards site consultation for your property, please email stormwater.stewards@gmail.com or call 360-867-2167.

ON THE COVER: River Ridge High School students plant a tree along Eagle Creek.

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

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
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Spring Cleaning the "GREEN" Way

Are you thinking about cleaning out your house or garage this spring? If so, you may have "hazardous" household products that should NEVER be put in the garbage. The average American household has dozens of hazardous products, including oil paints and thinners, solvents, used motor oil and some cleaning supplies.

How do you know if a product is hazardous? Look for the key words POISON, DANGER, WARNING or CAUTION on the label. In addition to being harmful to pets and family members, hazardous products can harm the environment if they are not properly stored and disposed of.

Follow these steps to keep your family, pets and local waterways safe:

- Store in original container, and do not remove label
- Store hazardous products in a large plastic tote to prevent/contain spills and leaks both at home and in the car
- Follow the label instructions carefully when cleaning up spills
- Never combine different products together. A combination of products could create hazardous fumes, ignite or explode
- Take all unused hazardous products and any materials used to clean up spills to Thurston County's HazoHouse for proper disposal

To make your home greener this spring, replace hazardous products with products that are safer for your family and the environment. For a guide to safer household products, go to http://www.co.thurston.wa.us/health/ehhm/saferproducts.html

If you plan to clean your carpets or do pressure washing (or plan to hire a contractor to do so), ensure these guidelines are followed to prevent illicit discharges:

Pressure washing:

- Use the lowest setting and direct the wash water to a landscaped area.
- Avoid using toxic cleaning products.
- Cover the ground with tarps, and sweep, vacuum, or rake up paint chips to keep them from entering catch basins. If you have an older home, have chips tested to find out if they contain heavy metals that require them to be disposed of as hazardous waste.

Carpet cleaning:

- If on a sewer system, filter out debris and flush dirty wash water.
- If on a septic, filter and spread dirty water over a landscaped area. The cleaning agents can harm your septic system.
- Throw filtered debris into the trash.
- If contracting a service, ask the company about their wash water disposal policy.

Hazardous household products can be safely disposed at HazoHouse, which is located at the Thurston County Waste and Recovery Center, 2418 Hogum Bay Road NE in Lacey. HazoHouse is open Friday through Tuesday from 8 a.m. to 5 p.m. The service is free for residential residents; there is a small charge for businesses. For more information about what materials are accepted at HazoHouse, how to properly pack and transport such items, or for directions, contact Thurston County Public Works at 360-786-5494 or go to: www.co.thurston.wa.us/solidwaste/hazardous/haz-hazohouse.htm

REPORTING SPILLS

An illicit discharge is defined as anything other than stormwater going into the stormwater system. Examples are carpet cleaning waste water, paint, oil, pet waste, sewage, foam, grease and garbage.

To report a small-scale spill or illicit discharge, call your jurisdiction's 24-hour hotline. You can do so anonymously.

Olympia: **360-753-8333** Lacey: **360-491-5644** Tumwater: **360-754-4150** Thurston County: **360-867-2099**

To report a large-scale spill or illicit discharge, call the WA Dept. of Ecology Spill Hotline: 360-407-6300.
Call 911 if there is an immediate threat to life.

Featured Waterbody

Chambers Lake & Chambers Ditch

Chambers Lake and Chambers Ditch

When settlers first arrived in what is now Thurston County, Chambers Lake looked very different. The vast wetlands that now lie northwest of the lake's westernmost point were part of the single spring-fed lake that included both modern day Chambers and Little Chambers Lakes. The shores of the lake were covered to the water's edge in shrubby native berries like gooseberries and currants. The lake had no real outlet before the Chambers Drainage Ditch was dug. (Records are unclear but suggest the ditch was first dug in 1902.)

Before the ditch, excess water from flooding would spill over and meander south, across Chambers Prairie, in the general vicinity of the present ditch. The excess water typically ended up in Chambers Creek, which drains to the Deschutes River. The ditch, eventually named Chambers Ditch, drained the lake and the farmland south of Chambers Lake, which frequently flooded. Local landowners formed a drainage district to enlarge and extend the ditch to its current length of 2.25 miles in the early 20th century. Chambers Ditch ends near Yelm Highway and Rich Road in an area that has several natural springs that feed Chambers Creek east of Rich Road.

In 1927, when the Chehalis-Western railroad was constructed, the lake was divided in two and connected by a narrow 500-foot-long channel. In 1949, an earthquake slowed the natural springs that had been supplying Chambers Lake with fresh water, and the water level dropped over the next 10 years. Withdrawals of water for irrigation increased the speed with which water levels decreased during this time.

Prior to the installation of a fish ladder at Deschutes Falls on the Deschutes River, there were no salmon or sea-run cutthroat trout in Chambers Creek or Chambers Ditch, but there were trout. After the fish ladder was constructed, and because trout eat salmon fry, the Game Department planted fewer trout in the Deschutes River. Since that time, there have been no trout in Chambers Ditch. Introduced, non-native crappie spend some time in the ditch between Yelm Highway and Chambers Lake in the early spring, but the ditch often dries up in the summer, so the crappie

LEFT: Chambers Lake from Trailhead Park

ABOVE: Construction of City of Lacey Chambers Lake Stormwater Treatment Facility

RIGHT: Crew hand digging Chambers drainage ditch c. 1916 (Courtesy of Louise Hangee, Lacey Museum)

migrate out during that time.

The Chambers Lake system is about 120 acres and is partially located in the City of Lacey and partially located in the City of Olympia. Chambers and Little Chambers Lakes drain about 1,376 acres of the land surrounding them. They have no feeder streams, but receive water from stormwater systems which collect rainwater from surrounding developments in Olympia and Lacey. Little Chambers Lake is slightly smaller and to the east of the larger, main portion of Chambers Lake.

Both portions of the lake are shallow and warm. The maximum depth of Chambers Lake is five feet and the maximum depth of Little Chambers Lake is seven feet. The lake levels tend to rise and fall with the seasons. The main portion of the lake has a large marsh area west of the lake and significant residential development east of the lake. Little Chambers Lake is partially surrounded by marsh.

Both lakes are eutrophic, with high nutrient concentrations year-round and many aquatic plants growing on their bottoms. Grass carp, a vegetarian fish species native to the Amur River in Asia, were introduced into the lakes in the spring of 1990. A screen maintained by the City of Lacey prevents the grass carp from escaping through the culvert at the southern end of Little Chambers Lake. The culvert carries excess water from the lake under the abandoned railroad tracks and into Chambers Ditch where it continues to flow slowly into Chambers Creek just east of Rich Road.

There is a boat launch on the main portion of Chambers Lake located at 3725 14th Avenue SE. People can fish for non-native largemouth and rock bass, bluegill, brown bullhead, common carp, black crappie, crawfish, yellow perch, pumpkinseed sunfish and warmouth, as well as native cutthroat trout.

With the help of a $1 million grant from the Washington State Department of Ecology, the City of Lacey is currently building a new stormwater treatment facility near the eastern shore of Little Chambers Lake. The facility will improve the water quality in the lake by using a four-celled engineered wetland to treat stormwater runoff from College Street and surrounding neighborhoods before it enters the lake.

The project will also add a sanitary sewer line replacement and enhance the shoreline of Little Chambers Lake by providing habitat, open space and new wetland-specific plantings. The final phase of the project will involve the addition of a paved pedestrian trail through the city-owned seven-acre site. The project is expected to be completed in the summer of 2015.

Information for this article was found at the following websites:

http://wdfw.wa.gov/lands/water_access/30574/

http://wdfw.wa.gov/fishing/washington/175/

http://www.co.thurston.wa.us/waterresources/basin/basin-chambers.html

TRAINING DATES

- **Thursday, April 16 OR Monday, April 20**
- **5 – 6 p.m.**

Spring Is Here! And The Purple Martins are Back!

Interested in monitoring these beautiful aerial acrobats? Join the East Bay Purple Martin Monitoring Team. No experience is necessary!

In April and May, purple martins return from South America and Mexico to the United States and Canada to breed. Purple martins find cavities in trees to build nests, but have also adapted to using nest boxes. In downtown Olympia, 24 nest boxes located in East Bay have been maintained and monitored by volunteers since 1996.

Monitoring the boxes is easy and fun! Using binoculars and/or a spotting scope (equipment provided on loan), volunteers watch the boxes periodically between April and September to determine which nest boxes contain nesting pairs of adults and if the young birds have fledged.

New volunteers attend a short training on monitoring basics and bird identification. To sign up, visit www.streamteam.info and click on "Register". For more information, please contact Michelle at mstevie@ci.olympia.wa.us.

The Pride of Local Oysters:

By Derek King, Puget Sound Restoration Fund

CREDIT: ROBERT KING

We have something to be proud of in South Sound: local access to freshly available, world-class, nutritious shellfish. Slurped raw with a squeeze of lemon or cooked to your delight, locally farmed oysters are a delicious reward for over a decade of work within the Henderson Inlet and Nisqually Reach watersheds. Recent improvements to water quality have restored historic growing areas once in peril, and now allow for the safe harvest of shellfish species such as oysters and clams. On the front lines since 2002, the Henderson Inlet Community Shellfish Farm (CSF) was founded in order to connect the community directly to this marine resource, and to provide a unique incentive for upland stewardship.

Prior to 2001, water quality was trending downward in Henderson Inlet, with bacterial contamination causing shellfish growing area closures and restrictions in the southern portion of the inlet. Stormwater and other watershed inputs that bring bacteria and other pollutants are intensified by periods of heavy rainfall, which is a common occurrence in Western Washington. During and after periods of rainfall, the marine waters in the southern inlet predictably failed state water quality standards. In Puget Sound, the primary sources of bacterial pollution that threaten access to bivalve shellfish are contaminated stormwater runoff (with pet, livestock and wildlife waste) and failing septic systems.

In 2002, Thurston County Commissioners appointed a stakeholder group for the newly formed Shellfish Protection District (SPD), the policy action intended to reduce contamination and recover water quality in the downgraded areas of Henderson Inlet and Nisqually Reach. This work group consisted of stakeholders who reside or work within the District's boundaries and represented the following interests: commercial agriculture, shellfish growers, builders and developers, representatives of cities and residents.

The groups were asked to craft recommendations on how to restore the quality of water in Henderson Inlet and Nisqually Reach to shellfishing standards. One of those recommendations was for the non-profit Puget Sound Restoration Fund (PSRF) to launch a Community Shellfish Farm (CSF) in Henderson Inlet modeled after PSRF's Drayton Harbor Community Oyster Farm. Funded by the Shellfish Protection District, with help from the Pacific Coast Shellfish Growers Association, Washington State University and community volunteers, the Henderson Inlet CSF was established in 2002.

The new CSF, managed by Puget Sound Restoration Fund, became a member of the SPD stakeholder group and part

A Community's Action for Water Quality in Henderson Inlet

of the strategy to recover and preserve a healthy shellfish growing area. The Henderson Inlet CSF produces a crop of oysters utilizing community volunteers and completes education and outreach tasks to connect the community with this local resource. It is supported with funding from Thurston County, Puget Sound Restoration Fund and Elliott's Oyster House. The Russell Family Foundation provided significant funding in the earlier years to get the operation off the ground.

The SPD stakeholder group developed recommendations to Thurston County, and it began investigating the sources of the problem and possible solutions for reducing bacterial contamination. The Washington Departments of Ecology and Health worked together to implement a Total Maximum Daily Load study in the Henderson Inlet SPD, which identifies bacterial sources and inputs to Henderson Inlet.

The Cities of Olympia and Lacey implemented stormwater management projects, including eight new stormwater treatment facilities. Thurston County implemented the Septic System Operation and Maintenance (O&M) Program that requires nearly 6,400 septic systems in the Henderson Inlet Watershed Protection Area to have renewable operational certificates. Thurston Conservation District assisted farmers with manure management and education outreach projects through South Sound GREEN and Clear Choices for Clean Water. Pet waste campaigns, neighborhood rain garden projects, septic inspection workshops and many more programs have been undertaken by SPD stakeholders and their partners.

It took nearly a decade until these efforts collectively began to change the water quality in Henderson Inlet. Beginning in 2010, Washington Department of Health's water sampling revealed reduced fecal coliform counts throughout the inlet. The results from monthly monitoring of water stations in Henderson Inlet allowed for the upgrade of over 340 acres of shellfish growing area from 2010 to 2012.

Since 2002, the Henderson Inlet Community Shellfish Farm has served as a location to engage the community in enjoying and celebrating healthy waters through an oyster farming experience. The farm is open to the public during monthly work parties (which are open to anyone ready to borrow some hip-boots and gloves) to help grow oysters from seed to market. Young and old are welcome, so bring the whole family! After the work is over, the reward is oysters on the grill, on the half-shell, or to take home and share with friends and family.

If a hands-on experience isn't what you're looking for, you can be a part of the story by enjoying these briny bites of Puget Sound, available at various outlets. The Henderson Inlet CSF Farm Stand at George and Sons Fruit Market in Olympia at 427 Lilly Rd. operates on Thursday and Saturday afternoons. CSF oysters can also be found at Olympia restaurants like the Dockside Bistro located on Olympia's waterfront.

The Community Shellfish Farm serves as an educational site available for school groups to come out and learn about water quality, marine biology and ecology, shellfish aquaculture and marine restoration. Partnerships with National Fish and Oyster Company, Nisqually Reach Nature Center, Nisqually River Council and South Sound GREEN have recently enriched existing educational programs in the Nisqually Reach Shellfish Protection District with a shellfish resource experience.

The CSF and shellfish growers in Henderson Inlet and Nisqually Reach have come together to recognize community actions for clean water in the Thurston County SPDs. The farm's Oyster Give-Away Program offers a free dozen oysters to Thurston County Septic System O&M participants, for working with Thurston Conservation District, for taking pledges to pet waste programs, and for other public actions aimed to reduce bacterial contamination in these watersheds.

The increasing pressure from local development and population growth requires us to be vigilant in protecting healthy marine waters and continue the positive momentum the community has achieved by taking action on multiple fronts. Keep up the good work - and don't forget to raise your shell and slurp with pride in celebration of locally grown oysters!

For more information, visit http://www.wdfw.wa.gov/ais/

For Aquatic Invasive Species (AIS) sighting or to find out more information, call 1-888-WDFW-AIS (1-888-933-9247)

Information about volunteering or internships with the Henderson Inlet Community Shellfish Farm and other Puget Sound Restoration Fund projects, can be found at http://www.restorationfund.org/projects/csf/hendersoninlet

Oyster-Give-A-Way information can be found at: http://www.restorationfund.org/getinvolved/waterquality

CREDIT: ROBERT KANGAS

Unwanted Hitchhikers!

As the weather starts to get sunnier and warmer, many people take to the outdoors. But, did you know that the gear you use and your footwear can become carriers of invasive animals, plants, seeds and diseases? By not practicing simple cleaning procedures, you could unknowingly spread an invasive species to a local creek, pond or other waterway.

For many years, boaters have been required to clean their boats and motors to stop the spread of invasive weeds like Eurasian water milfoil. With the increasing threat of the New Zealand mudsnail and other non-native invasive species, recreationists are also being asked to make sure that they decontaminate their equipment, gear and footwear. Decontaminating procedures are critically important in helping to prevent the spreading of aquatic invasive or nuisance species.

What's the big deal? Aquatic plant and animal invasive species are a serious threat to the biological diversity of our streams, lakes and coastal waters. Humans have carried plants, animals and disease with them since they first began to travel. With the ease of modern travel, the rate of invasive species introduction has increased dramatically, costing billions in control and eradication worldwide.

Nonnative invasive species spread rapidly in new environments where there are no natural controls. Many of the invasive species, as well as fungi and diseases, are accidentally introduced as they "hitchhike" on other plants and animals, or in some cases, on your boat and even the soles of your shoes! Invasive species outcompete native species, disrupting natural food chains and changing the environment of the aquatic system.

Locally, the New Zealand mudsnail is considered to be a highly invasive threat to fresh and brackish water environments. Since the mudsnail is tiny (less than 6mm), it is easily transported on the soles of your shoes. Since it reproduces asexually (all by itself), and at a rapid rate, population densities easily reach 100,000 snails per square meter. This aquatic hitchhiker can devastate stream ecology and fish production in a few short years.

What You Can Do To Prevent the Spread of Aquatic Nuisance Species

- Never release live pets, plants, bait or seafood products. This includes aquariums and terrariums.
- Do not transport firewood. Purchase firewood in the area used.
- Clean your boat after you float! Clean, drain and dry any watercraft after use.
- Decontaminate fishing gear and, especially, footwear.

How to decontaminate your gear and footwear:

- Thoroughly brush and rinse off any debris from footwear and equipment that came in contact with stream, lake or salt water. Bag all items.
- Drain any water used to clean equipment back into the water body from which it came.
- Keep gear bagged until you are able to wash gear in hot water (140F) for at least 5 minutes or freeze overnight.
- Other decontamination methods use chemical solutions for soaking boots and gear. If using chemicals, remember to dispose of waste water properly into the sanitary sewer system and not into streams, wetlands or storm drains.

ARBOR DAY RESTORATION & VOLUNTEER APPRECIATION

- **Saturday, March 28**
- **10 a.m. – 1 p.m.**
- **East and West Olympia Locations TBA**
- **Everyone Welcome!**

Arbor Day Restoration & Volunteer Appreciation Day!

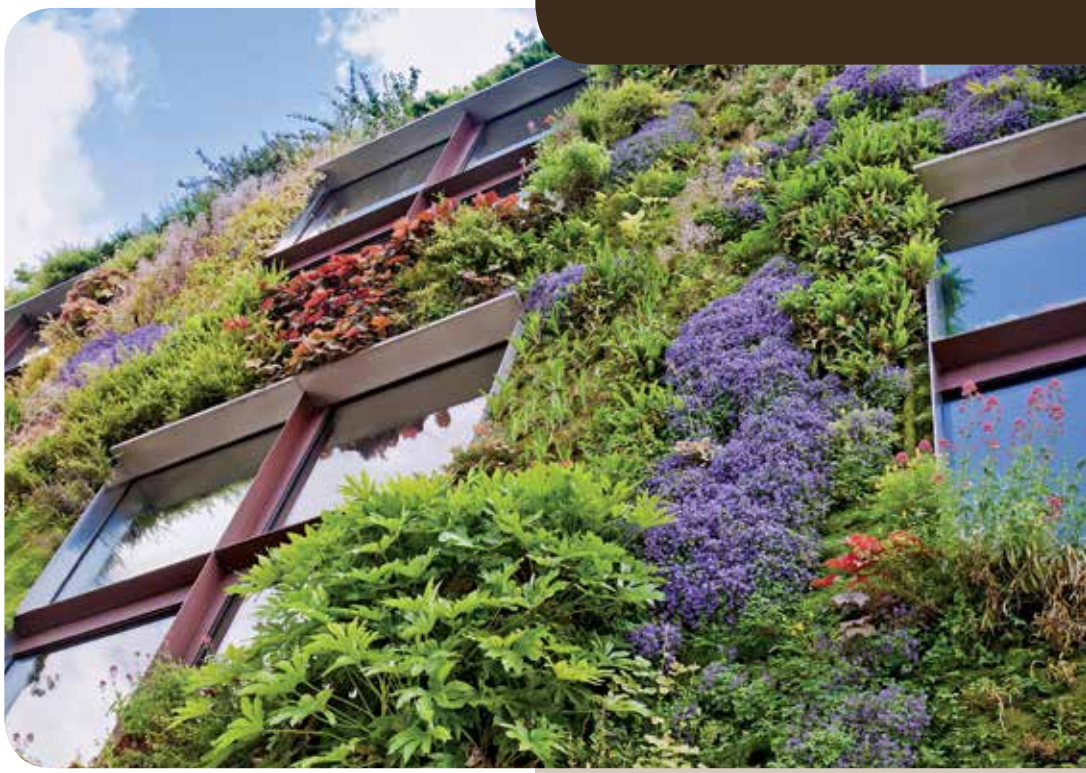
Stream Team is partnering with Olympia Parks, Arts, and Recreation, Olympia Urban Forestry and community and neighborhood groups for a large Arbor Day restoration event and celebration. Volunteers are needed to remove invasive species, plant trees and improve habitat in Olympia natural areas. Restoration work will occur in both East and West Olympia followed by a volunteer appreciation celebration downtown at the Artesian Commons. Join us to celebrate and improve the health of our urban forests!

To register for this workshop, visit www.streamteam.info and click on "Register". For more information, contact Tamara Lindner at 360-753-8159 or tlindner@ci.olympia.wa.us .

Living Walls

Low Impact Development Series

Is a wall that literally gives you a "breath of fresh air" the wall of the future? Even though trellising plants to a wall is an ancient practice, a purposeful level has been achieved in the last twenty years in living wall architecture which embodies sustainability, art and gardening. Living walls tie into low impact development because, if engineered to do so, they incorporate the use of cisterns, rain barrels and bioretention facilities.



Living walls don't capture rain water or stormwater, per se, but the more complex ones do manage it with a recirculation system. Roof runoff from the building is collected in a cistern or rain barrel and pumped via an irrigation system to the living wall. The excess water is then drained to a stormwater planter or rain garden, both examples of bioretention facilities. Bioretention methods are important contributors to clean water because they trap contaminants and sedimentation from polluted runoff and filter them through different layers of organic material before they are returned to groundwater.

If designed well, a living wall can be an added step in the treatment of stormwater, at the same time providing the additional benefits of sequestering carbon, providing oxygen, absorbing sound, conserving energy through heat absorption and beautifying the space.

There are different ways to construct a living wall. All living walls consist of plants suspended vertically via a variety of methods and surfaces. The surfaces, which are separate from the building, range from wooden pallets to metal frames mounted vertically. The methods often include hydroponic systems with plants rooted in plastic modules in water-holding felt pockets. The more complex installations include irrigation and drainage systems that are integrated into the design. Simpler designs can be watered by hand. Plants, including ferns, grasses and herbaceous species, can be arranged in a pattern or randomly. They can be used as art, food, purveyors of a healthier environment, or all of the above.

Eleven to twelve pounds per square foot is a typical weight for these structures, so it is important to know that your wall will hold the weight. Ongoing maintenance is necessary. Just as caring for any other landscape, the installation must be monitored for weeds and insects, pruned and trimmed of dead foliage and fertilized on a regular schedule. Easy access is crucial to making the job easier.

When adding a living wall to the interior or exterior of a building, the expertise of a professional is highly recommended to ensure the structure can be safely added to an existing wall. And, to benefit our streams, consider including a rain barrel and/or a rain garden in your design! Contact your local public stormwater utility to see what incentives they offer for rain gardens!

Resources/References:

http://www.solterrasystems.com/living-walls/

http://www.goodearthplants.com/living-walls/

http://agreenroof.com/green-walls/#

What you need for a living wall:

- A vertical surface
- Access to water
- Access to light (natural or artificial)
- Open space
- Plants chosen for texture and hardiness
- Easy access for maintenance
- Guidance from a structural engineer
- A rain barrel or cistern for watering
- A rain garden for drainage (optimal!)

Featured Creature

Taylor's Checkerspot Butterfly
(Euphydryas editha taylori)

CREDIT: MARY LINDERS

Taylor's Checkerspot Butterfly

Historic Distribution	There are 70 documented sites in Southern Vancouver Island, British Columbia, the San Juan Islands, Washington's Puget Trough and Oregon's Willamette Valley.
Current Distribution	Seven populations in Washington, one in British Columbia and two populations in Oregon.
Description	Medium-sized colorfully checkered butterfly with a wing span of 2.25 inches. It has short, stubby wings. The ventral (underside) wing surface is orange with bands of white cells. The dorsal (back) wing is a proportional mix of black, orange and white.
Status	Endangered. In October of 2013, the Taylor's checkerspot butterfly was listed as an endangered species under the Endangered Species Act (ESA).

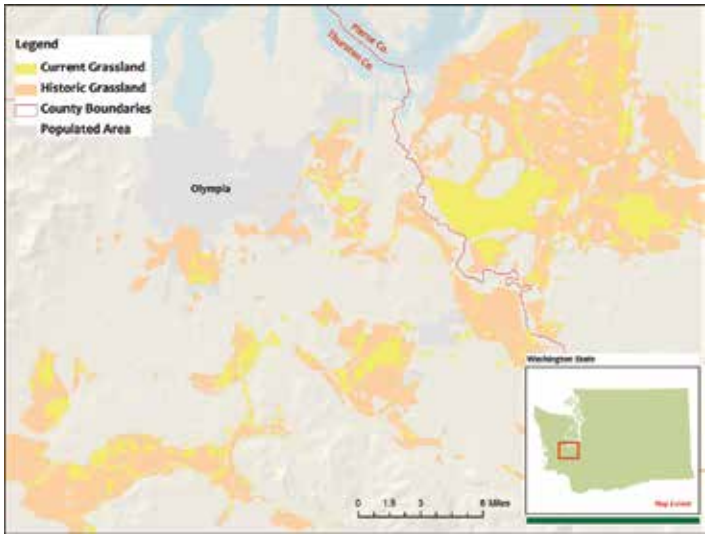
In Washington today, Taylor's checkerspot butterflies are reduced to very small populations and exist mostly in the balds (treeless hills), coastal bluffs and estuarine grasslands along the Strait of Juan de Fuca in Clallam County as well as scattered prairies and balds in Thurston, Mason, Pierce and Lewis counties.

The Taylor's checkerspot habitat includes open grasslands and grass/oak woodland sites that provide food for larvae as well as nectar sources for adults. These habitat areas are located primarily in coastal and inland prairies on post-glacial, gravelly outwash soils and balds.

After hibernation, adult butterflies emerge in the spring, during the months of April and May. After mating, the females lay their eggs in clusters (as many as 1200 eggs) on specific host plants. When the caterpillars emerge, they feed on these host plants until early summer when they enter an inactive diapause or dormancy stage. Emerging from diapause in late winter, the caterpillars feed more broadly on primary host plants and other available food plant sources.

Taylor's checkerspot, a subspecies of Edith's checkerspot, is highly sensitive to changes in habitat. Presence of the butterfly is considered to be a positive indicator that the health of the prairie ecosystem is functioning well. Decline of the Taylor's checkerspot, as well as other grassland dependent species, has occurred throughout Washington and the rest of the country. The loss of prairie and grassland habitats has been a direct result of land use changes such as agriculture (farming and grazing), development, invasion of non-native grass and forb species and forest encroachment. With increased settlement by Europeans, the cessation of burning practices used by Native Americans to control forest encroachment greatly altered prairie systems.

CREDIT: ROD GILBERT



Currently, there are numerous restoration efforts to restore prairie habitats and reestablish Taylor's checkerspot butterfly populations through reintroduction programs. The Washington State Department of Fish and Wildlife (WDFW), in cooperation with US Fish and Wildlife Service, Joint Base Lewis-McChord, the Center for Natural Lands Management (CNLM) and WDNR-Natural Heritage Program, have developed extensive habitat restoration programs. These programs include rigorous invasive plant management through the selective use of herbicides, mowing and prescribed burning, as well propagating native prairie host plants that are essential food resources for species survival.

Captive propagation and reintroduction. Propagation and reintroduction programs are beginning to see success on Puget Sound Prairies. Larval releases have consistently produced adult butterflies that are exhibiting normal foraging, basking, mating and egg-laying behaviors. The Sustainability in Prisons Project operated by The Evergreen State College and the Oregon Zoo has also developed successful captive propagation techniques. Reintroduction programs will continue to release and monitor populations to confirm population survival and establishment.

Interested in learning more? Check out volunteer opportunities through the Center for Natural Lands Management (CNLM) email at http://www.southsoundprairies.org and Wolf Haven International at http://www.wolfhaven.org

There is an annual Prairie Appreciation Day the second Saturday in May. For more information, visit the following sites: http://wdfw.wa.gov and http://www.co.thurston.wa.us/parks/parks-glacial-heritage.htm

WOLF HAVEN PRAIRIE FIELD CLASS

- **Saturday, May 16**
- **9 a.m. – Noon**
- **Wolf Haven International 3111 Offut Lake Road SE Tenino**
- **Van Pool leaving Thurston County Bldg. 4, Olympia 8:30 a.m.**

Wolf Haven Prairie Field Class

Wolf Haven International is known as a wolf sanctuary, but it is also a land steward of 36 acres of rare, native, mounded prairie, surrounded by Garry oak woodland.

Join Stream Team and Wolf Haven International on an exclusive tour of the Wolf Haven prairie with prairie expert Sanders Freed, Thurston County Program Manager at the Center for Natural Lands Management. The prairie tour will be followed by a free tour of Wolf Haven's sanctuary.

The prairie at Wolf Haven hosts a huge diversity of plants and animals, including endangered species like golden paintbrush plants and Mazama pocket gophers, and it is a future reintroduction site for Taylor's checkerspot butterflies. Besides providing biodiversity, prairies can protect our groundwater and help keep our drinking water clean by filtering pollutants from stormwater runoff before they reach the underlying aquifer system.

South Sound prairies were formed by the melting and retreating of the last continental glacier 15,000 years ago. To maintain the prairie habitat, Native Americans routinely burned the prairies to keep trees from encroaching. After the settlers arrived, controlled burns ceased and other land uses, such as farming and homesteads, changed the prairie habitat. Today, only 10% of the original prairie habitat in Pierce and Thurston County still remains. Development, encroachment by trees and invasive plant species threatens the remaining acreage.

Wolf Haven's prairie is a remnant of the historic Rocky Prairie Complex, which stretched for miles across the landscape just north of what is now Tenino. Today, Wolf Haven and the Center for Natural Lands Management are working together to protect this small, healthy prairie by doing controlled burns, removing invasive species and planting native species.

To register for this field class, visit www.streamteam.info and click on "register". For further information, contact Michelle Stevie at mstevie@ci.olympia.wa.us


CREDIT: WOLF HAVEN

Wildlife in the Classroom and at Home:
Do Not Release Wildlife!

Live animals in the classroom and at home are a way to stimulate students' interest in nature. Use of wildlife in the classroom or at home can teach about different species life history stages and habitat needs. Many of the wildlife species that come into the home or classroom are non-native species, meaning that they are not native to our region and may be considered exotic or invasive species.

As the school year ends, teachers and other education specialists, including parents, may wonder what to do with these animals that have become "pets". Unfortunately, once the lesson plan or school year is completed or the owners tire of taking care of these animals, they are often released into the wild.

Why not release wildlife?

Releasing household or classroom pets or surplus laboratory specimens into the wild is prohibited in many states, and, in all cases, it is unethical. Once released into the wild, many of these unwanted animals negatively impact native species and their ecosystems. Releasing household or classroom pets or laboratory animals can result in:

- The introduction of harmful pathogens and parasites that threaten native species
- Increased competition with native animal species for resources
- Predation on native animal species
- Degradation of the native population's gene pool
- Suffering or death of the animal released

Before you bring any animal into the classroom or home, consider the lifespan and long-term care needs of the animal. Can you or someone else care for it under safe and humane conditions? Animals such as turtles, snakes and some birds have a very long life span of up to 50 years! Also, you will need to consider what you are going to do with the animal after the school year ends or your child loses interest in it.

What should you do?

Instead of releasing unwanted classroom, laboratory or household animals into the wild, consider one of the following alternatives:

- Find the animal a new home or classroom that will be responsible for its long-term care
- Check with Thurston County Animal Services to see if the animal can be adopted
- Return it to the place where it was purchased (ask when animal is purchased)
- Keep it as a family pet
- Donate it to your local natural history museum, science center, zoo or aquarium (inquire before you purchase the animal)
- Do not flush any animal, including fish, down the toilet
- As a last resort, consider humane euthanasia (contact your local veterinarian)

All of these alternatives outweigh the risk of releasing captive animals into the wild. To avoid the problem of what to do with unwanted classroom, laboratory or household animals, think about what you will do with them before you obtain them. Although the release of "one little animal" into the wild may seem benign, that action could have long term serious biological and possible legal consequences.

Non-Native Invasive Species

Red-eared Slider Turtle

(Trachemys scripta elegans)

Native to southern USA, but it has been introduced and released all across the United States. Red-eared sliders have a life span of 20-50 years. They eat a variety of animal and plant species including fish, crayfish, tadpoles, snails, aquatic insects and numerous aquatic plant species. This exotic species may carry diseases that can be devastating to native turtle species.

Bullfrog

(Rana catesbeiana)

The bullfrog is a voracious hunter. This exotic species preys upon native populations of small birds, turtles, snakes, crayfish, frogs, salamanders and fish. The frog has been introduced into many wetland areas outside its natural range and has out-competed native species where it has been released.

Scientific Research:

Integrated Ambient Monitoring in Indian Creek

By Brandee Era-Miller, Randall Marshall and Scott Collyard, Washington State Department of Ecology

The Washington State Department of Ecology recently published Phase II of an integrated monitoring approach for assessing the aquatic health of streams. The Phase II study, conducted in Olympia's Indian Creek in spring of 2013, was a follow-up to the pilot study conducted in spring of 2010 in Indian Creek.

The integrated monitoring approach focuses on a stream's ability to support the early lifestages of salmonids and the food they need to survive and grow. The monitoring method includes *in-situ* (in-stream) toxicity testing with rainbow trout and bioassessments of benthic macroinvertebrates and periphyton (a mix of algae, cyanobacteria, microbes and detritus). Surface water and sediments from the stream are also analyzed for a mix of common pollutants to help identify the chemicals that may be causing stress to the aquatic community, but the biology is the focus for the integrated monitoring approach.

Many toxic pollutants cannot be detected by standard chemical analyses, and little toxicity information is available for many of the detectable chemicals. Mixtures of chemicals can have unpredictable combined effects. However, toxicity tests using living organisms will respond to any toxicant or combination of toxicants.

The in-stream trout toxicity test was borrowed from Environment Canada, which has published toxicity testing methods using early lifestages of rainbow trout. Each lifestage (embryo, alevin and fry) has different sensitivity to different pollutants. A test on all three lifestages is a true chronic test. The biological effects assessed include mortality, failure to hatch, abnormal development and stunted growth. Trout early lifestage testing can be done in streams to directly assess environmental conditions.

In Phase I, two sites on Indian Creek were monitored: 1) upper Indian Creek near the Frederick Street and the Woodland Trail crossing, and 2) lower Indian Creek near Quince Street before Indian Creek is piped under Plum Street and joins with Moxlie Creek. Results indicated good aquatic health at the upper site and impaired aquatic health at the lower site. During Phase I, a stormwater pipe carrying contaminated runoff from nearby parking lots was discovered just upstream from the lower monitoring site. Part of the Phase II monitoring design was to bracket this stormwater pipe by placing additional monitoring stations right above and just below the pipe.

The 2013 results for the instream exposures of rainbow trout embryos showed that survival just downstream of the stormwater pipe was 4% at the alevin lifestage. Survival of alevins right above the pipe was 60%. Fry survival 13 days later at the upper Indian Creek site was 93%. The upstream site has a wooded riparian buffer, along with nearby residential and commercial land uses and a highway (I-5).

Surviving trout were analyzed for six metals. Copper in fish tissue strongly correlated with fry survival. Both tissue zinc and copper correlated moderately with alevin survival. Metals concentrations also increased in trout tissue from lower Indian Creek compared to the upper site.

Benthic macroinvertebrate and periphyton communities at the lower site showed impairment, including an increase in metals-tolerant organisms. There was also an increase in metals concentrations in periphyton biomass in lower Indian Creek compared to the upper site.

Stream, stormwater, groundwater and sediment samples were analyzed for metals and polyaromatic hydrocarbons (PAHs). Stream, stormwater and groundwater samples were also analyzed for oxygenated (ketone- and quinone-substituted) PAHs. In addition, groundwater and sediment samples were analyzed for a large list of base/neutral acid extractable organics.

Results show lower Indian Creek to be unsuitable for salmon reproduction, and the weight of the evidence implicates a mixture of pollutants, with metals and PAHs standing out as contributing toxicants. The stormwater pipe at the lower site is the likely culprit, though there are also signs of moderately degraded water quality upstream of the culvert.

The integrated monitoring approach worked well for assessing the aquatic health of Indian Creek and identified sources of toxicity to the creek. Washington Department of Ecology researchers hope this approach will be considered by others for stream assessment. **The full reports for Phase I and II can be found at the following links:**

Phase I: https://fortress.wa.gov/ecy/publications/summarypages/1203012.html

Phase II - https://fortress.wa.gov/ecy/publications/SummaryPages/1403050.html

These studies are also being prepared for scientific journal publication in 2015.

Kids' CORNER

Clean Clean CARS STREAMS

We know how much kids love washing cars, whether it is to help around the house or raise money for a charitable organization. But, did you know washing a car can contribute to water pollution? When you wash a car, heavy metals, oil, grease, road salts and other chemical contaminants can get washed down storm drains and end up in our streams, lakes and Puget Sound.

Across

4. Dirty car wash water contains toxic _____ from the car and the soap.

6. Contaminants can harm fish and _____.

7. Only _____ down the storm drain!

8. When you wash your car take it to a _____ car wash.

10. Soapy, grimy rinse water flows down the nearest _____ catch basin.

11. _____ is the source of most of our drinking water in Thurston County.

Down

1. Contaminants pollute _____, lakes and Puget Sound.

2. Choose a low- or no-phosphate _____ car wash soap.

3. If you wash your car at home, wash it on the _____.

5. Dirty wash water does not get cleaned at a wastewater _____ plant.

9. Let's all do our best to _____ water quality!

Stream Team can help!

Go to: **streamteam.info/actions/carwashing/** to learn about our *Clean Car Clean Streams* program and what you can do to protect water quality.
Hint: The answers to the crossword are also there!

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.

Answers: 1. streams 2. biodegradable 3. lawn 4. pollutants 5. treatment 6. wildlife 7. rain 8. commercial 9. protect 10. stormwater 11. groundwater





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/**

MARCH

Amphibian Egg Mass Surveys

Sat., Mar. 7, 14, 21, 28 • 9:30 a.m – Noon

Location TBA

Stream Team needs trained volunteers to survey for frog and salamander eggs in local ponds. Not trained, but want to participate? Contact Michelle Stevie at mstevie@ci.olympia.wa.us . Register online (select as many dates as you wish).

Percival Creek Project

Sat., Mar. 21 • 10 a.m. – Noon

2352 Sapp Rd. SW, Tumwater

Invasive plant species removal party. For more info., contact Debbie at 360-754-4148 or dmsmith@ci.tumwater.wa.us . Register online.

Arbor Day Restoration

Sat., Mar. 28 10 a.m. - 1 p.m.

East and West Olympia Locations TBA

Invasive species removal and tree planting event.

For more info., contact Tamara at 360-753-8159 or tlindner@ci.olympia.wa.us. Register online.

APRIL

Purple Martin Monitoring

TRAINING DATES:
Thurs., Apr. 16 OR Mon., Apr. 20 • 5 – 6 p.m.

No experience necessary!

Stream Team needs volunteers to monitor the nest boxes at East Bay in downtown Olympia from April to September. For more info., contact Michelle at mstevie@ci.olympia.wa.us . Register online (select one date only).

Rain Gardens Workshop

Thurs., Apr. 23 • 6 – 8 p.m.

HANDS-ON PORTION: 8:15 – 9 p.m. (optional)

Olympia

Join Stream Team and WSU Native Plant Salvage Project for a free, hands-on workshop to learn how to design and install a rain garden in your yard! Participants will receive a free Rain Gardens poster and a free copy of the Rain Garden Handbook for Western Washington.

For more info., contact Native Plant Salvage Project at 360-867-2166 or nativeplantsalvage@gmail.com . Register online.

MAY

Juvenile Chinook Salmon Event

Sun., May 3 • Noon – 4 p.m.

Tumwater Falls Park
110 Deschutes Way SW, Tumwater

Family-friendly salmon-themed activities, including the chance to release juvenile Chinook salmon into the Deschutes River. For more info., contact Debbie Smith at dmsmith@ci.tumwater.wa.us or 360-754-4148.

Register online for a volunteer timeslot in the Stream Team booth. (Select as many timeslots as you like.)

Wolf Haven Prairie Field Class

Sat., May 16 • 9 a.m. – Noon

Wolf Haven International
3111 Offut Lake Rd. SE, Tenino

Van Pool leaves Thurston County Bldg 4, Olympia @ 8:30 a.m.

All Ages. Participants under age 13 must be accompanied by parent/guardian. Participants under age 18 must have a Stream Team Waiver signed by a parent/guardian. See pg. 11 for details. For more info., contact Michelle Stevie at mstevie@ci.olympia.wa.us Register online.

COMMUNITY EVENTS

How to Maintain Your Stormwater Pond Workshop

Sat., Apr. 18 • 9 a.m. – Noon

Learn how to inspect and care for your neighborhood stormwater pond and other stormwater facilities in this free workshop. Highly recommended for HOA board members. To register, contact Cathe at linnca@co.thurston.wa.us 360-867-2095.

Lacey Fun Fair

Sat., May 16 • 10 a.m. – 6 p.m.
Sun., May 17 • 11 a.m. – 5 p.m.

St. Martin's University, Lacey

Visit the Stream Team booth!

Stormwater Stewards Volunteer Trainings

Thurs. evenings for eight weeks starting in May, some Sat. field trainings

For more info. or to request a volunteer recruitment packet, email stormwater.stewards@gmail.com or call 360-867-2167.

Naturescaping for Water & Wildlife Field Class

Sat., May 30 • 10 a.m. – 5 p.m.

Olympia

Join WSU Native Plant Salvage Project Coordinator, Erica Guttman and landscape designer, Linda Andrews for a full day of learning about sustainable landscape design and creation. The morning classroom session will be followed by a field trip to local water-wise landscapes!

Bus travel provided. For more info., contact Native Plant Salvage Project at nativeplantsalvage@gmail.com or 360-867-2166. Register online.

Forage Fish Surveys

Mon., Mar. 16 • 8:30 a.m. – 12:30 p.m.
The Evergreen State College Beach

Sat., April 18 • 10 a.m. – 2 p.m.
Priest Point Park

Sat., May 16 • 9 a.m. – 1 p.m.
Burfoot Park

Lab dates to be announced

Survey various beaches located within City of Olympia & Thurston County for sand lance and surf smelt eggs. Surveys are tide dependent, so survey times will be variable.

Trained and untrained volunteers welcome!

Carpool available. For more info., contact Michelle Stevie at mstevie@ci.olympia.wa.us Register online.

MON TUES WED

Check online at **www.streamteam.info/getinvolved/calendar/** for up-to-date events, including additional tree planting events.

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

2000 Lakeridge Dr SW
Bldg 4 #100
Olympia, WA 98502
www.streamteam.info

Clean Cars Clean Streams

Spring is here and so is car washing season! There are many options when it comes to cleaning your car and your choices can have huge impacts on the pollution in our local streams, lakes and the Puget Sound.

When you wash your car in a driveway or on the street all the soapy, grimy rinse water flows to the nearest storm drain. Many people believe that this dirty water is then sent to a treatment plant to be cleaned, but this is not the case. Generally, the water from storm drains is piped directly to the nearest body of water, bringing with it toxic pollutants from the car and the soap.

It's more than just dirt that washes off your car. This runoff contains oil and gas, along with pollutants such as antifreeze and heavy metals including zinc and copper. These pollutants affect water quality in surface and ground water and can harm aquatic life. Specifically, heavy metals such as copper are known to damage the sense of smell in salmon, which may make them more vulnerable to predators or less likely to find their natal stream.

Luckily, there are ways to keep both your car and streams clean. The best option is to take your car to a commercial car wash. The rinse water at car wash businesses is piped to a wastewater treatment facility where pollutants are removed before they can harm fish and wildlife. Commercial carwashes also use much less water than a simple home wash. In fact, The Wave Car Wash in Lacey recently installed water-saving equipment which allows them to clean and reuse up to 75% of the water used in the washing process. They completed this project through a WaterSmart Technology rebate sponsored by LOTT Clean Water Alliance and City of Lacey. Since completion, they have saved over 900,000 gallons of water per year!

If you do choose to wash your car at home, the best place to do it is on your lawn. This allows the grass and soil to soak up the water, filtering out some of the pollutants before they reach our waterways. Be careful not to drive your car on top of your septic drainfield! Look for low-phosphate biodegradable soap to use as well.

Many charity groups choose to do carwashes to raise much-needed funds for their programs. However, these events are often held at locations where the water runs off and ends up in our water bodies. There are options for raising money from a charity car wash without polluting our streams!

The best option is to sell car wash tickets. Get tickets from Puget Sound Car Wash Association at www.charitycarwash.org .

An alternative option is to make sure your carwash is *Clean Cars, Clean Streams* approved. This means that the site where you are holding your event offers proper water treatment for the runoff. You can also reserve a free *Clean Cars, Clean Streams* car wash kit, which includes buckets, sponges, hose nozzles, biodegradable car wash solution and a *Clean Cars, Clean Streams* sign. Visit CleanCarsCleanStreams.info for details.