SHORE STEWARDS NEWS

August – October 2015 **Island County, Washington** **Issue No. 105**

We all love the marine ecosystem we call home in Puget Sound, but there are other aquatic ecosystems that play a vital role in the health of our region. In this issue you will learn the basics about streams, the organisms found in them, and how they are impacted by development. This issue of the newsletter was written by Cheryl Lowe, the WSU Extension Water Programs coordinator in Jefferson County.

Introduction to Streams

One of the greatest things about streams is their endless variety. No two streams are exactly alike – not even two segments of the same stream are exactly alike. Some flow through old growth forests, their banks covered in large, moss covered trees and rocks. Others flow through flat fields with their waters drenched in sunlight. Some flow through developed areas, where they are channeled through culverts and ditches past roads, lawns, and parking lots. There are even streams that flow through all of these environments.

Consider all of the physical characteristics that make up a stream. A single stream has a wide range of water velocities, depth, width, pools, riffles, vegetation (both in the water and on the shore) and the shape/characteristic of the shoreline. All of these characteristics influence water quality and in turn, influence the type and variety of habitats that are available to support aquatic life.

For example, a fast-moving stream is usually more turbulent than a slow-moving one. The speed and extra turbulence gives water the power to scour the stream bottom and banks and pick up sediment and other material. The faster the stream is moving, the larger the

materials it can pick up and carry with the current. In fact, algae and other organisms can't live in a stream or stream section that is moving too fast because of this strong scouring force. A stream's velocity can vary quite a bit, based on the season, depth, width, and curvature of the stream.

In the Puget Sound region, streams generally run higher and faster during the winter due to increased rainfall, and lower and slower during the summer. In the winter, when streams are already running at a higher velocity due to a greater volume of water, other factors can increase the velocity even more. In some places, culverts and stormwater runoff increase the amount of water in a stream. For impervious surfaces like parking lots, water that would normally soak into the soil now flows into storm drains or swales that may empty directly into streams. This unnatural increase of water in a stream can create higher than normal velocity (among other things), which can cause increased erosion and the removal of stream vegetation and aquatic life.

Hidden life of Macro Invertebrates

Macroinvertebrates are small animals that are visible to the naked eye and have no backbone. Most stream invertebrates are insects (either larval forms or adults), but worms, snails, mussels, crayfish and leeches are also macroinvertebrates.

Macroinvertebrates are often separated into four categories: 1) shredders, which use strong, sharp mouthparts to eat large pieces of leaves, bacteria and fungi, 2) collectors (or gatherers), which sieve the water through tiny hairs to collect smaller pieces of plant and animal matter, 3) scrapers, which scrape the algae, fungi, and bacteria off rocks and debris, and 4) predators, which… well, eat other macroinvertebrates.

Why is this important, you ask? As mentioned before, streams are patchy environments, so the relative abundance of the different functional feeding groups can tell us a lot about stream conditions.

The Biotic Index

For wadeable streams (streams you can walk through), scientists and citizen scientists often utilize the Biotic Index, which is a biological way to measure stream pollution by looking at aquatic invertebrates that tolerate various levels of pollution. (Pollution tolerance is often related to sewage and wastes that lower oxygen levels in the water).

The three classes that make up the Biotic Index include Class I – pollution sensitive, Class II – moderately tolerant, and Class III – pollution tolerant. Based on the number of different organisms (not total number of individuals) in each class found in the stream, and a little math, we can learn if a stream is clean or possibly polluted. A healthy ecosystem would have a wide variety of organisms from each class present. Just because an organism is found in Class III

doesn't mean it is only found in polluted water. It simply means that organism tolerates low oxygen conditions found in polluted water as well as healthier stream conditions.

When using a biotic index, it is important for the individual to be able to identify, if possible, the organism down to the species level. Simply saying "oh, this is a caddisfly" might not be good enough. What kind of caddisfly is it? To learn more about the Biotic Index Card, read about it here. To see a key to help start learning different kinds of macroinvertebrates, click here.

Streams and Human Development

Stream macroinvertebrates rely on natural nutrient inputs to support a healthy community. Many salmon species rely on a healthy macroinvertebrate population to feed young salmon in streams. In a study completed by the Washington Department of Ecology, it was found that the best macroinvertebrate communities occurred in stream sections (sometimes called "reaches") where the riparian corridor (vegetative buffer) was visually intact. Even impacts from land uses such as road runoff, culvert erosion, and/or upstream logging did not affect the relative health of macroinvertebrate communities if there was an intact, healthy, and forested riparian buffer. They found that stream organisms were most affected by land uses that could be seen from the stream and where no vegetative buffer was present, which allowed pollutants to reach the stream. Coho salmon numbers decreased in those streams that experienced higher degradation due to poor biological conditions for macroinvertebrates and obvious visual connections (no vegetative buffer) between stream and source pollution from land use.

Streams are the workhorses of the local watershed. Nutrients, organic matter, and other pollutants the streams collect from the watershed are dispersed along their path. Almost everything deposited in the watershed – and every parcel of land is contained in a watershed – eventually will reach a stream.

Because streams are constantly moving and are continually being replenished by rain and groundwater, they are self-cleaning. If we all do our part to remove and prevent pollutants from entering the watershed, streams will take care of themselves.

Practices that Help

1. Don't clear your land to the water.
2. Install, or keep, a vegetative buffer along stream shorelines. Contact your local Shore Stewards coordinator to be pointed in the right direction.
3. Use low-impact development (LID) techniques on your property to prevent increase water runoff.
4. Keep your septic system regularly inspected, pumped, and fixed, when needed.

5. Pick-up dog waste from your yard regularly and collect, contain, and cover livestock waste

These practices, and more, can help keep our streams healthy. Check out the Shore Stewards website, and link to the book, or more information.

Events

Free Shoreline Protection Workshop – Thursday, October 29

Shoreline landowners are invited to attend a FREE workshop on coastal processes and erosion management on Thursday, October 29, 2015 from 6:00 pm - 8:30 pm at Four Springs Lake Preserve: 585 Lewis Lane, Camano Island. Learn how you can protect and manage your shoreline property. Workshop topics include coastal and beach processes; erosion management; alternatives to hard shoreline armoring; benefits of bulkhead removal or reduction; use of native vegetation for slope stability and habitat.

RSVP required. Register online at: **https://www.surveymonkey.com/r/IslandFall** or contact Heidi Lehman at 360-733-1725 or lehman@nwstraitsfoundation.org.

A limited number of free technical site visits by coastal erosion specialists are also being offered to qualifying landowners. Attend the workshop or call 360-733-1725 for more information. This outreach effort is a project of the Northwest Straits Foundation, in partnership with the Island County Marine Resources Committee. Funding is provided by the Puget Sound Estuary and Salmon Restoration Program, WA Departments of Fish and Wildlife and Natural Resources, and US Environmental Protection Agency.

SHORE STEWARDS

Find us on Facebook

WASHINGTON STATE UNIVERSITY
ISLAND COUNTY EXTENSION