



Salt Spring Island Water Preservation Society

NEWSLETTER **SPRING 2013**

WPS RESERVE: A HOME FOR ENDANGERED ECOSYSTEMS



The Water Preservation Society's 272 acre nature reserve on the east-facing slopes above and to the north-west of St. Mary Lake can easily be seen from anywhere around the lake. This reserve, along with adjacent lands set aside by Channel Ridge Properties on the west-facing side of the hill, form the largest area of protected land in the north end of the island. But only the WPS-owned portion is under a conservation covenant and actively managed for protection of ecosystems.

"These undeveloped lands are remnants of the natural unbroken forest that used to cover most of Salt Spring. This forest is classified as the Coastal Douglas-fir (CDF) Biogeoclimatic Ecosystem Zone. It is the smallest of the 14 such zones in BC and is restricted to low elevations along south-eastern Vancouver Island, from Bowser to Victoria, the Gulf Islands south of Cortes Island, and a narrow strip along the Sunshine Coast near Halfmoon Bay". So, although it seems common to us, it is relatively rare.

"The CDF Zone contains some of the most imperilled of the coastal ecosystems. Since they occur along the coast, in regions favoured by people, they were some of the first forest types targeted for logging, and cleared for urban and agricultural development. Today, very few older forest ecosystems remain in the CDF zone, and those that do are highly fragmented. In other words, they exist as isolated "islands" among a landscape altered by human development."

Most of the WPS reserve was logged about 40-60 years ago, so it is considered an older forest rather than "old growth". But, since it is protected by a conservation covenant, in time it will become a mature forest. Currently less than one percent of mature or old growth forest in this zone remains and even much of that is under threat of logging.

That is why it is critical that we preserve our rare stands of forest that have the potential to become mature and support so many rare and endangered species.

But the WPS lands are even more rare than that. A biologist who examined the WPS lands in 2005 classified the property as in the CDF ecosystem "moist maritime" (CDFmm) subcategory. Of the three plant associations that cover much of the property, two are considered "critically imperilled" and the third is considered "imperilled" by the BC Conservation Data Centre. Critically imperilled is defined as "Extremely rare (5 or fewer extant occurrences or very few remaining individuals) or some factor(s) make it especially vulnerable to extirpation or extinction." Imperilled is defined as "typically 6-20 extant occurrences or few remaining individuals or some factor(s) make it vulnerable to extirpation or extinction."



The CDF is prime habitat for 15 red listed species, 8 of which are plants that exist only in the CDFmm subcategory. There are also 2 other plants, 11 birds, 3 mosses, 4 butterflies, two snails, two slugs, one frog and one snake that live in the CDF, that are likely to exist on Salt Spring and are considered to be either endangered or threatened.

There are documented occurrences of the following listed animal species within the greater St. Mary Lake Watershed that either have the potential to occur on the WPS lands, or have already been found there: Western Painted Turtle, Sharp-Tailed Snake, Olive-sided Flycatcher, Threaded Vertigo, Pacific Sideband Snail, Barn Swallow, Barn Owl, and Common Woodnymph. One species that has been seen on the WPS land is the Northern Red-legged Frog.

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SEPTIC FIELDS: HOW DO THOSE THINGS WORK ANYWAY ?

Before I moved to Salt Spring I had only had one occasion to know a septic field. My experience actually was before septic fields. When I was a boy we had a cess-pool. I was told not to put sticks down the vent. As a six year old, the day it was cleaned out was exciting. And that was my entire experience until moving to Salt Spring where I have tried to understand and make friends with ours. Our septic system, built in the 80's, is close to Cusheon Lake. When we moved in, I joined the Cusheon Lake Stewardship Committee and the Water Preservation Society where I met and learned how to respect and live with our septic system. What follows is what I have learned.

We all know that a septic system is designed to handle liquid waste from our homes. And it is likely we all know this system is usually made up of a septic tank, where solids accumulate and decompose and the septic field where the liquid effluent from the tank is distributed to the soil. The field is designed to be large enough so that the earth absorbing the effluent is not overwhelmed bringing the effluent to the surface. The field also allows further bacterial action to take place.

The system is designed to use biological decay to break down foods and other solids into water, carbon dioxide and other by-products such as ammonia. The bacteria in an ordinary system are anaerobic, that is, they live without oxygen and grow slowly. The process of anaerobic decomposition requires four stages: the first, called hydrolysis, breaks the huge molecules of carbohydrates, fats and proteins coming from house liquid waste into the smaller pieces of sugars, fatty acids and amino acids. The second stage known as acidogenesis (the making of acid) breaks these smaller pieces into carbonic acid, alcohol, hydrogen, carbon dioxide and ammonia. The third stage - acetogenesis - produces hydrogen, acetic acid and carbon dioxide. And finally the fourth stage - methanogenesis - results in more carbon dioxide and methane. It is the methane and ammonia that smells so bad and it is the methane that can be captured and burned.

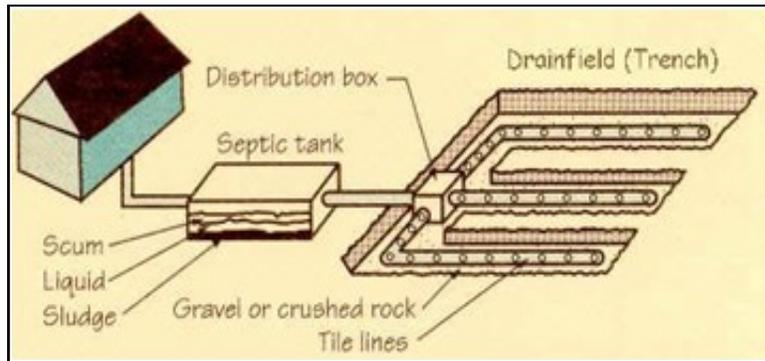
This is a complex and easily disturbed process which is why toilet cleaners and other strong cleaners can disrupt the system.

Returning to the septic system itself, there are two components of the waste water we need to remember as far as lake and water pollution are concerned. The second component important to lakes is phosphorus. See the next issue of the newsletter for a comprehensive discussion of phosphorus in septic systems and our lakes.

The first component, and arguably the most important, is bacteria that can cause illness. Septic systems were originally designed to deal with bacteria, and to this day high bacterial levels above ground is the only measurable issue the Vancouver Island Health Authority is concerned about with respect to septic systems. Current septic systems are made up of three parts: the large tank, the effluent tank and the septic field itself. The large tank collects all the liquid waste from our homes. Here the waste separates into three layers. The top layer, the scum, floats on top and is the home of a number of creatures including earth worms and beetles, who along with bacteria digest the wastes producing mainly water and carbon dioxide. The second layer is the effluent (often called black water) - a clear liquid containing dissolved waste and bacteria. The third layer, the sludge, sinks to the bottom where it too is digested by bacteria. One reason to ration your water usage (there are others) is to allow the waste water to sit as long as possible in this first tank so that waste breakdown is more complete.

The second tank, usually right next to and connected to the first tank, is a reservoir for effluent drained from between the two layers in the first tank. This second tank allows more biological breakdown to occur. The effluent leaves this second tank in one of two ways. If the septic tank is higher than the septic field, the effluent flows downhill from the top of this tank to the septic field. If the septic field is higher than the septic tank, the second tank collects the effluent from the first tank and when the liquid level reaches a certain depth, a pump turns on and pumps the effluent to the field.

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Schematic of a Drainfield

Taken from the following website:

[http://extension.umd.edu/
environment/water/files/septic.html](http://extension.umd.edu/environment/water/files/septic.html)

This site has other good diagrams.

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If your system has the tank lower than the field, it is important to place the pump 12 to 18 inches above the floor of the tank so that any solids that somehow get into the second tank have a chance to settle out and not get pumped to the septic field where they can collect and block the distribution pipes. It is also important to have an alarm attached to this effluent chamber so that in case the pump stops working, the effluent doesn't begin to work its way to the surface where children and pets can be exposed to the bacteria (or in my case it can flow on the surface to the lake).

The effluent from the septic tank is then distributed to the pipes in the septic field. This is accomplished through a pipe junction box called the "D" (for distribution) box. This is a very simple device that distributes the effluent evenly between the four, five or six underground pipes in your septic field. It is important to check the D box every four or five years to confirm that the equal distribution is still taking place. There are a number of reasons for uneven distribution: the D box may become filled with solids from the septic tank; the box may tip due to settling; or roots might grow into the box blocking one or more of the distribution pipes.

After leaving the D box, the effluent, rich in biological material and living bacteria, travels through the distribution pipes and seeps into the ground where it continues to decompose. Over time the bacteria die and decompose as well.

When a septic field is installed, it is important for large trees to be some distance away. since trees love the effluent and can grow vigorously by extending their roots through the holes in the distribution pipes and blocking them.

During the life of the septic field only grass should be grown on top of the field. Although vegetables and flowers will in fact thrive on top of a septic field, vegetables may absorb bacteria (fecal coliform) through roots penetrating down to the septic pipes, and that can cause serious illness. The roots of flowers, depending on the flower, can block the pipes. So short grasses are best.

Septic lines in the field can be easily traced during hot summers because the grass above the distribution pipes will grow quickly and be very green. This is due to the biological material in the effluent and the water from the plumbing. Bright green grass growing in areas not above the septic field during droughts may mean there is a leak in the septic system.

Septic fields have an average lifetime of 25 years more or less. Aside from root blockage or solids flowing from the tank and filling the distribution pipes a field may become so congested with biological material that effluent is no longer absorbed into the ground. When this happens, the entire field needs to be replaced.

There are ways to adapt a septic field to make it more friendly and efficient. These will be explored in a subsequent newsletter.

Although strange to imagine, the well cared for septic system is quite remarkable. It harnesses bacteria to clean up our wastes in a safe automatic way. It only requires a check and pumping every three to five years. For more information search the internet Under: septic systems.



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Older and large Douglas-fir forests provide specific characteristics for the species they support. The most endangered are often those that are dependent on dead or dying trees that are frequently removed in developed areas. "Red Squirrels nest in large Douglas-fir branches in the cavities created by woodpeckers. Spaces behind the bark of large, dead and decaying Douglas-fir trees provide safe roosting places for many of the 10 species of bats in the region, while woodpecker cavities are sometimes used as bat nurseries. Many birds, including some owls and chickadees and two species of swallows, also use woodpecker cavities for nest sites." These bats and insect eating birds help us by keeping insect populations under control.



The WPS lands are a good example of how protecting forest in its natural state serves so many valuable purposes: helping to protect St. Mary Lake drinking water, providing habitat for a variety of wild species and providing beautiful natural viewsapes around St. Mary Lake.



- ¹ CRD website: <http://www.crd.bc.ca/watersheds/ecosystems/douglasfir.htm>
- ² Ibid.
- ³ Living Landscapes Website:
<http://www.livinglandscapes.bc.ca/cbasin/history/speciesatrisk.htm>
- ⁴ Ministry of Environment Lands & Parks, "Coastal Douglas-fir Ecosystems", a brochure published in the series: Ecosystems in BC at Risk, 1999.

OUR EXECUTIVE

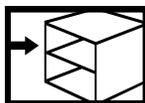
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COUNTRY GROCER TAPES

Please put your tapes in box #73



MEMBERSHIP

Since we're in a new year, please remember to renew your WPS membership soon for 2013. It's a 'can't-be-beat' value at only \$10 for individuals, or \$20 for family/couple.

Additional donations are **very** gratefully received, and help to keep WPS active, effective and working hard to protect our island waters. Tax receipts are issued.

Current members - mail membership fee to:
Box 555, Ganges PO, SSI, BC, V8K 2W3.

New members - request an application form to fill out & return.

Thanks everyone.

