



# WATERSHED NEWS

**Squamish River  
Watershed Society**

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## What's New This Year with the SRWS

We have had a busy year at the SRWS and will try to highlight some of the interesting projects and programs for you.

- Juvenile Chinook Outmigration Study (funded by PSF)
- Wetland Restoration in the Sea to Sky Corridor (funding MOTI)
- Education Outreach Program (funding from various sources)
- 2011 Rivers Day / Return of

the Salmon Festival to be held Sunday, September 25, 2011 at Britannia Beach

- Assisting Leigh Joseph on her riceroot lily research
- Seagrass Conservation Working Group Eelgrass Mapping and Restoration
- Invasive Species Weed pull of Himalayan Blackberry along the Squamish Training Dike Sunday, July 10, 2011

## Juvenile Chinook in Howe Sound

We started out in 2010 with approval to begin a study on juvenile Chinook salmon as they migrate down from the Squamish River and travel throughout Howe Sound. We are hoping to learn more about where the juvenile Chinook spend their time, how they are making use of the foreshore, and if there is competition between

wild stocks, hatchery stocks and stocks from other areas, such as Burrard and Puget Sound. The project commenced in April 2011 and involves a three person crew going out once a week onto the waters of Howe Sound to look at up to 3—5 sits per day out of a total of 13 sites. The crew does beach seining at each

of the sites collecting water chemistry data, fish identification, detailed information on Chinook salmon including fork length, weight, and DNA clipping. This information will be helpful to the Tenderfoot Hatchery in making any future decisions on the Chinook hatchery program.



## Education Outreach Program for 2011/2012



*Above Kimberley Armour is teaching the grade school children about invasive species through role playing.*

*Below are the teachers learning about the program in the estuary for that year (hanging out on one of the bridges on the Seagrass Trail)*



Last year we received enough funding to once again run the Rivers to Estuary Education Program for grades Kindergarten—7 with over 500 students from all seven of our local elementary schools coming out to participate. This year we hope to continue on for our 5th year and highlight some more of the restoration activities that the SRWS has been involved with over the years. In the past students have learned about the Squamish Estuary, Invasive Species Management, Riparian Planting, Fish Identification, What a Watershed Is, and have visited sites including the Squamish Estuary, Mamquam Reunion and the various newly constructed channels along Loggers Lane Creek including the Brennan Channel, the Ballfield Channel and lots more.

This program doesn't just provide education and experience for the school children but also engages volunteers and parents to come out and assist and also learn about the amazing natural areas near to where we live.

Without the assistance of our amazing volunteers, including support from Fisheries and Oceans Canada, District of Squamish, Quest University, Sea to Sky Invasive Species Council, Sea to Sky Streamkeepers, Squamish Trails Society (to whom we are very grateful for allowing us to partner with them this past year), the program would never have gotten off the ground. We are hoping to run this year's program either in the fall or in the spring of 2012 (depending if the teachers vote to work to rule) and are looking for people to help out once again. If you'd like to learn more about this amazing program or add your name to our volunteer list please either e-mail us at [srws@shaw.ca](mailto:srws@shaw.ca) or contact us at 604-898-9171.

Special thanks go out this year to VanCity, RBC Blue Water Fund, Pacific Salmon Foundation, and the Squamish Trails Society for providing us with funding support to continue for the 2011—2012 school year.

## 2011 Sea to Sky Corridor Rivers Day / Return of the Salmon Festival



Be sure to set aside Sunday, September 25th from 11:00 am to 3:00 pm to come out to Britannia Beach and join us for this year's Rivers Day and Salmon Festival. The event is suitable for the entire family and will include displays, salmon barbecue, tours of Epcor water treatment facility and the Howe Sound shoreline, as well as lots and lots of fun activities. For

more information or if you'd like to volunteer to help out please contact us at [srws@shaw.ca](mailto:srws@shaw.ca) or check out our website closer to the date at [www.squamishwatershed.org](http://www.squamishwatershed.org).



## Leigh Joseph—Getting back to her Roots

NICOLE TRIGG  
SPECIAL TO THE CHIEF

By Western standards, a garden or a farm is an easily recognizable, defined space for producing crops. But for the coastal First Nations, specific plants were tended in their natural environment, making their agricultural efforts invisible to the European settlers when they arrived.

Leigh Joseph, a Masters student in ethnobotany at the University of Victoria, is researching one such plant native to the Squamish estuary that members of the Squamish Nation once harvested as a major food source — the northern rice root, also commonly known as the chocolate lily or Indian rice.

“A common misnomer was that when European settlers arrived they looked and saw a landscape that to them looked like it was being wasted,” said Joseph, “but what was happening was a lot of plants in their native environment were being really intensively cultivated and weeded and fertilized, often with seaweed.

“There were traditional root gardens all through the estuaries here and up and down the coast,” she said. “Elders in the 70s... had the memories of rice root harvesting; they remembered their mothers and grandmothers going to harvest at a site further up the river.”

Today, rice root is listed locally as a threatened species. It has an edible root system that looks like a handful of rice grains clumped together in bulbets. A coveted sign of wealth at winter potlatches, it was an important source of carbohydrates in the traditional First Nations diet high in proteins and fibres. It could be eaten fresh but was often dried and preserved for winter use.

Joseph, whose father is a hereditary chief with the Squamish Nation, grew up in Victoria. As an undergraduate student, she spent her summers in Squamish working for the Squamish Nation Education Department (SNED), during which time she was introduced to the department’s project of reintroducing traditional foods back into the Squamish Nation diet.

“We didn’t have elders that were still holding the knowledge for the plant use in the estuary,” said her aunt Joy Joseph-McCullough, associate director for SNED, “so that’s why we collaborated with Leigh.”

Motivated by the department’s interest in estuary plant use, Joseph said she began to look for a plant to research that people were interested in. Rice root kept coming up.

“One of the reasons why I focussed on this plant was in the last four or five years working here, it’s come to my attention that people have

been talking about this plant and the majority of people who talk about it haven’t necessarily seen it before,” Joseph said. “For me, from a research standpoint, looking at how a plant that once was considered such a central food plant comes back into people’s psyches before the physical plant is actually there, it’s that idea of addressing health concerns by connecting to traditional foods.”

Using field ecology methods, Joseph has been collecting data to determine the prime conditions of the rice root plant. The goal of her research is to establish, in collaboration with the Education Department, an experimental and educational garden on the side of the estuary owned and managed by the Squamish Nation as a learning centre. The goal is to eventually sustain a certain level of harvesting there.

“We want to make more of a difference in our diet, to return back to our traditional diet for health purposes,” Joseph-McCullough said.

“The Indian rice or the chocolate lily... there’s an enzyme in it that our bodies as First Nation people naturally digest and we use everything up as opposed to store-bought rice. It’s harder to digest for our bodies.

“There’s a reason why we’re having such a high rate of diabetes, because our bodies aren’t used to it.”

Working closely with the Squamish River Watershed Society (SRWS), Joseph’s research has generated a great deal of interest from the general Squamish community — an interest she described as “meaningful.”

“We’re delighted to be working with Leigh Joseph and to be able to provide her assistance in her graduate research studies on the rice root lily,” said SRWS executive director Edith Tobe. “We recognize the cultural significance of re-introducing historic food sources for Squamish Nation in her field of ethnobotany and making it part of the current diet for Squamish Nation and the value that the rice root lily has to the ecosystem.”

Remarking on the strong cultural ties she feels to Squamish and its people, Joseph said her education and research have given her a way to “come home” to a place she considers home as much as where she grew up.

“I think the amazing thing about connecting to traditional foods is it also links you to your territory, your language, culture,” she said, “and so I think it addresses people, their mental health, physical health, emotional health, often it’s quite a healing thing to reclaim something from your past that you know you’ve been connected to through your ancestors for thousands of years.

“Knowledge of these traditional foods and medicines is, I really feel, coming back in a really good way and the community is really ready for that.”



Photo by Nicole Trigg –Special to the Chief

Masters student Leigh Joseph is partnering with the Squamish Nation to re-introduce the northern rice root — once an important source of carbohydrates for coastal First Nations — back into the community’s diet. Also called the chocolate lily, the plant’s Latin name is *fritillaria camschatcensis*. It is known as *lhásem* in the *Sʔwxʔwú7mesh* (Squamish) language.





## What is a Wetland and Why are they Important



Some native amphibians we would expect to see in our wetlands include the red-legged frog (and their egg masses which can be seen in the spring time); rough skinned newts (which have a very yellow belly); and red-backed salamander. Other amphibians in our area that are not shown in the photos to the left include north-western salamanders, western toads, wood frogs, and Pacific tree frogs. All of these amphibians need a stable wetland for at least a portion of their life cycle.

Have you ever wondered how much life there is in a wetland and how, even, do you identify what a wetland is?! Well, to start with, a wetland is an area that has hydric soils, or soil that contains moisture either permanently or seasonally. There are several types of wetlands including riparian zones along watercourses, fens, swamps, estuaries, bogs, and marshes. Much of the wetlands in and around Squamish are either marshes and swamps or estuaries (areas where fresh water meets ocean water creating a complex intermingling of brackish water - as can be found throughout the Squamish Estuary which is fed by the fresh-water systems of the Squamish River, the Stawamus River, and waters from the Mamquam River entering into Howe Sound). Wetlands are recognized as one of the most important habitats on our planet and in British Columbia remaining wetlands comprise around 5.6% of the province. These areas are important to fish, birds, amphibians, plants, flood control, water quality control, and play an integral role in maintaining a healthy vibrant ecosystem. Wetlands help to filter sediments and pollutants, including excess nutrients and can be a cost effective method to purify water. As well, wetlands recharge the groundwater, maintain stream flows, control stormwater runoff and flood waters. Wetlands reduce erosion, stabilize shorelines, regulate atmospheric gases and climate cycles and, in short, quickly absorb water and release it slowly over a period of time cleaning the water as part of the process. When left in-tact, wetlands can save municipalities thousands, if not millions, of dollars annually to do a far better job of flood management and water quality control than any artificial diking or water treatment plant ever could!



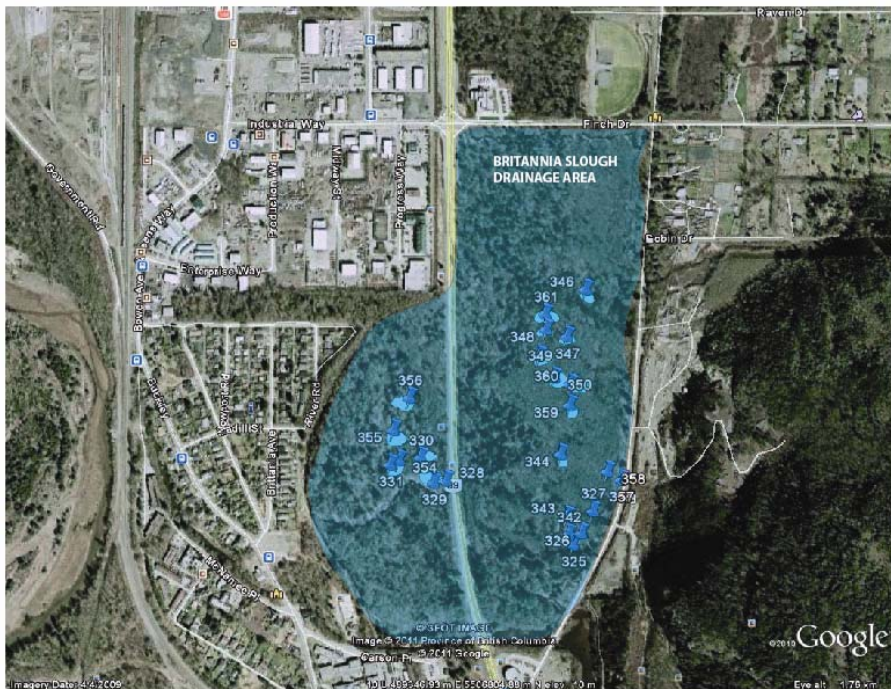
## Wetland Restoration in the Sea to Sky Corridor

Squamish has numerous watercourses and wetlands, not the least of which is the Squamish Estuary. Prior to the 1920's the Mamquam River flowed directly into Howe Sound through what is now Loggers Lane Creek and the Mamquam Blind Channel. A large flood event at that time changed the river to flow directly into the Squamish River. The former floodplain of the Mamquam River became the lands around Loggers Lane Road (where currently is the Brennan Park Recreational Centre, housing, and so forth). The number of wetlands and former stream-channels that were lost between the 1920's and the present remains unknown but we can assume that there was a significant change in land-use. Several of the larger tidal channels of the Mamquam Blind Channel remain to the present.

The SRWS hopes to recreate some of the habitat values associated with the former wetlands in this area. In the area around the Britannia Slough (see the diagram below) the intention is to recreate a series of wetlands. The Britannia Slough is an important area for amphibian species including red legged frogs, tailed frogs, wood frogs, spring peepers western toad and numerous salamanders. These species and migratory and resident birds make use of the large greenways corridors in this area. The site also provides an important waterway for numerous fish species including coho, chum, and pink salmon, cutthroat trout, Dolly Varden and steelhead as well as numerous not sports fisheries species (sculpins, stickleback, lamprey, etc.). The wildlife values include habitat for deer, otter, mink (and other members of the weasel family), bear and numerous other mammals.



Pacific Tree Frog



To the left is a map of the sites within the Britannia Slough that have been identified as being suitable for potential wetland restoration. Only around 8—10 wetlands in total will be created.



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## Calendar of Events:

Thursday, July 7, 2011—Invasive Species Tour  
from 5:15 pm: Meet in front of the Howe  
Sound Brew Pub

Sunday, July 10, 2011— Invasive Species Weed  
pull from 10:00 to noon: meet at Fisher-  
man's Entrance to the Squamish River Dike  
(Windsurfing Spit)

Sunday, September 25, 2011: Rivers Day / Return  
of the Salmon Festival from 11:00 to 3:00  
pm—meet at Britannia Beach for a fun filled  
day

Fall 2011—Education Outreach Program—stay  
tuned for dates and details

## Eelgrass Restoration in upper Howe Sound

For the past few years the SRWS has been working with the Seagrass Conservation Working Group to reestablish eelgrass (*Zostera marina*) back into upper Howe Sound where it was historically present. Eelgrass is an important aquatic species for the intertidal near-shore areas within the estuary providing shelter for fish, a food source for aquatic birds, and numerous aquatic species including crabs, mollusks and invertebrates. Eel-

grass beds also produce significant amounts of carbon for our carbon cycle. Squamish First Nations used to harvest herring roe laid on the eelgrass plants as part of their diet.

This coming year we hope to identify additional sites to those already being established along the Mamquam Blind Channel and we hope to reestablish a healthy vibrant aquatic ecosystem within our lifetime for future generations.



*Photos of volunteer support in preparing eelgrass for transplants into the Mamquam Blind Channel*

