ENVIRONMENTAL STEWARDSHIP

NEWSLETTER

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VISION

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"We, the Musqueam, will work together to take care of our territory so the following generations will know how to be self-reliant. We will remember our own history and as well, use our traditional teachings to take care of everyone and everything on this earth".

IN THIS ISSUE...

FROM THE EDITOR

Happy June Everyone!

On behalf of the Environmental Stewardship Department, I hope everyone has been enjoying the long days and warm weather. There is no better time of year to get outside and enjoy the beautiful lands and waters we are so lucky to call home. As we do, it's important to reflect on our role as stewards and guardians of this beautiful place. The Environmental Stewardship Department takes this responsibility seriously and takes pride in working to protect this territory on behalf of the Nation. We will continue to have a strong voice in representing the community's interests, needs, and priorities.

Many thanks and have a great summer,

Yeganeh Asadian, M.Sc., P.Ag., Environmental Stewardship Manager

PROTECTING STREAMS IN AN URBAN ENVIRONMENT

Green stormwater infrastructure is becoming more common within the urban sprawl of Metro Vancouver and other BC municipalities. This is due in part to stormwater runoff having adverse impacts on our streams, our water quality, and as a result, the people and wildlife that depend upon that water. As the diverse impacts of stormwater runoff become more apparent to the general public, green stormwater infrastructure is being viewed with greater importance.

Background

Recent flooding events in BC have brought newfound attention to water. Our relationship with water is on the forefront of people's minds. Before colonization on these lands, people would work with the flow of rivers, understood the tidal patterns, and avoided building permanent structures in areas that were known to flood. Since urbanization, municipalities have tried to manage and direct the flow of water

through stormwater systems in order to protect against flooding. However, these urban structures have had a profoundly negative impact on the surrounding environment.

In a natural environment, rainwater is able to infiltrate into the ground where it can enter into groundwater, be absorbed by plants, or flow into a stream or river. The soil and roots from plants serve to slow the flow of water as well as clean it. Rivers naturally take on complex patterns which slow down the water and allow for a diverse environment for fish to thrive in. A diverse mosaic of river, riparian, and wetland areas scatter the landscape.

In an urban concrete environment, rainwater is unable to infiltrate into the ground due to the abundance of impermeable surfaces, like concrete. According to the Fraser Basin Council, sidewalks and streets cover as much as 30% of an urban environment, with most of that water flowing into stormwater pipes. Without soil or vegetation to slow it down, rainwater moves much more quickly and picks up sediment and contaminants from the urban environment along the way. When it reaches a stream, it is usually at one concentrated point, leading to a "firehose" effect, which results in turbid waters and can lead to soil erosion. It can also result in high sedimentation, low oxygen, and pollution. These, along with the fact that many watercourses have been channelized which causes high currents and minimal cover, all contribute to low habitat quality for fish and aquatic life.

Mitigation Efforts

Different initiatives have taken root in BC which attempt to curb the impacts of stormwater on streams. Green spaces are being built in a way that not only beautifies the environment, but that can also handle large rainfall events. Bioswales are small landscaped channels, often adjacent to roads, designed to catch stormwater, allowing it to infiltrate into the ground and removing contamination in the process. By the time the water reaches a stream, many of the harmful chemicals have been removed and the flow has slowed, which reduces flooding. In one study, it was found that Coho salmon are extremely vulnerable to a prevalent chemical used to prolong the life of tires that is found in road runoff. When exposed to stormwater from roads, it resulted in 100% mortality for Coho spawners. However, when that same water had entered through soils and green infrastructure, all of the fish tested survived.

A report from the Fraser Basin Council titled "Showcasing Successful Green Stormwater Infrastructure" highlights promising projects in the Metro Vancouver area. One example is of a bioswale in the median strip along Lougheed Highway in Coquitlam. The 400-meter strip of vegetation is part of a pilot project to test the effectiveness of engineered soils in removing contaminants from highway runoff. The bioswale protects fish habitat in Como Creek, where the water is discharged. Water quality assessment for this bioswale identified significant improvements, with 75-90% of the pollutants removed.

In another example, the Mountain Equipment Co-Op Head Office and its Green Stormwater infrastructure was highlighted. Bioswale areas are composed of native plants, which, in addition to the benefit of fostering native vegetation, reduces the need for irrigation and offers greater drought resistance. Rainwater is captured from its "blue-roof", which covers about half of the building footprint. The rainwater is used for purposes such as toilets and irrigation, and reduces non-potable water use by 55%.

Initiatives also are being taken by individuals and communities. The Cougar Creek Streamkeepers are "an informal group of volunteers dedicated to restoring and maintaining the health of Cougar Creek", a salmon-bearing stream in Surrey and North Delta that flows into the Fraser River. In addition to stream

monitoring, salmon release, and restoration projects, they manage 29 rain gardens throughout North Delta. They have learned that the standard approach is not always the best one. Using engineered approaches like gravel and geotextile fabric have led to flooding in certain areas, which, when removed and replaced with more natural features, led to better flow the next year.

Summary

Although urban sprawl continues to grow, there is hope that greater consideration can be brought into these urban spaces, and how they impact the surrounding nature that sustains us. Successful implementation of comprehensive green stormwater infrastructure will require the help of everyone, from the backing of institutions, the action of community, and the awareness of individuals. As this awareness spreads, our relationship with our surrounding environment becomes clearer, as well as our willingness to address ecological issues with creative solutions. While the goals to restore nature and achieve true sustainability seem distant, it is hoped that solutions provided by green stormwater infrastructure will help mitigate impacts in the interim.

THE DECLINE OF BEE POPULATIONS

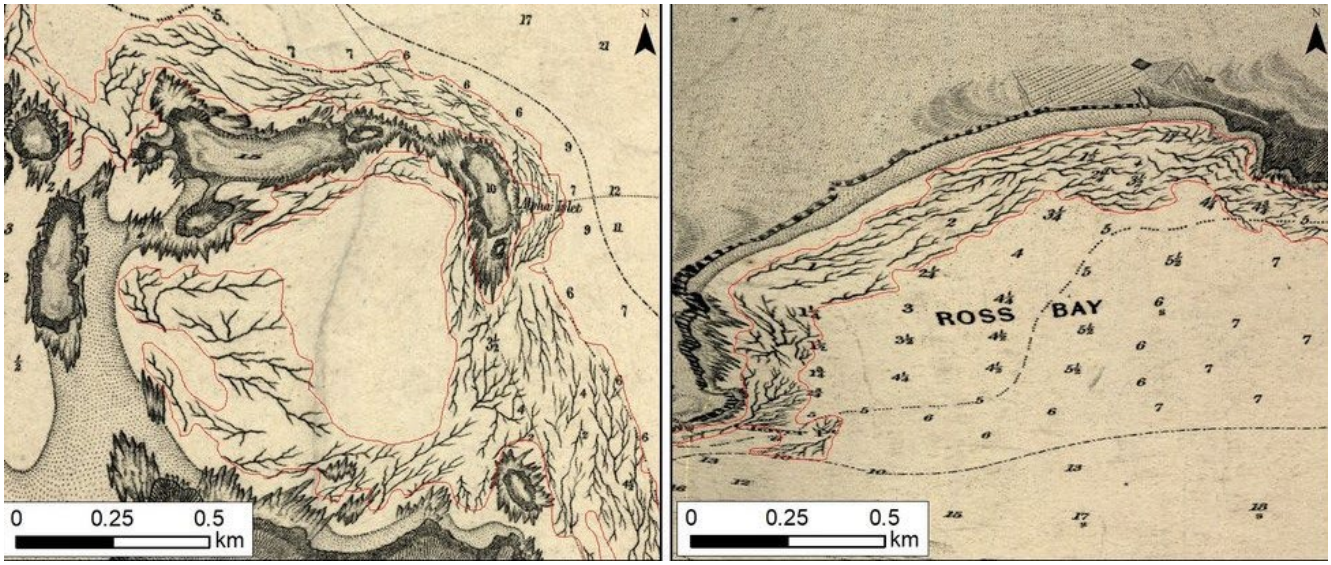
Bees are beloved by many people and play a vital role in ecosystems and human food production. However, due to land use regulations, the decisions of individuals and other factors, bumble bee populations have fluctuated over the last 100 years. A report published by the U.S. government to determine whether insects should be protected under the country's Endangered Species Act has found that heat waves and droughts have decreased the western bumble bee's presence by 57% since 1998. Across its wide-ranging habitat, this could lead to the bees being all but wiped out from its historic habitat, which ranges from alpine meadows and forests to prairie grasslands. In Canada, The Committee on the Status of Endangered Wildlife, designated the western bumble bee, *Bombus occidentalis*, as 'threatened' and the subspecies Bombus occidentalis mckayi as 'special concern' in 2014.

Many factors are causing the decline in bumble bees. In Canada, a type of insecticide called nitroguanidine neonicotinoids, or neonics, has been shown to strongly impact western bumble bees. Paul van Westendorp, B.C.'s provincial apiculturist, said it's standard for seed producers to douse their

product in neonics regardless of its actual need, similar to the overuse of antibiotics. Drought also harms bees by making plants produce fewer flowers and lower-quality pollen and nectar. Drought can also kill or prevent plants from growing, which can leave bees without food. A report found that extreme heat was the most significant factor hurting bees, having almost three times the effect of drought. The report also found that as climate change worsens, so will its impact on bees. Another cause of population decline is the reduction in biodiversity, often caused by monoculture farming and habitat loss, which impacts the timing and availability of their food sources.

While bee populations are in decline, many solutions could help reverse this trend. Bumble bees are important pollinators, but they are at risk by the presence of neonics in their environment. Integrated pest management should be used instead of the unnecessary use of pesticides and herbicides. By doing so, it is possible to significantly reduce their use without reducing the food produced. Farmers can also plant species that provide food for pollinators along the boundaries of fields. Individuals can also benefit bees by planting native pollinator friendly plants in their yard.

MAPPING KELP IN BC



Found in more than a quarter of the world coastlines, including throughout BC's coast, kelp is one of the most important and iconic species in our waters. BC is home to two species of kelp, giant kelp and bull kelp. These algae can reach up to 40 m tall and grow almost a foot per day. Kelp thrive in cold water and need hard substrates to anchor themselves to, making them perfectly suited to grow in our coastal environment where they often form large dense clusters. Because of this, they are often referred to as the rainforests of the oceans.

Kelp plays a vital role in marine ecosystems. Their enormous size and large numbers create complexity in the water, creating habitat for a large number of species. Kelp forests provide important shelter and feeding area for young fish like salmon, herring and rockfish. In this way, kelp forests act as a nursery for many species, contributing to the abundance of marine life and health of many species. Some species like herring, use the kelp directly for laying their eggs, while countless other species, like crabs and starfish, live in the forests. Another important role of kelp is to act as a physical barrier against powerful

waves and storms. This not only provides shelter for many species, as mentioned, but also reduces erosion and protects the shoreline. Kelp has also been found to sequester and store large amounts of carbon dioxide, helping to fight climate change. Despite these enormous benefits, the causes and extent of kelp decline have not been thoroughly studied.

There are several reasons why there has been a decline in kelp numbers over the last century. Firstly, kelp is very vulnerable to changing conditions, especially temperature, which makes it susceptible to climate change. Kelp is also vulnerable to pollution and increases in turbidity. This means shoreline development, industrial activities and other anthropogenic activities can all impact the health of kelp. Another human induced threat is changes in food web dynamics. Kelp is in a fine balance with both sea otters and sea urchins. Sea urchins can eat the rootlike structures of kelp, called holdfasts, at a rapid pace but are kept in check by sea otters which eat sea urchins in large numbers and depend on kelp forests for habitat and shelter. Unfortunately, sea otters were hunted nearly to extinction by the early 20th century. This caused an explosion in the number of urchins and therefore a decline in kelp. Because of these impacts, the conservation group Ocean Wise estimates that around half of kelp forests in the world are in decline.

BC has also seen declines in kelp abundance over the last century, though the extent has not been well studied. Geographer Maycira Costa and her team at the University of Victoria are working to address this gap in knowledge, in collaboration with Indigenous communities, government agencies and non-profits, by using a combination of old and new technologies. Her team is using British admiralty charts from 1858 through 1956 to create a map of historical kelp distribution. According to Costa, “kelp was considered a navigational hazard, so the British carefully annotated all kelp forests on their charts''. This historic map can then be compared to modern distribution maps made from satellite images and government kelp inventory studies from the 1970’s to 1990’s. This allows research to see exactly how the distribution of kelp has changed over time. According to Costa, kelp forests have previously been studied over limited geographic areas and short time scales but this provides relatively limited information since kelp growth or loss can be very dynamic and variable over short time scales.

These detailed maps can be used in many ways. Comparing maps allows researchers to determine areas where kelp has disappeared or declined and areas where it has been resilient. By comparing this with information on human activity, ocean conditions and other factors, researchers can learn invaluable information on why some areas have been resilient and some areas have been degraded. This information can be used in several ways. It will help inform marine spatial planning, fisheries management, kelp harvesting, aquaculture and where to prioritize conservation. It will also aid not only in determining where to prioritize restoration efforts, but how. For example, by identifying strains more resistant to the higher ocean temperatures expected in the future.

All this valuable information is only useful if it can be used by those involved in decision making and the management of marine areas. That is why Costa and her team are working with stakeholders, like First Nations, to integrate the data and satellite technology into their existing programs. This helps to disseminate the information and improve its usability. Hopefully, this research can help improve the health of our marine environment and promote a resilient strong blue economy and coastal communities.

SPRING EVENTS AROUND VANCOUVER

** Please note that all events are in accordance with BC Health & Safety Guidelines regarding COVID-19**

- **VCT Presents Silent Movie Mondays at the Orpheum Theater, June 5th and July 10th**
  Escape to the 1920s silent movie era with Silent Movie Mondays, Vancouver Civic Theatres' new film series hosted at the historic Orpheum theatre, June 5, and July 10, 2023. The nostalgic experience features screenings of popular silent productions accompanied by live music played on the theatre's original Wurlitzer organ – an instrument developed to accompany silent films and the last in Canada still performing in its original home.

- **Vancouver Canadians**
  Take me out to the ballgame! Enjoy the footlong hotdogs, the peanuts, the sushi run? It is all there for you when you watch the local minor league Vancouver Canadians at Nat Bailey Stadium. Relax in the sun at these exciting games have a great atmosphere and are a great activity for the whole family.

- **Vancouver International Children's Festival 2023, May 30th – June 4th**
  Enjoy spectacular performances from around the globe for kids and families of all ages at the Vancouver International Children's Festival May 30 to June 4, 2023. The 2023 Festival will offer a mix of in-person (on Granville Island) and online performances of circus arts, puppetry, theatre, dance, music and lots of arts activities created just for children. For more information visit www.childrensfestival.ca.

- **Vancouver International Jazz Festival, June 23rd – July 2nd**
  The Vancouver International Jazz Festival is held in multiple locations across the beautiful city of Vancouver. Framed by mountains and the ocean, this idyllic location is the perfect place to get your musical fix. This year will be the 38th year of the Festival that has featured thousands of artists in free and ticketed shows across hundreds of venues in Vancouver. This annual event is not to be missed. For more information visit https://www.coastaljazz.ca/.

- **Honda Celebration of Lights 2023, July 22nd, 26th, and 29th**
  The Honda Celebration of Light is the longest running offshore fireworks competition in the world. Each year, the event welcomes over 1.25 million people to the shores of English Bay in Vancouver to enjoy three nights of spectacular fireworks by the world's best pyrotechnic teams. This year will feature teams from Mexico, Australia and the Philippines. For more information visit https://hondacelebrationoflight.com/.

- **Brewery & the Beast, July 9th**
  Art Vancouver, Brewery and the Beast is a one-of-a-kind culinary event that brings together an extraordinary line-up of chefs and beverage makers to deliver a feast including fire-kissed meats. Live music from award winning recording artists provides the soundtrack for an ultimately memorable experience. For more information visit https://www.breweryandthebeast.com/.

For many more events taking place in Metro Vancouver this winter, visit Destination Vancouver's website at https://www.destinationvancouver.com/events/calendar-of-events/.

CONTACT US

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