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”.

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FROM THE EDITOR

Happy March Everyone!

On behalf of the Environmental Stewardship Department, I hope everyone has been having a pleasant winter. For many, spring is an uplifting time with longer days, warmer weather, and nature blooming back to life. We hope you can all take advantage and enjoy the beauty spring has to offer. The Environmental Stewardship Department is working hard to continue being a representative voice for Musqueam and their lands, water and territory. We look forward to continue working on initiatives, and projects, that will leave a positive impact on the community and the environment.

Sincerely,

Sarah Skapski, Interim Environmental Stewardship Manager

METRO VAN WILDLIFE CAMERAS SHOW SUCCESS OF CONSERVATION INITIATIVES

Metro Vancouver operates a series of parks and protected areas throughout the region. These include the Capilano, Seymour, and Coquitlam watersheds, which are primarily to protect the reservoirs and ensure Metro Vancouver's drinking water supply is as clean as possible. These areas are off limits to the public and any kind of industrial activity or development. Because of this, they are large, intact and healthy ecosystems. Totaling approximately 52,371 hectares, they are very ecologically diverse and important protected areas, even if they were not created directly for this purpose.

To assess how animals are using these areas, Metro Vancouver started a small-scale program in 2017 using wildlife cameras to capture photos and videos of animals found in the protected watersheds. Not surprisingly, these cameras have captured a wide range of species including deer, bears, cougars, coyotes and bobcats. According to Jesse Montgomery, the manager of Metro Vancouver's environmental program for water services, these temperate coastal forests have high biodiversity in part "because it's so well-connected with other wilderness areas, particularly to the north toward Garibaldi and Pinecone Burke Provincial Park". Therefore, "you get these big, protected wildlife habitat areas in

place". More surprising was the presence of Roosevelt elk and wolves, which were previously extirpated from the area.

Many species that were previously abundant in the region saw large population declines starting about 150 years ago due to hunting, urban development, and other factors. This includes wolves and Roosevelt elk. Elk in particular haven been extirpated from the south coast since around 1900. In an effort to help maintain and restore Roosevelt elk populations in BC, the province began relocation programs in the 1980s. The first efforts focused on relocating elk from Vancouver Island to the Sunshine Coast. While the elk are provincially blue listed, they are abundant in many parts of the island, so much so they are sometimes considered a nuisance and come into conflict with humans. Elk were relocated from the east coast of the island near Sayward and the Salmon River to the Sunshine Coast, including the Sechelt Peninsula and Powell River. These relocated elk have since thrived. The success of the first relocations was followed by the "Lower Mainland Roosevelt Elk Recovery Project", which started in 2000. This program involved relocating elk from the Sunshine Coast to areas around the lower mainland. Of 25 regions in the South Coast that were originally identified, 19 have been successfully repopulated as of 2015. This has increased the number of elks in the region from about 315 in 2000 to around 1600 in 2015.

Through relocations like these, elk can be moved from areas where they are abundant, and sometimes a nuisance, to areas within their historical range where they are extirpated or in low abundance. This helps to "spread the wealth" and ensure healthy, sustainable populations throughout the province.

According to Billy Wilton, a wildlife biologist with the BC Government, "reintroducing elk to their historic range helps restore biodiversity. They're a piece of the puzzle that went missing. Roosevelts are large, generalist grazers, so taking them out of the system impacts plant composition and has implications for a whole range of species". Elk are also an important food source for top predators. This includes wolves, who like the elk, have seen their numbers drastically reduce in the region. However, as the elk have returned and increased in numbers, so too have the wolves. Metro Vancouver's cameras caught sight of these wolves in the north end of the protected watersheds. "The wolves would have been considered to have been extirpated from, effectively, the South Coast portion of B.C. due to hunting and prey and other pressures over the last many decades," said Montgomery, "I believe in 2017 or 2018 we saw them for the first time since they went away many decades (ago)".

The return of these iconic species shows how successful relocation programs can be, and that animal populations can rebound quickly when they are given sufficient high-quality habitat, like those found in Metro Vancouver's protected watersheds. It also shows how vital links between animals are. The elk relocation programs have not only been hugely successful for the elk, but many other species of plants and animals that depend on them, like the wolf.

EELGRASS RESTORATION EFFORTS

While it is sometimes mistaken for seaweed, eelgrass is one of the keystone species that holds our coastal ecosystem together. Eelgrass is a flowering vascular plant that grows in shallow, flat parts of the marine coastline. Eelgrass meadows form some of the richest ecosystems in the world. It is estimated that eelgrass habitat supports 394 resident and migratory species in the Salish Sea. They create refuge for Dungeness crab, nursery areas for juvenile fish such as salmon and rockfish, and sources of food for resident and migrant birds. They also provide stable substrate for shellfish and invertebrates to grow on, and protect the eggs of squid, herring, and other species with their leaves.

Ecological Benefits

Despite occupying only 0.2% of the seafloor, seagrass meadows (including eelgrass) capture 10-18% of all the carbon sequestered by the world's oceans. That amounts to 48-112 million tons of carbon captured per year. They capture 35 times more carbon per area than tropical rainforests and can store it for millennia if left undisturbed. To put it another way, the 400 square kilometers of eelgrass in the Salish Sea is estimated to capture about the same amount of carbon as the 299,000 square kilometers of boreal forest in the province. However, this staggering amount of carbon can also be released as the eelgrass habitat is uprooted and disturbed, adding another layer of importance to their preservation.

One major concern along the Salish Sea is coastal erosion. In addition to protecting a wealth of species, eelgrass also protects our coastlines by holding down sediment and providing an important buffer against severe storms. As climate change accelerates, and intense storms become more common, eelgrass will continue to play an important role in mitigating these effects.

But increased storm intensity is not the only concern that climate change brings to marine ecosystems. Increasing levels of CO_2 being absorbed by the ocean also leads to ocean acidification, making it difficult for many species to create strong shells and skeletons. Amazingly, a recent study demonstrates that eelgrass can alleviate acidic conditions, creating an important buffer zone for crabs, bivalves, zooplankton, and other species that are dependant on their shells for survival. On top of this, every square metre of eelgrass can produce an incredible 10 litres of oxygen per day, filter polluted runoff, and absorb excess nutrients in the water.

Conservation Efforts

Eelgrass meadows, seemingly meek ecosystems, punch way above their weight in many aspects, providing crucial nurseries and habitat refuge to providing oxygen, sequestering carbon, and providing a buffer against climate change. But despite the wealth of benefits seagrass provides for our coastal communities, its role as a keystone species has long been overlooked. Since the colonialization of the Salish Sea, eelgrass habitat has been steadily disturbed and destroyed. Coastal developments, boat activity, and barges block sunlight and uproot vegetation, while warming temperatures and pollution result in algal blooms that smother seagrass beds. All of these effects have resulted in an estimated global of decline of 7% each year since 1990. This makes seagrass one of the most threatened ecosystems in the world, comparable to mangroves, coral reefs, and tropical rainforests.

In response, a number of conservation organizations have been working to protect and restore eelgrass habitat in the Salish Sea. SeaChange is a small conservation organization made up of about 15 staff, and has begun a number of efforts. In areas where seagrass has been lost, transplant efforts have been conducted, and with great success. In 2022, SeaChange planted more than 2,000 eelgrass shoots along Burrard inlet. In some areas, 100% growth within a year has been observed. In these transplant areas, fish and crabs can be seen entering the habitat almost immediately. Within a few months, underwater cameras show the areas teeming with sea life. However, transplanting is not always a success. Eelgrass must have certain conditions met to thrive including specific sand grain size, a flat ocean floor incline, and waters less than 7 meters deep along the shore for adequate sunlight. “Restoration is always Plan B. Plan A is conservation,” concludes Fiona Beaty, a regional coordinator for SeaChange. Still, eelgrass transplants play an important role in restoring areas that have historically been home to seagrass meadows, and that were once teeming with life.

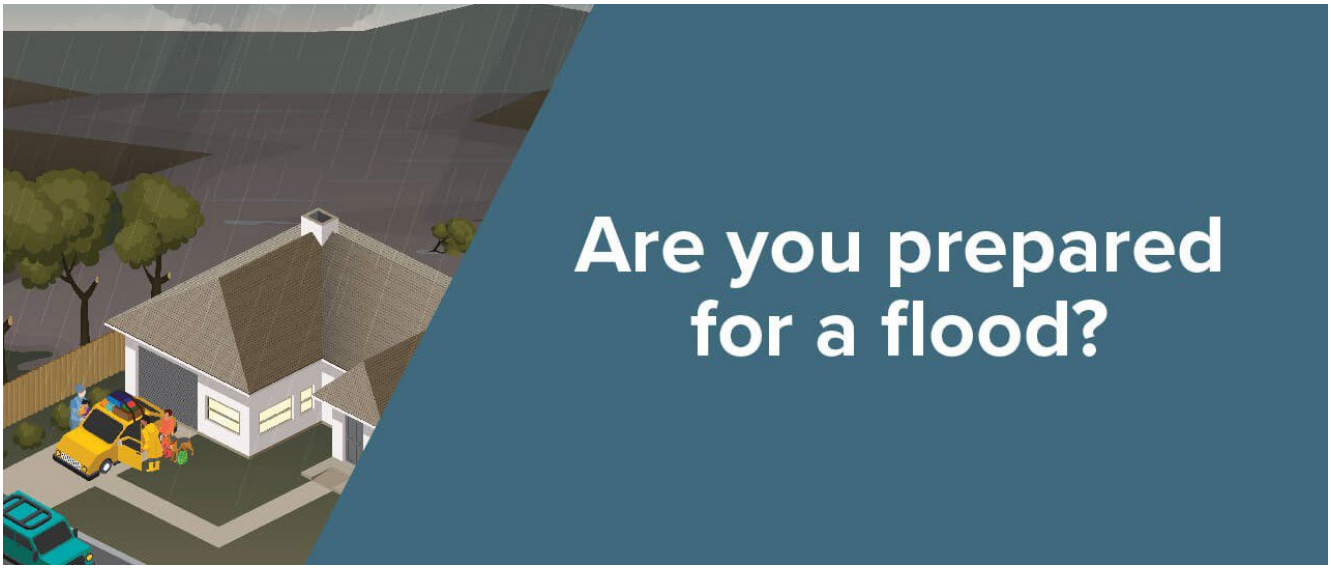
In 2021, SeaChange set up voluntary no-anchor zones in Mannion Bay off Bowen Island to protect seagrass meadows from being uprooted by anchors and blocked by boat presence in shallow waters. Through discussions with local communities and the municipality, buoys were strategically placed along the perimeter of the eelgrass habitat. Each buoy reads “Voluntary: Help Protect Eelgrass” with an image of an anchor over eelgrass being crossed out. Even though eelgrass is not protected by law, the level of ownership taken by the community has been remarkable. Mannion Bay residents would inform the municipality if boats were seen anchoring in the voluntary zone, even though there was nothing the municipality could do to compel boaters to stay out of the eelgrass areas. But since additional buoys were placed to ensure proper coverage two years ago, and as more members of the community understood what the program was about, no boats have been observed anchoring in the area. Beaty likes the voluntary approach because it helps encourage the community to take ownership and protect the meadows. “When you say that it’s a voluntary thing, if boaters really want to access that area, they still can, but we’re asking for their agreement and compliance”.

The types of boat anchors that are used can also make an impact. Heavy metal chains drag along the seafloor, uprooting eelgrass and everything else in the area. As an alternative, nylon rope with a float in the middle prevents interaction with the sea floor during low tide. And because it is not scouring the sea floor, it lasts much longer without needing to be replaced. SeaChange has voluntarily installed these anchors for waterfront owners. Simple design changes to docks to allow more sunlight can make a big difference for the underwater meadows. Education, and consciousness among individuals and the

community of the impacts on seagrass, can lead to small, gradual changes that help turn the tide for these underwater refuges.

In light of the successes seen in Mannion Bay, similar programs are being carried out in other areas. While compulsory laws play an important role in the protection of wildlife, these voluntary efforts paint a striking picture of the power that community involvement can play in ecological conservation. Rather than feeling imposed upon, community members feel empowered and take ownership of the protection of these eelgrass beds. Once people understand the important functions that eelgrass provides for the ecosystem, they tend to want to protect it. “Most people want a healthy ocean”, Beaty says. The success of the voluntary no-anchor zone on Bowen Island paints a promising picture of what could be possible on shores throughout the Salish Sea, and the willingness of people to protect critical ocean habitat.

ENVIRONMENTAL ISSUES: FLOODING



The Musqueam Reserve, and much of the traditional territory of the Musqueam People, has always been prone to natural cycles of flooding, which contributed regularly to the Fraser Delta. While these cycles were an inherent reason why the rich loam soil of the Delta lands of Ladner, Delta, Richmond and other regions were so fertile, the man-made changes on the landscape have altered this cycle. Added to this, environmental and climate changes have had increasing impacts on water and weather cycles, with consequences for flood events.

Certain effects of these climate shifts which can affect flooding cycles are rising sea levels, shifts in seasonal weather patterns and even drought. Extended dry periods can alter soils to be less capable of initially absorbing rainfall, a condition known as “Hydrophobic soil”, which causes flash floods or excessive run-off which can overload stream courses. For Musqueam, the most common impact of most environmental changes or disasters is increased flooding, both in the territory and on the reserve lands themselves.

In the past, portions of the lower reserve (IR2) have been subject to floods, requiring emergency evacuation. Mitigation measures, including dykes and drains, were put in place to aid in preventing further damage. However, in a storm surge, extreme rainfall, a high Spring Tide or a tsunami, these

measures could be temporarily overwhelmed. Some of these concerns can be dealt with through engineering projects, however this article is concentrated on what can be immediately done by people residing on the reserve.

Long-Term Preparations

Homes with basements and the first floors of a residential building should be examined for potential flooding damage and hazards. During a heavy rainfall that struck the Musqueam area in the early 2000s, many residential basements were heavily and suddenly flooded by run-off waters, and emergency pumps were unavailable. Additionally, ground water levels can rise during floods, even if there is not surface build-up, causing flooding of homes from beneath. Bearing these aspects in mind, vulnerable parts of lower floors to consider are:

- Sleeping quarters on ground or in basement levels. If flooding is slow and at night, residents may wake to find water around their bed, making escape difficult.
- Basements and first floors are usually where infrastructure and major appliances are located, such as hot water tanks, freezers, electrical panels, etc., that could be damaged or become hazards when immersed. Large appliances might also shift or become disconnected during severe flooding.
- Basement or first floor electrical outlets could be immersed during floods.
- Rising ground water could overcome floor drains, sewers, sump pumps or other intended drainage.

Solutions or Mitigations:

- Most importantly, create a family plan of a safe meeting place and who to contact, in advance.
- If you have sleeping areas in basements or on ground floors, consider installing a flood alarm that can alert sleepers to water presence earlier.
- In some homes, hot water tanks and electrical main panels have been installed or moved to upper floors. In many cases, preparations for the same involve raising large appliances onto raised platforms to keep them out of potential flood waters. Appliances can also be secured to prevent shifting.
- Consider having basement or ground level floor electrical outlets raised to prevent immersion.
- Ensure your sewer system has a non-return valve in order to prevent back-up during floods.
- Store all important and irreplaceable items in upper floors to prevent being lost to water damage. Such items would include: important documents, family photos, and culturally significant/family heritage possessions.

And finally: create a **"Grab and go Bag"**. Get a backpack and have it in a handy safe place with essential items in case of emergencies evacuation. You will likely not have time in an emergency to gather things together, so you need to be prepared. The bag must be stored somewhere ready at a moment's notice and must be checked regularly to inspect for damage or rotate food and medicines. The bag should have:

- Long storage emergency food and bottled water.
- Phone charger, batteries, flashlight and even a small radio.
- First aid kid and extra prescription medications.
- Toiletries (soap, wet wipes, toilet paper, hand towel) and extra glasses or contact lenses.

- Signal whistle, emergency blanket, pen and notepad.
- A copy of the family emergency plan, contact info, and photocopies of important documents (passport, driver's license, status card, home and vehicle insurance, etc.) in a double-sealed set of Ziplock bags.
- Spare clothing items.

<u>During a flood warning:</u>

- Monitor radio, TV and social media for updated news and official warnings. Be careful of personal social media accounts, though, as they might be very localized or motivated to post attention-grabbing content over accurate information.
- Be careful of using tap water. Unless tested, there may be contamination. Use boiled or bottled for consumption, teeth brushing or dishes
- If there is no flooding yet, move electrical appliances and vulnerable furnishings out of vulnerable areas and shut off power to parts of the house that might be submerged. Do not do this if there are flood waters in the house, as you could be at risk of injury or electrocution.

<u>Evacuation:</u>

There are three stages: **Alert, Order** and **Rescind.**

Evacuation Alert: Prepare to evacuate. Get grab and go bags and have them at door or in a vehicle. Make sure the vehicle has fuel/charge, is parked in a place where it will not be flooded or stranded, and pack supplies. Know your escape routes, especially which ones might be affected by flooding or overflowing streams. Ensure preparations are made for Elders, vulnerable people and pets.

Evacuation Order: You are at risk and must leave. Follow instructed evacuation routes and find out if evacuation centers have been established. Do not try to cross overflowing streams or flooded areas of roads. Six inches (15cm) of flowing water can knock over a person, a foot of fast water (30cm) can sweep a vehicle off the road.

Evacuation Order Rescinded: Do not assume everything is safe. Keep monitoring news for any new alerts, roads or routes may be damaged, and flooding damage may have made areas around or in your home unsafe. Return with caution.

These are readiness instructions for the most extreme conditions, however; **Prior Preparation Prevents Poor Performance.** A few simple precautions can aid, not just in case of flooding, but for other natural disasters as well. Most importantly, to treasure and protect your family.

For more information about emergency and flood preparation, please visit the follow websites:

- https://www2.gov.bc.ca/gov/content/safety/emergency-management/preparedbc
- https://www.sac-isc.gc.ca/eng/1397740805675/1535120329798

SPRING EVENTS AROUND VANCOUVER

- **Cherry Blossom Festival, March 29th to April 25th**
  Only in bloom for a short time, don't miss the local spring tradition of touring through the city's beautiful cherry blossom trees. This year's event features guided walks, fairs, picnics and tons of other fun events you won't want to miss. For more info visit https://vcbf.ca/the-festival/.

- **Coastal Dance Festival, March 1st to March 3rd**
  Dancers of Damelahamid present the 17th annual Coastal Dance Festival, honouring Indigenous stories, song, and dance from across Canada and around the world. The three-day festival showcases a dynamic line up of regional artists, including audience favourites: Chinook Song Catchers, Dakhká Khwáan Dancers, and Rainbow Creek Dancers, among many others. Visit https://damelahamid.ca/coastal-dance-festival-2024/ for more info.

- **Hidden History and Sweet Treats Tour, Weekly on Saturday and Sunday**
  Step inside downtown's iconic heritage buildings and hear the tales of intrigue that hide behind their walls. Take a stroll through the heart of Vancouver and finish off with a private viewing inside the Marine Building, all while enjoying a selection of 3 delectable sweet treats from some of the city's finest pastry chefs and chocolatiers. For more information visit https://forbiddenvancouver.ca/.

- **An Evening with Jane Goodall: Celebrating 90, April 12th**
  Dr. Jane Goodall's talks never fail to inspire people of all ages as she recounts her unique experiences as a young woman working alone in the rainforest and her hope for a future where people live in harmony with nature. Special Guest and Canadian icon, Jann Arden, will host a fireside chat with Dr. Jane following her lecture. For more info visit https://vancouvercivictheatres.com/events/jane-goodall-celebrating-90-apr-12-2024/.

- **Art Vancouver 2024, April 11th to April 14th**
  Experience Western Canada's most prestigious art, featuring artists from across the country and around the world. Over the years, Art Vancouver has evolved into a space where the contemporary art fair unites nations through art. With the show attracting a carefully curated selection of galleries and artists from across Canada and beyond, the event has become a platform for networking and collaboration within the global art community. For more information visit https://www.artvancouver.net/.

- **Silent Movie Mondays - Go West, April 8th**
  Escape to the 1920s silent movie era at the Orpheum theatre! Vancouver Civic Theatres is thrilled to present Silent Movie Mondays, an immersive experience that screens popular silent films accompanied by dramatic music played live on the historic Wurlitzer organ – the last theatre organ in Canada still performing in its original home. For more info visit https://vancouvercivictheatres.com/events/silent-movie-mondays-go-west-apr-8-2024/.

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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