



Krummholtz at Young Point

photos and article by James Schwartz

The rugged headlands of Young Point jut out into a wide and open section of the Salish Sea where they are subject to the prevailing southeasterly winter winds. The funnelling effects of Juan de Fuca Strait, Puget Sound, and the Fraser Valley all play into the punishing gale force storms which blast the fir and juniper trees clinging to Young Point's rocky bluffs. These extreme and harsh conditions have shaped many of the trees into gnarled dwarfed *bonsai*, some bent nearly horizontal to the ground. In some places whole groves of various trees including arbutus, battered by the weather and struggling to sustain themselves without soil, have been sculpted by the elements to the contours of surrounding rolling bluffs. These wonderful photographic krummholtz are on our island doorstep.

Krummholtz is a German word: *krumm* means "crooked, bent, twisted," and *holtz* "wood" is a botanical term used in forestry. It usually pertains to stunted, windblown coniferous trees growing in subarctic or alpine regions at the tree line. The Young Point property on the southern-most tip of Lasqueti Island recently acquired by the B.C. Parks Foundation has some very impressive examples of krummholtz.

Thanks to many generous donors, the 256-acre Young Point property on the extreme southern tip of Lasqueti Island has been successfully protected by the BC Parks Foundation. Islander Andrew Day is the Foundation's CEO (Chief Executive Officer). He helped to identify and steer this acquisition which includes old growth



trees, wetlands, rocky juniper bluffs and five kilometres of waterfront. LINC is grateful to have worked closely with the Foundation on making this project such a success. We are extremely thankful to LINC supporters and donors who

stepped up to help make the conservation of Young Point a reality.

According to Andrew Day, "The next steps are for us to do some clean up and start working with BC Parks on the details of adding the land to Squitty Bay Park and coming up with a management plan. This will involve discussions with the First Nations, and with the community. Those discussions will take some time, so thank you in advance for respecting that the area is not officially open to the public until we can transfer it to a park agency. Feel free to reach out with any questions to Casey Walker at 604-343-3975, or info@bcparksfoundation.ca."

This will be one of the largest conservation areas in the Gulf islands, totalling close to 375 acres of connected park and protected areas. As the Coastal Douglas-fir (CDF) *menziessii* is the smallest and most at risk biogeoclimatic zone in British Columbia, contiguous stretches such as this one make it an especially important contribution to our protected area forests in our province, linking the shoreline to the mountain top at Salish View.



Mount Trematon Study Update and a Big Thank You!

by Cora Skaien

The weekend of October 23rd-24th, amidst the big wind storm, ~15 volunteers showed up to help plant 192 native species as part of our biodiversity study on Mount Trematon Nature Reserve. I want to extend an enormous thank you to all of the volunteers and to the LINC board and the extended Gordon family for their dedication in helping to make this project happen. I also want to thank our fencing crew who have created an amazingly impressive fence amidst intense rock drilling over complex terrain. The quality of their work is outstanding!

The goal of the Mount Trematon Biodiversity study is to increase biodiversity within the Nature Reserve, while following best practices in restoration and gathering information on conditions that allow certain species to thrive. Best practices for restoration suggest that projects should have measurable outcomes, and one gold-standard method is the Before-After Control-Impact (BACI) design, which assesses the condition of a site before intervention and after, while also having control sites that did not receive intervention to account for changes that may have occurred naturally over time. The first part of this study involves tracking changes in vegetation via natural regeneration from seed banks and dispersal both within and outside of a fenced area by monitoring several 7-m radius plots over several years. The first vegetation inventory was conducted in the spring of 2021 before the fencing was constructed. Changes in vegetation

within these plots will be assessed annually for the next few years.

The second part of the study involves planting



Photos:

Top right: Cora Skaien, PhD in Forest and Conservation Sciences, documenting planting

Left: Kudos to the fencing crew: Tian Ostapovitch, Anna Smith, Heather Crawford, Mikyla Lironi with huge thanks to Duane West - Mt. Trematon LINC volunteer coordinator

Right pg. 3: Jean Gordon, indefatigable volunteer, planting



species associated with two habitat types within the Coastal Douglas-fir zone – the riparian and dry forest ecosystems. These have high biodiversity and pollinating value.

In the riparian bench, we planted thimbleberry, salmonberry, snowberry, ocean spray, pacific ninebark, red elderberry, red huckleberry and evergreen huckleberry.

In the dry forest, we planted ocean spray, bald hip rose, tall Oregon grape, dull Oregon grape, shore pine, mock orange and snowberry.

The same species and number of plants were planted inside and outside of the fenced areas, which allows for comparisons about which species may require fencing to successfully propagate, and which can thrive without protection via fencing on Lasqueti Island. The location for the current fenced area has been selected with considerations for capturing two different main habitat types for monitoring and restoration, while ensuring that current hiking paths are not obstructed. The results of this study can help inform conservation and restoration efforts on Lasqueti Island and nearby islands.

Conditions have changed over the last 100 years throughout the Gulf Islands and the world more broadly, and conditions will continue to change with further human development and the impacts of climate change. As a result, restoration becomes all the more important to build ecosystem resilience.

Moving forward, there will be a BioBlitz in the spring of 2022 in which the school and community members are invited to come out to search for as many plant and animal species as possible. The event will have scavenger hunt activities for the kids, and the goal will be to create a species list for plants, birds and amphibians on Mount Trematon Nature Reserve that can be compared to species lists generated at future BioBlitzes. There may also be public



tours in the future to show the current interventions. There are plans to fence two more habitat types using different fencing methods in the future on Mount Trematon Nature Reserve.

Thanks to the Islands Trust Conservancy,

who owns the land, and who have funded the fencing materials and labour to build the fence. Additional supplies, tools, plants, and volunteer lunches have been funded by the Public Conservation Assistance Fund - Habitat Conservation Trust Foundation.

Special thanks to these volunteers: Duane West, Jean Gordon, Catriona Gordon, Chris Francis, Ila Francis, Alec Francis, Bryn Gerson, Gordon Scott, Ken Lertzmen, Sheila (Izzy) Harrington, Wendy Schneible, Bruce Grant, James Schwartz, Valeria de Rega, Andrew Fall, Marie-Ange Fall.

Cattails *Typha latifolia*

by Wendy Schneible

Cattails and human needs fit together hand and glove. The plant provides year-round edibles: starchy roots all winter, crispy stalks early spring, a tasty vegetable followed by high protein pollen in summer, and then next year's dormant sprouts, which are good for munching raw or cooked.



First Nations here on the coast valued cattails especially as weaving material. The leaf blades, up to two metres long, are filled with sacs of air, storing oxygen even if the leaves are completely underwater. These air sacs give the leaves a nice cushion as well as insulating quality. Mats for many uses were made from the leaves: mats to sleep on, to pad your knees when kneeling in the canoe, to hang on the walls for insulation or as room dividers, and even as summer shelters. The plant contains a substance which holds water in to keep it from drying out and, in reverse, it sheds water, making it handy for rain capes. If the leaf blades are split and twisted, they make a perfect twine for sewing the mats together.

The fluff of the mature flowers is both absorbent and good insulation, so it was used for diapers, shoe padding and to stuff mattresses and pillows, as well as tinder for starting fires. Beyond the everyday, the fluff was valued ritually in part because of its white colour to cleanse and purify at death or other major life transitions.

Cattails are also a good fit for the planet: freshwater marshes may be second only to tropical rainforests for their biodiversity. Who lives among Lasqueti's cattails? Frogs and toads and salamanders are down in the damp, hunting an assortment of insects for dinner. When we visited Osland Reserve in May, many dozens of violet-green swallows were circling overhead feasting on insects, red-winged blackbirds were calling from cattail stalks, and an assortment of ducks flew off as we approached. Probably a snipe or two was hiding in the vegetation.

As a carbon sink, cattail marshes can hold remarkable amounts of Co2. A cattail seed is smaller than the eye can see—easy for the wind to lift it on its strand of fluff and carry it to a sunny, wet and nutrient-dense spot, ready to grow new cattails.

Trees, Forest, and Climate Change Adaptation

by Richard Hebda

Heat domes, droughts, fires and floods mark the impacts of climate change in British Columbia. We can mitigate and adapt to climate change by preserving, conserving and restoring ecosystems, saving and enhancing as much tree cover as possible. Many people, including those on Lasqueti Island, don't understand or appreciate the vital role of trees and native ecosystems. Trees are a dominant component of the biosphere. As we learn to respect and understand other human cultures, we equally must respect and understand living nature and its inherent rights and qualities.

Trees, like all biomass, play a fundamental role in the carbon cycle. Through photosynthesis they remove carbon from the atmosphere and store it in living tissue and soil biomass. About 18% of GHG emissions to the atmosphere are the result of forest loss and degradation through cutting, fires, disturbing the understory and soil and introducing invasive species. As the climate changes many trees show signs of decline. Some species such as our cherished western redcedars are dying in front of our eyes

West coast old-growth conifer forests store (or sequester) amongst the highest amount of carbon per hectare of any in the world, 1300 metric tonnes or more in some cases, half of that in the soil. As we address the challenges of climate change, the world needs us to take care of trees and their ecosystems. including those on Lasqueti Island. Climate change impacts some species more than others. Western redcedar is declining, and on dry sites, dying almost certainly from extended summer drought. The dropping red branchlets are *red flags* warning us of ecological change well underway. The lack of summer water is a direct consequence of climate change: reduced summer rainfall and increased temperatures. When trees are stressed, they are more likely to be susceptible to insects and other pests too. Douglas-firs are drought



Large, mature Douglas-fir and western redcedar on Lasqueti Island

resistant, but some of them are not healthy, especially on shallow soils, and others in the stand may be declining due to insect and pathogen attacks.

Trees need water to thrive, but they also help it stay in the ecosystem. Healthy forest stands store water in their porous organic humus soils which act like a sponge. The canopy keeps the ground cool, reducing moisture loss from the surface. Remove the trees, and the water flows off quickly, resulting in floods, erosion and summer moisture deficit. As many islanders on BC's coast understand, our water comes from our watersheds and forests. Tree cover in our natural water supply areas is vital.

Another recently discovered understanding is that trees and most plants in an ecosystem are linked underground by fungal mycelia called mycorrhizae. These microscopic threads of fungi help trees take up water and mineral

nutrients while absorbing plant-derived carbohydrates from trees, shrubs and herbs. Like humans, trees are much happier and healthier living in communities, not as solitary individuals; they are part of an integrated system including the understory and all the creatures that depend on it. (See *Finding the Mother Tree*, Suzanne Simard for more on that story.)

These interconnected carbon-rich living communities play a vital role in sustaining biological diversity, not only for our local area, but because of the globally unique character of our forests, for the world. Ecosystems rich in carbon are remarkably rich in biological diversity in all its forms. When we abuse the trees in an ecosystem you alter conditions for keystone and rare plants, animals and fungi that contribute biodiversity developed over millennia. Those species

and processes endow the ecosystem with natural resilience and an ability to resist and slowly transform when faced with climate change stress, rather than undergo catastrophic disruption. We all need to be concerned and care for our local biodiversity as much as for that of the Amazon.

In this time of global ecological and climatic disruption and stress, here are a few suggestions to support and improve the conditions for our natural forested ecosystems:

- 1) Preserve and conserve Lasqueti Island's trees and forests especially carbon-rich old growth and old second growth.
- 2) Restore degraded forests by planting native tree species and other plants in degraded stands and deforested sites.
- 3) Remove invasive species and avoid bringing regionally non-native fast-growing trees. These could degrade and transform ecosystems.
- 4) Manage forests to reduce risk of catastrophic fire. Follow the appropriate Province of BC's Firesmart protocols (<https://firesmartbc.ca/>). Clear out fire prone understory around houses and other buildings. Remove lower tree branches to reduce ladder fuels and crown fire. Chop your forest debris fine and spread it on the soil surface to maintain moisture.
- 5) Consider planting native deciduous trees and shrubs near sites of settlement. Their leaves contain abundant moisture and resist fire. Some of them are especially well-adapted to drought. Avoid planting drought sensitive conifers such as western redcedar, western hemlock and grand fir.
- 6) Develop in areas where there are no trees. Choose already degraded sites rather than degrading forested sites.

We have a collective responsibility for climate change and biodiversity. The coast of BC grows some of the largest trees on earth, stores masses of carbon, and represents globally unique biological diversity. We have opportunities to adapt, to produce more food, to live in harmony, to live as a part—not apart from nature. Every tree matters as we face the challenges of climate change.

A few native trees and shrubs to plant.

Garry oak: dry rocky sites and dry forest openings, from acorns or seedlings

Bigleaf maple: all but the driest sites, easy to grow and manage, excellent summer shade tree, large leaves, excellent for compost.



Bigleaf maple, Left photo R. Hebda; this fall S. Harrington

Pacific dogwood: medium to dry open and forest edge sites, challenging but beautiful.

Madrone or arbutus: medium to dry open sites, grown from fruit or seed

Bitter cherry: pioneering species good for medium to dry disturbed sites—can be underplanted by Douglas-fir for future conifer stand.

Cascara: medium to dry open and forest edge sites, modest size, beautiful fall colour.

Red alder and black cottonwood: disturbed medium to damp sites. These “pioneering” species persist for decades, add soil organic debris, prepare sites for longer lived species and resist fire.

Douglas-fir: most suitable forest conifer on all but driest sites.

Seaside juniper: small dense conifer, unique to the Salish sea and adjacent areas. An alternative to western redcedar, excellent along the shoreline,

For riparian zone and moist site species, read the Mt. Trematon Study report also in this issue.

Native shrubs suitable near building sites

Oceanspray: dry open to partly open sites, lovely flowers.

Red-flowering currant: dry, open to partly open sites, gorgeous flowers, attracts hummingbirds.

Nootka rose: Moist to dry, open to shaded sites, disturbed settings, great for hedges and banks, easy to grow.

Saskatoon: medium to dry open to forest edge sites, beautiful spring blooms and lovely fall colour.

Tall and dull Oregon-grape: Tall for open dry sites, Dull for forest understory, evergreen, gorgeous yellow spring blooms, fruit for making tart jam.

Richard Hebda is Curator Emeritus at the Royal BC Museum and adjunct faculty at the University of Victoria. He has authored or co-authored 150 scientific articles, books and reports on vegetation history, ethnobotany and climate change and hundreds of popular articles on native plants and gardening.



Oceanspray in bloom; Lower right: Red flowering currant, photos: Gordon Scott



Book Review

Mushrooms of British Columbia, by Andy MacKinnon and Kem Luther, A Royal BC Museum Handbook. 2021
reviewed by Ken Lertzman



Mushrooms are a mystery. The mass of the organism is mostly invisible underground and their surface expression is irregular, uncertain, and always a surprise. Mushrooms are the fruiting bodies of fungi that are mostly hidden belowground, yet this group includes the most massive organisms on earth. Mushrooms elicit wildly intense passions. They are variably delicious, disgusting, deadly poisonous, and sometimes merely “bleh”. But they are ecological keystones and are biologically complex, hard to identify, and hugely diverse. Fungi are often thought of as the secretive, hidden, mysterious branch of the plant kingdom. But they are not plants—they’re not part of the plant kingdom. They are their own separate thing, in fact, on the evolutionary tree, fungi are more closely related to animals—to us—than they are to plants.

Many of the fungi that produce the mushrooms that intrigue us are mycorrhizal—that is, they have an intimate symbiotic relationship with the roots of the plants of the forest. The relationships between trees and fungi support the growth of the forest and connect one tree to another in a web of ecological relationships that is mind boggling. All the trees that you see successfully growing in the forest are connected to the plants around them through a web of fungal mycelia, with carbon and other chemicals passing from one tree to another. Soil fungi are the superheroes of the forest.

For those of us who want to know more about the mushrooms around us, help is at hand. BC mushroom experts, Andy MacKinnon and Kem Luther, have written a new book *Mushrooms of British Columbia*, published by the Royal BC Museum. This is a beautiful, comprehensive, accessible, and lavishly informative book that can help all of us do better both at identifying the mushrooms we encounter and understanding more about their biology and ecology. Many of you will know Andy MacKinnon though his many books on plant identification (notably *Plants of Coastal British Columbia*), but in his heart, Andy is a mycologist, a fungus expert.

The book is nearly 500 pages long and highlights 350 species, with a total of 850 species mentioned. This still is a small fraction of just the known species of mushrooms in BC. The authors went through an extensive process of consultation with other experts to reach a happy

medium in scope between *inadequate* and *overwhelming*. Every focal species has a high-quality colour photograph which is usually quite beautiful. The writing is clear and engaging—and the authors do a great job of using (and defining) enough of the technical terminology to lead the reader along the path to understanding mushroom biology and identification, but not so much as to make the text impenetrable to beginners.

Every featured species’ account includes a description of the fruiting body—the mushroom itself, remarks on edibility, and general comments on its geographic distribution, ecology, and often its historical or cultural context. The book also begins with an extensive section on fungal biology, doing a great job of explaining the basics of mushroom anatomy and fungal reproduction that are necessary in order to go beyond the surface of mushroom identification. At the beginning of each major grouping of mushrooms is a nice section introducing that group. My favourite sections, however, are the short essays interspersed through the species descriptions that address important topics about mushroom ecology, history, and relationships to people. Overall, the book does a great job of communicating the bigger story of how mushrooms are connected to the world around them: while this is a great identification guide, it is far more than just a guide to identification.

A deep sense of place pervades the book. Not only are specific locales referred to in species descriptions, but some of the essays present distinctly BC-specific stories. These include essays about the arrival of Death Cap mushrooms in BC and the remarkable, long-term study of mushroom diversity at Observatory Hill outside of Victoria by noted BC botanists Oluna and Adolf Ceska. This is a book that should be on the shelf, and in the daypack, of every naturalist in BC!



WANT TO GET INVOLVED?
If you want to help with LINC’s work
as a volunteer on work parties,
as a director,
or as a contractor for small jobs
including administration or fencing,
contact linc@lasqueti.ca

Restoration at Osland and Salish View Nature Reserves

by Wendy Schneible

This fall over 30 volunteer, intrepid restorationists helped to carry and plant native species at both the Osland Nature Reserve and the Salish View Nature Reserve. Thanks to biologist Carrina Maslovat, restoration plans have been developed which will help protect and enhance biodiversity around the wetlands at both these nature reserves. Fencing and planting are key elements of the restoration plans.

Because of the following volunteers, there are now over 300 native plants in the ground in exclosures at the Osland and Salish View Reserves, as well as another 50 on site ready to plant at Osland. Big thank you to Petra's class at the False Bay School, Betsy W., Sue W., Gordon S., Katrina H., Adam E., Rob P., Darcy D., Martha and Bill K., Yves P., Carolyn M., James S., Hilary D., Aigul K., Bruce G., Sydney M., and four volunteers from the Nanaimo Land Trust (NALT): Madeleine, Oliver, Judy and Kyle.



Above: fall crocus at Osland Reserve,

Right: Betsy & Hilary carrying plants for restoration, photos Gordon Scott

Community Survey Highlights

by Gordon Scott

LINC conducted a survey of islanders' thoughts this summer about our programs, Lasqueti's natural habitats, and perceived threats to the island's ecology. Here are some of the results.

The survey was completed by 103 people, 68 full time residents, 27 part-time residents and 8 visitors. The majority of respondents (89) have lived on Lasqueti for more than 10 years. The age of the respondents reflects the overall demographic of Lasqueti with the majority (76) in the 50-75 year-old age group. Sixteen respondents were in the 25-50 years age group and 9 in the under 25 group. Eighty-one (81) of respondents identified as LINC members.

One of LINC's primary goals is to acquire and protect natural habitats. An overwhelming majority of respondents (92) agreed that LINC should acquire and protect important habitats on Lasqueti. When asked which habitat types are the most important to acquire and protect, 62% of the people responding ranked wetlands as the most important, followed closely by forests, marine shorelines, riparian areas and bluffs ranked lower, in that order.

Asked what people thought were the most critical biodiversity issues facing Lasqueti, the majority (56) ranked climate change as the biggest threat to the island's biodiversity, followed in order by human development, lack of ecological knowledge, feral sheep, and invasive plants and animals.

Part of LINC's mission is connecting people with nature. When asked if Lasquetians would like to see more public trails on Lasqueti 87% responded "yes".

Our regular LINC newsletter, delivered to all members by email and all island residents by post, is the main way we provide education and information to the community. Some comments included: "The LINC newsletter is a beautifully produced, well written and researched periodical providing a valuable education of our natural world", and "Enjoy. Appreciate the effort. Better than both island newspapers".

LINC's work acquiring land, managing and restoring it has increased, along with the number of protected properties and partnerships with other conservation organizations. As we continue to offer education to our members about Lasqueti's ecology, we realize that an all-volunteer organization has limitations. When asked if respondents supported the idea of hiring a part-time administrative assistant, 46 said yes, 41 said maybe, and 13 said no.

The overall results of the survey show strong support for LINC's mission and programs. Acquisition and protection of important habitats is broadly supported, and our outreach and education efforts are highly valued. The LINC Directors will be using these survey results to help them formulate our next Three-year Strategic Plan. Thank-you to everyone who participated in our survey.

Seen In Passing



Upper left: Pileated woodpecker with grub, photo Dianna Maycock; Stickleback found in Trematon Creek, photo Valeria deRege; Rough-skinned newt, Gordon Scott;
Lower left: Phacelia & bees, Valeria deRege; Evergreen huckleberry with edible berries, S Harrington, Woolly bear, or woolly worm, the larval form of the isabella tiger moth, *Pyrrharcia isabella*; surviving seastars, S. Harrington, all seen in passing, fall 2021

Donations help support the resilience of nature on Lasqueti and surrounding islands

Lasqueti Island Nature Conservancy has set up three funds to help direct your donations:

Acquisition Fund (to help acquire new protected sites)

Management & Stewardship Fund (managing and protecting nature reserves and covenants)

Operations Fund (office equipment, supplies and administrative support)

Donations gratefully accepted to support our work: Charity BN #84848 5595



Board of Directors: Gordon Scott, Wendy Schneible, Sheila Harrington, Hilary Duinker, Ken Lertzman, James Schwartz, Duane West

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