Lasqueti Island Nature Conservancy

linking people to nature on
Lasqueti and surrounding islands

Issue #28, Spring 2024

Focus On Wetlands

by Ken Lertzman

Why are wetlands such a big deal? British Columbia's wetlands cover about 5.3 million hectares (13 million acres), or approximately 5% of the land base. But their importance for ecosystem function and as habitat is far out of proportion to the small part of the land-base they occupy. They provide critical habitat for fish, birds, and many other kinds of wildlife. In fact, most wildlife species use wetland habitat at some point in their life cycle, even if they are associated with upland habitats at other times—and many red and blue listed species[1] are wetland dependent. Streams, rivers, lakes, wetlands, and the riparian areas adjacent to them, are some of the most biodiverse ecosystems in the Islands Trust Area. These features provide critical habitat for birds, fish, amphibians, insects, and plants, many of which have deep cultural importance to Lasqueti Island residents and the descendants of the Indigenous People who were here before us.

Wetland complex on Calvert Island, Central Coast, BC. Photo *K.Lertzman*

Wetlands play critical roles in the hydrology of watersheds, absorbing water quickly and releasing it slowly. They provide diverse "ecosystem services" that we all depend on. Wetlands absorb and filter sediments, can improve water quality by removing pollutants and excess nutrients, recharge groundwater, maintain stream flows, control runoff and store flood waters, reduce erosion, stabilize shorelines, and can play an important role in the carbon cycle. In many parts of the world most wetlands have been lost or damaged. Wetland restoration is a key tool to address a variety of environmental problems.

Historic land use patterns have significantly altered wetlands (and surface water ecosystems in general) and the important ecological functions and services they provide. In southern BC, estimates of how much wetland has been lost range from 60% to almost 100%, with the southwest coast and the Okanagan being the hardest hit areas. The impacts of changing climate further complicate the impacts of historical and ongoing development on watersheds. In coastal BC, we will see warmer, wetter winters (with lower spring snowpack) and longer, hotter, drier summers. This will create added stress for streams and wetlands, with many authors identifying wetlands as one of our most climate-sensitive ecosystems. Furthermore, on Lasqueti, as elsewhere, population growth and its associated development pressures will continue to degrade wetland ecosystems. We are, thankfully, behind the curve on the land-use development pathway, but we only have to look elsewhere on the south coast to see a potentially sad future for our island watersheds.

1 Any species or ecosystem that is at risk of being lost (extirpated, endangered or threatened) is considered red-listed. A species or ecosystem that is of special concern, such as being especially sensitive to development or management, is considered blue-listed.

Forested swamp at Hauyat, Hunter Island, Central Coast, BC. Photo: *Ken Lertzman*

LINC and the Xwe'etay/Lasqueti Archeology project are collaborating to locate wetlands and streams on Lasqueti—both those that exist now and those that existed prior to European settlement and land alteration. Freshwater and marine wetlands were places of great importance to ancient Indigenous peoples. In addition to mapping current wetlands, the Lasqueti Island Lost Stream and Wetland Project hopes to use local knowledge, historic air photos, and interviews with our elders, coupled with sophisticated GIS modeling, to "look back in time" to re-locate streams and wetlands that have been altered by historic land use. Based on GIS modeling and on-site visits of selected wetlands and streams, we hope to create a series of maps and graphics of what "used to be" and "what is now". These maps will be combined with the inventory of the island's archaeological sites collected through the Xwe'etay/Lasqueti Archeology to look at the relationship between aquatic ecosystems and ancient Indigenous use of the island and changes over time.

Types of Wetlands:

In *Wetlands of British Columbia: a Guide to Identification* Mackenzie and Moran describe a wide range of wetland types that are differentiated by their physical characteristics (such as pH, degree and consistency of inundation, and nutrient status) and the character of their plant communities. We have examples of many of these on Lasqueti. For those interested in details of the classification system, the physical environments provided by different wetland types, and the plant species and site associations, Mackenzie and Moran's Wetland Guide is available as a free PDF from the provincial government's website.

Bogs are nutrient poor, peaty wetlands with acidic surface waters. The source of water is typically rainfall accumulating directly, rather than drainage input via groundwater or surface flow. They are typically dominated by sphagnum mosses and Ericaceous (heather family) shrubs adapted to the high water table, acidity, and low nutrient availability.

Fens are peaty wetlands with more hydrologic connection to groundwater flow and thus a higher pH (more neutral) and higher mineral nutrient content in the rooting zone than bogs. They are typically dominated by non-Ericaceous shrubs, sedges, grasses, reeds, and mosses.

Marshes are shallowly flooded (i.e. with some open water) wetland dominated by emergent grass-like vegetation. They are rich in nutrients. While the flooding persists for long periods, they typically have a fluctuating water table, with high water levels early in the year, which fall through the growing season.

Swamps have a semi-permanent high water table, leaving the sub-surface continuously waterlogged. They are nutrient rich and productive, can be forested, or dominated by a mix of trees and tall-shrubs.

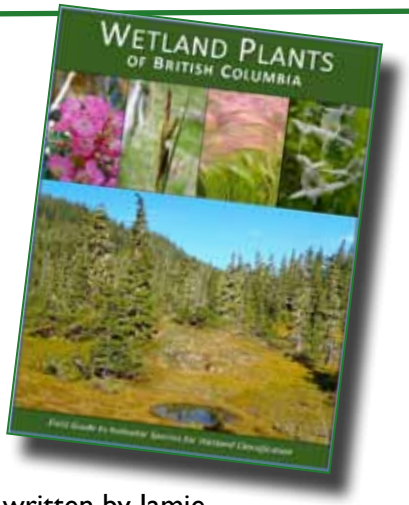
Low-medium and high-bench Floodplains are seasonally flooded during the growing season to varying degrees as a nearby aquatic ecosystem expands and contracts. They are often what are thought of as riparian forests, though in Mackenzie and Moran's usage, "riparian" can refer to the interface of any wetland adjacent to a terrestrial ecosystem.

Shallow open water ecosystems generally have depths less than two metres in mid-summer and may appear free of emergent vegetation except around their margins.

Saline meadows, estuarine marshes and meadows: Just as distinct ecosystems form at the boundary between freshwater and terrestrial ecosystems, distinct and ecologically important ecosystems develop at the boundary between the land and the sea. Salt marshes, meadows, and estuaries can be incredibly diverse and very productive ecosystems and often play critical roles in coastal carbon cycles. For those interested in the tropics, mangroves are intertidal forests—marine wetlands—that are biodiversity hotspots and provide critical protection from storm surges and hurricanes.

Wetland Plants of British Columbia: Field Guide to Indicator Species for Wetland Classification.

Jamie Fenneman and Ryan Durand, with illustrations by Alice Lee. 2021. The B.C. Wildlife Federation/ Wetlands Workforce



This is a new field guide written by Jamie Fenneman and Ryan Durand, with illustrations by Alice Lee. It is available free on-line as a PDF and is a product of the Wetlands Workforce Initiative of the BC Wildlife Federation. *The Wetland Plants of British Columbia* is an introduction to common species of wetland plants that are used as indicator species for different types of wetlands. Wetlands, like other types of ecosystems in BC, are classified using the provincial Biogeoclimatic Ecosystem Classification (BEC) system. These indicator species can be used to help identify where a wetland sits in this system. This new guide is intended to be used as a companion to the *Wetlands of British Columbia: A Guide to Identification,* released in 2004 .

The species' descriptions are organized by the type of wetland (e.g. Bog, Fen, Marsh, Swamp). Within each wetland type, plants are grouped by growth form (e.g. Trees, Shrubs, Forbs). Each description includes characteristics of the species to be used in identification, a distribution map, how to distinguish similar species, and photographs showing key characteristics.

This is a nice addition to the resources available for plant identification in BC, and it is especially exciting because it allows the species identifications to be used as an entry point for understanding the ecosystem classification of wetlands and the various ecological processes underlying the classification. This is a key element of wetland conservation and ecologically-based wetland management.

Fenneman, J. and R. Durand. 2021. *Wetland Plants of British Columbia: Field Guide to Indicator Species for Wetland Classification.* https://wetlandsworkforce.ca/wetland_plants_of_bc/

MacKenzie, W.H. and J.R. Moran. 2004. *Wetlands of British Columbia: a guide to identification.* Res. Br., B.C. Min. For., Victoria, B.C. Land Manage. Handb. No. 52. <http://www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh52.htm>

Labrador Tea

A rare wetland plant on Lasqueti

by Ken Lertzman

Labrador Tea images
Above from iNaturalist
Catharine K
Below photo Ellyne Geurts:
showing leaf undersides and margins
https://creativecommons.org/licenses/by-sa/4.0/

Labrador Tea (*Rhododendron groenlandicum,* formerly in the genus *Ledum*) is a perennial shrub of boggy habitats and is present in wetlands on Lasqueti Island. It is typically associated with nutrient poor, acidic soils. It has a wide geographic distribution and is found in wetlands across Canada and some of the northern states. Labrador Tea is closely related to two other similar species that are found in British Columbia: Trapper's Tea (*Rhododendron columbianum*, formerly *glandulosum* and *neoglandulosum*) and Northern Labrador Tea (*Rhododendron tomentosum*, formerly *palustre*). This seems to be a group of plants where both the genus and species names have changed frequently in recent years!

Labrador Tea was an important traditional medicine and aromatic beverage for many Indigenous peoples across its range, and it is still widely used as a drink today. It was used to treat a wide variety of inflammatory, chest, and digestive problems. Early settler communities learned of its use from Indigenous people and adopted it as well. It can be toxic, however, in large doses or concentrated form.

It is important to note that there are several other species that are similar (especially when not in flower) but are poisonous. These include the two closely related species mentioned above, plus two other wetland species of the BC coast: Western Bog-Laurel (*Kalmia microphylla*) and Bog-Rosemary (*Andromeda polifolia*). Of these, only *Kalmia* is known to be on Lasqueti. Labrador Tea can be distinguished by the dense rusty coloured hairs inside the slightly rolled-under edges of the underside of its leaves.

Wetlands on Lasqueti

Wetlands, swamps, and marshes are critical water resources not just for wildlife but for people too. Here on Lasqueti Island, with its shallow soils and exposed rock, the rain that falls runs off into the ocean quickly unless it is sucked up into a wetland and slowly drained away. This means wetlands keep our micro-hydro systems running longer in the year. This means wetlands keep the streams we use for our drinking water flowing longer into the summer season. Wetlands recharge the underground aquifers that fed our ponds and wells. However we are pretty lucky that the topography of Lasqueti has graced us with ponds, lakes and wetlands of all types scattered across the island providing all creatures, including all of us humans, with free water storage and filtration.

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United Way British Columbia

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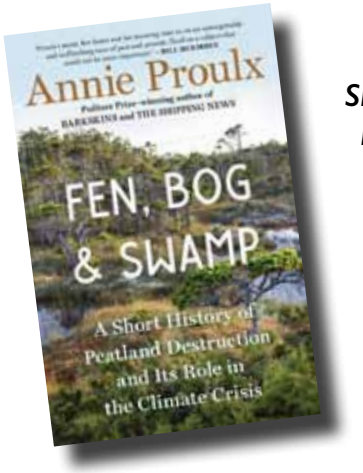
Canada



Fen, Bog & Swamp, A Short History of Peatland Destruction and Its Role in the Climate Crisis.

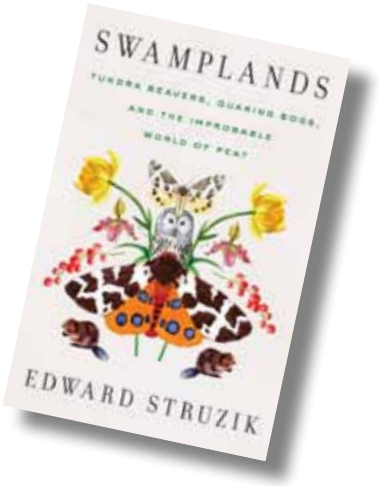
Annie Proulx,

Fourth Estate 2023

Swamplands, Tundra Beavers, Quaking Bogs and The Improbable World of Peat.

Edward Struzik,

Island Press, 2021



Book Reviews - by Duane West

Wetlands are a well known conservation priority, largely because they have always made up a small portion of the earth's surface and they seem to be humans' preferred sacrifice zones. With these books, two well-known authors give us a chance at a clear understanding of these amazing worlds—and, from my perspective, some amazing insights into the importance of wetlands in our future if we desire a life supporting planet.

In *Fen, Bog & Swamp,* Pulitzer prize-winning author Annie Proulx takes the reader on a journey to understand the wetlands that are so intimately tied to the climate crisis. In her words, "The literature is massive and I had to narrow down the focus to those special wetlands that form the peat that holds the greenhouse gases CO2 and methane—the fens, bogs and swamps and how humans have interacted with them over the centuries."

Canadian scientific and environmental author, Edward Struzik has written a more in-depth and personal look at the same quaking ground. Ninety-five percent water and you can stand on it. Covering the spread of time from when wetlands were thought to be the source of disease to our modern understanding that the destruction of natural habitat is bringing us pandemics, both books offer clear insights into our troubled relationship with wetlands. There are also case studies of hope through inspiring examples of wetland restoration and repair.

I appreciated Annie Proulx's book for its crisp distillation of a huge subject, with significant insights into the social history of wetland draining. The 'English Fenlands' section has amazing stories about swamp draining as social engineering come class struggle. At 172 pages, it's a quick, but authoritative, take on our relationship with wetlands. Edward Struzik's book covers almost identical ground but with more of a North America, largely Canadian, focus. Canada has a large share of the worlds intact but threatened peatlands, and I found his book made me a better informed citizen.

Frogs in the Wetlands

by Kaia Bryce

In early March, I tagged along with biologist Aimee Mitchell to hunt for frog eggs in the wetland in the Livingstone Forest covenant area on Lennie Rd. We found ourselves in a glorious swamp, complete with standing dead trees with inviting nest-holes–potentially being inspected by the mergansers that fled as we lumbered in.

Paddling around, Aimee quickly located over 100 red-legged frog egg masses, mostly attached to branches of trees that had toppled into the water. She also found about 70 chorus frog egg masses, which were attached to aquatic vegetation.

I was so inspired by these adorable globs of frog embryo that as soon as I got home, I started hauling branches to our pond and chucking them in along the 'wild side' (a salmonberry thicket). Maybe I could entice the native frogs to breed in my slapdash nursery. Our pond is only a year and a half old, so it still lacks the tangle of vegetation and woody debris that support amphibian livelihoods and help them hide out.

Top:the Livingstone Wetland, Photo by *Aimee Mitchell*
Above: Red-legged frog eggs. Photos: *Kaia Bryce*

LINC Lasqueti Island Nature Conservancy

Coming Events

Sharp Tailed Snake Presentation

Thursday April 18 - 7pm-9pm (Online)
check https://linc.lasqueti.ca/ for link

Hike to Lasqueti Island Ecological Reserve

Sunday May 19th. Start 10:30 at Richardson Bay.
Car pooling encouraged due to limited parking.
Bring a lunch. In search of blooming prickly pear cactus in the Ecological Reserve

Annual General Meeting

May 25 11:00 meeting—Judith Fisher Centre
1:00 hike to new protected area - tba
- bring water, good shoes, cameras

Book Launch and Reading

Voices for the Islands, Thirty Years of Nature Conservation on the Salish Sea, Sheila Harrington, Heritage House, 2024
July 21, 4-5 Judith Fisher Centre

These Trumpeter Swans spent most of the winter in the Collins Swamp. Nearly extinct in the 1900s, their greater numbers now feed in shallow ponds less than 6' deep primarily eating aquatic insects and plants. Photo *Kathy Schultz*

Marine Protected Areas: A Tool for Conservation on the BC Coast

by Darcy Dobell

Pacific White-Sided Dolphins seen from the Lasqueti ferry (Lagenorhychus obliquidens). While they are primarily found off-shore, since the 1980's they have become more common on the inside of Vancouver Island *Photo: Petra Knight*

Those of us lucky enough to live close to the sea may be awed by its power, but we also cannot help but be very aware of its decline. Recent historical records recall a time when whales were so abundant in the Salish Sea that they were a hazard to navigation; when a tugboat could travel from Campbell River to Cowichan Bay through an unbroken school of herring; when abalone burgers were pub standards in blue-collar coastal towns; when thick beds of kelp extended along any exposed coastline, and spawning salmon spilled over riverbanks from Richmond to the feet of the Rockies. And even that was a substantial thinning out of the abundance recorded in Indigenous histories.

There is no single cause of the alarming decline in fish and wildlife populations and in the overall health of marine ecosystems. Overfishing, pollution, and the loss of habitat from shorelines to seafloors all play a role. Climate change is making our oceans warmer and more acidic, while destabilizing ocean currents and nutrient exchanges.

For coastal communities, the costs to cultures, food security, and economies are very real. At a global scale, the current trend ends in catastrophe. The ocean is the foundation of most of our planet's food webs, the source of over half of our oxygen, and a key regulator of global temperature and rainfall. Around the world, billions of people rely on seafood as a primary staple. Across Canada, millions of jobs depend on healthy and productive seas. So do countless marine species, from the tiny bioluminescent organisms that light up our late-night summer swims to fish, seabirds, and whales. Restoring the health and resilience of our oceans is an increasingly urgent ecological, economic, and moral imperative.

An expedition to explore the deep sea off the west coast of Vancouver Island took place in the summer of 2023. The Department of Fisheries and Oceans (DFO) partnered with scientists and marine planners from several First Nations, and with the research institution Ocean Networks Canada, to focus on a location that fishermen and Indigenous communities have long known to be a fishing "hot spot". The researchers sent a remote submersible to the sea floor hundreds of feet below —and discovered a reef of rare cold-water corals. These corals provide important habitat for fish, which is why the area above the reef is so productive. As is often the case, habitat structure, biodiversity, and productivity are linked in special places on the land or sea-scape.

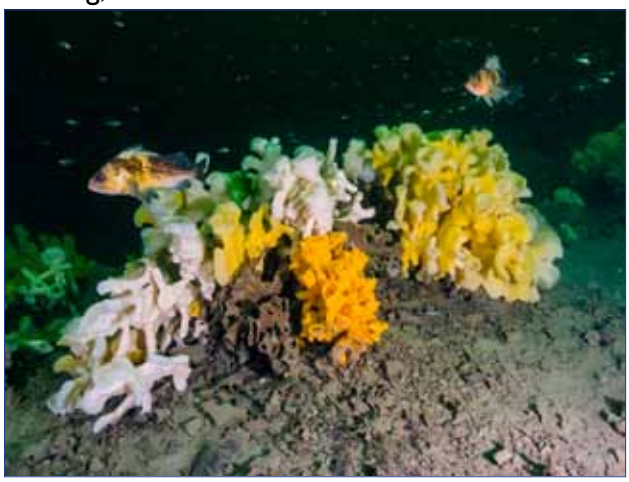
Places like this are critical targets for conservation. Just like on land, protected areas are an important tool for conservation at sea: they go hand-in-hand with abundant and productive ecosystems. Marine protected areas (MPAs) can be designed to protect important habitat for marine species from seagrass to whales; and can help make ecosystems and fisheries stronger and more resilient in the face of changing conditions.

MPAs have proven to help restore healthy marine ecosystems and to rebuild fish stocks. The best and fastest results come from MPAs that are large, highly protected, and well enforced. Even better are networks of MPAs that link multiple sites together to sustain the interconnected elements of marine ecosystems. One of the world's leading examples of robust MPA design is on BC's central and north coast, where First Nations, the federal and provincial governments, and representatives of industry and conservation organizations have worked together for years to build a science-based MPA

network. Once complete, the network will encompass a set of existing and new MPAs from northern Vancouver Island to the Alaska border, covering almost 30% of the ocean area with MPAs that have different types and degrees of protection and fisheries management guidelines. This conservation and management plan will help secure the future of some of the world's most productive cold-water seas—along with the creatures and communities that depend on them.

MPAs can also link habitats in the ocean and on land to provide an integrated, cross-ecosystem conservation strategy. For instance, we can help protect endangered seabirds by protecting their island nesting sites. They will have an even better chance of survival if we also protect the nursery habitat of the forage fish they feed on. The areas protecting nesting and foraging habitats may be hundreds of kilometers apart, but they work together.

Here in BC, multiple governing authorities and agencies bring different tools to MPA planning, each of which can advance distinct ocean protection needs. Within the federal government alone, different government departments can designate marine protected areas under the *Oceans Act,* the *Fisheries Act,* the *Wildlife Management Act,* and the *Parks Act*. Federal MPA designations automatically prohibit undersea mining, waste dumping, bottom trawling, and oil and gas development. Other restrictions can be added on a case-by-case basis depending on the specific conservation objective of a particular protected area. The Rockfish Conservation Areas around parts of the Lasqueti coastline are an example of a fisheries management tool that can also contribute to the recovery of local species and ecosystems.



Quillback over glass sponge reef
Photo *Glen Dennison*

MPAs sometimes, but not always, include limits on commercial fisheries. A federal MPA that is intended to protect delicate coral and sponge reefs might prohibit fishing with traps that could damage the reefs, while still allowing fishing with nets or hooks in the water above the reefs. An MPA that is intended to protect eelgrass meadows might prohibit anchoring, while an MPA that provides a quiet place for orcas to forage might limit motorboat traffic. A single MPA can include different sub-zones with different restrictions on industrial activity.

MPAs may also be established through Indigenous authorities. Along the BC coast, some First Nations have designated Indigenous Protected and Conserved Areas (IPCAs) to protect and restore important fish and shellfish habitat, spawning sites, and cultural sites. In the Hoeya Sound/Lull Bay IPCA, declared earlier this year by the Mamalilikulla First Nation, Indigenous designations and federal tools work in parallel, with each government bringing its own laws and policies to manage the MPA together.

Planning for marine protected areas needs to account both for the fluid nature of the seas, and for shifts in habitats and species movements that will come as the oceans continue to warm. Work to restore kelp beds in the Salish Sea, for example, has to consider the possibility that as oceans become warmer and more acidic, kelp may simply not grow where it used to. But the arguments for MPAs still stand: first, any improvement in habitat protection will give species and ecosystems a better chance of adapting to their changing world; and second, while particular species might move on, protecting physical features such as seamounts, estuaries, and sponge reefs is a good way to ensure living space for whoever comes next. While they are by no means the whole solution, MPAs are a key tool for building the resilience of our coast.

The Salish Sea has few designated MPAs. This is, in part, because high population density, the multiple layers of governing authorities, and the vast range of competing stakeholder interests make marine planning mind-bendingly complex and politically challenging here. But increasingly, all these interests are working together, united by a shared commitment to the coast.

In Atlkat'sem / Howe Sound, a collaborative Marine Stewardship Initiative is developing reference guides and other tools to support better planning and has helped illustrate the overlap of various conservation areas and conflicting uses. This spatial planning tool greatly improves communications by organizations such as Marine Life Sanctuaries Society of BC who were instrumental in discovering and gaining protection for the majority of Howe Sound's extraordinary glass sponge reefs.

Around the southern Gulf Islands, Indigenous and federal representatives are bringing together residents, industry players, and conservation groups to renew work towards a National Marine Conservation Area designation. First Nations all along the Salish Sea are advancing their own conservation plans and restoration efforts to rebuild marine habitats and food sources.

The deep-sea expedition last summer that found the cold water corals highlighted how local knowledge can help build our understanding of the interconnections between the foundations of marine ecosystems and the day-to-day health of fisheries and coastal communities. As we prepare for further changes in ocean conditions that are undoubtedly coming, marine protected areas will be critical tools to increase the strength and resilience of our coasts.

"British Columbia's ancient glass sponge reefs are a globally unique ecosystem that are areas of high biodiversity and provide important habitat for many marine animals including salmon, spot prawns, rockfish, herring, halibut and sharks." DFO

There are Glass Sponge Reefs off of Parksville and east of Hornby Island. Maps: https://www.dfo-mpo.gc.ca/oceans/ceccsr-cerceef/closures-fermetures-eng.html

Above: Diane Reid over Dorman biotherm, Photo Adam Taylor

Voices for the Islands, Thirty Years of Nature Conservation on the Salish Sea,
Sheila Harrington
Heritage House
to be released July 9, 2024

A book launch and author reading will take place on Lasqueti Island, Sunday, July 21, 2024
Judith Fisher Centre 4-5 pm

To read some early endorsements and find further information: www.heritagehouse.ca/book/voices-for-the-islands/

excerpt below from the Gambier Island Chapter

Glass Sponge Reefs

In 2016, an 136-hectare marine foreshore addition was added to Gambier Island's Halkett Bay Provincial Park to protect a rare glass sponge reef off the southeast shore of Halkett Point, located in only 30 metres of water. Glass sponge reefs are only found in fjords and on the continental shelf of the BC and Alaska coast. These ancient living structures had been recently found in Hecate Strait and Queen Charlotte Sound. Then in 1984 a local diver, Glen Dennison, discovered 12 new reefs within Howe Sound.

According to the Marine Life Sanctuaries Society, who spearheaded the marine foreshore addition, their locations "benefit from elevated bathymetry, whether as exposed glacial seafloor, pinnacles, seamounts or submarine ridges in areas of high silica concentrations and tidally-driven, near-bottom currents." These cloud and fingered-goblet sponges in Howe Sound build reefs by trapping sediments brought by currents into the sponge, then as they die their skeletal remains coalesce into a semisolid matrix. These reefs are important because they support large numbers of species, especially the rockfish that have been on an ever-increasing decline in the Salish Sea.

Because of the shallow depth of this sponge reef and sponge garden, it is one of only five diveable reef sites in the world! The society, originally formed in 1990, has a mission "to establish No-Take marine sanctuaries that will protect all marine life in their natural environment, in perpetuity." Along with this significant goal, the society and particularly its current leader, Adam Taylor, host public workshops on the marine life of the area, host dives to the 'city of glass', and work with other surrounding organizations, such as the Howe Sound Biosphere Region, Fisheries and Oceans Canada (DFO) , the Underwater Council of BC, and Canadian Parks and Wilderness Society to secure Marine Protected Areas status and No Take zones along the coast. In 2022, two more areas around Gambier and several more in wider Howe Sound were designated Sponge Reef Refuges.

Lasqueti Fungus Fest

With Andy MacKinnon

by Kaia Bryce

Last November's fungus festival was a feast for the senses! There were spore-ink and mushroom paper, mushroom dyed fabrics, medicinal teas and chocolates. Best of all, two long tables ran down the community hall, abounding with dozens of species of fungal specimens collected by Lasqueti mycophiles. Who knew there was such diversity lurking underfoot? Kids and adults alike roamed the displays, comparing colours (purple! black!) and textures, namedropping Latin and being gleefully revolted by the odour of certain 'spermatic' varieties.

Our special guest, Andy MacKinnon, guided forty or so damp enthusiasts on an extremely slow, yet illuminating, walk in the woods behind the hall. Even the tiniest of mushrooms that most of us would bustle past in search of something edible was greeted like a friend, and glowingly introduced. Rune Taiga (age 7) managed to stump Andy with a pungent little brown blob that was later identified in the lab as a Cubed Fold Truffle—the Lasqueti specimen has been preserved in the Beatty Biodiversity Museum in Rune's name. Only a couple of sightings of this mushroom have ever been recorded in BC!

Earlier in the day, Andy led a walk behind the Judith Fisher Centre with the students from False Bay School, who searched enthusiastically for fungi.

Later, over a hot meal, Andy regaled us with the history of magic mushrooms on the West Coast. His lecture, as well as highlights from his forest walk-and-talk, are available on the LINC Youtube channel. The event was a reminder to pause and appreciate the incalculable contributions of these fabulous organisms to the functioning of our forests.

Youtube channel: https://www.youtube.com/@LINC_BC

Photos:
Top left: Andy MacKinnon enjoys the sight and smell of an unusual mushroom
photo: *Julia Woldmo*
all photos right column by *Morgan Maher*
Top: event sculpture by Link Leisure & David Robinson
Above: paint made with mushrooms by Valeria DeRege
left: A sample table
below: Polypore dyed fabrics demonstrated by Mikaila Lironi and Iris Maher

Beavers and oysters are helping restore lost ecosystems with their engineering skills

Editor's. Note:

We thought it would be interesting to reprint this short piece from ***The Conversation.*** *It focusses on themes and species that are relevant to Lasqueti, but in some very different contexts. We think a lot about ecological restoration in LINC. In this article, people are taking advantage of species that are natural "ecosystem engineers" to make changes to the ecosystem that would be difficult and expensive to do ourselves. The article focuses on reintroducing beavers to Great Britain in order to re-establish wetlands that were lost a long time ago and rebuilding oyster reefs on the Australian coast.*

These are relevant to Lasqueti for different reasons. We have beavers here that are actively changing the face of the John Osland Reserve (see the photos on the next page, and the article in LINC newsletter #26, Spring/Summer 2022). Beavers are a natural part of the ecological community on Lasqueti, playing this kind of role for millennia (based on recent archaeological research).

We also have oysters that have a big impact on the character of the rocky intertidal areas along Lasqueti. But in contrast to the beavers, the dominant oysters here are an invasive species from the Asian Pacific coast introduced to the west coast of North America early in the 20th century. While they play an important role in our local economy and diet, we still don't really have a good understanding of their mix of positive and negative impacts on intertidal ecology.

Written by Daniel Merino (Associate Science Editor & Co-Host of *The Conversation Weekly Podcast,* ***The Conversation***) and Nehal El-Hadi (Science + Technology Editor & Co-Host of *The Conversation*

Whether you are looking at tropical forests in Brazil, grasslands in California or coral reefs in Australia, it is hard to find places where humanity hasn't left a mark. The scale of the alteration, invasion or destruction of natural ecosystems can be mindbogglingly huge.

Thankfully, researchers, governments and everyday people around the world are putting more effort and money into conservation and restoration every year. But the task is large. How do you plant a billion trees? How do you restore thousands of square miles of wetlands? How do you turn a barren ocean floor back into a thriving reef? In some cases, the answer lies with certain plants or animals—called ecosystem engineers—that can kick-start the healing.

In this episode of "The Conversation Weekly," we talk to three experts about how ecosystem engineers can play a key role in restoring natural places and why the human and social sides of restoration are just as important as the science.

The Conversation: January 26, 2023, reprinted with permission. https://theconversation.com/beavers-and-oysters-are-helping-restore-lost-ecosystems-with-their-engineering-skills-podcast-198573

Ecosystem engineers are plants or animals that create, modify or maintain habitats. As Joshua Larsen, an associate professor at the University of Birmingham, explains, beavers are a perfect example of an ecosystem engineer because of the dams and ponds they build.

"They create this pocket of still water, which allows aquatic vegetation to start to colonize that wouldn't otherwise be there," says Larsen. Once a beaver establishes a pond, the surrounding area begins to change from a creek or river into a wetland.

Larsen is part of an effort to reintroduce beavers into Britain, a place where they have been extinct for over 500 years and the landscape reflects that loss. There used to be hundreds of thousands of beavers—and hundreds of thousands of beaver ponds—all across Britain.

Without beavers, it would be prohibitively difficult to restore wetlands at that scale. But, as Larsen explains, "Beavers are doing this engineering of the landscape for free. And more importantly, they're doing the maintenance for free."

This idea of using ecosystem engineers to do the labor-intensive work of restoration for free is not limited to beavers. Dominic McAfee is a researcher at the University of Adelaide in Australia. He studies oysters and is leading a project to restore oyster reefs on the eastern and southern coasts of Australia.

"These reefs were the primary sort of marine habitat in coasts, coastal bays and estuaries over about 7,000 kilometers (4,350 miles) of Australian coastline," says McAfee. But today, "They're all gone. All those reefs were scraped from the seafloor over the last 200 years."

When you lose the oysters, you lose the entire reef ecosystem they support. So, a few years ago, McAfee and his colleagues decided to start bringing these reefs back. Oysters need a hard surface—like a rock, or historically, other oysters—to grow on. But all those old oyster reefs are gone and only sand remains. "So the first step to restore oysters is to provide those hard foundations. We've been doing that in South Australia by deploying limestone boulders," explains McAfee. After just a year, McAfee and his colleagues are starting to see results, with millions of oyster larva sticking to these boulders.

At this point, McAfee says that challenges are less about the science and more about getting community and political support. And that is where Andrew Kliskey comes in. Kliskey is a professor of community and landscape resilience at the University of Idaho in the U.S. He approaches restoration and conservation projects by looking at what are called social-ecological systems. As Kliskey explains, "That means looking at environmental issues not just from a single disciplinary point of view, but thinking that many things are often occurring in a town and in a community. Really, social-ecological systems means thinking about people and the landscape as being intertwined and how one interacts with the other."

For scientists, this type of approach involves sociology, economics, Indigenous knowledge and listening to communities that they are working with. Kliskey explains that it's not always easy: "Doing this sort transdisciplinary work means being prepared to be uncomfortable. Maybe you're trained as a hydrologist and you have to work with an economist. Or you work in a university and you want to work with people in a community with very real issues, that speak a different language and who have very different cultural norms. That can be uncomfortable."

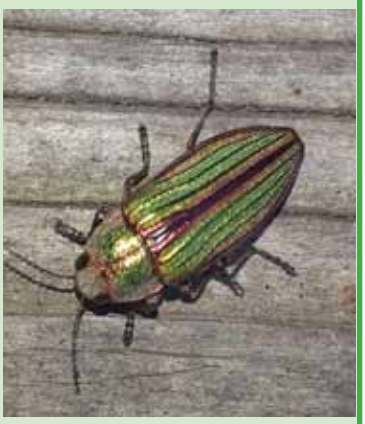
Having done this work for years, Kliskey has found that building trust is critical to any project and that the communities have a lot to teach researchers. "If you're a scientist, it doesn't matter which community you work with, you have to be prepared to listen."

Facing Page: the beaver and its dam.
Left: beavers create habitat for other species - eagle, deer, and on the right a raccon. *Photos by a wildlife camera on the John Osland Reserve.*

Seen In Passing

Early signs of spring -- Red-Flowering Currants in bloom (*Ribes sanguineum*). It is popular with hummingbirds and other early season pollinators, and the berries were a food source for Indigenous peoples. *Photo Ken Lertzman*

The Golden Shield Bupestrid (*Buprestis aurulenta Linnaeus*) is a common wood boring beetle in British Columbia--and has begun to be active this spring. Adults bore into recently dead or dying conifers to lay their eggs. The larvae excavate galleries in the wood as they grow. *Photo James Schwartz*



Trumpeter swans enjoying the fresh water runoff at Boat Cove this spring. Photo *Sheila Harrington*

Screech owls trying out a nest box - courtesy of Jay Rainey

Young Bald Eagle Photo *Dianna Maycock*

The differences between young Bald Eagles and Golden Eagles can be seen at https://avianreport.com/how-to-tell-a-juvenile-golden-eagle-from-a-juvenile-bald-eagle/

LINC Lasqueti Island Nature Conservancy

Annual General Meeting, May 25th 2024

Do you want to become a director or volunteer and help conservation and stewardship on Lasqueti? Contact linc@lasqueti.ca for further information

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