

## How Healthy Are Lasqueti's Forests?

by Ken Lertzman

Traditionally, the term “forest health” refers to the presence of insect pests and diseases. In the past, this was a concept focused on tree health, often in the context of timber management. In a world where climate change is already having impacts and we are concerned about the broad range of ecosystem services<sup>1</sup> provided by our forests, “forest health” has to mean something bigger. Holistically, we measure our body’s “system” as healthy if we have a strong immune system that allows us to fight off diseases and respond resiliently to the normal shocks of daily life. Similarly, a forest is a healthy “system” if it has an ability to respond adaptively to shocks and challenges – if it is “resilient” to disturbances and other changes. This includes the insects and diseases traditionally viewed as the core business of “forest health”, but also much more – things like invasive species and climate change. I argue that on Lasqueti we have some reason to worry about the health of our forests from this broader perspective.

Forests on Lasqueti have the normal history of natural disturbances for this drier part of the South Coast. They’ve had a history of fires, and also they have root rot fungi such as *Phellinus* and *Armillaria*, more or less in the normal degree

<sup>1</sup> “Ecosystem services are the benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services, such as nutrient cycling, that maintain the conditions for life on Earth.” From the UN’s Millennium Assessment document “Ecosystems and Human Well-Being”. <https://www.millenniumassessment.org/documents/document.356.aspx>.

you’d expect in such forests. These are a natural part of the cycle of growth, development, and mortality in our forests. Lasqueti’s forests have been disturbed and have recovered from these and other disruptions (including harvesting and fires set by Indigenous people) since deglaciation. Like most of the South Coast, Lasqueti’s forests have largely been logged. Fortunately, forests in coastal BC are, in general, good at recovering from disturbances unless they are really abused (and we’ve done our fair share of that in the Province). Normally, the complexity and diversity of old growth forests will recover over time as younger forests age and mature during their first few hundred years.

The problem is that over the past century or so some of the natural recovery mechanisms in our forests have been

impeded. On parts of Lasqueti, as on a lot of areas in the BC South Coast, we’ve seen a shift in the dominant species of trees. For instance, there’s been decline in the abundance of western redcedar through the region because it’s been targeted for logging and often has not regenerated effectively – in some cases because of artificially high levels of browsing. There are many second growth forests on the South Coast where almost all the large old stumps are Douglas-fir and redcedar,

but most of the current canopy trees are hemlock. On Lasqueti, there are many areas that had much more cedar historically than they do today, and in some places cedar regeneration has been virtually eliminated.



the fenced area has recovered a productive and diverse understory of herbs, shrubs, and ferns that contrast strongly with the barren ground outside the fence (K. Lertzman)

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There are other legacies on Lasqueti of our particular mix of logging history and failure to recover along normal pathways of forest development. For instance, *Arbutus* regeneration is also impeded by browsing, and it is one of our more drought tolerant species. So, between poor regeneration and the mortality of adult *Arbutus* from new diseases that have moved into our region, some of our drier rocky sites are in danger of losing their forest cover. Similarly, in areas with rich, productive soils, but a history of heavy sheep browsing, there are canopies of older grand fir (“balsam”) and alder that are reaching their natural age limits and dying. But many of these places have little understory and few subcanopy trees, so that when the canopy trees die, there is little growing there to replace them – and anything that does try to establish is browsed heavily. Unless something changes, these areas that would otherwise be productive forest will become open and unforested.

High levels of herbivory (animals eating plants) are the major cause of Lasqueti’s open understory, poor tree regeneration, and paucity of wildflowers. Grazing and browsing by introduced herbivores on islands has long been considered a classic problem in conservation. On Lasqueti, the problem probably arises from a combination of the feral sheep and the native deer. Neither has significant natural predators on the island, and hunting pressure is probably less than it used to be. Though the archaeological sites on Lasqueti show that deer have coexisted with our forests for many centuries, this coexistence probably took place in the presence of significant hunting pressure by Indigenous people (as indicated by deer bones in the middens).

Of course, there’s a lot of variability across the island in the abundance of both sheep and deer – and thus the intensity of browsing. In some areas there’s hardly any visible effect – the understory is lush and productive. But in other areas, the forest understory is sparse and has a shockingly low diversity and productivity compared to what one would normally expect. While these open areas can be pleasant and easy to walk through, they are missing many plants that would normally occur there. When we fenced off part of the forest near our house on the southeastern end of Lasqueti, within six months we were seeing native understory plants that we’d never seen there previously (such as starflower [*Trientalis*], lilies [*Erythronium*] and shooting stars [*Dodecatheon*]). In subsequent years, the fenced

area has recovered a productive and diverse understory of herbs, shrubs, and ferns that contrasts strongly with the barren ground surrounding it.

In fact, though ecological degradation from overgrazing and overbrowsing has an ancient history, high levels of browsing are increasingly a problem in many forests globally because of widespread species introductions combined with reduced hunting pressure and lower mortality from declining populations of natural predators. In our part of the world, there’s been a lot of research examining the effects on the forest of excessive deer herbivory, but little looking at the role of sheep. This focus on deer is both because native deer populations on the coast are widespread and because there are important locations where introduced deer populations have had dramatic impacts. In contrast, impacts from feral sheep are a problem that is pretty much home-grown on Lasqueti. Similarly, browsing by introduced deer in Haida Gwaii is a huge problem both for forest management and for conservation. We know from extensive research conducted in Haida Gwaii that this extreme level of browsing and consequent loss of plant diversity has cascading effects on the whole forest community, reducing the diversity and abundance of insects and birds as well. Similar work has been conducted by others in the Gulf Islands, with similar results<sup>2</sup>. Bird species that depend strongly on understory vegetation were less common on islands with high deer density.



Understory plants & flowers flourish in un browsed areas. (J McGown)

There are lots of reasons why we should care about this loss of diversity. One of them relates directly to the idea that “forest health” can be thought of as resilience to external impacts. In the world of finance and investments, we’re used to the idea that a diverse portfolio is a risk management strategy for dealing with a changing world. The same idea applies in ecology, where “portfolio effects” are an important idea for buffering against environmental change and human pressures.

We live in a world where the rate of change in environmental conditions is increasing and will continue to do so. Climate change is already having major ecological and social impacts around the world, including in BC. Summers like this past one will be the norm – and you can see the stress this summer has caused by just taking a walk in the forest. The heat and droughts, the fires, the floods,

<sup>2</sup> See online material for papers that discuss this

the hurricanes and more will be our new normal. The causes of most of these changes are out of our hands on Lasqueti. But the healthier our ecosystems are, going into this future, the more likely they will be to weather those changes until (and if) the global community can deal with the larger-scale drivers of change. We need all the diverse species that allow the forest community to have its best chance to respond adaptively and resiliently to change.

We, the human community of Lasqueti, need to have a thoughtful discussion about those aspects of ecosystem resilience that we can directly influence, and talking about what kinds of forests we want in the future, and what we need to do to get there. It is important to remember that there are inherent tradeoffs here: more herbivores means fewer native plants, birds, and poorer tree regeneration. But having open areas right around our homes is a good tactic for reducing fire risk. To make good decisions and understand these tradeoffs, we need more information.

Understanding the impacts of foraging and the options to reduce those impacts is a key part of being able to have a healthy, diverse and resilient forest in the future.

Islands elsewhere have chosen various strategies to deal with these issues, from controlling herbivores to eliminating them. Parks Canada has been eliminating introduced deer on special, isolated locations in Haida Gwaii, like the Hotsprings Island group. Elsewhere on Haida Gwaii, people will continue spending a lot of money to bring cedar abundance in the forest back to what it once was. On Santa Cruz Island off the coast of California, they eliminated feral sheep, but the road to recovery there has been a complicated process. Disturbed ecosystems often don't simply return to pre-disturbance conditions after the disturbance is removed. On Mayne Island, a report recommends a variety of measures intended to reduce or eliminate Fallow Deer and to reduce Blacktail deer populations through carefully regulated increases in hunting – and monitoring of both deer populations and the condition of island vegetation. It would be useful to compare numbers for Lasqueti with those published in 2011 for other Gulf Islands.

Some level of herbivory is a natural part of the ecological history of our forests on Lasqueti. A good starting point for us to consider would be a combination of: 1) gathering more information about herbivore populations and impacts on Lasqueti and 2) managing our herbivore populations more effectively.

## Seen in Passing

*Great blue heron egg (Connie Haist)*  
*chorus frog and garter snake (Izzy Harrington)*  
*unknown spider at Mount Trematon (Wendy Schneible)*



## Squitty Bay Day



Sea Stars off of Squitty Bay

**LINC's fourth Squitty Bay Day** August 20th was another great event! Starting with fantastic local lamb wraps and refreshments, attendees: joined the LINC board for a walk up Salish View, went for a shoreline walk and talk with Nikky Wright of SeaChange Conservation Society, or took another wonderful boat trip thanks to Craig Hardy - out past Squitty Bay to the outer islands in the south end. Kids searched for natural and unnatural wonders, bringing photos of their finds to show Sheila Ray. Then we danced the afternoon away with Ken and the Rousing Rebels. Thank you so much to all who came, to those who helped with the food (Bonnie Olesko., Anna DiFore, Wendy Schneible, Shirley Rogers and Aigul Kukoly), and to Nikky Wright for sharing her inspiring insights on shorelines. Much appreciation goes to Ken Pickard, Sam Marlatt, Gretje Lohmann, Darzo Olesko, Merrick Anderson and John Lindsey for the wonderful music!

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## Suggestions for Further Reading

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fawn lily that grew back once the area was fenced at Lertzman's home.



another view to compare the fenced and unfenced areas at Lertzman's home on Lasqueti



insects and birds are also missing in Lasqueti's browsed forests

# Beach Clean-up by Peter Dietsch

Towards the end of August, residents of Lasqueti got together for their second beach clean-up. Over two years, two tonnes of garbage have been pulled off about six kilometers of shoreline. Easily the biggest category of waste is Styrofoam, but hard plastic and car tires also wash up frequently. The provenance of the waste is hard to establish, but the size of the debris suggests that a large part comes from industrial activities or from fisheries.

## The threats to wildlife and to humans

Once onshore, the combination of winter storms and logs on the beaches grind down the foam into small pieces. In some coves with the right exposure, you sink into holes several feet deep and filled with bits of foam. A lot of these pieces, and smaller microplastic, make their way back into the ocean.

This is when plastic becomes a serious threat to wildlife. Microplastic gets ingested by plankton, or by small fish that feed on plankton and cannot tell the difference between plankton and plastic particles. From there, the plastic works its way up the food chain: Research done at the Scripps Institute of Oceanography at the University of California estimates that fish eat about 12000 to 24000 tons of plastic each year in the Pacific alone. Like it or not, that delicious steak of Pacific salmon on your plate contains plastic, too.

Filter-feeders such as clams or oysters represent another important group of victims from plastic pollution. They filter more than a liter of seawater per hour. In some places such as Squamish near Vancouver, we now measure up to 20 pieces of microplastic per litre. The cumulative effect is devastating. Finally, think of the pictures that have become all too common of dead sea birds, whose stomachs contain a whole array of plastic waste.

A more fundamental worry still lies in this pollution shutting down the ocean's capacity to produce oxygen. As Margaret Atwood succinctly wrote in regards to the plague of plastic, "dead oceans means dead people."

## Encouraging initiatives

More and more grassroots initiatives to clean up the oceans are being launched. This year, the waste cleaned up on our gulf island did not end up in landfill, but is being processed by Ocean Legacy, a not-for-profit foundation based in Vancouver. Their goal, in addition to organizing clean-ups all over the west coast themselves, is to recycle the plastic into various uses, including a

promising plastic-to-fuel programme that is being tested. Another NGO, The Ocean Cleanup, is working on the technology to siphon plastic out of the enormous gyres that circle way out in the oceans. Greenpeace has also launched an ocean plastics campaign recently.

## Volunteer efforts alone will not suffice



Jan Darwin (below) knee deep in styrofoam, was one of about twenty volunteers on Lasqueti Strofoam Day



Let's be realistic: this problem has become too big to be able to solve it through civil society efforts and based on the goodwill of an army of volunteers alone. Volunteers are desperately needed and coming forth in ever bigger numbers – anyone who has ever participated in a beach clean-up knows the feeling of satisfaction at the end of the day.

But at least as important as supporting the clean-up is the effort to reduce the mess in the first place. We need to change our attitude towards plastic consumption and towards our way of disposing of it. Governments need to pull all the levers available to them: we need educational programmes to convince Canadians to consume less plastic and to dispose of it responsibly; we need positive financial incentives, including higher taxes on oil, for the development of alternatives to plastic or biodegradable forms of it; we need negative financial incentives in the form of fines for the worst polluters; and, in some cases, we need legislation to do without plastic altogether: both shopping bags and coffee cups fall into this category.

It will take all of us to make a concerted effort to ensure future generations will still be able to enjoy this precious coast.