

2023 Dick Varney, RPF (Ret) Again, as a Retired RPF my assumptions and opinions are not professional advice.

LASQUETI PAST FOREST CONDITIONS: Update report for 2023

Here is a new update from more forest history studies, this follows both the “1875 Survey blog” and “CDF & Fire” blogs on the Lasqueti.ca web site. Now I bring you a report from studying the “1919 Surveyor’s report to J. E. Umbach, Esq., Surveyor-General, Victoria, B.C.” (original photo copy follows my writing). I also included an analysis from a 2023 fire history record map from the internet, a preliminary report on fire return for my house site presented at the 2023 fall fair, a report on a better quality 1968 Forest Cover Map (FCM) with symbols from that time period. The main thing I have learned in 2023 is that new information often shows me previous beliefs were not necessarily correct; we have to be flexible in our thinking when analyzing forest history. I also believe we need some insights into Traditional Ecological Knowledge and Wisdom (TEKW) for understanding the goals and practices behind cultural burning to paint a better picture of pre-contact forests of the CDFmm zone.

1919 legal survey

New info about 1919 on landscape conditions at that time from the 1919 surveyor: I found this 1919 report (referenced/copied below) and forgot about it or did not read it critically enough since it was less than two pages. (It was in the Annual report of the minister of lands of the Province of British Columbia for the year ending 31 December 1919). The part concerning Lasqueti is on pages 94 & 95, written by S. S. McDiarmid, B.C.L.S., the land surveyor who worked the 1919 resurvey and added additional survey lines that year on Lasqueti. The trails/road and grass (quote 1 & 2) information is very interesting; it shows a new picture of changing conditions between 1875 – 1919. This was after the first wave of settlement and just four years after Elda Mason (Elda was eight in 1919) arrived on Lasqueti Island (Windy Bay – Rouses Bay area). Also, McDiarmid (in quote 2) used the term “bush”, which *I believe historically meant young trees*. If this is the correct meaning to bush, this helps explain the amount of ingrowth over the 44 years since the last survey (or 56 years since the 1962 smallpox epidemic depopulated the First Nation local population). Tree ages from my house site support tree regeneration and ingrowth from 1836 to about 1909; many of these trees appeared younger than they aged out.

I have not read the complete 1919 legal survey, just a few pages. This report is McDiarmid’s year-end report on this Lasqueti survey and is his summary of the island. It provides a new look at forest landscape conditions or is it just McDiarmid’s (prejudice) opinion. It seems to indicate changing forest and grass cover since the 1875 legal survey. (Surveyor’s were highly educated and usually from the upper crust of Victoria’s society.) Here is an excerpt from end notes from Carey’s 1875 legal survey to compare to McDiarmid’s report of 1919. The full 1919 report is included and follows this paper.

The closing remarks by Carey the legal surveyor who surveyed in 1875 as a reminder

*"In describing Lasqueti Island I may state that the greater portion of the island is more suited for sheep pasturage than for actual agricultural purposes. Never the less there are many fertile belts of land extremely [Carey’s spelling] rich in soil and fit for cultivation. The chief portion of the cultivable soil lays at the west and towards the west end of the Island. Except one belt on the east end as described on the diagram. Although the island is very hilly and rocky it is also **very open and grassy** and well adapted for sheep raising the native grass being sweet and intermixture of clover and pea vine...."*

"The only settlers on the island are Capt. Pearce and Albion Transfield both engaged in sheep raising. Capt. Pearce improvements are a dwelling house and out offices, 4 acres under cultivation and fencing. Say 250 sheep and six head of horned cattle

Transfields improvements are a small cabin, sheep shed and corral, he also has about say 200 head of sheep. In conclusion I may state that Lasqueti island is capable of grazing about 10,000 sheep."

The **bolding** in the quotes (1919 survey) are me pointing out some interesting points. The quotes are what I found interesting and educational. Complete 1919 report is at end of this paper.

Quote one 1919 by McDiarmid:

*"There are two main trails on the island upon which Government grants have been spent, and therefore described as " roads " by the settlers. One runs from False Bay easterly to Squeti Harbor [McDiarmid's' spelling]; the other runs from Tucker Bay southerly to **Boat Cove***, at the foot of Mount Jenkins.*

*A new trail has been constructed south-easterly from False Bay into section 26. These trails are **not wide enough for wagons to be used and loads are hauled on sleighs or drags**. The post-office is at Tucker Bay, and the visitor is surprised to find rural free-delivery boxes along the trails, especially so when he knows of the infrequent mail service. The postmaster delivers the mail on foot to these boxes by carrying his load in a pack-sack. "*

*Not today's **Boat cove** but **Richardson Bay** today.

Roads in 1919 from quote 1.:

So, what this means is that the roads were really wide trails, not even improved (wide) enough for wagons or carts to use in 1919. I would now speculate that these trails were improved First Nation trails. (Were these trails old First Nation trails between population centres?) How wide were the sleigh and drags? It is assumed that the trails mainly snaked between the trees before 1919 and ran mostly on existing soil. I doubt any trees of large size had been cut to improve these trails. Some depressions had been filled in and maybe some humps had been cut down to provide the fill. Only hand tools and a possible horse drag would have been used before 1919 for trail improvements. These trails mostly follow today's roads but there were deviations in some areas, as time passed. All the logging that had been completed pre-1919 had the logs delivered to the chuck via local skid roads, not on these roads/trails. (Though according to Mason sections of the main Rat Portage skid road was used as a road after 1911.)

It is interesting to note that these trails/roads, as they improved after 1919, lessened the reliance of water travel between points on the island but not the travel to anywhere off island. The trails were also important for developing island community spirit. All exports of goods (timber, fish, farm produce, and animals) all left the island by boat. Elsewhere, it took the development of railroads between population centres to reduce trade by steamship and sailing boats.

We also know that there was a horse population on the island in 1919, but do not know the size or number of horses, and/or whether feed was brought in or pasture was used by settlers and or logging camps. We also do not know how many horses were on the island and how often the drag/sleighs were used on the trails. And how many non-logging camp horses there were on the island. Probably it was the 'non-logging camp' horses that also grazed on the island pastures along with sheep, pigs, and cattle (both dairy and oxen) during this period. (From other sources around the Gulf of Georgia we know that the delivery of grains and forage to logging camps by steamer was a major logging expense at that time.)

Some facts about forage so to understand reported (partial) populations of domestic stock.

One animal unit month (AUM) is equivalent to 780 lbs. to 800 lbs. of dry matter forage. Hay is between 85%-90% dry matter, while grasses are between 20% to >40% dry matter. Animal unit Equivalent (AUE) are on average: deer are rated as 7.7 to a AUE, sheep are rated as 1/5 AUE; cow is 1 AUE; horse is 1 ¼ AUE. Of course, working animals consume more in proportion to how much work they are doing. This extra energy is normally supplied by grains.

The 1875 the openness of the forest was necessary to produce the forage for all the different domestic species of the settlers. In 1875 domestic livestock were consuming 96 AUE or about 690,000 pounds of dry matter per year or the equivalent of 406 tons of hay per year (using assumptions of 6 cows, 200 ewes [12-months], and 250 lambs [6-month equivalent]. The wild deer were also eating at the same time, so also consuming grass and forbs. This is another indication of the openness of the forest, because it takes quite the area to grow the equivalent of

406 tons of hay of grasses and forbs. Open farm land with fencing on Lasqueti probably produces less than 1 tons per an acre without fertilization and irrigation. I have used a lot of assumptions from my farming and wildlife background. I wonder what the island population of domestic stock in AUE's was in 1919?

We can surmise that between 1919 and 1929-30 the trails/roads were widened so that carts and wagons could use them. From Mason 1976, she reported that cars arrived about 1927-30 and the first logging "cat" tractor in 1930. Mason notes that loggers had to widen and improve the roads for log truck use, but it seems this reference was later about 1935. The first government road truck (1935) arrived and was used to haul gravel; which was an improvement over the hand tools, wheelbarrows, and horses pulled scrapers that were all the tools available pre-1935 (Mason). Truck logging started in 1935-36 by Roy Seney and he needed to widen and gravel the roads to be able to haul logs (Mason).

Quote two 1919 by McDiarmid:

*"Lasqueti Island is mostly rocky—the east end roughly piled. In the hollows or bottoms are accumulations of earth, sometimes dry, but more often grassy swamps. The hills or mountains are moss-covered, but there are also **places where a wild grass grows* in the timber. According to the settlers, there was a few years ago much more grass and an attempt was made to turn the island into a large sheep-ranch. It is said that many hundreds of sheep were feeding there, but thieves and hunters made away with so many that the effort was abandoned. The bush** is now growing where there was at that time grass and the pasturage* is disappearing on the hills.**"*

*Grass still grows but has somewhat disappeared in 44 years.

**The big question is what was the bush?

Forest and pasture conditions in 1919 from quote 2.:

**The big question is what was the bush that replaced the grass understory? McDiarmid believes in grass decline and replacement by bush. What is unknown about this is true meaning of "bush" as used by McDiarmid? Was it young trees or brush or both?

Option 1. Was it that the sheep had consumed most of the grass and legumes over the last 44 or 56 years and then hunting had reduced the sheep population? What about horses, cattle and pigs; what did they eat? Was overgrazing the cause of grass decline?

Option 2. Was the grass decline a result from natural succession (regrowth and ingrowth of trees, or "bush") for both: A. areas logged (along the coast) "regeneration" growing and shading areas? and/or B. "ingrowth" of regeneration from areas that had lower tree density in 1875? Did infilling of regeneration and tree growth reduce the grass?

There had not been a lot of time for the locals to learn about and understand these natural factors and they would not have known much about the extent of previous First Nation practice of cultural burning (cultural burning has been a recent scientific discovery or improved new learnings of information about native culture). Or did the settlers' wives understand cultural burning and the practice continue some places. What was there - probably seemed be "natural" to them. (Knowledge about succession was not well known in 1919, it was mostly biologist and foresters who were studying succession that had any knowledge about forest succession.) First Nation cultural burning has just been researched in the last 50 years and has become more generally known in the last 10 years. There is still a large quantity of research being done about early succession of primary forests in the Pacific northwest, as we gather more and better data. More areas of frequent low intensity fires keep getting found or rediscovered, such as the wildfire research on the San Juan's, but this information is not widely spread to the public so far.

Option 3. How much did the cessation of cultural burning affect the landscape conditions of grass and growth of "bush"? From my **very rough analysis** of the 1875 survey trees about 80% of the island was roughly: 18% open forest (151-315 t/Ha), 50% plains (35-150 t/Ha), 12% prairies (0-35 t/Ha), and 20% forest (>315 t/Ha) **this of course does not include small trees**. In 1875 Carey mentioned young trees on 81% of his transects. Why were there multiple cohorts on my property from 1836 to 1909?

Today we see the result of ingrowth of trees as a natural part of our forest. As we walk our forests today in the hills where there are few stumps, we need to visually remove all the trees regenerated since the late 1800's to understand the openness of the forest in 1875 (also we should add in any cut/logged trees from the stumps).

It would be good to know more about regeneration growth rates - for both poor and good growth of the regeneration (since we see different tree ring widths in the same area). Were these different ring widths (early growth rates) because of different soil types/depths and/or were they from shading from different overstory spacing of trees. (A few months later, I found a high probability of 5-6 low intensity fires between 1836 and 1909 on my new house site. From other studies in the Pacific Northwest, it seems this was a period of short fire return.)

I now assume that the "bush" was young trees from ingrowth and regeneration from about 1863 (smallpox epidemic) and/or the 1875 survey onwards, [now I add the early 1800's]. This bush is likely the result of natural succession (within the CDFmm zone) with or without cultural burning in Lasqueti's open woodland forest areas (80%) of the island.

I now assume this regeneration and ingrowth was the reason that the Forest Cover Map (FCM) of 1968 demonstrated that after logging in the 1950-1960's that >50% of the area logged was already regenerated to "61-80" year old trees. (Tree height was probably the basis for age during the 1960 to 1968 inventory period, though there was a large amount of ground truthing on Lasqueti.) Was it mainly the trees that grew up during this 56 year [or now longer] period that made up the regeneration classed as "61-80" years old? (My site indicates that older regeneration on poor soils was also included because of slow growth.)

I was rereading "Beautiful Rocks," a history of the highland district near Victoria, BC by Highland Heritage Park Society and discovered settlers/sheep ranchers were also periodically burning up-land hills for pasturage in the late 1800's in the highlands (estimate of 300+ sheep and time period was 1860 to 1880's plus). (The Highland area has base rock of "terranes" just as Lasqueti has.) *"New range would need to be found within as little as five years after fire because, without reburning, natural succession quickly returned areas to shrubs and forest."* So, it now seems that cultural burning likely also continued after the earliest settlers on Lasqueti (1880-1905) (we need more evidence). That the practice may have died out by 1919 legal survey on Lasqueti is interesting. It seems as the importance of sheep ranching declined on Lasqueti, the practices of burning for forage may also have declined and bush takeover became more dominant. Alternatively, the 1910 Rat Portage slash burn may have also scared the settlers from continuing cultural burns.

Option 4. Was it the combination of options 1-3 that caused the grass decline?

Option 5+. Are there other options? Yes, there can be other factors that could produce tree regeneration and growth between 1836 - 1909. More study sites are needed.

***Grass still grows but has somewhat disappeared in 44 years.**

McDiarmid seems to believe in grass decline but that grass still persisted in some areas, but he did not identify these areas in his report. My best estimate is that there was still grass growing in the more open woodlands but it had noticeably declined in abundance from the "bush" ingrowth and other trees growing older and higher and shading it out. How much grass was rushes and/or sedges growing in the "grassy swamps" as McDiarmid called them? (We still have many of these grassy swamps today though some have changed over time.) I believe tree shading: caused by higher density regeneration and continued growth of trees helped close the tree canopy's, which also caused low light therefore less grass to grow. Then there were older trees which were just getting bigger and shading more. So new growth of trees, continuing regeneration "ingrowth" had probably decreased the grass as much as the sheep and other domestic stock's grazing had, but the cumulative decline was notable. This would have been the result of natural succession either with or without cultural burning and be another reason we have the high density of trees today. (Today's tree density is probably twice as dense as 1850 – from the study of trees in the Duncan area (Bjorkman, 2008).

What were the types of grasses in 1875 and 1919 and do they differ from what is there today? Again from “Beautiful Rocks” it seems native bunch grasses may have dominated our hills, but more research is needed. Bunch grasses usually also produce well in open areas between trees or in partial shade.

In this summary, McDiarmid has not mentioned anything about the peas, clovers and vetch mentioned in the 1875 survey, which Carey stated as the reason why he thought Lasqueti could support 10,000 sheep in 1875 (about 20 times the domestic stock population in 1875). Did the grazing reduce the peas, vetch, clovers, other legumes, and grass pasturage so that stocking had to be reduced? Did the consumption of nitrogen fixing legumes (preferred feed by all types of livestock) reduce the production of the grass? What did the pigs that settler had eat? Camas and what else did the pigs root out?

When we look at history from other areas of the west, there was often the common practice of overstocking sheep. Too many sheep for the forage results in sheep grazing close to the ground that often ended up killing off certain species. We do not know what happened locally on Lasqueti during those 44 years between legal surveys. The local report of hunters and thieves reducing the sheep population seemed a logical reason; or was it just increasingly poorer pastures over the years (mostly from trees growing and possibly over-grazing) that helped cause the decreasing sheep population – no one will ever know. Could internal parasites have helped reduce the sheep population, as we see in wet spring years today? What were the early 1900’s sheep numbers? (Estimated sheep population in 1875 was 450 [probably population of ewe’s (sheep) and that year’s lambs.]) What was the sheep population in 1919? *I doubt that there were ever 10,000 sheep (Carey’s predictive quote in 1875 because of legumes) or sheep equivalent on the island pre-1919. Though the number of horses, cattle, & pigs might have raised the stocking pressure on the pasturage.* What is the large predator history for Lasqueti? (McDiarmid writes Lasqueti is free of animals of prey in 1919.)

Local knowledge or rumor (from the 1970’s) has it that sheep grazing may have helped prevent fires, especially along the roads. Grazing can help prevent wildfires as herb & grass growth often needs two years to carry a cultural type burn. In this area of the west coast, a heavy winter rainfall, which promotes vegetive growth, before a dry summer often precedes a common fire year.

It is interesting to speculate on the local knowledge angle. I was told in the 1970’s that the sheep helped prevent fires by eating the bush and understory. Was this local knowledge just handed down knowledge from an earlier period of time or where did it come from? I do not know. From historical records, settlers have mostly thought fire was detrimental to the forest and threatened their livelihood (I believe since 1900 till today [there is still the belief all fires are bad]).

What is less known is that today (2023) we have a good crop of grass on the edges of stands where the trees are less dense and more open and it seems that grazing pressure seems to be low. The grass quickly disappears as the tree density increases (personal observation in 2023 at north end of island in early summer). But current reports from the south end of the island today indicate that most understory plants are overgrazed. Why do we have seemingly different conditions at the same time? Are sheep number the only reason? I also have grass starting to grow under a 20-23 year old stand that was thinned about four years ago. The thinning’s slash was removed from the area in the last two years (firesmart clean up), which opened the ground to more sun exposure. Then and this year a patch of grass & forbs grew well in the most open area. Both sheep and deer use this area for forage and did some grazing on the grasses.

An interesting speculation is: Would opening up our stands of trees (by increase inter-tree distances) increase forage production and reduce understory over-grazing? How much openness is needed? Would there be a need to underburn after the thinning to get grass to grow? To obtain increased forage growth where there is overgrazing **may require** reducing grazing pressure. But deer overgrazing the understory is a problem on other Gulf islands as it might become on Lasqueti with less sheep. We might be exchanging one problem for another. What other consequences are possible from opening up stands of trees? (more brush, unsuccessfully increasing the forage, increasing the sheep population, and probably other than my imagined consequences are also possible). What would opening the stands and burning the area do, to the grass production?

Quote three 1919 by McDiarmid:

*“The island has been and still is, **in places, well timbered***, and some excellent fir and cedar will be cut when the richer areas in other places have been depleted. Logging has been carried on Lasqueti, and **much valuable timber partly felled and cut into logs has been damaged by a fire** during the latter part of August of this year.** This island seems to be more adapted to forest-culture than to farming. The small patches of arable land are not sufficiently inviting to the practical farmer, and in several instances, it is **apparent that the timber and not the soil has attracted the pre-emptor***.** So much of the Crown-granted land is unoccupied that **pre-emption seems to be a form of speculation and there is much to discourage the pre-emptor****.** That which would have been an excellent forest reserve, surrounded by water, now is, or soon will be, **alienated from the Crown to so-called ranchers******, who in order to exist must have large sums of public money spent to open up lines of communication.”*

*This timber assessment by McDiarmid is quite different than Mason’s.

** Is this the same fire as Mason’s in 1919? The timing seems the same.

*** I believe the best timber was on the best soils along the coast and has already been logged, so what is McDiarmid meaning here? Now after comparing soils to early tree regeneration (1968 FCM) in 2023, I recognize some of the early logging was done on low (3rd rate) soils, but probably good quality trees that were more open (less dense so lower volume per acre).

**** This seems to contradict itself: unoccupied land means speculation by pre-emptors (McDiarmid) and then what are the conditions that discourage pre-emptors? Plus, McDiarmid seems to make positive comments about animals on Jervis and Jenkin’s islands that seems to support settlers.

What can we learn from McDiarmid’s report in Quote 3.

***This timber assessment by McDiarmid is quite different than Mason’s.**

Elda Mason wrote (page 32) “...*Lasqueti timber was known for its hardness and pitch and usually it was not in much demand.*” Probably the trees with these conditions resulted from being open grown and being repeatedly culturally burned. These might also be many of the trees that were harvested later after WWII. Then on page 86 wrote again “low quality” timber became worthwhile taking out.

S. S. MCDIARMID, B.C.L.S. wrote: “*The island has been and still is, **in places, well timbered***, and some excellent fir and cedar will be cut when the richer areas in other places have been depleted.*” We estimate that logging between 1925 to 1944 (according to 1968 FCM) covered over 2000 acres or >10% of the island. This is about the same area as what was logged between 1900 to 1924 (1968 FCM).

What is well timbered? What is well timbered but not as good as richer places? How do we interpret McDiarmid’s writing? From my research, volume per acre was the normal way to consider timber value and soil productivity from 1900 to >1968. We do not know how McDiarmid estimated timber?

Carey in 1875 used “scrub” and/or “scattered” to describe timber on 40% of his transects. Large fir & cedar on a very limited 4% of his transects, which did not include any of the early logged areas (Rat Portage and other coastal logging pre-1919). The rest of the transects just mentioned the species in his timber notes, but most transects had young or small fir mentioned within the timber notes. No quality assessments were presented in Carey’s reports. The 1875 survey analysis of inter tree distances indicated there were large inter tree distances (>10 meters) for >20% of all the different sized trees (4” to 100” in diameter), indicating at least 20% were very open grown or open woodland. Historical images from San Juan Island can provide an indication of open grown trees. Do we have historical images of trees on Lasqueti?

In “Beautiful Rocks” there are also different opinions/reports on timber quality of that area. This ranges from ‘trees too poor to mill’ to multiple accounts of logging so there were good trees for logging. So probably all these conditions were present and it just depended on where you were and how much soil there is on a location for the Highlands and Lasqueti.

I propose all these are correct, it just depended on the authors view point.

** Is this the same fire as Mason's in 1919?

Where was the 1919 fire? It seems it was in cut timber as S. S. MCDIARMID, B.C.L.S. wrote: "Logging has been carried on Lasqueti, and **much valuable timber partly felled and cut into logs has been damaged by a fire during the latter part of August of this year**". Was this the same fire as Elda Mason's 1919 fire; page 28 (1st of her books), "fire in the forty-acre slash left by the Rat Portage Logging Company."? Also, Mason says firefighters used the main road as a fire break – so which side of the road was the fire on since it jumped the road and threaten her house? Or did it jump the new fire line? There seems to be no indication on the 1968 FCM of a 1919 fire in that area.

But again, this is historical reporting with different sources giving possibly different opinions. Or was this left-over timber that was not moved to the water from the Rat Portage lease because of the 1911 fire that destroyed the logging equipment (British Colonist, 1868)? How recent in 1919 or before were these trees partly felled (McDiarmid)? The 1919 survey data (book 1 page 38) may explain this fire and the logging better. Mason said the fire was in older slash and McDiarmid said it was in partly felled timber. McDiarmid surveyed across Heemis Swamp, so the survey line page notes will probably indicate more information. I would like more information about this fire. Who was logging and where was the slash and timber fire in 1919? It seems it was within a mile of the beach, so was still considered practical for skid trail logging of either horse or steam donkey. This fire was not recorded on the historical fire map by the Wildfire Service, which follows this report. So, the fires in the Wildfire map probably started after 1919.

I have very limited info as I have only 16 pages from the two Surveyor note books from 1919 survey. From one page I have seen, it shows McDiarmid notes an old burn to the north of the line between sections 14 & 15, heading west about 4.5-5.0 chains from the corner; *I propose this might be the edge of the 1910 fire as three chains latter, on the other side of the line McDiarmid notes old logging [Rat Portage probably].* As I related, this part of the line had old logging to the east of the Lake Road trail in the section line at about 14 chains. The old logging was probably the Rat Portage lease logging, that stopped after the 1910 slash fire. The fire was probably some of this fire running up into the rockier edge timber not cut yet. The British Colonist newspaper in 1910 Aug 07 page 21 reported logging equipment and camp were destroyed in the slash fire on Lasqueti.) McDiarmid did run the line between sections 11 & 12 across Heemish swamp on p38 book 1 (from the 1919 survey map), but I have not seen this page. I have only seen a very limited amount of this survey, not even the complete 14 & 15 section line.

From the quote above "This island seems to be more adapted to forest-culture than to farming. The small patches of arable land are not sufficiently inviting to the practical farmer, and in several instances, it is **apparent that the timber and not the soil has attracted the pre-emptor**.

I had believed the best timber was on the best soil along the coast and has already been logged by 1919. There was some first-rate soil inland (possibly great timber) that had not been logged. It would now take multiple skids to get logs to water till 1930 when "cats" arrived. Skid roads were engineered just as railroads were to provide an even slope to facilitate log sliding. Logs also had to be debarked on the sliding side to reduce friction for skid road logging. Approximately <10% of Lasqueti that had been logged by 1919, this was probably the best timber grown on the island with easy access to water. Much of this area logged was by timber leases (pre-1925), then the logged sites became open for settlement as the leases ran out. So, I wonder why McDiarmid's opinion is that pre-emptors' are attracted by the timber.

Also, it seems McDiarmid was unaware of the many properties that had changed landowners (sold) before 1919 (example is the Millicheap farm was bought from Louis Vilac (Mason). Along the island coast the logged off leases had come up for sale and possibly pre-emption in the last few years. Some of these properties (if pre-empted) had already re-sold by 1919 (example was the Darwins in 1915 bought land and house from Mr. Bousefield whom had got it after Rat Portage (had logged its' lease and the land became available [possibly 1913] [Mason]). According to Mason many inland properties had been pre-empted or bought before 1919 for gardening and farming on. Another example is Section 34 {Sunset View} had been preempted by Creighton, then sold to Marshall brothers, then sold again to J.S.G. Pemberton before 1903. My analysis is that McDiarmid had only partial knowledge and his opinions were quite prejudicial against

ranchers/farmers. The exception is that McDiarmid seems to make positive comments about animals on Jervis and Jenkin's islands which seems to support settlers.

****** "So much of the Crown-granted land is unoccupied that pre-emption seems to be a form of speculation and there is much to discourage the pre-emptor****.** That which would have been an excellent forest reserve, surrounded by water, now is, or soon will be, **alienated from the Crown to so-called ranchers******, who in order to exist must have large sums of public money spent to open up lines of communication."

This seems to contradict itself: How does unoccupied land mean that pre-emptors were speculating? Were there other logical reasons properties were unoccupied in fall of 1919? Speculating in timber had been happening for over forty years on the coast, but were local settlers planning to make money off the timber (speculation) or re-investing this money into improvements on their land? McDiarmid seemed to be prejudicially in favor of forest reserves and prejudiced against settlers? It was the increasing settlement and land sales that caused the demand for the 1919 re-survey that employed McDiarmid. McDiarmid never provided any of the conditions that discouraged pre-emptors (except maybe the small patches of arable land), so we do not know completely what he was referring to. McDiarmid seemed to believe settlers took large sums of other tax-payers money to open up lines of communication. What are the lines of communication McDiarmid is referring to? (Possibly it was the trails and post office?) I have trouble understanding what S. S. MCDIARMID, B.C.L.S. believes discouraged pre-emptors and buyers when there was so much land ownership change between 1880 to 1919. Also how does he connect unoccupied land to speculation and what was "discouragement for a pre-emptor" – especially if the settlers were speculating on second- and third-rate timber? Is this an analysis of history or just one surveyor's opinion in an old report.

Lasqueti had had a mine operating, a fish plant, some logging, summer fishing, Farmer's Institute, and an Agricultural Association in 1919 (Mason). So, the farmers/ranchers were providing food for more than their own families. Yes, the Farmer's Institute did seek government aid for the purchase of stumping powder, fertilizer, and seed, but they had also communally bought a shorthorn bull and boar to improve bloodlines of island livestock (Mason).

It is interesting that settlers were clearing already logged land, I assume this from Mason quote "clear old stumps" from the need for stumping powder. The logged areas would have provided a lot more sunlight to the ground into openings (homesteads) than our tall forests today do. Even though early logging probably only harvested the best trees, often smaller trees were left standing on sites. The early settlers chose the easiest workable sites to preempt or buy; probably First Nation openings were chosen first, then logged sites (no big trees to get in the way of sunlight), probably last chosen were tree covered sites.

In conclusion, there is one paragraph about forest and some vegetation conditions in 1919 in this report (photo copy of 1919 report is on last three pages of this report). Does S. S. MCDIARMID, B.C.L.S. give us a better picture of changing early conditions, or is it just a limited look at possible changes? Have the meanings of terms used by S. S. MCDIARMID, B.C.L.S. changed over time? I would love to read the survey notes for the entire legal survey conducted by S. S. MCDIARMID, B.C.L.S. in 1919. Would the 1919 survey notes provide more information about forest conditions?

Lessons Learned:

The grass declined over the time period (1875 to 1919).

Bush took over from the grass – The most likely meaning of 'bush' is young trees.

There is a disagreement about the remaining timber quality, after the easiest/best coastal areas had been logged by 1919.

Fire history Map of Lasqueti:

I also discovered a provincial Wildfire History Map of Lasqueti Island. So, I thought to compare it to the 1986 forest cover Map (FCM):

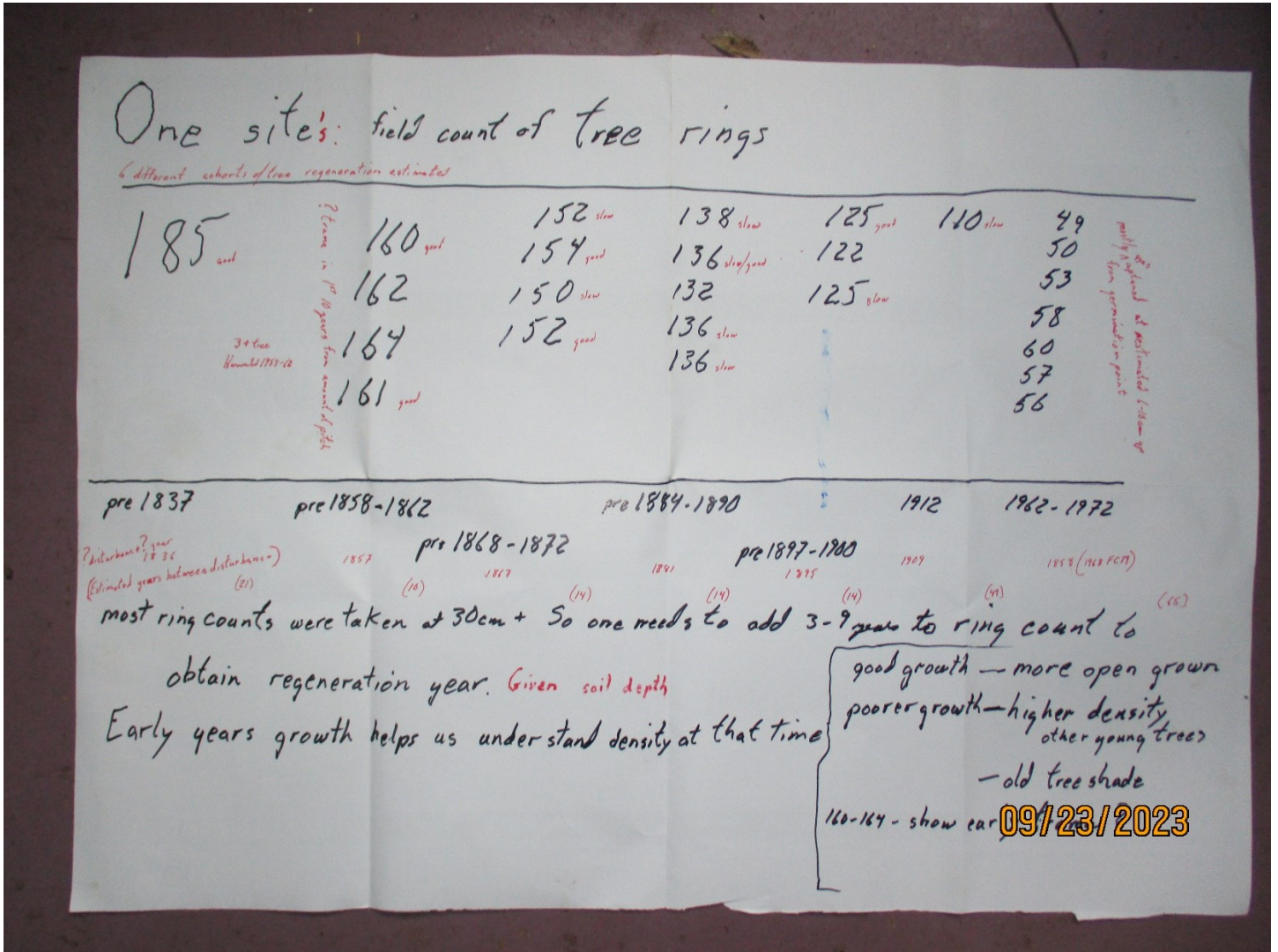
Lessons Learned:

Lasqueti has a well-documented fire history (after probably 1920's) – we just need more information about each fire. Fires pre-1920 were: pre 1875 (section line between sec. 2 & 5) from the 1875 survey map; 1910 (section 11 plus potentially parts of section [8 & 15]) from the British Colonist 1910 Aug 9; 1919 probably in section 12 from Madson and/or McDiarmid ; There may have been more if my interpretation of the 1968 Forest Cover Map are correct. All these fires were rather small areas estimate below 2 square miles in area.

My interpretation from the MoF 1968 Forest Cover Map is that about 10% of the island was logged by 1927, so a bit less would have been logged by 1919. This logging was mostly along the coast up to a mile inland and was some of the best timber stands. These stands were often relogged in the 1950's. Also, I estimate between a third to half the 1950-1970's logging was already regenerated to an estimated 61-80 year old trees directly after logging. I have been wondering for years why this age class of trees were so commonly mapped on Lasqueti on a major portion of Lasqueti on the 1968 Forest Cover Map, directly after logging. I have patches of these trees both in my rocks and among regeneration from the 1958-1965 logging on my property.

More on 1800's regeneration**This is the poster presented at the 2023 Fall Fair**

The following information seems to collaborate somewhat with 1919 summary report, in that there was a lot of tree regeneration from 1836 to 1912 on this site. These waves of regeneration "bush" would have helped reduce the grass reported in the 1875 legal survey. These ages of trees were probably the regeneration shown as 1885 to 1905 on the 1968 Forest Cover Map. As we obtain more local tree information from trees germinated pre-1910, our understanding of pre-1850 landscape (forest) conditions will be better understood.



What I found out preparing and presenting my sites trees at the 2023 Fall Fair:

I had been collecting a sample of the “tree cookies” from my house site, not all the trees. Then I decided to organize them to develop a display at the 2023 fall fair. I arranged them in piles of approximate ages as I originally aged them (some were regeneration age and some were the number years from the cut year). They seemed to fit the above pattern and this leads me to call each group a cohort of trees (cohorts are grouping of trees of about the same age that developed from the same disturbance). I surmised the fire return interval was about every 15 years between 1836 and 1909/12 (within about a 300-square foot area, with shallow soil prevailing & some root rot disease). I had not expected to find there were seven age groups of trees within that small area. I had only collected some of my tree cookies, so this not a complete record of all the trees from this site. There is also a large possibility that more low intensity fires might have burned, but left no signs, in the area or within the trees detected so far. I did notice possible fire scars within some of the tree cookies.

My property is in the center of the island or >1 mile from the sea in both directions. I started to collect tree “cookies” samples on my property and then saved cookies from only some of the trees where I am clearing for a house site. This is mostly, after the fact compilation of field type data, not a tree ring lab confirmed study; for what we call field ages of the cohorts or disturbances (not lab analysis of tree rings and estimation of years to counted age height location above germination point). All the trees were not the exact the same age because of many factors: actual germination year, different rates of growth, ages obtained at different heights above the germination point. I also noticed that the young growth rates (close the tree pith) varied for some cohorts (was this because of density or soil depth?). I have also not done an examination of tree ring fire scars for carbon, carbon found in fire-scars provide proof of a fire. The results so

far are that there were six or seven groups of ages which are called “cohorts” of trees that germinated from seven different disturbances.

At my house site, these disturbance events averaged out to 15 years between 1836 and 1909/13. Probably these were fires or cultural burning and yes, this period spans colonization. At that time, I had no reason why the disturbance intervals continued after colonization but thought our archaeology project may help develop an answer or options of why the fires continued during very early settlement 1870-1907.

Then I reread “Beautiful Rocks” it seems some settlers were used to burning open woods for increasing pasturage for sheep (immigrants from Europe). It seems to depend on where in Europe people came from on whether they had used fire for this purpose before coming to north America/the west coast. Another possibility is workers whom had been employed by Hudson Bay Company had learned of the practice of burning to increase pasturage (from First Nations residents) and used it after settlement started. Another re-read was “Gulf Islands of BC: A Landscape Analysis” by S. Eis & D. Craigdallie, 1980, p11; also has settlers repeatedly reburning areas for pasturage, but the reference was not documented – so no researchable record.

From the 1875 legal survey I would put colonization starting in 1879 (during the 1875 legal survey there were only two resident households but three more registered pre-emptions plus an additional two by the resident householders) (It seems Transfield may have settled earlier, but so far no one has found documentation.) (This settlement time period seems to be different than Mason or how other people have interpreted Elda Mason’s writing [1976 book].) The continued fire period from 1879 to 1910 has to be better explained. Can we accept the explanation for the fires continuing from “Beautiful Rocks” and Eis & Craigdallie?

From (Howe 1915, Bakker et al 2019, etc.) we know the regional fire frequency was high during this period of time, (what is unknown is the fire ignition causes on our island). Did the First Nations abandon Lasqueti by 1863 or did some marry into the settlers and/or other First Nation people who became settlers (example is George Douglas and wife from Saltspring/Duncan. Did these settlers or wives continue cultural burning? Were all the First Nation wives from elsewhere or were they returning or remaining residents of the island? How much did the cultural burning practices continue?

There can also be other reasons for six cohorts of trees on my property. From two or more Fort Lewis, Washington studies we surmise that infilling is much more complicated than “normal or even-aged” regeneration and seems to be periodic and not a result of climate factors. Low burning or cultural burning fires seemed to have been stopped by 1919 (from McDiarmid report) on Lasqueti. Could the large 1910 fire in the slash of Rat Portage’s lease have changed settlers’ attitude to burning? This seems to be a likely result of the large 1910 fire.

I will also note there was a trail through my property on the east side to a residence in the NE1/4 Sec 23 by 1919. So, I do not know when easy settler access started for my ¼ Section? Was this access related to some of these fires?

Also, I surmise that the disturbances were just ground fires that left many young trees alive. This short interval and young tree survival shows us the limited flame length of these fires. This is a preliminary report of **strong support** for cultural burning at short intervals for one site on Lasqueti that spanned the early settlement period.

The pitchy centres of the trees (1858-1862 likely germination) shows that there can be young tree survival with short fire intervals 9-11 years, but probably better survival at longer intervals of >12 years. I can surmise this from the latter cohorts that showed less signs of tree trauma healing (no pitch) near centre of the trees. Do even shorter fire intervals burn up young regeneration and leave no evidence of a fire?

I speculate that seed crops can be initiated from such fire disturbances. My reason is that I thinned and pruned 20 year old trees (stand edge trees) that then produced heavy cone crops out-side their populations, normal cone cycle. This pruning and thinning induced cone crops that I observed depended on the tree density and level of pruning, with less dense trees with <60% crown remaining as producing the biggest cone crops. Trees within the stand did not form cones.

So, I speculate that the disturbances (fires) also helped create the cone crops for the regeneration, especially in more open grown trees in the 1800's.

While at the fair I pointed out that one cohort had young growth filled with pitch and now I realize this was the cohort with just 10 or 11 years between disturbances. This shorter period between disturbances (fire) probably caused this pitch build-up in the centres of the trees from bark/cambium damage. I can now surmise that this "short time period" (between disturbances, probably fire) resulted in most of these surviving young trees to have this pitch build-up reaction so that now we see resin in around the tree piths. (This is a very small sample number of trees and was not all the trees cut). I also noticed some damage on other aged trees near their piths. Hopefully further study will reveal the time period (date) of the scars and whether these damages were overgrown fire scars containing carbon particles, (though not all fire scars contain carbon). Discolored wood and/or resin soaking seem to be normal reactions in sap wood underneath a fire scar (Smith et al, 2016).

This area has/had (I have removed some) many young trees that have recovered from beaver damage in the last 23 years, so tree recovery from bark damage has been demonstrated as likely on these shallow soil sites in recent time just as it might have happened in 1800's. This is just one site and still early observations of tree regeneration/growth at this site. Further study will help me understand tree growth history on this site better. I learned much from putting this display together and then talking about it with people during the fall fair.

Thank you all who talked or listened to me at the 2023 fall fair.

Conclusion:

Foresters rarely study a small area such as this for patterns of tree disturbance and/or age. I never expected to find these patterns. For this site the average fire return was 15 years for the period 1836 to 1909 (preliminary study). Is this common on the island?

Though this stand was not old-growth, it was **original growth before any logging** (1958 to 1963 probable time for first logging) happened in the area.

The trees that germinated after 1958 was the cohort resulting from logging. This last cohort is what is known as second growth, though the earlier cohorts had appeared to me to be second growth (now I would call it 'pre-logging second growth'). (Sometimes second growth just means young trees and is not related to logging – but it is then misleading term from my perspective because I usually believe most people consider second growth as regeneration after logging.)

It was the field counting of tree rings that proved the bigger trees all germinated about 50 years or more before any logging in this area. It took counting the age of all the trees to show this. On this site there were frequent disturbances/fires 1836 to 1912 that enabled regeneration of a cohort following each fire. There may have been additional fires that left no evidence, probably by burning up the seedlings or killing them.

What does this frequent regeneration tell us about pre-1850 forest conditions, since most of the regeneration was about 1857 to 1909? What else am I missing? Fires and regeneration seem to happen over a gradient and the results are not even-aged. Are these multiple disturbances or delayed regeneration and in-filling? Were they fire caused? The main thing I learned was that surface fires could repeatedly go through a stand every 9 to 20 years trees and leave a rather young cohort of trees living and also start a new cohort on my site in the CDFmm. The other point was that tree diameters ranged widely, there is no way to determine age from diameters. None of these trees were very large. Bark signs and epicormic branches are a better indication of tree age, but the branch signs may need to be modified for the CDFmm and open grown trees. Aging trees from visual signs is from Van Pelt, R. 2007. Identifying Mature and Old Forests in Western Washington. Washington State Department of Natural Resources, Olympia, WA. 104 p. Or possibly better is : Van Pelt, R. 2008. Identifying Old Trees and Forests in Eastern Washington. Washington State Department of Natural Resources, Olympia, WA. 166 p.

There have been increasing fire studies in Douglas-fir forest with approximately the same yearly rainfall and summer drought as the CDFmm, in the USA, that show low to medium intensity fire at short intervals. "Exceptional variability in

historical fire regimes across a western Cascades landscape, Oregon, USA” by Johnston et al, 2023; “Historical Forest Successional and Disturbance Dynamics in Coastal Douglas-fir Forests in the Southern Western Cascades of Oregon” by Merschel, 2021 are two such reports. It takes both tree rings (ages & disturbances [fire]) and understanding regeneration patterns of an area to gain an understanding of pre-1850 forests.

Looking at another attempt to totally age trees in a Nanoose CDFmm plot:

I tried to age all the trees on a ¼ Ha plot harvested in 2018 in Nanoose on MoF woodlot program #1479 by also collecting tree cookies. Before harvest I mapped the trees’ locations, so to hopefully identify them post-harvest, but that mapping was not completely identifiable after harvest. Any possible cohorts did not show themselves as easily as at my house site.

I then also collected cookies from a nearby smaller plot on a ridge top with poorer soils. The cohorts (bunching of similar aged trees) are easier to see on the ridge top site, poor soils show more response to environmental conditions usually, this was similar to my poor soil house site. On the richer site there appeared to be steadier infilling, with less indication of individual disturbances and less synchronicity of regeneration after a disturbance (again sampling was not complete). Was this because it was a richer and moisture site? [probably] On this richer site I was only able to date about 30% of the trees post-harvest, so it was only a sample of the trees. On the drier site the average time between cohorts was probably 13 years with a wider variance of years between cohorts for the same time period as my house site. This limited synchronicity of fire years appears to be normal for low intensity fires according to (Bakker et al, 2019) the San Juan fire studies. Although for the slightly wetter dry CWH (Howe, 1915) found a lot more synchronicity where the fire return was about 40 years, but these intervals went farther back in time and this was ‘1913 type’ data. Both these areas had extensive regeneration from 1830 to 1912, so a lot of good-sized trees in the CDF ecosystem are 111 to 193 years old and are not second growth “after logging”, though they appear as such, especially on medium to poor/low type soil. On my property this age of trees does not differ in appearance greatly from second growth on the better site series 06 soils or older second growth on more moist medium soils. Wetter and richer soils grow trees faster than poorer drier soils.

We need to understand disturbances and tree ages from other areas on Lasqueti, to better understand pre-1850 forest/landscape conditions. If you are planning to clear an area of the trees on your land, I would love to help with a study of the tree rings (on the stumps). I believe trees can teach you a lot about the area. There are a lot of ways to improve data collection from what I did this time but we all have to start somewhere.

Also in 2023 I found the original Lasqueti Island 1968 Forest Cover Map on the web.

1968 FCM in pieces: Web location: https://opendata.nfis.org/mapserver/bc-historical-fc_eng.html Last visited February 19, 2024

This is the 1968 Forest Cover Map (FCM) in different pieces; 7 maps but eight pieces. It can be enlarged so that all the information is a lot clearer than my paper copies of paper copies I have used till now.

Lasqueti was totally inventoried in 1962-68 not just the unceded “crown lands”. The southern part of Lasqueti was updated (to 1972) on a paper map copy I have. Usually only the crown lands were mapped at this time, but on Lasqueti the whole island was mapped for forest cover, and is very lucky for local knowledge. Before this I had just had (paper) copies of copies without the **correct time period map legends**. This limited my ability to interpret the map to a finer degree. I colored one paper map to tree ages and another to soils to try an understand historical data better.

I have now reviewed this map a few times, looking for more information for our history studies.

It is interesting that nowhere on Lasqueti did I see any indication of a fire or slash burn recorded, though there were two sites on that part of Texada that I looked at that were logged & slash burned in the 1950’s. Mason reported loggers on Lasqueti did not like to do this slash burning but were forced to. I did find two positive fire scars that indicated slash burning after logging on my property after the 1950’s logging, years ago. So, neither the provincial wildfire history map or the 1968 FCM show the whole story about fires though there is often evidence of slash burning on the island in the

forest. The no slash burning or fire before 1962-68 does not seem to agree with the Provincial Wildfire History map available on the web, but this is history from two different sources.

Also, there appears to be no way to fully understand the meaning of “+ F vets” either by tree numbers or tree quality; just that there was not enough harvestable volume for “+ F Vol” to be indicated. This “+F vets” indicated scattered Douglas-fir veterans from within the map symbols. Also, volume was not indicated for trees under 121 years old, whether it was there or not.

The symbol **M** indicated ‘wild hay meadows’, though many today would classify these as swamps. Swamps in 1968 must have meant some water on the surface. Both swamps on my properties south boarder were considered **M** – wild hay meadows (in 1987 I walk across parts of both of these meadows though one had head high brush not grass). With beaver habitation for a number of years, from just after purchase (1987 to about 2014) beaver raised the water level to year-round water in one of these 1968 mapped wild hay meadows. Conditions can change for many reasons.

The best thing is that the map legends are on each map and really explain a lot more than I have known in the past (although I had tried to research this information unsuccessfully). The legend information is also how they used terms in that inventory time period.

1. There is a way to determine how much an area was harvested (volume removed) from the map labels. Three levels are a. <25%, b. 26 – 75%, c. >76% of volume (not # of trees – bigger trees have more volume per stem).
2. The stocking (# of trees) was indicated in three levels for **mature trees >121 years of age**: a. 1 to 30 trees/acre (74.1 trees per hectare) over 11.1” DBH or (28.2cm DBH), b. >31 trees per acre, c. all immature (no numbers or 0) but “**mature**” seems to have a different meaning at different times or different indications. The 1983 *Forestry Handbook for BC* p432 uses >120 years for mature (volume tables); while the 1995 *Biodiversity Handbook* uses >80 years for CDF & CWH on page 23 for mature (stage). *Cruising Manual* of BC 2020 uses mature as: “*The above definition of second growth coniferous timber must not be confused with immature. Only trees less than 121 years old are considered to be immature. Trees between 121 years and 140 years old, while defined as second growth for appraisal purposes, will remain as mature trees for determination of loss factors, timber merchantability specifications and log grade algorithms.*”

It would be interesting to walk some of the older volume areas on Lasqueti to reassess them today. Both by numbers of trees and how much ingrowth/growth has taken place. Most of these sites are in the less accessible rocky areas today, and can be hard to accurately locate.

On my property the ‘1950’s logging showing already stocked’ was logged less than 25% of the volume, but there is no date. The map label is [**F 430-P + F Vets**] meaning Douglas-fir 61-80 years old, 20.1 to 39 meters tall, immature, and poor soil with veteran trees. This area was mostly surrounded by [**FD 110-P**] and symbol for logged >75% of volume in 1958-1960. Other areas were [**NSR -P +Vets**] not significantly restocked (**NSR**) and symbol for logged >75% of volume in 1958. All areas of my property have patches of similar trees (trees that were 20.1 to 39 meters tall in 1968) plus young trees from the 1950’s logging and older trees.

Within the 1950-60’s logging were three levels of tree removal done. In all three levels of removal produced areas of: **NSR**, good regeneration, and remaining stocked with Douglas-fir 61-80 years old, 20.1 to 39 meters tall, all immature on poor soil. Most of the 1950-60’s logging also showed **+ F Vets** without much harvestable volume in 1968. The then Douglas-fir 61-80 years old would now be about 117 to 136 according to the 1968 FCM, but it now seems this age ranges even older if we consider my building site. Some areas logged in the 1950-60 (mostly at the two ends of Lasqueti) were labeled as 20 years younger, so it would be interesting to age these trees today.

With this better-quality map, I can find about seven small coastal areas logged before 1907 and regenerated before 1907 where there was no slash burn after 1907, so that they indicate very earlier logging. Any slash fires after 1907 would put the regeneration into the next younger age class (example is Rat Portage fire of 1910). It also seems that logging continued around these areas after 1907, because of the latter age of regeneration. None of these areas were

the Rat Portage area, we know the 1910 slash burn recorded in the British Colonist seemed to have burned any earlier regeneration around today's Boat Cove. Keep in mind the range of accuracy for that time and I did find that a number of these older tree aged site were ground checked on the 1968 FCM. These areas could have burned after or during settlement clearing fires (but pre-1907) might have escaped, so need to be looked at closer to reveal what (timber lease and/or land buying and/or pre-emption) records show. The areas on the 1968 FCM are: two areas in the lowlands from northern Spring Bay to Maple/Scottie Bay; one near Lenny's Lagoon, one south of Tucker Bay/Wells Point; a possible one Northwest of Rouse Bay; two off the (McKinnel) Lagoon in False Bay with a possible third one on the coast. All other areas with this age regeneration are too far inland to indicate horse/oxen logging pre-1907.

From a small sample of some trees from a very small harvest on my property, I found the age spread to be over 70 years (1836-1909) for these F 430 trees not 20 years as per the 1968 FCM. There appeared to be 5-6 different cohorts of trees which indicates multiple fires. I wonder if the same is true in other areas of the island.

ANNUAL REPORT
OF THE
MINISTER OF LANDS
OF THE PROVINCE OF
BRITISH COLUMBIA
FOR THE
YEAR ENDING 31ST DECEMBER
1919



PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
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1920.

MUSSEL INLET.

An examination of maps and charts would leave one uncertain as to just where Mussel Inlet starts and Mathieson Channel ends, and there seems to be very little connection between the North and East Arms of Mussel Inlet. A way out of the difficulty would be to confine the name "Mussel Inlet" to the North Arm above its junction with Sheep Passage, and to give a new name altogether to the East Arm. The shores of both arms of Mussel Inlet are much steeper than those of Mathieson Channel, and the mountains are much higher and more rugged, although such timber as grows in the creek-bottom attains a fair size.

At the head of the North Arm of Mussel Inlet is Poison Cove, so called because some of Captain Vancouver's crew while charting the inlet were poisoned by eating mussels.

GAME.

Coast deer, geese, ducks, and grouse were the only edible game seen, and the islands in the vicinity of Millbank Sound and Seaforth Channel are pretty well stocked. Does with fawns were seen on several small islets. It seems that the fawns are born on these islets, some not an acre in extent, the does feeding on the main islands and swimming back to their young when satisfied. When disturbed the mothers swim away out of danger, well knowing that the young cannot be found.

On two occasions we attempted to discover the whereabouts of these creatures, but in each case nature's colouring proved too much for us. After the danger had passed the doe returned to see that everything was all right.

Bear are very numerous on the creeks on Mussel Inlet and the head of Mathieson Channel, especially during the salmon run. They are mostly of the black variety, although one grizzly was inspected through the transit from a quarter-mile distance. No effort was made to get closer acquainted, as the only rifle at hand was not intended for that sort of game.

Salmon run up all the creeks of any size and are caught for the canneries by means of purse and drag seines. Great shoals of herring were noticed, probably driven in by the whales, of which several were seen.

A rather unique experience was the sight of a 50-foot whale jumping clear out of the water, whether in play or by being attacked by some of its enemies was not determined, but the performance lasted for ten minutes on two separate days, and the thud of the fall on the water could be heard for five miles; unfortunately no camera was available on either occasion.

Sharks were also seen cruising around, and one arrived in the bay where we were camped one evening, just too late to chase the swimmers ashore. He cruised around for a while showing his triangular-shaped fin above water, but disappeared suddenly on getting a rifle-bullet through his fin. This or another shark was also seen jumping clear of the water. I am informed that they have no business in such cold water, but the fact remains that one was caught and photographed at Swanson Bay this summer.

The climate for the greater part of the year is mild and wet, although during July and August the weather is delightful. The snowfall, which at the heads of the inlets is very great, becomes rapidly less the nearer one gets to the open sea. Very little falls around the shores of Millbank Sound.

I have, etc.,

A. E. WRIGHT, B.C.L.S.

LASQUETI ISLAND AND VICINITY.

By S. S. McDIARMID.

VANCOUVER, B.C., November 14th, 1919.

J. E. Umbach, Esq.,
Surveyor-General, Victoria, B.C.

SIR,—Lasqueti Island, with an area of about twenty square miles, lies in the Gulf of Georgia about two miles west of the south end of Texada Island and about ten miles from Vancouver Island. The distance from Nanaimo is, roughly, thirty miles, and it is in this city that the settlers do most of their trading. There are wharves at Tucker Bay and False Bay, but no steamship service. The only regular line of communication with outside points is by the mail-

launch, and it has no licence for carrying passengers. In order to get to our work we were compelled to hire a special boat at Nanaimo.

There are two main trails on the island upon which Government grants have been spent, and therefore described as "roads" by the settlers. One runs from False Bay easterly to Squeti Harbour; the other runs from Tucker Bay southerly to Boat Cove, at the foot of Mount Jenkins. A new trail has been constructed south-easterly from False Bay into section 26. These trails are not wide enough for wagons to be used and loads are hauled on sleighs or drags. The post-office is at Tucker Bay, and the visitor is surprised to find rural free-delivery boxes along the trails, especially so when he knows of the infrequent mail service. The postmaster delivers the mail on foot to these boxes by carrying his load in a pack-sack.

Lasqueti Island is mostly rocky—the east end roughly piled. In the hollows or bottoms are accumulations of earth, sometimes dry, but more often grassy swamps. The hills or mountains are moss-covered, but there are also places where a wild grass grows in the timber. According to the settlers, there was a few years ago much more grass and an attempt was made to turn the island into a large sheep-ranch. It is said that many hundreds of sheep were feeding there, but thieves and hunters made away with so many that the effort was abandoned. The bush is now growing where there was at that time grass and the pasturage is disappearing on the hills.

The island has been and still is, in places, well timbered, and some excellent fir and cedar will be cut when the richer areas in other places have been depleted. Logging has been carried on on Lasqueti, and much valuable timber partly felled and cut into logs has been damaged by a fire during the latter part of August of this year. This island seems to be more adapted to forest-culture than to farming. The small patches of arable land are not sufficiently inviting to the practical farmer, and in several instances it is apparent that the timber and not the soil has attracted the pre-emptor. So much of the Crown-granted land is unoccupied that pre-emption seems to be a form of speculation and there is much to discourage the pre-emptor. That which would have been an excellent forest reserve, surrounded by water, now is, or soon will be, alienated from the Crown to so-called ranchers, who in order to exist must have large sums of public money spent to open up lines of communication.

There are three lakes of fair size, and one at the foot of Mount Tremerton is quite prettily situated. Its area is about 30 acres. Another lake, not so large, is in Section 14, and it is stocked with trout which may be caught up to 3 lb. in weight. These lakes and a large number of small brooks furnish an ample supply of fresh water, although during the past exceptionally dry summer many of the brooks were dry.

The climate is more like that of the vicinity of Nanaimo than the Mainland opposite. An evidence of the dryness of the climate is found in the cactus which may be seen along the southerly shore. This is the only locality where the writer has seen cactus growing on the Coast. The settlers say that there is little or no snowfall each winter.

There is a cannery at False Bay which provides employment during the fishing season. The only store on the island is at this place, but the Farmers' Institute is opening up a co-operative store at Tucker Bay.

Lasqueti is quite free from animals of prey, so that sheep may be raised safely. The only game is deer, which seem quite plentiful.

ADJACENT ISLANDS.

Seven small islands adjacent to Lasqueti were surveyed. They are all quite similar to the main island, except that they have even less soil for cultivation. The largest island of these seven is Jervis Island, and this has been made into a goat-farm. There seems to be no other or better way in which this rocky island, or any of the others, can be used, and although it is larger than a pre-emption claim, yet it would be of little value if subdivided.

Jenkins Island has a small flock of sheep feeding upon it.

I have, etc.,

S. S. McDIARMID, B.C.L.S.