R 37

QUANSA FOREST - 1930

Survey and Plan for Preliminary Management.

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Forest Surveys Division,
B.C. Forest Service.

SURVEY and PLAN
FOR PRELIMINARY MANAGEMENT
of
QUADRA FOREST
Vancouver Forest District

by

M. W. GORMELY

1930.

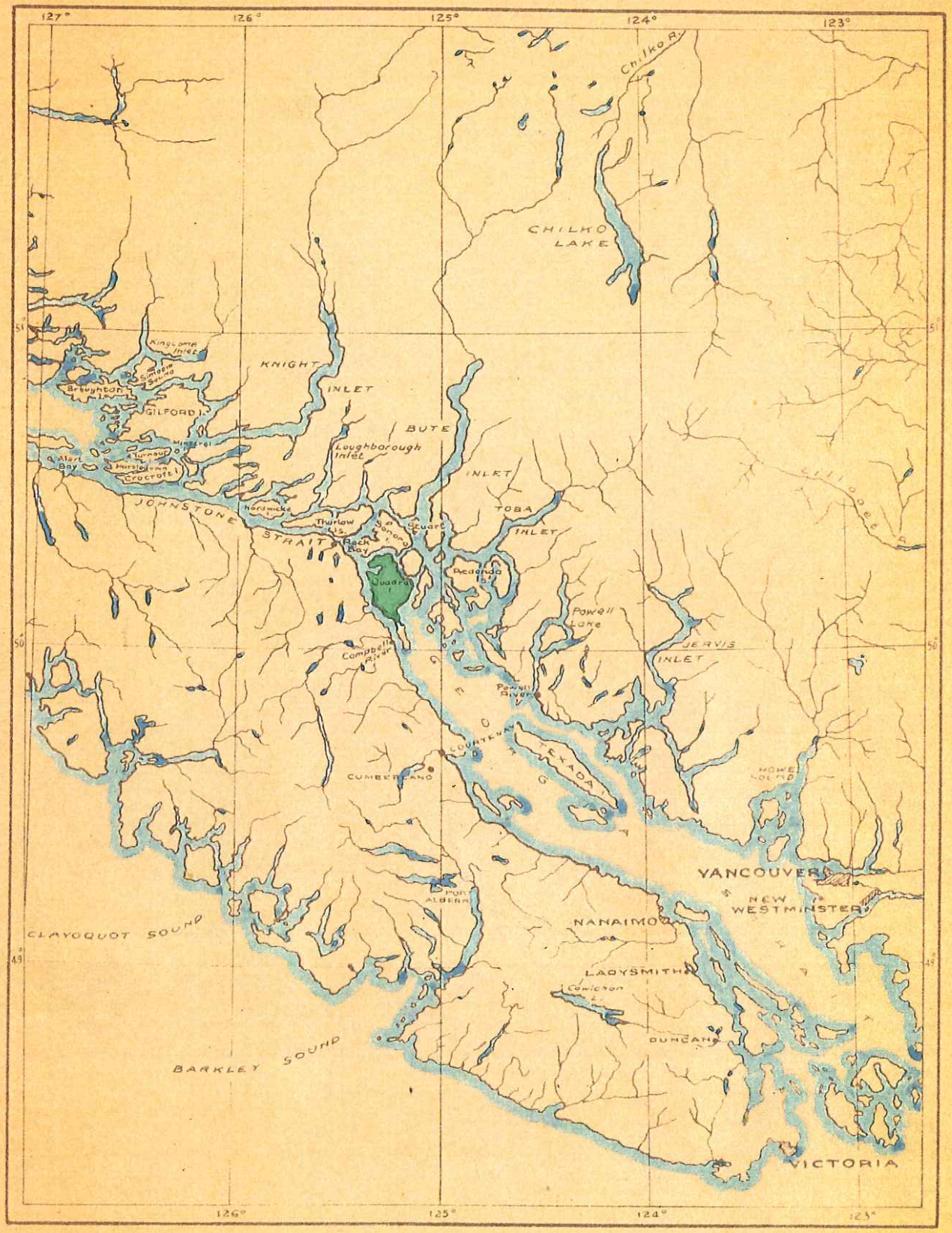
Map filed separately:-

1 Combined Forest Cover
and Topographical Map
Scale 2" to 1 mile.

Forest Survey No. R.37.

Survey File No.0105227
Administration File No.091068.

INDEX MAP
QUADRA FOREST



- Scale- 31.56 Miles to 1 Inch -

PREFACE.

This report is based upon a survey of the proposed Quadra Forest made by M. W. Gormely during the summer of 1930 and deals with forest conditions as at that time.

Areas having an appreciable or potential agricultural value were excluded from the proposed Forest in the determination of a permanent boundary.

Forester.

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SYNOPSIS

1. General location: the Quadra Forest covers the greater portion of Quadra Island, which lies in the west half of the Sayward Land District and is separated from Vancouver Island by Discovery Passage.

2. Area within proposed boundaries.

88 square miles
(a) Vacant Crown land - 39,740 acres
(b) Timber Licenses -- 4,280 "
(c) Crown Grants and Pre-emptions --12,600 "

3. Classification of areas (in acres).

(a)	Merchantable timber (accessible)		8,610
(b)	Immature timber -		
	1 - 20 year age-class	9,570	
	21 - 40 " " "	700	
	Total		10,270
(c)	Forest land unsatisfactorily stocked		
	Logged and burned	15,760	
	Non-commercial cover	340	
	Total		16,100
	Total productive forest land		34,980
(d)	Non-productive, alpine, swamp, etc.		21,640
	Total area of Forest.....		56,620

4. Summary of Sustained annual yield.

Present accessible productive capacity = 5,600 M.B.M.
Ultimate productive capacity = 9,539 M.B.M.
Present utilization = 2,500 M.B.M. per year (approx.)
Rotation = 100 years.

5. Estimate of Merchantable Timber in M.B.M., 11" D.B.H. and over.

Species.	Accessible.		
	Crown.	Licences.	Total
Fir	92,917	104,999	197,916
Hemlock	21,010	21,734	42,744
Cedar	16,842	13,914	30,783
Pine	4,267	3,878	8,145
Balsam	80	200	280
Spruce	75	121	196
Total M.B.M.	135,191	144,873	280,064
% of Total Volume	48.3	51.7	100
Area(Acres)	4330	4280	8610
% of Total Mature Area	50.3	49.7	100

Description of Area.

Boundaries and general topography.

The area recommended for the Quadra Forest occupies all of Quadra Island north of Heriot Bay, with the exception of three small areas excluded because of their agricultural value.

The country is generally rough but not mountainous. The west side of the island, north of Seymour Narrows, is very abrupt and broken, rising from the sea to an elevation of from 1500' to 2000' in a long ridge. The north end and the east side are also rough and very steep in parts, but rarely higher than 1500' above sea level. The south and central portions are low, but badly broken by rock bluffs and hills.

There are numerous lakes throughout the island, the largest of which are: Village Bay, Main and Clear Lakes. The creeks are all small and swift flowing.

Climate.

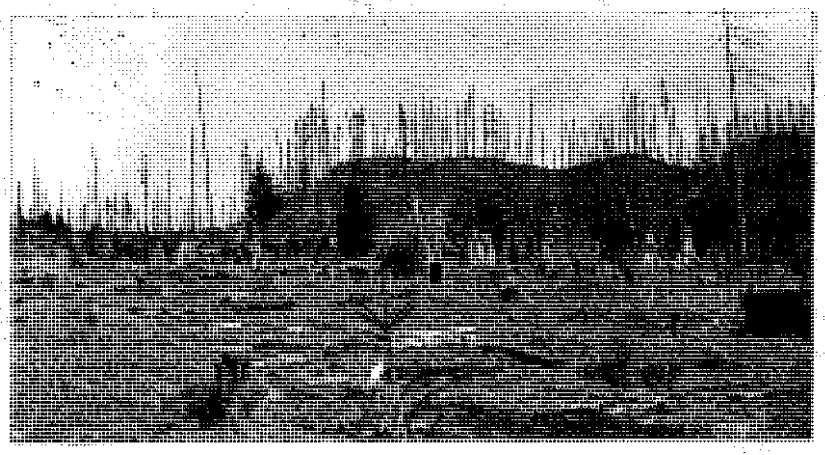
This Forest enjoys the moderate south coast climate. There are no meteorological stations in the Forest, but the stations at Thurston Bay, Sayward and Campbell River are close enough to give a reliable estimate as to climatic conditions.

Station.	Average Annual Precipitation.	Mean Temperature.
Thurston Bay	59.87"	48° F.
Sayward	58.74"	No Record.
Campbell River	40.43"	" "

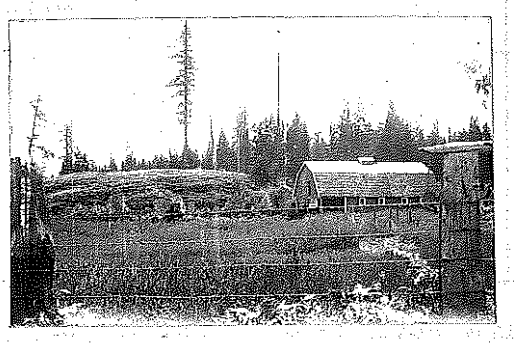
These averages have been taken over a period of 7 to 10 years.

Industries.

(a) Agriculture: There are a few small homesteads scattered throughout the island. Three isolated farms lie within the general forest area, but have been excluded from the recommended reserve. A total of 9,820 acres, chiefly south of Heriot Bay were found to be suitable for farming and were excluded from the Forest.



A small swamp, easily drained and with good agricultural soil - near Stramburg Lake on the old railroad grade. However these areas are only 2 or 3 acres in extent and generally well separated. No value for settlement purposes, although the surrounding area was sub-divided for settlement. Note numerous large stumps.



Small farm near Heriot Bay - Note presence of rock outcrop and second-growth in background.

Settlements on Quadra Island are:

Quathiaski Cove a small settlement whose main industry is fishing. There is a large cannery here. Several settlers are farming in a small way in this neighbourhood. Logging camps on the adjacent shore of Vancouver Island provide a small market for these products. Several good car roads connect Quathiaski Cove with the various other small settlements on the south end of the island.

Granite Bay (Post Office) a small settlement, which relies largely on the logging industry for a livelihood. Farm produce for local consumption only is produced. A good car road runs about 4 miles south from Granite Bay connecting a few scattered settlers in the valley.

Wyatt Bay (Post Office on Octopus Island), a small settlement of 3 or 4 families relying on the fishing and logging industry for a living. One large farm produces for outside markets.

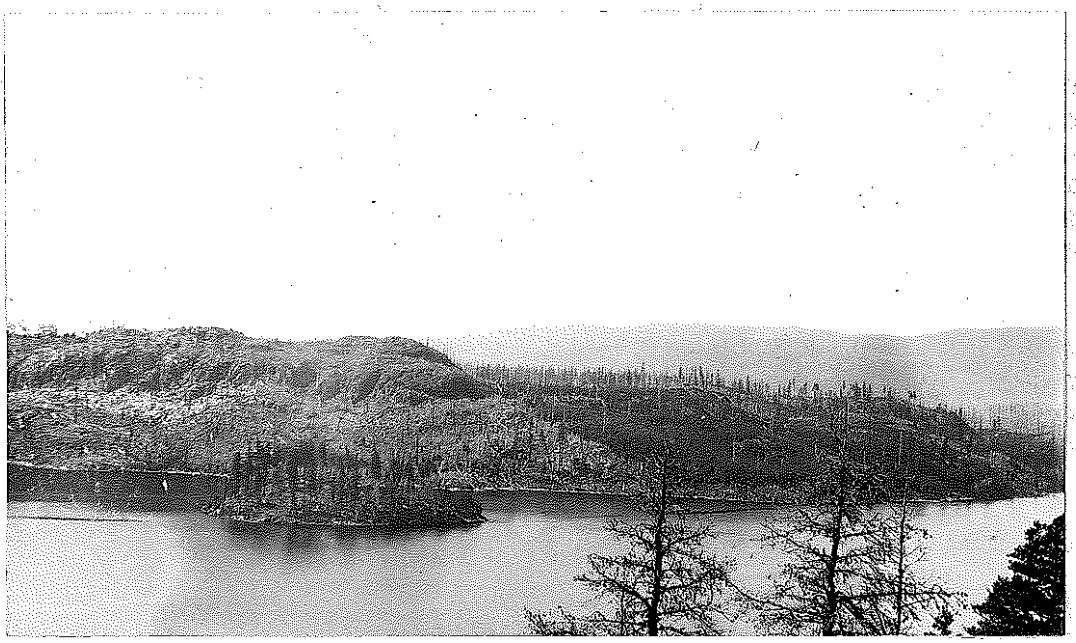
Bold Point (Post Office), a small settlement largely relying on the logging and fishing industries for livelihood. One good farm produces for outside consumption. A wagon road connects Bold Point with Village Bay Lake for the benefit of a few homesteaders.

Heriot Bay (Post Office), a small settlement largely relying on the fishing industry for a living. A few small farms produce fruit and vegetables for the Quathiaski Cove market. One large farm at Hyacinth Bay raises lambs for the outside market.

(b) Mining: There is one small mine in the forest which produces intermittently. This is the Santa Anna Mine, a copper mine of small importance near Bold Point. The Lucky Jim Mine near Granite Bay has been closed down for some time, also a small copper mine. Several prospects have been improved on the island of late years, but there is little activity at present. Future prospects in this industry are not very great.

(c) Fishing: This is one of the major industries in connection with this Forest. Most of the present inhabitants are either directly or indirectly connected with it. Quathiaski Cove, with its cannery, is the focal point of fishing activities.

(d) Summer resorts: Heriot Bay caters to summer vacationists. Fishing and swimming is to be had and a fine summer climate continues to attract vacationists. Cowlland Harbour likewisk attracts the summer tourists.



Looking south across Main Lake. Note patches of reproduction left unburned by 1925 fire, exposed rock and scattered seed trees.

Description of Forest.

Forest Species.

Common Name.	Botanical Name.	% of Total Volume of Merchantable Timber.
Douglas fir	Pseudotsuga taxifolia	71%
Western hemlock	Tsuga heterophylla	15%
Western red cedar	Thuya plicata	11%
Western white pine	Pinus monticola	3%
Silver fir (balsam)	Abies grandis Abies amabilis	
Sitka spruce	Picea sitchensis	

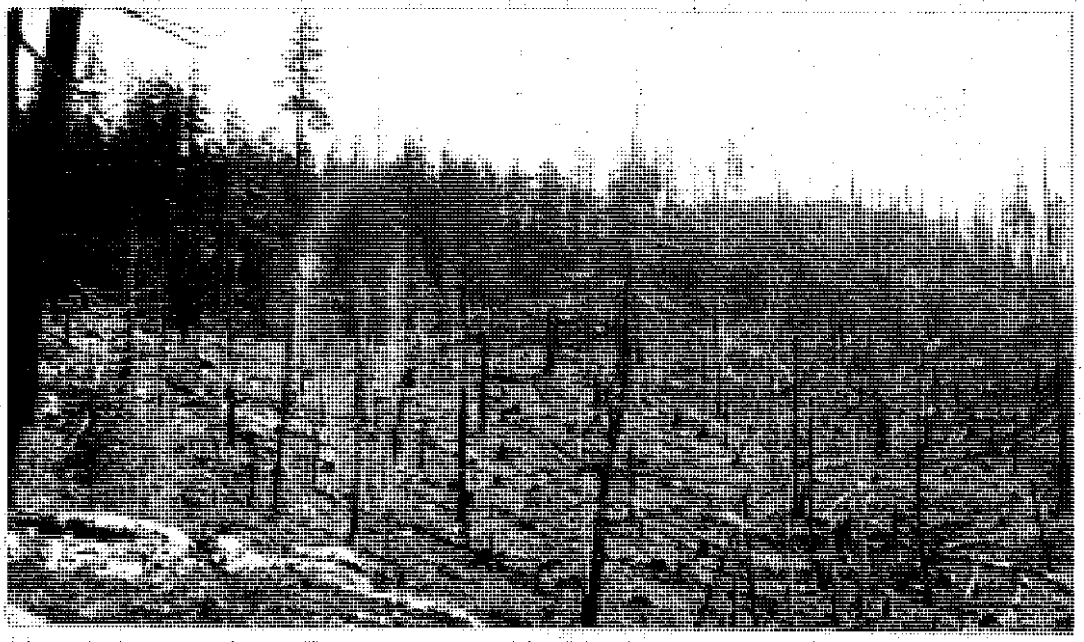
Forest types.

(a) Mature: Fir - hemlock - cedar is the only type on the Island. On the whole the mature stand is quite up to the average coast timber in size and quality, but owing to the prevalence of rocky knolls and ridges a considerable non-productive area of scrub timber may be found. Mature timbered areas comprise 15.2% of the Forest area.

(b) Immature: Immature areas comprise 11.1% of the Forest area. 93% of this type is less than 20 years old.

The immature stands are all mixed fir, cedar and hemlock in varying proportions. There is a lack of middle age classes as usual on the coast. In 1925 a fire swept the greater portion of the Island destroying large areas of fine reproduction about 15 to 20 years old, this reproduction having followed the logging of the areas. Practically all the 1 to 20 year age class reproduction is that untouched by the 1925 fire, the remainder consisting of various areas reproducing satisfactorily since this fire.

(c) Forest land not satisfactorily stocked. Areas containing less than the minimum number of trees per acre, as listed below for the various age classes, are considered as not satisfactorily stocked.



North West of Main Lake - Logged and burned not restocking satisfactorily. Note exposed rock, scrub knoll and timber.

Minimum Trees per Acre for Satisfactory Stocking.

	AGE CLASS.						
	1-10	11-20	21-30	31-40	41-50	51-60	61-80
Trees per acre	1000	750	550	425	350	275	200

On the basis of the above table 15,760 acres, or 27.8% of the total forest area, were found to be understocked. A large portion of this area is in need of artificial restocking, especially in the central and southern parts of the Forest.

(d) Non-commercial cover. The areas so classified comprise only 0.6% of the total area and are productive sites with a forest cover consisting of either deciduous trees or decadent conifers of no commercial value.

(e) Non-productive. The non-productive area covering 38.3% of the total area is composed of barren areas, scrub sites, swamps and water.

Reproduction and Factors Affecting It.

The immature stands are mixed hemlock - fir - cedar in varying proportions. Hemlock is generally the predominant species in these stands while the fir is usually the taller and sturdier of the two. The mature stand may be expected to contain a greater proportional volume of fir than the number of trees in the young stands would indicate.

The greater portion of the immature stands are those following old ground-lead logging and are well stocked but those following the high-lead logging are generally poorly stocked and patchy.

Disease and Infestation.

The only serious infection noticed in this Forest is white pine blister rust. This disease has spread over the whole island, but is most serious in the north end. Other diseases are only normally active throughout the forest. The more noticeable of these are: Conk (Trametes pini), buttrot (Polyporus schwinitzii), top-rot (Fomes roseus) and trunk rot (Fomes officinalis).

Insect infestation is about normal throughout the area. There are no obvious epidemics. Bark beetles are noticeable in hemlock, fir and balsam throughout the area, especially in fire-damaged stands.

UTILIZATION.

Present utilization.

There is very little logging being done in the Forest. Three small power operations have been working intermittently in the north end of the island. The largest, a two-donkey show, logs into Chonat Lake skidding the logs into Chonat Bay from the end of the lake. Another small operation in Cahnish Bay has one yarding donkey and uses horses for skidding the logs to salt water. The third operation is a one-donkey show, logging directly into the salt water in Discovery Passage north of Deepwater Bay. A small tractor operation logs into Plumper Bay. A horse-logging operation is working north of Waiatt Bay. Intermittent handlogging takes place on the Island. The total present utilization is about 2,500 M.B.M. per year.

Utilization recommendations.

Most of the timber in the forest is available for utilization during the next few years, as it is both accessible and mature. Certain areas, in a late stage of decay, or badly fire-damaged, should be cut immediately. This applies particularly to Compartments 4, 8 (south half) and 10A.

Utilization problems.

The great difficulty in properly regulating utilization lies in the fact that the best and most accessible blocks of timber are alienated and will be logged only at the owner's convenience. If the fire-damaged stands of Crown timber are not logged in conjunction with these private limits, it is doubtful if they will be logged at all, therefore every effort should be made to induce the logger to take the tributary Crown timber with that alienated.

Booming facilities, harbours and surrounding waters.

The numerous quiet bays and good harbours surrounding this forest provide adequate booming facilities for any future logging operations in the area. There are several fine harbours surrounding the island, all of which are excellent booming grounds. Quathiaski Cove, Granite Bay, Chonat Bay and Heriot Bay are all boat-stops and all have been used in the past as booming grounds. In addition Gowlland Harbour, Plumper Bay, Deepwater Bay, Cahnish Bay, Waiatt Bay, Village Bay, Open Bay, Hyacinth Bay and Drew Harbour have been used as booming grounds to advantage. There are several other small bays and lagoons with excellent booming facilities for small operations.

The surrounding waters are: Discovery Passage with its treacherous Seymour Narrows, Okisollo Channel, Surge Narrows, Hoskyn Inlet and Sutil Channel. The first three of these waters are very dangerous to navigation. Granite Bay freezes over in the colder periods of winter, thus interfering with the boat service. The other harbours are said to be quite free the year round.

MANAGEMENT

Main objects of management.

Efficient management of this Forest will be delayed until such time as the large area of alienated timber land has reverted to the Crown. A definite plan of management based on sustained yield is not practicable as yet. However, the main objects of management at the present time are:

1. To reserve all Crown timber, except that specified under "Utilization" as requiring immediate logging, for future use on account of the lack of control over the alienated timber.

2. To ensure an adequate and systematic protection system throughout the Forest.

3. To restock the large understocked areas as soon as possible.

4. To expedite an even distribution of age-classes throughout the Forest.

Yield.

The allowable annual cut is based on a rotation of 100 years. This rotation was deduced from estimates supplied by J.L.Alexander and represents the approximate economic rotation from a volume production standpoint. These estimates predict a mean annual increment of 272.7 f.b.m. per acre for this rotation. From this mean annual increment, and the forest inventory below, the sustained annual yield was determined. All volumes given are based on a minimum merchantable diameter of 11" d.b.h.

Forest Inventory

Type	Area(acres)	Mature vol. M.B.M.	Year's cut
Accessible mature timber	8,610	280,064	50
81-100 year age class	--	---	--
61-80 " " "	--	---	--
41-60 " " "	--	---	--
21-40 " " "	700	19,089	3
1-20 " " "	9,570	260,974	47
Totals	18,880	560,127	100

Determination of present accessible productive capacity.

For this determination Hanzlik's formula was used.

$$Y = \frac{Vm}{r} + I$$

Where Y = sustained annual yield.
Vm = present accessible volume = 280,000 M.B.M.
r = rotation = 100 years.
I = total mean annual increment on immature areas.
= 272.7 (10,270) f.b.m.

$$\therefore Y = \frac{280,064,000}{100} + 272.7\ (10,270) = \underline{5,600,000}\ \text{f.b.m.}$$

Determination of ultimate productive capacity.

Total productive area in the Forest = 34,980 acres.

Mean annual increment (100-year rotation) = 272.7 fbm. per acre.

$\therefore$ Ultimate sustained yield = 34,980 (272.7)
= 9,539,000 f.b.m.

Silvicultural treatment.

Method of cutting. Clear cutting is the prevalent logging method in this Forest, as it is the most economical method under present logging conditions. The large virgin timber requires expensive, high powered machinery, which, with the present highlead system of logging, leaves few, if any, undamaged trees standing on the area.

It is maintained that the use of such heavy machinery precludes the profitable cutting of trees under 20" d.b.h. and that all merchantable timber must be cut off as soon as possible in order to best realize on the investment. It is advocated that relogging the area for the light material left on the ground, with light machinery or horses, down to a minimum diameter limit of 11 inches d.b.h. would be both economical and desirable. Selective logging might well be introduced into this area.

If large areas are to be clean cut then sufficient seed trees should be left on each area (properly protected from slash fire damage) to restock it satisfactorily. If it is decided that the timber is not sufficiently fire resistant

or windfirm then the clean cutting must be done in patches, i.e., each setting separated from the succeeding one by green timber, so that the logged area will have a chance to seed in. In this case, each setting should not cover more than 30 acres in order that the logged area may be satisfactorily restocked from marginal timber.

(b) Slash disposal.

Broadcast burning is the method used for slash disposal in the forest and it is recommended for future use until a more satisfactory method is found. An efficient slash burn must be accompanied by an intelligent burning plan supervised by a capable officer. Too often in the past these fires have become uncontrollable, burning timber and young growth which has come in after a previous burn. The latter case is serious since after the second burn natural restocking is retarded on this area indefinitely, as there are no seeds left in the humus to germinate and restocking is left to whatever seed trees remain on the area, which are usually few and far between. Slash should be burned during the first season after logging, in the spring or fall, when weather conditions permit both good burning and good control. The burn should be planned so as to take full advantage of all natural and artificial fire-breaks, such as water, railroad grades, etc. Next to the protection of mature timber the important point is to prevent subsequent burns in all restocking areas.

(c) Reforestation.

A large proportion of the 15,760 acres of understocked land in the forest might well be artificially restocked. No doubt some of the area will restock naturally in a reasonable period of time, especially when scattered patches of unburned 15 to 20 year reproduction produce seed. Also certain areas are now being provided with a new layer of humus by the decaying ground cover, thus providing a good germination bed for the widely scattered seeds from the scattered mature seed trees left on the area. However, due to the badly burned condition of the soil over large areas, artificial restocking should be done by planting, rather than by seeding, in the majority of cases. The planting of fir in these areas is very desirable as it thrives in the open. White pine, another desirable species, should not be planted, due to the prevalence of white pine blister rust in this locality.

Looking North west across the west end of Main Lake - logged and burned, not satisfactorily restocking. Note patches of reproduction and seed trees, large area of exposed rock and the general rough character of the topography.

Granite Bay road about 3 miles from Granite Bay. Note where burn was stopped by road, different age classes of reproduction and bare rocky knolls in background.

PROTECTION.

Fire Damage in the Past 10 Years.

During the past 10 years, about 37,000 acres were burned over within the forest. The heaviest fire year was 1925 when a disastrous fire swept the island from Granite Bay to Heriot Bay, burning or reburning 95% of the total burned area. Several settlements were badly damaged and a large area of merchantable timber and valuable young growth destroyed. Large fires occurred on the island in 1919, 1921, 1922 and 1924, but all of these burns were in the path of the 1925 fire and on most of these twice burned areas the soil has been badly damaged. There have been no important burns since 1925.

Present System.

The Quadra Forest is under the direction of the Campbell River Supervisor District. During the fire season an organized and effective fire patrol is maintained by launch in all waters surrounding the island. There is a telephone connection between the main settlements from Granite Bay to Quathiaski Cove and the Ranger Station at Campbell River. Several settlers in the centre of the forest are also connected to this telephone system. The establishment of a lookout is warranted, a suitable site for same being a 1,600 foot knoll just north of Main Lake.

Road, Railroad Grades and Trails.

Roads.

Granite Bay road, a good car road running 4 miles south from Granite Bay along the old Hastings Logging Company's railroad grade to a point opposite Stramburg Lake. The old railroad grade extends south for another 3 miles. The road is being extended along this old railroad grade at intervals with the object of finally connecting it with the main road at Heriot Bay.

Heriot Bay roads - two good car roads connect Heriot Bay with Quathiaski Cove and the south end of the island. These roads, however, are almost entirely outside of the forest.

Bold Point road - a short wagon road running between Bold Point Post Office and Village Bay Lake.

Railroad grades.

The old Hastings Logging Company railroad grade mentioned above. The main line grade south of the end of the road is kept open by frequent travel over it. The several spurs of this line are in poor condition. The railroad was abandoned about 15 years ago.

The Comox Logging Company railroad grade runs north from Open Bay for about 2 miles, running within half a mile of the south end of the Hastings Logging Company grade. Both main line and spurs are in good condition, as the road has been abandoned only two or three years.

Looking west across south end of Main Lake. Logged, burned and reburned. Note exposed rock and lack of reproduction in spite of scattered seed trees.

Trails.

There are numerous short trails in the forest, but most of them run along old skidroads, poleroads and old railroad grades. There is one long trail, the telephone maintenance trail, which extends from Heriot Bay to Hyacinth Bay, where it divides with the telephone line, one branch going to Bold Point and the other to Granite Bay. The latter branch connects Hyacinth Bay to the old Hastings Logging Company grade and therefore to Granite Bay. Another trail, the ends of which are indefinite, runs from Deepwater Bay through the south end of Compartment 7 to the Granite Bay Road. Another poor trail joins Main Lake to the same Road. This forest is well opened up for foot travel and consequently is very accessible to fire fighters and any inspection or patrol that may be needed.

Recommendations for improved protection.

1. That the main communication trails, especially near the mature timber, be kept in good condition.

2. That a lookout be established as suggested above and connected with the telephone system.

3. That a row-boat, suitable for use with an outboard motor, be kept on Village Bay Lake.

4. That, when planning for future logging operations, routes through well established stands of second growth be avoided whenever possible.

APPENDIX I

Description of Individual Compartments.

Compartment 1, mature fir.

The timber in the compartment is very varied in size and quality. Small fertile draws contain timber of finest size and quality, while the rocky knolls and ridges on either side of the draw may contain scrub timber. The scrub timber has been typed out so that the merchantable timber shows a comparatively high volume per acre. Butt rot is the most prevalent disease in this stand, particularly in cedar, and allowance was also made for conk also noticed. Slight beetle infestation was noticed in the hemlock and fir. The country is badly broken by sharp draws and rocky bluffs, outcrop and ridges - a medium logging chance. Timber outlet via Cahnish or Chonat Bays. The more accessible timber has been logged all around this stand and several of the old chutes and pole-roads may still be used for the present stand. A power-logging operation is working at present, west of Chonat Lake.

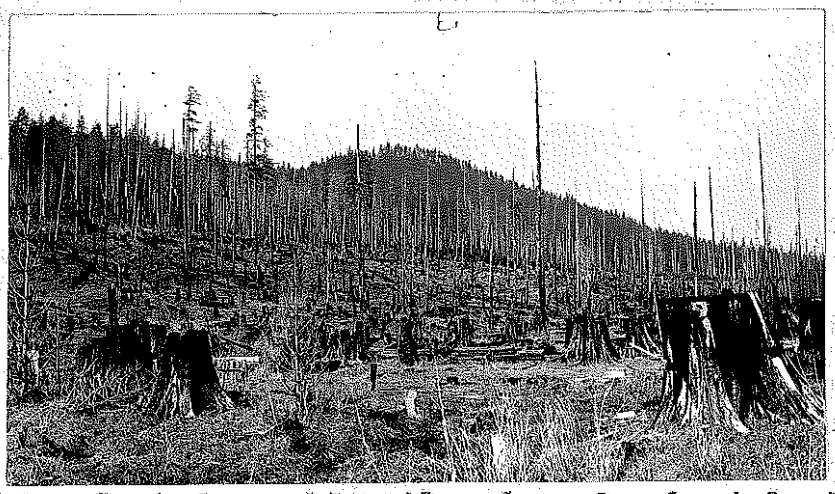
Compartment 2, Hemlock, fir, cedar, 1915

Logged and burned from 12 to 18 years ago - ground lead, horse-logging and hand-logging methods were used. The site quality varies from medium to good. Former stand ran about 35 M.B.M. per acre, fir, cedar, and hemlock. Seed trees are sufficiently plentiful over the area. One patch of fir seed trees running about 10 M.B.M. per acre east of Chonat Lake could be sold provided the young growth were protected. The topography is very varied in this compartment. It is smooth and flat on the east side, but over the rest of the area it is broken by rock bluffs and outcrop. On the whole, it is an excellent logging chance. Several good chutes, pole-roads and skidroads are to be found in this compartment. The logging operation mentioned in Compartment 1 logs into Chonat Lake and then skids the logs over a dirt road to Chonat Bay.

Compartment 2A, mature fir.

A sub-compartment composed of three small sub-areas. The timber is small, but of good grade. The timber has suffered slightly from fire damage; conk and centre-rot were noticed. This sub-compartment represents the last of a good and very accessible stand of timber. A horse-logging operation is being conducted in one of the sub-areas. The logs are skidded to Waiatt Bay.

Looking East near Stramberg Lake. Logged and burned - Compartment 3. Note destruction of fine stand of reproduction which followed logging. Seed trees few and scattered.



Looking East from old railroad grade about 1 mile South of Stramberg Lake. Logged and burned - Compartment 3.

Compartment 3, logged and burned 1915.

The greater portion of the compartment was logged about 15 to 20 years ago by ground lead methods. The area restocked satisfactorily after this logging, but subsequent burns, particularly in 1925, severely damaged the cover and soil over large areas. Large areas of rock have been exposed by the fires. However, scattered patches of 15 to 20-year reproduction were left unburned and these patches are gradually forming a humus layer around them and will soon be producing their own seed. The site, which formerly was good to excellent, is now medium to good. Seed trees are few -- generally in widely scattered patches, some of which might make small logging chances after the surrounding area becomes well stocked. Former stand varied widely over the whole area -- the stands ran from 25 to 75 M.B.M. per acre, fir - cedar. The topography is generally flat with frequent rocky knolls and outcrop. A good logging chance. The old Hastings Logging Company railroad grade, as well as that of the Comox Logging Company, run through the centre of this compartment -- the former to Granite Bay and the latter to Open Bay. Both main line grades are good -- the Comox grade having been abandoned only a few years.

Compartment 3A, mature fir - hemlock

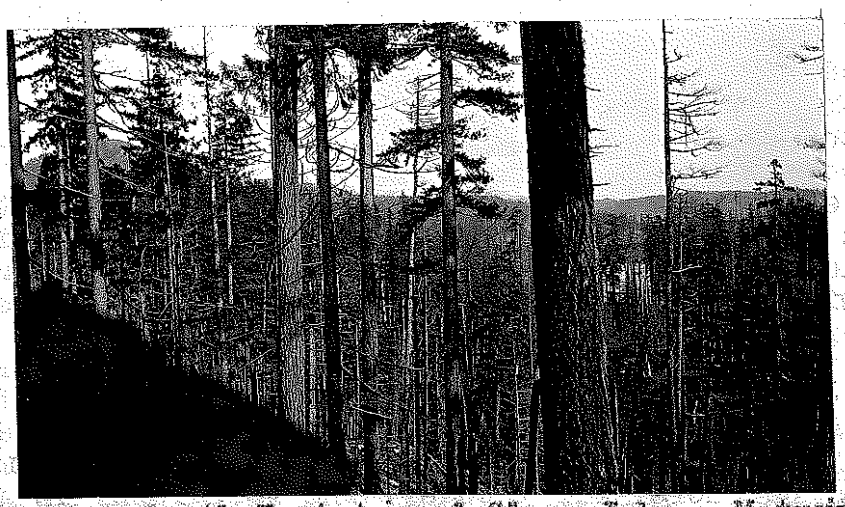
A small sub-compartment in a narrow steep draw. Timber is of good size and grade, although the stand has been somewhat fire-damaged -- the hemlock particularly suffering. Conk is heavy in the weakened hemlock, but the fir is in good condition. However, the stand should be logged soon. The logging chance is good as the area is close to Cahnish Bay.

Compartment 3B, non-commercial cover

A sub-compartment composed of several sub-areas. This type is made up a decadent timber. Fire damage has greatly accentuated the normal disease in these stands, so that they are now non-merchantable.

Compartment 4, mature fir

The timber is of poor size and quality, due to poor site and fire damage. The country is badly broken by sharp draws and rock bluffs, cliffs and outcrop. The timbered area is badly cut up by large areas of scrub.



Looking South East toward Clear Lake. Mature timber damaged by fire. Note open stand, snags and fire-scars - Compartment 4.

Looking North West from a point near the road about 3 miles South of Granite Bay. Dense hemlock, fir, cedar reproduction 19 years old left unburned by 1925 fire - Compartment 6. Note value of road as a fire-break.

Disease and beetles are active in this timber and most of the trees are badly fire-scarred. Conk and buttrot are very prevalent and the timber should be logged immediately. That part of the area sloping into Okisollo Channel is very accessible and provides a good logging chance. The remainder of the timber will go out via Clear and Main Lakes, either to Village Bay or Granite Bay. Due to the long and somewhat difficult outlet this logging chance is only fair. There are no improvements within this compartment.

Compartment 5, fir 1915

Logged and burned about 15 to 20 years ago. The ground lead method of logging was used. This compartment is made up of three accessible areas which escaped the 1925 fire. The site quality is good. Former stand ran 20 to 50 M.B.M. per acre fir. Seed trees are few and widely scattered. The country is fairly smooth throughout. The logging chance is excellent, especially in the two most southerly areas. A wagon road runs through that sub-area east of the south end of Village Bay Lake.

Compartment 6, hemlock - fir, 1911

Logged and burned 15 to 20 years ago. Ground lead and hand logging methods were used. Selective logging was practised over some of the area and two small operations are now cleaning up the remaining timber. The site quality varies from medium to good. Former stand ran 40 to 75 M.B.M.per acre, fir - cedar. Sufficient seed trees are to be found over the north and west parts of the compartment, but they are very few on the south end. One good pole-road and a few good skid-roads are to be found in the compartment. The topography is quite smooth and the area is very accessible, making this an excellent logging chance.

Compartment 6A, logged and burned 1911

A sub-compartment within the main compartment, but subsequently burned by the 1925 fire. This fire was very severe over the area and the site quality has been reduced from good to medium. There are no seed trees on this area, but nearby timber will restock the south half of this area in time.

Compartment 7, mature fir

The fir is of good size and quality, but the other species are small. The fir on several rocky ridges is small, but merchantable, running less than 20 M.B.M. per acre. Buttrot and conk are noticeable in this stand and beetles were noticed in fir on one area. The country is badly broken by steep, rocky bluffs and ridges, but the majority of the timber is in a few large draws. This stand is quite accessible and will go out via Granite Bay. The south end of the compartment, however, is tributary to Deepwater Bay and the timber in this area will probably be taken out that way. The Granite Bay Road runs parallel with the east side of the compartment and about half a mile from it. This is a good logging chance.

Compartment 8, mature fir

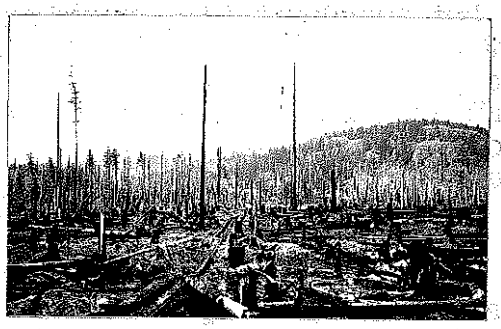
This timber is of good size and quality, but is somewhat fire damaged on the east and south sides of the compartments. In this damaged area fungus and beetles have made noticeable headway so that a large volume of timber on this area should be logged immediately. The country is badly broken up on the east side of the compartment, but quite smooth over the rest of the area. This compartment is not so accessible as Compartment 7, as the timber is generally higher, and farther from the coast. Some of this timber may go out via Deepwater Bay, but the majority of it should go out via Granite, Open or Hyacinth Bays. On the whole, it is a medium logging chance. A small area of inaccessible timber lies on the west side of the compartment on a steep sidehill. This timber is of poor size and grade and is unmarketable at the present time.

Compartment 8A, burned 1925

Several sub-areas comprising this sub-compartment were burned 5 years ago. The timber was destroyed but a small volume of cedar may be salvaged. The soil was shallow over these areas and much rock was exposed by the fire. However, these areas show good signs of early restocking from the surrounding timber.

Compartment 9, hemlock - fir - white pine, 1885

Burned about 35 years ago. Now plentifully stocked and in some areas overstocked. The site quality is medium to



Looking East from Seymour Lagoon. Logged and burned, not restocking. Note old pole-road, and non-productive hills behind Horte Lake. Compartment 10.

good. Former stand ran about 45 M.B.M. fir - cedar - hemlock - spruce. The seed trees are plentiful and, provided the young growth is properly protected, timber sales may be made in the seed tree areas. The topography is fairly smooth and the area very accessible. An excellent logging chance. A tractor logging operation has been skidding its logs through this compartment during the last year or two, but no unnecessary damage has been done to the young growth. Two small sub-types have been included in this compartment -- one containing satisfactorily restocked 1-20-year age class reproduction and the other an understocked area recently logged.

Compartment 10, logged and burned 1925

Compartment largely logged and burned from 2 to 5 years ago. One sub-area near Deepwater Bay was logged and burned about 30 years ago. A large part of the recently logged and burned area shows signs of good restocking in a year or so, as many seedlings are showing above the ground, but are not yet established. Seed trees are very scarce over the area, as a whole. The site quality of the compartment is medium. Former stand ran 20 to 60 M.B.M. per acre, fir - cedar - hemlock. The topography is generally smooth over the compartment except on the sub-area mentioned above, where it is steep and broken. The logging chance is good. Two sub-types were included in the compartment -- one is a small area of mature timber now being logged and the other is composed of several small areas of non-commercial cover (alder.)

Compartment 10A, mature fir

The timber is badly fire damaged, although of large size and good grade. Conk and bark beetles are noticeable and have been at work for some time. This timber should be logged immediately as it is rapidly losing value due to this damage. It is quite accessible and is a good logging chance.

Compartment 11, fir - hemlock 1916

Logged and burned about 16 years ago. Ground lead methods were used in logging. The site quality is medium to good. Former stand ran 50 to 60 M.B.M. per acre, fir - cedar. The seed trees are few and patchy. Some alder is scattered amongst the reproduction. The topography is quite low and smooth and the area is very accessible, making this compartment an excellent logging chance.

Classification of Areas (in Acres). QUADRA Provincial Forest Date, 1930.

84A—1M-230-9429

COMPARTMENT.		CAPABLE OF PRODUCING TIMBER.											NON-PRODUCTIVE.			
				Immature.												
Locality.	No.	Mature (1).	Mature (2).	1 to 20 Yrs.	21 to 40 Yrs.	41 to 60 Yrs.	61 to 80 Yrs.	81 to 100 Yrs.	Over 100 Yrs.	Selection.	Logged or Burned.	Non-commercial Cover.	Barren.	Scrub Sites.	Grass and Meadow.	Swamp.
N.of Cahnish Bay	1	1260											80	1340		10
N & W.of Waiatt Bay	2			4590									10	1410	110	70
" " " "	"A	170														
Centre of Quadra Id.	3										11160		100	4740	270	260
Near Granite Bay	3A	80														
" Main Lake	3B											220				
N.of Main Lake	4	1320											20	1470		10
Near Main & Village Bay Lake	5			1800										230	70	20
" Open Bay	5A											120				
S.of Cahnish Bay	6			2830									10	50		10
" "	6A										280					
E.of Deepwater Bay	7	2330											60	1840		40
E.of Seymour Narrows	8	3000	210										10	3450		80
N.of Hyacinth Bay	8A										270					
Plumper Bay	9				700									530		
N.of Gowland Harbour	10										4050		850	1880	90	70
" " " "	10A	240														10
" " " "	11			350												10
Grand Total		8400	210	9570	700						15760	340	1140	16940	540	590

Summary of areas also examined but excluded from the forest as being valuable agricultural land.

	2			130										10	20	
	3										90			80	60	
	5			10												
	8													40		
	10										110	20		10	60	
	TOTAL			140							200	20		140	140	

CAPABLE OF PRODUCING TIMBER.										NON-PRODUCTIVE.					TOTAL.	REMARKS.
ture (2).	Immature. 1 to 20 Yrs.	21 to 40 Yrs.	41 to 60 Yrs.	61 to 80 Yrs.	81 to 100 Yrs.	Over 100 Yrs.	Selection.	Logged or Burned.	Non-commercial Cover.	Barren.	Scrub Sites.	Grass and Meadow.	Swamp.	Water.		
										80	1340		10	80	2770	
	4590									10	1410	110	70	130	6320 170	
								11160		100	4740	270	260	1660	18190	
									220						80 220	
										20	1470		10	300	3120	
	1800								120		230	70	20		2120 120	
	2830							280		10	50		10		2900 280	
										60	1840		40	60	4330	
210								270		10	3450		80	10	6760 270	
		700									530				1230	
								4050		850	1880	90	70 10	190	7130 250	
	350												10		360	
210	9570	700						15760	340	1140	16940	540	590	2430	56620	

also examined but excluded from the forest as being valuable agricultural land.

	130										10	20			160	
								90			80	60			230	
	10														10	
											40				40	
								110	20		10	60			200	
	140							200	20		140	140			640	

Total productive area 34980 acres.
Total non-productive 21640 acres.

F.B. 341—2M-329-5470

CRUISE OF QUADRA. Provincial Forest SUMMARY OF MATURE TIMBER BY COMPARTMENTS. Date, 19 30.

Compartment, ~~Section, Lot, or Strip~~ No.	~~Forty No.~~	ACRES OF Merchantable (1).	Merchantable (2).	Immature.	Logged or Burned.	Non-commercial.	Barren.	Scrub.	Grass.	Swamp.	Water.	TOTAL ACRES.	Total Volume - M.B.M. F	C	H	P	B	S		Total	REMARKS.
													Summary of Accessible Timber.								
1		1260					80	1340		10	80	2770	36370	7950	10570	2908				57798	
2A		170										170	4655	880	593	70				6198	
3A		80										80	2368	18	654					3040	
4		1320					20	1470		10	300	3120	18369	3346	1422	272		46		23455	
7		2330					60	1840		40	60	4330	60224	3971	15876	1756	280	150		82257	
8		3000	210				10	3450		80	10	6760	71492	14378	12999	3139				102008	
10A		240								10		250	2338	240						2578	
Total		8400	210				170	8100		150	450	17480	195816	30783	42114	8145	280	196		277334	
													Summary of Inaccessible Timber.								
8			210									210	2100		630					2730	Included with accessible timber in i being such a small a
													Summary of Alienated Timber (all accessible)								
1		760										760	21911	4993	6354	1824				35082	
4		960										960	13025	2421	983	191		21		16641	
7		1300										1300	36500	2700	11000	1200	200	100		51700	
8		1260										1260	33563	3827	3397	663				41450	
Grand Total		4280										4280	104999	13941	21734	3878	200	121		144873	

QUADRA. Provincial Forest SUMMARY OF MATURE TIMBER BY COMPARTMENTS. Date, 19 30.

Compartment No.
Sheet No. 20

Barren.	Scrub.	Grass.	Swamp.	Water.	TOTAL ACRES.	Total Volume - M.B.M. F	C	H	P	B	S		Total	REMARKS.	TOTALS.
						Summary of Accessible Timber.									
80	1340		10	80	2770	36370	7950	10570	2908				57798		
					170	4655	880	593	70				6198		
					80	2368	18	654					3040		
20	1470		10	300	3120	18369	3346	1422	272		46		23455		
60	1840		40	60	4330	60224	3971	15876	1756	280	150		82257		
10	3450		80	10	6760	71492	14378	12999	3139				102008		
			10		250	2338	240						2578		
70	8100		150	450	17480	195816	30783	42114	8145	280	196		277334		
						Summary of Inaccessible Timber.									
					210	2100		630					2730	Included with accessible timber in inventory being such a small area and volume.	
						Summary of Alienated Timber (all accessible)									
					760	21911	4993	6354	1824				35082		
					960	13025	2421	983	191		21		16641		
					1300	36500	2700	11000	1200	200	100		51700		
					1260	33563	3827	3397	663				41450		
					4280	104999	13941	21734	3878	200	121		144873		

IMMATURE TIMBER.

QUADRA. Provincial Forest. Date, 1930. Summary of Immature Timber by Compartments. Type..... Age-class.....

F.B. 84—1M—329-5478

Compartment. Section, Lot, or Strip No.	PRODUCTIVE (Acres). IMMATURE. Main Type.	Sub-types.	Mature Merchantable.	Logged or Burned.	Non-Commercial.	NON-PRODUCTIVE (Acres). Barren.	Scrub Sites.	Grass and Meadow.	Swamp.	Water.	TOTAL ACRES.	STRIP. Chainage.	Acres.	DESCRIPTION (per Acre). D.B.H. F	C	H	P	TOTAL HEIGHT. F	C	H	P	TOTAL AGE. F	C	H	P	NUMBER. F	C	H	P	Other Species.	Total.
1 - 20 year Compartments.																															
2	4470					10	1430	110	70	130	6220	Average	1	.35	.7	1.0	1.28	15		13	8	15		15	12	332	168	2140	41	50	2731
5	1740			60			230	70	20		2120	"	2	.10		1.2		15		10		14		12		1080	10	75	5	75	1245
6	2830					10	50		10		2900	"	1	.88		.87	2.35	18		13		19		14		194	-	3449	51	6	3700
11	350								10		360	"	1	.33				12				14				990	4	278	58	10	1340
21 - 40 year Compartments.																															
9	570	50		80			530				1230	Average	3	.0		2.8		40		32		35		30		850		2200	280	130	3460

QUADRA. Provincial Forest. Summary of Immature Timber by Compartments. Date, 1930. Type..... Age-class..... years. Compartment No..... Sheet No. 21

N-PRODUCTIVE (Acres). Scrub Sites.	Grass and Meadow.	Swamp.	Water.	TOTAL ACRES.	STRIP. Chainage.	Acres.	D.B.H. F	D.B.H. C	D.B.H. H	D.B.H. P	TOTAL HEIGHT. F	TOTAL HEIGHT. C	TOTAL HEIGHT. H	TOTAL HEIGHT. P	TOTAL AGE. F	TOTAL AGE. C	TOTAL AGE. H	TOTAL AGE. P	NUMBER. F	NUMBER. C	NUMBER. H	NUMBER. P	NUMBER. Other Species.	NUMBER. Total.	SEED TREES.	REMARKS. (Former Stand, Date of Fire, or other History.)
- 20 year Compartments.																										
430	110	70	130	6220	Average	1.35	.7	1.0	1.28		15		13	8	15		15	12	332	168	2140	41	50	2731		
230	70	20		2120	"	2.10		1.2			16		10		14		12		1080	10	75	5	75	1245		
50		10		2900	"	1.88		.87	2.35		18		13		19		14		194	-	3449	51	6	3700		
		10		360	"	1.33					12				14				990	4	278	58	10	1340		
- 40 year Compartments.																										
530				1230	Average	3.0		2.8			40		32		35		30		850		2200	280	130	3460		

APPENDIX II.

Volume and yield tables used

The volume tables used were made by J.L.Alexander in 1924 from data obtained in a large number of logging operations typical of all coast conditions. These tables are total height tables divided into 3 site classes, i.e.,short, medium and tall. The tables were available for fir, cedar and hemlock only. For other species, the old log-length tables, also compiled by Alexander, were used.

No yield tables were available, but estimates, typical of average coast conditions and also compiled by Alexander, were used. These estimates of yield for various rotations appear below:-

Rotation (years)	Yield (f.b.m.)
80	21,430
100	27,270
120	31,910
140	36,210
160	39,889

Method of Survey

Field methods of survey were based on the instructions for forest surveys issued in 1928.

Cost of Survey

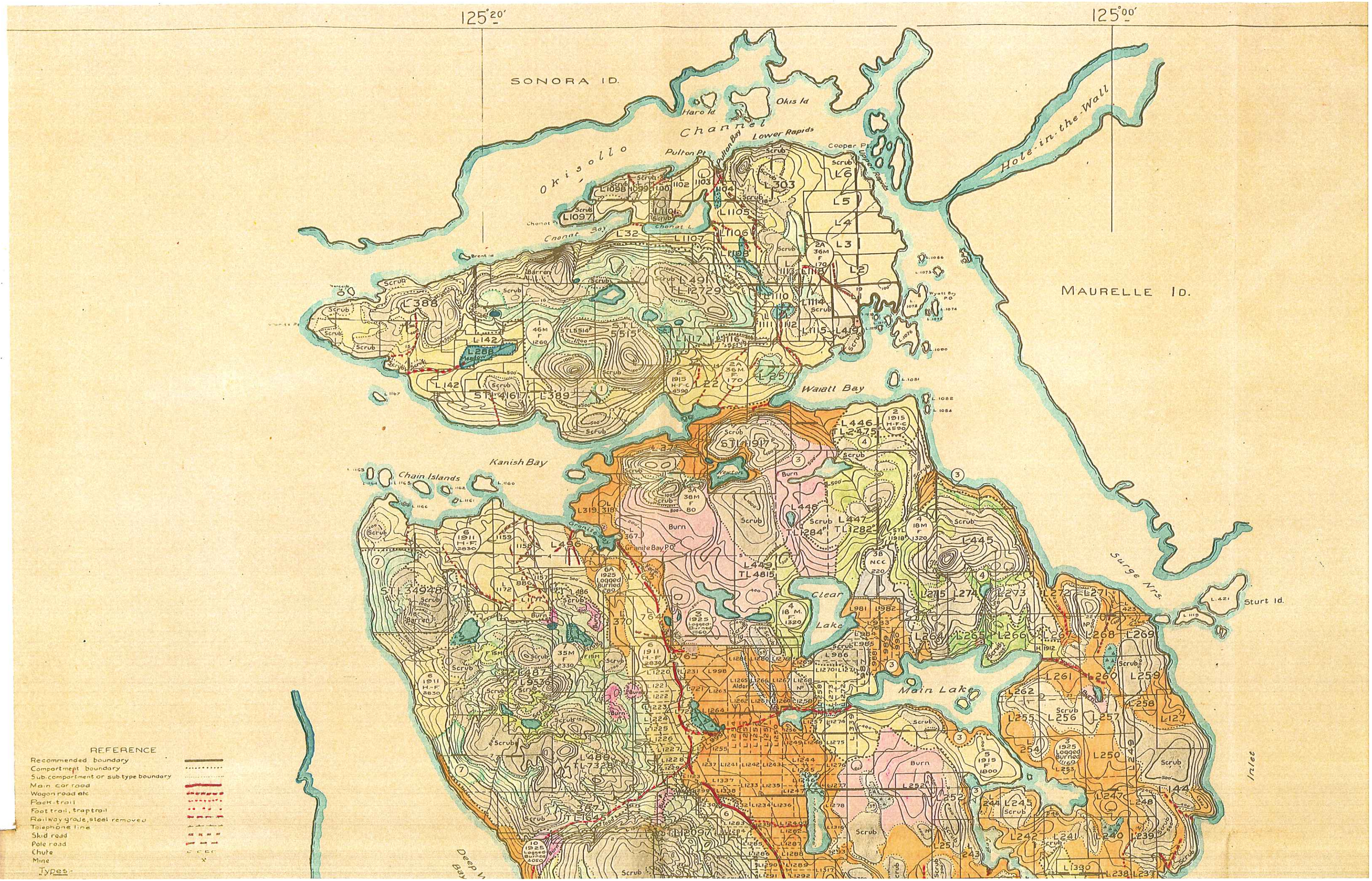
Total area examined - 57,260 acres
Total cost of survey - $718.89
Cost per acre - $.012

Base Maps

The base maps for the Quadra Forest were made from Lands Department reference Map #4A. This map was enlarged to the required scale of 40 chains - 1 inch.

Party Personnel

M.W.Gormely.....Party chief and cruiser
D.M.Carey.....Compassman
C.F.McBride.....Junior and spare compassman


125°20'
125°00'
SONORA ID.
MAURELLE ID.
Harold
Okis Id
Okisollo Channel
Lower Rapids
Cooper Pt
Pulton Pt
Pulton Bay
Hole-in-the-Wall
Chonat Bay
Brent Id
Barren
Waiatt Bay
Kanish Bay
Chain Islands
Granite Bay P.O.
Clear Lake
Main Lake
Surge Nrs.
Sturt Id.
Inlet
Deep Bay
Wyatt Bay P.O.
REFERENCE
Recommended boundary
Compartment boundary
Sub-compartment or sub type boundary
Main car road
Wagon road etc
Pack-trail
Foot trail, trap trail
Railway grade, steel removed
Telephone line
Skid road
Pole road
Chute
Mine
Types -

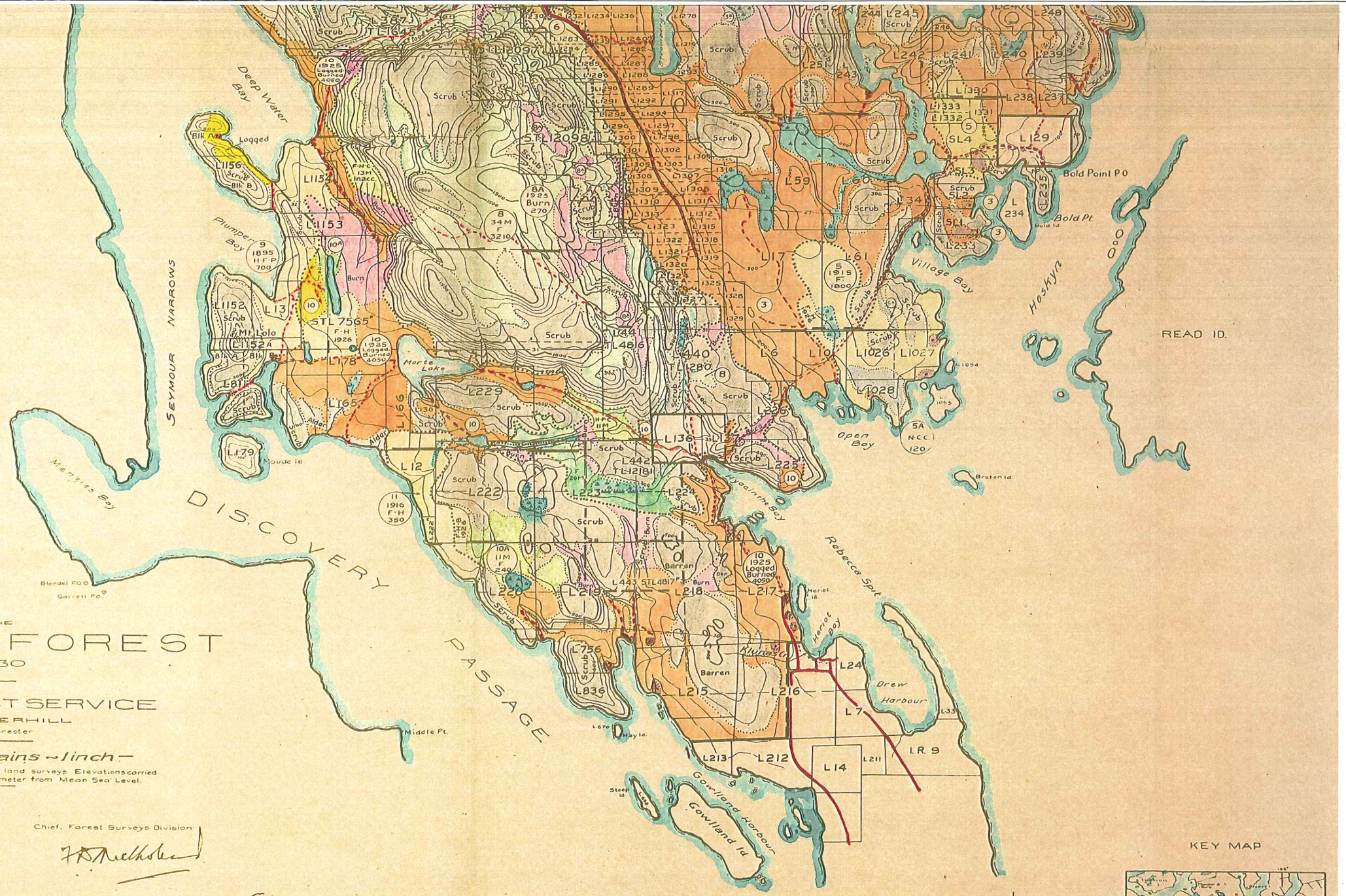
Pack-trail
Foot trail, trap trail
Railway grade, steel removed
Telephone line
Skid road
Pole road
Chute
Mine

Types -

Merchantable Timber
20 MBM and over per acre
Under 20 MBM per acre
Immature
Non-commercial cover
Logged & Burned
Logged
Burned NSR
Non productive
Swamp

Descriptive Circles show:
Compartment or Sub-compartment number corresponding to Summary Sheets.
Date of reforestation for Young Growth - or average per acre for Merchantable Timber type.
Acres in compartment or sub-compartment.

Abbreviations - H-Hemlock, B-Silver Fir (Balsam); C-Cedar, F-Douglas Fir; NP-Non productive; N.C.C-Non commercial cover, Inacc.-Inaccessible, L&B-Logged & Burned; SR-Satisfactorily restocking; NSR-Not satisfactorily restocking.



THE

QUADRA FOREST

1930

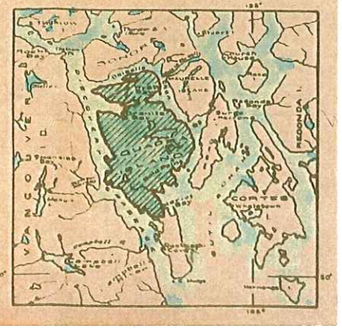
B.C. FOREST SERVICE

P. Z. CAVERHILL
Chief Forester

— Scale:- 80 chains - 1 inch —

Basis - Survey based on official land surveys. Elevations carried by Abney Level and barometer from Mean Sea Level.

Chief, Field Party — H. A. Gormely

Chief, Forest Surveys Division — F. D. Mulholland

KEY MAP