



August 22, 2016

Pacific Traverse Trail Timber Cruise and Valuation Assessment

David Craven, ATE
Licensed Log Scaler

PROFESSIONALLY RESOURCEFUL



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1.0 Introduction

A Timber Cruise and Valuation Assessment were completed on behalf of Parsons Engineering and Parks Canada for the proposed Pacific Traverse Trail (located in Pacific Rim National Park) from July 4 to July 23, 2016 by David Craven, ATE of Strategic Natural Resource Consultants Inc (SNRC).

The proposed trail alignment begins approximately 7.0 km to the southeast of Tofino directly adjacent the Pacific Rim Highway (Highway 4) and ends approximately 1.1 km to the northwest of the junction between the Pacific Rim Highway and the Tofino - Ucluelet Highway 4. The total trail length is approximately 24.0km with a width of 5.2 meter right-of-way. The majority of the trail alignment parallels the Pacific Rim Highway and is approximately 20-25m away from the highway. Portions of the trail alignment utilize existing trails and roads such as in the Florencia Bay area. Refer to Appendix I for The Pacific Rim Trail locator map.

A preliminary design map showing the proposed trail alignment (with building envelopes / rear yard setbacks), access road, and trail systems was provided by Parsons Engineering prior to conducting the assessment. (Appendix I)

Previous discussions between SNRC, Parks Canada, and Parsons Engineering outlined general project expectations with regards to assessment requirements. These initial discussions provided the basis for the methodologies used in the field and within this report.

1.1 Project Objectives

The following project objectives were determined for the assessment:

Objective #1:

- Determine Timber Types for stratification purposes.

Objective #2:

- Determine approximate timber volume to be removed during the "Clearing" phase.

Objective #3:

- Determine approximate stand value based on grade, volume and current Ministry of Forest, Lands and Natural Resources (MFLNR) price list.



Objective #4:

- Determine viability of commercial sale of timber based on stand value vs harvesting costs.

Objective #5:

- Propose suitable standards for disposal of timber.

2.0 Methodology

Orthographic maps provided by Parsons were used by SNRC GIS department to stratify Timber Types prior to field assessments. Field teams then walked the length of the alignment to ground truth the timber types.

After confirming Timber Types, a linear 150 meter sample grid was draped over the length of the alignment. The 150m grid represents a sampling intensity of roughly 8 sample plots per hectare. The high sampling intensity was used to ensure results would not be overly impacted in the case of an alignment shift prior to clearing.

Detailed field data collection was performed by an Accredited Timber Evaluator.

The timber cruise data was reviewed for quality purposes and then entered into a MFLNR approved compilation program. The compilation program produces a detailed report with a volume, grade, piece size, height, Timber Type and valuation breakdown.

The volume and value information collected is then used to determine the viability of the stand and how to best dispose of the felled timber.

3.0 Results

3.1 Timber Type Stratification:

After reviewing the orthographic maps, it was identified that multiple Timber Types fell along the Pacific Traverse Trail (PTT) alignment. To accurately capture the varying stand characteristics it was determined that five individual types would be stratified out and treated independent.

The types were stratified out based on volume of removal, dominant tree species, heights and piece size.

The five Types are spread out over the entire length of the alignment and have been categorized together based on type not locality. (ie. Polygons were identified on



multiple locations along the trail and aggregated together to provide a total Timber Type area).

Note: The Timber Type labels represent the timber to be removed from the alignment, not the stand characteristics as a whole.



3.2 Timber Type Summary

Timber Type #1

Figure 1: Photo of Timber Type 1



Timber Type Label – HwCw 931	
Height	Surrounding trees are tall where trees to be removed are general <20 meters tall
Density	Low impact / low number of trees per hectare
Quality	Higher quality surrounding trees / Low quality trees to be removed
Ground Cover	Thick, dense underbrush makes navigation difficult



Timber Type #2

Figure 2: Photo of Timber Type 2



Timber Type Label – Hw(CwBaSs) 430	
Height	Tall second growth timber >20 meters
Density	Medium impact / high number trees per hectare
Quality	Good quality second growth timber
Ground Cover	Open, clear ground – easy to navigate and work around



Timber Type #3

Figure 3: Photo of Timber Type 3



Timber Type Label – CwPIHw 921	
Height	Small diameter, short non merchantable timber
Density	Low impact / low number of trees per hectare
Quality	Poor quality throughout
Ground Cover	Thick brush and wetter soils



Timber Type #4

Figure 4: Photo of Timber Type 4

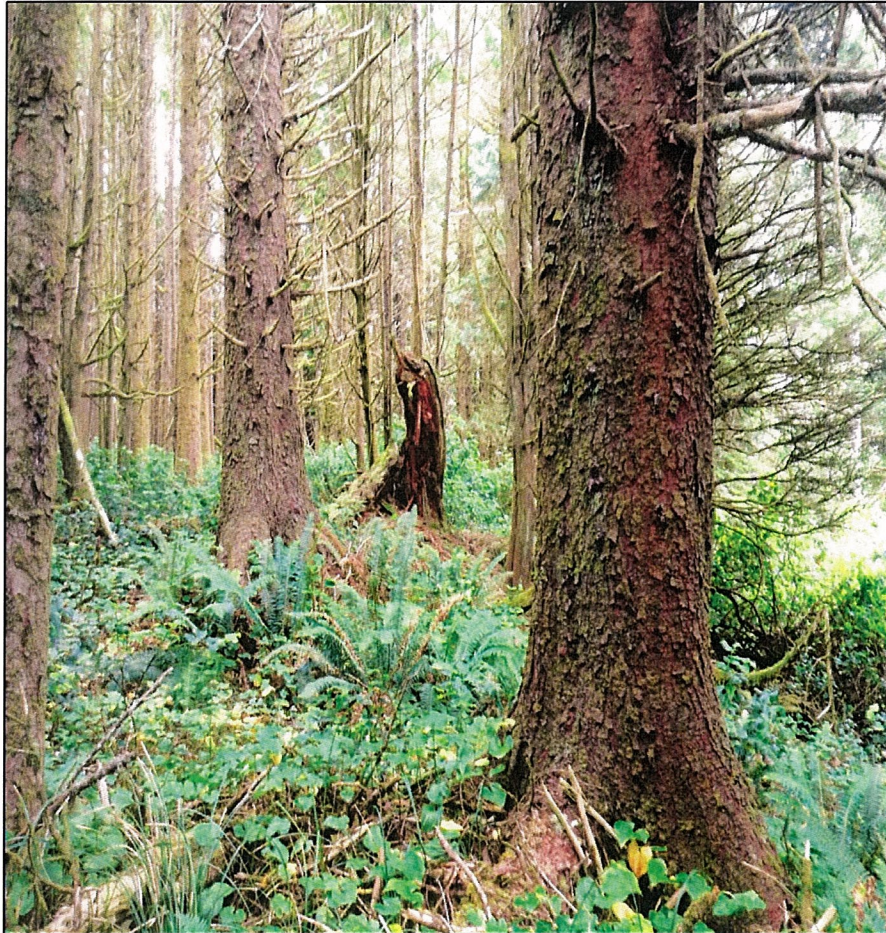


Timber Type Label – Dr(Hw) 320	
Height	Smaller, deciduous timber <20m
Density	Medium impact/ high number of trees per hectare
Quality	Higher quality surrounding trees / Low quality trees to be removed
Ground Cover	Thick, dense underbrush makes navigation difficult



Timber Type #5

Figure 5: Photo of Timber Type 5



Timber Type Label – SsHw(Dr) 430	
Height	Tall timber >20 meters
Density	Low impact / less trees to remove per hectare
Quality	High quality timber surrounding
Ground Cover	Thick, dense underbrush makes navigation difficult



3.3 Timber Cruise Compilation:

As one of the main objectives for the PTT design team was to manage for low impact and low tree removal, it was not expected that a high volume of timber would require clearing. The timber cruise data summarizes both the volume of the entire alignment and individual timber types. Separating the volumes by Timber Types provide site specific compilations. Knowing volumes and piece size specific to a location allows for better planning and management at the clearing and grubbing phase.

Note: The timber cruise data in this report represents the area of impact based on the trail alignment as of the June 15, 2016 maps (Appendix I). Any changes to the length or location of the alignment will impact the area which in turn will affect the final volumes of timber to be removed. Some portions of the trail were not finalized at the time of the Timber Cruise. Those areas were sampled based on an proposed alignment location. If significant changes are made, the final length and area will require a site visit by ATE to confirm data, and a re-compilation.

*All volumes are represented in cubic meters (m3) and are based on merchantable timber greater than 12cm diameter at breast height. Any material less than 12cm at breast height is not considered noteworthy as the clearing and removal is minimal. The timber cruise was compiled in the Call Grade Net Factor (CGNF) system using the "CruiseComp 2016" program.

Timber Volumes:

Timber Type #1 Net Merchantable Volume	968m3
Timber Type #2 Net Merchantable Volume.....	1,068m3
Timber Type #3 Net Merchantable Volume	159m3
Timber Type #4 Net Merchantable Volume	118m3
Timber Type #5 Net Merchantable Volume	<u>287m3</u>
Total Net Merchantable Volume per Hectare.....	224m3
Total Net Merchantable Volume	3,155m3





Species Percentage:

Western Hemlock, <i>Tsuga heterophylla</i> (Hw)	45%
Western Red Cedar, <i>Thuja plicata</i> (Cw).....	25%
Sitka Spruce, <i>Picea sitchensis</i> (Ss).....	11%
Lodgepole Pine, <i>Pinus contorta</i> (Pl).....	8%
Amabilis fir, <i>Abies amabilis</i> (Ba).....	5%
Red Alder, <i>Alnus rubra</i> (Dr).....	5%
Douglas Fir, <i>Pseudotsuga menziesii</i> (Fd).....	<u>1%</u>
	100%

Total Grade Breakdown:

H Grade (Saw log).....	5%
I Grade Breakdown (Large Utility/Shop Log)	1%
J Grade (Gang Log)	39%
M Grade (Cedar shingle).....	1%
U Grade (Utility/Small Pulp)	31%
Y Grade (Pulp)	<u>23%</u>
	100%

* Full Call Grade Net Factor Timber Cruise Compilation Report attached in Appendix II





4.0 Discussion:

4.1 Stand Valuation:

An overall stand valuation was assessed to determine if the timber being cleared would have enough value to consider a commercial sale.

In order to determine the stand value, the volumes, grades and recovery percentages were taken from the timber cruise data. This information was then applied to the current MFLNO provincial price list (3 month average ending May 31, 2016)

The alignment was laid out to minimize impact and avoid larger, mature trees. By doing this, smaller utility and pulp quality timber was left in the alignment. The low market value in utility grade (U) does not justify the added harvesting costs associated with removing and selling the wood. The added cost would offset the value and any commercial sale would be at a loss.

4.2 Disposal of Cleared Timber:

The low volume of the timber to be cleared makes the disposal of material manageable.

Although the commercial sale of the timber is cost prohibiting there are other options for fibre recovery on some portions of the trail.

- Timber Type #1 has a few patches of heavy blowdown. Based on a visual assessment of the blowdown, there are opportunities to salvage some of the intact, higher quality Western Red Cedar. This wood could be donated to the local First Nations for carvings or cultural use.
- Timber Type #2 has the highest volume of stems to be removed. In particular the timber near the Combers Beach parking lot is high volume and could easily be brought to the parking lot and left as firewood. The only added cost is forwarding to the parking lot. To limit site degradation and cost a forwarding limit of 500m would be reasonable.



5.0 Recommendations:

1. Timber should not be sold commercially. The low value and added impact associated with removal does not justify selling the timber.
2. Fallers to fell timber within the 5.2 meter alignment
3. In areas where timber can not safely be felled or will have a high likelihood of damaging surrounding timber, the stems should be climbed and felled from the top down (tree climbing)
4. After timber is felled, remaining stumps should be cut flush to ground (allow for industrial traffic to move along alignment)
5. Felled timber should be bucked and limbed to manageable lengths for the alignment width and machinery being used
6. Bucked logs should be stacked on one side of the alignment where limbs, tops and waste to be stacked on the other side
7. A tracked grapple style skidder or a machine with similar capabilities and impact should be used during the clearing phase
8. The skidder should disperse bucked logs throughout the forest while considering aesthetic appeal
9. The limbs, tops and waste should be loaded into an industrial chipper on site and dispersed into the forest
10. Danger trees should be assessed during the clearing. Trees outside the trail alignment that potentially pose a safety threat should be identified and discussed with on site monitor
11. Down Cedar logs that require removal should be assessed and considered for cultural value





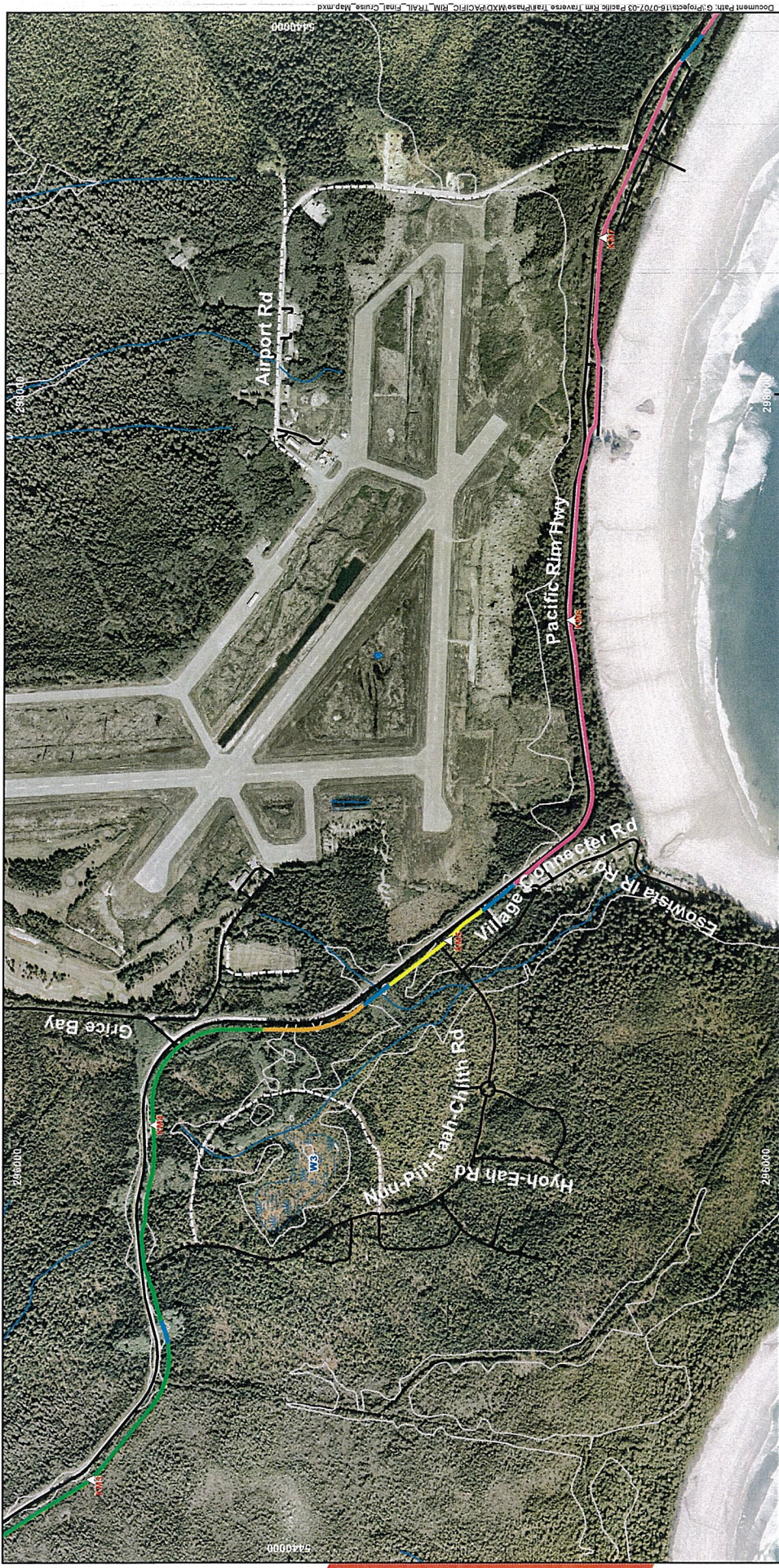
Field work and Report prepared by:
David Craven, ATE

August 18, 2016



Appendix I – Pacific Traverse Trail Timber Type Maps





Map Center Coordinates
 Easting: 296,981 LAT: 49°43'06"N
 Northing: 5,439,734 LONG: 125°46'48.36"W

Coordinate System: NAD 1983 UTM Zone 10N Scale: 1:10,000
 Projection: Transverse Mercator Date: 8/22/2016
 Datum: North American 1983 Produced By: randy.carter
 Units: Meter Base Map: 92F001002

**Pacific Rim Trail
 Final Cruise Map
 2 of 8**

STRATEGIC
 NATURE RESOURCES CONSULTANTS
 Port McNeill
 2-4881 Beach Dr.
 P.O. Box 556-2700

Map Features

- Stream
- Lake
- Wetland/Swamp
- Reserve Zone
- Management Zone
- Freshwater Sensitive Area

Map Center Coordinates

Map Scale

0 100 200 300 Meters

LEGEND

- Highway/Paved Road
- Gravel Road
- Trail
- Index Contour (100m)
- Index Contour (20m)
- Built Trail/Road

Cruise Stratum

- 1 HwCw 931
- 2 Hw(CwBaSa) 430
- 3 CwPlHw 921
- 4 Dr(Hw) 320
- 5 SHW(Dr) 430

CMT

- Danger Tree
- Raptors Nest
- Bear Den
- Kilometer Markers

PSYU : 31 Pacific Rim
LU : Clayport SNZ

Map Features

- District : South Island
- Region : Coast
- PSYU : 31 Pacific Rim
- LU : Clayport SNZ

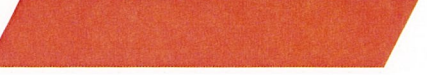
Map Scale

0 100 200 300 Meters

Map Center Coordinates

Map Scale

0 100 200 300 Meters





Map Center Coordinates
 Easting: 302,088 **LAT: 49°31'16.14"N**
 Northing: 5,437,109 **LONG: 125°42'32.30"W**

Coordinate System: NAD 1983 UTM Zone 10N
 Projection: Transverse Mercator
 Datum: North American 1983
 Units: Meter

Scale: 1:10,000
 Date: 8/22/2016
 Produced By: Randy Carter
 Email: rjc@psu.edu

STRATEGIC
 NATURAL RESOURCE CONSULTANTS
 Port McNeill
 2-1488 Beach Dr.
 Port McNeill, BC
 V1B 4S6

**Pacific Rim Trail
 Final Cruise Map
 4 of 8**

Map Features

- Stream
- Lake
- Wetland/Swamp
- Reserve Zone
- Management Zone
- Freshwater Sensitive Area

CMT

- Danger Tree
- Raptors Nest
- Bear Den
- Kilometer Markers

Highway/Paved Road

- Gravel Road
- Trail
- Index Contour (100m)
- Index Contour (20m)
- Built Trail/Road

Cruise Stratum

- 1 HwCw 931
- 2 Hw(CwBaSa) 430
- 3 CwPHW 921
- 4 Dr(Hw) 320
- 5 SHW(Dr) 430

Meters

- 8866
- 4819
- 8654
- 1021
- 3940

LEGEND

Map Features

- Stream
- Lake
- Wetland/Swamp
- Reserve Zone
- Management Zone
- Freshwater Sensitive Area

CMT

- Danger Tree
- Raptors Nest
- Bear Den
- Kilometer Markers

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- Trail
- Index Contour (100m)
- Index Contour (20m)
- Built Trail/Road

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- 4 Dr(Hw) 320
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Meters

- 8866
- 4819
- 8654
- 1021
- 3940

Map Features

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- Index Contour (20m)
- Built Trail/Road

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Meters

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- 8654
- 1021
- 3940

Map Features

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- Bear Den
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- Index Contour (20m)
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- 3 CwPHW 921
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- 5 SHW(Dr) 430

Meters

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- 4819
- 8654
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- 3940

Map Features

- Stream
- Lake
- Wetland/Swamp
- Reserve Zone
- Management Zone
- Freshwater Sensitive Area

CMT

- Danger Tree
- Raptors Nest
- Bear Den
- Kilometer Markers

Highway/Paved Road

- Gravel Road
- Trail
- Index Contour (100m)
- Index Contour (20m)
- Built Trail/Road

Cruise Stratum

- 1 HwCw 931
- 2 Hw(CwBaSa) 430
- 3 CwPHW 921
- 4 Dr(Hw) 320
- 5 SHW(Dr) 430

Meters

- 8866
- 4819
- 8654
- 1021
- 3940

FIG : B District : South Island PSYU : 31 Pacific Rim
 TSB : 38A Barkley S.B. Region : Coast LU : Claycoquit SMZ



Map Features

- Stream
- Lake
- Wetland/Swamp
- Reserve Zone
- Management Zone
- Freshwater Sensitive Area

Map Center Coordinates

Eastings: 304,035 LAT: 49°27'48"N
 Northings: 5,435,474 LONG: 125°40'53.61"W

Coordinate System: NAD 1983 UTM Zone 10N Scale: 1:10,000
 Projection: Transverse Mercator Date: 8/22/2016
 Unit: Meter/American 1983 Base Map: 201001002

Map Center Coordinates

Eastings: 304,035 LAT: 49°27'48"N
 Northings: 5,435,474 LONG: 125°40'53.61"W

Coordinate System: NAD 1983 UTM Zone 10N Scale: 1:10,000
 Projection: Transverse Mercator Date: 8/22/2016
 Unit: Meter/American 1983 Base Map: 201001002

Map Center Coordinates

Eastings: 304,035 LAT: 49°27'48"N
 Northings: 5,435,474 LONG: 125°40'53.61"W

Coordinate System: NAD 1983 UTM Zone 10N Scale: 1:10,000
 Projection: Transverse Mercator Date: 8/22/2016
 Unit: Meter/American 1983 Base Map: 201001002

LEGEND

	Highway/Paved Road
	Gravel Road
	Trail
	Index Contour (100m)
	Index Contour (20m)
	Built Trail/Road

Cruise Stratum

	1 HwCw 931	Meters	8886
	2 Hw(CwBaSs) 430		4819
	3 CwPHw 921		8654
	4 Dr(Hw) 320		1021
	5 SsHw(Dr) 430		3940

Map Features

- CMT
- Danger Tree
- Regions Nest
- Bear Den
- Kilometer Markers

Map Features

- District: South Island
- Region: Coast
- PSYU: 31 Pacific Rim
- LU: Claycoquet SMZ

Map Features

- FI2: B
- TSB: 38A Bartley S.B.

Map Features

- 38A Bartley S.B.

Map Features

- 31 Pacific Rim

Map Features

- Claycoquet SMZ

Map Features

- 38A Bartley S.B.

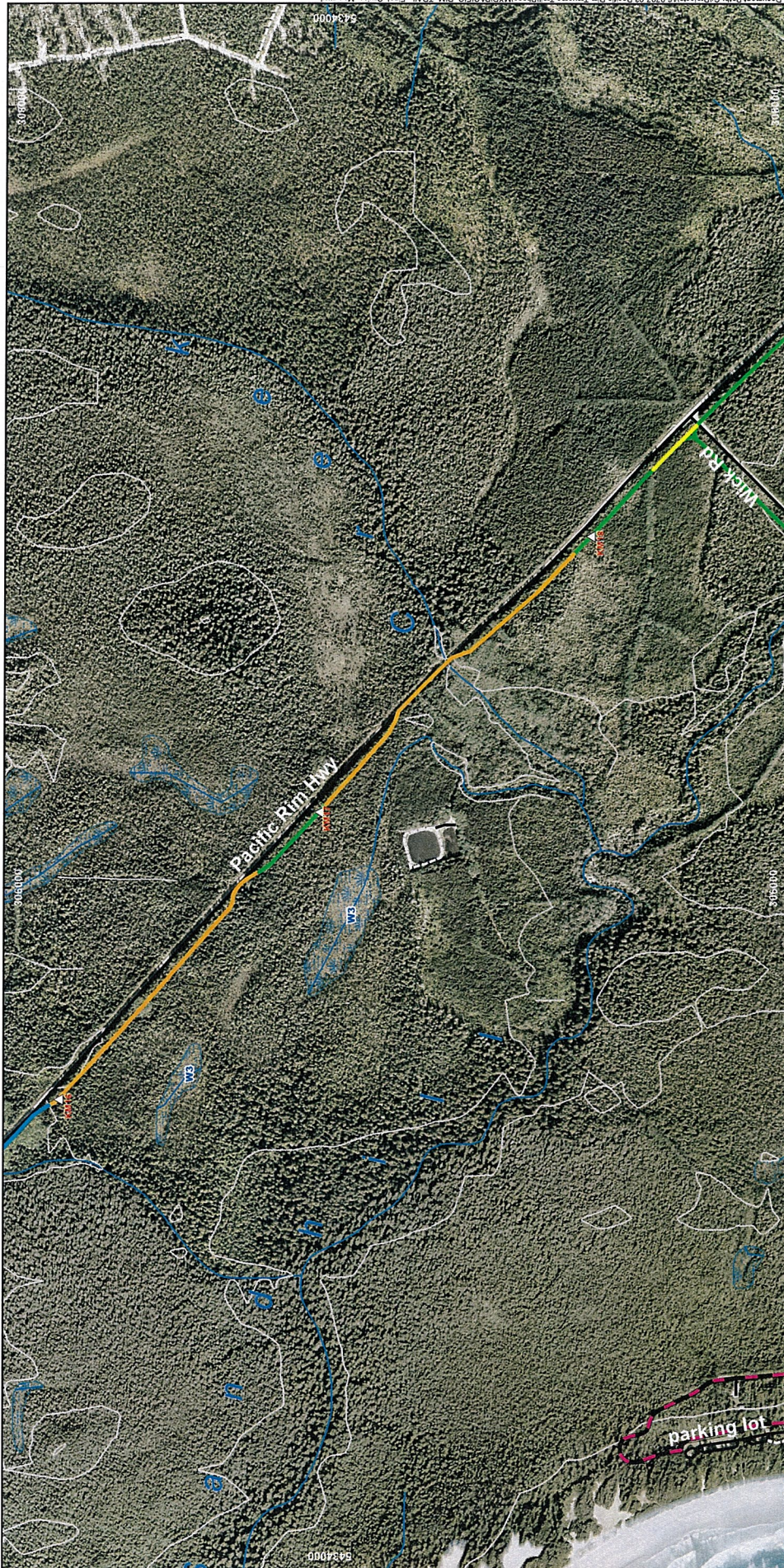
Map Features

- 31 Pacific Rim

Map Features

- Claycoquet SMZ





Map Features

- Stream
- Lake
- Wetland/Swamp
- Reserve Zone
- Management Zone
- Freshwater Sensitive Area

CMT

- Danger Tree
- Raptors Nest
- Bear Den
- Kilometer Markers

Map Center Coordinates

Eastings: 306,258 LAT: 49°13'56"N
 Northings: 5,433,834 LONG: 125°39'1.42"W

Coordinate System: NAD 1983 UTM Zone 10N Scale: 1:10,000
 Projection: Transverse Mercator Date: 8/22/2016
 Units: Meter Base Map: 32F-001002

STRATEGIC
 NATURAL RESOURCE CONSULTANTS
 Port McNeill
 27-003 Beach Dr.
 P.O. Box 252, 2013

LEGEND

- Highway/Paved Road
- Gravel Road
- Trail
- Index Contour (100m)
- Index Contour (20m)
- Built Trail/Road

Cruise Stratum

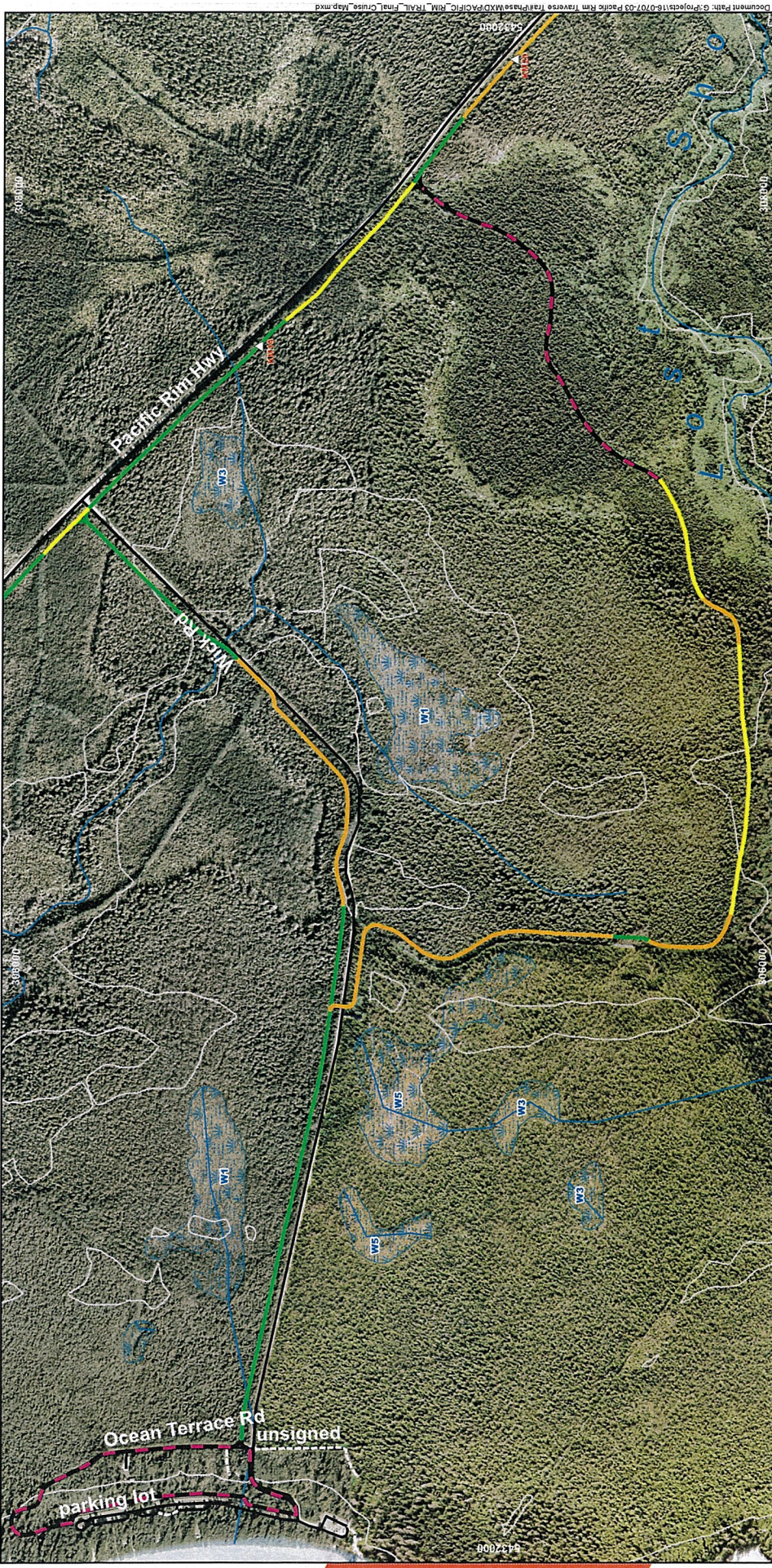
- 1 HwCw 931
- 2 Hw(CwBaSs) 430
- 3 CwPHw 921
- 4 Dr(Hw) 320
- 5 SHw(Dr) 430

Metres

- 8885
- 4819
- 8654
- 1021
- 3940

**Pacific Rim Trail
 Final Cruise Map
 6 of 8**

FIG : B District : South Island PSYU : 31 Pacific Rim
 TSB : 38A Barkley S.B. Region : Coast LU : Clayoquot SMZ



Map Center Coordinates
 Easting: 305,464 **LAT: 49°04'07.07"N**
 Northing: 5,432,283 **LONG: 125°58'46.61"W**
 Coordinate System: NAD 1983 UTM Zone 10N Scale: 1:10,000
 Projection: Transverse Mercator Date: 8/22/2016
 Datum: North American 1983 Produced By: Randy Carter
 Units: Meter Base Map: 327-001002

Cruise Stratum

Stratum	Color	Elevation (Meters)
1	Orange	8886
2	Yellow	4819
3	Green	8654
4	Blue	1021
5	Pink	3940

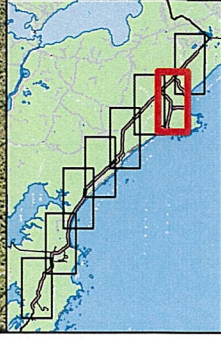
LEGEND

Highway/Paved Road	Thick black line
Gravel Road	Thin black line
Trail	Dashed black line
Index Contour (100m)	Thin grey line
Index Contour (20m)	Thin black line
Built Trail/Road	Thick black line
CMT	Green arrow
Danger Tree	Red arrow
Raptors Nest	Blue circle
Bear Den	Blue circle
Kilometer Markers	Black triangle
Map Features	Stream, Lake, Wetland/Swamp, Reserve Zone, Management Zone, Fisheries Sensitive Area
PSYU	31 Pacific Rim
LU	Clayport SMZ

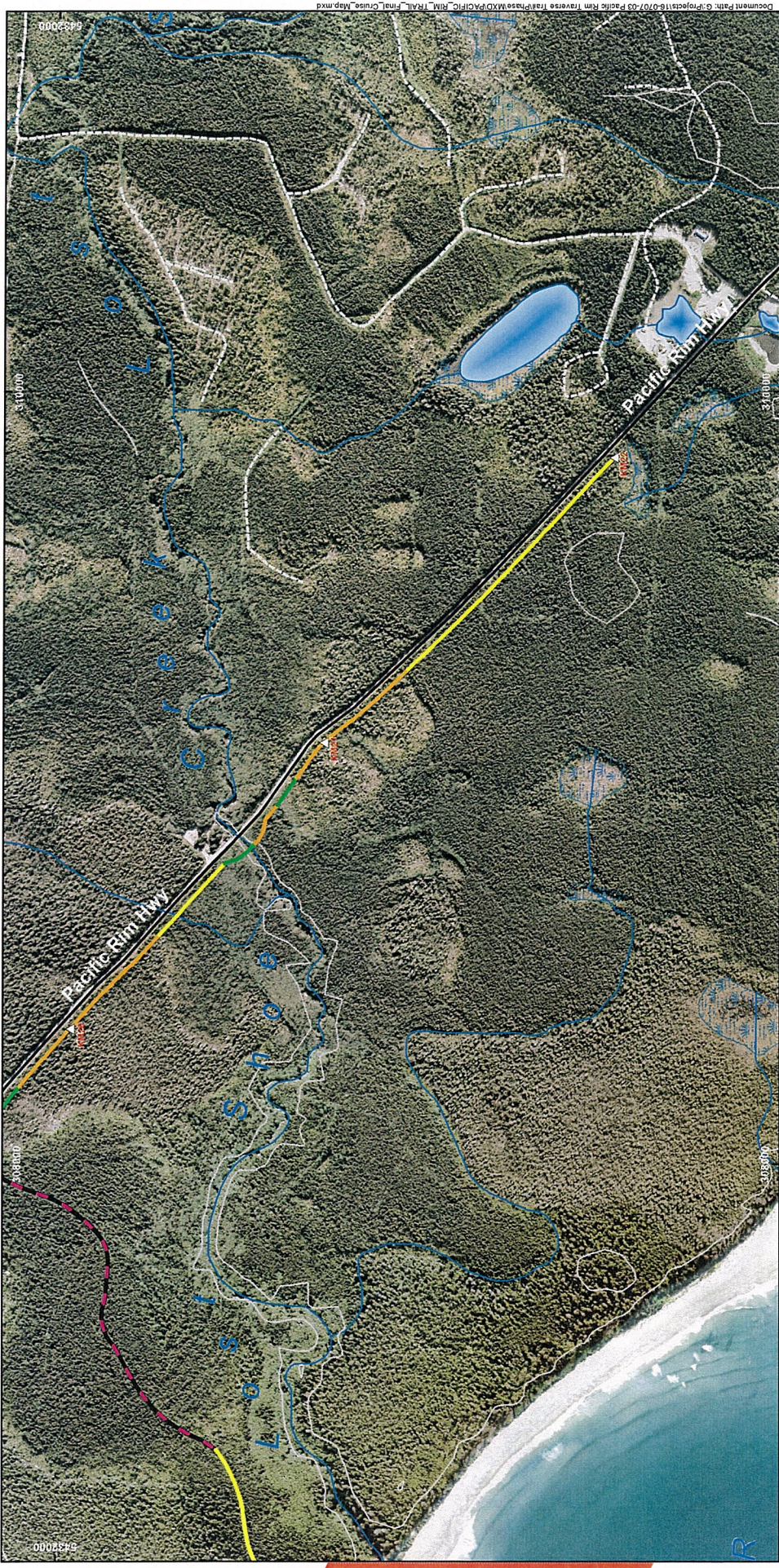
Map Features
 Stream, Lake, Wetland/Swamp, Reserve Zone, Management Zone, Fisheries Sensitive Area

CMT
 Danger Tree, Raptors Nest, Bear Den, Kilometer Markers

Map Center Coordinates
 Easting: 305,464 **LAT: 49°04'07.07"N**
 Northing: 5,432,283 **LONG: 125°58'46.61"W**
 Coordinate System: NAD 1983 UTM Zone 10N Scale: 1:10,000
 Projection: Transverse Mercator Date: 8/22/2016
 Datum: North American 1983 Produced By: Randy Carter
 Units: Meter Base Map: 327-001002



**Pacific Rim Trail
 Final Cruise Map
 7 of 8**



Map Center Coordinates
 Easting: 306,977 LAT: 49°01'2.69"N
 Northing: 5,431,135 LONG: 125°36'43.05"W

Coordinate System: NAD 1983 UTM Zone 10N Scale: 1:10,000
 Projection: Transverse Mercator Date: 8/22/2016
 Datum: North American 1983 Produced By: randy.carter
 Units: Meter Base Map: 92F-001/002

STRATEGIC
 Port McNeill
 2-4888 Beach Dr.
 P. 250-555-2010

**Pacific Rim Trail
 Final Cruise Map
 8 of 8**

Map Features

Stream	Highway/Paved Road
Lake	Gravel Road
Wetland/Swamp	Trail
Reserve Zone	Index Contour (100m)
Management Zone	Index Contour (20m)
Reserve Sensitive Area	Built Trail/Road

Cruise Stratum

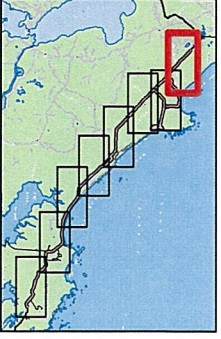
1 HwCw 931	Meters
2 Hw(CwBaSs) 430	8886
3 CwP(Hw 921	4819
4 Dr(Hw) 320	8654
5 SHW(Dr) 430	1021
	3940

LEGEND

CMT	Danger Tree	PSYU : 31 Pacific Rim
▲	Raptors Nest	LUU : Claycoot SMZ
⊙	Bear Den	
⊙	Kilometer Markers	
⊙	Built Trail/Road	

District : South Island Region : Coast

FIZ : B TSB : 30A Barkley S.B.



Document Path: G:\Projects\19-07-03 Pacific Rim Reverse Trail Phase\XD\PC\FIC_Rim_Final_Cruise_Map.mxd

Appendix II – Pacific Traverse Trail Timber Cruise Compilation

PTT

PARKS - CP# 1

Pacific Rim
Block #: PTT

**SUMMARY OF VOLUMES (CGNF)
FULL VOLUMES APPLIED**

22-Aug-2016 03:47:22PM

Cruised by: DC
Compiled by: STRATEGIC



Average Line Method : PARKS
 PTT
 Licence Number: PARKS CP: 1
 Project: 999

Map Area Statement Report
 Grades: Cruiser Called Alpha
 Park: Pacific Rim
 Region: 2 - West Coast
 District: 04 - South Island

22-Aug-2016 03:47:22PM
 Filename: ppt_primarycomp.ccp
 Compiled by: STRATEGIC
 Cruised by: DC
 Version: 2016.00 IFS build 6004

Card A Cruise Identity
 Licence # : PARKS
 Number of Blocks : 1
 Forest District : South Island
 Unit No : Pacific Rim
 Quota : Prop./Mngd.PSYU,TFL,or SSA
 Elevation : 1
 East : 0
 Total Merch Area : 14.10
 Locality : Pacific Rim

Cutting Permit # : 1
 Forest Region : West Coast
 Type : Park
 Tenure : Woodlot Licences (COAST)
 Sale Type : Right of Way Clearing
 Co-ordinates Zone : Unknown
 North : 0
 Report Type : *** FOR MPS PURPOSES ***

Card B Compilation Standard
 Damage : Damage
 Double Sampling : Measure and Counts Plots
 Species Compilation : Exceptions Not Used

Selective : Compile All Trees
 Special Compilation : No Special Compilation
 Type of Compilation : Coastal

Compilation Standard
 Mature Immature
 DBH Limit 17.50 12.00
 Stump Height 30 30
 Top Diameter 15.00 10.00

Card C Type Description

Type	Description	Maturity	Type	A
1	HwCw 931	M	1	4.6
2	Hw(CwBaSs) 430	M	2	2.5
3	CwPwHw 921	M	3	4.5
4	Dr(Hw) 330	M	4	0.5
5	SsHw(Dr) 430	M	5	2.0

Silvicultural Treatment Units

Card D Block Description

Block	Description	Maturity	Type	A
PTT	PTT	M	1	4.6
			2	2.5
			3	4.5
			4	0.5
			5	2.0

Silvicultural Treatment Units

Card F Harvesting Description

Harvest Method	Description	Type	A
SC	Ground Systems - Clearcut	1	4.6
		2	2.5
		3	4.5
		4	0.5
		5	2.0

Silvicultural Treatment Units

Average Line Method
 PTT
 Licence Number: PARKS CP: 1
 Project: 999

22-Aug-2016 03:47:22PM
 Filename: ptt_primarycomp.ccp
 Compiled by: STRATEGIC
 Cruised by: DC
 Version: 2016.00 IFS build 6004

Block Summary
 FIZ: B
 Park: Pacific Rim
 Region: 2 - West Coast
 District: 04 - South Island

Grades: Cruiser Called Alpha
 Cruiser Est Decay
 Cruiser Est Waste
 CGNF Breakage Table

Net Area: Block : (M) - PTT:PTT, Plots in Block: 101, TUs: [A : 14.1]

Utilization Limits	Total	Conifer	Decid	F	C	H	B	S	Y	PL	D
Min DBH cm (M)	3491	3330	161	20	911	1582	166	352	17.5	298	161
Stump Ht cm (M)	3173	3019	155	18	795	1427	163	334	17.5	280	155
Log Len m	225	214	11	1	56	101	12	24	30.0	20	11
Volume and Size Data	100	95	5	1	25	45	5	11	15.0	9	5
Net Merchantable m3	3	3	3	5	5	3	3	3	13.0	2	2
Net Merch - All m3/ha	3	3	3	5	3	3	3	3	17.5	2	2
Distribution %	3	3	3	5	3	3	3	3	30.0	2	2
Decay %	3	3	3	5	3	3	3	3	30.0	2	2
Waste(billing) %	3	3	3	5	3	3	3	3	15.0	2	2
Breakage %	3	3	3	5	3	3	3	3	13.0	2	2
Total Cull (DWB) %	9	9	4	2	13	10	2	5	17.5	6	4
Stems/Ha (Live & DP)	564.8	498.3	66.5	1.0	198.4	188.6	5.4	50.2	17.5	54.8	66.5
Avg DBH (Live & DP) cm	28.1	29.0	20.2	45.4	27.8	30.5	43.7	28.1	30.0	27.0	20.2
Snags/Ha	96.1	96.1	28.9	28.9	29.7	29.7			15.0	37.4	
Avg Snag DBH cm	18.9	18.9	18.2	18.2	17.7	17.7			13.0	20.2	
Gross Merch Vol/Tree m3	0.44	0.47	0.17	1.42	0.33	0.60	2.20	0.50	17.5	0.39	0.17
Net Merch Vol/Tree m3	0.40	0.43	0.16	1.31	0.28	0.54	2.15	0.47	17.5	0.36	0.16
Avg Weight Total Ht m	23.5	23.6	21.3	28.4	19.5	25.0	36.8	27.0	17.5	19.7	21.3
Avg Weight Merch Ht m	16.1	16.4	9.8	21.8	12.3	17.2	29.1	19.7	30.0	12.8	9.8
Avg 13.0 m Log Net m3	0.35	0.37	0.16	0.67	0.28	0.43	0.73	0.38	15.0	0.33	0.16
Avg 13.0 m Log Gross m3	0.37	0.39	0.16	0.71	0.30	0.46	0.73	0.39	13.0	0.34	0.16
Avg # of 13.0 m Logs/Tree	1.19	1.21	1.04	2.00	1.08	1.30	3.00	1.28	13.0	1.13	1.04
Net Immature %	60.0	57.9	100.0	100.0	42.9	60.3	100.0	86.4	13.0	27.2	100.0
Net 2nd Growth %	0	57.9									
Average Slope %	0										
Cruiser Call Variable Length Grades %											
#2 Sawlog H	5	5			5	7		9			
#3 Sawlog I	1	1				1					
#4 Sawlog J	39	41			30	41	100	48		37	
#4 Shingle M	1	1			4						
#5 Utility U	31	31	30	44	41	33		26		11	30
#6 Utility X					1						
#7 Chipper Y	23	21	70	56	19	18		17		52	70
Statistical Summary											
Coeff. of Variation %	65.6	62.4	335.9	1022.3	111.1	106.7	204.5	319.3		217.9	335.9
Two Standard Error %	14.9	14.2	76.3	232.2	25.2	24.2	46.4	72.5		49.5	76.3
Number and Type of Plots	MP = 76	CP = 25									
Number of Potential Trees	121										
Plots/Ha	7.2										
Cruised Trees/Plot	2.0										
Slope % Statistics											
Min= 0, Max= 26, CV=707.1, Std Error of Mean=0.4, 2SE%=139.3											

*** 30 tree(s) changed to tree class 6: because only log was less than 3.00 m ***
 FLAG: Full Volumes, Normal Cruise, All Trees Compiled, Double Sampling Factor Applied, Damage,
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Average Line Method Grades: Cruiser Called Alpha
 PTT Cruiser Est Decay
 Licence Number: PARKS CP: 1
 Project: 999 CGNF Breakage Table

Type Summary

File: B
 Park: Pacific Rim
 Region: 2 - West Coast
 District: 04 - South Island
 Version: 2016.00 IFS build 6004

22-Aug-2016 03:47:22PM
 Filename: ppt_primarycomp.ccp
 Compiled by: STRATEGIC
 Cruised by: DC

Net Area: Type 1 (M):HwCw 931, Plots in Type: 46, TUs: [A : 4.6]

Utilization Limits	Total	Conifer	Decid	F	C	H	B	S	Y	PL	D
Min DBH cm (M)	1098	1098		17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
Stump Ht cm (M)	969	969		30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Top Dia cm (M)	211	211		15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Log Len m	100	100		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Volume and Size Data											
Gross Merchantable m3	1098	1098		362	325	680	8	5	48		
Net Merch - All m3/ha	211	211		71	129	129	1	1	10		
Distribution %	100	100		33	61	61	1	1	5		
Decay %	4	4		4	4	4	30				
Waste %	3	3		2	2	2					
Waste(billing) %	4	4		2	2	2					
Breakage %	4	4		5	5	5	2				
Total Cull (DWB) %	12	12		10	13	13	33				
Stems/Ha (Live & DP)	425.9	425.9		235.7	159.4	159.4	11.3				
Avg DBH (Live & DP) cm	30.8	30.8		27.5	35.8	35.8	22.1				
Snags/Ha	47.0	47.0		47.0							
Avg Snag DBH cm	18.5	18.5		18.5							
Gross Merch Vol/Tree m3	0.56	0.56		0.33	0.93	0.93	0.15				
Net Merch Vol/Tree m3	0.49	0.49		0.30	0.81	0.81	0.10				
Avg Weight Total Ht m	23.9	23.9		20.2	26.4	26.4	16.8				
Avg Weight Merch Ht m	16.6	16.6		12.5	18.8	18.8	6.9				
Avg 13.0 m Log Net m3	0.41	0.41		0.29	0.56	0.56	0.11				
Avg 13.0 m Log Gross m3	0.45	0.45		0.30	0.62	0.62	0.15				
Avg # of 13.0 m Logs/Tree	1.26	1.26		1.10	1.51	1.51	1.00				
Net Immature %	41.2	41.2		47.6	32.4	32.4	100.0				
Net 2nd Growth %	41.2	41.2									

Cruiser Call Variable Length Grades %

Grades	#2 Sawlog	#3 Sawlog	#4 Sawlog	#5 Utility	#7 Chipper	Total
H	3	2	43	34	17	100
I	2	43	1	34	17	100
J	2	43	1	34	17	100
M	2	43	1	34	17	100
U	2	43	1	34	17	100
Y	2	43	1	34	17	100
Statistical Summary						
Coeff. of Variation %	71.6	71.6	71.6	71.6	71.6	71.6
Two Standard Error %	19.9	19.9	19.9	19.9	19.9	19.9
Number and Type of Plots	MP = 33	CP = 13				
Number of Potential Trees	49					
Plots/Ha	10.0					
Cruised Trees/Plot	1.7					

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 FLAGS: Full Volumes, Normal Cruise, All Trees Compiled, Double Sampling Factor Applied, Damage,
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*** FOR MPS PURPOSES ***

Average Line Method
PTT
Licence Number: PARKS CP: 1
Project: 999

Grades: Cruiser Called Alpha
Cruiser Est Decay
Cruiser Est Waste
CGNF Breakage Table

Type Summary
Fiz: B
Park: Pacific Rim
Region: 2 - West Coast
District: 04 - South Island

22-Aug-2016 03:47:22PM
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Cruised by: DC
Version: 2016.00 IFS build 6004

TS- 2 , p11

Net Area: Type 2 (M):Hw(CwBaSs) 430, Plots in Type: 22, TUs: [A : 2.5]

Utilization Limits		Total	Conifer	Decid	F	C	H	B	S	Y	PL	D
Min DBH	cm (M)				17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
Stump Ht	cm (M)				30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Top Dia	cm (M)				15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Log Len	m				13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Volume and Size Data												
Gross Merchantable	m3	1105	1105		20	188	578	166	123		30	
Net Merch - All	m3	1070	1070		18	181	565	163	114		29	
Distribution	%	428	428		7	72	226	65	46		12	
Decay	%	100	100		2	17	53	15	11		3	
Waste	%	1	1				0		5			
Waste(billing)	%	0	0									
Breakage	%	2	2									
Total Cull (DWB)	%	3	3									
Stems/Ha (Live & DP)		887.5	887.5		5.6	330.1	443.4	30.3	30.2		47.9	
Avg DBH (Live & DP)	cm	27.3	27.3		45.4	23.7	27.0	43.7	43.7		22.0	
Snags/Ha												
Avg Snag DBH	cm	0.50	0.50		1.42	0.23	0.52	2.20	1.63		0.25	
Gross Merch Vol/Tree	m3	0.48	0.48		1.31	0.22	0.51	2.15	1.51		0.24	
Net Merch Vol/Tree	m3	27.0	27.0		28.4	19.1	27.2	36.8	30.7		21.0	
Avg Weight Total Ht	m	19.0	19.0		21.8	10.8	18.2	29.1	22.9		11.7	
Avg Weight Merch Ht	m	0.37	0.37		0.67	0.20	0.39	0.73	0.77		0.25	
Avg 13.0 m Log Net	m3	0.38	0.38		0.71	0.21	0.39	0.73	0.81		0.25	
Avg 13.0 m Log Gross	m3	1.31	1.31		2.00	1.11	1.33	3.00	2.00		1.00	
Avg # of 13.0 m Logs/Tree	%	100.0	100.0		100.0	100.0	100.0	100.0	100.0		100.0	
Net Immature	%											
Net 2nd Growth	%											

Cruiser Call	Variable	Length	Grades	%
#2 Sawlog	H	7	7	14
#4 Sawlog	J	54	54	44
#5 Utility	U	27	33	10
#7 Chipper	Y	12	12	9
Statistical Summary				
Coeff. of Variation	%	75.4	75.4	117.2
Two Standard Error	%	26.4	26.4	46.8
Number and Type of Plots		MP = 16	CP = 6	
Number of Potential Trees		33		
Plots/Ha		8.8		
Cruised Trees/Plot		2.6		

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 FLAGS: Full Volumes, Normal Cruise, All Trees Compiled, Double Sampling Factor Applied, Damage,
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Average Line Method
 PTT
 Licence Number: PARKS CP: 1
 Project: 999

Grades: Cruiser Called Alpha
 Cruiser Est Decay
 Cruiser Est Waste
 CGNF Breakage Table

Type Summary

File: B
 Park: Pacific Rim
 Region: 2 - West Coast
 District: 04 - South Island

22-Aug-2016 03:47:22PM
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 Cruised by: DC
 Version: 2016.00 IFS build 6004

Net Area: Type 3 (M):CwPwHw 921, Plots in Type: 24, TUS: [A : 4.5]

Utilization Limits	Total	Conifer	Decid	F	C	H	B	S	Y	PL	D
Min DBH cm (M)	871	871		17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
Stump Ht cm (M)	729	729		30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Top Dia cm (M)	162	162		15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Log Len m	100	100		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Volume and Size Data											
Gross Merchantable m3	871	871		354	249	249	48	221			
Net Merchantable m3	729	729		284	196	196	45	204			
Net Merch - All m3/ha	162	162		63	44	44	10	45			
Distribution %	100	100		39	27	27	6	28			
Decay %	5	5		7	5	5	2	2			
Waste %	6	6		6	11	11	3	3			
Waste(billing) %	8	8		7	14	14	5	5			
Breakage %	5	5		7	5	5	2	2			
Total Cull %	16	16		20	21	21	5	7			
Stems/Ha (Live & DP)	444.4	444.4		188.8	128.0	128.0	2.4	125.2			
Avg DBH (Live & DP) cm	30.5	30.5		31.8	30.2	30.2	66.4	27.6			
Snags/Ha	252.9	252.9		42.6	93.1	93.1		117.2			
Avg Snag DBH cm	18.9	18.9		17.9	17.7	17.7		20.2			
Gross Merch Vol/Tree m3	0.44	0.44		0.42	0.43	0.43	4.41	0.39			
Net Merch Vol/Tree m3	0.36	0.36		0.33	0.34	0.34	4.19	0.36			
Avg Weight Total Ht m	19.9	19.9		19.1	19.1	19.1	37.7	18.7			
Avg Weight Merch Ht m	13.8	13.8		13.0	13.0	13.0	31.2	11.9			
Avg 13.0 m Log Net m3	0.35	0.35		0.35	0.33	0.33	1.47	0.33			
Avg 13.0 m Log Gross m3	0.40	0.40		0.40	0.39	0.39	1.47	0.35			
Avg # of 13.0 m Logs/Tree	1.09	1.09		1.05	1.10	1.10	3.00	1.12			
Net Immature %	4.1	4.1		15.2	15.2	15.2					
Net 2nd Growth %	4.1	4.1									

Cruiser Call Variable Length Grades %

#2 Sawlog H	7	7									
#4 Sawlog J	20	20									
#4 Shingle M	3	3									
#5 Utility U	34	34									
#6 Utility X	1	1									
#7 Chipper Y	35	35									
Statistical Summary											
Coeff. of Variation %	100.9	100.9		109.2	219.1	219.1	424.3	234.3			
Two Standard Error %	34.3	34.3		48.8	46.5	46.5	238.9	59.0			
Number and Type of Plots	MP = 18	CP = 6									
Number of Potential Trees	23										
Plots/Ha	5.3										
Cruised Trees/Plot	1.9										

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 FLAGS: Full Volumes, Normal Cruise, All Trees Compiled, Double Sampling Factor Applied, Damage,
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Average Line Method
 PTT
 Licence Number: PARKS CP: 1
 Project: 999

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 Compiled by: STRATEGIC
 Cruised by: DC
 Version: 2016.00 IFS build 6004

Type Summary
 FIZ: B
 Park: Pacific Rim
 Region: 2 - West Coast
 District: 04 - South Island

Grades: Cruiser Called Alpha
 Cruiser Est Decay
 Cruiser Est Waste
 CGNF Breakage Table

Net Area: Type 5 (M):Sshw(Dr) 430, Plots in Type: 3, TUs: [A : 2.0]

		Total	Conifer	Decid	F	C	H	B	S	Y	PL	D
Utilization Limits												
Min DBH	cm (M)				17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
Stump Ht	cm (M)				30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Top Dia	cm (M)				15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Log Len	m				13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Volume and Size Data												
Gross Merchantable	m3	294	238	56			64		174			56
Net Merchantable	m3	287	233	54			63		170			54
Net Merch - All	m3/ha	143	116	27			31		85			27
Distribution	%	100	81	19			22		59			19
Decay	%	0	0	0			0		0			0
Waste (billing)	%											
Breakage	%	2	2	4			2		2			4
Total Cull (DWB)	%	3	2	4			2		2			4
Stems/Ha (Live & DP)		639.6	388.9	250.7			104.5		284.4			250.7
Avg DBH (Live & DP)	cm	23.0	25.6	18.4			28.5		24.4			18.4
Snags/Ha												
Avg Snag DBH	cm											
Gross Merch Vol/Tree	m3	0.23	0.31	0.11			0.31		0.31			0.11
Net Merch Vol/Tree	m3	0.22	0.30	0.11			0.30		0.30			0.11
Avg Weight Total Ht	m	21.2	21.2	21.2			14.2		23.3			21.2
Avg Weight Merch Ht	m	11.5	12.9	5.4			8.0		14.7			5.4
Avg 13.0 m Log Net	m3	0.21	0.27	0.11			0.31		0.26			0.11
Avg 13.0 m Log Gross	m3	0.21	0.27	0.11			0.31		0.26			0.11
Avg # of 13.0 m Logs/Tree		1.08	1.13	1.00			1.00		1.17			1.00
Net Immature	%	100.0	100.0	100.0			100.0		100.0			100.0
Net 2nd Growth	%											

		#4 Sawlog	#5 Utility	#7 Chipper	Statistical Summary	Coef. of Variation	Two Standard Error	Number and Type of Plots	Number of Potential Trees	Plots/Ha	Cruised Trees/Plot
Cruiser Call Variable Length Grades %		36	24	40		71.3	48.0	MP = 3	4	1.5	1.3
#4 Sawlog	J	44	29	27		173.2	430.3		106.5	264.6	
#5 Utility	U	60	40			173.2	430.3		106.5	264.6	
#7 Chipper	Y	100				173.2	430.3		106.5	264.6	
Statistical Summary						173.2	430.3		106.5	264.6	
Coef. of Variation	%					173.2	430.3		106.5	264.6	
Two Standard Error	%					173.2	430.3		106.5	264.6	
Number and Type of Plots						173.2	430.3		106.5	264.6	
Number of Potential Trees						173.2	430.3		106.5	264.6	
Plots/Ha						173.2	430.3		106.5	264.6	
Cruised Trees/Plot						173.2	430.3		106.5	264.6	

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 FLAGS: Full Volumes, Normal Cruise, All Trees Compiled, Double Sampling Factor Applied, Damage,
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