

## Transitioning to a Second Growth Strategy in SE Alaska (POW Region) Mater Report Update Based on 2014 GIS Results

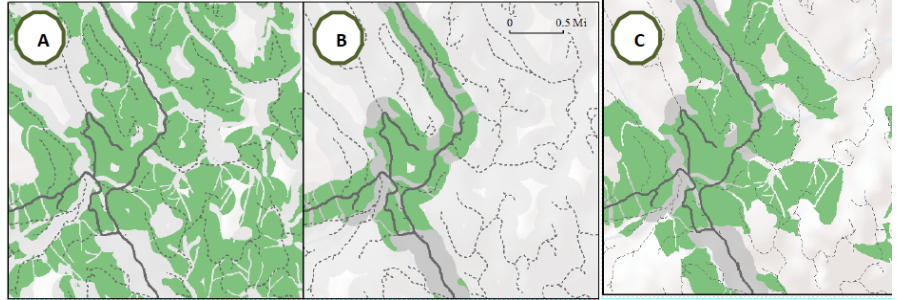
In 2012, Mater Ltd. was retained by Oregon-based GEOS Institute to conduct an analysis of second growth strategy options for SE Alaska (targeted Prince of Wales- POW- area) assuming a lifting of cumulative mean annual increment (CMAI) restrictions allowing for harvest of 55-year old second growth stands. In 2013, a Report Update was issued by Mater Ltd. which estimated that **35,300 acres of pre-commercially thinned (PCT) stands** could be available for harvest at 55 years within POW targeted Ranger Districts where stands are located within 800' of open (operable) Forest Service roads. Those ranger districts are Craig, Wrangell, Petersburg, Thorne Bay, and Ketchikan. The report update further estimated that within those same ranger districts an additional **40,000 acres of stands identified for commercial thinning (CT)** within 800' of open Forest Service roads could also be made available for harvest at 55 years. **The constraint: the analysis was not based on spatially explicit Forest Service data about the actual location and age of stands.**

In 2014, the Natural Resources Defense Council (NRDC) retained Conservation Biology Institute (CBI) to conduct GIS analysis within the five targeted ranger districts to construct spatially explicit inventories using latest Forest Service datasets. Results of that analysis are incorporated into this 2014 Mater Report Update as follows:

- Of the 83,000 acres of PCT identified in the targeted 5 Ranger District region, **35,840 acres** are located within 800' of open Forest Service roads (500 acres more than estimated in the 2013 report). As in the 2013 report, the 2014 GIS analysis excludes all environmentally-sensitive acres (karst, roadless, beach, etc).
- No GIS datasets exist for acres scheduled for commercial thinning in the future in the targeted region (~40,000 acres), so the 2013 acre estimates for CT remain in the model.
- The table below shows the acres comparison between non-GIS 2013 estimates, 2014 GIS-confirmed PCT acres, and 2014 GIS-confirmed PCT overlap acres (see overlap discussion on the next page).
- Access to the GIS data layers constructed by CBI for this project using Forest Service data is made available to the public through a special "SE Alaska Second Growth" portal created in DataBasin (<http://databasin.org/>).

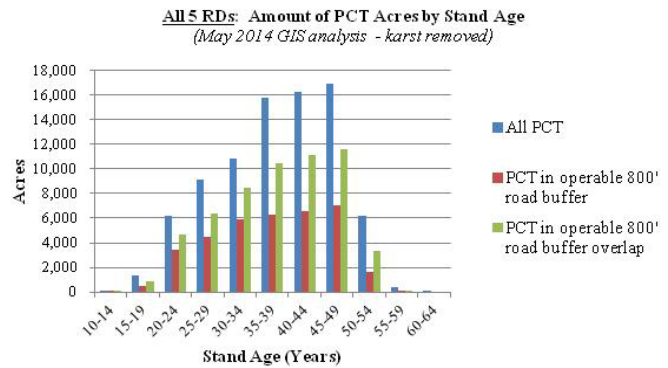
Acres Comparison: 5 RDs; 55-year harvest; all karst removed within 800' of <u>open</u> Forest Service roads confirmed by GIS (May 2014)						
(roaded acres)						
	Jan 2014 Mater estimates <i>No GIS</i>		GIS confirmed PCT (including scheduled PCT within the buffer)		GIS confirmed PCT (including scheduled PCT within the buffer) <u>plus</u> future commercial thin acres (CT*)	
	CT*	PCT	PCT	PCT with overlap	PCT /CT*	PCT/CT* with overlap
Craig						
Thorne Bay						
Wrangell						
Ketchikan						
Petersburg						
2015-2019	1,768	1,556	1,658	3,432	3,426	5,200
2020-2024	3,837	3,377	7,051	11,623	10,888	15,460
2025-2029	4,225	3,718	6,604	11,131	10,829	15,356
2030-2034	5,537	4,873	6,242	10,447	11,779	15,984
2035-2039	4,808	4,231	5,891	8,502	10,699	13,310
2040-2044	2,976	2,619	4,468	6,395	7,444	9,371
2045-2049	4,978	4,381	3,412	4,695	8,390	9,673
2050-2054	6,708	5,903	537	898	7,245	7,606
2055-2059	3,827	3,368	4	4	3,831	3,831
2060-2064	1,458	1,283	0	0	1,458	1,458
2065-2069	reharvest		reharvest			
	* includes acres currently identified for future commercial thinning within 800' buffer (~40,000 acres).				* includes acres currently identified for future commercial thinning within 800' buffer (~40,000 acres).	
Total acres	40,122	35,309	35,867	57,127	75,989	97,249
		Estimated acres same as GIS confirmed				

- The term "Overlap acres" refers to the ~20,000 PCT acres in GIS polygons parts of which lie beyond the 800' open Forest Service road buffer and may have been thinned from classified but currently non-active (ie



Maintenance Level 1) roads. These closed roads could require some preparatory work to re-open. The Thorne Bay Ranger District example shown above details the amount of suitable PCT acres within 800' of both open and closed roads (noted as green area in A), and within 800' of open FS roads (B). The grey-shaded area is the 800' buffer; the solid black line indicates open Forest Service roads. Dashed lines are closed Forest Service roads. "Overlap analysis" noted in C above shows those stands (defined by Tongass NF management activities) of suitable PCT acres with some portion within 800' of open FS roads.

- While only 4% of PCT stands in the 800' buffer would be available for harvest at 55 years in 2015, the largest percentage of GIS-confirmed PCT stands (20%) now aged 45-49 years would be available for harvest in 2020, followed by stands now aged 40-44 years (18%) available in 2025, then 35-39 years (17%) in 2030.



- The most likely scenario for annual volume to be generated from harvesting 55-year old PCT and CT stands located within 800' of open Forest Service roads is shown in the table below. The first five years would realize ~17 mmbf/yr of timber supply. Starting year 6, the volume dramatically increases to over 50 mmbf/yr. A mill requiring 35 mmbf/yr of logs would have a consistent supply of volume over many decades with earlier year volumes retained for future year harvesting to produce a sustainable timber supply. At 35 mmbf/yr of log supply, a mill located in the POW region would produce ~ 70 mmbf of lumber per year and create 150 FTE direct jobs in the mill.

Craig Thorne Bay Wrangell Ketchikan Petersburg	Annual Volume Comparison: 5 RDs; 55-year harvest; all karst removed within 800' of open Forest Service roads confirmed by GIS (May 2014)			
	GIS confirmed PCT (including scheduled PCT within the buffer)		GIS confirmed PCT (including scheduled PCT within the buffer) plus future commercial thin acres (CT*)	
	(mmbf log scale)		(mmbf log scale)	
	PCT	PCT with overlap	PCT /CT*	PCT/CT* with overlap
2015-2019	7,728	16,005	16,763	25,040
2020-2024	32,461	53,916	52,073	73,528
2025-2029	31,481	52,957	53,073	74,549
2030-2034	28,630	48,045	56,929	76,344
2035-2039	27,082	39,248	51,657	63,823
2040-2044	21,055	30,134	36,267	45,346
2045-2049	16,370	22,529	41,811	47,970
2050-2054	2,739	4,575	37,020	38,856
2055-2059	20	19	19,580	19,579
2060-2064	0	0	7,453	7,453
2065-2069	0	0	0	0
			* includes acres currently identified for future commercial thinning within 800' buffer (~40,000 acres).	
	2		Most likely scenario	

Appendices attached to this summary:

- Appendix 1: Conservation Biology Institute (CBI) GIS analysis details.
- Appendix 2: Sources and assumptions for future commercially thinned ( $CT_e$ ) acres not included in GIS data.
- Appendix 3: May 2014 GIS results – Pre-commercially thinned (PCT) acres by stand age
- Appendix 4(a): GIS-confirmed results for PCT; acres by stand age.
- Appendix 4(b): GIS-confirmed results for PCT within 800' of open FS road.
- Appendix 4(c): GIS-confirmed results for PCT overlapping 800' buffer of open FS road.
- Appendix 5(a):  $CT_e$  detailed calculations by stand age.
- Appendix 5(b):  $CT_e$  detailed calculations by 55 yr harvest schedule.
- Appendix 6: GIS confirmed PCT and future  $CT_e$ - roaded and overlapp combined results

**Appendix 1: Second Growth Forest Suitable for Harvest in Southeast Alaska GIS Analysis Details:**

The Conservation Biology Institute produced three tables summarizing the amount of CT and PCT second growth forest suitable for harvest on the Tongass National Forest, based on criteria specified by Mater Engineering and NRDC:

- 1) Harvest-Suitable Operable (Open) FS-Roaded Areas In 800 ft buffer, Karst removed, Areas with null suitability values removed
- 2) Harvest-Suitable Open FS-Roaded Areas Overlapping 800 ft buffer, Karst removed, Areas with null suitability values removed
- 3) Harvest-Suitable (All) Areas, Karst removed, Areas with null suitability values removed

Note, communication with Tongass National Forest GIS personnel (Velia Diemert and Nida Crumley) revealed that areas where attributes in the “Activity Polygon” dataset indicate “SUIT = null” are not suitable and should be excluded from calculations. The results of this analysis reflect exclusion of these areas.

When analysis on the “Activity Polygon” dataset was carried out, Tongass Forest had not yet specified that reserve amounts equal to 100 should be excluded, so this wasn't done. However, there are only three stands that have both reserve\_amount = 100 and a precommercial or commercial thinned status. On the five Ranger Districts of interest, these stands make up only 0.0058% of the total area determined to be suitable for harvest, based on thinned status, LUD, karst impact, roadless areas, etc. So, the area added by the reserves with thinned status is essentially negligible.

Forest age classes were updated to match the categories in Mater Engineering’s documents.

Roaded areas for operable (open) FS roads were determined based on the NSF definition:

Route status = existing

Jurisdiction = forest service

System = NFSR

Oper\_Maint\_Level of “2” and above, which excludes roads assigned “ 1 – Basic Custodial Care (Closed)”.

Calculations to determine the amounts of suitable PCT and CT second growth forest suitable for harvest on the Craig, Petersburg, Thorne Bay, Wrangell and Ketchikan-Misty Ranger Districts were based on the following datasets:

Name	Source, Originator	Use In Analysis
<b>Tongass National Forest Activity Polygon, 2013</b>	Southeast Alaska GIS Library* Sheila Spores (Tongass NF, Forest Silviculturist) advised age-class assignments should be based on the “DATE_ORIGIN” field.	To determine forest stand age-classes based on harvest dates from the “DATE_ORIGIN” field. Dates were reformatted in the "DATEOR2" field, and stand age was calculated in years and stored in "Stand_age2". Stands were categorized into five-year age classes, based on this information. Note, not all polygons have a date stored in this field. Polygons classified as having thinning activities without dates were put in the “NULL” age-class category. Polygons were joined to the FACTS dataset (FACTSJoinActivitiestoACTV160RSW dataset), based on “SUID”.

Name	Source, Originator	Use In Analysis
<b>Tongass National Forest Suitability, 2013</b>	Southeast Alaska GIS Library, USFS, Tongass NF, Tongass Forest Planning Staff, Correspondence with Velia Diemert and Nida Crumley	To define areas suitable for harvest with less than 72% slope (based on prior Forest Service analysis). Tongass NF GIS staff (Velia Diemert) confirmed areas where attributes indicate "SUIT is null" are not suitable and these were excluded from calculations.
<b>Ranger Districts</b>	Southeast Alaska GIS Library, USFS, Tongass NF	To define and select Ranger Districts of interest and to summarize total acreage of forest suitable for harvest.
<b>Transboundary Karst</b>	Southeast Alaska GIS Library, Audubon Alaska	To exclude areas with karst formations from suitable harvestable forest.
<b>Tongass National Forest Land Use Designations, 2013</b>	Southeast Alaska GIS Library, USFS, Tongass NF, Tongass Forest Planning Staff	To exclude potential habitat conservation areas, based on Land Use Designations (LUDs) "DESCRIPTION" = 'Old Growth Habitat'. Note, these areas looked like they already had been excluded from the suitable layer.
<b>Tongass National Forest Roadless Rule, 2001</b>	Southeast Alaska GIS Library, Tongass Forest Planning Staff	To exclude roadless areas from forest suitable for harvest, based on "CATEGORY" = '1B' or '1C'.
<b>RoadsWithCoreAttributes</b>	Southeast Alaska GIS Library	To identify operable (open) FS roads and roaded areas, based on 800 ft buffer distance.
<b>FACTSJoinActivitiestoACT V160RSW</b>	Created by Tongass NF, Ketchikan SO  (Data provided by Sheila Spores.)	Dataset was created by Tongass NF staff "by joining the activity polygon with FACTS tabular data through the use of the GI tool".  CBI used this dataset (information from the FACTS database) to identify areas where commercial and precommercial thinning have previously taken place. ("ACTIVITY" = 'Commercial Thin' or 'Precommercial Thin')

\*The Southeast Alaska GIS Library (<http://seakgis.alaska.edu/>) is a cooperative project sponsored by the Alaska Department of Environmental Conservation, the Alaska Department of Fish and Game, the Alaska Department of Natural Resources, the Alaska Department of Transportation and Public Facilities, the Geographic Information Network of Alaska, The Nature Conservancy of Alaska, the National Marine Fisheries Service of NOAA, the US Forest Service, the US Fish and Wildlife Service, the US Geological Survey and the University of Alaska Southeast.

**\*\*The complete list of activities present in FACTs Database is as follows:**

Administrative Changes, Anadromous Fish Control undesirable species, Anadromous Fish habitat monitoring, Anadromous Fish habitat non-structural maintenance, Anadromous Fish Thinning for Fish Habitat Improvement, Anadromous Fish Tree planting for fisheries habitat improve, Anadromous Fisheries Habitat Improvement Activities, Animal Control for TSI, Animal Damage Control for Reforestation, Broadcast Burning - Covers a majority of the unit, Certification-Planted, Certification of Natural Regeneration with Site Prep, Certification of Natural Regeneration without Site Prep, **Commercial Thin**, Disease Control, Fertilization, Fill-in or Replant Trees, Fill-in Seed or Reseed Trees, Genetic Evaluation Plantation Establishment, Group Selection Cut (UA/RH/FH), Improvement Cut, Inland Fish Thinning for Fish Habitat Improvement, Insect and Disease Surveys, Leave Tree Protection, Leave Trees (Wildlife Reasons) - Area, Natural Changes (excludes fire), No Treatment Matrix, Patch Clearcut (EA/RH/FH), Patch Clearcut (w/ leave trees) (EA/RH/FH), Permanent Land Clearing, Plant Trees, Plantation Survival Survey, Post Treatment Vegetation Monitoring, Precommercial thinning for visual, **Precommercial Thin**, Pretreatment Exam for Reforestation, Pretreatment Exam for Release or Precommercial Thinning, Prune, Reforestation Enhancement, Reforestation Need Change due to Classification Changes, Reforestation Need Change due to Other (windthrow, etc), Reforestation Need Change due to Stocking Changes, Reforestation Need Created by Fire, Reforestation Need Created by Harvest, Reforestation Need created by Regeneration Failure, Salvage Cut (intermediate treatment, not regeneration), Sanitation Cut, Seed-tree Seed Cut (with and without leave trees) (EA/RH/NFH), Seed (Trees), Shelterwood Establishment Cut (with or without leave trees) (EA/RH/NFH), Shelterwood Removal Cut (EA/NRH/FH), Silvicultural Stand Examination, Single-tree Selection Cut (UA/RH/FH), Site Preparation for Natural Regeneration - Burning, Site Preparation for Natural Regeneration - Chemical, Site Preparation for Planting - Burning, Site Preparation for Planting - Manual, Site Preparation for Planting - Other, Site Preparation for Seeding - Burning, Stand Clearcut (EA/RH/FH), Stand Clearcut (w/ leave trees) (EA/RH/FH), Stand Diagnosis Prepared, Stand Silviculture Prescription, Stocking Survey, Tree Release and Weed, TSI Certification - Fertilization, TSI Certification - Pruning, TSI Certification - Release/weeding, TSI Certification - Thinning, TSI Need (precommercial thinning) Eliminated, TSI Need (release or weeding) Eliminated, TSI Need Created- Fertilization, TSI Need Created- Precommercial Thin, TSI Need Created- Pruning, TSI Need Created- Release or Weeding, Two-aged Patch Clearcut (w/res) (2A/RH/FH), Two-aged Seed-tree Seed and Removal Cut (w/res) (2A/RH/FH), Two-aged Shelterwood Establishment Cut (w/res) (2A/RH/NFH), Two-aged Stand Clearcut (w/res) (2A/RH/FH), Underburn - Low Intensity (Majority of Unit), Visual Resources Protection & Improvement, Watershed Resource Monitoring, Watershed Resource Non-Structural Improvements Erosion Cont, Watershed Resource Non-Structural Improvements Stream Chann, Wildfire - Fuels Benefit, Wildlife Habitat Access management (Closure Area), Wildlife Habitat Create corridors, Wildlife Habitat Create openings, Wildlife Habitat Grasses and forbs, Wildlife Habitat Improvement, Wildlife habitat inventory, Wildlife Habitat Mechanical treatment, Wildlife habitat monitoring - area, Wildlife habitat non-structural maintenance, Wildlife Habitat Precommercial thinning, Wildlife Habitat Rehabilitate openings, Wildlife Habitat Release and weeding, Wildlife Habitat Seeding and planting, Wildlife Habitat Slash treatment, Wildlife Habitat Structural Improvement

**Analysis Results:**

**1)**

**Suitable (ONLY Operable Roads) Roded Area for Harvest (Acres) In 800 ft Buffer, Karst Removed, Null Suitability Removed**

		Craig		Ketchikan - Misty		Petersburg		Thorne Bay		Wrangell			
Stand Age		Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Stand Age	
	10-14							3.5					10-14
	15-19			507.6				21.0		4.9			15-19
	20-24	331.8		406.1		380.9		755.7		1,032.1			20-24
	25-29	134.7		521.1		684.4		1,139.3		1,145.8			25-29
	30-34			114.0		1,313.9		1,271.9		1,759.8			30-34
	35-39	23.6		547.5		1,250.1		2,184.6		687.9			35-39
	40-44	33.9		498.6		722.9		2,201.4		2,072.7			40-44
	45-49	409.3		55.7		1,035.5		3,858.5		0.2			45-49
	50-54	558.7	23.4	143.0		239.7		337.6	0.5	8.7			50-54
	55-59			0.0		17.2							55-59
60-64								4.5			60-64		
NULL	75.4				5,110.4		2,238.3	0.2			NULL		
<b>Totals</b>	1,567.3	23.4	2,793.6	0.0	10,754.9	0.0	14,011.8	5.1	6,712.1	0.0			

**2)**

**New Suitable (ONLY Operable Roads) Roded Area for Harvest (Acres) Overlapping 800 ft Buffer, Karst Removed, Null Suitability Removed**

		Craig		Ketchikan - Misty		Petersburg		Thorne Bay		Wrangell			
Stand Age		Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Stand Age	
	10-14							3.5					10-14
	15-19			793.3				25.7		4.9			15-19
	20-24	389.2		543.6		545.7		954.7		1,488.1			20-24
	25-29	214.1		689.8		990.4		1,655.3		1,567.3			25-29
	30-34			234.1		1,777.1		2,102.8		2,360.7			30-34
	35-39	26.8		1,415.9		2,205.1		2,915.1		1,087.9			35-39
	40-44	40.3		1,132.0		1,385.4		3,180.6		3,108.6			40-44
	45-49	775.0		55.8		1,581.2		6,177.7		0.7			45-49
	50-54	831.6	27.6	345.8		472.4		854.0	0.5	21.3			50-54
	55-59			0.4		43.4							55-59
60-64								4.5			60-64		
NULL	176.8				8,150.9		3,010.5	0.2			NULL		
<b>Totals</b>	2,453.8	27.6	5,210.6	0.0	17,151.7	0.0	20,879.9	5.2	9,639.4	0.0			

**Analysis Results Con't:**

3)

**New Suitable Total Area for Harvest (Acres), Karst Removed, Null Suitability Removed**

		Craig		Ketchikan - Misty		Petersburg		Thorne Bay		Wrangell		
Stand Age		Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Stand Age
	10-14								3.5			
15-19				1,325.3				33.7		9.7		15-19
20-24		393.7		1,291.3		633.4		1,130.1		1,881.1		20-24
25-29		214.9		2,292.9		1,041.0		2,368.4		1,718.0		25-29
30-34		22.0		1,177.3		1,935.3		2,306.3		2,948.6		30-34
35-39		361.6		2,075.0		3,480.9		3,765.7		1,715.3		35-39
40-44		109.0		1,481.0		2,572.5		4,148.9	12.1	4,440.7		40-44
45-49		1,257.8		112.5		2,651.6		7,920.0		763.3		45-49
50-54		1,557.4	29.5	678.0		1,079.3		1,274.5	0.5	168.1		50-54
55-59				0.4		171.7				46.4		55-59
60-64									4.5	3.1		60-64
NULL		191.2				14,890.8		3,451.6	0.5			NULL
<b>Totals</b>		4,107.6	29.5	10,433.7	0.0	28,456.7	0.0	26,402.7	17.6	13,694.3	0.0	

**Data Details:**

**FACTSJoinActivities to ACTV160RSW** No data description or details provided by Tongass NF with this dataset.

**Transboundary Karst**

- Title: Transboundary Karst Mapping
- Originator: Nathan Walker, Audubon Alaska, GIS Biologist
- Publication Date: 20120522
- Website URL: [http://seakgis.alaska.edu/data/Transboundary\\_Final.zip](http://seakgis.alaska.edu/data/Transboundary_Final.zip)
- Resource(Server) URL: [http://seakgis03.alaska.edu/rest/services/CrossBound\\_Test/CB\\_Karst/MapServer](http://seakgis03.alaska.edu/rest/services/CrossBound_Test/CB_Karst/MapServer)
- Abstract: This dataset was created in order to facilitate transboundary conservation work and research projects, by integrating land cover maps into a single dataset from Cape Caution, BC, to Yakutat Bay, AK. It includes three levels of land classification, site index, elevation, hydric soils (yes/no), karst (yes/no), primary and secondary species, size class, and volume class. It also includes a number of other important attributes from individual datasets, which were not crosswalked



between the different areas. This file represents karst formations in the study area.

Purpose: This dataset was created in order to facilitate transboundary conservation work and research projects, by integrating land cover maps into a single dataset from Cape Caution, BC, to Yakutat Bay, AK. This file represents karst formations in the study area.

Use: Please cite Audubon Alaska and the data contributors listed in the Credits section in any products derived from these data. Data source constraints information provided below: VRI, BTM, and karst data: BC data is provided by the Province of British Columbia under the Open Government License for Government of BC Information v.BC1.0 (license information viewable at <http://pub.data.gov.bc.ca/license/OGI-vbc1.0.pdf>). Alaska land cover data: The Nature Conservancy shall not be held liable for improper or incorrect use of the data described and/or contained herein. Any sale, distribution, loan, or offering for use of these digital data, in whole or in part, is prohibited without the approval of the Nature Conservancy. The use of these data to produce other GIS products and services with the intent to sell for a profit is prohibited without the written consent of the Nature Conservancy. All parties receiving these data must be informed of these restrictions. The Nature Conservancy shall be acknowledged as data contributors to any reports or other products derived from these data. Alaska land cover, harvest, site index data: The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. They may be developed from sources of differing accuracy; accurate only at certain scales; based on modeling or interpretation; incomplete while being created or revised; etc. Using GIS products for purposes other than those for which they were created, may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify or replace GIS products without notification. Any hardcopy or electronic products utilizing these data sets shall clearly indicate their source. If the user has modified the data in any way, they are obligated to describe the types of modifications they have performed. User specifically agrees not to misrepresent these data sets, nor to imply that the US Forest Service, Tongass National Forest approved the changes. Canadian Digital Elevation Dataset: The Licensee shall identify GeoBase® as a data source where any of the Data are redistributed, or contained within Derivative Products, and use of the Data shall not be construed as an endorsement by GeoBase® of those Derivative Products. License information viewable at <http://www.geobase.ca/geobase/en/licence.jsp;jsessionid=689CA83D172904F012EA27966A9C90E4National>. Elevation Data: None. Acknowledgement of the originating agencies would be appreciated in products derived from these data. Glacier Bay National Park land cover data: The Information Resource does not contain any sensitive information. No copyrights or other ownership issues. There are no distribution restrictions based solely on the proprietary evaluation.

### **Tongass National Forest Suitability**

*Note, communication with GIS personnel (Vel and Nida) of Tongass National Forest revealed that areas with "SUIT is null" designation are not suitable and should be excluded from calculations.*

Title: Tongass National Forest, Suitability, 2013

Originator: USFS, Tongass National Forest, Tongass Planning Staff, Forest Planning Staff

Publication Date: 20080101

Website URL: <http://seakgis.alaska.edu/data/Suitability.zip>

Resource(Server) URL: [http://seakgis03.alaska.edu/rest/services/USFS/USFS\\_Suitability/MapServer](http://seakgis03.alaska.edu/rest/services/USFS/USFS_Suitability/MapServer)

Abstract: This dataset represents the suitable areas for timber harvest on the Tongass National Forest

Purpose: This data was created as the input to the process of delineating the Tongass National Forest LSTA and should be used for planning purposes only.

Use: The USDA Forest Service makes no warranty, expressed or implied, including the warranties of merchantability and fitness for a particular purpose, nor assumes any legal liability or responsibility for the accuracy, reliability, completeness or utility of these geospatial data, or for the improper or incorrect use of these

geospatial data. These geospatial data and related maps or graphics are not legal documents and are not intended to be used as such. The data and maps may not be used to determine title, ownership, legal descriptions or boundaries, legal jurisdiction, or restrictions that may be in place on either public or private land. Natural hazards may or may not be depicted on the data and maps, and land users should exercise due caution. The data are dynamic and may change over time. The user is responsible to verify the limitations of the geospatial data and to use the data accordingly. The US Forest Service makes no express or implied warranties (including warranties of merchantability and fitness) with respect to the character, function, or capabilities of the electronic services or products or their appropriateness for any users purposes. To ensure distribution of the most current public information, please refer requests for data or products to the US Forest Service. See specific distribution contact information above.

### **Tongass National Forest Activity Polygon**

Title: Tongass National Forest, Activity Polygon, 2013  
Originator: USFS, Tongass National Forest, Timber Management Staff, Forest Timber Staff  
Publication Date: 20070101  
Website URL: <http://seakgis.alaska.edu/data/ActivityPolygon.zip>  
Resource(Server) URL: [http://seakgis03.alaska.edu/rest/services/USFS/USFS\\_ActivityPolygon/MapServer](http://seakgis03.alaska.edu/rest/services/USFS/USFS_ActivityPolygon/MapServer)  
Abstract: Depicts the area of activities within or in close proximity to an administrative unit. The ActivityPolygon layer is updated for new treatment units and will display the gross boundary of the unit as well as the retained sub-units. Units being managed by the US Forest Service are all that is reliably displayed on this layer.  
Purpose: Used for resource planning and management in conjunction with the tabular data stored in the Forest Service Activity Tracking System (FACTS) database.  
Progress: In work  
Frequency: As needed

### **Tongass National Forest Ranger Districts**

Title: Ranger Districts  
Originator: USDA Forerst Service Tongass National Forest  
Publication Date: 20071101  
Website URL: <http://seakgis.alaska.edu/data/RangerDistrict.zip>  
Resource(Server) URL: [http://seakgis03.alaska.edu/rest/services/USFS/USFS\\_RangerDistrict/MapServer](http://seakgis03.alaska.edu/rest/services/USFS/USFS_RangerDistrict/MapServer)  
Abstract: A depiction of the boundary that encompasses a Ranger District.  
Purpose: This SDE Geodatabase is intended for read-only use. These data were prepared to describe Forest Service administrative area boundaries. The purpose of the data is to provide display, identification, and analysis tools for determining current boundary information for Forest Service managers, GIS Specialists, and others.

### **Tongass National Forest Land Use Designations**

Title: Tongass National Forest, Land Use Designation, 2013  
Originator: USFS Tongass National Forest, Tongass Planning Staff, Forest Planning Staff

Publication Date: 20080101

Website URL: <http://seakgis.alaska.edu/data/LandUseDesignations.zip>

Resource(Server) URL: [http://seakgis03.alaska.edu/rest/services/USFS/USFS\\_LUD/MapServer](http://seakgis03.alaska.edu/rest/services/USFS/USFS_LUD/MapServer)

Abstract: This dataset is used to denote USFS Land Use Designations (LUD) on the Tongass National Forest. Chapter 3, of Land and Resource Management Plan includes the complete management prescription for the 19 LUDS used in the Forest Plan. Please refer to the following document for further information:[https://fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5367422.pdf](https://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5367422.pdf)**Note:** Private land was taken out from this layer. Before doing any calculations, users will need to overlay with current ownership.

Purpose: This dataset is used to denote USFS Land Use Designations (LUD) on the Tongass National Forest. Chapter 3 of Land and Resource Management Plan includes the complete management prescription for the 19 LUDS used in the Forest Plan.

### **Tongass National Forest Roadless Rule, 2001**

Title: Tongass National Forest, Roadless Rule 2001, 2013

Originator: USFS Tongass National Forest, Tongass Planning Staff, Forest Planning Staff

Publication Date: 20010101

Website URL: <http://seakgis.alaska.edu/data/Roadless.zip>

Resource(Server) URL: [http://seakgis03.alaska.edu/rest/services/USFS/USFS\\_Roadless/MapServer](http://seakgis03.alaska.edu/rest/services/USFS/USFS_Roadless/MapServer)

Abstract: Created by the Roadless Rule (WO-Group). It's the Law. This coverage contains the true inventoried roadless area and it will not change. Use this feature class for Roadless.[http://www.fs.usda.gov/wps/portal/fsinternet!/ut/p/c5/04\\_SB8K8xLLM9MSSzPy8xBz9CP0os3gjAwhwtDDw9\\_AI8zPwhQoY6IeDdGCqCPOBqwDLG-AAjgb6fh75uan6BdnZaY6OiooA1tkqlQ!!/dl3/d3/L2dJQSEvUUt3QS9ZQnZ3LzZfMjAwMDAwMDBBODBPSEhWTjBNMDAwMDAwMDA!/?ss=119930&navtype=BROWSEBYSUBJECT&cid=null&navid=15115000000000&pnavid=15100000000000&position=BROWSEBYSUBJECT&ttype=main&pname=Roadless-%2520Maps](http://www.fs.usda.gov/wps/portal/fsinternet!/ut/p/c5/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gjAwhwtDDw9_AI8zPwhQoY6IeDdGCqCPOBqwDLG-AAjgb6fh75uan6BdnZaY6OiooA1tkqlQ!!/dl3/d3/L2dJQSEvUUt3QS9ZQnZ3LzZfMjAwMDAwMDBBODBPSEhWTjBNMDAwMDAwMDA!/?ss=119930&navtype=BROWSEBYSUBJECT&cid=null&navid=15115000000000&pnavid=15100000000000&position=BROWSEBYSUBJECT&ttype=main&pname=Roadless-%2520Maps)

Purpose: Used to identify areas on the Tongass where the prohibitions of the roadless rule apply.

### **Roads With Core Attributes**

Title: Roads With Core Attributes

Originator: USDA Forest Service Tongass National Forest

Publication Date: 20120827

Website URL: <http://seakgis.alaska.edu/data/RoadsWithCoreAttributesRSW.zip>

Resource(Server) URL: <http://seakgis03.alaska.edu/rest/services/Transportation/MapServer>

Abstract: A route feature stores the spatial locations (geography) of the road. These feature classes have an (M) value or measure on their vertices. A route system depicts

all roads within or in close proximity to an administrative unit. A road is a motor vehicle travel way over 50 inches wide, unless classified and managed as a trail. This feature is only SPATIAL ROAD DATA, other data (open, closed, jurisdiction, maintenance level) is stored in INFRA. Used to link spatial roads to INFRA data, ROAD NO., BMP, EMP and Calibration. Routed roads are a single spatial line, all have data in INFRA and this data must be attached. Routed roads need to have INFRA data table attached by use of R10 Geospatial Interface (GI) tool and Visualization named Roads with Core Attributes RSW - This creates an output roads layer and adds the following fields from the INFRA database at NITC: name, lanes, service life, system, surface type, jurisdiction, objective maintenance level, operational maintenance level, route status, functional class and primary maintainer. Routed ROADS CAN HAVE OTHER DATA TABLES ATTACHED, (R10 Stream Data Point-RSW, Road Points -RSW, Bridges-RSW, MVUM Roads and Transportation Atlas. A road may be classified or unclassified. Classified roads are roads within the National Forest System lands planned and managed for motor vehicle access including State roads, county roads, private roads, permitted roads, and Forest Service roads. Unclassified roads are roads not intended to be a part of nor managed as a part of the forests transportation system, such as temporary roads, and unplanned, unengineered, unauthorized off-road vehicle tracks and abandoned travel ways. Route measurements and route directions must correspond to those stored in the INFRA Oracle table RTE\_BASICS. Associated National Application: INFRA Travel Routes. IWeb Infra Roads webpage <http://basenet.fs.fed.us/support/help/roads/>. All routed roads are required to have data in INFRA and all roads having data in INFRA are required to be routed. Note: Extracted from GI on August 27, 2012

Purpose:

The purpose of this feature class is to depict and label the road network system on this National Forest. It will be used to provide road network information to attach and display INFRA Travel Routes linear and point data for any necessary analysis and management. Route measurements and route directions must correspond to those stored in the Infra Oracle table RTE\_BASICS.



**F. Prevalence of species and Volume Recovery per acre**

Species	avg % prevalence <sup>1</sup>	avg mbf/ac <sup>2</sup>	% defect subtracted <sup>2</sup>
W. Hemlock	70%	23	5%
S. Spruce	30%	20	0%

=ACRES \* 70% resulted in acres assumed to be hemlock  
 =ACRES \* 30% resulted in acres assumed to be spruce  
 Each species was then multiplied by its average mbf/acre; 5% was subtracted from the hemlock mbf

<sup>1</sup> Prevalence of the two main SE Alaskan tree species estimated from DeMars 2000 and Deal et al. 1991.

<sup>2</sup> Personal communication, Tongass NF; Dec. 2013

**F. Log Recovery Factor (LRF) (long log to merchantable log)**

LRF 1.2

personal communication, Alan Brackley, USFS Sitka; 2013

**Sources:**

**Alexander, Susan J., Eric B. Henderson, and Randy Coleman. 2010.** Economic Analysis of Southeast Alaska: Envisioning a sustainable economy with thriving communities. USDA Forest Service Region 10. R10-MB-725, Juneau, Alaska, 93 p.

**DeMars, Donald J. 2000.** Stand-density study of spruce-hemlock stands in Southeastern Alaska. USDA Forest Service, Pacific Northwest Research Station, Sitka, AK. General Tech. Report 496.

**Grundy, Colleen. 2008.** Tongass Young Growth Strategy. White paper. USDA Forest Service, Alaska Region. 90 pp.

**Appendix 3: May 2014 GIS results - pre-commercially thinned (PCT) acres by stand age**

- GIS Data:**
- 1) PCT only acres within 800' of open FS roads; all karst removed
  - 2) PCT only acres overlapping 800' of open FS roads; all karst removed
  - 3) "NULLS" acres (PCT acres with no stand age info) were distributed within stand age on same % basis as PCT with stand age; assumed averaged log volume recovery to be conservative (low - medium- high)

**GIS Data Sources:**

Second growth age and acres distribution by Ranger District received from online GIS data combined with FACTS dataset  
 GIS data from The Southeast Alaska GIS Library (<http://seakgis.alaska.edu/>)  
 FACTS dataset provided by Sheila Spores, Tongass National Forest  
 GIS analysis provided by Conservation Biology Institute (<http://consbio.org/>) , Corvallis, Oregon

**MBF per Acre**

avg mbf/ac

Species	avg % prevalence	% defect	PCT	Null - low	Null - med	Null - high	Avg mbf/ac Null acres
W. Hemlock	70%	5%	23	5	13	23	14
S. Spruce	30%	0%	20	4	10	20	11
personal communication, Tongass NF				33.3%	33.3%	33.3%	

Prevalence of the two main SE Alaskan tree species estimated from:

DeMars, Donald J. 2000. Stand-density study of spruce-hemlock stands in Southeastern Alaska. USDA Forest Service, Pacific Northwest Research Station, Sitka, AK. General Tech. Report 496.

Deal, R. L., C. D. Oliver, and B. T. Bormann. 1991. Reconstruction of mixed hemlock-spruce stands in coastal southeast Alaska. Can. J. For. Res. 21:643-654.

**Long log to merchantable log recovery factor**

LRF **1.2**

*personal communication, Alan Brackely; 2013*

**Suitable (ONLY Operable Roads) Roaded Area for Harvest (Acres) In 800 ft Buffer, Karst Removed**

Stand Age	Craig		Ketchikan - Misty		Petersburg		Thorne Bay		Wrangell	
	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin
5-9										
10-14							3.5			
15-19			507.6				21.0		4.9	
20-24	331.8		406.1		380.9		755.7		1,032.1	
25-29	134.7		521.1		684.4		1,139.3		1,145.8	
30-34			114.0		1,313.9		1,271.9		1,759.8	
35-39	23.6		547.5		1,250.1		2,184.6		687.9	
40-44	33.9		498.6		722.9		2,201.4		2,072.7	
45-49	409.3		55.7		1,035.5		3,858.5		0.2	
50-54	558.7	23.4	143.0		239.7		337.6	0.5	8.7	
55-59			0.0		17.2					
60-64								4.5		
65-69										
70-74										
NULL	75.4				5,110.4		2,238.3	0.2		
<b>Totals</b>	1,567.3	23.4 1,590.7	2,793.6	0.0 2,793.6	10,754.9	0.0 10,754.9	14,011.8	5.1 14,016.9	6,712.1	0.0 6,712.1

NULL = no age given

From GIS layers, Tonass National Forest and Southeast Alaska GIS library (<http://seakgis.alaska.edu/>)

**NULL acres distribution based on distribution of PCT age classes.**

Stand Age	Craig		Ketchikan		Petersburg		Thorne Bay		Wrangell	
	PCT	NULL*	PCT	NULL*	PCT	NULL*	PCT	NULL*	PCT	NULL*
5-9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-14	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.7	0.0	0.0
15-19	0.0	0.0	507.6	0.0	0.0	0.0	21.0	4.0	4.9	0.0
20-24	331.8	16.8	406.1	0.0	380.9	344.8	755.7	143.7	1,032.1	0.0
25-29	134.7	6.8	521.1	0.0	684.4	619.6	1,139.3	216.6	1,145.8	0.0
30-34	0.0	0.0	114.0	0.0	1,313.9	1,189.6	1,271.9	241.8	1,759.8	0.0
35-39	23.6	1.2	547.5	0.0	1,250.1	1,131.8	2,184.6	415.4	687.9	0.0
40-44	33.9	1.7	498.6	0.0	722.9	654.4	2,201.4	418.6	2,072.7	0.0
45-49	409.3	20.7	55.7	0.0	1,035.5	937.5	3,858.5	733.6	0.2	0.0
50-54	558.7	51.6	143.0	0.0	239.7	217.0	337.6	64.7	8.7	0.0
55-59	0.0	0.0	0.0	0.0	17.2	15.6	0.0	0.0	0.0	0.0
60-64	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0
65-69	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-74	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Totals</b>	1,492.0	98.7 1,590.7	2,793.6	0.0 2,793.6	5,644.6	5,110.4 10,754.9	11,773.5	2,243.4 14,016.9	6,712.1	0.0 6,712.1

\* plus GIS-reported CT acres (very small acreage amount)

**Suitable (ONLY Operable Roads) Roaded Area for Harvest (Acres) Overlapping 800 ft Buffer, Karst Removed**



Appendix 3

		Craig		Ketchikan - Misty		Petersburg		Thorne Bay		Wrangell	
		Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin	Precommercial Thin	Commercial Thin
Stand Age	5-9										
	10-14							3.5			
	15-19			853.2				33.7		4.9	
	20-24	393.7		608.5		550.7		955.1		1,493.4	
	25-29	214.1		708.3		990.6		1,670.4		1,605.5	
	30-34			250.6		1,777.1		2,124.4		2,360.7	
	35-39	54.7		1,566.0		2,210.5		2,954.7		1,130.5	
	40-44	40.3		1,139.4		1,435.5		3,198.7		3,457.4	
	45-49	999.7		55.8		1,581.7		6,388.4		0.7	
	50-54	837.7	27.6	345.8		472.4		964.9	0.5	40.5	
	55-59			0.4		43.4					
	60-64								4.5		
	65-69										
70-74											
NULL	176.8				8,321.2		3,078.3	0.5			
<b>Totals</b>	2,717.1	27.6 2,744.7	5,527.8	0.0 5,527.8	17,383.1	0.0 17,383.1	21,372.1	5.6 21,377.6	10,093.7	0.0 10,093.7	

NULL = no age given

From GIS layers, Tonass National Forest and Southeast Alaska GIS library (<http://seakgis.alaska.edu/>)

**NULL acres distribution based on distribution of PCT age classes.**

		Craig		Ketchikan		Petersburg		ThorneBay		Wrangell	
		PCT	NULL*	PCT	NULL*	PCT	NULL*	PCT	NULL*	PCT	NULL*
Stand Age	5-9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	10-14	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.6	0.0	0.0
	15-19	0.0	0.0	853.2	0.0	0.0	0.0	33.7	5.7	4.9	0.0
	20-24	393.7	27.4	608.5	0.0	550.7	505.6	955.1	160.7	1,493.4	0.0
	25-29	214.1	14.9	708.3	0.0	990.6	909.7	1,670.4	281.1	1,605.5	0.0
	30-34	0.0	0.0	250.6	0.0	1,777.1	1,631.8	2,124.4	357.5	2,360.7	0.0
	35-39	54.7	3.8	1,566.0	0.0	2,210.5	2,029.8	2,954.7	497.3	1,130.5	0.0
	40-44	40.3	2.8	1,139.4	0.0	1,435.5	1,318.1	3,198.7	538.3	3,457.4	0.0
	45-49	999.7	69.6	55.8	0.0	1,581.7	1,452.4	6,388.4	1,075.2	0.7	0.0
	50-54	837.7	85.9	345.8	0.0	472.4	433.8	964.9	162.9	40.5	0.0
	55-59	0.0	0.0	0.4	0.0	43.4	39.8	0.0	0.0	0.0	0.0
	60-64	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0
	65-69	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70-74	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Totals</b>	2,540.3	204.4 2,744.7	5,527.8	0.0 5,527.8	9,062.0	8,321.2 17,383.1	18,293.8	3,083.8 21,377.6	10,093.7	0.0 10,093.7	

## Appendix 4 (a): GIS-confirmed results for PCT; acres by stand age

Species	avg %	% defect	mbf/ac			Avg mbf/ac Null acres	
			PCT	Null - low	Null - med		Null - high
hemlock	70%	5%	23	5	13	23	14
spruce	30%	0%	20	4	10	20	11

\* plus GIS-reported CT acres (very small acreage amount)

By Age Class	Age Class in 2014 (yrs)	Acres			Overlap Buffer, Null*
		In Road Buffer, PCT	In Road Buffer, Null*	Overlap Buffer, PCT	
Craig RD	5-9	-	-	-	-
	10-14	-	-	-	-
	15-19	-	-	-	-
	20-24	332	17	394	27
	25-29	135	7	214	15
	30-34	-	-	-	-
	35-39	24	1	55	4
	40-44	34	2	40	3
	45-49	409	21	1,000	70
	50-54	559	52	838	86
	55-59	-	-	-	-
	60-64	-	-	-	-
	65-69	-	-	-	-
70-74	-	-	-	-	
<b>Total</b>		<b>1,492</b>	<b>99</b>	<b>2,540</b>	<b>204</b>
Ketchikan RD	5-9	-	-	-	-
	10-14	-	-	-	-
	15-19	508	-	853	-
	20-24	406	-	608	-
	25-29	521	-	708	-
	30-34	114	-	251	-
	35-39	547	-	1,566	-
	40-44	499	-	1,139	-
	45-49	56	-	56	-
	50-54	143	-	346	-
	55-59	0	-	0	-
	60-64	-	-	-	-
	65-69	-	-	-	-
70-74	-	-	-	-	
<b>Total</b>		<b>2,794</b>	<b>-</b>	<b>5,528</b>	<b>-</b>
Petersburg RD	5-9	-	-	-	-
	10-14	-	-	-	-
	15-19	-	-	-	-
	20-24	381	345	551	506
	25-29	684	620	991	910
	30-34	1,314	1,190	1,777	1,632
	35-39	1,250	1,132	2,211	2,030
	40-44	723	654	1,436	1,318
	45-49	1,036	938	1,582	1,452
	50-54	240	217	472	434
	55-59	17	16	43	40
	60-64	-	-	-	-
	65-69	-	-	-	-
70-74	-	-	-	-	
<b>Total</b>		<b>5,645</b>	<b>5,110</b>	<b>9,062</b>	<b>8,321</b>

Thorne Bay RD	5-9	-	-	-	-
	10-14	3	1	3	1
	15-19	21	4	34	6
	20-24	756	144	955	161
	25-29	1,139	217	1,670	281
	30-34	1,272	242	2,124	358
	35-39	2,185	415	2,955	497
	40-44	2,201	419	3,199	538
	45-49	3,859	734	6,388	1,075
	50-54	338	65	965	163
	55-59	-	-	-	-
	60-64	-	4	-	4
	65-69	-	-	-	-
70-74	-	-	-	-	
<b>Total</b>	<b>11,773</b>	<b>2,243</b>	<b>18,294</b>	<b>3,084</b>	
Wrangell RD	5-9	-	-	-	-
	10-14	-	-	-	-
	15-19	5	-	5	-
	20-24	1,032	-	1,493	-
	25-29	1,146	-	1,606	-
	30-34	1,760	-	2,361	-
	35-39	688	-	1,131	-
	40-44	2,073	-	3,457	-
	45-49	0	-	1	-
	50-54	9	-	41	-
	55-59	-	-	-	-
	60-64	-	-	-	-
	65-69	-	-	-	-
70-74	-	-	-	-	
<b>Total</b>	<b>6,712</b>	<b>-</b>	<b>10,094</b>	<b>-</b>	

\* plus GIS-reported CT acres (very small acreage amount)

By Age Class		Acres			
	Age Class in 2014 (yrs)	In Road Buffer, PCT	In Road Buffer, Null*	Overlap Buffer, PCT	Overlap Buffer, Null*
Tongass total					
2005-2010	5-9	-	-	-	-
2000-2004	10-14	3	1	3	1
1995-1999	15-19	534	4	892	6
1990-1994	20-24	2,907	505	4,001	694
1985-1989	25-29	3,625	843	5,189	1,206
1980-1984	30-34	4,460	1,431	6,513	1,989
1975-1979	35-39	4,694	1,548	7,916	2,531
1970-1974	40-44	5,530	1,075	9,271	1,859
1965-1969	45-49	5,359	1,692	9,026	2,597
1960-1964	50-54	1,288	333	2,661	683
1955-1959	55-59	17	16	44	40
1950-1954	60-64	-	4	-	4
1945-1949	65-69	-	-	-	-
1940-1944	70-74	-	-	-	-
		<b>28,416</b>	<b>7,453</b>	<b>45,518</b>	<b>11,609</b>
			<b>35,868</b>		<b>57,127</b>

**Appendix 4 (b): GIS-confirmed results for PCT within 800' of open FS road**

\* plus GIS-reported CT acres (very small acreage amount)

\*\* long log to merch. log recovery factor

**Within Open Road Buffer**

By 5-yr Period		at 55 years		MBF								Annual avg mbf harvested
				Acres		PCT		Null		total mbf by species		
				In Road Buffer, PCT	In Road Buffer, Null*	Western Hemlock -5% defect	Sitka Spruce	Western Hemlock -5% defect	Sitka Spruce	Western Hemlock -5% defect	Sitka Spruce	
Craig RD	Years	PCT	CT	WH	SS	WH	SS	WH	SS	mbf	annual mbf	
	2015-2019	559	52	8,545	3,352	469	175	9,014	3,528	15,050	3,010	
	2020-2024	409	21	6,260	2,456	188	70	6,448	2,526	10,769	2,154	
	2025-2029	34	2	519	203	16	6	534	209	892	178	
	2030-2034	24	1	361	142	11	4	372	146	621	124	
	2035-2039	-	-	-	-	-	-	-	-	-	-	
	2040-2044	135	7	2,060	808	62	23	2,122	831	3,544	709	
	2045-2049	332	17	5,075	1,991	152	57	5,227	2,048	8,730	1,746	
	2050-2054	-	-	-	-	-	-	-	-	-	-	
	2055-2059	-	-	-	-	-	-	-	-	-	-	
	2060-2064	-	-	-	-	-	-	-	-	-	-	
	2065-2069	-	-	-	-	-	-	-	-	-	-	
	2070-2074	559	52	8,545	3,352	469	175	9,014	3,528	15,050	3,010	
	2075-2079	409	21	6,260	2,456	188	70	6,448	2,526	10,769	2,154	
	Total to 2069	1,492	99	22,820	8,952	897	336	23,717	9,288	39,606		
Ketchikan RD	Years	PCT	CT	WH	SS	WH	SS	WH	SS	mbf	annual mbf	
	2015-2019	143	-	2,187	858	-	-	2,187	858	3,653	731	
	2020-2024	56	-	852	334	-	-	852	334	1,424	285	
	2025-2029	499	-	7,626	2,992	-	-	7,626	2,992	12,742	2,548	
	2030-2034	547	-	8,374	3,285	-	-	8,374	3,285	13,991	2,798	
	2035-2039	114	-	1,743	684	-	-	1,743	684	2,912	582	
	2040-2044	521	-	7,970	3,127	-	-	7,970	3,127	13,316	2,663	
	2045-2049	406	-	6,212	2,437	-	-	6,212	2,437	10,378	2,076	
	2050-2054	508	-	7,764	3,046	-	-	7,764	3,046	12,972	2,594	
	2055-2059	-	-	-	-	-	-	-	-	-	-	
	2060-2064	-	-	-	-	-	-	-	-	-	-	
	2065-2069	-	-	-	-	-	-	-	-	-	-	
	2070-2074	143	-	2,187	858	-	-	2,187	858	3,653	731	
	2075-2079	56	-	852	334	-	-	852	334	1,424	285	
	Total to 2069	2,794	-	42,729	16,762	-	-	42,729	16,762	71,388		
Petersburg RD	Years	PCT	CT	WH	SS	WH	SS	WH	SS	mbf	annual mbf	
	2015-2019	257	233	3,929	1,541	2,114	791	6,043	2,332	10,051	2,010	
	2020-2024	1,036	938	15,838	6,213	8,520	3,188	24,358	9,401	40,511	8,102	
	2025-2029	723	654	11,056	4,337	5,948	2,225	17,004	6,562	28,280	5,656	
	2030-2034	1,250	1,132	19,121	7,501	10,286	3,848	29,407	11,349	48,908	9,782	
	2035-2039	1,314	1,190	20,096	7,883	10,811	4,044	30,907	11,928	51,402	10,280	
	2040-2044	684	620	10,467	4,106	5,631	2,107	16,098	6,213	26,773	5,355	
	2045-2049	381	345	5,826	2,285	3,134	1,172	8,960	3,458	14,901	2,980	
	2050-2054	-	-	-	-	-	-	-	-	-	-	
	2055-2059	-	-	-	-	-	-	-	-	-	-	
	2060-2064	-	-	-	-	-	-	-	-	-	-	
	2065-2069	-	-	-	-	-	-	-	-	-	-	
	2070-2074	257	233	3,929	1,541	2,114	791	6,043	2,332	10,051	2,010	
	2075-2079	1,036	938	15,838	6,213	8,520	3,188	24,358	9,401	40,511	8,102	
	Total to 2069	5,645	5,110	86,334	33,867	46,445	17,375	132,779	51,243	220,826		

Appendix 4 (b)

Thorne Bay RD	Years	PCT	CT	WH	SS	WH	SS	WH	SS	mbf	annual mbf
	2015-2019	338	69	5,163	2,026	628	235	5,792	2,261	9,663	1,933
2020-2024	3,859	734	59,016	23,151	6,667	2,494	65,684	25,646	109,595	21,919	
2025-2029	2,201	419	33,670	13,208	3,804	1,423	37,474	14,632	62,527	12,505	
2030-2034	2,185	415	33,413	13,108	3,775	1,412	37,188	14,520	62,049	12,410	
2035-2039	1,272	242	19,454	7,631	2,198	822	21,651	8,454	36,126	7,225	
2040-2044	1,139	217	17,426	6,836	1,969	737	19,395	7,572	32,361	6,472	
2045-2049	756	144	11,559	4,534	1,306	489	12,865	5,023	21,465	4,293	
2050-2054	21	4	321	126	36	14	357	139	596	119	
2055-2059	3	1	53	21	6	2	59	23	98	20	
2060-2064	-	-	-	-	-	-	-	-	-	-	
2065-2069	-	-	-	-	-	-	-	-	-	-	
2070-2074	338	69	5,163	2,026	628	235	5,792	2,261	9,663	1,933	
2075-2079	3,859	734	59,016	23,151	6,667	2,494	65,684	25,646	109,595	21,919	
Total to 2069	11,773	2,243	180,075	70,641	20,389	7,628	200,465	78,269	334,480		

Wrangell RD	Years	PCT	CT	WH	SS	WH	SS	WH	SS	mbf	annual mbf
	2015-2019	9	-	134	52	-	-	134	52	223	45
2020-2024	0	-	3	1	-	-	3	1	5	1	
2025-2029	2,073	-	31,702	12,436	-	-	31,702	12,436	52,966	10,593	
2030-2034	688	-	10,522	4,128	-	-	10,522	4,128	17,579	3,516	
2035-2039	1,760	-	26,916	10,559	-	-	26,916	10,559	44,971	8,994	
2040-2044	1,146	-	17,525	6,875	-	-	17,525	6,875	29,280	5,856	
2045-2049	1,032	-	15,786	6,192	-	-	15,786	6,192	26,374	5,275	
2050-2054	5	-	75	29	-	-	75	29	125	25	
2055-2059	-	-	-	-	-	-	-	-	-	-	
2060-2064	-	-	-	-	-	-	-	-	-	-	
2065-2069	-	-	-	-	-	-	-	-	-	-	
2070-2074	9	-	134	52	-	-	134	52	223	45	
2075-2079	0	-	3	1	-	-	3	1	5	1	
Total to 2069	6,712	-	102,662	40,273	-	-	102,662	40,273	171,522		

Within Open Road Buffer		Acres		MBF							
				PCT - mbf		CT - mbf		total mbf by species		Annual avg mbf harvested	
Tongass total	Years	In Road Buffer, PCT	In Road Buffer, Null*	Western Hemlock -5% defect	Sitka Spruce	Western Hemlock -5% defect	Sitka Spruce	Western Hemlock -5% defect	Sitka Spruce		**1.2 LRF
2015-2019	1,305	353	11,413	4,477	2,742	1,026	14,155	5,503	38,640	7,728	
2020-2024	5,359	1,692	81,969	32,155	15,376	5,752	97,345	37,907	162,303	32,461	
2025-2029	5,530	1,075	84,574	33,177	9,767	3,654	94,341	36,831	157,407	31,481	
2030-2034	4,694	1,548	71,791	28,162	14,072	5,264	85,863	33,427	143,148	28,630	
2035-2039	4,460	1,431	68,209	26,757	13,009	4,867	81,218	31,624	135,411	27,082	
2040-2044	3,625	843	55,449	21,752	7,662	2,866	63,110	24,618	105,274	21,055	
2045-2049	2,907	505	44,457	17,440	4,592	1,718	49,049	19,158	81,848	16,370	
2050-2054	534	4	8,160	3,201	36	14	8,196	3,215	13,693	2,739	
2055-2059	3	1	53	21	6	2	59	23	98	20	
2060-2064	0	0	0	0	0	0	0	0	0	0	
2065-2069	0	0	0	0	0	0	0	0	0	0	
2070-2074	1,305	353	19,958	7,829	3,211	1,201	23,169	9,031	38,640	7,728	
2075-2079	5,359	1,692	81,969	32,155	15,376	5,752	97,345	37,907	162,303	32,461	
Total to 2069	28,416	7,453	426,074	167,143	67,262	25,163	493,337	192,306	837,821		
	re-harvest		35,868								

**Appendix 4 (c): GIS-confirmed results for PCT overlapping 800' buffer of open FS road**

\* plus GIS-reported CT acres (very small acreage amount)

\*\* long log to merch. log recovery factor

**Overlapping Open Roads**

By 5-yr Period	at 55 years	MBF									
		Acres		PCT		Null		total mbf by species		**1.2 LRF	Annual avg mbf harvested
		Overlap Buffer, PCT	Overlap Buffer, Null*	Western Hemlock -5% defect	Sitka Spruce	Western Hemlock -5% defect	Sitka Spruce	Western Hemlock -5% defect	Sitka Spruce		
Craig RD	Years	Overlap	Overlap	WH	SS	WH	SS	WH	SS	mbf	annual mbf
	2015-2019	838	86	12,813	5,026	781	292	13,594	5,319	22,695	4,539
	2020-2024	1,000	70	15,290	5,998	632	237	15,922	6,235	26,588	5,318
	2025-2029	40	3	617	242	25	10	642	251	1,072	214
	2030-2034	55	4	837	328	35	13	871	341	1,455	291
	2035-2039	-	-	-	-	-	-	-	-	-	-
	2040-2044	214	15	3,275	1,285	135	51	3,411	1,336	5,695	1,139
	2045-2049	394	27	6,022	2,362	249	93	6,271	2,455	10,471	2,094
	2050-2054	-	-	-	-	-	-	-	-	-	-
	2055-2059	-	-	-	-	-	-	-	-	-	-
	2060-2064	-	-	-	-	-	-	-	-	-	-
	2065-2069	-	-	-	-	-	-	-	-	-	-
	2070-2074	838	86	12,813	5,026	781	292	13,594	5,319	22,695	4,539
	2075-2079	1,000	70	15,290	5,998	632	237	15,922	6,235	26,588	5,318
	Total to 2069	2,540	204	38,854	15,242	1,858	695	40,711	15,937	67,978	
Ketchikan RD	Years	Overlap	Overlap	WH	SS	WH	SS	WH	SS	mbf	annual mbf
	2015-2019	346	-	5,294	2,077	-	-	5,294	2,077	8,845	1,769
	2020-2024	56	-	853	335	-	-	853	335	1,425	285
	2025-2029	1,139	-	17,427	6,836	-	-	17,427	6,836	29,116	5,823
	2030-2034	1,566	-	23,952	9,396	-	-	23,952	9,396	40,017	8,003
	2035-2039	251	-	3,832	1,503	-	-	3,832	1,503	6,403	1,281
	2040-2044	708	-	10,833	4,250	-	-	10,833	4,250	18,100	3,620
	2045-2049	608	-	9,307	3,651	-	-	9,307	3,651	15,549	3,110
	2050-2054	853	-	13,050	5,119	-	-	13,050	5,119	21,803	4,361
	2055-2059	-	-	-	-	-	-	-	-	-	-
	2060-2064	-	-	-	-	-	-	-	-	-	-
	2065-2069	-	-	-	-	-	-	-	-	-	-
	2070-2074	346	-	5,294	2,077	-	-	5,294	2,077	8,845	1,769
	2075-2079	56	-	853	335	-	-	853	335	1,425	285
	Total to 2069	5,528	-	84,548	33,167	-	-	84,548	33,167	141,258	
Petersburg RD	Years	Overlap	Overlap	WH	SS	WH	SS	WH	SS	mbf	annual mbf
	2015-2019	516	474	7,890	3,095	4,305	1,610	12,194	4,705	20,280	4,056
	2020-2024	1,582	1,452	24,192	9,490	13,200	4,938	37,392	14,428	62,185	12,437
	2025-2029	1,436	1,318	21,956	8,613	11,980	4,482	33,936	13,095	56,437	11,287
	2030-2034	2,211	2,030	33,810	13,263	18,448	6,901	52,258	20,165	86,907	17,381
	2035-2039	1,777	1,632	27,181	10,663	14,831	5,548	42,011	16,211	69,867	13,973
	2040-2044	991	910	15,152	5,944	8,267	3,093	23,419	9,037	38,947	7,789
	2045-2049	551	506	8,422	3,304	4,595	1,719	13,018	5,023	21,649	4,330
	2050-2054	-	-	-	-	-	-	-	-	-	-
	2055-2059	-	-	-	-	-	-	-	-	-	-
	2060-2064	-	-	-	-	-	-	-	-	-	-
	2065-2069	-	-	-	-	-	-	-	-	-	-
	2070-2074	516	474	7,890	3,095	4,305	1,610	12,194	4,705	20,280	4,056
	2075-2079	1,582	1,452	24,192	9,490	13,200	4,938	37,392	14,428	62,185	12,437
	Total to 2069	9,062	8,321	138,603	54,372	75,625	28,292	214,229	82,664	356,271	

Thorne Bay RD	Years	Overlap	Overlap	WH	SS	WH	SS	WH	SS	mbf	annual mbf
	2015-2019	965	167	14,759	5,790	1,521	569	16,280	6,359	27,167	5,433
2020-2024	6,388	1,075	97,711	38,330	9,771	3,656	107,482	41,986	179,362	35,872	
2025-2029	3,199	538	48,924	19,192	4,893	1,830	53,817	21,023	89,807	17,961	
2030-2034	2,955	497	45,192	17,728	4,519	1,691	49,711	19,419	82,956	16,591	
2035-2039	2,124	358	32,492	12,746	3,249	1,216	35,741	13,962	59,644	11,929	
2040-2044	1,670	281	25,549	10,023	2,555	956	28,104	10,978	46,899	9,380	
2045-2049	955	161	14,608	5,731	1,461	547	16,069	6,277	26,816	5,363	
2050-2054	34	6	516	202	52	19	568	222	948	190	
2055-2059	3	1	53	21	5	2	58	23	97	19	
2060-2064	-	-	-	-	-	-	-	-	-	-	
2065-2069	-	-	-	-	-	-	-	-	-	-	
2070-2074	965	167	14,759	5,790	1,521	569	16,280	6,359	27,167	5,433	
2075-2079	6,388	1,075	97,711	38,330	9,771	3,656	107,482	41,986	179,362	35,872	
Total to 2069	18,294	3,084	279,804	109,763	28,027	10,485	307,831	120,248	513,694		

Wrangell RD	Years	Overlap	Overlap	WH	SS	WH	SS	WH	SS	mbf	annual mbf
	2015-2019	41	-	620	243	-	-	620	243	1,036	207
2020-2024	1	-	11	4	-	-	11	4	19	4	
2025-2029	3,457	-	52,882	20,745	-	-	52,882	20,745	88,352	17,670	
2030-2034	1,131	-	17,292	6,783	-	-	17,292	6,783	28,890	5,778	
2035-2039	2,361	-	36,106	14,164	-	-	36,106	14,164	60,324	12,065	
2040-2044	1,606	-	24,557	9,633	-	-	24,557	9,633	41,028	8,206	
2045-2049	1,493	-	22,841	8,960	-	-	22,841	8,960	38,161	7,632	
2050-2054	5	-	75	29	-	-	75	29	125	25	
2055-2059	-	-	-	-	-	-	-	-	-	-	
2060-2064	-	-	-	-	-	-	-	-	-	-	
2065-2069	-	-	-	-	-	-	-	-	-	-	
2070-2074	41	-	620	243	-	-	620	243	1,036	207	
2075-2079	1	-	11	4	-	-	11	4	19	4	
Total to 2069	10,094	-	154,383	60,562	-	-	154,383	60,562	257,934		

Overlapping Open Roads		MBF									
		Acres		PCT - mbf		CT - mbf		total mbf by species		Annual avg mbf harvested	
Tongass total	Years	Overlap Buffer, PCT	Overlap Buffer, Null*	Western Hemlock -5% defect	Sitka Spruce	Western Hemlock -5% defect	Sitka Spruce	Western Hemlock -5% defect	Sitka Spruce		**1.2 LRF
2015-2019	2,705	727	28,562	11,205	5,826	2,180	34,389	13,384	80,023	16,005	
2020-2024	9,026	2,597	138,057	54,158	23,604	8,830	161,661	62,988	269,579	53,916	
2025-2029	9,271	1,859	141,805	55,628	16,898	6,322	158,703	61,950	264,784	52,957	
2030-2034	7,916	2,531	121,082	47,499	23,002	8,605	144,083	56,104	240,224	48,045	
2035-2039	6,513	1,989	99,612	39,076	18,080	6,764	117,692	45,840	196,238	39,248	
2040-2044	5,189	1,206	79,367	31,134	10,958	4,099	90,324	35,234	150,670	30,134	
2045-2049	4,001	694	61,200	24,008	6,305	2,359	67,505	26,367	112,646	22,529	
2050-2054	892	6	13,641	5,351	52	19	13,693	5,370	22,876	4,575	
2055-2059	3	1	53	21	5	2	58	23	97	19	
2060-2064	-	-	0	0	0	0	0	0	0	0	
2065-2069	-	-	0	0	0	0	0	0	0	0	
2070-2074	2,705	727	41,376	16,231	6,607	2,472	47,983	18,703	80,023	16,005	
2075-2079	9,026	2,597	138,057	54,158	23,604	8,830	161,661	62,988	269,579	53,916	
Total to 2069	45,518	11,609	683,379	268,079	104,729	39,180	788,108	307,259	1,337,135		
re-harvest			57,127								

Appendix 5 (a) : CT<sub>e</sub> Detailed Calculations by Stand Age

	% prevalence	mbf/ac	% defect
hemlock	70%	23	5%
spruce	30%	20	0%

By Age Class	Age Class in 2014 (yrs)	Acres			
		Total Acres (Brackley)	Suitable/ Available Acres	Suit YG: Harv Only	Suit YG: Nat Dist
Brackley 2G Craig RD	5-9	1,369	1,369	1,220	149
	10-14	3,860	3,695	3,293	402
	15-19	4,114	3,938	3,509	428
	20-24	5,138	2,261	2,015	246
	25-29	1,766	777	693	85
	30-34	395	192	171	21
	35-39	2,073	1,008	898	110
	40-44	2,882	1,093	974	119
	45-49	4,240	1,608	1,433	175
	50-54	8,722	1,095	976	119
	55-59	1,519	191	170	21
	60-64	452	24	21	3
	65-69	522	27	24	3
	70-74	384	384	342	42
<b>Total</b>	<b>37,436</b>	<b>17,661</b>	<b>15,740</b>	<b>1,921</b>	
Ketchikan RD	5-9	1,323	1,323	1,046	278
	10-14	4,401	4,213	3,328	885
	15-19	6,132	5,870	4,637	1,233
	20-24	3,993	1,757	1,388	369
	25-29	3,116	1,371	1,083	288
	30-34	2,513	1,222	965	257
	35-39	5,046	2,453	1,938	515
	40-44	2,740	1,039	821	218
	45-49	2,701	1,024	809	215
	50-54	6,149	772	610	162
	55-59	5,550	697	550	146
	60-64	384	20	16	4
	65-69	347	18	14	4
	70-74	423	423	334	89
<b>Total</b>	<b>44,818</b>	<b>22,203</b>	<b>17,540</b>	<b>4,663</b>	
Petersburg RD	5-9	1,391	1,391	992	400
	10-14	3,912	3,745	2,669	1,075
	15-19	6,456	6,179	4,404	1,774
	20-24	13,430	5,911	4,213	1,697
	25-29	6,670	2,935	2,092	843
	30-34	20,297	9,868	7,034	2,834
	35-39	10,311	5,013	3,573	1,440
	40-44	10,898	4,133	2,946	1,187
	45-49	8,892	3,373	2,404	969
	50-54	4,530	569	405	163
	55-59	1,708	214	153	62
	60-64	945	50	35	14
	65-69	1,310	69	49	20
	70-74	497	497	354	143
<b>Total</b>	<b>91,248</b>	<b>43,947</b>	<b>31,326</b>	<b>12,621</b>	



Thorne Bay RD	5-9	2,371	2,371	2,224	147
	10-14	4,659	4,459	4,184	276
	15-19	11,507	11,014	10,333	681
	20-24	24,617	10,834	10,164	670
	25-29	17,509	7,706	7,229	477
	30-34	17,368	8,444	7,921	522
	35-39	27,973	13,600	12,759	841
	40-44	28,296	10,732	10,068	664
	45-49	26,608	10,092	9,468	624
	50-54	7,990	1,003	941	62
	55-59	4,587	576	540	36
	60-64	1,726	91	85	6
	65-69	1,455	77	72	5
	70-74	575	575	539	36
<b>Total</b>	<b>177,240</b>	<b>81,571</b>	<b>76,527</b>	<b>5,045</b>	
Wrangell RD	5-9	441	441	352	90
	10-14	2,405	2,302	1,835	467
	15-19	5,173	4,951	3,947	1,004
	20-24	6,077	2,674	2,132	542
	25-29	2,303	1,014	808	206
	30-34	8,107	3,941	3,142	800
	35-39	7,692	3,740	2,981	759
	40-44	6,912	2,621	2,090	532
	45-49	4,086	1,550	1,235	314
	50-54	1,039	130	104	26
	55-59	1,904	239	191	48
	60-64	1,563	82	66	17
	65-69	707	37	30	8
	70-74	563	563	449	114
<b>Total</b>	<b>48,971</b>	<b>24,286</b>	<b>19,359</b>	<b>4,927</b>	

By Age Class	Acres				
	Age 2014 (yrs)	Total Acres	Suitable/ Available	Suit YG: Harv Only	Suit YG: Nat
<b>Tongass total</b>					
2005-2010	5-9	6,896	6,896	5,833	1,063
2000-2004	10-14	19,238	18,413	15,309	3,105
1995-1999	15-19	33,382	31,952	26,830	5,121
1990-1994	20-24	53,254	23,437	19,912	3,525
1985-1989	25-29	31,364	13,803	11,906	1,898
1980-1984	30-34	48,680	23,667	19,234	4,433
1975-1979	35-39	53,094	25,813	22,149	3,664
1970-1974	40-44	51,727	19,619	16,899	2,720
1965-1969	45-49	46,527	17,647	15,350	2,297
1960-1964	50-54	28,430	3,569	3,036	533
1955-1959	55-59	15,268	1,917	1,604	313
1950-1954	60-64	5,070	267	223	43
1945-1949	65-69	4,341	228	189	39
1940-1944	70-74	2,442	2,442	2,019	423
		<b>399,713</b>	<b>189,669</b>	<b>160,492</b>	<b>29,176</b>

Includes all suitable 2G after harvest and 50% after natural disturbance

	% prevalence	mbf/ac	% defect
hemlock	70%	23	5%
spruce	30%	20	0%

Appendix 5 (b) : Roaded CT<sub>e</sub> Detailed Calculations by 55 year Harvest Schedule

\*\* long log to merch. log recovery factor

Roaded CT <sub>e</sub>		Acres			1.2** LRF (-5% WH defect)	Annual avg mbf harvested
		Suit YG: -Nat Dist	Western Hemlock	Sitka Spruce		
at 55 years		Suit-Nat	WH	SS	mbf	annual mbf
Craig RD	Years	Suit-Nat	WH	SS	mbf	annual mbf
	2015-2019	383	268	115	9,796	1,959
	2020-2024	358	251	108	9,157	1,831
	2025-2029	244	170	73	6,223	1,245
	2030-2034	225	157	67	5,737	1,147
	2035-2039	43	30	13	1,093	219
	2040-2044	173	121	52	4,426	885
	2045-2049	504	353	151	12,874	2,575
	2050-2054	877	614	263	22,420	4,484
	2055-2059	823	576	247	21,036	4,207
	2060-2064	305	214	92	7,794	1,559
	2065-2069	-	-	-	-	-
	2070-2074	383	268	115	9,796	1,959
	2075-2079	358	251	108	9,157	1,831
Total to 2069	3,935	2,755	1,181	100,556		
Ketchikan RD	Years	Suit-Nat	WH	SS	mbf	annual mbf
	2015-2019	381	267	114	9,742	1,948
	2020-2024	202	142	61	5,170	1,034
	2025-2029	205	144	62	5,245	1,049
	2030-2034	484	339	145	12,380	2,476
	2035-2039	241	169	72	6,167	1,233
	2040-2044	271	190	81	6,920	1,384
	2045-2049	347	243	104	8,868	1,774
	2050-2054	1,159	811	348	29,623	5,925
	2055-2059	832	582	250	21,260	4,252
	2060-2064	261	183	78	6,679	1,336
	2065-2069	-	-	-	-	-
	2070-2074	381	267	114	9,742	1,948
	2075-2079	202	142	61	5,170	1,034
Total to 2069	4,385	3,070	1,316	112,056		

Appendix 5 (b)

Petersburg RD	Years	Suit-Nat	WH	SS	mbf	annual mbf
	2015-2019	249	175	75	6,371	1,274
	2020-2024	601	421	180	15,358	3,072
	2025-2029	737	516	221	18,823	3,765
	2030-2034	893	625	268	22,827	4,565
	2035-2039	1,758	1,231	528	44,937	8,987
	2040-2044	523	366	157	13,368	2,674
	2045-2049	1,053	737	316	26,915	5,383
	2050-2054	1,101	771	330	28,137	5,627
	2055-2059	667	467	200	17,053	3,411
	2060-2064	248	174	74	6,336	1,267
	2065-2069	-	-	-	-	-
	2070-2074	249	175	75	6,371	1,274
	2075-2079	601	421	180	15,358	3,072
Total to 2069	7,831	5,482	2,349	200,125		
Thorne Bay RD	Years	Suit-Nat	WH	SS	mbf	annual mbf
	2015-2019	544	381	163	13,911	2,782
	2020-2024	2,367	1,657	710	60,484	12,097
	2025-2029	2,517	1,762	755	64,321	12,864
	2030-2034	3,190	2,233	957	81,508	16,302
	2035-2039	1,980	1,386	594	50,606	10,121
	2040-2044	1,807	1,265	542	46,183	9,237
	2045-2049	2,541	1,779	762	64,930	12,986
	2050-2054	2,583	1,808	775	66,012	13,202
	2055-2059	1,046	732	314	26,727	5,345
	2060-2064	556	389	167	14,208	2,842
	2065-2069	-	-	-	-	-
	2070-2074	544	381	163	13,911	2,782
	2075-2079	2,367	1,657	710	60,484	12,097
Total to 2069	19,132	13,392	5,740	488,891		
Wrangell RD	Years	Suit-Nat	WH	SS	mbf	annual mbf
	2015-2019	210	147	63	5,356	1,071
	2020-2024	309	216	93	7,892	1,578
	2025-2029	522	366	157	13,350	2,670
	2030-2034	745	522	224	19,044	3,809
	2035-2039	785	550	236	20,071	4,014
	2040-2044	202	141	61	5,162	1,032
	2045-2049	533	373	160	13,619	2,724
	2050-2054	987	691	296	25,214	5,043
	2055-2059	459	321	138	11,722	2,344
	2060-2064	88	62	26	2,248	450
	2065-2069	-	-	-	-	-
	2070-2074	210	147	63	5,356	1,071
	2075-2079	309	216	93	7,892	1,578
Total to 2069	4,840	3,388	1,452	123,677		

Appendix 5 (b)

Roaded CT<sub>e</sub>

at 55 years

*\*\* long log to merch. log recovery factor*

Tongass total	Years	Acres			1.2** LRF (-5% WH defect)	Annual avg mbf harvested
		Suit YG: -Nat	Western Hemlock	Sitka Spruce	mbf	annual mbf
	2015-2019	1,768	1,238	530	45,176	9,035
	2020-2024	3,837	2,686	1,151	98,061	19,612
	2025-2029	4,225	2,957	1,267	107,962	21,592
	2030-2034	5,537	3,876	1,661	141,496	28,299
	2035-2039	4,808	3,366	1,443	122,874	24,575
	2040-2044	2,976	2,083	893	76,059	15,212
	2045-2049	4,978	3,485	1,493	127,207	25,441
	2050-2054	6,708	4,695	2,012	171,406	34,281
	2055-2059	3,827	2,679	1,148	97,799	19,560
	2060-2064	1,458	1,021	437	37,266	7,453
	2065-2069	0	0	0	0	0
	2070-2074	1,768	1,238	530	45,176	9,035
	2075-2079	3,837	2,686	1,151	98,061	19,612
	<b>Total to 2069</b>	<b>40,123</b>	<b>28,086</b>	<b>12,037</b>	<b>1,025,305</b>	<b>205,061</b>

**Appendix 6: GIS-confirmed PCT and future CT<sub>e</sub> - roaded and overlapp combined results**

*GIS confirmed PCT (incl. scheduled w/in buffer) PLUS future commercial thin acres*

RD	PCT/CT <sub>e</sub>			Annual avg mbf harvested	PCT/CT <sub>e</sub> w/ Overlap			Annual avg mbf harvested
	Years	acres	mbf	annual mbf	acres	mbf	annual mbf	
Craig RD	2015-2019	994	24,846	4,969	1,307	32,491	6,498	
Ketchikan		524	13,395	2,679	727	18,587	3,717	
Petersburg		739	16,422	3,284	1,239	26,651	5,330	
Thorne Bay		951	23,574	4,715	1,677	41,078	8,216	
Wrangell		218	5,579	1,116	250	6,392	1,278	
<b>Total</b>		<b>3,426</b>	<b>83,816</b>	<b>16,763</b>	<b>5,200</b>	<b>125,199</b>	<b>25,040</b>	
Craig RD	2020-2024	788	19,926	3,985	1,428	35,745	7,149	
Ketchikan		258	6,594	1,319	258	6,596	1,319	
Petersburg		2,574	55,869	11,174	3,635	77,542	15,508	
Thorne Bay		6,959	170,079	34,016	9,830	239,846	47,969	
Wrangell		309	7,897	1,579	310	7,910	1,582	
<b>Total</b>		<b>10,888</b>	<b>260,364</b>	<b>52,073</b>	<b>15,461</b>	<b>367,640</b>	<b>73,528</b>	
Craig RD	2025-2029	279	7,115	1,423	287	7,295	1,459	
Ketchikan		704	17,987	3,597	1,345	34,361	6,872	
Petersburg		2,114	47,102	9,420	3,490	75,259	15,052	
Thorne Bay		5,137	126,848	25,370	6,254	154,128	30,826	
Wrangell		2,595	66,316	13,263	3,980	101,702	20,340	
<b>Total</b>		<b>10,829</b>	<b>265,368</b>	<b>53,074</b>	<b>15,355</b>	<b>372,745</b>	<b>74,549</b>	
Craig RD	2030-2034	249	6,358	1,272	283	7,192	1,438	
Ketchikan		1,032	26,371	5,274	2,050	52,397	10,479	
Petersburg		3,275	71,735	14,347	5,134	109,734	21,947	
Thorne Bay		5,790	143,557	28,711	6,642	164,463	32,893	
Wrangell		1,433	36,623	7,325	1,876	47,933	9,587	
<b>Total</b>		<b>11,779</b>	<b>284,644</b>	<b>56,929</b>	<b>15,984</b>	<b>381,720</b>	<b>76,344</b>	
Craig RD	2035-2039	43	1,093	219	43	1,093	219	
Ketchikan		355	9,079	1,816	492	12,570	2,514	
Petersburg		4,262	96,339	19,268	5,167	114,803	22,961	
Thorne Bay		3,494	86,732	17,346	4,462	110,250	22,050	
Wrangell		2,545	65,042	13,008	3,146	80,395	16,079	
<b>Total</b>		<b>10,699</b>	<b>258,285</b>	<b>51,657</b>	<b>13,310</b>	<b>319,112</b>	<b>63,822</b>	
Craig RD	2040-2044	315	7,969	1,594	402	10,121	2,024	
Ketchikan		792	20,237	4,047	979	25,020	5,004	
Petersburg		1,827	40,141	8,028	2,423	52,315	10,463	
Thorne Bay		3,163	78,543	15,709	3,759	93,082	18,616	
Wrangell		1,348	34,442	6,888	1,808	46,190	9,238	
<b>Total</b>		<b>7,445</b>	<b>181,332</b>	<b>36,266</b>	<b>9,371</b>	<b>226,728</b>	<b>45,346</b>	

Appendix 6

Craig RD	2045-2049	852	21,603	4,321	925	23,345	4,669
Ketchikan		753	19,247	3,849	956	24,417	4,883
Petersburg		1,779	41,816	8,363	2,110	48,564	9,713
Thorne Bay		3,440	86,396	17,279	3,657	91,746	18,349
Wrangell		1,565	39,992	7,998	2,026	51,780	10,356
<b>Total</b>			<b>8,390</b>	<b>209,054</b>	<b>41,811</b>	<b>9,673</b>	<b>239,853</b>
Craig RD	2050-2054	877	22,420	4,484	877	22,420	4,484
Ketchikan		1,667	42,595	8,519	2,012	51,426	10,285
Petersburg		1,101	28,137	5,627	1,101	28,137	5,627
Thorne Bay		2,608	66,608	13,322	2,623	66,960	13,392
Wrangell		992	25,339	5,068	992	25,339	5,068
<b>Total</b>			<b>7,245</b>	<b>185,099</b>	<b>37,020</b>	<b>7,605</b>	<b>194,282</b>
Craig RD	2055-2059	823	21,036	4,207	823	21,036	4,207
Ketchikan		832	21,260	4,252	832	21,260	4,252
Petersburg		667	17,053	3,411	667	17,053	3,411
Thorne Bay		1,050	26,825	5,365	1,050	26,824	5,365
Wrangell		459	11,722	2,344	459	11,722	2,344
<b>Total</b>			<b>3,831</b>	<b>97,897</b>	<b>19,579</b>	<b>3,831</b>	<b>97,896</b>
Craig RD	2060-2064	305	7,794	1,559	305	7,794	1,559
Ketchikan		261	6,679	1,336	261	6,679	1,336
Petersburg		248	6,336	1,267	248	6,336	1,267
Thorne Bay		556	14,208	2,842	556	14,208	2,842
Wrangell		88	2,248	450	88	2,248	450
<b>Total</b>			<b>1,458</b>	<b>37,266</b>	<b>7,453</b>	<b>1,458</b>	<b>37,266</b>
Craig RD	2065-2069	0	0	0	0	0	0
Ketchikan		0	0	0	0	0	0
Petersburg		0	0	0	0	0	0
Thorne Bay		0	0	0	0	0	0
Wrangell		0	0	0	0	0	0
<b>Total</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Craig RD	2070-2074	994	24,846	4,969	1,307	32,491	6,498
Ketchikan		524	13,395	2,679	727	18,587	3,717
Petersburg		739	16,422	3,284	1,239	26,651	5,330
Thorne Bay		951	23,574	4,715	1,677	41,078	8,216
Wrangell		218	5,579	1,116	250	6,392	1,278
<b>Total</b>			<b>3,426</b>	<b>83,816</b>	<b>16,763</b>	<b>5,200</b>	<b>125,199</b>
Craig RD	2075-2079	788	19,926	3,985	1,428	35,745	7,149
Ketchikan		258	6,594	1,319	258	6,596	1,319
Petersburg		2,574	55,869	11,174	3,635	77,542	15,508
Thorne Bay		6,959	170,079	34,016	9,830	239,846	47,969
Wrangell		309	7,897	1,579	310	7,910	1,582
<b>Total</b>			<b>10,888</b>	<b>260,364</b>	<b>52,073</b>	<b>15,461</b>	<b>367,640</b>

Appendix 6

Petersburg Thorne Bay Wrangell Ketchikan Craig RD	Annual Volume Comparison: 5 RDs, 55-year-harvest; all karst removed within 800' of open roads (May			
	GIS confirmed PCT (incl. scheduled PCT w/in		GIS confirmed PCT (incl. sched. PCT) + future CT <sub>e</sub>	
	PCT	PCT w/ Overlap	PCT/CT <sub>e</sub>	PCT/CT <sub>e</sub> w/ Overlap
2015-2019	7,728	16,005	16,763	25,040
2020-2024	32,461	53,916	52,073	73,528
2025-2029	31,481	52,957	53,074	74,549
2030-2034	28,630	48,045	56,929	76,344
2035-2039	27,082	39,248	51,657	63,822
2040-2044	21,055	30,134	36,266	45,346
2045-2049	16,370	22,529	41,811	47,971
2050-2054	2,739	4,575	37,020	38,856
2055-2059	20	19	19,579	19,579
2060-2064	0	0	7,453	7,453
2065-2069	0	0	0	0
<b>Total</b>	<b>167,564</b>	<b>267,427</b>	<b>372,625</b>	<b>472,488</b>