

## Tongass Second Growth Transition Project

### At a Glance Summary of Results

*Results of an Intensive Three Year Study to Determine Whether an Accelerated Transition to Young Growth Logging Can Be Operable by 2020*



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*A project jointly funded by:*

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## Three-Year Study Methodology

### *For the study effort, what to solve for?*

Tackling perceptions . . . fact or fiction?

- Too few acres; too little volume
- Acres too scattered for economic viability
- Too much single log (32') only capture; too much forest residual left on the ground after harvest; needs at least another 5-10 years to grow.
- Poor access to acres
- Non-operability of acres (slopes too steep)
- Too many acres in low site productivity soils
- No markets for second growth
- Poor economics of harvesting second growth
- Lack of compliance with TAC recommendations
- Required changes in milling operations to transition to second growth processing

Goal: Identify ‘reduced risk’ acres in POW region that may help to reduce the glide path to a second growth transition in SE Alaska.

“Reduced Risk” acres are:

- a) acres outside of *litigious environmentally sensitive areas* and
- b) acres that can be accessed by currently open FS roads resulting in *significantly reduced logging costs*.



Petersburg 8.1

Result: Move from all second growth acres to emphasis on “suitable” pre-commercially thinned (PCT) and non-PCT acres with access to currently open FS roads.

- **2013-2014:** Conducted comprehensive GIS analysis on 78,000 pre-commercially thinned (PCT) acres and 46,000 non-PCT acres servicing the Prince of Wales (POW) region. 43 analysis zones in five Ranger Districts were created for 3-year study. All acres have access to currently open FS roads.
- **2014:** Established free public portal access to all Forest Service (FS) GIS data analysis via DataBasin ([www.DataBasin.org](http://www.DataBasin.org)). 900 acres cruised in Thorne Bay and Petersburg Ranger Districts. Complete transparency on all work.
- **2015:** Undertook the most intensive timber cruises ever conducted on the Tongass National Forest to date (one plot per acre cruise protocol). Shared all raw cruise data with the Tongass NF (at no cost to the agency).
- **2015-2016:** Analyzed all past FS stand exams conducted on the targeted PCT and non-PCT acres (over 3,500 plots analyzed in the POW region over the last 10 years). Compared findings to 2015 cruise results.
- **2016:** Used updated (2016) FPS modeling produced by the FS to estimate growth and yield from second growth acres cruised in 2015. Extrapolated to larger GIS-analyzed landscape.
- **2016:** Compared all results back to Tongass Advisory Committee recommendations.
- **2016:** Established Good Faith Lumber Company pilot project for completion in 2017 to address specific lumber grade and volume recovery issues in second growth transition effort. Project will harvest 200,000 board feet of second growth timber from Dargon Point timber sale in Thorne Bay Ranger District; process logs through portable HewSaw scanning system and Good Faith mill, and flow product into market.



4 areas in **Craig** Ranger District  
(10,205 roaded PCT & Non-PCT ac.)



7 areas in **Wrangell** Ranger District  
(18,486 roaded PCT & Non-PCT ac.)



9 areas in **Petersburg** Ranger District  
(24,851 roaded PCT & Non-PCT ac.)

### 43 Ranger District Analysis Zones



15 areas in **Thorne Bay** Ranger District  
(58,060 roaded PCT & Non-PCT ac)



8 areas in **Ketchikan** Ranger District  
(14,180 roaded PCT & Non-PCT ac)

## What we now know:

### *Overall:*

- Approximately **78,000 acres** of low-risk **PCT** stands exist just within 5 RDs that service the POW region and are located next to current open FS roads (low cost access). Another **13,000 acres** of low-risk **PCT** acres exist within ranger districts adjacent to the POW service region.
- Approximately **46,000 acres** of low-risk **non-PCT** stands exist within the same 5 RDs and are located next to current open FS road (low cost access).
- Acres by **age class** distribution within those PCT and non-PCT acres are **significant and evenly-distributed** allowing volume rollover for sustainable harvest from year to year beginning 2020. Harvest at 55 years.
- The Dargon Point sale highlights the need for changes in the Forest Service FPS model (estimating growth and yield), **as projected second growth volumes were significantly under-estimated**. This under-estimation was due to the difference between second growth and old growth tree characteristics (lower defect, less taper, etc.) not reflected in the FPS model. The Forest Service updated their FPS model in 2016 to more accurately reflect second growth conditions based on lessons learned at Dargon Point, **but more updates are anticipated with the expected Forest Service release of Farr plot (young growth) data in 2017**.
- Based on 2015 cruise data, 2016 FPS modeling, and prior FS stand exams going back ten years, **beginning 2020, between 41 mmbf/yr to 55 mmbf/yr of second growth merchantable volume could be available for harvest at 55 years of age**. This volume can be a sustained annual volume over time for the next 50+ years before re-harvest. Market demand @ 46 mmbf/yr was established by the Forest Service in 2016.
- **2020-2024** annual harvest is based on **12.2 mbf/ac**. **2025 and beyond** annual harvest is based on **14.6 mbf/ac** for PCTstands and **15.4 mbf/ac** for non-PCT stands, with harvest down to 4.5” tops. **All mbf/ac volumes used in analysis are recognized as conservative**.

## What we now know:

### *Based on 2015 cruise results:*

- There is **lower-cost logging operability** on almost 90% of the targeted acres (~ 45% of acres are < 30% slope; another 40% are between 30% and 50% slope).
- The PCT acres are comprised of **highly productive soils**; more than 60% of acres in all but the Wrangell RD have site index of > 90 (tree height in feet grown over a 50-year period). 40% of the non-PCT acres are in highly productive stands.
- Defect in both hemlock and spruce overall is both **comparable and low** (5% to 7%). (Old growth is typically 50% defect).
- **Trees are notably larger** (both in height and dbh) than expected, achieving desired log characteristics for small log processing technology currently being evaluated for SE Alaska. **Approximate dbh for harvest at 55 years will be between 13" to 14"; approximate tree height will be 78'.**
- Based on 2016 updated Forest Service FPS modeling and growing out for 10 years: **mean dbh change over a decade will be +1.5"; mean tree height change will be +17'.**
- Based on 2016 updated Forest Service FPS modeling and growing out for 10 years: **stands aged 50-54 years (40-44 in 2015) will produce between 16-20 mbf/ac; stands aged 55-59 yrs (45-49 in 2015) will produce 18 mbf/ac; and stands aged 60-64 yr (50-54 in 2015) will produce 24 mbf/ac.**
- Based on 2016 updated Forest Service FPS modeling and growing out for 10 years: **at least 55% of merchantable volume per stand will come from trees that produce at least 2 Grade A logs (32' log length) or one Grade A log and one Grade B log (26' - 31' log length) at harvest time at 55 years.**

## What we now know:

### *Based on past Forest Service stand exams over the last decade:*

- Over 80% of all second growth trees cruised by the Forest Service over the last ten years in the targeted PCT and non-PCT stands were aged 39 yrs or younger. Only 4% of trees cruised were in stands aged 45 - 49 years; only 1% were in stands aged 50 years and older. **The 2015 timber cruises conducted for this study supplied a significant portion of updated stand exam data for second growth stands older than 45 yrs.**
- Based on updated FPS modeling not available to the public until mid 2016, **past FS estimates on volume availability from second growth stands were under-estimated by the Forest Service** (up to 10% under-estimations for current volume conditions). **Additional under-estimations are expected** with the release of new Farr plot data showing existing Taylor growth and yield curves require adjustment upward for second growth accuracy.
- Over 60% of PCT acres and 40% of non-PCT acres are in **highly productive sites (90+ site index)**.
- **At survey time:** For PCT sites with site index 90+ at age **45-49 years**, dbh range was 13" to 16"; height range was 56' to 81'. For non-PCT sites with site index 90+ at age **45-49 years**, mean dbh was 12"; mean height was 66'. For non-PCT sites with site index 90+ at age **50-54 years**, mean dbh was 15"; mean tree height was 80'.
- For stands **49 years and younger**: **little variation** in tree height between PCT and non-PCT stands in same age class, regardless of site indices. However, **variations in tree height notable in stands aged 50 yrs and older based on site index** (90+ stands produce taller trees). Similar results noted in dbh.

## What we now know:

### ***Based on SE Alaska Industry Preparedness to Transition to Second Growth Processing:***

- Current industry operates off of three log grades: **Grade A log = 32' or longer length; Grade B log = 26' to 31' log length; Grade C = 8' to 25' log length.**
- No mills currently operating in SE Alaska have small log processing equipment in place to **efficiently process smaller diameter second growth logs.**
- New small log processing technology (HewSaw) **is readily available to beta-test on small diameter second growth logs off the Tongass.** This technology economically processes down to 4.5" diameter logs and is established small log processing equipment used in many regions across the US. Harvesting down to 4.5" tops produces notable increases in log Grade recovery.
- HewSaw equipment manufacturers **are ready to partner with industry in SE Alaska to beta-test their small log processing technology on-site in SE Alaska.**
- Good Faith Lumber Company in Thorne Bay has **offered to participate in a pilot project with HewSaw to test the technology on the harvest of their Dargon Point second growth timber sale purchase.** Assuming funding for the pilot is secured, harvest and processing will occur in 2017.
- Lessons learned from a Good Faith pilot project (Dargon Point sale) will have immediate application to larger second growth landscape: While mbf/ac off of Dargon Point appears higher than the anticipated norm (likely due to tree height), dbh is 11"- 12", matching 40-49 yr old tree characteristics cruised in 2015. **Processing of Grade A, B, and C logs from the Dargon Point sale with regard to lumber and grade recovery from log segments will directly inform transition efforts at larger scale.**

**What's next?** Getting answers to what we don't know . . .

## What we don't know . . .

### *. . . about forest inventory work underway*

We know that past Forest Service stand exams relied on a cruise protocol of one plot per 10-15 acres. We also know that variability within stands can be substantial from acre to acre (as noted in the 2015 cruise results), and that one plot per 2-4 acres cruise protocol is preferred in order to reduce high chances for error. More intensive timber cruise work is needed to shore up missing data points. As a result of the TAC recommendations, that work has already begun by the Forest Service (at one plot per 2.5 acres), but acres identified for cruising do not appear to focus on the most important acres needed for timely transition (40 to 60 year old stands). From FS data we see:

- The largest bulk (284,045 acres or 66%) of all second growth acres on the Tongass are 45 years old or younger
- Another 20% (78,844 acres) are aged 46-52 years
- Another 10% (40,360 acres) are aged 53-59 yrs
- The remaining 4% (17,456 acres) are aged 60 years and above, with 65% of those acres aged 60-69 yrs.

With only 4% of all second growth acres on the Tongass aged 60 yrs and older and past Forest Service stand exams primarily focused on 35-39 yr old acres, **current inventory work should be solely focused on those acres that could supply the production chain in the next 5 years, 10 years, and 15 years out (ie 40-59 yr old stands)**

The current forest inventory work being undertaken by the Tongass encompasses 70,000 acres, **but only 20% of acres being cruised appear to fall into the important 40-60 year age bracket.**

- 20,000 acres = old growth (30% of inventory volume)
- 15,000 acres = 50-54 yr old stands (20% of inventory volume)
- 35,000 acres = "55+" (50% of inventory volume) – with no indication that focus will be on 55 to 59 yr old stands vs. 60 yr old and older stands

## What we don't know . . .

### *. . . about wood volume and lumber grade recovery*

- Currently there is **no data available on volume recovery** from second growth supply in SE Alaska.
- Prior **limited research on grade recovery** from second growth only looked at **dimension** grade recovery, and **did not evaluate for value-added grade recovery**. The number of logs sampled in past research was very small.
- Some very limited (and not well-documented) processing of second growth supply to market has occurred at Good Faith Lumber (for TNC) and Icy Straits Lumber (for Sealaska), but in both cases supply provided to the mills for processing had been either downed or decked for several years, resulting in wood over-dryness (TNC) and a high percentage of ambrosia (Sealaska). **No testing has been done on fresh-cut second growth supply in sufficient quantities to capture market attention.**
- ***The Dargon Point sale can be effectively used as an important case study to help inform the overall second growth strategy in SE Alaska. With funding approval, this research project could be completed by end of 2017.***

## What we don't know . . .

### *. . . about replication of volume and grade recovery results at larger landscape scale*

- No data currently exists documenting application of site specific ('case study') research to **larger landscape scale replication**.
- The US Forest Service Pacific Northwest (PNW) Research Station is currently engaged in a **large scale second growth wood quality research study that would evaluate wood volume and grade recovery by species and site index from at least 10 representative second growth cut block locations across the Tongass**.
- The project would entail processing of second growth at 3 mills in SE Alaska and an outside mill employing high-tech internal log scanning technology. As much as 80 log sorts would be processed through each mill (8 sorts per cut block location for specie, age, site index, and PCT vs non-PCT)).
- Current funding for this larger scale project covers study design and peer review phase, selection of cut blocks, NEPA on cut blocks, and project budget development. **An additional \$3 million is estimated to be required to fully engage the project in the field. Currently, NEPA is not scheduled to be completed until early 2018.**
- ***Top priority should be to accelerate this project so full completion can occur by end of 2018.***

## What we don't know . . .

### *. . . about efficient processing of second growth supply*

- Application of **new small log processing technology (like HewSaw) needs to be tested** to determine appropriateness of application on SE Alaska supply and conditions
- If changes in infrastructure are required to efficiently process second growth, what are the **costs to completing infrastructure change-out** and what lead time is needed before becoming fully operational?
- Even if new infrastructure is not required (like use of existing dry kilns), securing **appropriate dry kiln schedules for processing second growth is quickly needed.**

## What we don't know . . .

### *. . . about overall economics of processing second growth supply in SE Alaska*

This remains the over-arching question surrounding transitioning to second growth supply, and rotates back to the key “what to solve for” questions and perceptions detailed earlier in this report (see pages 4-7). Key actions proposed to be accomplished in 2017 and 2018 to help address transition economics are as follows:

- 1) **Complete the Good Faith Lumber Company case study by 2017.** The case study may not be able to address volume per acre (mbf/ac) application to larger landscape scale (as the Dargon Point sale is on a karst site that , on the surface, appears to produce taller trees than other sites at same age), but it will be able to address:
  - volume and grade recovery from log *segments* (as dbh matches to other second growth sites aged 45 to 60 years)
  - harvesting costs, especially distinguishing between roaded vs non-roaded conditions for access to supply
  - processing requirements such as lumber drying schedules for second growth
  - market acceptance of products produced from second growth
  - application of new small log processing technology
  
- 2) **Secure commitment of funding to allow the larger PNW wood quality study to move quickly forward and have completion by end of 2018.**