Estimating the Range of Expected Tongass National Forest Timber Purchase and Sale Offer

Key Message

The Tongass National Forest, in compliance with the 1990 Tongass Timber Reform Act (Public Law 101-626), seeks to provide an annual supply of timber to meet market demand to the extent consistent with providing for multiple use and sustained yield of all renewable forest resources.

Issue

The 1997 Record of Decision for the *Tongass Land and Resource Management Plan* committed the Forest Service to develop procedures to ensure annual timber sale offerings are consistent with implementing the "seek to meet market demand" language of the Tongass Timber Reform Act. In April 2000, the Forest Service published its procedures in *Responding to the Market Demand for Tongass Timber: Using Adaptive Management to Implement Section 101 of the 1990 Tongass Timber Reform Act*.

The Forest Service Pacific Northwest Research Station has published several studies that estimate derived demand for timber in Southeast Alaska, most recently, Daniels et al. (2016)2. The derived demand projections from Daniels et al. (2016) were incorporated into the Morse Method and used to estimate needed Tongass National Forest timber sale offering for fiscal year 2023. A new derived demand analysis will be initiated in fiscal year 2024 to support Tongass National Forest Plan revision efforts.

Background

The Morse Method continues to be used to estimate annual Tongass National Forest timber sale offerings. The general approach of the Morse Method is to consider the timber requirements of Southeast Alaska's sawmills at different levels of operation and under different assumptions about market conditions and technical processing capacity. The procedures address the uncertainty associated with forecasting market conditions, the continuing transformation of the timber industry, and the inability of the Forest Service to respond quickly to market fluctuations due to the time involved in preparing timber for sale.

The method allows for adaptation to current situations. Since the Morse Method was developed in 2000, model inputs have been adjusted to reflect new understanding and information, such as share of raw material provided by the Tongass National Forest to local processors, lead time

between timber sale purchase and harvest, and sawmill capacity. Several changes and noteworthy events impacted FY2023 model results. Lack of response to the annual Southeast Alaska sawmill survey conducted by Alaska Region staff have introduced uncertainty in the sawmill capacity, utilization rate, and share of industry raw material calculations (Items A, B, and C). In addition, the useable wood input (Item D) was adjusted because the volume of log exports was greater than total Tongass harvest in calendar year 2022. Tongass timber management staff explain the situation as the lag in time between harvest and export. For example, timber harvested in 2021 could be stored and exported in 2022. To account for this issue, the proportion of Tongass harvest exported as logs for Alaska yellow cedar, Sitka spruce, and western hemlock was set to 100%. Another change for FY2023 is the inclusion of sales 50 MBF or greater in lead time calculations (Item F) to account for the contributions of small sale purchasers to the Tongass timber program. Previously, only sales greater than 500 MBF were included. For FY2023, Item H (probability of meeting consumption) remains at 80% to account for modest timber offerings in the prior year.

As indicated in the model, planning the annual timber program requires more than economic factors. Budget and organizational constraints such as delays in timber sale preparation, policy changes, objections, and/or litigation, limit the extent that the Forest Service can respond to economic cycles and associated fluctuations in timber demand. These factors are considered in evaluating the annual market demand for timber.

The 2023 model results are attached. View historic reports on the Alaska Region website.

For More Information

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Predicting Tongass National Forest Timber Purchases and Offer Levels – Fiscal Year 2023

Model Item	Description	Notation	Baseline	Scenario 1 Young Growth Transition	Scenario 2 Wood Energy Growth	Scenario 3 Housing Market Rebound
Demand						
A	Installed and Operable Sawmill Capacity [MMBF, Log Scale]	A	124	124	124	124
B	Industry Rate of Capacity Utilization	B	13%	13%	13%	13%
C	Share of Industry Raw Material Provided by Tongass National Forest	C	42%	42%	42%	42%
D	Percent of Useable Wood in Average Tongass National Forest Timber Sale	D	96%	96%	96%	96%
E	Annual Tongass National Forest Timber Consumption [MMBF, Theoretical]	E = ((A*B)*C)/D	7	7	7	7

F	Average Lead Time [Years]	F	1.3	1.3	1.3	1.3
G	Standard Deviation of Lead Time [Years]	G	1.06	1.06	1.06	1.06
H	Probability of Meeting Consumption [One-Tailed Test for 80% at Infinity]	H	0.84	0.84	0.84	0.84
I	Timber Inventory Requirements [MMBF]	I = (E*G) + ((E*H)*F)	15	15	15	15
J	Volume Under Contract [MMBF]	J	33	33	33	33
K	Projected Harvest [MMBF], 2023 [per PNW Research Station]	K	47	47	61	48
L	Projected Inventory Shortfall [MMBF]	L = I - J	-18	-18	-18	-18
M	Low Range of Expected Timber Purchases [MMBF], FY23	M = if L < 0, K + L, else K	29	29	43	30
N	High Range of Expected Timber Purchases [MMBF], FY23	N = if L < 0, K, else K + L	47	47	61	48
O	Expected Timber Purchases, FY23	O = median (M:N)	38	38	52	39
Offer						
P	Difference Between Volume Offered and Sold	P	42%	42%	42%	42%
Q	Offer Needed to Meet Volume Under Contract (VUC) Objectives	Q = O + (P*O)	53.7	53.7	73.8	54.9

Notes on model item data and calculations:

A. CY22 from Southeast Alaska mill survey, held constant over scenarios. Estimated from equipment installed in the mills, based on industry standard 250-day per year, two shifts per day annual operating schedule.

B. Five-year average from mill surveys held constant over scenarios

C. Five-year average from mill surveys held constant over scenarios

D. With Limited Export Policy (2007), all timber considered "useable" minus utility.

E. Auto calculation

F. Amount of time needed to replenish inventory. Sales selected for inclusion based on 1) Sale volume over 50 MBF; 2) Award date = FY15 to present. Excludes settlement, non-resource stewardship (IRSC), defaults, and study sales. Held constant over scenarios

G. Auto calculation

H. Statistical t-distribution critical value p value for one-tailed t-test I: Auto calculation

J: Sum of Tongass remaining volume under contract as of December 31, 2022 held constant over scenarios

K: Projected Tongass harvest for 2023, table 5 from Daniels et al. (2016)

L: Auto calculation

M: Auto calculation

N: Auto calculation

O: Auto calculation

P: Ten-year average of difference between Tongass timber offered and sold held constant over scenarios

Q: Auto calculation