

FOREST SERVICE HANDBOOK ALASKA REGION (R10) JUNEAU, ALASKA TIMBER APPRAISAL HANDBOOK CHAPTER 20 - LOGGING COSTS

Supplement No.: 2409.22-2018-2

Effective Date: 11/26/2018

Duration: This supplement expires 5 years from the effective date unless superseded or removed earlier.

Approved: /s/ Jeremiah C. Ingersoll

(For) Regional Forester

Date Approved: 11/26/2018

Posting Instructions: Handbook supplements are numbered consecutively by Handbook number and calendar year. Post by document; remove the entire document and replace it with this supplement. Retain this transmittal as the first page(s) of this document.

Last Change: 06/21/2013

New Document: 2409.22-2018-2, 10 Pages

Superseded Document(s): 2409.22-2013-2, 6/21/2013, 12 Pages

Digest:

<u>20</u> – Region 10 logging cost models and formulas are updated annually based on cost indices, sale footage divisors, and periodic production studies.

<u>21</u> – Updates and clarifies activities included in conventional yarding cost center. Clarifies when manufacturing cost center begins for logs rafted or barged to manufacturing facility.

<u>22</u> – Clarifies Logging System definitions. Changes short-span cable external yarding distance (EYD) to 1000 feet.

<u>23</u> – Updates instructions for appraisal line item inputs.

<u>24</u> – Removes logging cost collection.

Table of Contents

20 – LOGGING COSTS	.3
21 – Logging Cost Centers	.3
22 – Logging System Definitions	.4
23 – Appraisal Line Item Inputs	.5
24 – Logging Cost Program Maintenance	10

20 - LOGGING COSTS

Logging costs in the Region 10 Residual Value (R10-RV) appraisal spreadsheet are estimated with logging cost models and formulas developed specifically for Region 10. The cost models and formulas are updated annually based on cost indices (labor and fuel), sale footage divisors, and periodic production studies.

21 - Logging Cost Centers

1. <u>Conventional Fall, Buck, Yard, & Load</u>. All costs of felling, bucking, yarding, decking, and loading logs, trees, or products onto truck in cable and shovel logging areas (including temporary road right-of-way). Conventional yarding cost center also includes mobilization of conventional logging equipment to the sale area. Demobilization is not included because move-out is part of move-in to next timber sale. NOTE: Normal temporary road closure is included in post haul maintenance cost center.

a. <u>Activities</u>. Crew transportation, falling, bucking, and limbing merchantable, cull, and hazard trees, equipment mobilization, crew transportation, landing moves and set up, equipment operation, yarding (from stump to landing), stream protection and cleanout, fire prevention, log trimming, branding, painting, decking and loading at unit landing, normal landing maintenance and closure, and routine road maintenance.

b. <u>Cost Categories</u>. Labor, payroll assessments, fuel, parts, repairs, supplies and freight, shop, equipment operation/depreciation/lease, pro-rata general administration, and mobilization.

2. <u>Helicopter Logging</u>. All costs of falling, bucking, yarding, decking and loading logs onto truck. Helicopter yarding cost center also includes mobilization and demobilization of the helicopter to and from the sale area.

a. <u>Activities</u>. Equipment moves and operation, crew transportation, felling, bucking, yarding, trimming, branding, painting, decking and loading logs at unit landing, normal landing maintenance and closure, routine road maintenance, stream protection, fire prevention, and spill prevention.

b. <u>Cost Categories</u>. Labor, payroll assessments, fuel, parts, repairs, supplies and freight, shop, equipment operation/depreciation/lease, pro-rata general administration, mobilization and demobilization.

3. <u>Log Haul</u>. All costs of hauling logs or products by truck from unit landing to log transfer facility or mill.

a. <u>Activities</u>. Hauling logs by truck.

b. <u>Cost Categories</u>. Labor, payroll assessments, fuel, parts, repairs, supplies and freight, shop, equipment operation/depreciation/lease, pro-rata general administration, and mobilization.

4. <u>Total Rafting or Barging</u>. All costs of sorting, decking, bundling, storing, loading (logs on barge) or dumping (logs in water); constructing and reconstructing raft grounds and raft storage area; towing (barge or rafts) to manufacturing facility or storage. NOTE: Log scaling is included in manufacturing costs. Manufacturing facility establishment (including ship moorage) is also part of manufacturing costs. Manufacturing begins when logs arrive at the manufacturing destination and includes unloading and storage on land and water.

a. <u>Activities</u>. Crew transportation and travel, equipment moves and operation, log sorting, decking, bundling, loading to barge, or dumping to water; raft construction and storage, hooking to tugboat, towing to mill or logyard, salvaging lost logs, and patrolling storage areas. Normal maintenance and cleanup of sortyard, log transfer facility, log dump, raft grounds, and storage areas.

b. <u>Cost Categories</u>. Labor, payroll assessments, fuel, parts, repairs, supplies and freight, docks/floats, shop, equipment operation/depreciation/lease, pro-rata general administration, mobilization, direct and incidental towing costs, fuel, insurance, and raft facility and equipment amortization.

5. <u>Camp</u>. Costs of providing camp or temporary lodging for logging crew. Number of camp days includes both conventional and helicopter logging days.

a. <u>Activities.</u> Moving-in, setting-up, providing room/board, maintaining camp for logging crew members, dismantling camp, and moving-out.

b. <u>Cost Categories</u>. Full-camp is where logging company provides lodging, laundry, maid service, and meals. Camp may also include commissary, labor, payroll assessments, utilities, fuel, parts, repairs, supplies and freight, shop, and equipment operation/depreciation/lease, pro-rata general administration, mobilization and demobilization. Half-camp is where company provides lodging-only.

6. <u>Temporary Road and Landing Construction</u>. Costs of constructing temporary roads and landings (both temporary and permanent). Purchaser constructed road right-of-way felling and yarding costs are excluded and lumped in conventional felling and yarding cost centers. Permanent (specified) road construction, pre-haul and post-haul road maintenance are engineering cost centers.

a. <u>Activities</u>. Temporary road and landing construction, equipment moves, equipment operation.

b. <u>Cost Categories</u>. Labor, payroll assessments, fuel, parts, repairs, supplies and freight, shop, equipment operation/depreciation/lease, pro-rata general administration, and mobilization.

22 – Logging System Definitions

External Yarding Distance (EYD). The longest horizontal distance (measured on unit map) from landing to cutting unit boundary.

<u>Average Cable Yarding Distance (AYD)</u>. The average horizontal distance (measured on unit map) from landing to all logs in a setting. For example, AYD in a fan-shaped cable setting is usually 0.67 times EYD.

<u>Short-span Cable</u>. Any cable setting where longest EYD is less than or equal to 1000 feet.

<u>Long-span Cable Acres</u>. Where logs are yarded to a cable corridor greater than to 1000 feet.

<u>Short-span Cable Partial Cut Uphill</u>. Short-span cable settings (uphill yarding) where the number of merchantable leave trees will contribute to additional yarding costs. For example, more than 25 dispersed leave trees (9+" DBH) per acre may require lateral yarding to extract turns from amongst leave trees. If short-span cable partial cut includes significant areas of downhill yarding, contact Regional Valuation Staff for costing assistance. NOTE: Partial cut definition does not apply where lateral yarding is employed in a clear-cut.

<u>Cold-deck and swing</u>. This system requires two yarding operations. Typically, logs are shovel-yarded from stump to cold-deck and then cable-yarded from cold-deck to roadside landing.

<u>Shovel logging</u>. A swing-boom shovel/loader is used to repeatedly swing and deck logs progressively closer to roadside landings. NOTE: In the past, shovel yarding was typically limited to favorable ground conditions and short distances. In recent years, however, shovel logging has proven to be technically, economically, and environmentally feasible on difficult ground and further distances. Advice should be sought from sale administrators and soil specialists when shovel logging is debatable during sale preparation.

<u>Shovel Partial Cut Downhill</u>. Shovel settings (downhill yarding) where the number of merchantable leave trees will contribute to additional yarding costs. For example, more than 25 dispersed leave trees (9+" DBH) per acre may require extra time and maneuvering to extract turns amongst leave trees. If shovel partial cut includes significant areas of uphill yarding, contact Regional Valuation Staff for costing assistance.

<u>Helicopter-logging</u>. An aerial logging system utilizing helicopters to fly logs or products from stump to landing. Production, although high, typically does not cover the high operating costs. Landing location is critical, not only to reduce yarding distances and turn times, but also to provide adequate room for safe operations.

23 – Appraisal Line Item Inputs

The following data is needed for logging cost calculations and shall be entered in Input Page 1 of the appraisal program.

Line 8. <u>Appraisal Point</u>. All sales 500+ net MBF shall be appraised to Klawock. Any other appraisal point (500+ net MBF sales) requires Regional Office Forest Management Director approval. If export port other than Klawock is approved, unusual cost adjustment must include stevedore costs calculated in the 'Stevedore' tab of the R10 Logging Cost Calculator. Requests for any other appraisal point must include justification in letter from Forest Supervisor.

Line 9. <u>Cruise of Record (COR) Certification</u>. Enter Yes if COR meets all standards in FSH 2409.12. Enter No if COR includes cruise policy waivers or is prepared outside of National Cruise System, e.g. GNA.

Line 10. <u>Minimum Diameter Inside Bark (DIB) utilization</u>. Enter 7 or 9. The minimum DIB utilization standard is 7", which corresponds to a 9.0" minimum DBH. Sale-specific utilization changes require approval by Regional Office Forest Management Director (R10 FSH 2409.22_10).

Line 11. <u>Minimum DBH Utilization Standard</u>. This is a protected field and only changed after Regional Office Forest Management Director approves a sale-specific change in minimum DIB utilization.

Line 12. <u>WRC Export to Lower 48, Yes/No</u>. This is a protected field and only changed after the Regional Forester approves Western Red Cedar (WRC) for export (determined as surplus to Alaska domestic processing needs). Contact Regional Valuation Staff for assistance in appraising WRC for export.

Line 13. <u>Total Harvest Acres Including ROW</u>. Enter total sale acres (including right-ofway) as shown in Cruise A1 Report. Round acres to nearest whole number.

Line 14. <u>Total OG Net Sawlog MBF Removed</u>. Enter total volume for OG net sawlog removed shown in Cruise R001 Report.

Line 15. <u>Total YG Net Sawlog MBF Removed</u>. Enter total volume for YG net sawlog removed shown in Cruise R001 Report.

Line 16. <u>YG Helicopter Percentage by Net Sawlog.</u> Enter YG helicopter percentage (calculated by dividing YG helicopter net sawlog MBF by sale total YG net sawlog MBF). Sawlog cut volumes by unit are shown in Cruise UC5 Report. Round percentage to two decimal places.

Line 17. <u>YG Ground-Based Percentage by Net Sawlog.</u> Enter YG ground-based percentage. Round percentage to two decimal places. Sawlog cut volumes by Unit are shown in Cruise UC5 Report.

Line 18. <u>YG Short Cable Percentage by Net Sawlog.</u> Enter YG short cable percentage. Round percentage to two decimal places. Sawlog cut volumes by unit are shown in Cruise UC5 Report. Lines 19-21. <u>YG Net Sawlog MBF Removed by Logging System.</u> These are calculated fields.

Line 22. OG Helicopter Percentage by Net Sawlog. This is a calculated field.

Line 23. <u>OG Shovel Clearcut (CC) Percentage by Net Sawlog</u>. Enter OG Shovel CC percentage (calculated by dividing Shovel CC net MBF sawlog by sale total net MBF sawlog). Round percentage to two decimal places. Sawlog cut volumes by unit are shown in Cruise UC5 Report.

Line 24. <u>OG Shovel Partial-Cut (PC) Downhill Percentage by Net Sawlog</u>. Enter OG Shovel PC Uphill percentage. Round percentage to two decimal places.

Line 25. <u>OG Short Cable CC Percentage by Net Sawlog</u>. Enter OG Short Cable CC percentage. Round percentage to two decimal places.

Line 26. <u>OG Short Cable PC Uphill Percentage by Net Sawlog</u>. Enter OG Short Cable PC percentage. Round percentage to two decimal places.

Line 27. <u>OG Long Cable Percentage by Net Sawlog</u>. See definition of Long-Span Cable Acres. Enter OG Long Cable percentage. Round percentage to two decimal places.

Line 28. <u>OG Long Cable, AYD (horizontal distance)</u>. Round AYD up to nearest 50 feet. NOTE: Long Cable AYD should be at least 500 feet ($0.5 \times 1000 = 500$ rounded up to 500 feet; $0.67 \times 1000 = 670$ rounded up to 700 feet).

Line 29-34. <u>OG Helicopter, Shovel CC, Shovel PC Downhill, Short Cable CC, Short</u> <u>Cable PC Uphill, Long Cable Acres.</u> Acres are found in the Timber Sale Report. Round acres to nearest whole number.

Line 35. <u>OG Net Sawlog MBF Removed Per Piece (32 ft. avg log).</u> OG only. Enter volume shown in Cruise R001 Report. Round to three decimal places. NOTE: Average piece size should be less than 1.0 MBF.

Line 36. <u>OG Net Sawlog MBF Removed per Acre.</u> OG only. Enter volume per acre shown in Cruise R001 Report.

Line 37. <u>Haul, OG Net Sawlog MBF Removed.</u> This is a calculated field. If sale has required removal OG volume that is not hauled (i.e. heli-yarded directly to barge), contact Regional Valuation Staff for assistance.

Line 38. <u>Haul, YG Net Sawlog MBF Removed.</u> This is a calculated field. If sale has required removal YG volume that is not hauled (i.e. heli-yarded directly to barge), contact Regional Valuation Staff for assistance.

Line 39. <u>Estimated Round-Trip Truck Haul Hours.</u> Enter estimated round-tip time (RTT) in hours and round to two decimal places. The R10 Haul Round-Trip Time (RTT) Calculator (tab in R10 Log Cost Calculator) shall be used to estimate RTT for all R10-RV sales. Unit volumes from Cruise UC5 Report are entered into the Haul RTT Calculator

which calculates average driving time weighted by unit volumes. Haul RTT includes driving time plus delay. The Haul RTT Calculator automatically adds delay allowance for loading/unloading. Appraiser can add allowance for additional delay due to highway construction, winter haul, and so forth.

Line 40. <u>Round-trip Tow Statute Miles.</u> Measure round-trip tow distance on appropriate maps and round to nearest whole number.

Line 41. <u>Total Log Rafting or Barging Cost.</u> Enter total log rafting or barging cost rounded to nearest whole number. The Tow Cost Calculator (tab in R10 Log Cost Calculator) shall be used to calculate and compare total rafting vs. barging costs for all R10-RV sales requiring water transportation. Appraiser selects least cost transportation method (unless facility configuration does not allow different options). Contact Regional Valuation Staff for assistance if tow involves drop-off storage between log transfer facility and manufacturing facility, for example "Pothole".

Line 42. <u>YG Ground-based Cost \$ per Net MBF Sawlog (Including Fall & Buck)</u>. Enter YG logging cost per net MBF for sales requiring removal of YG sawlogs. The YG Stump-to-Truck Cost Calculator (tab in R10 Log Cost Calculator) shall be used to calculate YG Ground-based logging costs for all R10-RV sales.

Line 43. <u>YG Cable Cost \$ per Net MBF Sawlog (Including Fall & Buck)</u>. Enter YG cable logging cost per net MBF or sales requiring removal of YG sawlogs. The YG Stump-to-Truck Cost Calculator (tab in R10 Log Cost Calculator) shall be used to calculate YG cable logging costs for all R10-RV sales.

Line 44. <u>YG Helicopter Cost \$ per Net MBF (Including Fall & Buck)</u>. Enter YG helicopter logging cost per net MBF for sales requiring removal of YG sawlogs. Appraiser follows instructions in the RV Input Pg1 tab (cell D44) to determine appropriate YG helicopter logging cost.

Line 45. <u>Conventional (Cable, Shovel, Ground-based) Equipment Move-in Cost.</u> Enter conventional yarding equipment mobilization cost. This is the cost for moving conventional yarding equipment from previous sale to new sale area. The Conventional Equipment Mobilization Cost Calculator (tab in R10 Log Cost Calculator) shall be used to calculate conventional yarding equipment mobilization cost for all R10-RV sales requiring conventional yarding systems.

Line 46. <u>Number of Logging Days (Including Heli)</u>. Enter total logging days. The Camp Cost Calculator (tab in R10 Log Cost Calculator) shall be used to calculate total logging days for all R10-RV sales. Appraiser follows instructions within the calculator to calculate total logging days.

Line 47. <u>Total Cost for camp or lodging provided by logging company</u>. Enter total camp cost and round to nearest whole number for all sales including camp or lodging costs. Logging camp or lodging shall be included on all timber sales likely to be purchased by timber companies with 10 or more employees. The Camp Cost Calculator (tab in R10 Log Cost Calculator) shall be used to calculate camp or lodging cost. Small companies (less than 10 employees) do not provide lodging on sales within commuting distance.

Use full camp cost when logging company will likely provide lodging (with all amenities) for more than half crew, such as remote location or where full camp was provided on previous timber sale in the area. Use partial camp cost where a portion of logging crew resides in towns within commuting distance of sale and logging company provides 'lodging-only' to other crew members.

Line 48. <u>Specified Road Construction & Development</u>. Enter engineer's estimate. NOTE: All logging and engineering cost estimates should exclude profit and risk (P&R) because the effective P&R percentage in the R10-RV appraisal accounts for the P&R in all cost centers and selling values.

Line 49. Specified Road Reconstruction. Enter engineer's estimate.

Line 50. <u>Temporary Road and Landing Construction Cost</u>. Enter total temporary road and landing costs and round to nearest whole number. Use the current Tongass temporary road cost guide to estimate total cost for temporary road and landing construction. Landing costs include both temp and permanent landings.

Line 51. <u>Pre-Haul Road Maintenance Total Cost</u>. Enter engineer's estimate of necessary pre-haul maintenance costs.

Line 52. <u>Post-Haul Road Maintenance Total Cost</u>. Enter engineer's estimate of necessary post-haul maintenance costs, including surface replacement and normal temporary road closure.

Line 53. <u>Acres of Specified Road Right-of-Way associated with Timber Property Value (TPV)</u>. Calculate and enter the acres of right-of-way felled and yarded to construct Specified Roads under a public works contract. See FSH 2409.18, section 45.42.

Line 54. <u>Calculated Timber Property Value</u>. This is a calculated field based on acres entered in Line 53.

Line 55. Essential KV Total. See FSH 2409.18, section 45.42.

Line 56. <u>Other Logging Cost and Unusual Adjustments Total Amount</u>. Enter total dollar amount for other logging costs and unusual adjustments and round to nearest whole number. This includes unusual adjustments for non-typical costs, such as: additional stevedore cost, cold deck and swing; slash removal from units; unusual treatment of submerchantable material (including 9-10.9" DBH material when DIB is changed to 9"), or when submerchantable trees exceed 50 trees per acre in clearcut cutting units.

The Additional Stevedore Cost Calculator (tab in R10 Log Cost Calculator)and instructions shall be used to calculate Total Stevedore Unusual Cost Adjustment for R10-RV sales appraised to export ports other than Klawock.

Line 57. <u>Old Growth Hemlock-Spruce Export Step 1 or 2</u>. Enter '1' or '2'. Use first 'Step' with no deficit in 2400-17 cell C51. Use Step 1 if 2400-17 appraised value is positive. Only use Step 2 if Step 1 is deficit but Step 2 has a positive appraised value. If

both Step 1 and Step 2 result in a deficit appraised value consider all actions to improve sale value above minimum rates as shown in section 12.

Line 58. <u>Old Growth Hemlock-Spruce Export Step 3</u>. This is a protected field and can only be changed by Regional Office if 100% hemlock-spruce export is required for a positive appraisal with documented rationale and formal approval from Regional Forester.

Line 62-69. <u>Volume Matrix by Species, Diameter, and Grade</u>. Enter Gross and Net MBF removed by species, by log category from Cruise Report R009 Log Matrix Output file.

The following data is needed for OG helicopter logging cost calculations. Data shall be entered for each OG helicopter setting in OG Heli Input tab of the R10-RV appraisal program.

Heli Input Item 1. <u>Helicopter OG Setting Number</u>. Enter setting or unit number from which logs are yarded to a landing.

Heli Input Item 2. <u>% Basal Area Retention</u>. Enter percent basal area retention as whole number if logs will be yarded from a stand with high (equal or greater than 66%) basal area retention that will result in increased turn times.

Heli Input Item 3. <u>Uphill Yarding (yes/no)</u>. Enter "yes" or "no" whether logs will be yarded uphill from unit to landing.

Heli Input Item 4. <u>Setting Volume Net Sawlog MBF Removed</u>. Enter net MBF to be removed from setting to landing. Round net MBF to three decimal places.

Heli Input Item 5. <u>Setting AYD Horizontal Distance</u>. Measure horizontal AYD from a point on map that represents half of logs or volume to be yarded in setting to landing. Round AYD up to nearest 50 feet.

Heli Input Item 6. <u>Setting Elevation Change</u>. Calculate difference in elevation between AYD location and landing. Round elevation change up to nearest 50 feet.

24 - Logging Cost Program Maintenance

By April 1 of each year, sale administrators shall provide logging divisors and maps (on prior year's timber sale operations) to Regional Valuation Staff for timber valuation program maintenance.