26 January 2022

SENT TO LSU AGCENTER/LOUISIANA FOREST PRODUCTS DEVELOPMENT CENTER - FOREST SECTOR / FORESTY PRODUCTS INTEREST GROUP

Please find attached your complimentary copy of my quarterly Market Trends report. The fourth quarter once again saw volatile product prices, and uninspiring log prices. Demand for building products remained strong, supported by strong housing starts at the end of the year and historically strong builder sentiment. Existing homes available for sale remain very tight, while new home inventories have largely returned to historical "normal" levels. Affordability has settled lower in the face of soaring home prices, and the prospect of rising interest rates. Timberland transactions in 2021 surpassed 2020 volume, but remains subdued compared to the heady days of the 1990's and early 2000's. Timberland transaction values averaged lower in all regions in 2021.

In this quarter's Deeper Dive, I review the Carbon reports issued by all four timber REITs. Unfortunately, the lack of third-party review, uniform standards and procedures, combined with a bit of marketing spin, have resulted in some rather dubious claims, limited transparency, and inconsistent methodologies. Excerpts from the four REIT Carbon Reports are provided in the "In Case You Missed It" section of my report.

I hope that your 2022 is off to a great start and look forward to connecting at some point during the year.

Best Regards,

Will

William Sonnenfeld
WillSonn Advisory, LLC
P.O. Box 4706
Rollingbay, WA 98061-0706

Cell: 206 445-2980
Attention: My email address has changed! Please update my contact information in your records.
Email: WillSonnAdv@outlook.com

Please support our timber industry, reduce your carbon footprint, and conserve the earth's natural resources by purchasing products made from wood: America's great renewable, recyclable and sustainable resource.

Richard P. Vlosky, Ph.D.
Director, Louisiana Forest Products Development Center
Crosby Land & Resources Endowed Professor of Forest Sector Business Development
Room 227, School of Renewable Natural Resources
Louisiana State University, Baton Rouge, LA 70803
Phone (office): (225) 578-4527; Fax: (225) 578-4251; Mobile Phone: (225) 223-1931
Web Site: www.LFPDC.lsu.edu

MARKET TRENDS

4TH QUARTER, 2021

Perspectives on the latest market trends and indices impacting the Timber and Wood Products sectors, compliments of WillSonn Advisory, LLC

DISCLAIMERS

- The information provided in this presentation is for general informational purposes only. All information included herein is provided in good faith, however WillSonn Advisory, LLC makes no representations or warranties of any kind, express or implied, regarding the accuracy, adequacy, validity, reliability, availability, timeliness, or completeness of any information. This information has not been formally peer reviewed.
- WillSonn Advisory is not liable for any damages or losses arising from the use of any materials contained in this presentation, or any action, inaction, or decision taken as a result of the use of this information.
- The materials contained herein comprise the views of WillSonn Advisory, and do not constitute legal or other professional advice. You should consult your professional advisers for legal or other advice.
- The information in this presentation material may contain copyrighted material or be compiled from copyrighted material, the use of which may not have been specifically authorized by the copyright owner. This presentation material is being made available in an effort to illustrate trends and explain issues relevant to individuals interested in the Timber and Wood Products Industry and is being distributed without profit for educational purposes. In such cases, original work has been modified, reformatted, combined with other data or only a portion of original work is being used and could not be used to easily duplicate the original work. This should constitute a fair-use of any such copyrighted material as provided for in Title 17 Chapter 1, Section 107 of US Copyright Law.

Q4 2021 HIGHLIGHTS

Market Trends

- Builder sentiment and construction expenditures plateau at high levels (page 5)
- Housing Affordability settles lower as home prices soar (page 7)
- Housing Starts of 1.6 million starts registered in 2021 (page 9)
- Existing Homes for Sale plummet in Q4, New Home inventories build (page 11)
- Product Prices bounce back in Q4 as builders scramble for material (page 13)
- PNW Log prices drift sideways while Southern CNS Prices tick up again (page 15-16)
- Gross sawmill margins rebound in Q4, South remains on top (page 17)
- US Timberland Sales ends year strong, valuations drift lower in 2021 (page 18)

Deeper Dive

- A Critical Review of Four Timber REIT Carbon Reports (page 20-30)

In Case You Missed It

- Excerpts from Four Timber REIT 2020 Carbon Reports (page 32-46)

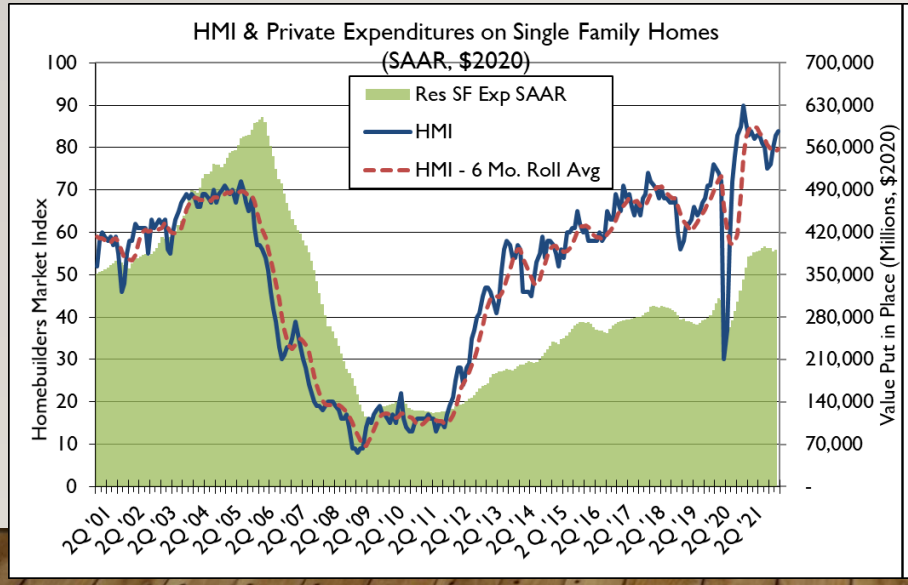
About WillSonn Advisory, LLC

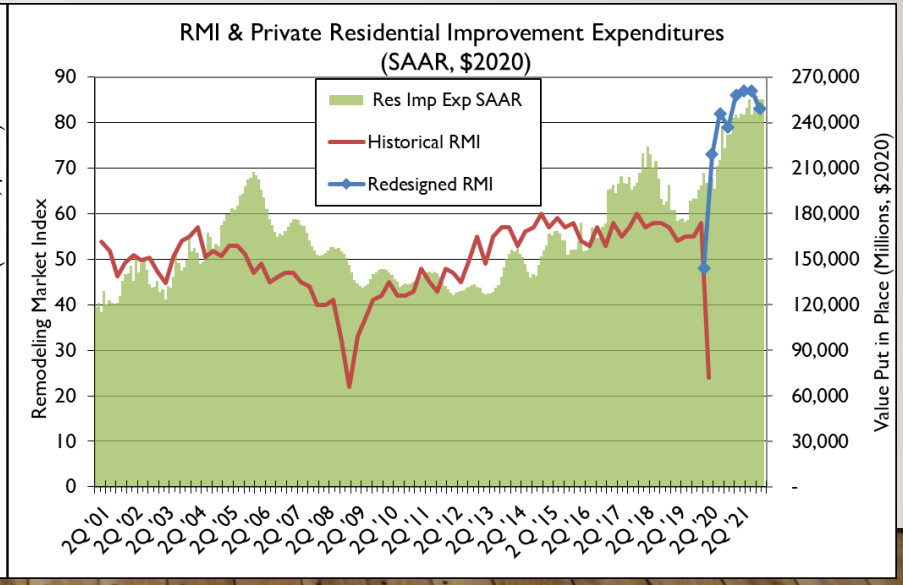
SECTION 1:

LATEST TRENDS

BUILDER SENTIMENT & PRIVATE RESIDENTIAL EXPENDITURES

- **Recent Trends**: The Homebuilder Market Index (HMI) ended 2021 with a reading of 84, down from its all-time high of 90 in November 2020. Likewise, the quarterly Remodeling Market Index (RMI) slipped to 83 in Q4 2021, coming off its all-time high of 87 in Q3.
- Single Family New Residential Expenditures exceeded 2020 levels through 11 months of 2021 by 28.5%, following a 10.0% gain in 2020. Private Residential Improvement Expenditures have continued to climb, averaging 15.4% above 2020 levels, following 2020's 17.8% increase.
- **Explanation**: The continued interest in home construction along with redirection of resources (time and money) into remodeling, pushed residential expenditures higher during the pandemic. Record building product prices and constrained labor contributed to higher construction expenditures as well, partially offset by longer construction times and somewhat smaller home sizes.
- **Implication**: Higher builder confidence generally bodes well for near to intermediate-term housing starts and therefore continued demand for building products for both construction and remodeling. Higher construction costs risk limiting the pool of qualified buyers and delays in construction. A resumption of pre-pandemic interests (e.g., travel) may undermine strength in remodeling activity.
- **Expectation**: In the longer-term, construction expenditures should see slower growth or even contraction as lower building material prices make their way through the distribution channels. Constrained supply of existing homes, developed lots and scarce labor and contractor productivity will keep residential construction and improvement expenditures elevated.

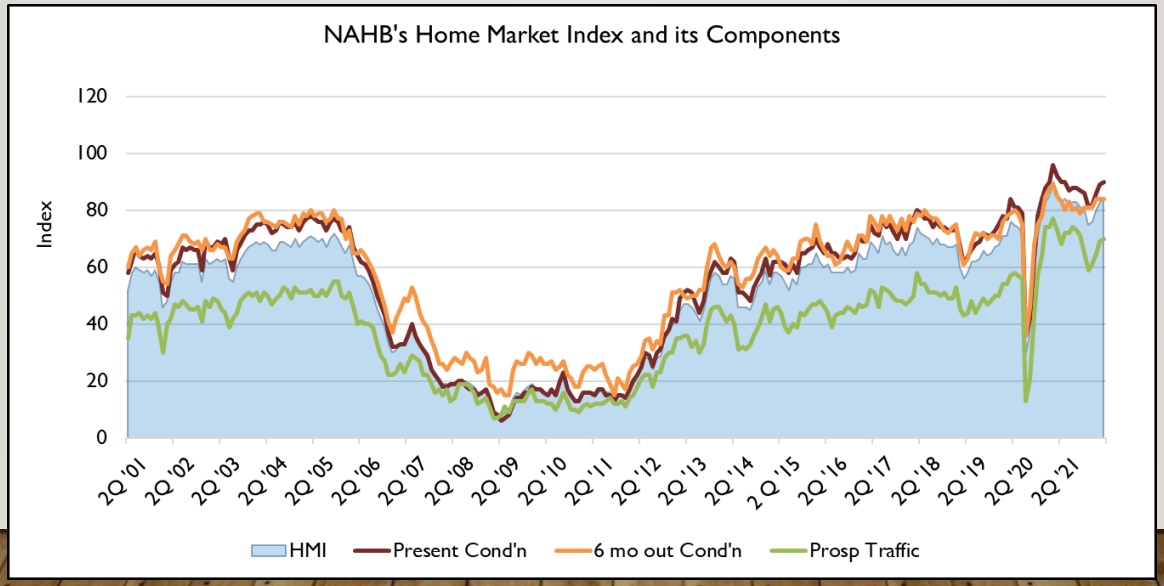




Data Sources: Census Bureau, NAHB, Dept. of Commerce Charts & Analysis: WillSonn Advisory

BEHIND THE NUMBERS: BUILDER SENTIMENT & PRIVATE RESIDENTIAL EXPENDITURES

- NAHB's Homebuilder Market Index (HMI) and Remodeling Market Index (RMI) are measures of home builder and remodeling contractor sentiment.
  - In the chart below, you see the three components of the HMI – Present Condition, Condition 6 months out, and Prospective Buyer Traffic.
  - During the pandemic, Prospective Buyer Traffic has been much stronger than in prior good markets, both in terms of the absolute number, but also relative to the other two measures.
  - Also note that the "6 month out" component is weaker than "Present" which is unusual, historically.
- Private Construction Expenditures on Single Family Housing and Remodeling are in constant 2020 dollars (i.e., inflation adjusted)
- The monthly HMI and quarterly RMI are dispersion indices, measuring the proportion of respondents who have a positive versus negative view (neutral responses are ignored in the calculation). While a reading over 50 indicates a prevailing positive view of current and future conditions, it says nothing about the proportion in the neutral camp.
  - Note that the NAHB instituted a new RMI survey beginning in Q1 2020, such that comparisons to prior years are meaningless.

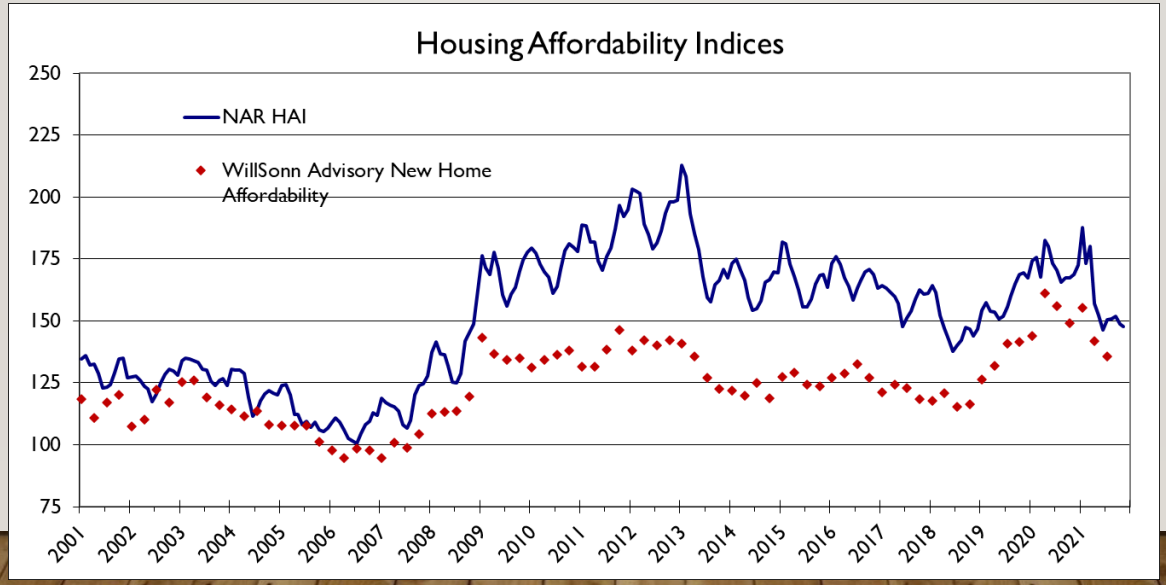


Data Sources: Census Bureau, FRED website

Charts & Analysis: WillSonn Advisory

HOUSING AFFORDABILITY

- **Recent Trends**: The Housing Affordability Index ("HAI") (blue line) shot up in January as stimulus checks hit taxpayer bank accounts. After registering 186 in January 2021, the HAI has fallen to 148 in November. The New Home Affordability (red diamonds), increased in 2020, from which it has retreated to 135 in Q3 '21.
- **Explanation**: The HAI drifted lower in 2012-18 as home price increases outpaced income growth. In 2019 and 2020, mortgage rates eased and income accelerated, bolstering affordability, but soaring home prices in 2021 pushed affordability lower.
    - As cautioned in Q2, existing home affordability was overstated in late 2020/early 2021; bidding wars pushed transaction prices above listing prices in many markets and three stimulus checks artificially (and temporarily) boosted family income figures.
- **Implication:** Over the years, there is a rather weak link between affordability and housing starts (R-squared of just .19). In fact, the highest levels of housing starts occurred when affordability was in a trough (~2006). Thus, a "fear of missing out" may have spurred some home buyers to buy sooner than later, before home ownership was forever out of reach. Easy credit back then also helped.
- **Expectation**: A battle to stem inflation will push mortgage rates higher while thin home inventories will keep home values elevated. Expect affordability to continue to drift lower in the coming months, but don't worry too much about its impact on housing starts. Also don't expect builders to pass along lower construction costs to buyers when material costs ease; they like the margins.

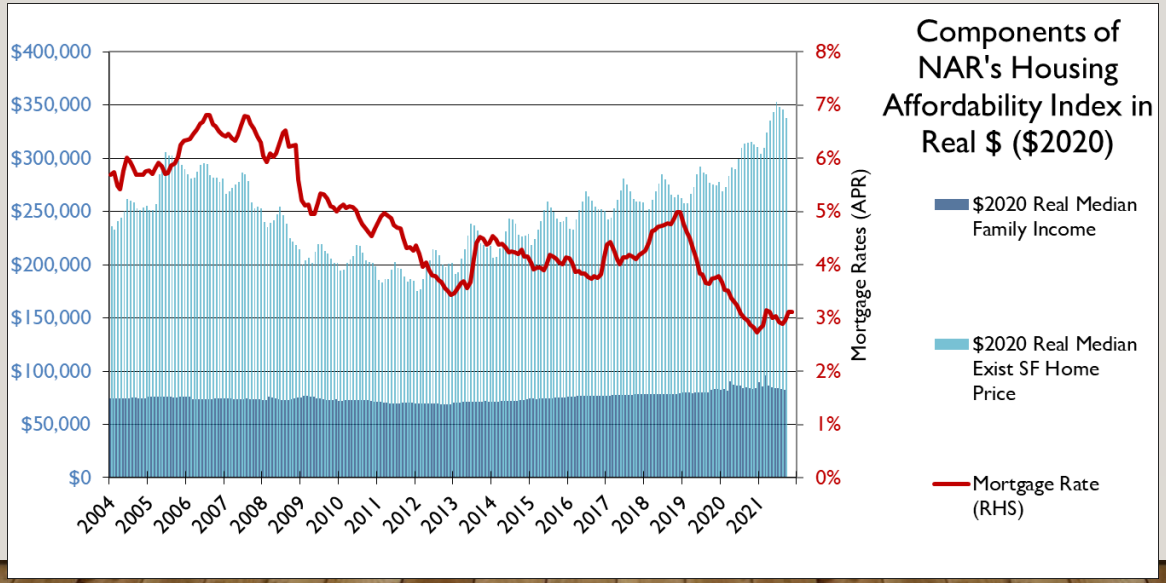


Data Sources: NAR, Census Bureau,, Dept. of Commerce

Charts & Analysis: WillSonn Advisory

BEHIND THE NUMBERS: HOUSING AFFORDABILITY

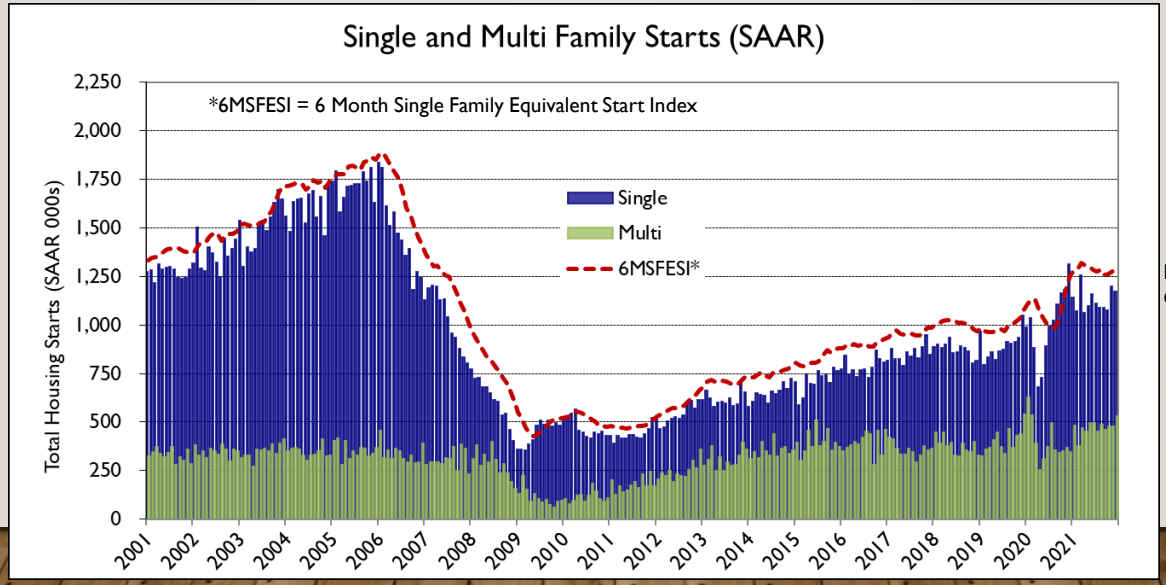
- The National Association of Realtors' Housing Affordability Index ("HAI") is based on three inputs: list prices of existing homes for sale, 30-year fixed mortgage rates and median family income. New Home Affordability uses the actual sales price of new homes, with the same income and mortgage rate figures as the HAI.
- A reading of 100 means that a family with median income would need to spend fully 25% of its monthly income on a mortgage to purchase the median priced existing home. A reading of 140 means that 25% of the median family income is 1.4 times the mortgage payment for the median priced existing home.
- This chart displays the movement in the three components of the NAR Affordability Index – home prices, mortgage rates and family income – in Real dollar terms. So far in 2021, compared to 2020, median home prices are up 16.8% and Median Family Income is up 5.1% (with the help of stimulus payments), while Mortgage rates have declined -5.6%. As a result, Mortgage Payments, as a percent of Income has increased 8.9%, resulting in the lower average YTD 2021 HAI, down -7.7% from 2020's average.
- In November 2021, mortgage rates averaged 3.12%, 33 basis point higher than January 2021 and just 5 bps below the average 2020 rate. Holding home price and income steady, a 50-basis point increase in mortgage rates drives the Affordability Index down about 10 points.



Data Sources: NAR, FRED website
Charts & Analysis: WillSonn Advisory

HOUSING STARTS

- **Recent Trends:** Total Housing Starts averaged 1.644 million units in Oct-Dec (SAAR), 18% above 2020's pace of 1.394 million units. In 2021, Housing Starts (SAAR) totaled 1.598 million units, an improvement of 17.9% versus 2020. 2021 Single Family Starts are up 15.0%, while Multi Family Starts are up 26.4%, compared to full-year 2020.
  - The WillSonn Advisory "6 Month Single Family Equivalent Start Index," recasts a multi-family unit into a single- family unit based on relative wood use, so a better measure of Housing Start's demand for wood. November's 1,281,000 unit reading represents 68% of the 2006 peak of 1.9 million SFES's.
- **Explanation**: Housing has led the economic recovery in the US during the pandemic-induced recession. Near-term demographics are supportive of a resurgence in demand for homes, both new and existing, with limited turnover of existing homes favoring new home construction. It also helps that memories of the implosion of the housing-induced recession of 2008-9 are fading over time.
- **Implication**: Housing Starts account for 30%-40% of wood usage, so rising starts are directly tied to higher lumber and panel demand.
- **Expectation**: Housing starts are expected to continue to improve over the coming months and years, as the 2008-2018 deficit of homes built is replenished and as existing homes availability is tight. Gains will be tempered by limits on construction labor, a scarcity of developed lots, long construction times, tighter construction financing standards, declining home size, and by the occasional recession.



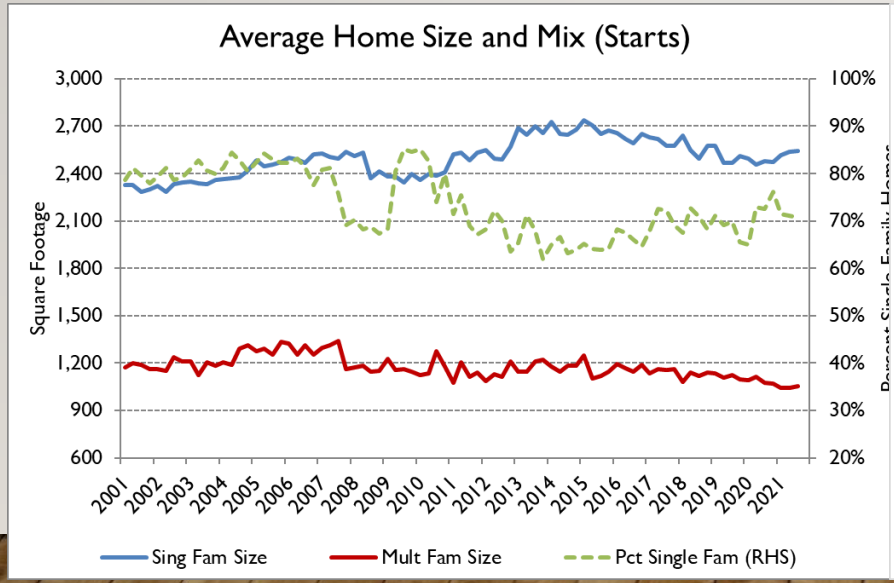
Data Source: U.S. Census Bureau
Charts & Analysis: WillSonn Advisory

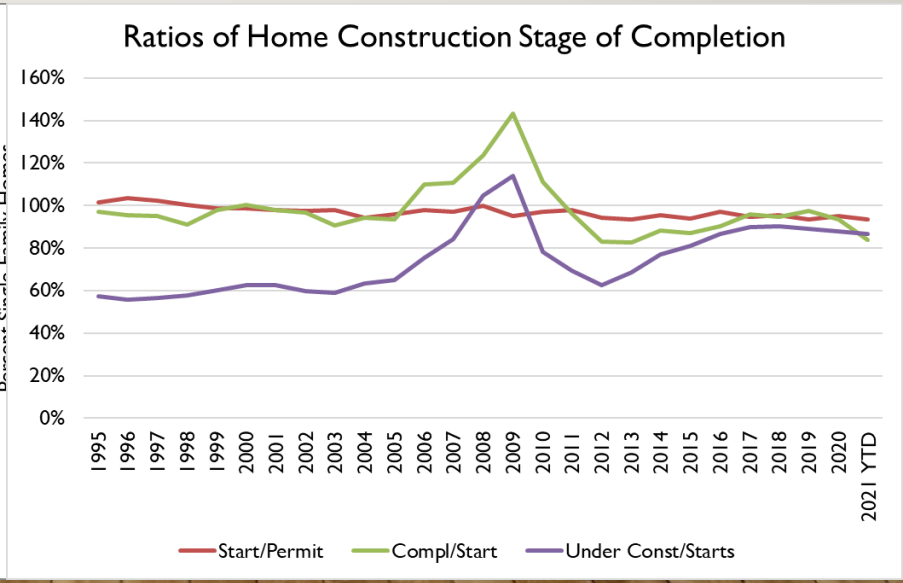
BEHIND THE NUMBERS: HOUSING STARTS

- The size of Single-Family Home Starts through the first three quarters of 2021 averaged 2,533 sq. ft., up modestly 2.3% from 2020's average of 2,476 sq. ft. The average size of Multi-Family Units started in H1 2021 averaged 1,046 sq. ft., down -3.7% from the 2020 average of 1,087. Single Family units made up 72% of Total Starts in the first nine months of 2021, the same as 2020 and 11 points below the pre-bust average of 82%.
- Multi-family units use approximately 2/3 as much wood per square foot of construction compared to a Single-Family Unit, and since Multi-Family Units are about half the size of Single-Family homes, I count them as a 1/3 single family equivalent.
- The average number of Permits increased along with Starts in 2021, with Starts averaging 93% of Permits. In the bottom right chart, you can see that the ratio of starts to permits has been declining over time, such that the old rule of thumb of ~97 Starts per 100 Permits should be lowered to 95 or lower. Also declining is the ratio of Completions to Starts (the green line), averaging just 84% in 2021. As noted earlier, the run up in construction materials, along with supply chain woes and backlogged inspections has delayed many completions so far in 2021.

Data Source: U.S. Census Bureau

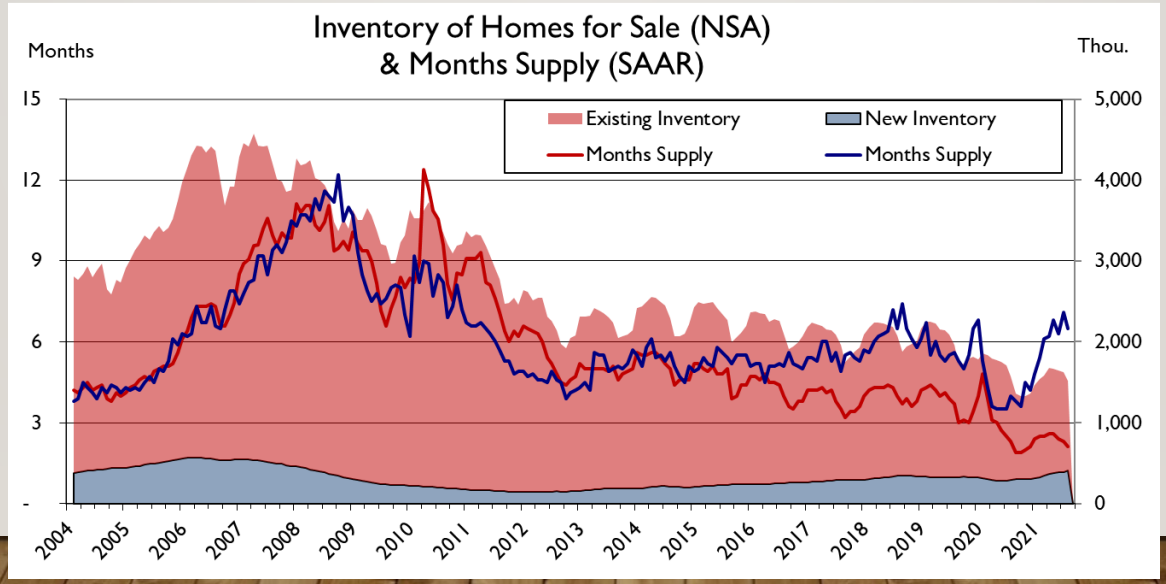
Charts & Analysis: WillSonn Advisory





PACE OF HOME SALES & INVENTORIES

- **Recent Trends**: The Inventory of Homes For Sale (Existing + New) cycled lower to 1.515 million units in November, up 153k units from December 2020, but still down -4% (55k units) from November 2020. Separately, Existing Home Inventories are down 170k units, while New Home inventories are up 115k units, compared to November 2020. At their respective current pace of sales, there are a scant 2.1 months of sales in Existing Home inventories, and 6.5 months of sales in New Home inventories. Five or six months is normal.
- **Explanation**: The inventory of existing homes has been suppressed as homeowners have stayed put, increasing tenure from six or seven years a generation ago, to nine or ten years today. New home inventories have recently recovered to the high end of the normal range as higher home prices may be driving buyers to the sidelines or looking at existing homes as new home prices rise.
- **Implication**: Tighter inventories are contributing to higher home prices, which in turn limits existing homeowners' options to purchase replacement homes, a vicious cycle. While New homes are a major user of building materials, many R&R projects occur within the first couple years of ownership, so lower Existing home turnover can have a negative effect on building products demand as well.
- **Expectation**: It is unlikely (and unwise) that the US housing market would return to frothy levels of the early 2000's when mortgage standards were lax. With the prospect of rising mortgage rates in the months to come, home price growth may slow and Existing Home inventories may recover as the pace of sales tapers off.

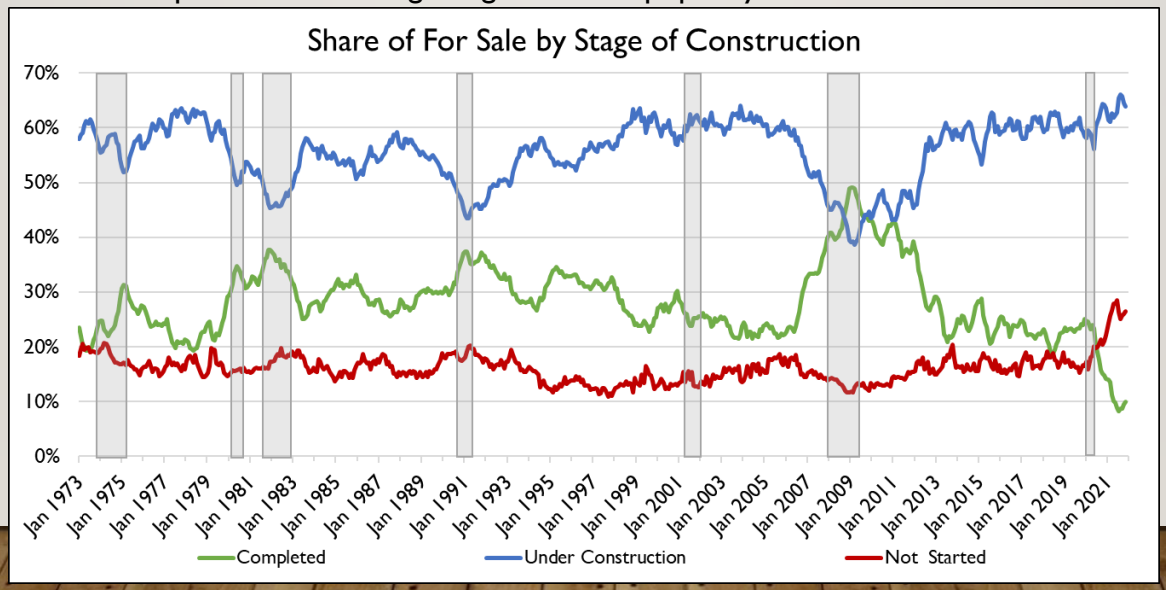


Data Source: U.S. Census Bureau, NAR

Charts & Analysis: WillSonn Advisory

BEHIND THE NUMBERS: PACE OF HOME SALES & INVENTORIES

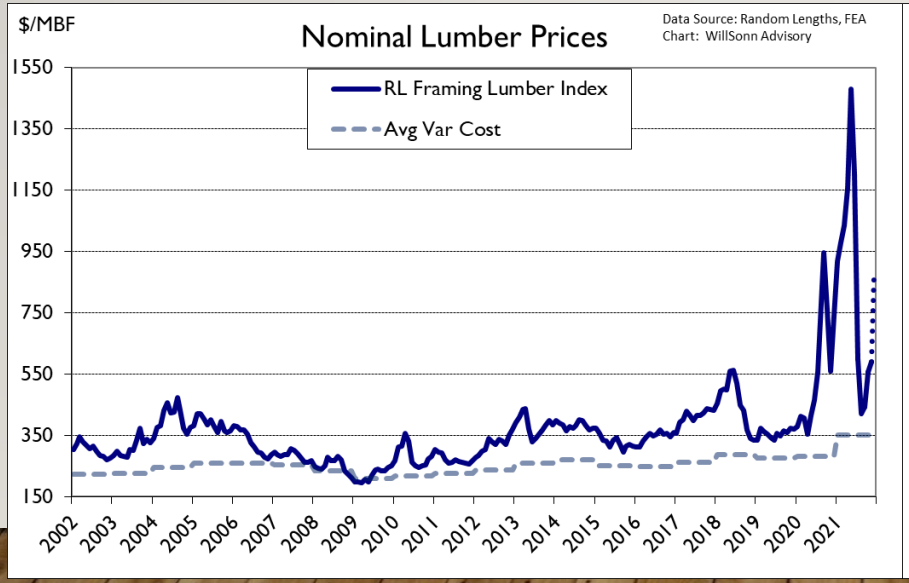
- The inventory of New and Existing homes combines data from the National Association of Realtors ("NAR") which provides data for Existing home sales (both single and multi-family homes), and the U.S. Census Bureau, which provides data for New home sales (single family only). Inventory figures are not seasonally adjusted. ("NSA"). Months Supply is derived from inventories and monthly sales volume and are seasonally adjusted (Seasonally Adjusted Annual Rate, or "SAAR").
- In the chart below, I've plotted the share of homes for sale, by stage of construction. Also shown on the chart are the US recessions, in grey bars. What I notice in this chart is that a US recession is typically accompanied by a buildup (up to 30%+) in the share of Completed Homes for Sale and the longer the recession, the more pronounced the buildup of Completed Homes becomes. These patterns are typically mirrored by a decline in the share of homes Under Construction (as builders got stuck with more completed homes on hand).
- Of the 405,000 New units for sale at the end of November 2021, only 10% were Completed (near a 47-year low), 64% were Under Construction, and 26% had Not Yet Started (just off its recent record of 29%).
- With the onset of the pandemic, and its impact on construction activity (slowed) and demand (heightened) we saw the for-sale inventory of homes Completed plummet, while the share of for-sale homes Not Yet Started climb. High Building product prices appear to be delaying the start of construction as builders try to pass off the risk of high material costs to buyers, and as buyers chose to let lumber and panel prices come down. Completed homes are getting snatched up quickly.

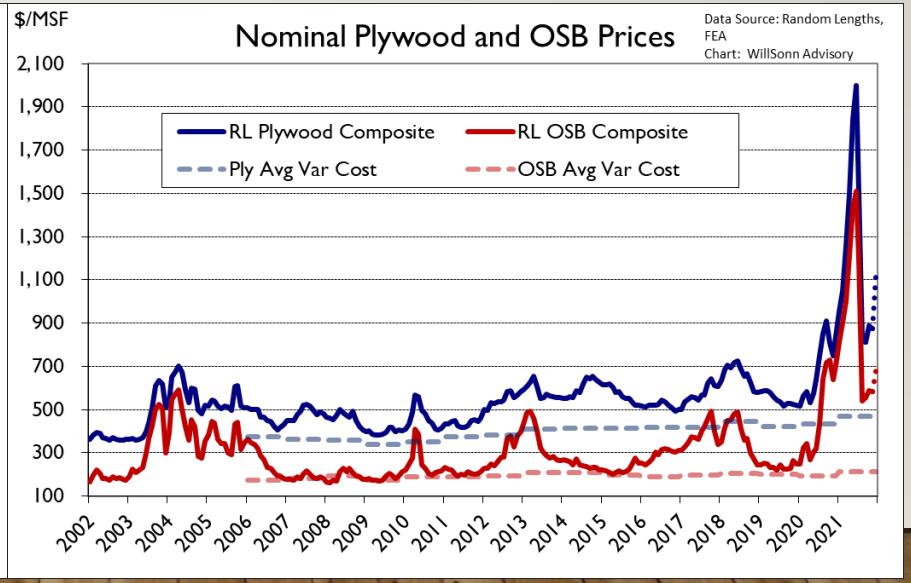


Data Source: U.S. Census Bureau, NAR
Charts & Analysis: WillSonn Advisory

WOOD PRODUCT PRICES

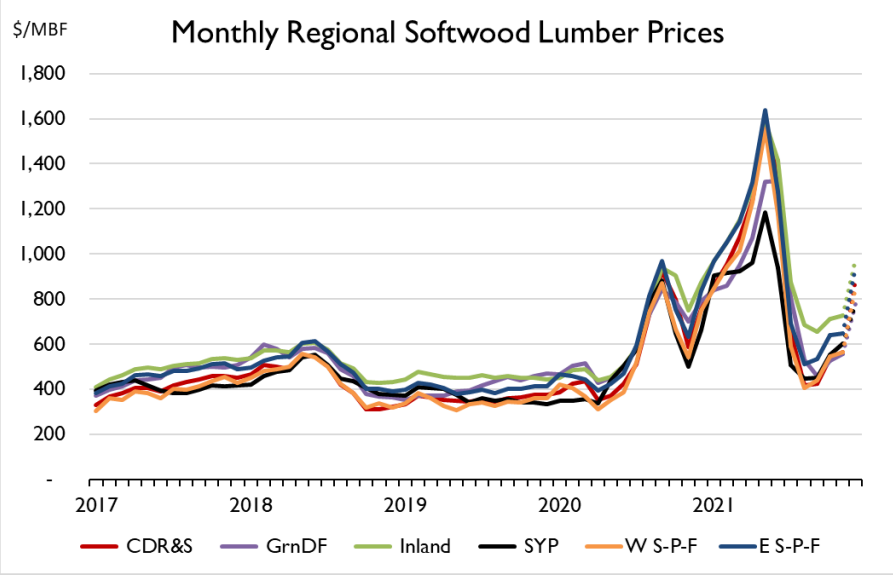
- **Recent Trends**: The Random Length Framing Lumber Composite Index in Q4 2021 gained 38% from Q3 to register 19% above Full Year 2020 prices. Panel prices lagged lumber. Plywood pricing was down again, dropping 8% in Q4 from Q3, though it remains at a level 39% above FY 2020. OSB also retreated in Q4, moving down 19% below Q3 prices. Relative to FY 2020, Q4 OSB prices remain up 31%.
- **Explanation**: Early in the year, strong housing starts drove prices higher, only to be dashed by initial reactions to stay-at-home orders related to Covid-19. When home center demand surprised on the upside, and residential construction resumed in short order, producers fell behind in shipments. Extreme price volatility has ensued as manufacturers and transportation sectors have wrestled with labor tightness, covid-related work absences and spot capacity closures for multiple quarters. Pent up demand due to high prices in Q2 led to excessive buying during the Q3 pull back in prices, which have driven prices higher late in Q4.
- **Implication**: As predicted, rising cost for home builders and remodelers caused some to delay, downsize or abandon projects, reducing demand and price. Historically, high prices have traditionally brought on additional mill shifts, a surge in imports and substitution from non-wood materials, each of which have been muted during the pandemic-induced run up.
- **Expectation**: As prices moderate and supply improves, builders and DIY demand should improve. Vaccinations should also ease labor constraints, allowing for higher production and easing of transportation bottlenecks. But with multiple waves of covid variants, it's hard to know when volatility will subside.

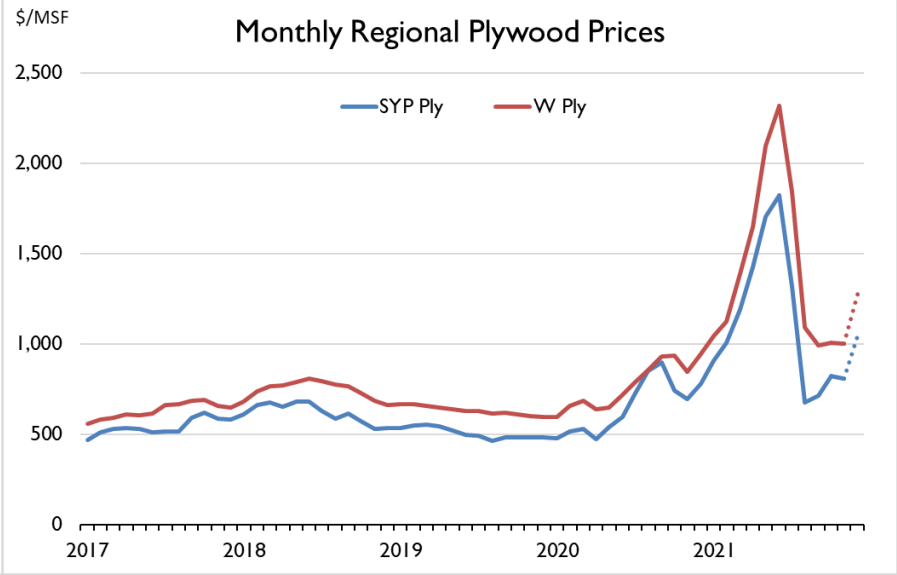




BEHIND THE NUMBERS: WOOD PRODUCT PRICES

- Record prices were enjoyed by all regions in all product segments during the second quarter of 2021, but by late summer, all regions saw a significant downward correction, only to see prices rebound unevenly going into the new year.
- Regionally in Q4 2021 relative to Q3 2021
  - West Coast lumber mills saw a 33% increase in Coastal Dry Random & Stud ("CDR&S") prices but just a 4% increase in Green DF prices
  - Inland sawmills saw prices improve a modest 9%.
  - Southern Yellow Pine ("SYP") sawmills saw prices rebound 38%.
  - Canadian components of the Random Lengths Framing Composite Index saw S-P-F prices reverse course to gain 36% and 28% in the West and the East, respectively.
- Fourth quarter plywood prices were marginally lower in both regions, with Southern Plywood prices down 1% and Western Plywood down 16% during the quarter. Panel price movements continue to lag lumber prices.

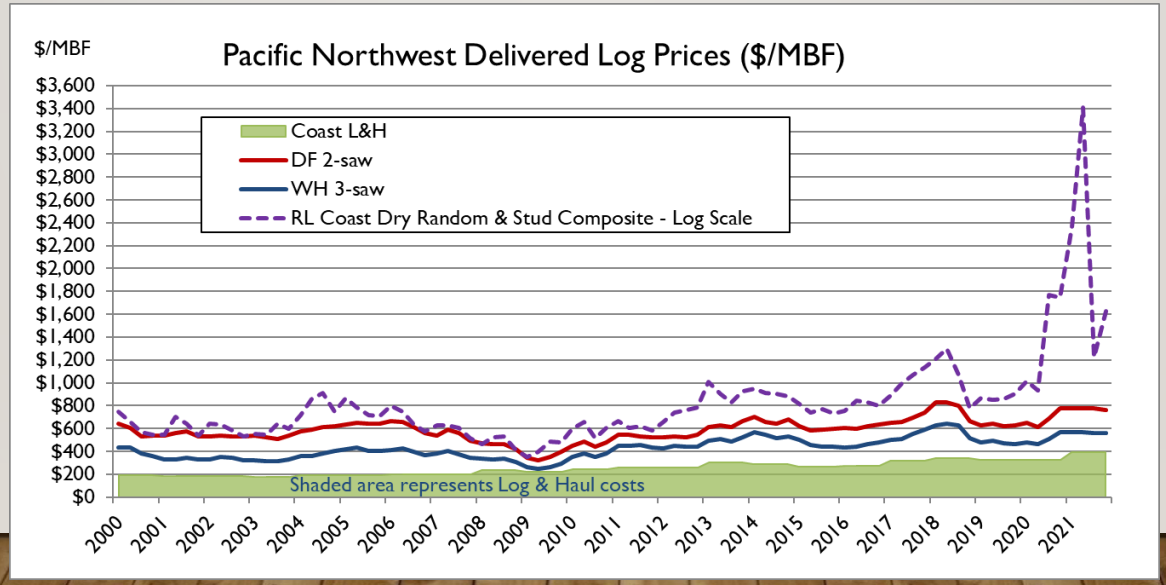




PNW LOG PRICES

- **Recent Trends**: Delivered log price movements were muted in the fourth quarter with Douglas-fir 2saw prices down -2% (but 12% above 2020 levels) and western hemlock 3saw log prices off -1% (but remain 10% above 2020 levels). Over the past 10 years, 4th quarter DF log prices have typically gained 2% while WH prices are typically flat, so this quarter's movement in DF prices was atypical.
- After adjustments for lumber recovery, the Random Lengths Coast Dry Random & Stud Composite price (on a log scale) gained over $400/MBF (33%) during the fourth quarter.
- **Explanation**: Despite high end-use demand in the midst of constrained production, western mill throughput of logs has been only modestly higher. Extensive fires throughout the West in 2020 and 2021 resulted in extensive salvage operations in 2021, keeping pressure on landowners to move logs at any price (and cost). Thankfully, the 2021 fire season (6.5 M acres YTD) was not quite as bad as 2020.
- **Implication**: Simply put, mills were able to keep log prices largely in check during the historic run-up in product prices.
- **Expectation**: Fourth quarter price movement is usually positive, with DF 2saw gaining $15/MBF and WH 3saw gaining $13/MBF over the past 10 years. Supply chains will likely remain choppy as access in the forest is limited in the short-term, and salvage operations raise costs and volumes and lower log quality in the intermediate term. Log & Haul costs are expected to remain elevated in 2022.

Historically, with about a one-quarter lag, western lumber prices have been the primary driver in West Coast domestic log pricing, though changes in supply and export log prices do exert some influence.

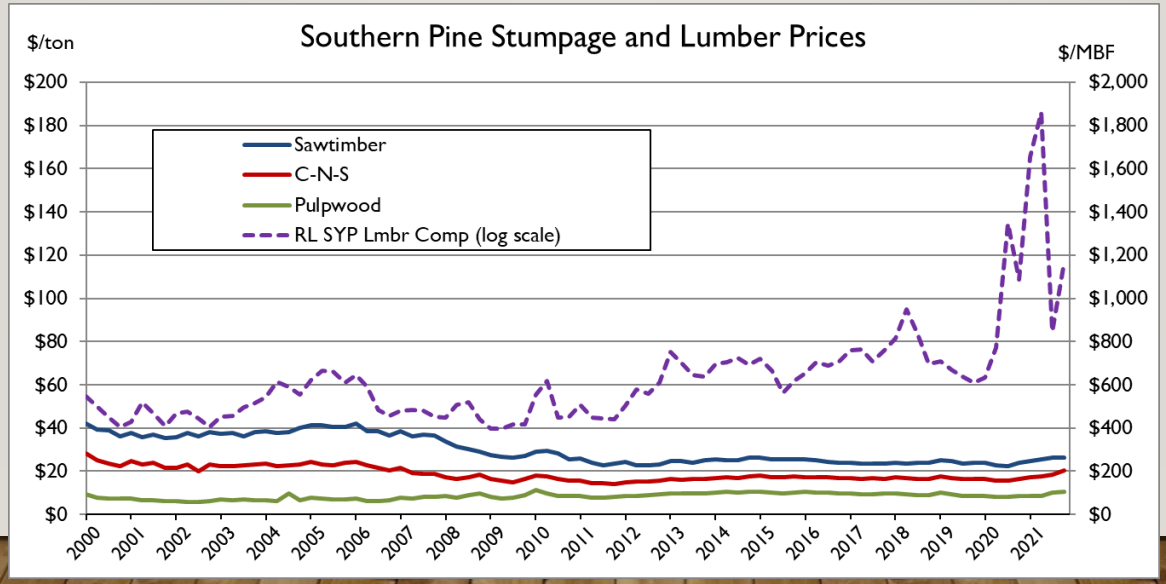


Data Source: Oregon DOF, WA DNR, Random Lengths, FEA, Log Lines

Charts & Analysis: WillSonn Advisory

SOUTHERN PINE LOG PRICES

- **Recent Trends:** Fourth quarter Southern Yellow Pine stumpage prices made varied gains across the spectrum, with big movement in Chip-n-Saw and pulpwood. SYP Sawtimber prices gained $0.20/ton in the Q4 (+1%), Chip-n-saw stumpage prices were up $1.94/ton (+11%) and pine pulpwood was up $0.57/ton (+6%). Relative to full year 2020, third quarter PST prices are up 13% while CNS and Pulpwood are both up 26%.
- The Random Lengths SYP Lumber Composite, adjusted for lumber recovery, bounced back 38% in Q4 '21 compared to Q3 '21, registering 22% above full year 2020 prices.
- **Explanation**: Q4 prices typically see prices gain of $0.20-$0.55 per ton as wet Fall weather sets in, so 2021's upward movement was certainly exaggerated for CNS and pulpwood. Q2 and Q3 in the South was unseasonably wet, compounded by improved manufacturing demand, which supported the continued uptick in price. Despite record lumber prices and increased production, sawlogs remain plentiful in the US South.
- **Implication**: As a result of the uneven price movement, Sawtimber to Pulpwood price ratios tightened with the outsized gains in pulpwood, averaging 2.5:1 in Q4, on par with the 2.5:1 ratio of the last few years. With ratios below 4:1, landowners are less inclined to grow sawtimber.
- **Expectation**: Q1 prices typically see prices gain $0.25-$0.50 per ton price as wet Winter weather continues. My longer-term view has not changed; SYP sawtimber prices will remain under pressure for an extended period as plentiful inventory on the stump, slow gains in housing starts, increased plantation productivity, and incremental improvements in mill recoveries all work against significant gains in southern log prices.



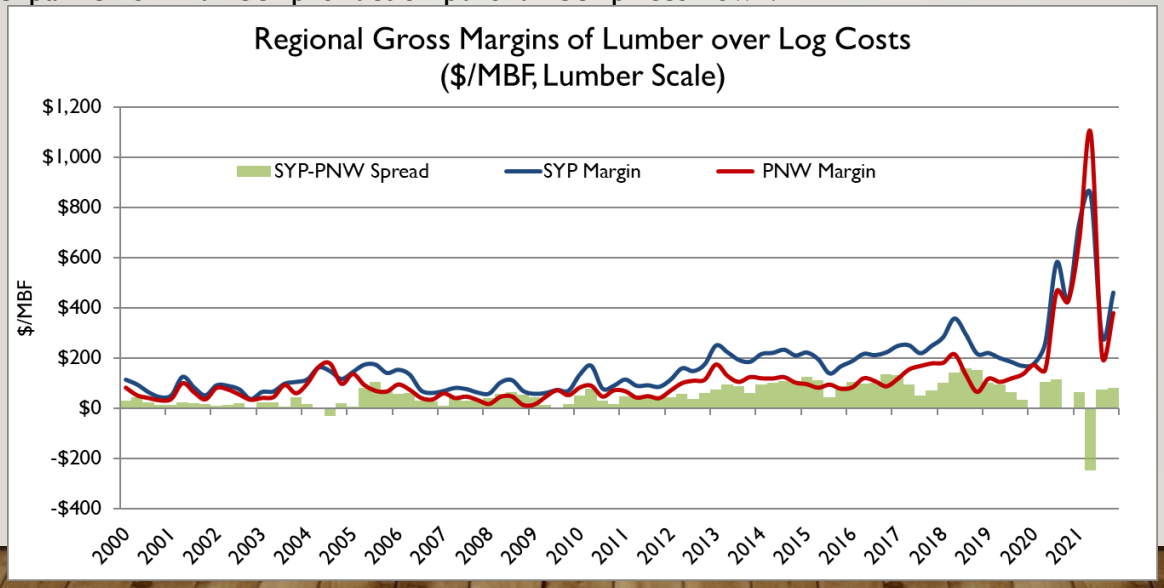
Data Source: Timber Mart South, Random Lengths, FEA

Charts & Analysis: WillSonn Advisory

REGIONAL GROSS MARGINS

Sawmill Gross Margins (lumber price minus delivered raw material costs) in the Northwest and South were derived from the figures on the previous two pages. The difference in margins between the two regions is the "spread."

- **Recent Trend:** The gross margin spread between Southern and PNW sawmills expanded slightly in Q4 to $80/MBF in favor of the South, up from $75/MBF in Q3. The $80/MBF spread compares to an average spread in 2020 of $57/MBF enjoyed by southern mills. Gross margins moved back up this quarter, from $211/MBF to $380/MBF in the PNW, and from $286/MBF to $459/MBF in the South. Since 2013, Southern sawmills have enjoyed gross margins over $200/MBF in 26 of the last 36 quarters, while PNW mill gross margins hit that mark only seven times.
- **Explanation**: Since 2012, log export markets and declining Interior BC lumber production pushed PNW log prices to historical highs. In the South, persistent excess inventories of mature sawtimber on the stump have kept downward pressure on log prices, even as lumber prices improved. Both regions saw gross margins expand during the pandemic-fueled run-up in lumber prices.
- **Implication**: Manufacturing capital investments will continue to favor the US South as its margin advantage persists.
- **Expectation**: I expect the spread between the PNW and South to settle in the $50 to $100/MBF range when lumber markets settle down, in favor of the South. These spreads will persist until standing sawtimber inventories are worked down in the South over the next several years, or until expanded SYP lumber production pulls lumber prices down.



Data Sources: Timber-Mart South, Random Lengths, FEA, Oregon DOF, WA DNR

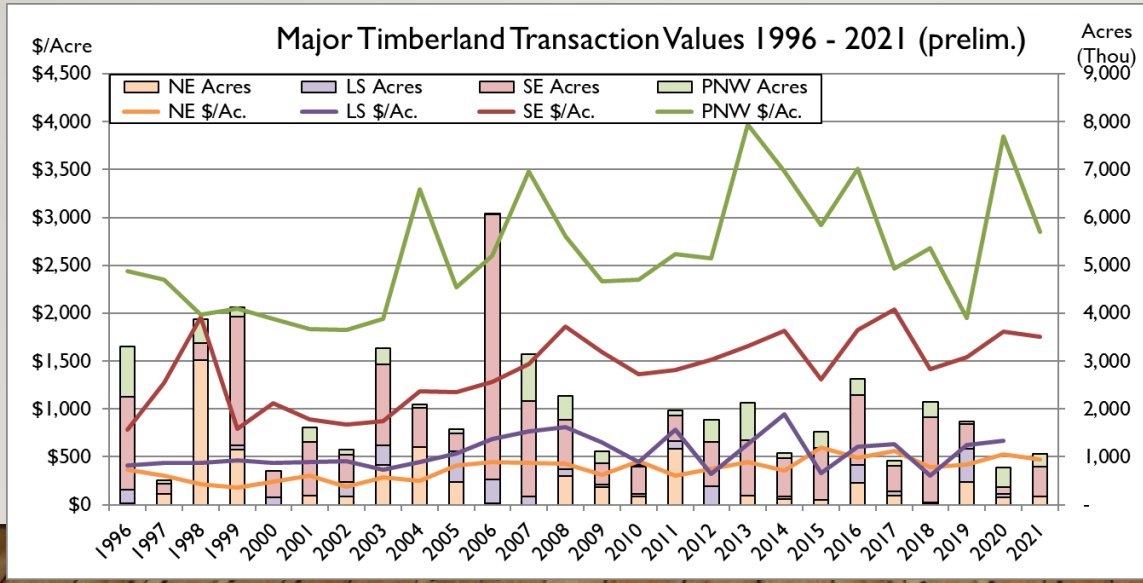
Chart & Analysis: WillSonn Advisory

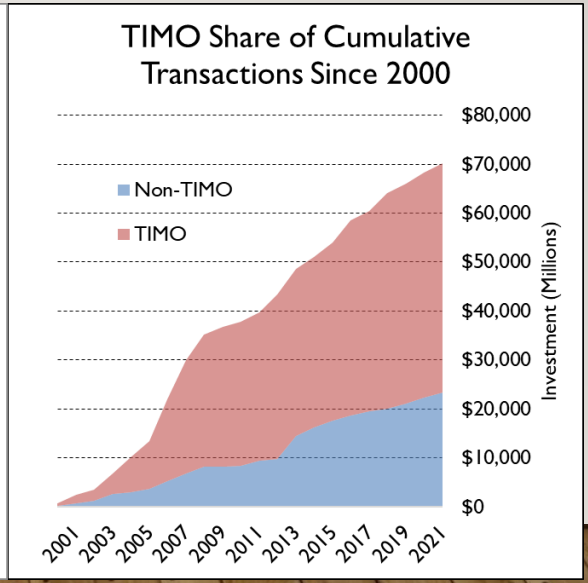
Assumptions: 67/33 weight of DF2saw and WH3saw in the PNW, and a 75/25 weight for S/T and CNS in the South (using 7.5 tons/MBF, along with FEA's estimates of Cut & Haul cost for S/T and CNS). All figures are lumber scale, and regional differences in lumber recovery factors are incorporated.

REGIONAL TRANSACTION VALUES

- **Recent Trends**: Activity through November of 2021 has been decent at $1.97 B on 1,102,000 acres, with another +/- 920,000 acres sold at undisclosed values. There may be as much as another 1.05 million acres in process which could bolster deal tallies for the year. Year-to-date, 39% (by dollar) of disclosed transactions have been made by integrated lumber producers.
- By investment sector, Timberland Investment Management Organizations ("TIMOs") have funded 67% of the acquisitions from 2016 to 2021, well above the 25% captured in the 2013-2015 period. By comparison, TIMO buyers acquired 78% of US timberlands sold (by dollar) in the previous 13 years (2000-2012).
- **Explanation**: Prices in the Pacific Northwest turned lower as PNW sales were dominated by a couple large non-strategic (i.e., lower value) sale by Weyco and Roseburg. Long-term upward price movement in the South and PNW during the 1996-2006 period reflected increased deal competition, discount rate compression and increasing use of "optimization" models in timberland valuations.
- **Implication**: As discount rates used to calculate timberland values decline, expected cash-on-cash returns to decline, all other things being equal. Optimization models used to schedule harvests and merchandize logs are "best-case scenarios," less likely to be realized.
- **Expectation**: In the near-term, integrated producers may continue to invest outsized lumber profits in timberlands. Longer-term, rising borrowing costs may erode value, but could be more than offset by buyers pricing in Carbon sales to bolster valuations.

NE: Northeast LS: Lake States SE: Southeast PNW: Pacific Northwest Not Shown: Appalachia and Inland Northwest Data Source: TMS, TMR, Press Releases Charts & Analysis: WillSonn Advisory





SECTION 2:

DEEPER DIVE

A REVIEW OF PUBLIC TIMBER REIT 2020 CARBON REPORTS

Analysis and Commentary

OVERVIEW

- During 2021, all four of the publicly traded timber REITs (Weyerhaeuser (WY), PotlatchDeltic (PCH), Rayonier (RYN) and CatchMark (CTT)) provided investors and analysts with figures relating to the Carbon impacts of their operations.
  - Weyerhaeuser: Weyerhaeuser Investor Relations - Events & Presentations Look for the September 22, 2021 WY Virtual Investor Day Presentation, pages 53-56.
  - PotlatchDeltic: PotlatchDeltic - Investor Relations Scroll down and look for the ESG Presentation, a 20-page overview (pages 9-10), or if you are feeling ambitious, download the ESG Report next to the overview on their webpage.
  - Rayonier: rayonier-carbon-report-2020.pdf
  - CatchMark: PowerPoint Presentation (investorroom.com)
- In order to develop my own independent estimates of CO_2e sequestration and emissions, I relied primarily on:
  - Each timber REIT's 2020 Annual report (acres owned and managed, timber inventory, 2020 harvest volumes).
  - USDA FS General Technical Report NE-343 "Methods For Calculating Forest Ecosystem and Harvested Carbon with Standard Estimates for Forest Types of the United States" by James E. Smith et al, 2006, ("GTR NE-343"). GTR NE-343 is based on widely used USDA Forest Service Forest Inventory Assessment ("FIA") data.
  - A number of California Air Resource Board's Forest Carbon Offset worksheets (Assessment area, mill efficiency, and individual tree species characteristics data files) to workup alternative results to cross-check results using USFS data.
- On the pages that follow, I present a summary of my analysis and issues I see with how each of the REITs report their Carbon stored, sequestered and emitted.
  - I went into this analysis open to the idea, even hopeful, that each REIT's Carbon Report was presented consistently, and that the analysis underpinning their claims were done with sufficient rigor, transparency and propriety.
  - **All of my analysis has been conducted independently, without notice, consultation or input from any of the REITs. The calculations herein (and any mistakes or errors) are my own.**
  - I encourage you to retrieve each timber REIT's report from its website, the navigation to which is provided above. Key pages in their reports are presented in the next section, In Case You Missed It, for your convenience.

ANNUAL REPORT DATA USED, WITH SOME ADJUSTMENTS

- The following data was extracted from the annual reports published by each timber REIT, with some adjustments and/or estimates made in order to fill in the gaps in disclosure and provide some consistency.
  - Rayonier's US inventory was adjusted to include "restricted" timber volumes (presumably used by them to calculate Carbon stores and sequestration rates), and 5% of western harvests were assumed to be hardwoods.
  - Weyerhaeuser's inventory was reduced slightly to exclude inventory volumes reported for pre-merchantable age timberlands.
  - PotlatchDeltic's inventory data was apportioned between hardwood and softwood species.
  - CatchMark's inventory data was apportioned between the South and the West.

	All figures in Thousands	WY		PCH		RYN - US		CTT	
	Acres Owned & Leased (12/31/2020)		Distribution		Distribution		Distribution		Distribution
1	Acres Owned - South	6,755	63%	1,118	63%	1,733	77%	390	96%
2	Acres Owned - West	2,731	26%	647	37%	507	23%	18	4%
3	Acres Owned - North	1,202	11%	0		0		0	
4	**Total Acres**	**10,688**		**1,765**		**2,240**		**408**	
	Merch Inventory (tons, inc. restricted volume)		Tons/Acre		Tons/Acre		Tons/Acre		Tons/Acre
5	Inventory - South Softwood	199,000	42	37,450	48	51,552	41	12,000	41
6	Inventory - South Hardwood	82,000		16,050		19,132		4,000	
7	Inventory - West Softwood	147,000	58	28,310	46	17,205	36	570	33
8	Inventory - West Hardwood	11,000		1,490		906		30	
9	Inventory - North Softwood	17,000	35	0		0		0	
10	Inventory - North Hardwood	25,000		0		0		0	
11	**Total Inventory**	**481,000**	45	**83,300**	47	**88,795**	40	**16,600**	41
	2020 Harvest Volume (Thousand tons)		% Harvest		% Harvest		% Harvest		% Harvest
12	Sawtimber Cut - South	11,112	8.2%	2,138	7.9%	2,243	8.6%	877	13.7%
13	Pulpwood Cut - South	12,037		2,063		3,804		1,322	
14	Sawtimber Cut - West	7,688	5.4%	1,669	6.1%	1,306	8.9%	109	20.5%
15	Pulpwood Cut - West	854		137		297		14	
16	Sawtimber Cut - North	601	2.9%	0		0		0	
17	Pulpwood Cut - North	625		0		0		0	
18	**Total Harvest**	**32,917**	6.8%	**6,007**	7.2%	**7,650**	8.6%	**2,321**	14.0%

TWO APPROACHES TO CALCULATE MTCO$_2$e IN INDUSTRIAL ROUNDWOOD

- Two approaches to calculating Metric Tons of Carbon Dioxide equivalents were evaluated.
- In the bottom left example, thousands of green English tons were converted directly to metric tonnes then adjusted for standard moisture contents by species to estimate the oven-dry weight of the wood (what I call the "Moisture Content" approach).
  - This approach is more consistent with how CARB calculates Carbon content.
- In the bottom right example, thousands of green English tons were first converted to standard unit volumes, then converted to cubic meters, and finally to oven-dry metric weight using the specific gravity of wood (the "GTR NE-343" approach).
  - This is more consistent with the approach used in GTR NE-343.
- In theory, both approaches should result in similar estimates, but they don't.
  - In the Moisture Content approach, the ratio of MTCO2e to green English tons averages ~1.0 across all regions, ranging from .85 to 1.15
  - In the GTR NE-343 approach, the ratio of MTCO2e to green English tons averages ~0.65 across all regions, generally in the .60 to .70 range.
- **In my analysis, I gave the timber REITs the benefit of the doubt and used the more generous Moisture Content approach.**

The Moisture Content Approach	Weyco South	Weyco South
	Pulpwood	Sawtimber
green English tons	**12,037**	**11,112**
ET/MT	1.102	1.102
Metric Tons	10,923	10,083
moisture content	80%	82%
OD MT wood	6,054	5,553
Pct Carbon	50%	50%
MT Carbon	3,027	2,777
CO2/C	3.667	3.667
MTCO2e	**11,100**	**10,182**

The GTR NE-343 Approach	**Weyerhaeuser**	
	Pulpwood	Sawtimber
2020 harvest - US South (tons)	**12,037**	**11,112**
Conversion to Cords and MBF	2.68	7.50
Cords of PW and MBF of sawlogs	4,492	1,482
Conversion to cubic meters	2.24	5.40
Cubic Meters	10,048	8,000
Specific Gravity (Conv. to ODMT)	0.476	0.472
Oven Dry Metric Tonnes of Wood	4,784	3,776
Pct Carbon per GTR NE343 analysis	50.0%	50.0%
Tonnes of Carbon	2,392	1,888
MT CO_2e/MTC	3.667	3.667
Tonnes of CO_2e in Industrial Rndwd	**8,771**	**6,923**

ESTIMATING THE CARBON CONTENT OF OTHER FOREST/HARVEST COMPONENTS

- Once MTCO2e was estimated for industrial roundwood (either the tons harvested and sold, or tons estimated in each company's merchantable timber inventory), I used ratios found using GTR NE-343 methodologies to estimate some of the other figures.
  - Industrial roundwood makes up approximately 45-55% of the Carbon contained in a live tree, the rest residing in the roots, bark, tops, branches, and needles or leaves. I calculated more precise figures based on the timber types by region specific to each REIT.
  - Of the industrial roundwood sold, approximately 60-70% is stored in wood products at the time of conversion (averaging approximately 30-45% over 100 years in Use and in Landfills), while the rest is either emitted or burned for energy. I calculated more precise figures based on the harvest grade mix reported by each REIT for each region.
- I also used ratios found in the yield tables found in GTR NE-343 to estimate rates of Carbon accumulation and estimates for Carbon in pre-merchantable live trees.
  - Where available (all REITs except PotlatchDeltic), I used their acres or volumes by age class detailed in their Annual Reports to develop my estimates.
  - Further refinements to my estimates were made to account for differences in pine plantation productivity classes in the US South.
- My estimates of the Carbon stored in dead material (standing and down), understory vegetation, and forest floor (together with live tree carbon, "non-soil" carbon) were also derived from regional timber-type tables found in GTR NE-343. I also used this approach to estimate the Carbon in the mineral soil, though it is acknowledged that some of the REITs could have much better inventories of soils for their respective properties.
  - I used my knowledge of dominant regional timber types and my best judgement in weighting each timber type, to develop regional averages for each REIT.

CARBON STORED IN FORESTS

- PotlachDeltic provides the greatest amount of detail for Live Tree Carbon, to be applauded.
  - However, PotlatchDeltic failed to present the (non-trivial) figure for Carbon stored in other non-soil components of the forest.
  - Details provided by the other timber REITs was sorely lacking.
- Weyerhaeuser provided a range of values for other non-soil forest Carbon stores and Carbon stored in the soil.
  - The mid-point estimate of their range will be used in my analysis that follows.
- CatchMark reported carbon stored, sequestered and emitted for its southern timberlands only, in a very summary format. My analysis ignores CTT's northwest properties as well.
- Comparative Analysis:
  - Carbon stored in the Forest (Line 26) and stored in the Soils (Line 27) on a per acre basis varied more widely than expected, despite comparable distribution of lands by region.
    - The variance between companies, of Carbon stored in the Forest (Line 26), is significantly greater than the tons per acre variance depicted on page 22 above (Line 11).
  - While PotlatchDeltic's western timberlands are located in the Inland region, where somewhat lower soil Carbon would be expected, their figure on Line 27 still appears low.
  - Likewise, CatchMark's southern timberland per acre values are well below its peers.

	$MTCO_2e$ Stored in Forest (Thousands)	**WY - Lo**	**WY - Hi**	**WY - Mid**		**PCH**	Distribution	**RYN - US**		**CTT-S**	
19	Merch Ind Logs					98,000	72%				
20	Merch other AG					27,000	20%				
21	Merch BG					11,000	8%				
22	**Merch Total**				$MTCO_2e$	**136,000**	$MTCO_2e$		$MTCO_2e$		$MTCO_2e$
23	Premerch				per Acre	9,000	per Acre		per Acre		per Acre
24	**Forests - Live**	**1,000,000**	**1,000,000**	**1,000,000**	94	**145,000**					
25	Dead logs, Understory Veg, Forest Floor	300,000	700,000	500,000							
26	**Total Forests**	**1,300,000**	**1,700,000**	**1,500,000**	140	**145,000**	82	**352,039**	157	**23,619**	61
27	Soils	1,000,000	1,900,000	1,450,000	136	72,000	41	298,848	133	20,073	51
28	**Total Carbon Stored in Forests**	**2,300,000**	**3,600,000**	**2,950,000**	276	**217,000**	123	**650,887**	291	**43,692**	107

MY ESTIMATES FOR CARBON STORED IN FORESTS

- Using the approaches described above, my estimates for Weyerhaeuser was quite close (within 5%) for each component they detailed, and reasonably close for Rayonier (~20% lower).
  - For Weyerhaeuser, I estimated more Carbon in the forest and less in the soil, the two variances largely offsetting.
  - For Rayonier, less Carbon was estimated in both categories.
- I estimated 80% more Carbon stored in the forestlands for both PotlatchDeltic and CatchMark.
  - The detail provided by PotlatchDeltic suggests that the Forest Carbon in standing and dead wood, understory vegetation and the forest floor may have been overlooked, accounting for most of the variance. Carbon residing in the mineral soil appears to be understated as well. For Carbon within merchantable trees, PCH shows a higher proportion of Carbon residing in the merchantable portion of the merchantable live trees, compared to GTR NE-343 proportions.
  - The lack of detail provided by CatchMark is perplexing. Either a number of components in the Forest were overlooked and/or CatchMark used a different approach to estimate the Carbon in the Forest, either or both of which could have resulted in lower estimates.
  - Using my estimates results in significantly less variation in Carbon Dioxide equivalents stored in the Forest, more in line with the variances seen in their reported timber inventories per acre shown on page 22 (Line 11).

	$MTCO_2e$ Stored in Forest (Thousands)	**WY - Mid**	**WSA**	**PCH**	**WSA**	**RYN - US**	**WSA**	**CTT-S**	**WSA-S**	Derived
19	Merch Ind Logs		479,300	98,000	80,577		85,879		14,810	MC est.
20	Merch other AG		524,049	27,000	86,299		89,061		14,421	WITTB
21	Merch BG			11,000						
22	**Merch Total**		**1,003,349**	**136,000**	**166,876**		**174,940**		**29,231**	GTR-343
23	Premerch		116,735	9,000	17,530		22,464		4,207	GTR-343
24	**Forests - Live**	**1,000,000**	**1,120,084**	**145,000**	**184,406**		**197,404**		**33,438**	
25	Dead logs, Understory Veg, Forest Floor	500,000	563,354		76,675		104,113		11,532	GTR-343
26	**Total Forests**	**1,500,000**	**1,683,437**	**145,000**	**261,081**	**352,039**	**301,517**	**23,619**	**44,970**	
	Total Forest MTCO2e per acre	*140*	*158*	*82*	*148*	*157*	*135*	*61*	*115*	
27	Soils	1,450,000	1,109,299	72,000	136,169	298,848	222,826	20,073	33,655	GTR-343
28	**Total Carbon Stored in Forests**	**2,950,000**	**2,792,736**	**217,000**	**397,250**	**650,887**	**524,343**	**43,692**	**78,626**	

MY ESTIMATES FOR CARBON SEQUESTERED IN THE FOREST IN 2020

- As was the case for Carbon stored in forests, the REITs varied greatly in the details they provided in their annual Carbon sequestration and emission estimates.
  - PotlatchDeltic again provided the most detail.
  - Weyerhaeuser provided a single number, so we don't know if one or more components are missing.
  - Rayonier detailed two of the four components but was silent on the other two.
  - CatchMark appeared to combine one or more categories.
  - Weyerhaeuser chose to also include Carbon sequestered in forests owned by their log suppliers, a rather dubious claim.
- In my analysis, I estimate significantly more Carbon sequestered by WY, a slightly positive net balance for PCH, and a materially lower figure for CTT. RYN's disclosure is incomplete.
  - Using the Moisture Content approach, my analysis results in Carbon Harvested as Industrial Roundwood figures that are very close to figures put forth by PCH and RYN. Hard to say for WY and CTT given their consolidated disclosures.
  - In a regulated forest, where harvest equals growth on operable timberlands, one would expect to see a slightly positive Net Change in Forest CO_2e stocks, owing to accumulations on inoperable (a.k.a., restricted) lands.
    - WY states in its 10-k that its average age of harvest in the West is 49 years, and in the South, 29 years, longer than most. We also saw on page 22 that WY is harvesting a smaller percentage of its standing inventory than its peers, particularly in the West (5.4%). It makes sense that they are in a net positive position.
    - By the same logic, we would expect CTT to report a net negative change in Forest Stocks, as it is harvesting at a rate well above its peers, at 14%.

	$MTCO_2e$ Sequestered in Forests	**WY - Mid**	**WSA**	**PCH**	**WSA**	**RYN - US**	**WSA**	**CTT-S**	**WSA-S**	
29	Carbon Sequestered in Forest (growth-mortality & decay)		81,760	7,500	11,523	11,804	15,360	858	2,413	GTR-343
30	Carbon Harvested as Industrial Roundwood		-31,850	-6,000	-5,730	-7,626	-7,343		-2,153	MC est.
31	Carbon Harvested - All Harvest Residuals		-31,609	-2,000	-5,780		-7,101	-711	-2,096	GTR-343
32	Carbon Stored - Persistent Harvest Residuals		5,763		1,038		1,312		384	GTR-343
33	**Net Change in Forest CO_2e Stocks**	**10,000**	**24,064**	**-500**	**1,050**		**2,228**	**147**	**-1,452**	
34	**Change in Forests where 3rd party logs purch'd**	**4,000**								

MY ESTIMATES FOR CARBON STORED IN WOOD PRODUCTS

- Each of the REITs enumerates the amount of Carbon stored in wood products.
  - Weyerhaeuser uses (appropriately) 100-year average storage, while the other three REITs provide storage immediately after harvesting (i.e., at year 0).
    - While PCH, RYN and CTT provide charts and tables that depict declining storage over time, these three REITs only provide Carbon Stored in the year of harvest without enumerating emissions related to their prior years' harvests. That's akin to failing to record depreciation expense for long-term assets used to generate revenues.
  - WY and PCH both have manufacturing operations, but it appears that PCH provided just the estimate for Carbon stored in wood products manufactured from the logs it harvested in 2020. WY claimed Carbon for lumber it produced from third-party logs as well.
- While it is reasonable to point out to readers an estimate for Carbon stored in wood products, it is another thing to claim the storage in the tally for your company's Carbon impact. WY and CTT explicitly "claimed" Carbon storage in wood products, for assets they no longer own.
  - To make matters worse, CTT claimed initial storage rather than 100-year average storage.
- In my estimates below, I provide both initial storage and 100-year average storage (in Use and in Landfills) for each company, based on the volume of logs harvested as industrial roundwood.
  - I did not attempt to estimate the Carbon stored in wood products produced by PCH or WY from their own mill operations, from logs sourced from third parties.
  - The figures provided for Weyerhaeuser bifurcate Carbon storage in wood products from logs harvested from WY land, some of which is contained in Line 35, the rest in line 37.
  - When estimating Carbon stored in wood products in the year of conversion, my estimates approximate those made by CTT, RYN and PCH, validating the math, but not the concept of inclusion.

	MTCO2e Stored in Wood Products	WY - Mid	WSA	PCH	WSA	RYN - US	WSA	CTT-S	WSA-S	
35	Stored in REIT Wood Products - 100-year average	11,000								
36	Stored in REIT Wood Products - Year of conversion									
37	Stored in Log Customer Wood Products - 100 yr avg.	7,000	10,592		1,917		2,183		589	GTR-343
38	Stored in Log Customer Wood Products - Yr. of conv.		19,838	3,250	3,531	4,720	4,450	1,031	1,264	GTR-343
39	Total Stored in Wood Products Claimed	**18,000**	**10,592**	**3,250**	**1,917**	**4,720**	**2,183**	**1,031**	**589**	

HOW AN AUDITOR MIGHT ASSESS THE SUFFICIENCY OF THESE CARBON REPORTS

- There are some basic accounting principles being violated in the presentation of the Carbon data by each of the timber REITs.
  - Using an audit framework can often be helpful as a checklist of what makes a table of numbers and associated footnotes (financial statements or otherwise) reliable and informative.
  - The 2020 Carbon Reports presented by each of the REITs, along with their associated footnotes, fall short of many of these objectives, in my view.
    - The table below offers my assessment (green – adequate, yellow-suspect, red – deficient).
    - Foremost among the issues with the information provided:
      - The abbreviated formats adopted by WY, RYN and CTT violate disclosure objectives and hamper evaluation.
      - Apparent incomplete data provided by each of the REITs in one or more places.
      - Relative Carbon/acre estimates that vary greatly from comparable timber inventory/acre estimates.
      - The explicit claim by WY and CTT to Carbon stored in wood products they don't own, and WY's claim to Carbon sequestered on forests they don't own.
- These quasi-accounting issues would be resolved by adoption of the formats and line items presented on pages 26 and 27, and the use of a consistent approach to generate the estimates derived.
  - Just as with accounting and reporting standards embodied in Generally Accepted Accounting Principals, the adoption of standard reporting and estimation processes are needed to instill confidence by readers of the reports, and to provide comparability between companies. Inconsistent approaches to estimating and reporting Carbon stores, emissions and sequestration is problematic for the industry as a whole.

	Carbon Stocks				Sequestered in Forest & Wood Products				
Objectives	WY	PCH	RYN	CTT	WY	PCH	RYN	CTT	*Description of Objectives*
Validity									*whether the amounts included in the statements should actually be included*
Completeness									*whether all of the amounts that should be included have actually been included*
Ownership									*items included should generally be owned before they are included*
Valuation									*amounts included are valued properly*
Classification									*amounts included are properly classified*
Cutoff									*transactions near the statement date are recorded in the proper period*
Accuarate									*details in statements agree with related subsidiary ledgers, foot to the total, and agree with the total*
Disclosure									*amounts and related disclosures are properly presented in the statements*

Key: Adequate Suspect Poor

CONCLUSIONS AND REMARKS

- Through my independent review and analysis using publicly available data and broadly accepted research, I strongly suspect that the timber REITs are using inconsistent methods for estimating Carbon stores, sequestration and emissions related to their forestry operations.
  - I was able to replicate only some of the figures, for only some of the REITs.
  - From a basic accounting perspective, it is clear that the REITs have all taken different approaches to estimating Carbon stores and net Carbon sequestration. The inconsistency in the presentation of their findings is apparent on the surface.
- The concept of claiming Carbon Sequestered in Harvest Converted to Wood Products, an asset the REITs neither own nor control, is also flawed, and contribute to a material overstatement of their Net Carbon Impact.
  - This overstatement is compounded by some REITs ignoring the current-year emissions related to the decay or burning of wood products produced from prior-years' harvests. 100-year average storage is a more reasonable approach.
  - Ultimately, it isn't the timber REIT (or the mill, or the lumber yard, or the builder) who stores the Carbon in Wood Products, it is the **homeowner** who chooses to buy or remodel a house with wood rather than steel or concrete, and the **consumer** that buys paper products rather than plastic. They should be the ones claiming credit for storing Carbon (even if only temporarily).
  - Let's also not forget that before Carbon is stored in a home, emissions occur in its delivery from the mill to the distributor to the lumberyard and to the job site, and during construction, none of which is accounted for in the analysis provided in the reports.
- The reports were not prepared by, certified by, audited by, endorsed by, verified by, or even reviewed by independent outside parties.
  - While CatchMark states that their report was "completed in consultation with GreenRaise Consulting," this weak claim speaks volumes to the potential lack of veracity of the report. Advice of a consultant is too easily dismissed.
- As an industry, it is imperative that the standards by which each firm calculates and reports its Net Carbon Impact and Carbon Stocks to the public be no less rigorous and principled than the standards by which they report their income, cash flows and financial condition to investors.
  - In today's investment environment, where ESG criteria have become an important segment for investor consideration, it is more important than ever to establish uniform standards and transparent methodologies for calculating and reporting Carbon information.
  - **The industry successfully established and adopted standards for making sustainability claims through SFI and FSC; it's time to do the same for Carbon reporting.**

SECTION 3:

IN CASE YOU MISSED IT

KEY PAGES FROM CARBON REPORTS WEYERAEUSER

OUR CARBON RECORD

Leading Our Sector in Disclosure and Methodology

CARBON REMOVALS		CARBON EMISSIONS	
Direct and Indirect – Scope 1 & 2			
Net change in our forests[1] *Net increase in aboveground forest carbon, including sequestration, harvest and mortality*	10 million	Company owned and controlled sources *Primarily natural gas used in our mills and fertilizer used in our forests*	0.4 million
		Purchased electricity *Used to power our mills*	0.6 million
Value Chain – Scope 3			
Net change in other forests from which we source[2] *Our share of the net increase in aboveground carbon*	4 million	Upstream and downstream products & services *Emissions related to customers' use of our wood fiber* *Fuel used in forestry operations & product transportation* *Emissions related to our purchased goods and services*	6 million
Stored in our wood products[3] *Climate benefit of the products we produced*	11 million		
Stored in downstream wood products[3] *Climate benefit of products customers made from our logs*	7 million		
32 MILLION $mtCO_2e$ in 2020		**7 MILLION** $mtCO_2e$ in 2020	

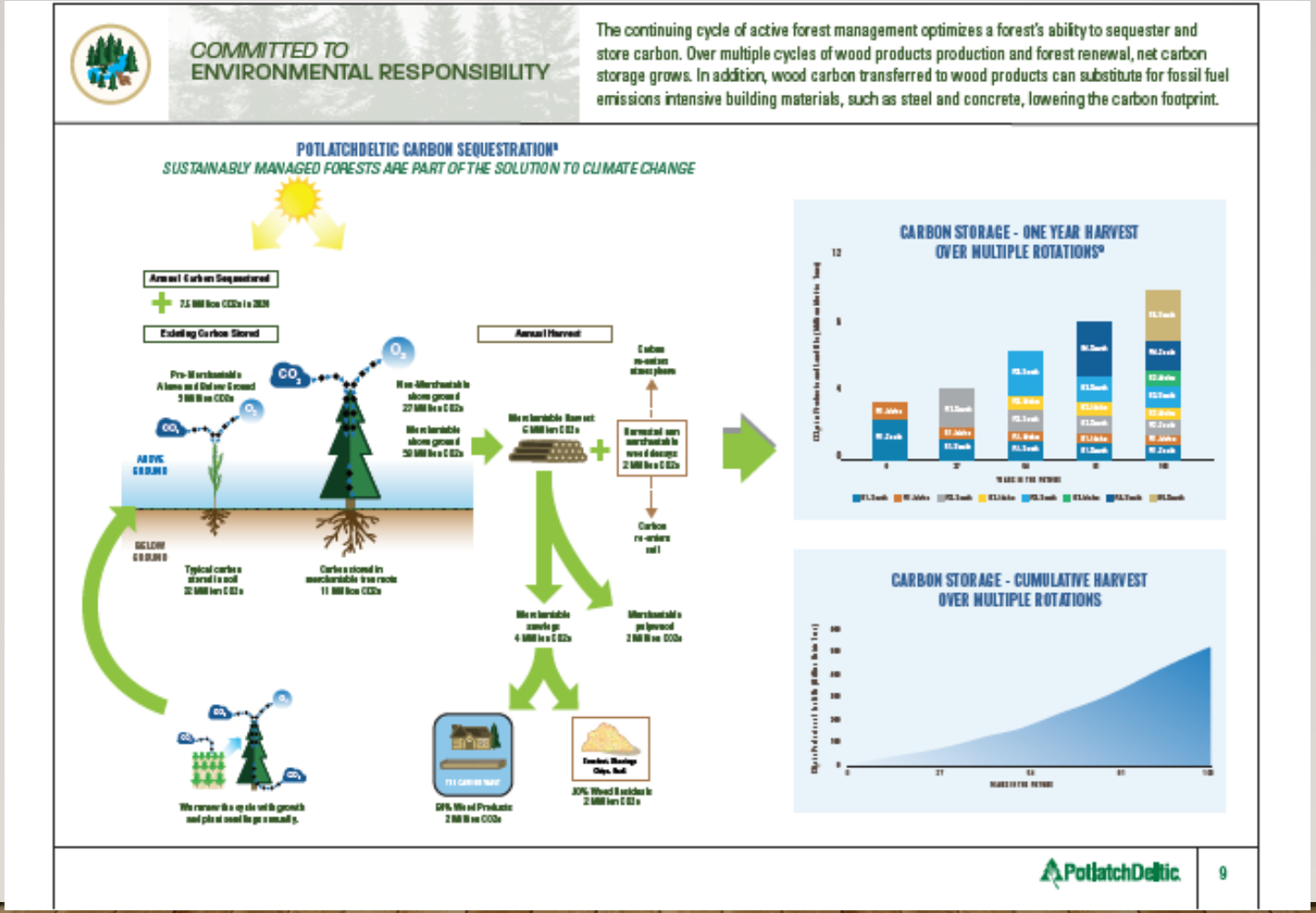
For more information on our carbon record methodology, please visit the 3 by 30: Climate Change section of our website.

(1) Using a consistent spatial boundary to assess year-over-year change.
(2) Allocation of overall net change based on public data from our fiber sourcing regions.
(3) Wood products store carbon for the life of the product. Represents average annual climate benefit over 100 years.

55

KEY PAGES FROM CARBON REPORTS WEYERAEUSER

KEY PAGES FROM CARBON REPORTS POTLATCHDELTIC



COMMITTED TO
ENVIRONMENTAL RESPONSIBILITY

The continuing cycle of active forest management optimizes a forest's ability to sequester and store carbon. Over multiple cycles of wood products production and forest renewal, net carbon storage grows. In addition, wood carbon transferred to wood products can substitute for fossil fuel emissions intensive building materials, such as steel and concrete, lowering the carbon footprint.

POTLATCHDELTIC CARBON SEQUESTRATION[a]

SUSTAINABLY MANAGED FORESTS ARE PART OF THE SOLUTION TO CLIMATE CHANGE

Annual Carbon Sequestered

Existing Carbon Stored

Annual Harvest

CARBON STORAGE - ONE YEAR HARVEST OVER MULTIPLE ROTATIONS[a]

CARBON STORAGE - CUMULATIVE HARVEST OVER MULTIPLE ROTATIONS

PotlatchDeltic

9

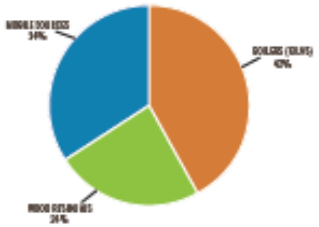
KEY PAGES FROM CARBON REPORTS POTLATCHDELTIC

COMMITTED TO ENVIRONMENTAL RESPONSIBILITY

Our consolidated scope 1 greenhouse gas (GHG) emissions are mostly from natural gas used for boilers at kilns, pollution control equipment, and mobile sources. Scope 2 GHG emissions are from purchased electricity with the lowest intensity in Idaho where electricity is produced from hydro-power. We are currently working on calculating our Scope 3 GHG emissions.

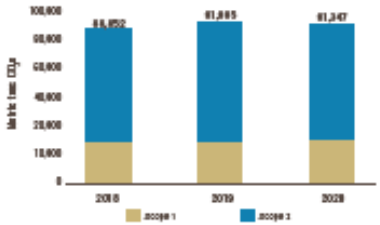
GREENHOUSE GAS EMISSIONS[12]

SCOPE 1 GHG EMISSION SOURCES

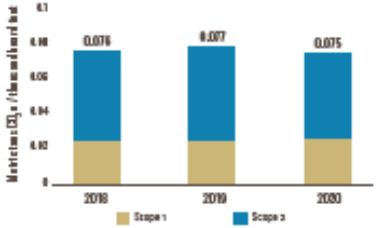


SCOPE 1 AND SCOPE 2 GHG EMISSIONS

GHG GAS EMISSIONS[1]



GHG INTENSITY[11]



- Scope 1 GHG emissions from boilers is weighted to natural gas fired boiler at Gwinn and pollution control equipment at St. Maries
- GHG emissions from wood residuals limited to methane and nitrous oxide from combustion of wood residuals
- Emissions from biogenic carbon were 465,294 metric tons of CO2e and are not included and considered carbon neutral

SCOPE 3 – EXAMPLE GHG EMISSIONS

HARVESTING[11]

Scope 3

50,089

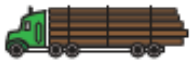
metric tons CO^2e

HAULING[1]

Scope 3

37,388

metric tons CO^1e



PotlatchDeltic 10

KEY PAGES FROM CARBON REPORTS POTLATCHDELTIC

FOOTNOTES

1. Acres in thousands, as of December 31, 2020.
2. Capacity represents the proven annual production capabilities of the facility under normal operating conditions and producing a normal product mix. Normal operating conditions are based on the configuration, efficiency and the number of shifts worked at each individual facility. In general, the definition includes two shifts per day for five days per week (two 40-hour shifts) at each facility, which is consistent with industry-wide recognized measures. Production can exceed capacity due to efficiency gains and overtime. Actual lumber production for 2020 was 1,098 MMBF. Plywood production normally expressed in square footage 3/8" basis has been converted to board feet and included in total (Plywood Production MBF = Plywood Production MSF 3/8" X 0.375 MBF/MSF 3/8"). MMBF stands for million board feet; MMSF stands for million square feet, 3/8-inch panel thickness basis.
3. Rural real estate as of December 31, 2020.
4. Actual emission calculations based on the application of accepted industry emission factors and site-specific stack test data to production throughput in board feet and/or hours of operation. Production throughput includes plywood volumes converted from square feet, 3/8" basis to board feet.
5. 1 Megaliter = 1,000,000 Liters
6. Total Energy Intensity – total energy consumed/total division production. One petajoule is equal to 1 million gigajoules. Note that total division production includes plywood volume converted to board feet. 2018 energy consumption and production includes previous Deltic-owned Ola and Waldo mills for first two months of 2018 prior to merger.
7. Total Waste Intensity – total waste generated / total division production. 2018 waste generation and production includes previous Deltic-owned Ola and Waldo mills for first two months of 2018 prior to merger.
8. Managing forests to avoid large emissions from the loss of old trees while rapidly removing CO_2 from the atmosphere through young forest growth can provide both storage and sequestration benefits.
9. R – Rotation. A rotation is the cycle of planting, growth, culture and final harvest for a single stand of trees.
10. Greenhouse gas emission estimates are based on the methods outlined in NCASI Report "Calculation Tools for Estimating Greenhouse Gas Emissions from Wood Products Facilities" Version 1.0 and associated workbook "NCASI Spreadsheets for Calculating GHG Emissions from Wood Products Manufacturing Facilities" Version 1.0. CO_2e (or CO_2 equivalent emissions) is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO_2e signifies the amount of CO_2 which would have the equivalent global warming impact. For PotlatchDeltic, CO_2e emissions include emissions of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O).
11. GHG Intensity – Total Scope 1 and 2 GHG emissions/total division production.
12. Scope 3 emissions are indirect emissions from the activities of assets in our value chain that we do not own or control (e.g., transportation and distribution, purchased goods and services, travel).
13. Estimated Scope 3 emissions for harvesting and hauling were based on sample data from fee land and stumpage sale operations in 2019 as a proxy multiplied over the 4.5 million sawlog tons used by our 7 wood products facilities to calculate total gallons of diesel fuel consumed. CO_2e were calculated from the total gallons of diesel fuel used plus a factor of 2.3 kg CO_2e/gal to account for diesel fuel production.
14. Managers include executive/senior level managers, first/mid-level managers, and professionals; Salaried Employees include all salaried employees minus fixed rate employees; Hourly employees include all hourly employees along with fixed rate employees.
15. Turnover is the number of employees who left PotlatchDeltic and whose positions were rehired. Turnover does not include retirees, students, interns and employees on long term leave of absences.
16. Total Case Incident Rate (TCIR) – (Number of OSHA recordable injuries and illnesses x 200,000) / Employee total hours worked; Days Away, Restricted or Transferred (DART) – (Number of OSHA recordable injuries and illnesses that resulted in days away, restricted or transferred x 200,000) / Employee total hours worked; Industry Averages are based on NAICS code 113 for Forestry and Logging, NAICS code 321 for the Wood Products Industry (sawmills and plywood mill combined) and NAICS code 321113 for Sawmills only.
17. More information on Idaho Fish & Games access program can be found at https://idfg.idaho.gov/access/potlatchdeltic.
18. Board tenure, age and diversity data as of May 1, 2021.

PotlatchDeltic 19

KEY PAGES FROM CARBON REPORTS RAYONIER

CARBON STORED BY OUR PORTFOLIO

Forests play a critical role in the carbon cycle, using carbon not only for growth but storing it as well. When estimating the **carbon stored** in our forests, Rayonier includes overstory trees, understory vegetation, coarse woody debris, and forest floor, as well as the soil on our land.

The amount of carbon stored in Rayonier's trees varies considerably across the portfolio depending on species, growth conditions and age.

Carbon Stored in Rayonier Forests[1] at year-end 2020
Metric Tons of CO_2 Equivalents[2]

REGION	FOREST[3]	SOIL	TOTAL ECOSYSTEM
U.S.[4]	352,038,859	298,847,876	650,886,736
N.Z.[5]	53,582,478	52,289,342	105,871,820
TOTAL	**405,621,337**	**351,137,218**	**756,758,556**

3 | Rayonier Carbon Report

KEY PAGES FROM CARBON REPORTS RAYONIER

CARBON SEQUESTERED BY OUR FORESTS

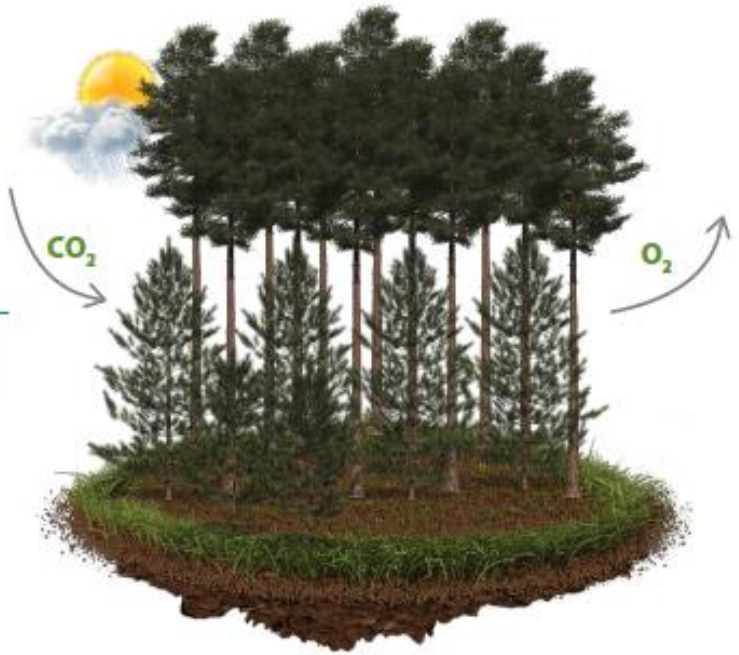
Sustainably managed working forests provide many environmental benefits — including **carbon sequestration**. Through photosynthesis, trees absorb carbon dioxide (CO_2) and convert it to stems, branches, leaves/needles, and roots, while also emitting oxygen. Importantly, younger trees generally sequester carbon at a higher rate than mature trees.

CARBON SEQUESTERED[1] BY RAYONIER'S FORESTS DURING 2020 »

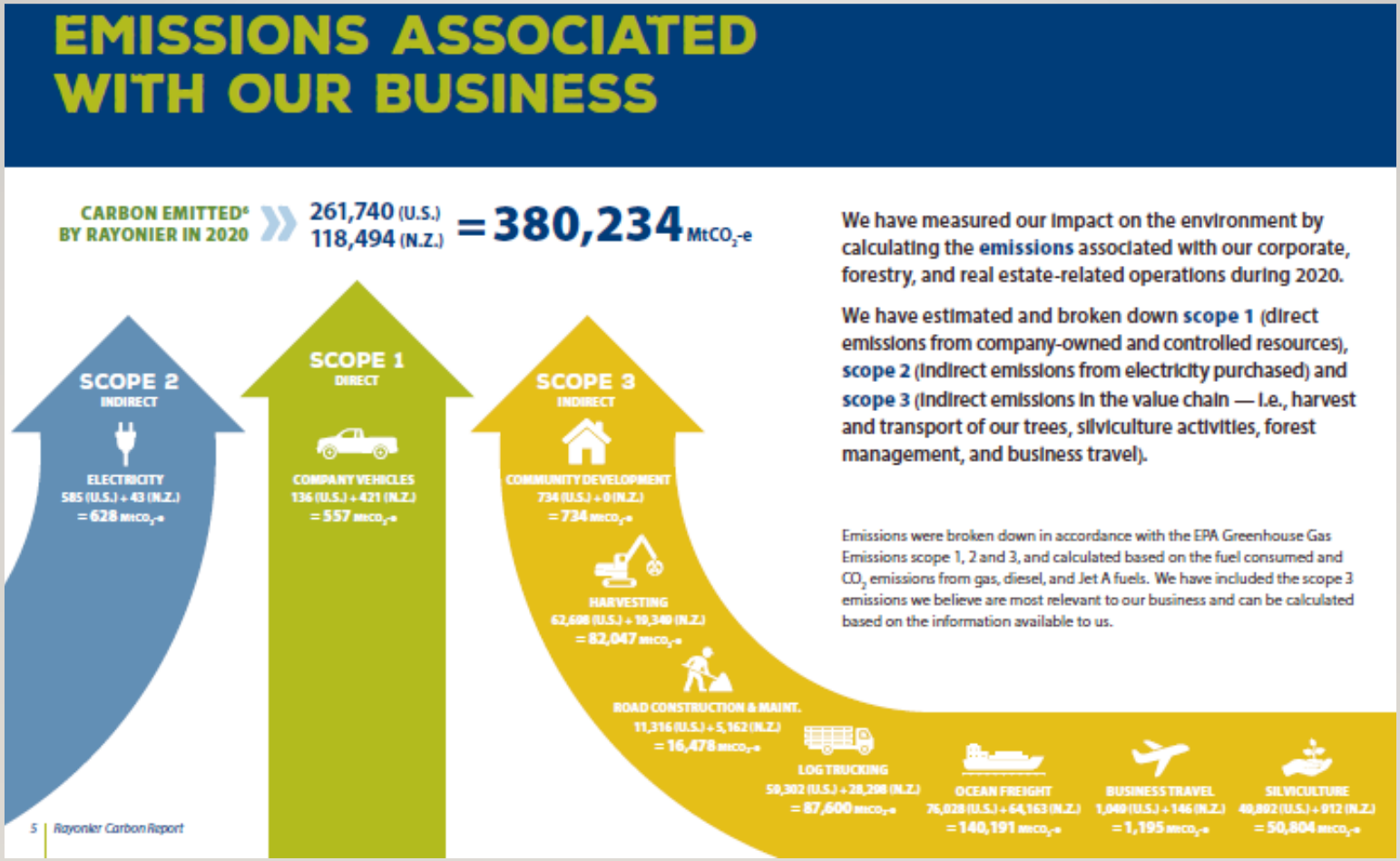
11,803,517 (U.S.)[2]
2,724,501 (N.Z.)[4]

14,528,018 $MtCO_2e$

For context, the 14.5 million metric tons of CO_2 equivalents sequestered by our forests in 2020 is comparable to the annual carbon emissions of approximately 910,000 people in the United States, or taking approximately 3.1 million vehicles off the road annually.[3]

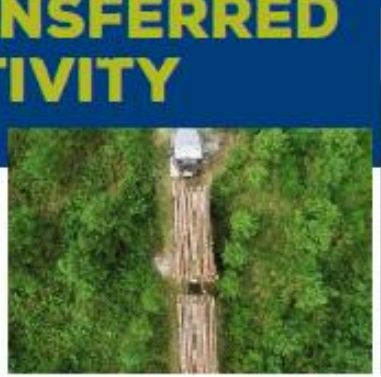


KEY PAGES FROM CARBON REPORTS RAYONIER



KEY PAGES FROM CARBON REPORTS RAYONIER

CARBON REMOVED/TRANSFERRED THROUGH HARVEST ACTIVITY



When we **harvest** our trees, we remove/transfer a portion of the carbon contained in our forests. After our trees are harvested, we then replant our forests and start the process of growing trees and sequestering carbon all over again.

CARBON REMOVED/ TRANSFERRED[7] THROUGH RAYONIER'S 2020 HARVEST ACTIVITY

7,626,367 (U.S.)[8]
1,577,703 (N.Z.)[10]

9,204,070 $MtCO_2$-e

Our estimates are based on Rayonier's actual harvest volume for the year and will fluctuate year-to-year depending on several factors, including the age and species of the trees harvested.

6 | Rayonier Carbon Report

KEY PAGES FROM CARBON REPORTS RAYONIER

PROJECTED CARBON STORAGE BENEFIT OF HARVESTED TIMBER

We have estimated our 2020 harvest volumes by product and destination. This analysis shows the carbon that remains stored in end-use forest products well after the timber has left our forests.

Importantly, life cycle assessment studies have demonstrated the additional benefit of carbon storage in wood-based building products — fewer greenhouse gas emissions (in construction and in use) as compared to other building materials, such as concrete and steel.

2020 Harvest Activity: Projected Carbon Stored in End-Use Forest Products Over Time[11]
Metric Tons of CO_2 Equivalents[2]

REGION	PRODUCT DESTINATION	CARBON REMOVED/ TRANSFERRED DURING 2020 HARVEST	2020 HARVEST CONVERTED TO PRODUCT[16]	YEARS IN THE FUTURE					
				5	10	25	50	75	100
U.S.	DOMESTIC[12]	7,283,565	4,407,968	3,435,415	2,873,120	2,294,314	1,970,627	1,814,597	1,723,002
U.S.	EXPORT[13]	342,802	312,303	149,981	80,908	24,255	6,493	2,284	858
N.Z.	DOMESTIC[14]	759,959	727,481	610,868	491,026	255,020	85,578	28,717	9,637
N.Z.	EXPORT[15]	817,744	752,171	538,409	354,493	101,180	12,519	1,549	192
TOTAL		**9,204,070**	**6,199,923**	**4,734,673**	**3,799,547**	**2,674,769**	**2,075,217**	**1,847,147**	**1,733,689**

8 | Rayonier Carbon Report

KEY PAGES FROM CARBON REPORTS RAYONIER

FOOTNOTES AND SOURCES

(1) Carbon sequestered and stored was calculated based on 2.2 million acres in the U.S. and 417,000 acres in New Zealand. Calculations do not include "look-through" acres in the Timber Funds business. Calculations based on hardwood and softwood forest types by age class for each of our regions: U.S. South, U.S. Pacific Northwest, and New Zealand. Our New Zealand calculations reflect a fully consolidated estimate, although Rayonier owns only a 77% interest in this entity.

(2) $MtCO_2e$ = metric tons CO_2 equivalent using the EPA Greenhouse Gases Equivalencies Calculator—Calculations and References. https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references

(3) U.S. carbon sequestered and stored was calculated using carbon yield tables (metric tons/hectares) developed by the USDA Forest Service in *"Methods for Calculating Forest Ecosystem and Harvested Carbon with Standard Estimates for Forest Types in the United States—GTR NE-343."* https://www.nrs.fs.fed.us/pubs/gtr/ne_gtr343.pdf

(4) N.Z. carbon sequestered and stored was calculated using regional default carbon yield tables (CO_2 -e/ha) developed by the N.Z. Ministry for Primary Industries and used as the basis of calculating carbon sequestration and emission liabilities under N.Z.'s Emission Trading Scheme (https://www.teururakau.govt.nz/dmsdocument/4762-A-guide-to-Look-up-Tables-for-Forestry-in-the-Emissions-Trading-Scheme). Estimates include both productive and non-productive areas. Estimates of carbon in non-productive areas were derived through the application of the methodology outlined in N.W.H. Mason, F.E. Carswell, J.McC. Overton, C.M. Briggs and G.M.J. Hall, February 2012. *"Estimation of current and potential carbon stocks and Kyoto-compliant carbon gain on conservation land."* Department of Conservation Te Papa Awawhai. https://www.doc.govt.nz/globalassets/documents/science-and-technical/sfc317.pdf

Note: The estimate of gross carbon sequestered in N.Z. during 2019 included carbon obtained through acquisitions during the year (comprising 1,366 ha, or 723,681 tCO_2-e). For 2020 and going forward, acquisitions are not included in annual carbon sequestered but instead reflected in year-end carbon stored.

(5) Represents overstory trees, understory vegetation, coarse woody debris, and forest floor.

(6) Carbon emissions in 2020 reflect the fuel emitted from company vehicles (Scope 1 Direct), purchased electricity from the Rayonier corporate headquarters along with our field offices (Scope 2 Indirect), and fuel associated with our real estate activities, harvest machinery, road construction/maintenance, log trucking, ocean freight, silviculture (site preparation, planting, weed control, fertilization, and pre-commercial thinning), and business travel and commuting miles (Scope 3 Indirect). Emissions were broken down in accordance with the EPA Greenhouse Gas Emissions Scope 1, 2, and 3, and calculated based on the fuel consumed and CO_2 emissions from gas, diesel, and Jet A fuels.

(7) Carbon removed/transferred in harvested timber was calculated based on Rayonier's 2020 harvest volumes in each of our regions, U.S. South, U.S. Pacific Northwest, and New Zealand, as reported on our 2020 Form 10-K.

(8) Per capita and vehicle CO_2 emissions calculated based on conversions provided by the EPA. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018. U.S. Environmental Protection Agency, EPA 430-R-20-002. https://www.epa.gov/sites/production/files/2020-04/documents/us-ghg-inventory-2020-main-text.pdf

(9) Carbon removed/transferred in U.S. harvested timber was calculated based on conversion of harvest volume green weight to oven dry weight using data in the U.S. Forest publication *"Specific Gravity and Other Properties of Wood and Bark for 156 Tree Species Found in North America – RN NRS-38."* Carbon content of the oven dry wood was calculated using the EPA Greenhouse Gases Equivalencies Calculator—Calculations and References. https://www.nrs.fs.fed.us/pubs/rn/rn_nrs38.pdf and https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references

(10) Carbon removed/transferred in N.Z. harvested timber was based on the methodology reported by Manley and Evison (2017) in *"Quantifying the carbon in harvested wood products from logs exported from New Zealand."* https://ir.canterbury.ac.nz/handle/10092/16312

(11) Carbon stored in harvested forest products was calculated based on Rayonier's 2020 harvest volumes within each of our regions, U.S. South, U.S. Pacific Northwest, and New Zealand, then sorted by product type and destination with half-life assumptions.

(12) Carbon stored in U.S. harvested forest products for domestic use, including carbon stored in landfills, was calculated based on the USDA Forest Service publication *"Methods for Calculating Forest Ecosystem and Harvested Carbon with Standard Estimates for Forest Types in the United States—GTR NE-343."* https://www.nrs.fs.fed.us/pubs/gtr/ne_gtr343.pdf

(13) Carbon stored in U.S. harvested forest products for export use was based on the half-life of forest products from logs exported to China, India, and Korea as reported by Manley and Evison (2017) in *"Quantifying the carbon in harvested wood products from logs exported from New Zealand."* https://ir.canterbury.ac.nz/handle/10092/16312

(14) Carbon stored in N.Z. harvested forest products for domestic use was based on the IPCC harvested forest products categories and half-life methodology as outlined by Wakelin et al (2020) *"Estimating New Zealand's harvested wood products carbon stocks and stock changes."* https://link.springer.com/article/10.1186/s13021-020-00144-5#citeas

(15) Carbon stored in N.Z. harvested forest products for export use was based on the half-life of forest products from logs exported to China, India, and Korea as reported by Manley and Evison (2017) in *"Quantifying the carbon in harvested wood products from logs exported from New Zealand."* https://ir.canterbury.ac.nz/handle/10092/16312

(16) Calculated to assume decay of carbon once converted into various forest products.

KEY PAGES FROM CARBON REPORTS CATCHMARK

CARBON STORED IN OUR TIMBERLANDS

CatchMark

Carbon is stored within forest ecosystems at several levels. When accounting for the carbon stored within CatchMark's forests[5], the following carbon pools were included: live trees, standing dead trees, understory vegetation, down dead wood, forest floor (organic material on forest floor including woody debris), and soil.

The amount of carbon stored within a specific forest stand varies depending on the age, growth, species and management activities applied.

CARBON STORED IN OUR FORESTS[5] ($MtCO_2e$)

Region	Forest	Soil	Total Ecosystem
U.S. South	23,619,312	20,072,933	43,692,245

6

KEY PAGES FROM CARBON REPORTS CATCHMARK

NET CARBON SEQUESTRATION SUMMARY

CatchMark

The summary below defines the amount of carbon sequestered by our forests and by harvest converted into product after incorporating the company emissions and the carbon removed through harvest. This is defined as our *Net Carbon Impact*.

A positive *Net Carbon Impact* means that our forest lands and products post-harvest are removing more CO_2 from the atmosphere than our activities related to forest harvesting have emitted and therefore are helping combat climate change.

NET CARBON IMPACT (MtCO2e/year)	
Carbon Sequestered by Forests[4]	858,219
Carbon Sequestered by Harvest Converted to Product[4, 5]	1,030,533
TOTAL CARBON SEQUESTERED	**1,888,752**
Carbon Emissions Through Forest Management	(24,151)
Carbon Emitted Through Harvest[6]	(710,575)
TOTAL NET CARBON SEQUESTERED	**1,154,025**

7

KEY PAGES FROM CARBON REPORTS CATCHMARK

CARBON STORAGE WITHIN FOREST PRODUCTS (HARVEST CONVERTED TO PRODUCT)

CatchMark

Once trees are harvested, some of the carbon continues to be stored within end-use products such as lumber, plywood wood pellets and paper.

The following analysis depicts the carbon that remains in forest products once the timber has been harvested. The amount of carbon that decreases as the years progress into the future represents the eventual decay or burning of forest products after their term of use and the resulting release of CO_2. The long-term carbon storage of wood products is one of the many benefits timber products have over other construction products such as steel or concrete.

The analysis was conducted by utilizing 2020 harvest volumes by product type and region.[5]

2020 HARVEST ACTIVITY: PROJECTED CARBON STORED IN FOREST PRODUCTS (metric tons of CO_2 equivalent)

	Carbon Stored in Harvested Products	Years in the Future					
		10	20	30	50	80	100
U.S. South	**1,030,533**	663,283	554,530	508,541	454,898	413,533	397,141

10

KEY PAGES FROM CARBON REPORTS CATCHMARK

NOTES

CatchMark

All data as of 12/31/2020 except as otherwise noted.

1. This Carbon Report focuses on the acres owned in the U.S. South and does not include the any acreage in the Pacific Northwest or interests in property held through joint ventures, all of which have been sold as of the date of this report.
2. CatchMark owned acreage as of 12/31/2020 in the U.S. South.
3. All values were calculated to determine metric tons of Carbon and multiplied by the factor of 3.667 (International Panel of Climate Change (2006). Guidelines for National Greenhouse Gas Inventories. Vol. 4. Agriculture, Forestry and Other Land Use) to convert to metric tons of carbon dioxide equivalents (MtCO2e)
4. International Panel of Climate Change (2006). Guidelines for National Greenhouse Gas Inventories. Vol. 4. Agriculture, Forestry and Other Land Use) to convert to metric tons of carbon dioxide equivalents (MtCO2e)
5. Carbon stored in forest products was calculated from harvest depletion data obtained from CTT, utilizing the i-Tree Harvest Carbon Calculator online https://harvest.itreetools.org/
6. Calculated based on CatchMark's 382,554.55 acres of CTT forest land within the U.S., including Georgia, Alabama, Florida, and South Carolina. Areas reported are net acres and do not include non-productive stands.
7. Source: U.S. EPA Greenhouse Gas Equivalencies Calculator. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
8. Scope 1 direct emission sources: Purchased fuel for company vehicles and purchased quantities of commercial fuels (gallons).
9. Scope 2 Indirect emission sources: Consumption of electricity by state (kWh).
10. Scope 3 Indirect emission sources: Business travel by air and vehicle (miles), fuel consumption by contractor vehicles and equipment (gas, diesel, gallons).
11. Air travel was calculated based on UK Dept. for Business, Energy & Industrial Strategy Air Transport Emission Factor of 11.2 kgCO2/vkm
12. 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Rep. No. Volume 4. Agriculture, Forestry and Other Land Use). (2006). Retrieved July 1, 2021, from Intergovernmental Panel on Climate Change website.

This report was completed in consultation with GreenRaise Consulting. GreenRaise Consulting GmbH (as a spin off of Zimmfor Management Services Ltd.) is a leading global specialist in the field of Greenhouse Gas (GHG) emission programs, management systems and third-party certification. www.green-raise.com; www.zimmfor.com

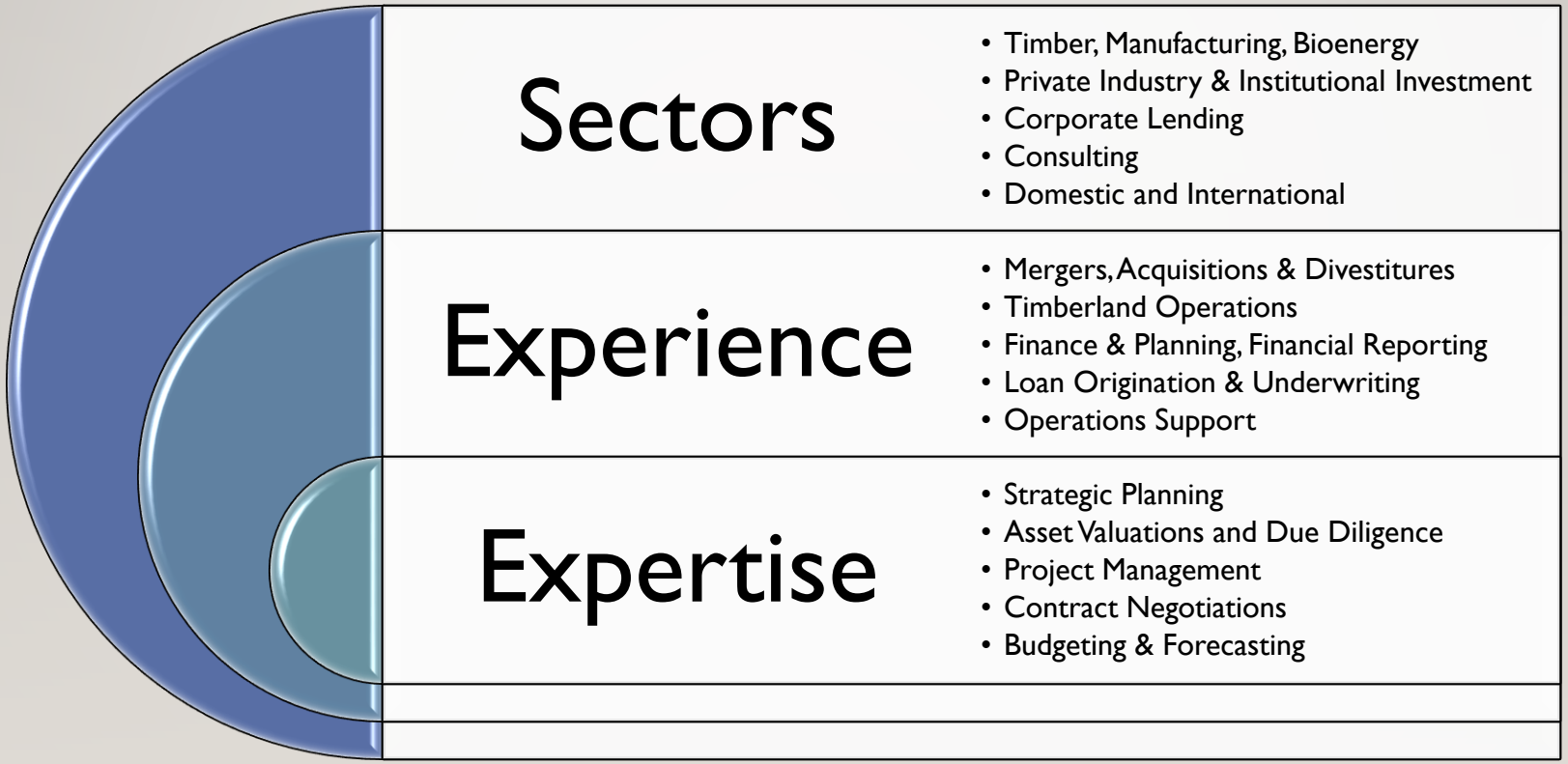
14

SECTION 4:

ABOUT WILLSONN ADVISORY, LLC

CRITICAL EXPERIENCE FOR CRITICAL ENDEAVORS

WillSonn Advisory brings senior management experience, across multiple sectors of the wood products industry, with expertise in leading an array of strategic initiatives.



WILLSONN ADVISORY SERVICES

- Timberland & Mill Valuations
- Acquisition "Post-Mortem" Audits
- Conversion of Acquisition Pro Forma to Lender Financial Projections
- Acquisition and Operational Due Diligence
- Development of Company Enterprise Valuations
- Incorporating Economic Forecasts into Business Plans

Business Assessments & Due Diligence Services

- Acquisition and Divestiture Process Management
- Conduct Regional or Global Market Studies
- Plan and Oversee Inventory & GIS Projects and/or Audits
- Independent Review of Harvest Flow Projections and Processes
- Prepare Offering Memorandums and Prospectuses

Project Management Services

- Fiber/Log Supply Agreements
- Purchase & Sale Agreements
- Timber Deeds and Leases
- Conservation Easements & Carbon Projects
- Service and Offtake Agreements
- Joint Ventures & Partnerships
- Contract Negotiating Strategies

Contract Structuring and Negotiation Services

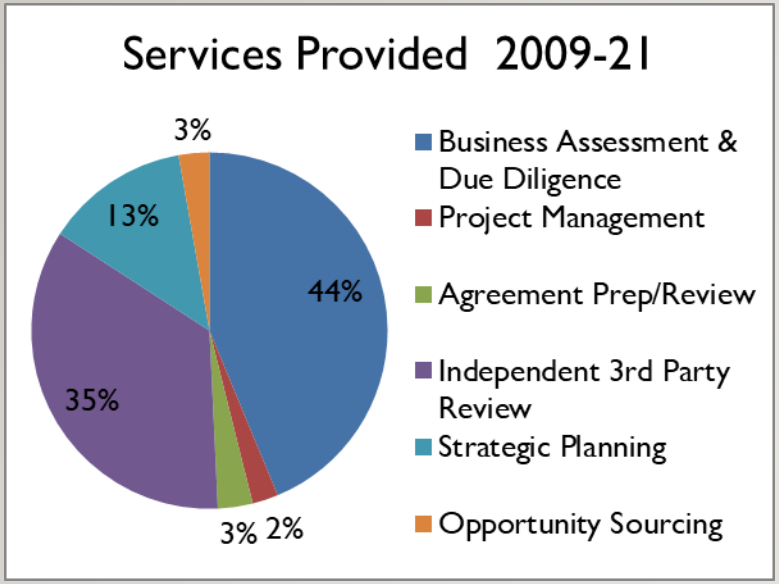
- Strategic Plan Process Design, Facilitation and Documentation
- Company Specific Price, Supply and/or Demand Forecast Development
- Contingency Plan Development and Monitoring
- Financial Planning and Capital Restructuring
- Work-out Strategy Development
- Capital Investment Assessments

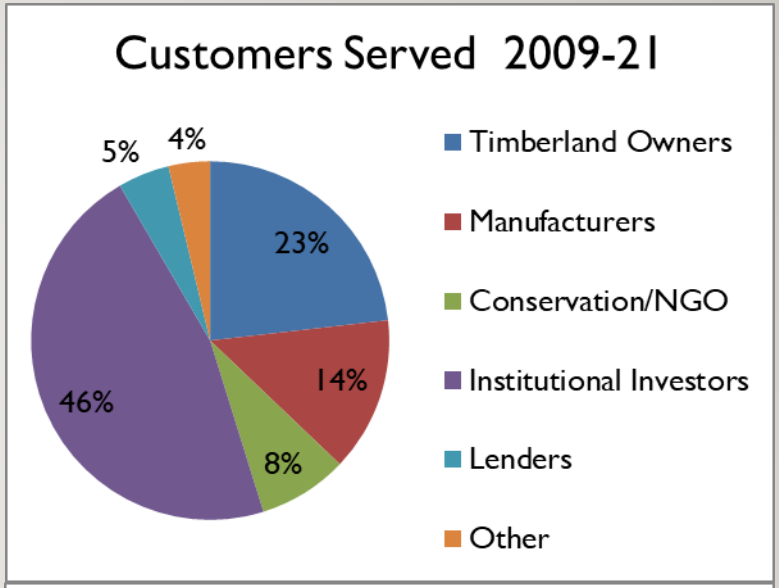
Strategic Planning & Business Restructuring Services

- Validate Acquisition Valuations & Due Diligence Procedures
- Evaluate Existing or Proposed Agreements or Easements
- Interpret Annual Management Plans & Appraisals
- Examine Proposed Transfers of Ownership
- Review Divestiture Timing & Strategies
- Track Investment Performance

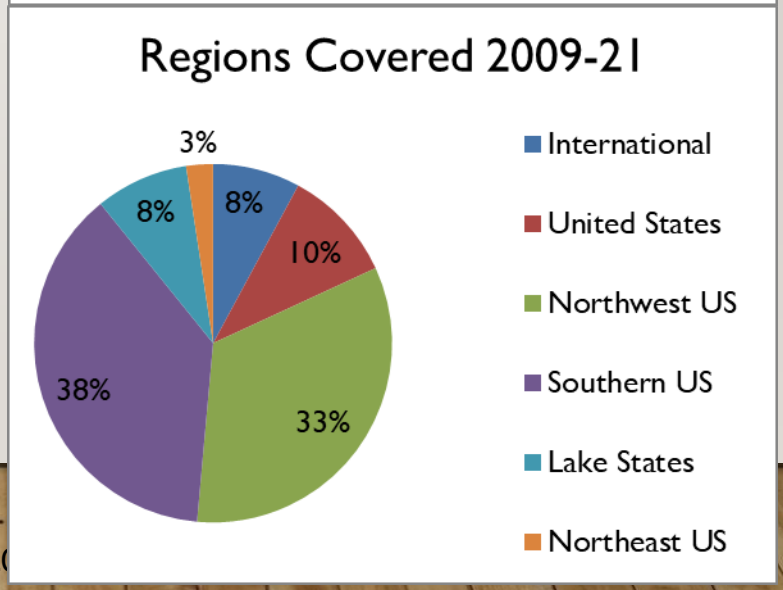
Institutional Investor Services

ENGAGEMENT PROFILES





Since 2009, Will Sonnenfeld has provided a broad range of consulting services to dozens of clients across the full spectrum of industry sectors, in all regions of the US and abroad.



I look forward to receiving any comments or questions you may have and would welcome the opportunity to serve your consulting needs.

William E. Sonnenfeld, Principal

WillSonnAdv@outlook.com
Cell: (206) 445-2980

PO Box 4706
Rollingbay, WA 98061-0706