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Unlocking transparency, exposing material risk: Key findings from timber market study

World Forest ID worked with a group of corporate partners, operating primarily in the USA and UK, to assess the validity of document-based claims within global supply chains. Utilizing Stable Isotope Ratio Analysis, a chemical technique that is mainstream in the food and textile sectors, the study aimed to scrutinize the stated geographical sourcing of wood fiber in a range of retail products.

A total of 59 samples, from a range of different products and processing centers around the world, were successfully analyzed for their stable isotope ratio measurements and evaluated using a peer-reviewed spatial model.[1] The study focused on birch (Betula spp.), in light of recent concerns about sanctioned sourcing.[2]
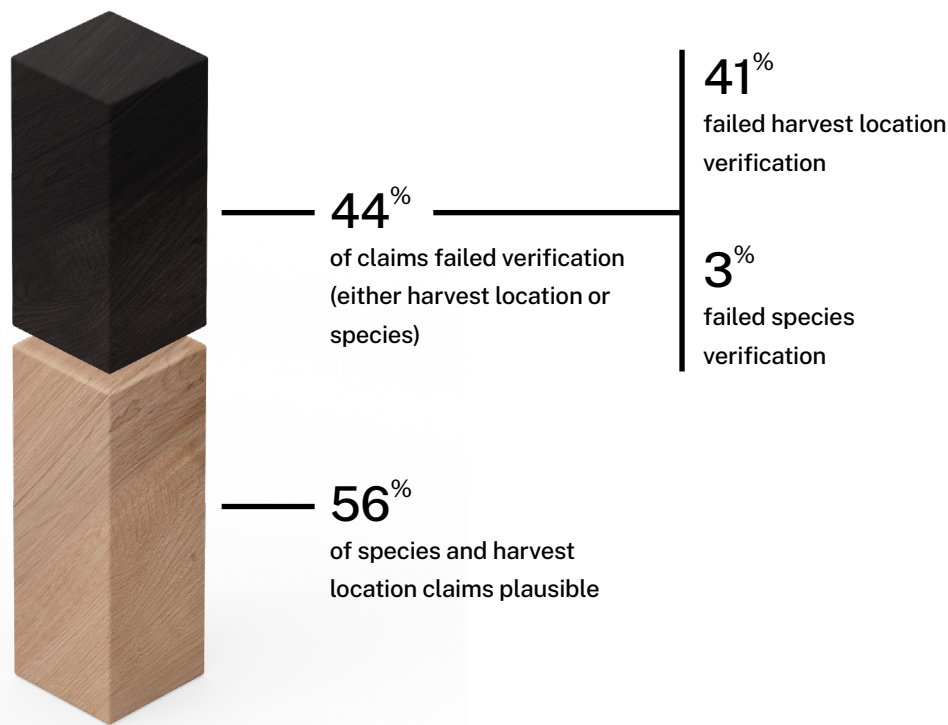
1. Mortier, T., Truszkowski, J., Norman, M., Boner, M., Buliga, B., Chater, C., Jennings, H., Saunders, J., Sibley, R., Antonelli, A., Waegeman, W., & Deklerck, V. (2024). A framework for tracing timber following the Ukraine invasion. Nature Plants, 10(3), 390–401. https://doi.org/10.1038/s41477-024-01648-5

2. World Forest ID (2023). Tracking Russian Birch: Insight Series, September 2023. Insight Report. Available at: https://learn.worldforestid.org/wp-content/uploads/2024/07/WFID_Insight_Sept_2023.pdf

TABLE 1: *Verification results summary*

Tested samples		59
Plausible origin and species claim	**56%**	(33/59)
Incorrect origin or species claim	**44%**	(26/59)
Incorrect origin claim	**41%**	(24/59)
Incorrect species claim	**3%**	(2/59)
Certified samples	**88%**	(52/59)
Certified samples with an incorrect claim	**46%**	(24/52)

1. Exposing the reality: Claim discrepancies create material risks for companies that only scientific testing can identify.

KEY FINDING: *44% of the evaluations showed that documentary claims relating to wood fiber species or harvest location were incorrect.*

Discrepancies highlight the urgent need for scientifically-enhanced verification to restore trust in supply chains. 56% of the results demonstrated that both species and harvest location claims were plausible, meaning the physical nature of the wood fiber matched birch reference samples, and the chemistry of the wood fiber did not differ significantly from reference data from the claimed locations of harvest. However, 3% showed significant differences from the characteristics of the claimed species and 41% revealed incorrect harvest location claims, indicating a substantial level of opacity and misdeclaration within these highly regulated, and majority certified, supply chains.

FIGURE 1: *Verification results for wood fiber harvest location and species claims*

44% of claims failed verification (either harvest location or species)

41% failed harvest location verification

3% failed species verification

56% of species and harvest location claims plausible

2. Enhancing certification with data: Achieving transparency through scientific testing builds integrity and trust.
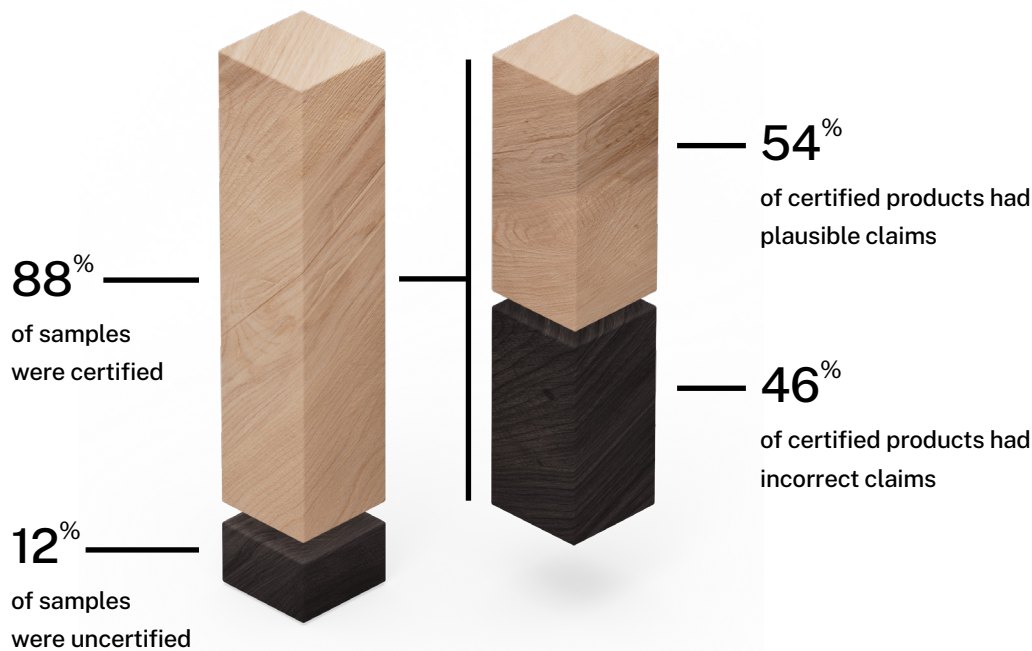
KEY FINDING: *46% of certified products had claims that were incorrect.*

While certification is a critical step towards a global market that recognizes legal and sustainable forestry practices, and these samples were identified on the basis of a high level of misdeclaration risk, it is clear that genuine system integrity can only be established through supplementary verification in chain of custody.

88% of the samples submitted by companies were certified, with 14% covered by the Programme for the Endorsement of Forest Certification (PEFC) and 85% by the Forest Stewardship Council (FSC). While certification schemes are often used to mitigate the risk of sourcing illegally-harvested or sanctioned wood, the study revealed that a significant percentage of certified products tested had incorrect claims for their wood fiber.

These results indicate that existing oversight processes, such as audits, are not sufficient to guarantee accurate claims, and both outcomes and efficiencies can be improved significantly by data-driven, scientific verification, which could be most effectively mainstreamed through integrity programs.

FIGURE 2: *Incorrect claims on certified products*

$88^{%}$ of samples were certified

$12^{%}$ of samples were uncertified

$54^{%}$ of certified products had plausible claims

$46^{%}$ of certified products had incorrect claims

3. Porous borders: False timber harvest claims near sanctioned regions reveal major enforcement gaps.

KEY FINDING: *High percentages of incorrect claims were found for wood fiber from products with harvest location claims in Ukraine, Poland, Estonia, and Latvia, all of which border sanctioned birch production areas.*
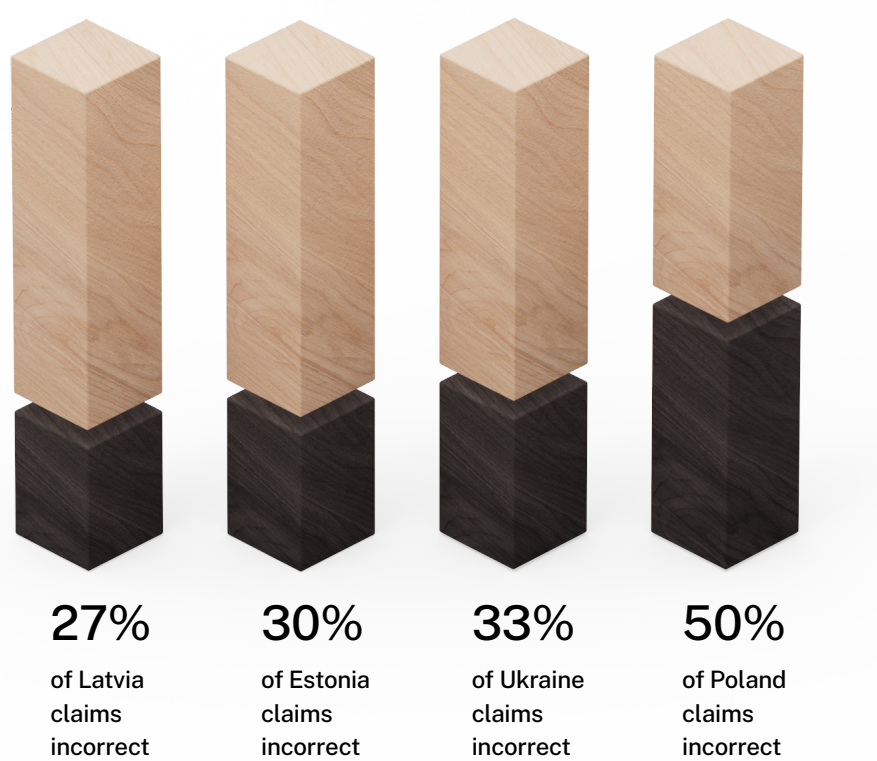
In order for trade measures such as sanctions and punitive tariffs to be meaningful, they should be designed in a way that allows for the identification of products that are 'laundered' through multi-country processing and transshipment.

World Forest ID's comprehensive Eastern European reference collection for birch, a species currently at high risk of misdeclaration due to sanctions on wood harvested in Russia and Belarus, was used to identify the following claim inaccuracies observed in the study:

- 50% of harvest location claims for wood fiber attributed to Poland were incorrect.
- 33% of harvest location claims for wood fiber attributed to Ukraine were incorrect.
- 30% of harvest location claims for wood fiber attributed to Estonia were incorrect.
- 27% of harvest location claims for wood fiber attributed to Latvia were incorrect.

These findings underscore the vulnerability of supply chains to misrepresentation in regions bordering sanctioned, or otherwise problematic production areas.

FIGURE 3: *Proportion of birch samples with incorrect harvest location claims*

27%
of Latvia claims incorrect

30%
of Estonia claims incorrect

33%
of Ukraine claims incorrect

50%
of Poland claims incorrect

4. Fair trade starts with traceable timber: Misrepresentation undermines responsible suppliers.
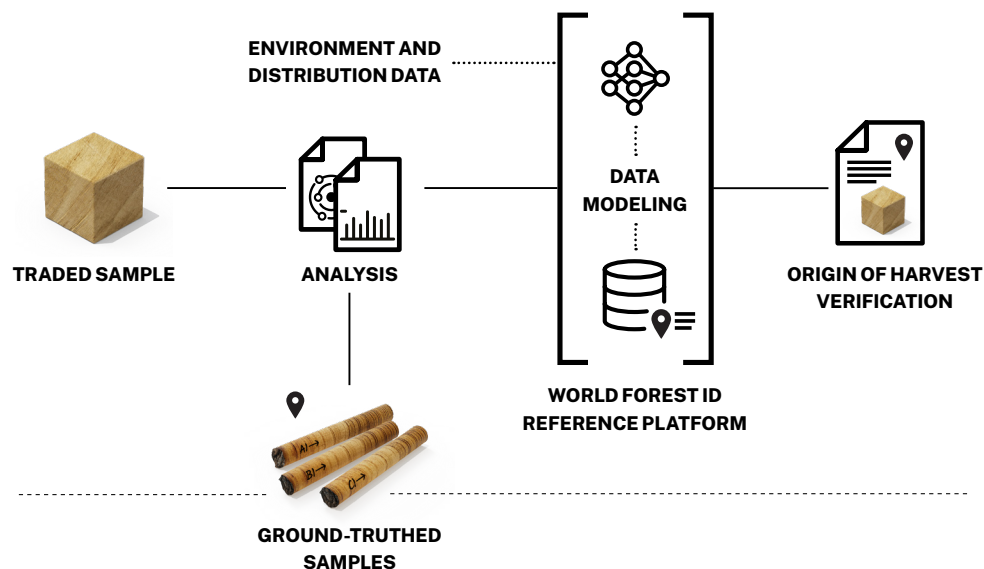
KEY FINDING: *The project highlights the prevalence of document confusion and misrepresentation in global supply chains, which hampers efforts to source responsibly and directly impacts the incentives for legal and sustainable forestry operations around the world.*

This is particularly true of the growing majority of supply chains that include processing in third countries. Supply chain length and complexity has been highlighted by regulators as a risk metric, and it is apparent from the data created in this study that multi-country chains obscure fiber harvest information, making scientific validation even more important for credibility.

This insight is relevant to ongoing discussions in key consumer markets regarding the need for measures to protect domestic forestry interests, as well as avoiding supply chain harms such as deforestation. These debates highlight the challenges of balancing open trade with the need to ensure responsible sourcing and prevent the circumvention of regulations. The implementation of strategic tariffs and trade restrictions underscores the importance of robust verification of harvest location and supply chain transparency in a globalized marketplace.

By making this verification possible by multiple actors, World Forest ID aims to level the playing field, ensuring that responsible producers are not undermined by fraudulent practices. This is a key motivation for retailers, who seek confidence in the integrity of their upstream sourcing and its wider impact. Our efforts directly support legal foresters in the USA and EU, as well as the Global South, by increasing supply chain transparency and reducing the economic toll of illegal logging on legitimate foresters and traders.

FIGURE 4: *World Forest ID's process for verifying origin of harvest in wood fiber*

TRADED SAMPLE   ANALYSIS   ENVIRONMENT AND DISTRIBUTION DATA   DATA MODELING   ORIGIN OF HARVEST VERIFICATION   WORLD FOREST ID REFERENCE PLATFORM   GROUND-TRUTHED SAMPLES

5. Data gaps limit transparency: Investment in reference datasets is critical for credible markets.

KEY FINDING: *This study was made possible by 2022/3 investment in scaled public-utility reference data and a spatial machine learning enabled evaluation model.*[3]

Without that significant foundational investment, these supply chain claims would be impossible to evaluate. An absence of reference data from a number of key producer countries that were not sampled in 2022/3 was a barrier to expanding the study, as the whole set of samples generously submitted by corporate partners included claimed harvest locations outside the existing data set. It was also difficult to ascertain to a high degree of certainty whether samples that returned incorrect harvest claims were the result of verifiable sanctioned sourcing, or simply confusion in the supply chain documentation. Such challenges may result from high levels of opacity, the demand for cost efficiency, and a historical absence of tools for objective verification of claims.

Ongoing efforts to increase reference data are hampered by the cost of collecting and measuring the chemical characteristics of ground-truthed samples from forests around the world, as well as increasing security and sovereignty challenges. Machine-learning-enabled modeling is a critical tool in overcoming these barriers, making it possible to fill gaps where finance and security issues make sampling impossible, and increase the amount of 'knowledge' that can be extracted from each ground-truthed physical sample.

To achieve truly transparent and accountable supply chains, World Forest ID emphasizes the urgent need for investment in comprehensive 'public-good' reference datasets and scaled support for the development of credible machine learning models, as well as the mainstreaming of science-based verification into certification schemes and other tools for supply chain management.

3. Tokar, D, (2024, June 10). Keeping sanctioned Russian timber out of the EU is tricky. This nonprofit has a solution. The Wall Street Journal. https://www.wsj.com/articles/keeping-sanctioned-russian-timber-out-of-the-eu-is-tricky-this-nonprofit-has-a-solution-1bf366b0?reflink=desktopwebshare_permalink

Conclusion

This study, conducted by World Forest ID with grant funding provided by the US Department of Agriculture's Animal & Plant Health Inspection Service, reinforces our joint commitment to making forest-connected supply chains transparent. By combining scientific testing, data modeling, collaborative efforts and anonymized reporting, we collectively aim to empower retailers and consumers with the information they need to make responsible choices, and protect forests as well as the livelihoods of legal and sustainable foresters.