



Timber Volume Count Template

**Empowering Landowners with Accurate
and Sustainable Forest Insights**



Grade Timber
Illinois (Serving all of Illinois)

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Disclaimer: This template is for educational and planning purposes only. It aims to inform you about basic forestry principles, but timber volume estimates should always be verified by certified professionals to account for variables like soil quality, climate impacts, and market fluctuations. Grade Timber assumes no liability for decisions based solely on this resource.



Welcome to Your Timber Volume Count Template

Estimating timber volume is a crucial skill for landowners, as it allows you to quantify the merchantable wood on your property—typically trees with a diameter at breast height (DBH) of 12 inches or more that can be harvested for lumber, pulp, or other products.

This process, known as a timber cruise or forest inventory, helps prevent over-harvesting, which can lead to soil erosion and loss of biodiversity, while maximizing economic returns.

By following this workbook, you'll learn to identify high-value species like oak or walnut, understand growth patterns, and promote sustainable practices that support wildlife habitats and carbon sequestration.

Key Educational Benefits:

- ✓ **Gain insights into forest ecology:** Trees aren't just resources; they're part of a dynamic ecosystem.
- ✓ **Avoid common pitfalls:** Underestimating volume might lead to undervalued sales, while overestimating could harm regeneration.
- ✓ **Prepare for professional collaboration:** Use your data to discuss options with experts, ensuring informed decisions.



Preparation Checklist

Before heading into the field, thorough preparation is key to safety and accuracy. This checklist educates you on why each step matters and how it contributes to reliable results. Mark each item as completed.

Step	Task Description	Why It Matters	Complete	Note
1.	Define your property boundaries using maps, deeds, or GPS devices.	Accurate boundaries prevent trespassing and ensure your inventory covers only your land, avoiding legal issues.		
2.	Identify forest stands—areas with similar tree species, ages, and densities (e.g., a mature oak grove vs. young pine patch).	Stands allow stratified sampling, improving estimate precision by accounting for variability in growth and value.		
3.	Gather essential tools: Diameter tape for measuring DBH, clinometer for tree height, notepad or app for recording, and safety gear like helmets, gloves, and sturdy boots.	Proper tools ensure measurements are consistent and safe; for instance, DBH is measured at 4.5 feet to standardize across slopes.		
4.	Choose a sampling method: Fixed-area plots (e.g., circular 1/10-acre plots) for beginners, or variable-radius prism cruising for efficiency on larger tracts.	Fixed plots are educational for novices, teaching direct measurement, while prisms simulate larger samples statistically.		
5.	Research local tree species common in Illinois (e.g., black walnut, hickory) and select a volume table like the Doyle or International 1/4" log rule.	Volume tables convert measurements to board feet (bd ft), a standard unit; choosing the right rule matches local mill practices for realistic valuations.		
6.	Schedule your cruise during optimal conditions, such as leaf-off seasons (winter) for better visibility, and avoid rainy or windy days.	Good weather enhances accuracy and safety; leaf-off allows clearer height estimates and defect spotting.		
7.	Check for any required permits for access, especially on public-adjacent lands, and note environmental regulations.	Compliance protects you legally and promotes sustainable forestry, preserving water quality and habitats.		



Educational Tip: If your property exceeds 50 acres, sampling 10-20% provides a statistically sound estimate. Start small to build confidence—practice teaches you about tree health indicators like crown vigor.



Field Inventory Checklist

In the field, systematic data collection is vital for building an educational foundation in forestry. This step teaches you to observe tree characteristics that influence volume and value, such as species adaptability to Illinois soils. Always prioritize safety: Watch for hazards like uneven terrain or wildlife. Follow these steps to gather data that reflects your forest’s true potential.

Step	Task Description	Why It Matters	Complete	Note
1.	Mark sample plots on your map or GPS, spacing them evenly (e.g., grid every 100-200 feet) to represent the entire stand.	Even spacing reduces bias, ensuring your sample mirrors the whole property for extrapolated accuracy.		
2.	At each plot, measure all merchantable trees (typically >10" DBH) within the defined radius (e.g., 37.2 feet for a 1/10-acre plot).	Focusing on merchantable trees educates on market viability; smaller trees are left for future growth.		
3.	Record key details: Species, DBH (at 4.5 feet), merchantable height (usable trunk length), and form class (1-5 scale for straightness and quality).	These metrics form the basis of volume calculations; form class accounts for defects reducing usable wood.		
4.	Note any defects like rot, cracks, or insect damage that could lower value.	Defects teach about tree health—e.g., rot from fungi indicates poor site conditions, guiding management.		
5.	Tally trees by broad groups (e.g., hardwoods like maple vs. softwoods like pine) for summary analysis.	Grouping highlights diversity, which supports resilience against pests and climate change.		
6.	Take photographs of representative trees, plots, or unusual findings for later reference or professional review.	Visual records aid in learning and verification, helping identify species or issues post-field.		
7.	Expand your sample to cover 10-20% of total acreage for robust data.	Larger samples increase confidence in estimates, illustrating statistical principles in forestry.		




Data Collection Template


Log measurements here to organize your observations. This table educates by linking field data to calculations—photocopy for more plots.

Tree #	Species (e.g., Red Oak)	DBH (inches)	Height (feet)	Form Class (1-5)	Defects/Notes	Estimated Volume (bd ft)*
1.						
2.						
3.						
4.						
5.						

*Calculate volume on Page 4 using formulas.



Example Entry: Tree 1 | White Pine | 18 | 80 | 4 | Minor branch scars from past storms | (To be calculated)



Educational Pro Tip: Apps like Forest Metrix can digitize this process, teaching tech integration in modern forestry while reducing errors.



Calculation Checklist

With field data in hand, calculations transform raw measurements into actionable insights. This educates on volumetric principles: Volume isn't just size—it's adjusted for shape, defects, and regional standards. Use reliable tables to avoid overestimation, which could lead to unsustainable cuts.

Step	Task Description	Why It Matters	Complete	Note
1.	Group trees by species and size classes (e.g., 12-16" DBH) for organized computation.	Grouping simplifies analysis and reveals patterns, like which sizes dominate your forest's value.		
2.	Apply a volume formula or lookup table to each tree, referencing your chosen log rule.	Formulas standardize estimates; e.g., Doyle rule is conservative for hardwoods in the Midwest.		
3.	Sum volumes per plot, then extrapolate to the full property (e.g., multiply by 10 for 1/10-acre plots).	Extrapolation teaches scaling: It assumes uniformity, so diverse stands need more samples.		
4.	Adjust downward for defects (e.g., subtract 10-30% based on severity).	Adjustments ensure realism, educating on how quality affects market price.		
5.	Total in board feet (bd ft) or cubic feet, common units for sales.	Units align with industry; bd ft measures lumber potential, aiding valuation.		
6.	Compare with local Illinois market values (e.g., via extension services) for a rough economic estimate.	This links data to real-world economics, showing timber as a renewable asset.		
7.	Document all assumptions, like log rule or adjustment percentages, for transparency.	Documentation supports learning and future audits, fostering accountable management.		



Volume Calculation Formulas and Table

Understand these methods: Board feet estimate sawn lumber; cubic feet measure total wood.



Board Foot Volume (Doyle Rule Example): $V \text{ (bd ft)} = (DBH - 4)^2 \times (\text{Number of 16-ft logs}) / 16$.
Merchantable height determines logs (e.g., 40 ft = 2.5 logs).



Cubic Foot Volume (Simple Approximation): $V = 0.005454 \times DBH^2 \times \text{Height}$. Useful for pulpwood.

Simplified Doyle Scale Lookup (for one 16-ft log; multiply by log count):

DBH (inches)	Volume (bd ft, one 16-ft log)
12	40
14	65
16	95
18	130
20	70
22	215

Worked Example: 18" DBH oak, 32 ft merchantable height (2 logs): $V = 130 \times 2 = 260$ bd ft. Adjust if defective.

For full property:
(Plot average V) × (Expansion factor) × Acres.



Educational Tools Recommendation: Integrate into Excel for automation, or contact Grade Timber for advanced software that incorporates growth modeling.



Summary Checklist

Finalize your estimate to consolidate learning: Review totals to understand your forest’s composition and potential. This reinforces sustainable principles—harvest should never exceed annual growth to maintain health.

Step	Task Description	Why It Matters	Complete	Note
1.	Tally total volume by species (e.g., Oak: 5,000 bd ft total).	Species breakdowns educate on biodiversity value and targeted management.		
2.	Estimate economic value by multiplying volume by local stumpage prices (e.g., \$0.50/bd ft for mixed hardwoods).	Valuation ties ecology to economics, highlighting timber as an investment.		
3.	Assess sustainability: Compare planned harvest to estimated growth rate (e.g., 1-2% annually in Illinois).	Ensures long-term viability, preventing depletion and supporting regeneration.		
4.	Plan post-harvest actions like reforestation or invasive species control.	Planning educates on stewardship, enhancing soil health and future yields.		
5.	Store your data digitally or in binders for ongoing monitoring and comparisons.	Records track changes over time, illustrating forest dynamics like succession.		

Total Volume Summary Template

Summarize here for a clear overview of your forest’s profile.

Species Group	# of Trees	Total Volume (bd ft)	Estimated Value (\$)	Notes
Hardwoods				
Softwoods				
Other				
Grand Total				





Next Steps and Resources

- ✓ **Consult Professionals:** Reach out to Grade Timber for a free consultation, full timber cruise, or management plan to apply your new knowledge.
- ✓ **Educational Resources:**
 - USDA Forest Service Handbooks: Detailed guides on volume estimation and ecology (fs.usda.gov).
 - Mobile Apps: Timber Calculator for quick computations or i-Tree for ecosystem service valuations.
 - Local Support: Illinois Forestry Association or University of Illinois Extension for workshops on sustainable practices.
- ✓ **Sustainability Insight:** Selective harvesting preserves canopy cover, aiding wildlife and climate resilience—always aim for a balanced forest.

Thank you for using this educational template from Grade Timber. For questions, customized services, or to deepen your forestry knowledge, contact us today!

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