Sources of help to North Carolina private forest owners

Available Services	Cooperative Extension	Division of Forest Resources	Farm Service Agency	Natural Resources Conservation Service	Wildlife Resources Commission	Consulting Forester	Industry Landowner Assistance Forester
References & information	XXX	XXX	x	хx	XXX	х	хx
Educational workshops	ххх	хx		хx	хх		
On-site visits	хх	x x x		ххх	XXX	X X X	хx
Management plans	A	XXX		А	Х	X X X	хx
Cost-share opportunities	А	xxx	XXX	хx	A	A	A
Boundary surveys						x x x	
Timber appraisals						x x x	
Timber sale contracts	А	А				x x x	х
Timber marked for sale		x				x x x	х
Logging oversight	А	А				x x x	х
Site prep and planting	А	хx		А	хx	х	
Wildlife management	А	А		A	хx	х	
Prescribed burning	А	XXX			A	xx	А
Timber stand improvements	А	A				хx	х



Timber Sales A Planning Guide for Landowners



Timber Sales A Planning Guide for Landowners

Introduction

Learning from experience can be very expensive when it comes to timber sales, many of which are once- or twice-in-a-lifetime occurrences. Years of growth and value are accumulated in a mature timber stand, and the combined annual income from all those years is frequently marketed in a single transaction. When and how you sell your timber can influence how much money you make, your overall financial plans, the cost of forest regeneration, and other management objectives.

Too much is at stake for you to sell timber without an understanding of the markets and of the quality and quantity of your timber. There are no daily market price reports for standing timber (stumpage), nor are there any government support prices. Demand and price for many timber products fluctuate widely. Size, quality, and species of timber are also highly variable. Specialized knowledge is required to identify tree species and to estimate volume and value within standards accepted by local markets.

This publication offers tips on marketing and selling, timber terminology, examples of timber sale agreements, and advice on seeking professional help from a consulting forester. By using this information, you can make your next (or first) timber sale both a pleasant and a profitable experience.

Timber buying process

Before you sell your timber

Before you sell your timber you should consider these questions:

- How is timber bought and sold?
- What trees should I sell, and why?
- How soon must I market them?
- Are property and cutting boundaries well marked?
- What is the timber volume? (And which of three "log rules"—Doyle, Scribner, or International—

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will be used to estimate the board-foot content of trees?)

- What is the growth rate?
- What is the fair market value of my timber?
- What is the current timber market price trend?
- Are the trees financially mature?
- Who and where are the appropriate timber buyers?
- What sale method should I use?
- Do I know my basis?
- How will the income be taxed?
- How should I reforest harvested areas?
- How can I get advice from a professional?

How timber is bought and sold

Timber buying process. The timber buying process involves a timber owner, a timber buyer, a logger, and a mill (manufacturer). The raw materials that supply the manufacturer are obtained through a network of buyers who purchase timber from private forest landowners. Buyers can work directly for a mill, for wood suppliers, for loggers, or for timber brokers. Buyers may be paid a salary or a commission, or they may receive part of the profits. Timber brokers buy and resell timber, making their income from profits.

Timber selling methods. Timber is sold either "per-unit" or "lump sum." A per-unit sale is one in which the buyer and the seller negotiate a price per unit of harvested wood, and the buyer pays for the timber after it is cut and the volume is determined. Per-unit timber is sold either by product class or at a blended average price for all products. Product classes include poles and pilings, veneer or plylogs, sawtimber, chip-n-saw, and pulpwood. Landowners own per-unit timber until it is harvested and payment is received. Landowners continue to assume most of the risks associated with owning timber, including timber destruction, damage caused by acts of nature, and theft. A lump sum sale is one in which the buyer and seller agree on a total price for the timber within a defined area of sale, and the seller receives payment before the harvest begins. In this method the buyer, upon purchasing the standing timber, assumes the ownership risks.

How timber is measured

Timber owners should have a basic understanding of how standing timber volume is customarily estimated. A timber "cruise" is an inspection of the timber stand made to estimate the volume of marketable or merchantable timber present. In a stand of large or high-value timber, the cruise may involve measuring all merchantable trees. More commonly, the cruise is based on a systematic sample of trees on plots or strips representative of the entire stand; it is carried out with statistical design to give confidence in the estimates.

Two measurements are usually needed on each tree to determine volume: the diameter at a height of 4.5 feet above the ground line (DBH or diameter at breast height), and the merchantable height. The height of sawtimber is generally recorded in terms of the number of "logs" (usually 16 feet long) to some "merchantable top" (usually a small-end diameter of 8 inches on the outside of the bark). Pulpwood tree height may be measured as the number of pulpwood "sticks" or feet to a merchantable top diameter (usually 3 inches on the outside of the bark), or total tree height may be recorded. Tree measurements can be made using a timber scale stick or other forestry measuring devices (see Woodland Owner Note No. 5, *Estimating the Volume of a Standing Tree Using a Scale (Biltmore) Stick*, www.ces.ncsu. edu/forestry/). Once the trees' diameters and heights are known, their volumes can be determined from various log rules. A log rule is a table or formula used to estimate volumes for various log diameters and lengths. Log rules often measure volume in board feet.

The quality or grade of trees is also important, particularly for hardwoods; excessive limbs and crooked or otherwise defective stems have less value.

Over the past century, at least 100 log rules have been developed, with the International 1/4-inch, Doyle, and Scribner log rules being the most widely adopted in the eastern and southern United States. In North Carolina,



Figure 1. Relationship among three log rules in board-foot volume estimates for trees using the International 1/4-inch rule as a standard for comparison.

Which price do you use?		
Timber prices per board foot vary, based Here are conversion factors for the varior	on which log rule is u us log rules:	sed to estimate timber volume.
Log Rule Conversions (Dollar Values)		
Doyle to Scribner	(26% difference)	0.75 Doyle to Scribner
Scribner to Doyle		1.33 Scribner to Doyle
Doyle to International ¼-inch International ¼-inch to Doyle	(39% difference)	0.62 Doyle to International ¼-inch 1.60 International ¼-inch to Doyle
Scribner to International ¼-inch International ¼-inch to Scribner	(20% difference)	0.83 Scribner to International ¼-inch 01.20 International ¼-inch to Scribner
For example: You know that pine sawtim	nber is selling for \$300	per 1,000 board feet (Scribner log rule).

What is the price equivalent for the International ¼-inch log rule?

\$300 per 1,000 board feet (Scribner log rule) X 0.83 = \$249 per 1,000 board feet (International ¼-inch log rule).

Table 1. Price conversions between various log rules.

the Scribner rule is most frequently used for southern yellow pines and the Doyle rule more commonly for hardwoods. The legal rule for settling disputes is the International rule, which is the most accurate.

The choice of log rule can significantly change the volume estimate of timber in a stand (Figure 1). If both buyer and seller are aware of this and if price is adjusted accordingly (Table 1), any log rule may be used because the total value of the timber (price multiplied by quantity) will remain the same (Figure 2). For example, a tree 14 inches DBH containing two 16-foot logs might be estimated to contain 130 board feet by the International log rule, 115 board feet by the Scribner rule, but only 75 board feet by the Doyle rule. A price of \$115 per thousand board feet (MBF) by the International rule would result in a \$15 stumpage value for the tree. To generate the same \$15 stumpage value for the tree by the other two log rules, an adjusted price of \$130/MBF by the Scribner rule or \$200/MBF by the Doyle rule would be required.

Weight and other timber measurement units are increasingly being used by timber buyers. The choice of log rule or measurement unit is relatively unimportant to "lump sum" timber sellers. However, landowners who sell timber on a "per-unit" basis need to understand the units being applied. The seller should have some means of verifying measurements and know how to accurately convert these measurements to more familiar units. Weight scaling (the process of estimating log volume based on weight) is less desirable because tree species, soils, growth rate, and other factors yield widely variable weights per unit volume. There can be as much as a 35 percent difference in the weight of an equivalent volume of wood among similar species, and this may significantly affect the price a seller receives for his timber.

Factors affecting timber stumpage prices

Species, tree quality and size, product type, acreage, location, site conditions, markets, and contract provisions all affect the price paid for standing timber.

Species. In the Southeast, most pine timber brings higher stumpage prices than sweetgum or mixed hardwoods. High-quality black cherry, northern red oak, cherrybark oak, white oak, and yellow poplar can bring premium prices. Species price varies widely with location and with changing market demand.





Figure 2. Relative value of a tree 14 inches DBH and 38 feet merchantable height, based on relationship of three log rules.

Quality and size. Large, sound trees with clear logs (logs without knots or branches) that could be used for lumber, veneer, or export products generally bring the highest prices. **Beware of high grading!** High grading is the removal of the most commercially valuable trees from the stand, often leaving a residual stand composed of trees of poor quality and/or poor species composition. A high-graded stand often has little or no future economic value with regard to timber.

Product type. Major products that can be produced from pine trees include pulpwood, chip-n-saw, sawlogs, veneer logs (also known as plylogs), and pilings or poles. Major products produced from hardwood trees include pulpwood, sawlogs, and veneer logs (also known as grade or export logs). Each of these products must meet certain minimum size requirements (Table 2), and each varies in value based on the product, tree quality, and markets.

Acreage and volume. Logging operations require high capital investments in equipment. Low volumes of timber on small acreages usually cannot be logged profitably by highly mechanized and efficient contractors, so the relative stumpage values generally increase with both volume and acreage. Acreage and volume become less of a concern as tree quality (grade) increases.

Location. The distance to the mill, accessibility to good roads, and ease of logging are important factors affecting the price paid for stumpage. Most logging contractors would like all of their operations to be clear-cuts, located beside paved roads, near mills, on well-drained soils, and without contractual restrictions, simply because these conditions reduce logging costs. Consequently, when logging conditions are more difficult and the distance to the mill is greater, the price that the buyer is willing to pay for stumpage will be lower.

Competitive markets. Competitive bidding by timber buyers in the local area tends to assure that fair market value for timber is offered. A buyer, whose sole purpose is to avoid competition, often offers the unsolicited bid. The number of bidders and their interest in a sale can be influenced by advertising, which contributes to competition and positively affects the price paid. Some situations

See a forester first

A North Carolina couple recently was offered an unsolicited bid of \$20,000 for their 20 acres of mature pine sawtimber. Realizing the complexity of selling timber, the couple hired a consulting forester to watch out for their interests.

The consulting forester, who worked by contract for a percentage of the gross revenue, conducted a sealed-bid timber sale. Gross revenue from the sale was \$39,895—\$19,895 more than the original unsolicited bid. This increase in income was significantly higher than the fee charged by the consulting forester. Table 2. Minimum size requirements for varioustimber products.

Do you know your forest	w what products contains?
Pine	
Pulpwood	≥ 6" DBH
	to a minimum 3" top diameter
Chip-n-saw	9-14" DBH
	to a minimum 6" top diameter
Sawtimber	≥ 14" DBH
	to a minimum 8" top diameter
Veneer log	≥ 16" DBH
	clear/straight first log
Pilings	various specifications
	based on local markets
Hardwood	
Pulpwood	≥ 6" DBH
	to a minimum 3" top diameter
Sawtimber	≥ 16" DBH
	to a minimum 10" top diameter
Veneer log	≥ 18" DBH
	clear/straight first log

involving specialized products, unusual harvesting conditions, poor quality timber, or poor markets may be better handled by negotiating with a single appropriate buyer.

Contract provisions. Restrictions placed upon the harvest of timber can protect the site, the residual trees, and/or the landowner, but they may reduce the price paid for stumpage. Contract provisions that address important considerations should be included in a timber sale contract or deed (see page 9, "Basic contract and deed provisions").

Steps to marketing timber

As the delivered price, logging costs, and transportation costs fluctuate, so will the stumpage price buyers are willing to pay. How you conduct your sale will have a major impact on your overall profit. Be well informed and aggressive in marketing your timber. Buyers have more confidence in sellers who use a businesslike approach. Here are some suggestions:

Seek professional assistance. Research (Cubbage, *et al.*, 1996) indicates that professional advice can be valuable. Landowners who received professional forestry assistance before harvesting timber averaged 23 percent more income per acre, received a 64 percent higher price per board foot, and had a projected income stream from future sales of 120 percent more as a result of improved regeneration and stocking (see page 9, "A consumer's guide to consulting foresters").

Sell financially mature timber. Make sure your timber is financially mature. If timber is not financially mature, a partial harvest (thinning), leaving the best trees to grow, may be more appropriate than clear-cutting. A short-term loan using timber as collateral could be less costly than a premature or inappropriate timber sale. Information in the appendix, "Cut Your Timber, Not Your Profits!" will be helpful.

Check the market. Check the current timber market demand and recent trends. Prices for sawtimber and other high-value products fluctuate widely. Your professional consulting forester tracks market trends and can advise you on this. Landowners



Is your timber financially mature?

may obtain this information from state agencies, universities, and businesses that provide price report information. In North Carolina, you can obtain general market trends and price information through the cooperative extension service, either by calling your local extension agent or by visiting www.ces.ncsu.edu/forestry/price.htm.

Have a reforestation plan. Landowners should begin planning reforestation well in advance of the harvest cut. Having a well-planned timber sale that includes a reforestation plan will minimize regeneration costs and assure that the desired species regenerate on the harvested area.

Mark the sale boundaries clearly. A legal timber sale requires that harvest boundaries be marked clearly. Resurveying the boundaries is often the biggest expense of conducting a timber sale, but the cost can be deducted as a cost of the sale. Establishing well-marked boundaries can protect the seller from increased liability and litigation.

Use a registered, consulting forester. Have a registered consulting forester cruise the timber to estimate its volume, quality, and value. Consulting foresters are available and prepared for this work. Following the harvest, these professionals can also help establish a new timber crop that will have maximum value in the future (see "A consumer's guide to consulting foresters," page 9). **Do**

not rely on the timber buyer to assure you fair market value; their interests are not your interests.

Inform neighbors. Inform adjoining landowners of any



For advice and help contact a professional forester.

proposed timber sales to make certain that boundary and access road locations are acceptable. Also, you may find that your neighbor wishes to sell his timber, too. Combining sales among neighboring tracts can sometimes increase volume without substantially increasing logging costs, which could result in higher prices to the sellers.

Have access to the land. If the land on which the timber is for sale has no reasonable means of access, a statutory right-of-way (cartway) can be established pursuant to North Carolina General Statue §136.69. G.S. §136.69 provides entry and exit to a public highway over intervening lands from other lands that have no other reasonable means of access and that are being or could be used for legally identified commercial or agricultural purposes. A landowner is entitled to a right-of-way if he is engaged in an activity enumerated by the statute, if there is no public road or other adequate means of reasonable access to the landowner's property, and if it is necessary, reasonable,

and just that the landowner have a private way.

Advertise the sale. Use a consulting forester to advertise the timber to all reliable buyers in the area. High-value products or tracts could attract buy-



Do you have access to your land?

ers from as far away as 100 miles. To obtain a list of most timber buyers for a particular county in North Carolina or for all of North Carolina, consult *Buyers of Timber Products in North Carolina*, an online publication by the North Carolina Division of Forest Resources (NCDFR) at www. dfr.state.nc.us./tending/tending_tblists.htm.

Research shows that sealed bids usually result in a higher offer than auctions or negotiated sales. Potential buyers can best be notified by sending them invitations to bid on timber (see "Invitation to bid," page 8). Provide as much information about the timber, the tract, and contract restrictions as can be given in the bid invitation. Describe payment provisions, including any security deposits or performance bonds that will be required. Also include copies of vicinity maps, plat maps, or aerial photographs indicating the location of the timber offered for sale.

Preharvest plans. Have a registered consulting forester develop a preharvest plan to look out for your interests. Preharvest planning is necessary to protect soil and water quality and to ensure implementation of appropriate best management practices (BMPs). For the landowner's protection, the plan should include a list and description of the BMPs to be implemented. Depending on the site and nature of the harvest, the plan and map should address property boundaries, sales areas, color and type of tree marking if used, forest type, soils, slopes, timing of harvest (season or weather controls), and approximate location of haul roads, skid trails, potential log landings, water courses, streamside management zones, and planned stream crossings.



Conducting the sale

Do you have a preharvest plan to protect your interest?

Conduct the timber sale as advertised. Allow at least a month for buyers to make their own examinations, or timber cruises, before the sale is held (see "Invitation to bid," page 8). Before the sale, set a minimum bid that you will accept and one that buyers are unaware of. The consulting forester can help you determine this minimum bid. Reserve the right to refuse any or all bids. The "Right to Refusal" protects the seller, allowing the seller to halt the sale if a minimum bid is not met or to choose a buyer with a business and land ethic more suitable to the seller. Small tracts, low volumes, poor timber quality, or poor access may require negotiated timber sales.

Timber sale agreements. Ideally, a professional forester who is knowledgeable of legal provisions should prepare the sale agreement. The consulting forester usually prepares the conditions of sales and the sale map, which are recorded with the timber deed. A good timber sale agreement is clearly understandable, workable, and enforceable

for both buyer and seller. It is not so complicated that it attempts to cover all eventualities. Neither is it so brief as to exclude essential points of the transaction.

Standing or

severed (cut)

timber. Certain

legal and tax im-



What are the legal and tax implications of harvesting your timber?

plications come into play, depending on whether timber is sold as standing or severed (cut). Standing timber in North Carolina is real property, and cut timber is personal property. By law, the conveyance of an interest in real property, for example, standing timber, must be by written document. Deeds and contracts provide the means of conveying rights to an interest in timber. Timber deeds are used most often when payment is made for standing timber; contracts are used when payment is for severed timber. **Contracts.** A contract establishes both the conditions to which buyer and seller agree and their rights and duties under these conditions. Timber sales contracts or cutting contracts are commonly used in transactions where timber is not sold in a lump-sum timber sale. Payment is made periodically as the timber is delivered to a mill or loading site, although title to the trees passes to the buyer once timber is severed.

Contracts are suitable for unit sales such as pulpwood, chip-n-saw, selective timber cuts, poles and piling, and other specialty product sales. However, because sample contracts (see "Basic contract and deed provisions," page 9) seldom include provisions appropriate or desirable for particular sales, many buyers prefer not to accept them.

Deeds. Deeds are most often used with lump-sum timber sales, especially with purchasers of standing timber who require a deed upon payment. Most timber buyers prefer a timber deed prepared by their legal department. In many ways, deeds are usually less complicated than contracts. They contain the standard provisions (see "Basic contract and deed provisions," page 9) for roads, fences, ditches, fields, and boundary trees. The legal description of the property is the only additional information needed. Before the deed can be executed, an essential point is to have the seller's signature notarized. Even though it contains occasional changes that most landowners accept, title to the timber passes to the buyer once a properly drawn deed has been delivered.

Finally, the sellers should practice their rights to control logging through the wording of the contract or deed, but without making the document long and complicated. Such complicated documents might discourage timber buyers, cause them to submit lower bids, or be impossible to administer. Similarly, too many constraints on logging will increase logging costs, in which case, the seller should be prepared to accept a lower stumpage price. But some important constraints include limiting wet weather logging and placing a limit on the time the buyer has to remove the timber. In most cases a time limit of not more than two years should be established.

Closing the sale. Ideally, there should be mutual confidence and understanding between buyer and seller. Any important paper, contract, or conveyance should have notarized signatures and should be registered or recorded immediately upon execution at the courthouse of the county where the property is located. Timber sales are conducted as real estate transactions with the seller often paying for deed preparation, revenue stamp, and commission of the consulting forester. The buyer often pays for the title search and any documents required for securing the funds. Before closing the sale, both parties should understand who will cover the various costs of the sale. For a good relationship on which to build future sales, you should conduct and conclude the sale in a cordial and businesslike manner.

Invitation to Bid On 30 +/- Acres of Timber Owned by Joe Pine, Tupelo County, NC November 29, 2007, at 10:00 AM

Description of timber. Joe Pine is offering all timber within the sale area for sale through his agent, Selling Timber Enterprises (hereafter referred to as "S.T.E."). The timber sale area supports predominately mature loblolly pine sawtimber, with some mixed pine and hardwood pulpwood, and will be reforested following harvest.

Summary of timber volumes: Volume estimates are for information only and are not construed as implying or guaranteeing any specific amount of timber by the owner. For information on timber cruise, contact S.T.E., (III) 222-3333.

Estimated sawtimber: (6" top) Scribner 78 Pine - 212 MBF /1389 Tons Pine C-N-S -II MBF /100 Tons (10" top) Doyle 78 Misc Hdwd - 2 MBF /18 Tons

Estimated pulpwood (includes topwood) Pine - II Tons

Hardwood - 70 Tons

Sale area, property lines, and boundary marking. The timber sale area is bounded by Reedy creek forming the west boundary, center line of state road NCSR 2007 forming the north boundary, and lines described in deed book 8-J page 401 forming the south and east boundaries back to the creek (west boundary). Please see the attached map for better identification. The sale has good access with average logging conditions. The tract is located 22.5 miles east of the town of Red Oak in Tupelo County, NC. Logging access will be provided from NCSR 2007. Tract boundaries are marked with blue paint. Streamside Management Zones (SMZ) are marked in red, and no trees are to be taken from inside SMZs.

Method of sale. Timber will be sold by sealed bid, lump-sum sale on November 29, 2007, from 10 a.m. to 2 p.m. Bids will be accepted at S.T.E.'s office, 100 Ash Avenue, Red Oak, NC. Only those bids submitted in person at the sale location will be accepted. The seller reserves the right to refuse any and all bids. A 10 percent deposit may be due at the time of the sale, at the sole discretion of the seller's agent, S.T.E. At the time of closing the full accepted bid amount will be due. Closing will occur within 10 days of the timber sale. A performance deposit of one thousand dollars will also be required at the time of closing.

Conditions of sale. Sale of the previously described timber tract is subject, but not limited, to the following conditions:

(Conditions for harvest will be spelled out in a separate contract and must be signed by both parties.)

1.Term. Timber offered under the terms of the sale must be cut and removed within 24 months of execution of the timber deed.

2. Assignment of Contract. The buyer may not assign this contract to a third party without consent of the seller or seller's agent. In the event of such assignment, the buyer is not relieved of said duties under the sale contract unless the seller has granted such release. The buyer may subcontract cutting, logging, hauling, and removal of timber without written consent of the seller but will not be relieved of any obligation under the timber sale contract.

3. Notification. Seller's agent must be notified at least 24 hours prior to the beginning of logging operations and 24 hours prior to expected harvest completion.

4. Decking/skidding/loading. All decking, skidding, and loading shall be done within the designated timber sale areas.

5. Ditches. Any ditches on site must be left free of all logging debris. All ditches will be left in better or equal condition to that prior to logging.

6. Logging Debris. No logging debris is to be left outside designated sale areas. Logging debris at decking areas is to be scattered throughout sale areas such that no piles are more than 36 inches in height from ground level.

7. Boundary Lines and Reserved Areas. Boundary line trees are not to be cut. A fee of two hundred dollars per tree will be assessed for damages to boundary line trees in addition to the value of the tree as assessed by the agent. The buyer shall be responsible for damage to corner markers and boundary trees. All areas within marked boundaries may be harvested with the exception of SMZs.

8. Trash/Wildfire. The buyer of the timber will be responsible for keeping his trash off the tract during logging operations, which includes maintaining a trash barrel on site. The buyer is to use reasonable care in preventing wildfires due to his actions.

9. Indemnity Clause. The buyer of the timber shall indemnify and hold harmless the seller from any and all liability and any and all loss, including attorney fees and other reasonable expenses incurred, arising from the operations, activities, or omissions of the buyer's employees, contractors, subcontractors, and invitees, and whether such liability or losses be to an adjoining property, licensees of the buyer, or to any others for property damage, personal injury, death, or otherwise. The buyer must agree to maintain workers' compensation insurance for his agents and employees.

10. Title. The seller warrants his title to said timber and agrees to defend said title against any and all claims. Title to said timber passes title to byproducts such as tops, slabs, and sawdust, but only if the purchaser removes these during the time of the timber sale contract. The buyer of the timber will not be permitted to conduct direct firewood sales to the general public from the tract.

11. Statutes. It is the responsibility of the buyer to abide by any and all federal, state, and local laws applicable to timber harvesting, such as NC General Statutes § 77-13, § 77-14, and §§ 113A-50 through 82, relating to timber harvesting, water quality, and stream sedimentation as they affect this property and further, that the buyer shall be solely responsible for any violations of such regulations. It is the responsibility of the buyer to follow best management practices in accordance with the Forest Practice Guidelines (15A NCAC 11 .0100 -.0209).

12. Wet Weather Clause. In the event of wet weather, the seller's agent has the right to temporarily suspend harvesting activities if site damage is excessive or probable due to weather conditions. The cutting period will be extended for an equal period that the agent halted harvesting operations.

13. Performance Bond. The buyer shall post a one-thousand-dollar performance bond with seller's agent at closing. The bond shall be forfeitable by the buyer to the agent upon failure to perform as per cutting contract, subject to a final logging inspection by the agent. The bond does not limit liability for damages incurred as determined by the agent

14. Ingress and Egress. Roads on the timber sale map may be used for ingress and egress. Roads must be maintained in a condition comparable to that found prior to beginning of logging. Gate keys will be provided.

15. Stream Crossings. No stream crossings are anticipated. Ditches and streams must be kept clear of all logging debris. The buyer will be responsible for seeding and mulching any stream or ditch crossing that may be encountered during logging.

Basic contract and deed provisions

Contract. No two timber-cutting contracts are exactly alike, but all contracts should include basic provisions such as:

- 1. Guarantee of title and description of the land and boundary lines.
- 2. Specific description of timber being conveyed; method of designating trees to cut; and when, where, and how to determine volume.
- 3. Terms of payment.
- 4. Starting date and duration of agreement.
- 5. Clauses to cover damages to nondesignated trees, fences, ditches, streams, roads, bridges, fields, and buildings.
- 6. Clauses to cover fire damage where harvesting crew is negligent and to protect seller from liability that may arise in the course of harvesting.
- 7. Clause limiting wet weather logging to include repairing damage to the site if any rutting occurs.
- 8. A standard to completely utilize the merchantable portion of trees.
- 9. Clauses for arbitration in case of disagreement.

Deed. A basic timber deed may contain provisions such as:

- 1. Specification of parties, both seller and buyer.
- 2. Terms of payment.
- 3. Legal description of the property.
- 4. Guarantee of title against third party claims.
- 5. Special conditions under which timberland should be logged. These will vary, depending on the sale. Possible conditions include:
 - a. A clause covering length of time to conduct the harvest.
 - b. A map of the sale area designating the location of access, decks, skid trails, etc.
 - c. A clause covering what condition roads, skid trails, decks, etc., must be left in upon completion of harvest
 - d. A clause to cover damage to nondesignated trees, roads, fences, bridges, streams, etc.
 - e. A clause regarding erosion and sediment control.
 - f. A clause limiting wet weather logging to include repairing damage to the site if any rutting occurs.
 - g. Notification of commencement of harvesting operations.

A consumer's guide to consulting foresters

What is a consulting forester?

A consulting forester is a full-time professional. He or she represents, for a fee, the interests of his or her clients in all matters concerning the forest. A consulting forester can improve the quality of the forest environment and increase the production of marketable products. When the trees become merchantable, the consulting forester can find buyers and supervise the timber sale. The fee charged by the consultant may be based on an hourly or daily rate or on forest acreage, or it may be a contract price based on a percentage of gross revenues from the sale of the forest products. The cost of these services usually will be recouped by the timber owner through the higher prices received for timber that is marketed correctly and through faster tree growth after the timber is cut and sold.

What are the qualifications?

As in all professions, the knowledge and experience of consulting foresters vary widely. In North Carolina, registered foresters generally hold a bachelor of science or

higher degree in forestry or have shown equivalent knowledge by passing an examination given by the state Board of Registration for Foresters. They must also meet continu-



What is a consulting forester?

Seeking professional advice

When seeking professional forestry advice, ask some questions:

- What are your qualifications?
- What are your fees, and what services do you provide?
- Are you associated with a sawmill or wood products firm?
- · Can you provide references from previous clients?

To verify whether a forester is registered in North Carolina, contact the state Board of Registration for Foresters at 919-772-5883 or online at http://members.aol.com/ncbrf/.

ing education requirements set forth by the state Board of Registration for Foresters. Many qualified consultants are certified members of the Association of Consulting Foresters of America, Inc.—an organization that promotes the service, practice, and standards of consulting forestry and seeks to strengthen its ethical and professional standards.

A list of forestry consultants may be obtained from county Cooperative Extension Centers (www.ces.ncsu. edu), from the NCDFR (www.dfr.state.nc.us/), or from the Association of Consulting Foresters of America, Inc. (www.acf-foresters.org). A landowner may also obtain names from a telephone directory or a woodland-owning friend or neighbor.

How do you select a consultant?

The landowner should request information from several consulting foresters before selecting one. Be sure to obtain the forester's specific qualifications, references from previous clients, and fee estimates. Ask to see a recent job so you can see the consultant's work for yourself. To prevent a potential conflict of interest, avoid those who are buyers for forest products companies.

Once a professionally qualified consulting forester has been selected, a contract or written agreement should be signed. It should include a list of services to be performed, who will perform them, and the agreed-upon cost of services. The consultant should welcome any questions and clarifications that the landowner may seek. Good communication between the landowner and consultant is essential.

What services does a consultant provide?

Services offered by consulting foresters vary considerably according to the fee and the landowner's desires. The following is a list of services the landowner should expect from a fully qualified professional. The landowner should be sure that the contract or written agreement clearly itemizes the services he or she expects.

Timber sales. When a stand of timber is to be harvested by the clearcut method, the consultant marks the boundaries of the area. When using the selection method, the consultant marks the boundaries and may or may not mark the specific trees to be harvested, depending on the selection method. The trees to be harvested are marked by painting the stumps as well as the trunks to make sure unmarked trees are not cut. Sometimes the trees to be left are marked instead of the trees to be cut. If the boundary of the timber sale area corresponds with a property boundary, then a survey of the property boundary by a registered surveyor may be required. The consultant will inventory the stand, recording species, diameter, height, and quality. With this information, the consultant will calculate the volume of the sale and prepare a contract or deed for the owner's approval. The consultant also may mark where the skid trails will go and where the trees will be skidded for delimbing, cutting to length, and loading on the log truck.

For a sealed-bid sale, the consulting forester will send potential buyers an "invitation to bid on standing

timber," which includes location and tract maps, legal description of the property and how the boundaries are marked, location of any buffers or areas excluded from the sale, and a description of the volumes, species, size classes, and tree quality.



Which trees are to be harvested?

The invitation to bid also may include dates for woodlot inspection, the payment schedule, dates for beginning and completing logging operations, the performance deposit required, if any, and any other conditions of the sale that will protect the landowner's property and interests.

The forester will show the woodlot to potential buyers and supervise the opening of bids. After the landowner chooses the buyer, the sale will often be closed through an attorney who will have the buyer sign the deed, then collect the performance bond and all or part of the sale price. Upon closing of the sale, the forester will arrange the details of the logging operation. The consultant will check the logging operation on a periodic basis to ensure that the terms of the agreement are honored.

If a negotiated sale (similar to a sealed-bid sale) is decided upon, the consultant may personally contact buyers in an attempt to receive the best price for the stumpage.

Management plans. The management plan is based on the landowner's goals and objectives. Information in the management plan usually describes the goals and objectives, current condition of the forest, stand history, the species

present, and the size, volume, and quality of the timber. The plan should list for each forest stand a recommended sequence of operations necessary to achieve the objectives outlined for the management period. Management plans vary in sophistication from a short report based on a brief walk through the woods to a detailed financial analysis with computer simulations of forest growth and suggested treatments. The cost will reflect the time and effort required to collect the data and prepare the report.

To create a management plan, the consulting forester must locate the boundaries of the managed area and conduct an inventory, or timber cruise, of the trees and forest products. Age, stocking, and growth rates are estimated. These data are processed, and a forest-type map is drawn. The forester then develops a management plan that will promote the landowner's objectives.

Appraisal. A buyer or seller of timber may want to know the quantity or value of the timber on the tract for any of several reasons: a timber sale, financial planning, tax planning, establishment of basis, or determination of a casualty loss. The consultant can provide this information by performing a timber cruise and a site analysis. This involves measuring a representative sample of trees, preparing forest-type maps from aerial photographs and ground surveys, and calculating the volume and value of the timber. If a more comprehensive appraisal is desired or required, a forest landowner can have a comparative market analysis conducted by a real estate appraiser or a formal appraisal conducted by a state-certified appraiser.

Boundary marking. Boundary marking requires the forester to check the deed registry, locate the most recent survey, consult with adjacent landowners, and identify boundaries on the ground. Boundaries are flagged, blazed, or painted, and a map showing their bearing and length is drawn and given to the landowner. The consultant may recommend a registered surveyor in case of contested boundaries, litigation, relocation of corners and lines, or establishment of new lines. The consultant cannot provide bona fide surveying services unless he or she is licensed by the state as a registered land surveyor.

Regeneration. The establishment of a new forest crop is encouraged by providing growing space through harvesting, killing, or removing all or part of the preceding crop. Prescribed burning and/or mechanical site preparation is sometimes necessary to create the appropriate environmental conditions for natural or artificial regeneration.

A prescribed burn removes unwanted vegetation or logging residues before the establishment of the new forest. It is a low-cost, low-impact alternative if done correctly. The consultant will assist the landowner in the selection of a contractor or certified burner to conduct the burn. Upon completion, the consultant will inspect the area to determine whether the desired results were achieved. Landowners interested in conducting prescribed burns on their property should contact the NCDFR about the certified burner program.

Mechanical site preparation, often more costly than prescribed burning, typically requires a bulldozer. It is used first to knock down unwanted vegeta-



Have you planned for regeneration?

tion and then to chop or pile the vegetation and logging residues. The consulting forester should begin this operation by notifying third-party contractors and accepting bids on the job. The consultant can assist in the selection of a contractor and will inspect the area upon completion. After the site has been prepared, the consultant or contract crews may plant seeds or seedlings.

Fire protection. A consultant forester's role in fire protection is to assist the landowner in reducing the risk of wildfire. Two common methods of forest fire protection include firelane construction and maintenance and prescribed burning. Firelanes are barriers built to stop the spread of fire,

or they may be created by prescribed burning to reduce fuel. The consultant's role in fire protection is often the role of selecting a contractor who will perform the work.

Timber stand improvement. Timber stand improvement may include any combi-



Are you at risk of losing your forest to a wildfire?

nation of silvicultural (forest care) operations designed to improve the vigor, health, growth, and quality of the trees. Removing undesirable trees that compete with the crop trees can accelerate the growth of the desired trees. Undesirable trees may be removed for fuel wood, killed by chemicals, cut down, or girdled (have a ring of bark several inches to several feet wide cut from around the stem of the tree to cause its death). **Other services.** Consultants also may offer advice on wildlife and recreation management, state and federal cost-share programs, tax issues, estate planning, and road construction.

For further information concerning forest land management and choosing a consulting forester, contact your local Cooperative Extension Center, NCDFR, or the Association of Consulting Foresters of America, Inc.

Summary

A landowner need not sell timber frequently to sell it successfully, but selling timber still can be a mysterious and complex process. It is highly recommended that you use a consulting forester to sell your timber. Remember, a single sale may be your only chance to cash in on the many years of annual income accumulated in a mature timber stand.

No single publication could cover all possible marketing situations, nor could it make you an expert timber seller. But there are questions you should ask and answers you should know. See a forester for help before selling timber. Know what to sell and when to sell. Plan for reforestation. Be a tough trader. In short, market your timber in a businesslike manner to get the most that it will bring.

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Cut Your Timber, Not Your Profits! Determine Financial Maturity by Percent Growth

Introduction

Forest landowners sell timber for various reasons. Frequently, timber harvesting and other forest management decisions are based on economics. Product changes, current market strength, and market trends influence economic decisions. One important economic consideration is the rate at which a tree or stand is growing in value.

Stands of trees have fairly predictable volume growth rates. After several decades of vigorous development, growth rate declines with increasing age. Value growth is more complex than volume growth, since it is also influenced by quality standards and changing products. Generally, value growth rate also slows after trees grow into more valuable product classes. As its value growth falls below some "acceptable" rate, a timber stand is considered to be "financially mature" and should be thinned or harvested.

To determine financial maturity, measure the market value of both tree volume and growth. Most North Carolina landowners receive the highest values for sawtimber and veneer logs, products that are generally measured in board feet. Thus, you should estimate the *board-foot* content and growth of standing timber.

Two ways to look at forest value growth are value growth per acre and value growth percent. When land is limited, managers sometimes try to maximize value and growth per acre. A stand might be scheduled for harvest when it no longer produces, for example, 500 board feet (or its economic equivalent, depending on markets, say \$60) per acre per year. You should compare this per-acre amount with other income opportunities, such as crops.

Money is more limited than land in most investment situations. Managers therefore try to maximize return *per dollar*. To do this, value growth of trees (or stands) is more usefully expressed as percent, to compare with rates of return possible through alternative investments. When a stand's stumpage value (the capital tied up in a stand) could earn more in alternative investments (a higher percentage), then the stand is financially mature.

These two methods of evaluating the adequacy of timber growth can lead to quite different answers. For example, a stand containing 5,000 board feet per acre and growing 500 board feet per acre per year is returning 10 percent. Ten years later, the same stand should contain 10,000 board feet because each year's growth has been automatically reinvested (tax free). However, the stand is now returning only 5 percent (500 on 10,000), even though the volume growth rate has remained constant. After converting percent volume growth to value growth, the

investor with more attractive alternatives elsewhere would prepare to market this financially maturing timber stand.

The following tables use easy-to-collect field measurements to estimate the volume growth of standing timber expressed as percent. Volume growth is then systematically converted to value growth so that financial maturity may be assessed.

How to estimate volume growth

Select several of the tallest, most vigorous "crop" trees in the stand to be sampled. Estimate both the *present volume* and *growth* for these crop trees.

Present volume is estimated by the appropriate log rule after measuring 1) the Diameter Breast High outside bark (DBH, 4.5 feet above the ground line), and 2) the merchantable height in number of 16-foot logs. Merchantable height is the point at which the top of the smallest sawlog would be cut and is usually determined by the location of heavy limbs. The upper stem diameter at this point (merchantable top) may range from less than 50 percent of DBH for 4-log or taller trees to about 80 percent of DBH for 1-log trees. Merchantable top diameters in most small to medium sawtimber average about 8 inches inside bark.

Growth estimation also depends on both height and diameter, as they change over some time period (for example, 10 years).

Merchantable height growth is difficult to measure but may be roughly estimated using Table 1. Height growth is primarily determined by age and site index (the quality of the soil for tree growth). Table 1 assumes approximately constant 30 percent live crown for "typical" conditions.

16-FOOT LOGS.			
	Site	e index (feet) ^a
Age (years)	60	80	100
20	1/2	1⁄2	1

 $0 - \frac{1}{2}$

0

1/2

0

1/2

0

Table 1.	10-Year	Merchantable	Height	Growth	in
16-Foot	Logs.				

^a Total height at base age 50.

40

60

																		Γ
Growth 10-year	of tree height gro	wth																
(mercha	ntable 16-	foot logs)		None					NO	e-half					One			
10-year I (inches c	DBH growt	r (X	-	5	ო	4	S	۲	5	ю	4	5	1	7	з	4	5	1
Rings pe	r radial inc	ň	20	10	7	5	4	20	10	7	5	4	20	10	7	5	4	
Size	of tree																	
DBH	No. 16-ft	Vol. board																
y	logs 1	feet 10	41	77	10.8	13.7	16.5	7.7	11.6	14.6	17.5	19.8	9.6	13.5	16.5	19.4	22.5	
σ		2.5	5.9	5.5	8.2	10.3	12.3	6.4	9.1	11.3	13.4	15.7	8.2	10.9	13.7	15.9	18.2	
ç	~ 10	35 36	2.8 2/5	5.4 1/5	8.1 6/1	10.1 8/0	12.3	4.2 7	7.0	9.4 0.6	11.7 11.3	14.0	4.8 7 8	7.8 0.8	10.6	13.1 18.0	15.4 15.8	
2	- 01 0	10 0 1 21 0	0.00 0.00 0.00	4 4 ΓΩ	t 0 0 1 0 0	0.0 4.7	9.0 10.2	3.8 1	0.0	8.2 0.7 0	10.0	11.9	5.0	7.4 7.4	9.6 7 0	11.4	13.4	
12	י מ	/3 56	7.0 1.8	0.0 4.0	5.1	9.1 6.6	8.0	- 4.9	0.0 6.5	0.0	0.0 0.0	11.3 11.3	- 7.2	0.0 0.0	0.7 10.8	12.4	13.9	
!	C	92	2.0	3.7	5.4	6.9	8.4	3.5	5.2	7.1	8.6	10.2	4.8	6.6	8.5	10.1	11.7	
	ლ •	120	2.1	80 0 80 0 80 0	5.7	7.2	80 G 80 G	2.8	4.5	6.5	8.2	9.7	3.4	5.2	7.3	9.0	10.6	
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14	v	78 132	1.7		4.5 4.6	5.7	7.0	4.7 3.3	6.2	1.1	9.0	10.4	4.7	8.7	10.2	9.11.6	13.0 10.5	
	10	174		3.3	4.8	6.1	7.5	2.6	4.2	5.7	7.1	8.5	3.4	5.1	6.6	8.0	9.4	
	4	200	1.9	3.6	5.1	6.5	7.9											
16	-	106	1.3	2.5	3.8	4.9	6.1	ъ,	5.7	7.0	8.2	9.5	6.9	8.2	9.6 -	10.8	12.1	
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	v 4	285	1.5	2.8 2.8	4.4 1.4	5.4 5.4	6.6	r. v.	0.0 -	0.0	0.9 0.0	c. / 2.3	. o	. . .	י ס.	0.6	0.4 8.0	
18	- -	136	1.3	2.3	3.5	4.5	5.4	4.4	5.6	6.8	7.9	8.9	6.9	8.1	9.3	10.5	11.5	
	0	233	1.3	2.4	3.6	4.7	5.7	2.9	4.1	5.3	6.4	7.5	4.4	5.6	6.8	7.9	9.0	
	დ 4	314 374	ເ	2.5	3.7 3.8	4.8 9.4	5.9 2.9	2.2	3.4 4.0	4.7	5.8 5.6	6.8 6.7	. 3.1	4.3 3.8.5.1	5.6 6.3	6.7 7.4	7.8	
20	- (171		2.1	3.1	3.9	4.9 0	4.4	5.4	6.4	7.3	8 	6.9	8.0	0.6	9.9	11.0	
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	• 01	368	0.9	1.8	2.8	3.7	4.5	2.6	3.6	4.5	5.5	6.3	4.1	5.1	6.1	7.0	7.9	
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	<u>ى</u> .	691	1.0	2.0	3.0	4.0	4.9											
24		251	0.9	1.8	2.6	3.3	4.1	4.2	5.1	6.0 	6.7	7.6	6.8	7.7	8.6 0.0	9.4	10.3	
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	5	840	1.0	2.0	2.8	3.6	4.5				4.3	5.2	-			4.9	5.9	
a Internatio <u>Vol (year</u> Vol(yea	onal 1/4-inch <u>N+10)</u> = (l+, <i>ir N</i>)	ר Log Rule, form class 7 (י) ¹⁰	8															

EXAMPLE: Use left columns to enter appropriate tree size (DBH and number of merchantable 16-foot logs). Use top headings to enter growth estimate (number of merchantable16-foot logs and either 10-year DBH growth or number of rings per radial inch). A 12-inch, 2-log tree growing 1 log and 4 inches in 10 years (or 5 rings per inch, radial growth) is increasing at 10.1 percent.

Table 2. Tree Growth in Board Feet^a Expressed as Percent Annual Compound Interest^b

10-year price ratio	Percent annual price increase	Percent	annual t (fro	ooard foo om Table	ot volume 2)	e growth
		2	4	6	8	10
1.0	0.0	2.0	4.0	6.0	8.0	10.0
1.2	2.0	4.0	6.1	8.1	10.2	12.2
1.5	4.0	6.1	8.2	10.2	12.3	14.4
1.8	6.0	8.1	10.2	12.4	14.5	16.6
2.2	8.0	10.2	12.3	14.5	16.6	18.8
2.6	10.0	12.2	14.4	16.6	18.8	21.0
3.1	12.0	14.2	16.5	18.7	21.0	23.2

Table 3. Value Growth of Trees Expressed as Percent AnnualCompound Interest

Diameter growth can be measured by extracting a growth core. Measure the last 10 growth rings (10 years' radial growth) and multiply by 2.1 to convert to diameter and compensate for bark growth. An alternative for fast growing trees is to count the number of rings in the last radial inch.

Use this size and growth information to determine the board-foot growth rate in percent annual compound interest (Table 2). Size of tree determines the appropriate line in the table, while growth rate determines the correct column. An example is given below the table. Keep in mind that no stand can grow at a rate greater than its most vigorous crop trees.

How to estimate value growth

The growth rates in Table 2 are based upon merchantable volume growth only. If stumpage prices are the same at the beginning and end of the growth period (10 years), then value growth would be identical to volume growth. This is usually not the case. Both inflation and the increasing value of larger trees tend to increase stumpage prices over time. To convert volume growth to value growth, apply price change information using Table 3.

If price increase information is expressed as percent, it is roughly (but not exactly) additive to volume growth. Where appropriate prices for the end and beginning of a 10-year growth period are available, a simple price ratio (price at the end of 10 years divided by price at beginning) may be used to enter Table 3. As an example, a price ratio of 1.5 (50 percent increase in 10 years, or 4 per cent annual compound interest rate) applied to the example tree from Table 2 growing at 10 percent gives a value growth rate of 14.4 percent per year.

Conclusion

Percent growth is one technique for deciding when to thin or harvest a financially mature forest. Still, this is only a guide. Market fluctuations alone can offset several years' growth. And most stands can be managed many years beyond strict financial maturity before stagnation or potential catastrophe begins to force regeneration or a timber sale. Therefore, percent growth or any other determination of financial maturity must be accompanied by a comprehensive management plan and sound marketing strategy.

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