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# **Timber Prices: A Guide for Woodlot Owners in New York State**

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## **Chapter I. Introduction**

### **A. The Forest Resource in New York**

New York's forest ecosystem provides a wide range of opportunities and services. The forest resource in New York supports an important economic base for the State in the form of employment, recreation, tourism, and a broad-based forest products industry, and provides wildlife habitat, biological diversity, scenic landscapes, and recreation opportunities. Of course the forest resource also helps provide clean water and clean air. While these environmental qualities are important to landowners in New York, the purpose of this bulletin is to provide landowners with an introduction to the factors that affect timber prices, as well as an understanding of recent trends in timber prices and the implication of these trends on timber management.

#### **1. Land Area, Most Common Species, and Timberland Ownership**

As shown in **Table 1**, forestland covers 18.46 million acres, or 54%, of New York's 34.24 million acre total land area; of these 18.46 million acres, 15.78 million are classified as timberland (NEFA, 2001). The USDA Forest Service classifies timberland as forestland that is productive and accessible enough to produce wood as a crop (USDA, 2004). To be classified as timberland, the land must also not be prohibited by regulation or ordinance from harvesting timber.

**Table 1. New York Forest and Timber Land (million acres) 2004**

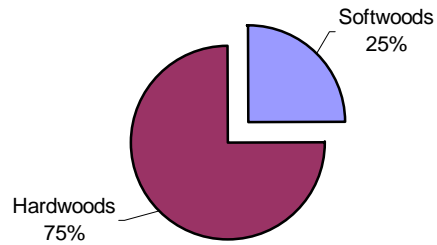
Total Land Area	Forestland	Timberland
34.24	18.46	15.78

Source: USDA Forest Service, 2004

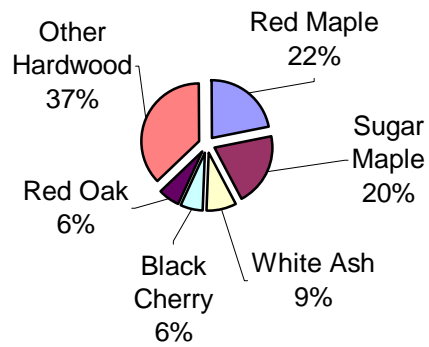
New York has over 100 different species of trees that grow within its borders. The USDA Forest Service Forest Inventory and Analysis Unit provides estimates of the volume of all live trees on forestland in New York by major species group, with each species group classified as either a softwood or hardwood. Softwood is a term for coniferous or evergreen trees that bear needles instead of broad leaves, and also refers to the wood products from such trees. Examples of softwoods include spruce, fir, pine, and cedar. Hardwood is a term for broadleaf, deciduous, trees such as oak, maple, ash and elm, and does not necessarily indicate the actual ‘hardness’ of the wood. Softwoods comprise 25% of the volume of the state’s forestland, while hardwoods account for 75% (**Figure 1**) (USDA FIA, 2004).

The most common hardwood species groups, in terms of volume, as shown in **Figure 2** are red maple (22%), sugar maple (20%), white ash (9%), red oak (6%), and black cherry (6%) (USDA FIA, 2004). In **Figure 3** the most common softwood species in 2002 were eastern hemlock at 37%, and eastern white pine at 30% of total softwood volume (USDA FIA, 2004). Both figures refer to the volume of each species in New York.

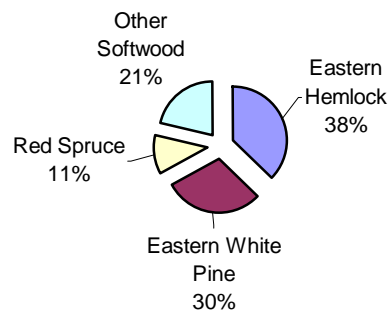
**Figure 1. Softwood and Hardwood Species Composition of New York Forests 2002**



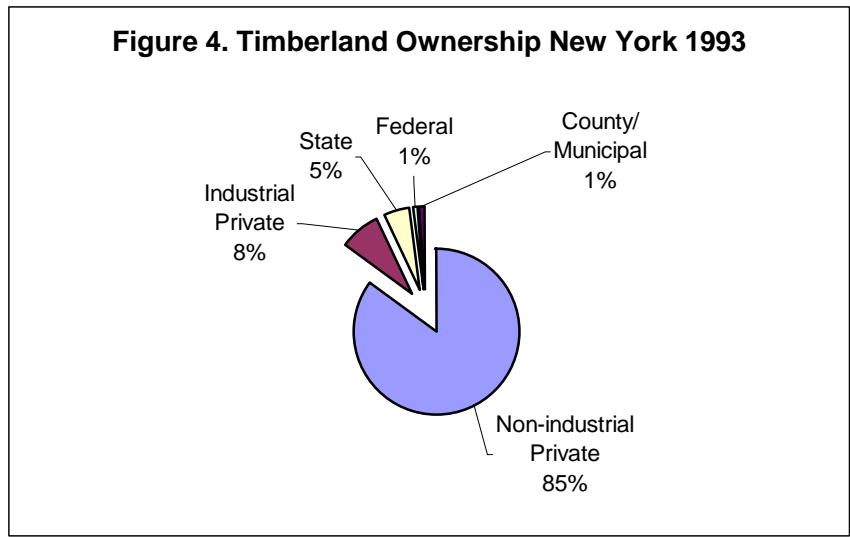
**Figure 2. Hardwood Species Composition New York 2002**



**Figure 3. Softwood Species Composition New York 2002**



Almost all of New York's timberland is privately owned (**Figure 4**). 14.2 million acres, or 93%, of timberland in New York is privately held, with 85% owned by non-industrial private owners and 8% owned by industrial private owners (USDA FIA, 1993). Non-industrial private forestland is land that is not owned by government or forest products manufacturing firms. (In the United States, over 90% of all non-industrial private owners hold less than 100 acres.) The remaining timberland in New York is divided between the state government, which owns 5%, and the federal and county governments, with each owning 1% (USDA FIA, 1993). With over 13 million acres of New York's forests owned by about 500,000 non-industrial private owners, and the recognition of the economic significance of the forest in many rural areas, there is a need for an improved understanding of the factors that affect timber markets and management.





## 2. Economic Importance

New York's forests are a significant source of employment and payroll for many people in rural areas of the state, and serve as an important source of income for forest landowners. The state's forest products industry generates over 60,000 jobs and approximately \$1.7 billion in payroll; each 1,000 acres of timberland supports 2.8 forest-based manufacturing jobs and 0.5 forest related tourism and recreation jobs (NEFA 2001).

Overall, the state's forest-based manufacturing and forest related tourism and recreation sectors contribute over \$9 billion to the State economy on an annual basis. Of that total, \$7.7 billion is produced by the forest products industry, which represents 5.2% of the statewide value for manufacturing, and \$1.3 billion is generated by recreation and tourism activities (**Table 2**) (NEFA, 2001).

Table 2. Revenues Generated From New York's Forests

	Millions of \$	\$ per Acre
Forest Based Manufacturing	7,700	414
Forest Related Tourism and Recreation	1,300	70
Associated Forest Products	28	2
<b>Totals</b>	<b>9,028</b>	<b>486</b>

Source: Northeast State Foresters Association 2001

The forest-based manufacturing sector in New York involves timber harvesting, primary manufacturing, and secondary manufacturing. Timber is harvested by felling trees, skidding the trees to a landing where it may be processed into logs, and then transporting logs to primary manufacturing facilities located in New York, Pennsylvania, Canada, and all over the world. Primary manufacturing consists of converting logs into lumber, plywood, medium density fiberboard, particleboard, veneer, pulp, and paper. Secondary manufacturing in New York involves drying, planning, cutting, and assembly of lumber into finished products such as furniture, baseball bats, wine racks, and log homes (NEFA 2001). Since the 1980's, an increasing amount of timber harvested in New York is being transported to primary manufacturing facilities in Canada that can offer higher prices for various qualities of timber than their New York counterparts. As discussed below in Chapter III, an increase in competition in the forest products industry, including an increase in the export of timber products to primary manufacturing facilities in Canada, has led to an increase in the average price of timber paid to landowners.

Recreation and tourism revenues generated by New York's forest refer to expenditures made during activities that take place in the forest environment. The expenditures for activities included in Table 2 are camping, hiking, hunting, downhill skiing, cross-country skiing, snowmobiling, fall foliage viewing, and wildlife viewing (NEFA, 2001). Determining the exact dollar amount contributed by the forest to the above activities is difficult, but it is assumed that 75% of the revenue generated by each recreation and tourism activity above would not take place without the existence of the forest (NEFA, 2001).

Associated forest products are forest products other than timber or pulp. These include maple syrup, which totals \$5.9 million, Christmas trees and wreaths, which total \$15.3 million, and ginseng harvesting at \$6.5 million (NEFA, 2001).

Changes in the forest-based manufacturing sector, consumer preferences, and other market forces have the biggest effect on timber prices. Forest related recreation and tourism and associated forest products are difficult to measure and are not considered to have much of a direct effect on timber prices. An exception to this could be the purchase or reservation of large tracts of forestland by the State, land trusts, or other organizations for recreation, tourism, and conservation purposes that reduces the availability of timber for harvest in the state.

## **B. Overview of Forest Management**

### **1. Management Goals**

New York, like the rest of the country, has experienced an increase in the number of forest landowners during the past 25 years. An increase in the number of landowners of a fixed asset like forests decreases the average parcel size, which contributes to fragmentation of the overall forest landscape in the state. Further, property tax pressure increases the costs of stewardship, creating an incentive for forestland owners to convert their land. Conversion refers to the loss of forestland to other uses such as housing development, and often drives permanent fragmentation. The environmental concerns associated with increasing fragmentation, conversion, and urban sprawl have lead to an increase in environmental awareness in the approximately 500,000 forest landowners in

New York, as well as an increase in regulations and government purchases of large tracts of forestland in the state.

As patterns in land ownership continue to change throughout the state, so do the interests of the forest landowners. Reasons for owning and managing a woodlot are diversifying from timber production and towards enhancement of wildlife habitat and biological diversity, scenery, solitude, recreation opportunities, and conservation of forestland.

A properly managed forest can provide multiple benefits, including lumber, fuel, wildlife habitat, recreation, special products such as hockey sticks and maple syrup, paper products, employment, water management, wind control, shade, and aesthetic enjoyment (Goff et al, 1994). To maintain and enhance any of these benefits, forest owners should evaluate their woodlot and determine its potential for their purposes and goals, and then design a management plan to achieve those goals.

Regardless of their primary goals for owning forestland, most, if not all, private forest owners will eventually harvest and sell a portion of their woodlot for financial gain, even if only to enhance the environmental attributes listed above. Because of this inevitability, it is important for forest owners to understand the nature of timber management and timber prices, and to know that managing their woodlot for timber is compatible with and even complimentary to other ownership objectives and forest values.

## **2. Timber Management**

One of the primary goals of timber management in New York is to harvest and sell high quality, healthy trees that produce logs for lumber (sawlogs) and veneer.

Products of these tree crops include furniture, lumber, cabinets, flooring, tool and baseball bat handles, and fence posts. Production of healthy and high quality timber that exhibits a high rate of growth requires planning and careful management.

For a detailed description of timber management practices, see “ Timber Management for Small Woodlands” by Goff, Lassoie, and Layer, available from the Department of Natural Resources at Cornell University. They point out that proper timber management requires the landowner to know the woodlot by taking inventory and dividing their lot into compartments to be managed for specific purposes. The owner should conduct an estimate of the standing timber contained in the lot, understand different units of wood and how to measure trees, and be aware of the recommended practices for managing overstocked or understocked stands. Knowing how to protect the forest from disease, insects, fire, and wild animals is also very important as years of planning and management can be destroyed by such catastrophes. The harvest and sale of timber involves deciding when and which trees to harvest, which harvest system to employ, and arranging a contract for sale with a prospective buyer. The harvest and sale of timber represents one of the landowner’s rewards for care and management of the woodlot, as well as the culmination of years of forest growth. It is therefore important for the landowner to understand the factors that affect the value of timber in the woodlot, a subject that is the focus of the remainder of this report.

## **C. Stumpage Prices**

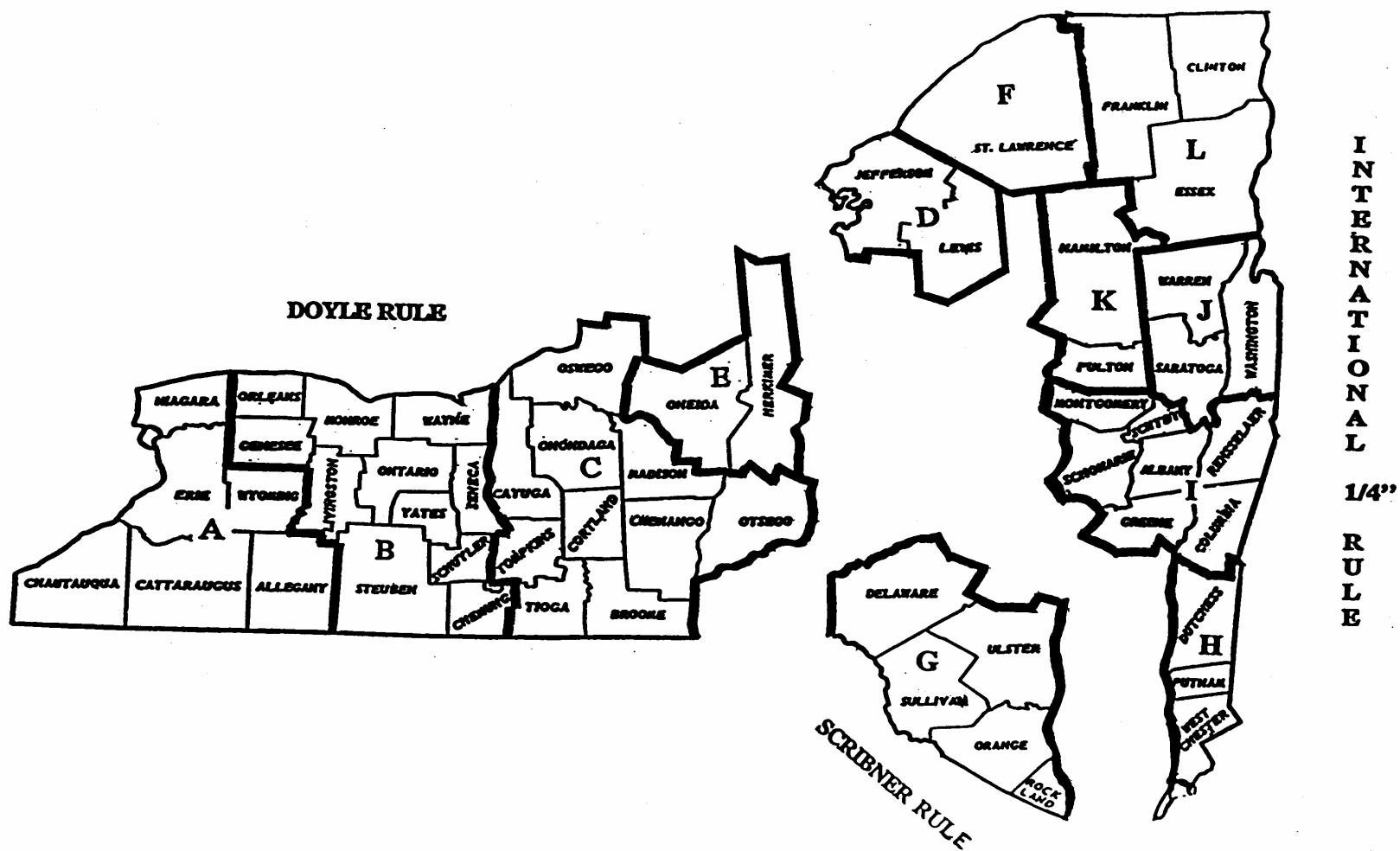
### **1. Definition and Determination of Stumpage Price**

The term ‘stumpage price’ refers to the price which will be paid to a landowner for standing timber which is to be harvested. Stumpage price is determined by supply and demand factors that vary by location and over time, and often interact in complex ways. It is estimated that private landowners in New York receive approximately \$230 million in annual stumpage revenue (Crawford, 2004).

### **2. Description of the New York State Department of Environmental Conservation Stumpage Price Report**

Stumpage prices in New York State are collected and published by the New York State Department of Environmental Conservation. The Stumpage Price report lists current stumpage prices for 21 different species of sawtimber (used for lumber and veneer) and cordwood prices (cordwood is used for pulpwood and firewood). The report is issued each January and July, and reports prices for 12 regions that include 60 counties in New York. Price data are reported as an estimate of the average of the observed price distribution, include the average price range, and are screened for extreme or illogical values (Crawford, 2004). Price data is collected by the NYDEC through a mail survey of loggers, foresters, and other timber buyers for stumpage prices on private or public lands in which they were involved. The sample is dependent on voluntary responses, can be classified as a self selected sample, and may involve expert choice or judgment sampling (Sendak et al, 2001). Stumpage price regions and the log rule used in each region are shown in **Figure 5**.

Figure 5. Map of New York Stumpage Price Regions 1994-2004



Changes in stumpage region boundaries affect stumpage prices throughout the state. For example, in 1994 the DEC reduced the number of regions from 14 to 12, and each region changed its designation; regions I and J in 1994 became region C in 1995. It is important to note that stumpage price regions may change again in the future.

Note that in **Figure 5** different regions use different tree scale or volume rules. Tree volume rules are used to estimate the standing volume of the merchantable section of the tree, which affects stumpage prices per board foot. Although over 100 different tree volume rules exist, the Doyle, Scribner, and International  $\frac{1}{4}$  scales are the most widely used in the Northeast. Because the use of a particular log rule can significantly change the estimated volume of timber, and different regions in New York use different log rules, comparing stumpage prices between regions that use different log rules can be problematic unless the prices are converted to one rule.

Comparing stumpage prices with different log rules is similar to comparing different currencies; one cannot compare the price of a car in dollars with the price of the same car in Euros without converting the currencies. To compare stumpage prices of a species between regions that use different log rules, it is necessary to convert stumpage prices to one log rule. However, different regions have switched from one log rule to another over the past 25 years, which then makes standardizing log rules for all regions over time challenging. To convert a Doyle price to an International  $\frac{1}{4}$  price, divide by 1.659. For example, a Doyle stumpage price of \$800 per thousand cubic feet would be



\$482 in the International ¼ inch log rule. To convert a Scribner price to an International ¼ inch price, divide the Scribner price by 1.159<sup>1</sup>.

There are limitations to stumpage price data. Comparing prices over time or between locations may unintentionally include variables that are caused by differences in species, grade, product mix, and harvesting and production technology (Sendak et al, 2001). Adjusting for these is difficult in a practical price reporting system especially in a state as large and with as many counties as New York.

### **III. Species Analyzed in this Report**

This report will focus on 5 species that are the highest value and volume species of sawtimber in New York as of 2002: Black Cherry, Hard Maple, Red Oak, Red Maple, and White Ash. Because stumpage prices for the above species have generally kept pace with inflation over the past 25 years (Canham, 2004; Goff and Smallidge 2001), the focus of this report will be on trends in nominal stumpage prices from 1980 to 2004. Before trends in stumpage prices are discussed, it is important to understand the factors that drive stumpage prices.

## **Chapter II. Factors That Affect Stumpage Prices**

### **A. Overview of Supply and Demand Factors**

Demand for wood products is probably the most significant factor driving stumpage prices. Changes in major wood products markets have significant implications

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<sup>1</sup> These conversion factors assume that the average log has a 13-inch diameter at the small end

for stumpage prices and therefore timber management and harvesting decisions. For example, when housing starts decrease, so does the demand for the wood products (lumber, plywood, and particleboard) used in framing, flooring, and cabinets. In addition, increased demand for steel frame housing and metal in interior housing reduces demand for wood. When demand for items that require shipping on wood pallets goes down, so does demand for wood products. When consumers buy less wood furniture, the demand for timber declines. The net effect of these decreases in demand for wood products is eventually felt by the private landowner in New York, who is offered lower stumpage prices.

Demand for New York timber is also significantly affected by competition from other countries. For example, increases in furniture purchases do not necessarily lead to an increase in demand for U.S. timber if imported furniture is made at lower cost from wood from other countries.

The supply of stumpage is determined by the willingness of the approximately 500,00 forest owners in New York to place their timber on the market (Canham, 2004). Because landowners have many reasons for holding forestland, there exists a range of reasons for harvesting timber. Potential reasons for logging include the need for cash, the economic maturity of the woodlot, recreation enhancement, and improvement of wildlife habitat. Supply is also affected by trends towards conservation of large tracts of ecologically valuable forestland by landowners, conservation organizations, and the state.

## **B. Description of Common Factors Listed in NYDEC Stumpage Price Report**

Many other factors affect the stumpage price offered by a buyer to the landowner. The NYDEC stumpage price report lists 17 factors that influence the value of a specific stand of timber. In addition to the market forces described above, these factors include timber quality, logging terrain and accessibility, total volume offered for sale, species mix, average tree size, per acre harvest volume, distance to public roads and markets, landowner requirements such as performance bonds, season, and technological advancements in harvesting machinery and production (NYDEC, 2004). Local ordinances are also becoming a larger factor (Gerow, 2004). The effect of any of these factors on the price of a particular species may be more significant in certain areas of the state, although determining the exact effect of any of these factors on the stumpage price for a specific species in a particular region is difficult. Because stumpage prices are driven to some degree by each of these factors, it is necessary to provide a more detailed description of their effect on timber sales.

### **1. Product to be Manufactured from Timber**

If prices for intermediate and end products to be manufactured from timber increase, the stumpage price will usually also increase. This factor is closely related to the demand dynamics discussed above. As demand increases for high-end solid wood furniture, so will the stumpage price for Black Cherry. Likewise, the price of white ash has a positive relationship to the demand for end products that use wood handles such as axes and baseball bats; as demand for wood baseball bats decreases, so does the stumpage price of White Ash.

## **2. Timber Quality**

Large and straight trees that do not have outward defects such as branches, knots, or seams are considered the highest quality trees. The usable section of the tree that is closest to the ground is called the butt of the log. The main determinant of the value of a tree (up to 70%) is determined by the butt log (McEvoy, 2001; Smallidge 2004).

When managing a woodlot for timber quality, it is important to avoid the damaging practice of high-grading. High-grading removes all the commercially valuable trees from a woodlot, including young trees just reaching their growth or quality potential. This leaves a residual stand that contains trees of poor quality and poor species composition. High grading practices, such as diameter limit cutting, significantly reduce the quality of long-term timber production by leaving a woodlot with little future economic value.

## **3. Logging Terrain and Accessibility**

Anything that increases the costs of production of the timber buyer will decrease the stumpage price the buyer is willing and able to offer to the landowner. This holds regardless of the quality of the timber and species composition of the site. Most loggers in New York would probably prefer that all of their logging jobs be clear-cuts of the highest quality and value species, on well-drained soils, next to paved roads, close to mills, and without any landowner requirements for harvest management, since all of these conditions reduce their logging costs (Bardon, 2003).

Costs of production are especially affected by the logging terrain and accessibility of the site. Steep slopes require road building, poorly drained sites limit harvesting options, and anything else that has a negative impact on the quality of the terrain and accessibility of the site reduces the stumpage price offered to a landowner. For example, loggers prefer hard surface roads that reduce potential damage to the logs as well as minimize clean up requirements. Logs have a specific value delivered to the market, regardless of where the market is. Every dollar spent to get the log from stump to market is one less dollar available to pay for stumpage. Poor terrain and inaccessibility makes high-value timber worth less than under optimal conditions, and makes low-value timber almost worthless to the buyer if it does not cover the costs of hauling it out of the woods (McElvoy, 2003).

#### **4. Distance to Public Roads and Mills**

The distance of the landing to public roads and mills also significantly affects the costs of production. As a general rule, an increase in transportation costs decreases stumpage prices, although this is dependent on the efficiency of transportation in terms of the type of truck and road type. Building quality roads through the woods that can support heavy logging trucks is expensive; the more logging roads that have to be built, the higher the cost of production and therefore the lower the stumpage price. It is more efficient to minimize the distance from the landing to the pavement, as loaded logging trucks can travel five times faster on a paved road than a woods road (McElvoy, 2003). Once the logs are out the woods, the logger still has to take them to the nearest mill. Sites

that are far away from a mill not only increase the turnaround time of the logger, but also increase fuel cost.

#### **5. Total Volume Offered for Sale**

Because harvesting operations are highly mechanized, labor intensive, and require high capital investment, low volumes of timber may prevent a logger from covering his fixed costs of production and making a profit. A buyer is able to pay a higher stumpage price per unit if the cost per unit of production decreases. Stumpage prices therefore increase with a higher volume offered for sale, although this is less relevant if the timber is high quality.

#### **6. Species Mix**

The higher percentage of high value species in a timber sale, the higher stumpage price a buyer is willing to pay for the entire sale. In New York, the highest value species are black cherry, sugar maple, and red oak; even a few black cherry trees in a woodlot offered for sale can make other less valuable species more attractive to a buyer and raise the price of the entire sale.

#### **7. Per Acre Harvest Volume**

One of the main costs of harvesting timber is getting the timber from the stump to the landing; the more volume of timber the logger is able to harvest per acre, the lower their cost per unit of wood processed (McElvoy, 2001). A higher per acre harvest volume

increases the efficiency of the harvest, which translates into a higher stumpage offer from the buyer.

## **8. Average Tree Size**

Tree value usually increases with the age and size of the tree because more board feet are harvested from the tree, and the quality may be higher and therefore worth more per board foot (Goff and Smallidge, 1999). For example, the rate of tree growth and value of financially mature hardwood usually peaks at approximately 20-24 dbh (diameter at breast height). This is significant because larger logs reduce the costs of production per thousand board feet as well as increase the efficiency of production at the mill (McElvoy, 2001).

## **9. Landowner Requirements and Knowledge**

Every landowner has different goals and requirements for the sale of their timber. Most usually want to maximize financial return. But there are other goals such as providing room for good young trees for future growth, minimize disturbances to wildlife, minimize erosion and stream sedimentation from the logging and skidding roads, requirement of a bond from the logger to assure a satisfactory clean up of the site, and situating the landing area away from public roads to minimize unauthorized access. The goals and requirements of the landowner are a significant driver of the supply dynamics discussed above since it is the landowners who balance their financial and environmental goals when deciding how many acres of their woodlot they want to harvest. Landowner requirements are often in conflict with the wishes of the logger,

especially if those requirements increase costs and reduce volume from a harvest. It is important to remember and ensure that landowners are in full control of their land before, during, and after a harvest, and that their requirements are translated into workable actions on their property.

A landowner's knowledge of timber prices and markets is also very important. In most cases the landowner will have less knowledge about the product and price than a buyer, which can have a significant affect on the stumpage price offered (McElvoy, 2001). It is therefore prudent for a landowner to know as much as possible about stumpage markets, and to consider hiring a consulting forester before entering into a sale agreement.

#### **10. Season of Year**

Seasons can play an important role in stumpage prices, depending on the severity of the weather. For instance, some loggers prefer frozen logging roads provided by a cold winter since there is less mess with a solid logging road and therefore less owner complaints. However, too much snow or an ice storm can prohibit efficient harvesting or destroy the crop of an entire region. Also, heavy rainfall that saturates the ground can make logging roads dangerous, slow, and quite messy.

#### **11. Technological Advancements in Production**

Recent advancements in harvesting and manufacturing capabilities have made a major impact on the yield and value of many species in New York. Changes in technological capabilities, along with changing consumer preferences, are considered the



main drivers of increases in stumpage prices during the past 10 years (Crawford, 2004; Irland, 2004). Timber that was once considered too small or that had zero clear faces is now manufactured into a high value-added product. Mills are now able to produce engineered flooring from low quality logs. As manufacturers are able to utilize more veneer and make it thinner, the yield from veneer logs increases, which in turn leads to an increase in the price paid per unit and a change in what is considered veneer.

### **Chapter III. Trends in New York Stumpage Prices**

#### **A. Annual Percentage Rate of Change in Price for Selected Species in New York State 1980-2004**

In financial analysis, the relation of present and future values is expressed by a compound interest formula. The model is useful for estimating annual percentage rate of change (APR) in value for stumpage prices. Annual rates of change were estimated for each of the 5 species analyzed in this report across all 12 stumpage regions from 1980 to 2004<sup>2</sup>. The estimates for each species were then standardized to annual percentage rates, as shown below in **Table 3**.

The historical trends show that even large departures from long term stumpage price trends, due to changes in regions or log rules and seasonal anomalies, are eventually mitigated by market forces that drive the overall trend for each species. **Table 3** shows the rate of change for Black Cherry over the past 25 years to be slightly over 10%, the last ten years of which can be seen graphically in the following section in **Figure 6**.

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<sup>2</sup> The price trend and annual percentage rate of change for all regions and each species were estimated statistically. They were all significant at the 5% probability level.

**Table 3. Annual Percentage Rate of Change  
in Price For Selected Species in New York  
1980-2004**

Species	% Rate of Change
Black Cherry	10.23%
Hard Maple	11.04%
Red Oak	5.34%
White Ash	3.21%
Red Maple	5.36%

Black Cherry is the highest value and most demanded species for high-end furniture products in New York. For comparison, the average inflation rate over the same period was 4.95%, so all of the species (except White Ash) increased in value more than the increase in inflation.

The annual percentage rate of change of 11.04% for Hard Maple is the highest APR for all of the species in New York over the past 25 years. This is not surprising as the Hard Maple trend in **Figure 7** shows that the species has consistently commanded a high stumpage price, although it is only about 2/3 as high as Black Cherry. Preferences of consumers for light colored cabinets and other products have driven the increase in stumpage value of Hard Maple over the past decade (Canham, 2004). High quality Hard Maple is also able to grow in most areas of the state, another reason for its strong annual growth in value.

The annual percentage rate of change for Red Oak of 5.34%, while still positive, is approximately only half of the APR for Black Cherry and Hard Maple. The price of Red Oak rivaled Black Cherry until the early 90's, and used to be well above Hard Maple until the late 90's when increases in demand for light colored cabinets produced a sharper increase in the price of Hard Maple. Still, Red Oak is one of the highest value species and has shown steady growth in price over the past 25 years, as well as the past the past 10 years as illustrated by **Figure 8**.

Despite leveling off and even declining in price from 1994-2004 (**Figure 9**), White Ash had a positive APR of 3.21%. White Ash was higher in price than most species and used to be about the same price as Black Cherry until the late 80's, but demand for the products that are made of ash, such as wooden tool handles and baseball bat handles, has decreased since that time while the demand for cherry sharply increased (Canham, 2004).

The annual percentage rate of change for Red (Soft) Maple is expected to maintain itself or increase in the near future in New York. Also, advances in processes like color sorting and color matching make it possible to produce products from Red Maple with almost the same aesthetic appeal as Hard Maple (Canham, 2004). Despite its lower APR relative to other species over the past 25 years, Red Maple's status as the most abundant hardwood and as one of the closest substitutes for Black Cherry in the production of furniture bodes well for its future growth in stumpage price.

## **B. Trends in Selected Species**

The 5 price trend figures below (Figures 6-10) show the trends for the regions in Figure 5, page 15. (All prices discussed here have been converted to the International ¼ inch log rule.)

### ***Black Cherry***

Black Cherry is and always has been the highest value species growing in New York, with a price range over the past 2 years between \$600 and \$1000 per mbf (thousand board feet) throughout the state. Regions in Western New York have the highest prices, with prices decreasing as they move across the state to stumpage regions in Central New York, the Adirondacks, and then the Hudson Valley where prices are the lowest. The trend in decreasing stumpage prices from Western to Eastern New York is due in part to the fact that Western New York has site conditions that are more conducive to growing higher quality Black Cherry. Black cherry has maintained a consistently high price as it is considered the premier species for veneer and for furniture manufacturers of high-end solid wood furniture in New York and companies that purchase their timber from the northeast (Canham, 2004).

**Figure 6** shows the price trend for Black Cherry for each region in New York from 1994 to 2004<sup>3</sup>. More recent advances in manufacturing have also allowed furniture manufacturers to not rely on big logs of Black Cherry; manufacturers are now able to use smaller pieces of cherry that they previously would have discarded by increasing the

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<sup>3</sup> Color versions of all graphs are available upon request.

efficiency of their cuts and developing the ability to join and laminate small pieces together.

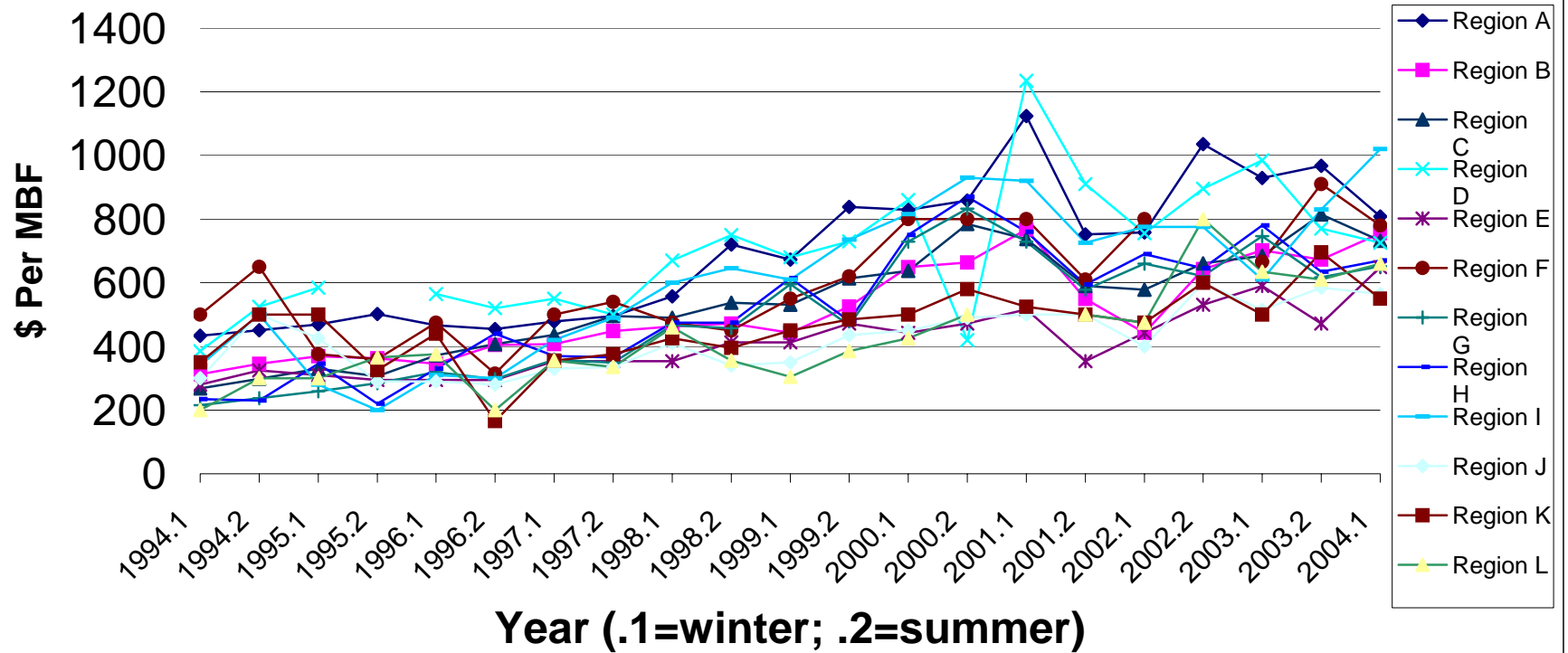
### ***Hard (Sugar) Maple***

Hard Maple has been the second highest priced species over the past few years, and has shown steady growth in price across all regions in New York since 1994 (**Figure 7**). The price range throughout the state has been approximately \$400 - \$600 per mbf over the past 3 years, and is steadily trending upward in most regions. Although there are a few instances where prices in particular regions experienced a significant drop while others surged, the trend of decreasing prices from eastern to western New York is less pronounced in the Hard Maple series, a result of its ability to grow quality logs in most areas of the state.

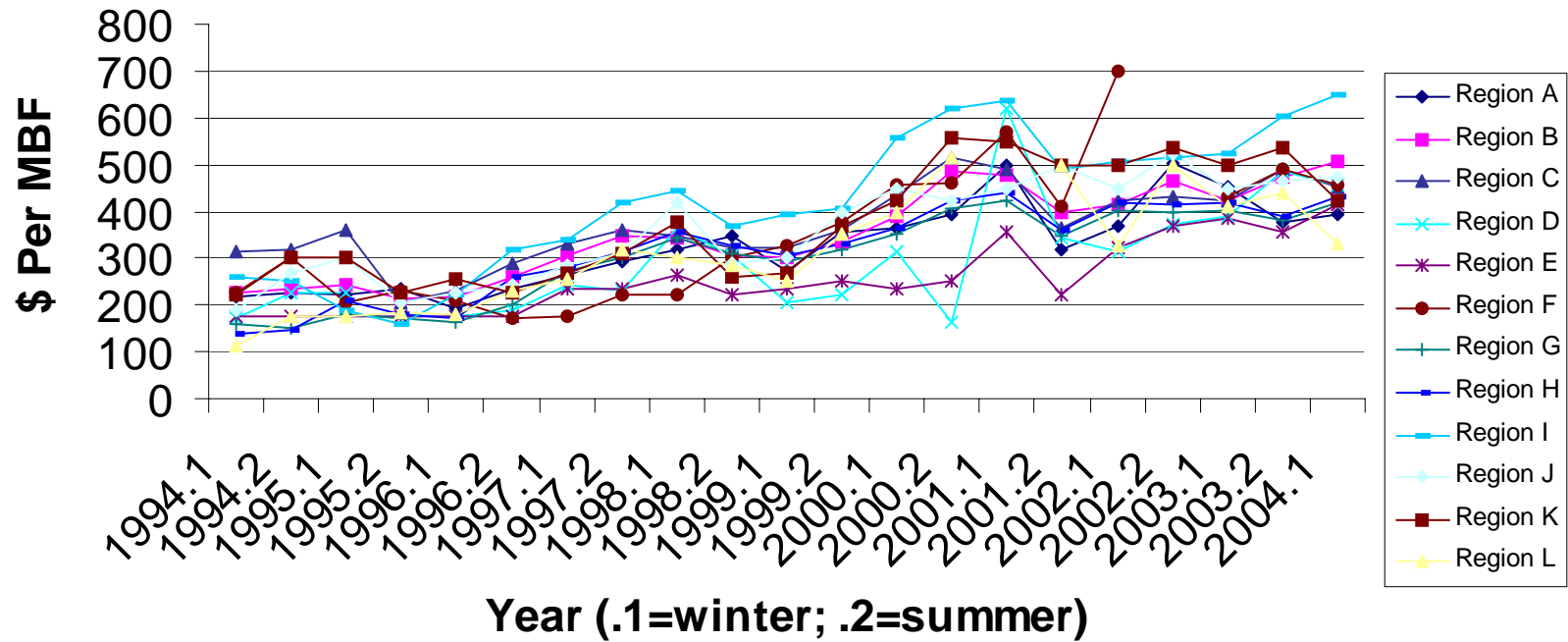
### ***Red Oak***

Red Oak is the third highest value species in New York, and has experienced a steady increase in price from 1994-2004 as illustrated by **Figure 8**. Red Oak consistently commands a stumpage price between \$300 and \$600 throughout the state. Red Oak experienced a significant price increase in the 70's and 80's due to changes in demand for solid wood furniture, and used to compete with Black Cherry for the highest stumpage prices in the state, but has tapered off over the past decade as markets have changed leading to a downward shift in demand (Canham, 2004). In some regions, however, Red Oak still commands stumpage prices that are higher than Hard Maple.

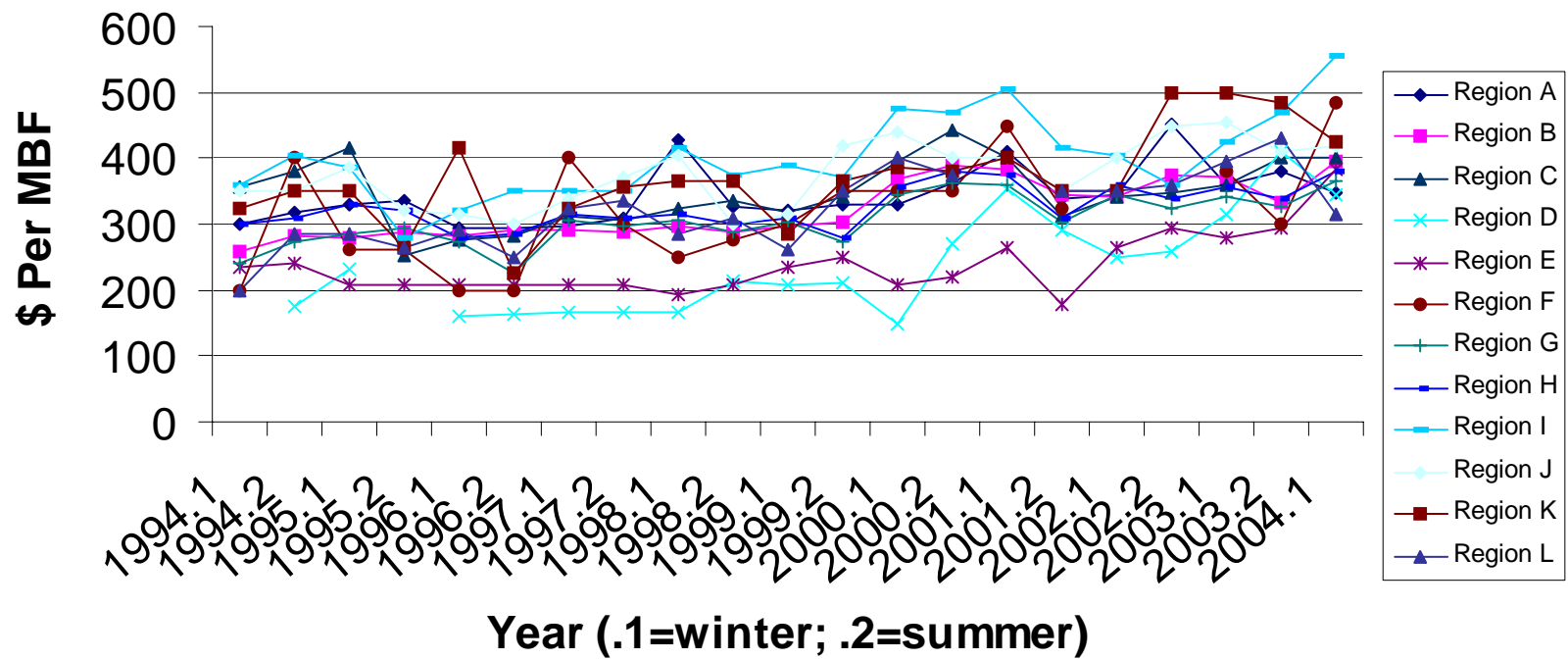
### Figure 6. NY Black Cherry Stumpage Prices 1994-2004 (International 1/4 inch Log Rule)



**Figure 7. NY Hard Maple Stumpage Prices 1994-2004 (International ¼ inch Log Rule)**



### Figure 8. NY Red Oak Stumpage Prices 1994-2004 (Int'l 1/4-inch Log Rule)





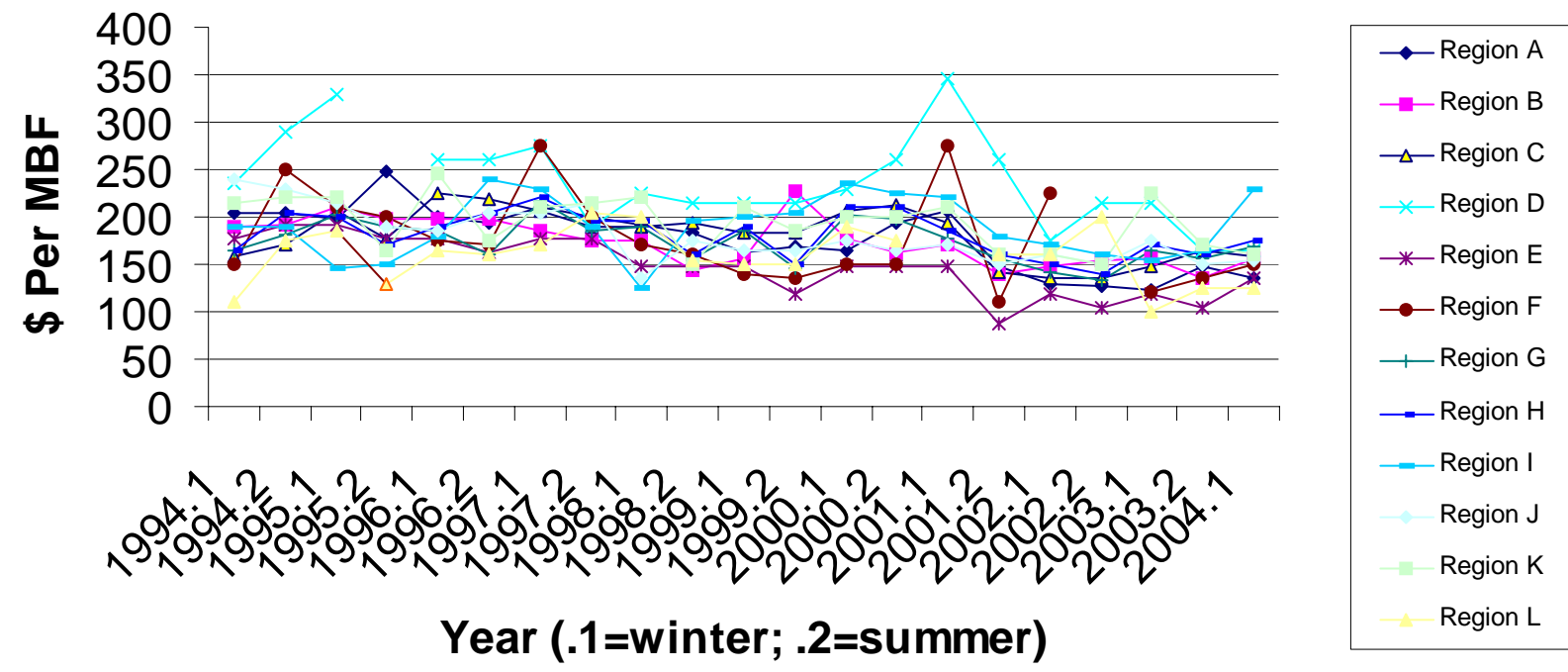
### ***White Ash***

Stumpage prices for White Ash have been steadily declining from 1994-2004 (**Figure 9**), a trend that is expected to continue due to changes in market forces. White Ash used to be a premier species in terms of stumpage prices paid in most regions, but shifts in baseball bat markets towards aluminum and decreases in demand for its other uses like wooden tool handles really hurt its stumpage value. Consumption of White Ash in New York is expected to drop sharply as mills that once utilized ash have gone or are going out of business.

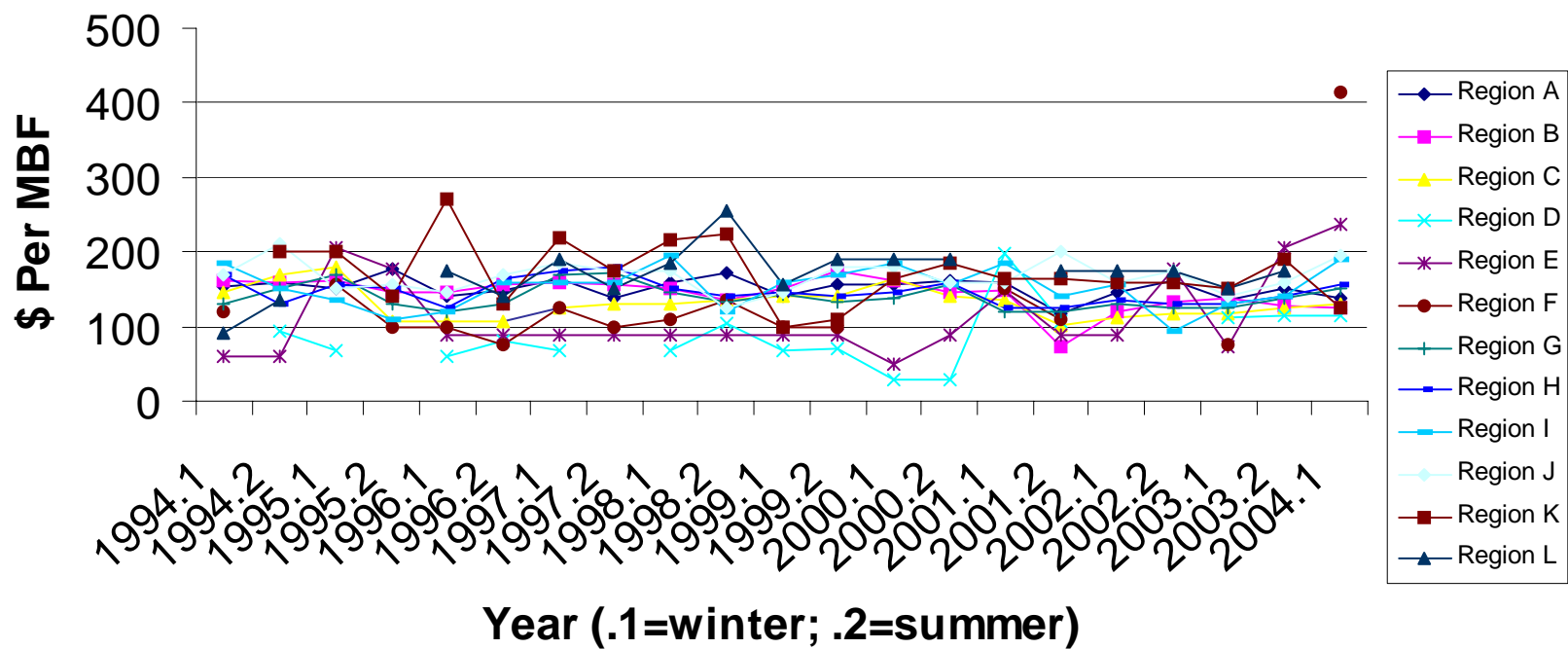
### ***Red (Soft) Maple***

Red maple (**Figure 10**) is currently the fifth highest value species, although that is expected to change with the downward trend in White Ash value. Red Maple is the dominant species in terms of volume in the state, and remains a particularly strong grower on old farm land. Because of its abundance, high demand, and substitutability for Black Cherry, mills have developed more efficient ways of producing Red Maple, which further supports its current and future status as a species to manage for across the state.

### Figure 9. NY White Ash Stumpage Prices 1994-2004 (Int'l 1/4-inch Log Rule)



### Figure 10. NY Red Maple Stumpage Prices 1994-2004 (Int'l 1/4-inch Log Rule)



### **C. Current and Future Trends**

Changes in international markets are changing New York timber markets. About 25%, or 200 million board feet, of New York timber goes to Canada each year (Crawford, 2004). Canadian mills are able to pay prices for timber that are unheard of in New York, as provincial governments in Canada are able to effectively subsidize their mills with low interest rates. While this is good for the landowners in New York who are receiving high stumpage prices for low-end logs, it may prove difficult for local mills that face increasing competition from Canadian mills. Because New York can grow some of the highest quality Black Cherry, Hard Maple, Soft Maple, and Red Oak, woodlot owners in New York will continue to realize the benefits of changes in market forces.

The second main factor that will drive future stumpage prices in New York is technological advancements in the utilization of different qualities of logs, which is closely related to the changing market forces discussed in the previous paragraph. The definition of what is considered veneer is changing as Black Cherry, Hard Maple, Soft Maple, and Red Oak logs that a few years ago would have been used for firewood or sawlogs because of defects or small size are now able to be manufactured into high-end furniture through more efficient cutting and laminating techniques. For example, Canadian sawmills have offered as much as \$350 per mbf for zero clear face logs, or logs that have outward defects such as knots on all sides of the logs (Crawford, 2004). New drying techniques have also increased the grade recovery of hard maple in New York, minimizing the staining of kiln-dried maple while driving the stumpage price upward. New York landowners will clearly benefit from these advancements in the form of higher stumpage prices for varying qualities of species used for products in high demand.

## **Chapter IV. Implications for Timber Management and Harvesting Decisions**

How do the trends discussed above influence timber management and harvesting decisions? Understanding the characteristics of and recent trends in stumpage prices provides insight into how forest landowners should manage their woodlots for optimal timber production.

### **A. What to Harvest and When to Cut**

**Table 4** illustrates the general size requirements, in terms of diameter at breast height, for various timber products. (These size requirements are intended to be illustrative.)

Sawtimber refers to trees capable of supplying logs for the production of lumber (for decking and flooring), veneer (for cabinetry and furniture) and other high-end wood products. Although one important goal of timber management can be the harvest and sale of high quality veneer, veneer comprises less than 10% of the volume of a typical timber sale, and some timber sales may yield no veneer at all (McElvoy, 2001). When following trends of different timber products such as furniture or pallets, it is therefore useful to know what products your woodlot contains in order to make a more informed decision with regard to which trees can and should be harvested and for what purpose.

Determining when to harvest is one of the most important aspects of a profitable timber sale. Harvesting trees as soon as they are financially merchantable (i.e. the tree has enough wood fiber to meet the costs of extraction and processing) is not usually the best course of action, unless time is a factor as in the event of a financial emergency. **Table 5** provides an overview of how stumpage value increases relative to the size and grade of a

sugar maple tree on a managed site that is in good condition; the relationships between the diameter, height, grade, and value of a particular tree are crucial elements of profitable timber management.

As shown in **Table 5**, high quality hardwoods such as Sugar Maple at 12" DBH have a low value, although their rate of growth in terms of merchantable height is high. From 16"-20" DBH the tree moves up in log grade and growth in height continues, although at a slower rate. Hardwoods typically reach financial maturity at 20"-24" DBH on good sites, or 16"-20" on poor sites, as their grade peaks and the annual rate of growth slows to 1.5% (Goff and Smallidge, 1999). Because the value of an individual tree is a function of the quality of the lumber or veneer as well as the amount of wood fiber it contains, it follows that tree value increases as trees grow because they attain larger volume, shift into the next higher grade, and are worth more per board foot (Goff and Smallidge, 1999). These values are potential values, and vary according to factors such as site conditions, species, damage from disease or insects, and stand management; growth rates may be two-thirds higher in managed stands versus unmanaged stands (Smallidge, 2004).

**Table 4. General Sizes for Various Timber Products: An Illustration**

<b>Timber Type:</b>	<b>At Least:</b>
<b>Softwood</b>	
Pulpwood	6" DBH to a min. 3" top diameter
Sawtimber	No min. DBH to a min. 4" top diameter
Veneer Log	No min. DBH with clear/straight first log
<b>Hardwood</b>	
Pulpwood	6" DBH to a min. 3" top diameter
Sawtimber	8" DBH to a min. 7" top diameter
Veneer Log	No min. DBH with clear/straight first log

Source: Bardon, 2003, Crawford 2004. Remember, these sizes are illustrations. Actual sizes harvested can be significantly different.

**Table 5. Stumpage Value Illustration for Sugar Maple Trees Based on Size and Grade**

DBH*	# of	Volume		Dollar Value	Age	Dollar Value Annual	
(inches)	16 ft. logs	(board feet)**	Grade***	per thousand	of	per tree	Compound
				board ft.****	Tree	(Sawtimber)	Growth
							Rate*****
12	1.0	58	3	\$125	50	\$17	8.50%
14	1.5	110	2 or 3	200	60	\$44	8.50%
16	2.0	183	2	300	70	\$73	8.50%
18	2.0	240	1 or 2	400	80	\$204	3.00%
20	2.5	360	1	550	90	\$259	3.00%
24	3.0	628	1	550	110	\$458	1.50%
28	3.0	877	1	600	135	\$635	1.50%

\* DBH = Diameter at breast height or 4.5 feet off ground

\*\* Int'l ¼ inch log rule

\*\*\* Grade classification of butt log: 1 = highest quality. These are typical grade changes with size

\*\*\*\* Based on quantity and quality of expected yield of 1-inch lumber, 1998 stumpage value.

\*\*\*\*\* Does not include inflation, but quality sawtimber value generally matches or exceeds the inflation rate

Sources: Goff, Gary and Smallidge, Peter (1999). Tree value: A Basis for Woodland Management.  
Goff, Gary, Lassoie, James, and Katherine Layer (1995). Timber Management for Small Woodlands.



**Table 6** illustrates the age at which different species reach financial maturity in a managed stand on a good site. A tree has reached financial maturity when it is no longer increasing in value at a profitable rate (Goff and Smallidge, 1999). Because of the different factors that affect growth mentioned in the previous paragraph, the table provides only a general framework; actual harvesting decisions depend upon specific circumstances.

As illustrated by Tables 5 and 6, taking advantage of current trends in stumpage markets should be balanced with a long term perspective based on the relative financial maturity of each species in a stand. That said, if a species or stand has reached financial maturity and is in high demand or otherwise experiencing a high stumpage value, it is wise to consider a timber harvest.

## **B. The Importance of Hiring a Professional Forester**

Seeking the input of a professional forester when conducting a timber harvest not only helps ensure that the buyer is adhering to the wishes of the landowner in each step of the process, but can make a difference of thousands of dollars in revenue. Woodlot owners who receive assistance from a professional forester can average 23% more income per acre, a 64% percent higher price per board foot, and an estimated future stream of income of 120% more as a result of better management for regeneration and stocking (Bardon, 2003; Cabbage et al, 1996). As experienced by one woodlot owner in New York, the hiring of a professional forester can result in significantly greater revenue than originally offered by a logger, and can help ensure that landowner requirements such as location of the access road, a satisfactory clean up, and minimal

**Table 6. Average Age at Which Timber Species Reach Financial Maturity (24 inch DBH) in Managed Stands on Good Sites**

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65-75 Years	75-95 Years	95-124 Years	125 Years or More
White Pine	Black Oak	Hemlock	White Oak
Tulip Poplar	Black Cherry	Sugar Maple	Chestnut Oak
Red Oak	White Ash	Red Maple	
Red Pine	Basswood	Yellow birch	
		Hickory	
		Beech	

Source: Goff and Smallidge, 1999

damage to the residual stand are met (Schaufler and Chapman, 1997). The extra cost of hiring a professional forester to assist in the harvest and sale of timber can be outweighed by the potential increase in income from the sale as well as the improved regeneration of the forest.

## **Chapter V. Conclusion**

The forest resource in New York represents a significant portion of the state's total land area, and is vital to the economies of many rural communities in the state. Because 85% of all of the timberland in the state is owned by non-industrial private owners, it is the objectives of these owners and their decisions to harvest and sell timber or pursue other goals related to environmental objectives that will determine the future of the forest products industry in the state and the condition of the forest.

Forest owners, managers, and potential investors are interested in the price trends and outlook for New York timber. Stumpage price trends are very important to those who have an interest in New York timber markets, especially landowners and analysts who use price trends for a variety of business and resource management purposes. However, users of price trend information should be cognizant of the inherent limitations in price reporting for a nonstandard product like stumpage, and be conservative with stumpage price expectations (Sendak, 2001; Irland 2004).

This report estimated price trends from 1980-2004 for Black Cherry, Hard Maple, White Ash, Red Oak, and Red Maple across all 12 stumpage regions in New York. Over the entire period, the price trend and annual percentage rate of change for all regions for

each species are positive. For all the species, except White Ash, prices rose more rapidly than inflation. The historical trends show that even large departures from long term stumpage price trends, due to changes in regions or log rules and seasonal anomalies, are eventually mitigated by market forces that drive the overall trend for each species.

“Prices over time will continue to increase for high quality wood products. And the way to obtain high quality wood products is through good forest management” (Gerow, 2004).

Looking to the future, we expect the general picture to be one of continuing short-term fluctuations in prices, but in the long term the overall trend will continue toward increasing prices.

# **Appendix A: Examples of Calculating Stumpage Value**

## Appendix A: Examples of Calculating Stumpage Value

### Estimating Hypothetical Stumpage Value of a Sugar Maple and Black Cherry

- Sugar Maple 16” one log = 74 bf
- Sugar Maple 16” one log = \$56.98
  - $74\text{bf}/1000\text{bf} = .074$
  - $.074 \times \$600 \text{ per mbf} = \$44.40$
- Sugar Maple 19” two logs = 202 bf
- Sugar Maple 19” two logs = \$155.54
  - $202\text{bf}/1000\text{bf} = .202$
  - $.202 \times \$600 \text{ per mbf} = \$121.20$

- 
- Black Cherry 18” one log = 104 bf
  - Black Cherry 18” one log = \$128.96
    - $104\text{bf}/1000\text{bf} = .104$
    - $.104 \times \$1240 \text{ per mbf} = \$128.96$
  - Black Cherry 22” two logs = 305 bf
  - Black Cherry 22” two logs = \$378.2
    - $305\text{bf}/1000\text{bf} = .305$
    - $.305 \times \$1240 \text{ per mbf} = \$378.2$

Note: “mbf” means 1,000 board feet.

# **Appendix B:**

## **Sample Prospectus and Bid**

## Appendix B: Sample Prospectus and Bid

### SALE OF FOREST PRODUCTS - NOTICE OF SALE 04-2

Posted June 23, 2003.

Bids Due July 14<sup>th</sup>, 2003. Bid opening at 3:00 PM

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The following sawtimber stumpage is offered for sale by Cornell University at Arnot Teaching and Research Forest, 611 County Route 13, Van Etten, NY 14889. (607) 589-6095 [voice and fax].

The sawtimber sale is located in the Town of Newfield, Tompkins County NY on 45 acres approximately 6 miles southwest of the hamlet of Newfield, NY, in Lot 33 west (see maps). Closest access to sale area is via Irish Hill Road.

#### **Sawtimber Marked for Sale**

Species	# of Sawtimber Stems	Volume (MBF Doyle)
Sugar Maple	149	18.132
Red Oak	116	23.707
Ash	72	15.300
Red Maple	115	15.117
Hemlock	107	10.094
Basswood	72	5.962
Chestnut (Rock) Oak	6	0.741
<b>TOTAL</b>	<b>637</b>	<b>89.053</b>

**Minimum Bid For Sawtimber:**                      **\$30,000**

This sawtimber sale gives the successful bidder the option of negotiating for the purchase of an additional 225 tons of scrag and firewood located within the sale area.

#### **Tree Marking within Sale**

- All sawtimber trees for sale have been stump marked.
- All trees reserved as “seed trees” and not to be cut or damaged have a paint mark at DBH. All trees with paint at DBH will be left standing.
- Scrag and firewood available for negotiated sale to successful sawtimber bidder. Scrag and firewood 10” DBH and larger have a stump mark. Once negotiated, all trees smaller than sawtimber and without a DBH mark can be cut for firewood.

#### **Sale & Harvest Considerations**

1. The volume of standing trees was estimated and is based on the Doyle rule. Volume estimates and cull deductions were made in the field. Seller does not guarantee the estimated quality or quantity of the stumpage advertised. Trees for



- sale are marked only with ORANGE stump marks. Leave trees are marked with an ORANGE stripe at DBH and no stump mark. “Leave/Seed” trees are not for sale and should not be damaged during logging. “Leave/Seed” trees are the seed source for the next stand. Trees should be cut using directional felling techniques to minimize damage to residual stand. All personnel must wear appropriate personal protective equipment such as hard hat, eye and hearing protection, and chainsaw chaps.
2. The skid trails and landings will be laid out by the Seller prior to the removal of any stumpage. Only skid trails marked [flagged] by the Arnot Forest Manager may be used. Most skid trails in this stand were established during a previous harvest and will be re-flagged for this sale. Forest manager will flag any new skid trails at approximately 120 foot intervals. No additional skid trails may be installed without permission of Arnot Forest Manager. All skid trails must be left open after logging. All trees must be winched to the marked skid trails. Skid trail restrictions are to minimize damage to root systems and stems of residual trees.
  3. Logging will not be allowed when ground conditions will not reasonably support equipment. **NO MUD SEASON OR WET GROUND LOGGING** will be allowed.
  4. A maximum of 35 earthen diversion structures (waterbars) will be constructed following completion of the sale to control erosion. These structures will be located by the Arnot Forest Manager and installed by Buyer to meet current BMP specifications for depth and angle.
  5. The successful bidder will supply Arnot Forest Manager with a tally of all material harvested by species and scale upon completion of job. This is for research purposes only.
  6. Upon completion of the sale the main haul road and skid trails will be regraded and left in a condition for farm tractor travel. All skid trails must be left open after logging. Landing areas will be cleared of debris and regraded and left in a neat clean condition. This work is to be performed to the satisfaction of Cornell University.
  7. Bids will be accepted in person, by mail, or fax sent to **ARNOT FOREST TIMBER BID 04 - 2 ARNOT FOREST 611 C.R. 13 VAN ETTEN, NY 14889**. Fax number is 607 589 6095. Bids will be opened at **3:00 PM July 14, 2004** at Arnot Forest Manager’s Office.

### **Terms of Bid**

The Seller reserves the right to reject any and all bids. Successful bidder will be notified in writing by the Seller within five days of the bid deadline.

### **Terms of Sale**

The sale will be on a lump sum basis. The successful bidder will be required to execute a written contract within fifteen days of notification of the award. Payment for all materials will be made when the contract is executed. The contract can be reviewed or a

copy obtained prior to the bidding by contacting 611 County Route 13, Van Etten, NY 14889. The terms of such contract are incorporated by reference herein.

The executed contract must be accompanied by a surety bond in the form of certified check or cash in the amount of 10% of the bid price or three thousand dollars whichever is greater. Surety bond ensures the faithful performance of the contract. Seller reserves the right to retain this performance bond in the event the contract is not fulfilled.

The successful bidder will remove all equipment and materials from Seller's land by **February 28, 2006**. All materials remaining on Seller's land after that date become the property of the Seller unless otherwise agreed upon.

The successful bidder will satisfy all Workers Compensation and liability insurance requirements imposed by the contract and the laws of the State of New York. The successful bidder will provide at his own cost and expense a policy of liability insurance in limits of at least \$1,000,000 and property damage in the amount of \$100,000 naming Cornell University as an additional insured. Said policy shall be written by an insurance company authorized to do business in the State of New York. A Certificate of Insurance will be delivered to Cathy ZZZ, no later than fourteen days prior to commencement of harvest.

**BID SHEET - ARNOT FOREST SALE 04 – 2 (stand 1-3)**

I have examined the forest products offered for sale by Cornell University at Arnot Forest Van Etten, NY 14889 and hereby place the following bid in accordance with the terms of the advertisement.

\_\_\_\_\_ Dollars and \_\_\_\_\_ cents

\$\_\_\_\_\_.

If I am the successful bidder, I agree to abide by the terms of the agreement and to execute the contract within fifteen days of notification of the award and to pay the bid price as agreed upon when the contract is executed.

\_\_\_\_\_  
Company Name

By \_\_\_\_\_  
\_\_\_\_\_

Signature \_\_\_\_\_  
\_\_\_\_\_

Title \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date \_\_\_\_\_

Note: At time of contract signing, the successful bidder has the option to negotiate for 225 tons of scrag & firewood within the sale area.

# **Appendix C: Sample Contract**

## Appendix C: Sample Contract

### Contract for the Sale of Standing Timber

This contract made this \_\_\_\_ day of August, 2004, by and between CORNELL UNIVERSITY, c/o Real Estate Dept., Box DH, Cornell University, Ithaca, N.Y., 14853, hereinafter referred to as Seller, and XXX HARDWOOD, LLC, P.O. Box 68, Cayuta, NY 14824, hereinafter referred to as Buyer.

#### 1. SALE

Seller shall sell and Buyer shall purchase from Seller, on the terms and conditions stated, all standing timber, as defined in this contract, growing on and forming a part of real property owned by Seller in **Tompkins** County, New York, described as set forth on Schedule A attached hereto and made a part hereof.

On payment of the purchase price, buyer and buyer's representatives, contractors, and assigns, shall have full and free right and license to enter on the described real property and to cut and remove timber, provided, however, the cutting and removing of timber shall be accomplished and finally completed by February 28, 2006.

#### 2. DESCRIPTION OF TIMBER TO BE CUT AND REMOVED:

Buyer shall pay for and remove the following described timber:

##### SAWTIMBER:

<u>SPECIES</u>	<u>NUMBER</u>	<u>VOLUME</u>
Red Oak	116	23.707
Sugar Maple	149	18.132
Red Maple	115	15.117
Ash	72	15.300
Hemlock	107	10.094
Basswood	72	5.962
Rock Oak	6	.741
<u>TOTAL</u>	637	89.053 MBF Doyle

The sawtimber is located in the Town of Newfield, Tompkins County, on 45 acres approximately six (6) miles southwest of the hamlet of Newfield, N. Y., in Lot 33 west (see sale area map).

Trees for sale are marked with orange stump marks only. Leave trees as marked with an orange paint stripe at DBH and no stump mark. These trees are not for sale. They are the seed source for the next stand. Trees should be cut using directional felling techniques to

minimize damage to residual stand. All personnel must wear appropriate personal protective equipment such as hard hat, eye and hearing protection and chainsaw chaps.

### 3. METHOD OF MEASURING TIMBER

The volume of standing trees was estimated and based on the Doyle Rule. Volume estimates and cull deductions were made in the field. Seller does not guarantee the estimated quality or quantity of the stumpage advertised. Seller makes no representations or warranties as to the quality or quantity of the timber and Buyer enters at his own risk, accepting the premises and product in "As Is" condition.

### 4. TERM OF CONTRACT

The term of this agreement shall commence upon payment to Seller as provided under Section Five (Price and Terms of Payment) and terminate on February 28, 2006. The Buyer will remove all materials from Seller's land by February 28, 2006. All materials remaining on Seller's land after that date become the property of the Seller unless otherwise agreed upon.

### 5. PRICE AND TERMS OF PAYMENT

Forty-five Thousand Seven Hundred Fifty-one Dollars (\$45,751.00) being the consideration due Seller under terms of this agreement, shall be paid by Buyer upon execution of this agreement. All checks covering payments hereunder shall be certified check, bank order or money order.

Buyer shall pay the following penalties if any unmarked or otherwise undesignated trees are damaged by Buyer:

One hundred Dollars (\$100.00) per tree, and in addition, Buyer shall pay Seller three times the market value of such tree, as reasonably determined by Seller.

### 6. ROADS AND FACILITIES

a. The location of all truck roads, main skid trails, landings, stream crossing areas and other operation installations must be approved by Seller prior to commencement of construction or removal of any stumpage.

b. Buyer has the option to upgrade the main skid trails to haul roads suitable for truck travel.

c. Upon completion of the sale, main haul roads and skid trails will be regraded and left in a condition suitable for farm tractor travel. Landing areas will be cleared of

debris and regraded and left in neat condition. This work is to be performed to the satisfaction of Seller.

d. Buyer shall assure that all existing roads, fire lanes, and public highways on the contract area shall be kept clear of tops, logs, brush or other obstructions and any damage caused to roads, ditches, rails, bridges, fences, telephone lines, etc. shall be promptly repaired at the expense of Buyer.

e. Buyer shall secure and maintain all necessary rights-of-way over privately owned roads and land.

f. A maximum of **thirty-five (35)** earthen water diversion structures (broad based dips) will be constructed by Buyer following a completion of tree removal to control erosion. The location and suitability of these structures will be determined by the Seller's Forest Manager.

## 7. HARVESTING PRACTICES

a. Logging will not be allowed whenever ground conditions, in judgment of Seller, will not reasonably support equipment used.

b. Only those trees which have been marked or otherwise designated by Seller shall be cut by Buyer under the terms of this agreement. All trees so marked or designated shall be cut by Buyer. Any marked or designated trees which are not cut shall nevertheless be paid for at the unit price fixed by the terms of this agreement.

c. Stumps shall be cut at a height above the ground, measured on the uphill side, no greater than their diameter.

d. Utilization shall be to a minimum top diameter as desired by Buyer.

e. Winching from stump to the main skid trail will be done with minimal damage to the residual stand.

f. Skidding will be allowed by a vehicle with blade attached, provided blade width does not exceed vehicle width.

g. Skidding equipment shall be kept back from stream edges at least fifty (50) feet. Logs lying closer to the stream edge shall be winched away.

h. Harvesting equipment shall not be allowed in any stream except at crossing designated by Seller.

i. Trees shall not be felled into or across stream channels. Any logging debris falling in any channel shall be removed immediately at Seller's discretion.

j. No harvesting operations in conjunction with this sale will be allowed on adjacent lands without Seller's permission. Any damage to adjacent property shall be promptly repaired at the expense of Buyer.

k. Buyer, in removing said products, shall use due care to avoid damage or injury to the property of Seller, and Buyer shall leave the premises and surrounding areas used by him for any purpose in a neat and clean condition as approved by Seller.

## 8. FIRE PRECAUTIONS

When in the opinion of Seller the fire hazard on the contract areas justifies increased precautions, Buyer shall perform and carry out such additional preventative and precautionary measures as may be prescribed by Seller. This does not in any way relieve responsibility of Seller and Buyer, respectively, to exercise reasonable care in the avoidance of fire.

## 9. INSURANCE/INDEMNIFICATION

Buyer shall provide evidence of Comprehensive General Liability insurance with limits at a minimum of One Million Dollars (\$1,000,000.00) with property damage insurance limits in the amount of at least One hundred Thousand Dollars (\$100,000.00). Said policy shall be written by an insurance company authorized to do business in the State of New York and shall name Cornell University as additional insured. A copy of said Certificate of Insurance shall be delivered to Seller on or before execution of this Agreement.

Proof of Worker's Compensation insurance coverage as required by New York State must be supplied by Buyer on or before execution of this Agreement. At no time shall any of Buyer's employees be considered employees of Seller, its agents or assigns.

Buyer will indemnify and save Seller harmless from any loss, cost, or expense of any sort or nature, and from any liability to any person on account of any damage to person or property due to or arising out of this contract or Buyer's operations.

This agreement is made upon the express condition that Cornell shall be free from all liabilities and claims for damages and/or suits for or by reason of any injury or injuries to any person or persons or property of any kind whatsoever, whether the person or property of the buyer, its agents or employees, or third persons, from any cause or causes whatsoever while in or upon such premises or any part thereof during the term of this agreement or occasioned by any occupancy or use of said premises or any activity carried on by buyer in connection therewith.



10. TAXES AND LIENS

Buyer shall pay all taxes, if any, levied on any improvements placed by Buyer on Seller's real property and shall indemnify Seller against all liens and claims of any kind arising out of Buyer's operations or the presence of Buyer's equipment on real property.

11. SECURITY/PERFORMANCE BOND

Before this agreement shall be in force and effect, Buyer shall deliver a good and sufficient bond in the sum of **four** thousand **five** hundred **seventy five** dollars with a surety company doing business in the State of New York (or certified check in lieu of bond) as minimum security for the faithful performance of all of buyer's obligations under this agreement. Buyer shall maintain the bond until all obligations due Seller from Buyer have been satisfied. Such bond or sum shall not in any way limit Buyer's liability hereunder or be construed as liquidated damages for any purpose.

12. RISK OF LOSS

Risk of loss to timber subject to removal and an insurable interest in such timber shall pass to Buyer at time of sale.

13. MODIFICATION

Should there be any changes, additions, or modifications of the terms, stipulations, and conditions of this contract, such changes, modifications, additions, or revisions, as the case may be, shall be initialed by the respective parties or their authorized agents.

14. CONSENTS AND WAIVERS

All consents, waivers, agreements, elections, and determinations under this agreement shall be in writing and be signed by the parties or their authorized agents; otherwise, such instruments shall not be effective.

15. ASSIGNMENT

Buyer shall not assign, transfer, convey, subcontract or otherwise dispose of this agreement or any of its rights, title or interest herein without the prior written consent of Seller.

16. GOVERNING LAW

Buyer will perform all operations under this agreement in accordance with the rules and regulations of the Seller, the laws of the State of New York, and the laws of the United States of America.

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands and seals the day and year first above written.

Date: \_\_\_\_\_

SELLER: CORNELL UNIVERSITY

By: \_\_\_\_\_  
John ZZZ, Director  
Real Estate Department

Date: \_\_\_\_\_

BUYER: XXX HARDWOOD, LLC

By: \_\_\_\_\_

State of New York )  
 ) ss:  
County of Tompkins )

On this \_\_\_\_\_ day of August, 2004, before me, the subscriber, personally appeared John ZZZ, who being by me personally known, did depose and say that he resides in Ithaca, New York and that he is the Director of the Real Estate Department of Cornell University, the corporation described in the within instrument and that he is authorized to execute said document and he signed his name thereto by such authority.

\_\_\_\_\_  
Notary Public

STATE OF NEW YORK )  
 ) ss.:  
COUNTY OF TOMPKINS )

On this \_\_\_\_\_ day of August, 2004, before me, the undersigned, a Notary Public in and for said State, personally appeared \_\_\_\_\_, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that she/he executed the same in her/his capacity, and that by her/his signature on the

instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

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**Notary Public**

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